

A Guide to OSHA's Revised General Industry Walking-Working Surfaces and Fall Protection Standards

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Our Mission Is To Educate Our Clients...Protect Your Company's Assets... And Keep Your Employees Safe While Working At Heights

Congratulations for taking the time to educate yourself on OSHA's updated Slips, Trips, and Falls Standards. This e-book is a comprehensive guide to the Occupational Safety and Health Administration's final ruling on Walking-Working Surfaces (29 CFR Part 1910, Subpart D) and the general industry Personal Protective Equipment Standards (29 CFR Part 1910, Subpart I).

The revised ruling is over 500 pages in length and the new requirements will impact over 112 million employees at an estimated 6.9 million general industry establishments. With many of the provisions of this detailed final ruling becoming effective in January of 2017, many safety professionals are wondering about the steps they need to take in order to ensure their company's compliance. We hope this guide helps.

Diversified Fall Protection has served clients spanning a wide range of industries since 1994. Our holistic, managed approach to safety ensures full compliance with all OSHA fall protection regulations and safeguards the well-being of your employees.

If you have questions about OSHA's new ruling, feel free to contact Diversified Fall Protection for further clarification.

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Chapter 1

Overview

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Overview of OSHA's Final Ruling on Walking-Working Surfaces and Fall Protection Systems

OSHA efforts to revise and update existing walking-working surfaces standards have been ongoing since 1973. During this time, OSHA has gathered and analyzed huge amounts of data and information on walking-working surface hazards and methods to prevent and eliminate them.

Although OSHA's final ruling has been long in the making, the agency's work is vital to the protection of the U.S. work force. According to Bureau of Labor Statistics (BLS) data, falls from heights are among the leading causes of serious work-related injuries and deaths. OSHA estimates that, on average, approximately 202,066 serious (lost-workday) injuries and 345 fatalities occur annually among General Industry workers directly affected by the final standard.

OSHA's final rule on Walking-Working Surfaces and Personal Fall Protection Systems better protects workers in general industry from these hazards by updating and clarifying standards and adding training and inspection requirements. OSHA estimates implementation of the new Walking-Working Surfaces ruling will yield over \$300 million annually in monetized employer benefits by preventing fatalities and lost-workday injuries.

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Net Benefits of the Final Revision to OSHA's Walking-Working Standards

Annualized Costs	
§1910.22 General Requirements	\$33.2
§1910.23 Ladders	\$11.3
§1910.24 Step Bolts and Manhole Steps	\$18.0
§1910.27 Scaffolds and Rope Descent Systems	\$71.6
§1910.28 Duty to Have Fall Protection and Falling Object Protection	\$55.9
§1910.29 Fall Protection Systems and Falling Object Protection – Criteria and Practices	\$13.1
§1910.30 Training Requirements	\$74.2
§1910.132 General Requirements	\$12.7
§1910.140 Personal Fall Protection Systems	\$11.0
Rule Familiarization	\$4.1
Total Annual Costs	\$305.0 million
Annual Benefits	
Number of Injuries Prevented	5,842
Number of Fatalities Prevented	29
Monetized Benefits (assuming \$62,000 per injury and \$8.7 million per fatality prevented)	\$614.5 million
OSHA standards that are updated and consistent with voluntary standards.	Unquantified
Net Benefits (benefits minus costs)	\$309.5 million

Source: U.S. Department of Labor, OSHA, Directorate of Standards and Guidance, Office of Regulatory Analysis-Safety.

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Summary Explanation of the Final Rule

The final rule covers all general industry walking-working surfaces, including floors, ladders, stairways, runways, dockboards, roofs, scaffold and walkways. To protect workers from hazards associated with these surfaces, particularly hazards related to falls from elevations, the final rule updates and revises the Walking-Working Surfaces Standard (29CFR part 1910, Subpart D). The final rule includes revised and new provisions that address fixed ladders, rope decent systems, fall protection systems and criteria, including personal fall protection systems, training on fall hazards and fall protection systems. In addition, the final rule adds new requirements on the design performance, and use of personal fall protection systems to the general industry Personal Protective Equipment (PPE) standards (29CFR part 1910 subpart I).

The final rule also gives the employer greater flexibility to prevent and eliminate walking-working surface hazards (guardrail is no longer the only mandated fall protection solution) and increases harmonization between OSHA construction and general industry standards. The final rule drew many provisions from national consensus standards, including those of the American Society of Safety Engineers (ASSE), the American National Standard Institute (ANSI), and the International Window Cleaners Association (IWCA).

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Final Subpart D	Existing Subpart D
§1910.21 Scope and definitions.	§1910.21 Definitions.
§1910.22 General requirements.	§1910.22 General requirements.
§1910.23 Ladders.	§1910.23 Guarding floor and wall openings and holes.
§1910.24 Step bolts and manhole steps.	§1910.24 Fixed industrial stairs.
§1910.25 Stairways.	§1910.25 Portable wood ladders.
§1910.26 Dockboards.	§1910.26 Portable metal ladders.
§1910.27 Scaffolds and rope descent systems.	§1910.27 Fixed ladders.
§1910.28 Duty to have fall protection and falling object protection.	§1910.28 Safety requirements for scaffolding.
§1910.29 Fall protection systems and falling object protection—criteria and practices.	§1910.29 Manually propelled mobile ladder stands and scaffolds (towers).
§1910.30 Training requirements.	§1910.30 Other working surfaces.

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The following lists the sections in subpart D where changes have occurred

1910.21	Scope and definitions
1910.22	General requirements
1910.23	Ladders
1910.24	Step bolts and manhole steps
1910.25	Stairways
1910.26	Dockboards
1910.27	Scaffold and rope decent systems
1910.28	Duty to have fall protection and falling object protection
1910.29	Fall protection systems and falling object protection – criteria and practices
1910.30	Training Requirements
1910.140	Personal fall protection systems

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Chapter 2

Scope and Definitions

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1910.21 Scope and Definitions

The scope of OSHA's final ruling applies to all general industry workplaces and covers ALL walking-working surfaces unless specifically excluded by an individual section of Subpart D. Walking surfaces are defined as horizontal, vertical, and inclined/angled surfaces, including (but not limited to):

- Floors
- Fixed and Portable Ladders
- Stairways
- Steps
- Roofs
- Ramps
- Runways
- Aisles
- Scaffolds
- Dockboards
- Step Bolts

The final paragraph (b) defines terms that are applicable to all sections of the final/revised Subpart D. It's important to note that new ruling does not retain previously used definitions if the terms are no longer in the regulatory text (e.g., qualified climber, safety factor) and new terms are added (e.g., low slope roof, personal fall arrest system, travel restraint system, and warning line). Most of the definitions are common industry terms that describe new control methods to protect workers from falling. For example, several definitions relate to personal fall protection systems, which the final rule allows employers to use instead of guardrails, cages, and wells specified by the prior ruling.

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1910.21 Definitions:

■ **Anchorage:** a secure point of attachment for equipment such as lifelines, lanyards, deceleration devices and rope decent systems. Anchorages can also be a component of a fall protection system. An anchorage may be installed to serve such purpose or may be a fixed structural member such as a post, beam, girder, column, floor, or wall that is an integral part of a structure. An anchorage must be capable of safely supporting the impact forces applied by a fall protection system.

■ **Authorized:** a worker the employer assigns to perform a specific type of duty, or may be in a specific location or area in the workplace. The work authorized employees perform involves situations or conditions where fall hazards are present.

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Definitions

■ **Cage:** an enclosure mounted on the side rails of a fixed ladder or fastened to a structure located behind the fixed ladder. The final definition also specifies that a cage surrounds the climbing space of the ladder. Important note—the final ruling eventually phases out ladder cages and requires:

- Installing personal fall arrest or ladder safety systems on new fixed ladders over 24 feet and on replacement ladders/ladder sections, including fixed ladders on outdoor advertising structures (2 years),
- Ensuring existing fixed ladders over 24 feet, including those on outdoor advertising structures, are equipped with a cage, well, personal fall arrest system, or ladder safety system (2 years), and,
- Replacing cages and wells (used as fall protection) with ladder safety or personal fall arrest systems on all fixed ladders over 24 feet (20 years).

■ **Carrier:** the track of a ladder safety system that consists of a flexible cable or rigid rail attached to the fixed ladder or immediately adjacent to it.

■ **Dangerous Equipment:** equipment, such as vats, tanks, electrical equipment, machinery, equipment or machinery with protruding parts, or other similar units that, because of their function or form may harm an employee who falls into or on to it.

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Definitions

- **Designated Area:** a distinct portion of a walking-working surface delineated by a warning line in which work may be performed without additional fall protection.

- **Dockboard:** a portable or fixed device that spans a gap or compensates for the difference in elevation between a loading platform and a transport vehicle. Dockboards include but are not limited to bridge plates, dock plates, and dock levelers.

- **Equivalent:** alternate designs, equipment, materials, or methods that the employer can demonstrate will provide an equal or greater degree of safety for workers compared to designs, equipment, materials or methods specified in the revised subparts.

- **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. For the purpose of this definition, load refusal includes permanent deformation of a component part or anchorage.

- **Fall Hazard:** any condition on a walking-working surface that exposes a worker to a “risk of harm” from a fall on the same level or to a lower level.

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Definitions

■ **Fall Protection:** any equipment or device or system that prevents a worker from falling from an elevation or that mitigates the effect of such a fall. For the purpose of the final rule, ‘mitigates the effect’ means that the fall protection prevents the worker from coming into contact with a lower level if a fall occurs. Fall protection includes guardrail systems, safety net systems, ladder safety systems, personal fall arrest systems and similar fall arrest systems.

■ **Fixed Ladder:** A ladder with rails or individual rungs that is permanently attached to a structure, building, or equipment. The definition also states that fixed ladders include individual rung ladders, but do not include ship stairs, step bolts or manhole steps. While fixed ladders include ladders attached to equipment, OSHA notes ladders that are designed into or are integral part of machines or equipment are excluded from coverage 1910.23(a) (2).

■ **Grab Bar:** individual horizontal or vertical handhold installed to provide workers with access above the height of a ladder.

■ **Hand Rail:** a rail used to provide workers with a handhold for support. Handrails may be horizontal, vertical, or sloping.

■ **Hoist Area:** any elevated access opening to a walking-working surface through which equipment or materials are loaded or received.

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Definitions

- **Hole:** a gap or open space in a floor, roof, horizontal walking-working surface, or similar surface that is at least (2) inches in its least dimension. Similar surfaces include runways, dockboards, stair treads, and other low slope or inclined surfaces where employees walk or work.

- **Individual Rung Ladder:** a type of fixed ladder that has rungs individually attached to a building or structure.

- **Ladder:** a device with rungs, steps or cleats used to gain access to a different elevation.

- **Ladder Safety System:** a system designed to eliminate or reduce the possibility of falling from a ladder. A ladder safety system usually consists of a carrier; a safety sleeve, which is a moving component that travels on the carrier; a lanyard; connectors; and a body harness. **The new final definition also specifies that cages and wells are no longer considered ladder safety systems and phases out their use. See notes above on ladder cages for the timetable for replacing ladder cages.**

- **Low Slope Roof:** low-slope is defined as a roof with a slope less than or equal to a ratio of 4 feet in 12 feet. A ration of 4 in 12 means a vertical rise of 4 feet to every 12 feet of horizontal run. The final definition is almost identical to the definition of “low-slope roof” found in the construction fall protection standard in § 1926.500(b).

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Definitions

- **Lower Level:** a surface or area to which workers could fall. Examples are but not limited to floors, roofs, ramps, runways, excavations, pits tanks, material stacks, water, equipment and similar surfaces and structures or portions thereof.
- **Maximum Intended Load:** the total load (weight and force) of all employees, equipment, vehicles, tools, materials and other loads the employer reasonable anticipates to be applied to a walking-working surface at any one time.
- **Opening:** a gap or open space in a wall, partition, vertical walking-working surface or similar surface that is at least 30 inches high and at least 18 inches wide, through which a worker can fall to a lower level.
- **Personal Fall Arrest System:** a system used to arrest a workers fall from walking-working surface if one occurs. The final definition explains that a personal fall arrest system consists of a body harness, anchorage, connector and a means to connect the body harness and anchorage such as a lanyard, deceleration device, lifeline or a suitable combination of.

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Definitions

■ **Personal Fall Protection System:** a system (including all its components) an employer uses to provide protection from falling or to safely arrest a workers fall if one occurs. Examples include travel restraint systems, and positioning systems. Personal Fall Protection Systems have the following components in common: an anchorage, body support like a body harness, and connectors used as a means to connect the anchorage and the body support.

■ **Platform:** a walking-working surface that is elevated above the surrounding area.

■ **Positioning System:** a system of equipment and connectors that, when used with a body harness 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 also are called “positioning system devices” and “work positioning devices.”

■ **Qualified:** a person who by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject, the work or the project.

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Definitions

■ **Ramp:** an inclined walking surface that is used to gain access to another level. Ramps are generally permanent devices or structures sometimes temporary and are used to move workers, materials, equipment, and vehicles from one level to another.

■ **Rope Decent System (RDS):** a suspension system that allows a worker to descend in a controlled manner and, as needed, to stop at any time during the descent. The final definition explains the RDS usually consists of a roof anchorage, support rope, descent device, carabiner or shackle and a chair or seatboard. The RDS may also be called controlled descent equipment or apparatus and does not include industrial rope access systems.

■ **Runway:** an elevated walking-working surface such as a catwalk, a foot walk along shafting, or an elevated walkway between buildings. The definition more clearly indicates that employees use runways to perform work as well as to gain access to other areas in the workplace.

■ **Scaffold:** this term means any temporary elevated or suspended platform and its supporting structure, including anchorage points, used to support workers, equipment, materials and other items. Scaffold does not include crane-suspended or derrick-suspended personal platforms or rope descent systems.

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Definitions

■ **Side-step Ladder:** a type of fixed ladder that requires a worker to step sideways from it to reach a walking-working surface such as a landing. The final definition also clarifies that when a worker steps off a side step ladder onto a walking-working surface, it may be a landing platform or another type of surface such as a roof.

■ **Tieback:** an attachment between an anchorage (something structural) and a supporting device. The final definition clarifies that supporting devices include, but are not limited to, parapet clamps or cornice hooks. Other choices for tieback applications include tieback lines or lanyards, and tieback anchors.

■ **Travel Restraint System:** this system is a combination of an anchorage, an anchorage connector, lanyard, and body support that an employer uses to eliminate the possibility of a worker going over the edge of a walking-working surface.

■ **Unprotected Side and Edges:** this term means any side or edge of a walking-working surface (except at entrances and other points of access) where there is no wall, guardrail system, or stair rail system to protect workers from falling to a lower level.

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Definitions

■ **Walking-Working Surface:** a horizontal or vertical surface on or through which workers walk, work, or gain access to work areas or workplace locations. Walking-working surfaces include floors, stairways, roofs, fixed and portable ladders, runways, ramps, walkways, dockboards, aisles, platforms, manhole steps, step bolts, equipment trailers, and other surfaces

■ **Warning Line:** a barrier that is erected on a roof to warn workers they are approaching an unprotected side or edge, and which designates an area in which work may take place without using other means of fall protection. The warning line is a component of a designated area, which is an alternative method for preventing falls on low-slope roofs. Warning lines alert workers that the space marked off by the line is an area where they may work without conventional or additional fall protection such as guardrail, a safety net or personal fall protection system. Workers may enter the demarcated area only if the employer provides them with the required fall hazard training (1910.30) and assigns work in a demarcated area.

■ **Well:** a permanent complete enclosure around a fixed ladder. A well surrounding a fixed ladder must provide sufficient clearance to enable the employee to climb the ladder. The term “well” and “Cage” typically are used together because the structure serves the same purpose; to enclose the climbing area of a fixed ladder. See notes above on cages and ladder safety systems.

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Chapter 3

General Requirements

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1910.22 General Requirements

The General Requirements of Final § 1910.22 revises and updates the existing requirements that apply to surfaces in general industry. These provisions address:

- Surface conditions and housekeeping (paragraph (a));
 - Application of loads on walking-working surfaces (paragraph (b));
 - Access to and egress from walking-working surfaces (paragraph (c));
- and
- Inspection, maintenance, and repair of walking-working surfaces (paragraph(d)).

In general, the final rule revises the previous requirements in several ways. First, final § 1910.22, as well as all other sections of final subpart D, uses the term “walking-working surface” which it defines as any horizontal or vertical surface on or through which an employee walks, works, or gains access to a workplace location. In final § 1910.22, as in other sections of final Subpart D, OSHA revised the existing language so it is performance based and easier to understand.

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1910.22 General Requirements

Final Paragraph (a) Walking-working surfaces

■ **1910.22(a)(1)** requires employers to ensure surfaces are kept in clean, orderly, and sanitary condition in all places of employment, passageways, storerooms, service rooms and walking-working surfaces. This regulation not only covers slips, trips, and falls but also includes fire and explosion resulting from combustible dust accumulation, reference FR28874.

■ **1910.22(a)(3)** requires employers walking working surfaces are maintained free from hazards such as loose boards, corrosion, leaks, spills, snow, ice, and sharp protruding objects.

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1910.22 General Requirements

Final Paragraph (b) Loads:

Final paragraph (b) requires employers ensure each walking-working surface can support the “maximum intended load” for that surface. Maximum intended load is the total weight of all employees, equipment, machines, vehicles, tools materials, and loads that employers reasonably anticipate may be applied to that walking-working surface.

The final rule, like the construction fall protection standard, does not require that employers hire engineers or other experts to make a technical determination about whether a walking-working surface has the strength and structural integrity to support the maximum intended load employers reasonable anticipate placing on that surface. OSHA agrees an employer may comply with the final paragraph (b) by making “a visual examination of the condition of the roof and the rest of the structure.” If employer cannot confirm from visual examination that the walking-working surface can support the load they will place on it, OSHA requires employers to conduct a more involved or detailed inspection to ensure the surface is safe for employees.

■ **1910.22(d)(2)** the existing rule specifies the load the building official approves for a specific walking-working surface “shall be marked on plates of approved design and securely affixed in a conspicuous place in the space to which they relate.”

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1910.22 General Requirements

Final Paragraph (c) Access and Egress

Final paragraph (c) requires employers provide and ensure that each worker uses a safe means of access and egress to and from walking-working surfaces. For purposes of the final rule, the term “safe” means that no condition (for example, an obstruction, lock or damage) could prevent or endanger a worker trying to access or egress a walking-working surface. Employers must ensure that means of access and egress remain clear and in good repair so workers can safely move about walking-working surfaces.

Examples of walking-working surfaces that require safe access and egress include floors, stairways, ladders, roofs, ramps, and aisles.

Final paragraph (c) requires that an employer provide and ensure workers a safe means to and from walking-working surfaces. One way employers can meet the performance language used in the final ruling is by appropriately marking passageways and permanent aisles as a means of identifying safe access and egress.

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1910.22 General Requirements

Final Paragraph (d) Inspection, Maintenance and Repair

Final paragraph (d)(1) requires that employers inspect and maintain walking-working surfaces in a safe condition. To ensure they are in a safe condition the final rule specifies that employers must inspect walking-working surfaces both (1) regularly and (2) as necessary.

The term “regular inspection” means that the employer has some type of schedule, formal or informal, for inspecting walking-working surfaces that is adequate enough to identify hazards and address them in a timely manner.

The term “as necessary” means the employers must conduct inspections when particular workplace conditions, circumstances, or events occur that warrant an additional check of walking-working surface to ensure that they are safe for workers to use. For example, additional inspection may be necessary when a significant spill or leak has occurred on the walking-working surface, after a major storm to ensure the walking-working surface is free from storm debris, downed power lines and other related hazards.

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1910.22 General Requirements

Final Paragraph (d) Inspection, Maintenance and Repair

■ **1910.22(d)(2)** requires that employers correct or repair hazardous conditions on walking working surfaces before allowing workers to use those surfaces again. If the employer cannot fix the hazard immediately, they must guard the hazard to prevent workers from using the walking-working surface until they correct or repair it.

■ **1910.22(d)(3)** requires that when any correction or repair involves the structural integrity of the walking-working surface a qualified person must perform or supervise that correction or repair.

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Chapter 4

Ladders

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Section 1910.23 Ladders

This section updates the requirements that apply to ladder in general industry:

- Paragraph (a) Application
- Paragraph (b) General Requirements for All Ladders
- Paragraph (c) Portable Ladders
- Paragraph (d) Fixed Ladders
- Paragraph (e) Mobile Ladder Stands

Final Paragraph (a) Application

1910.23(a)(1) excludes ladders used in emergency operations or training for these operations. The final rule has been expanded to include all emergency operations, training including tactical law enforcement operations.

1910.23(a)(2) exempts ladders that are designed into or are an integral part of machines or equipment. This exemption applies to vehicles the Department of Transportation (DOT) regulates.

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Section 1910.23 Ladders

Final Paragraph (b) General Requirements for All Ladders

- **1910.23(b)(1)** requires that employers ensure ladder rungs, steps, and cleats are parallel, level and uniformly spaced when the ladder is in position for use. The final paragraph is consistent with OSHA's other ladder requirements in general industry, marine terminals, longshoring, and construction.

- **1910.23(b)(2)** requires that, except for ladders in elevator shafts and telecommunication towers, employers ensure ladder rungs, steps, and cleats are spaced not less than 10 inches, and not more than 14 inches apart as measured between the centerlines of the rung or step.

- **1910.23(b)(2)(i)** specifies that employers must ensure rungs and steps on ladders in elevator shafts are spaced not less than 6 inches and not more than 16.5 inches apart, as measured along the ladder side rails.

- **1910.23(b)(2)(ii)** specifies that employers ensure that vertical spacing on fixed ladder rungs and steps on telecommunications towers not exceed 18 inches, measured between the centerlines of the rungs or steps.

- **1910.23(b)(3)** requires that employers ensure stepstool steps are spaced not less than 8 inches and not more than 12 inches apart, as measured between centerlines of the steps.

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Section 1910.23 Ladders

Final Paragraph (b) General Requirements for All Ladders (Cont.)

- **1910.23(b)(4)** requires employers to ensure that ladder rungs, steps and cleats on portable and fixed ladders have a “minimum clear width” of 11.5 inches and 16 inches respectively. “Clear width” is the space between ladder side rails, but does not include the width of the side rail. OSHA also incorporates into this paragraph the proposed note informing employers that the clear width measurement on fixed ladders is done before installation of any ladder safety system.

- **1910.23(b)(4)(i)** includes an exception for ladders with narrow rungs that are not designed to be stepped on, such as those located on the tapered end of orchard ladders and similar ladders.

- **1910.23(b)(4)(ii)** exception for portable manhole entry ladders supported by manhole openings. The final rule only requires that the rungs and steps of those ladders have a minimum clear width of 9 inches.

- **1910.23(b)(4)(iii)** exception for telecommunications rolling ladders, requires that rungs and steps on rolling ladders used in telecommunications centers have a minimum clear width of 8 inches.

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Section 1910.23 Ladders

Final Paragraph (b) General Requirements for All Ladders (Cont.)

■ **1910.23(b)(4)(iv)** is a new requirement that addresses the minimum clear width of stepstools, which OSHA defines as a type of portable ladder. The final rule specifies that stepstools which must have a minimum clear width of 10.5 inches instead of the 11.5 inch minimum clear width that the final rule requires for other forms of portable ladders.

■ **1910.23(b)(5)** adds a new requirement that employers ensure wooden ladders are not coated with any material that may obscure structural defects. OSHA does not consider manufacturer- applied “warning” labels to be “coatings” therefore, final paragraph (b)(5) does not prohibit placing labels on one side of side rails.

■ **1910.23(b)(6)** requires that employers ensure metal ladders are made with corrosion-resistant material or are protected against corrosion. For example, metal ladders coated or treated with materials that resist corrosion will meet this requirement. Alternatively, employers may use metal ladders made with material that is inherently corrosion-resistant, such as aluminum.

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Section 1910.23 Ladders

Final Paragraph (b) General Requirements for All Ladders (Cont.)

- **1910.23(b)(7)** employers must ensure ladder surfaces are free of puncture and laceration hazards. Workers can suffer cuts and puncture wounds if a ladder has sharp edges or projections, splinters or burrs. A workers instantaneous reaction to getting cut on a sharp projection could be to release his or her grip on the ladder, which could cause the worker to fall.

- **1910.23(b)(8)** requires that employers ensure ladders are used only for the purpose for which they were designed.

- **1910.23(b)(9)** requires that employers ensure ladders are inspected before initial use in each work shift, as well as more frequently as necessary. The purpose of this inspection is to identify visible defects that could affect the safe use and condition of the ladder and remove unsafe and damaged ladders from service before a worker is hurt.

- **1910.23(b)(10)** requires that employers immediately tag ladders with structural or other defects “Dangerous: Do Not Use” or similar language that is in accordance with 1910.145. In addition, employers are required to remove defective ladders from service until the employer repairs them in accordance with 1910.22(d) or replaces them. 1910.22(d) (2) contains a general requirement that employers correct, repair, or guard against “hazardous conditions on walking working surface surfaces,” including ladders.

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Section 1910.23 Ladders

Final Paragraph (b) General Requirements for All Ladders (Cont.)

■ **1910.23(b)(11)** requires that employers ensure workers face the ladder when climbing up or down it.

■ **1910.23(b)(12)** adds a new provision requiring that employers ensure workers use “at least one hand to grasp the ladder at all times when climbing up and down it.” As stated in the proposal, the intent of this provision is for employers ensure their workers maintain “three point contact.”

■ **1910.23(b)(13)** requires that employers ensure workers climbing ladders do not carry any objects or loads that could cause them to lose their balance and fall. The purpose of this provision is to emphasize the importance of proper and careful use of ladders when workers need to carry items to and from a work space. Employers also need to ensure workers know what items they can and cannot carry while climbing. OSHA does not believe workers can maintain the required balance and control if they must carry a heavy or bulky object in one hand while climbing.

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Section 1910.23 Ladders

Final Paragraph (c) Portable Ladders

The final rule defines “portable ladder” as a ladder that can be readily moved or carried, and usually consists of side rails joined at intervals by steps, rungs, or cleats.

■ **1910.23(c)(1)** requires that employers minimize slipping hazards on portable metal ladders. Employers must ensure rungs and steps of portable metal ladders are corrugated, knurled, dimpled, coated with skid resistant materials, or otherwise treated to minimize the possibility of slipping.

■ **1910.23(c)(2)** retains existing requirements that employers ensure each stepladder, or combination ladder used in a stepladder mode, is equipped with a metal spreader or locking device. This rule also requires that the spreader or locking device securely holds the front and back sections of the ladder in an open position while the ladder is in use.

■ **1910.23(c)(3)** requires that employers not load portable ladders beyond their maximum intended load. The maximum intended load includes the weight and force of workers and the tool, equipment, and materials workers are carrying, which is consistent with the definition of “maximum intended load” per 1910.21(b).

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Section 1910.23 Ladders

Final Paragraph (c) Portable Ladders

■ **1910.23(c)(4)** requires employers ensure portable ladders are used only on stable and level surfaces unless they are secured or stabilized to prevent accidental displacement. When the footing of ladders is not stable or level and the ladder is not secure, the ladder can slip out of place or tip over because of workplace activities, traffic, and weather conditions.

■ **1910.23(c)(5)** requires that employers ensure workers do not use portable single-rail ladders. Portable single-rail ladder is defined as a 'portable ladder with rungs, cleats, or steps mounted on a single rail instead of the normal two rails used on most other ladders.

■ **1910.23(c)(6)** is a new requirement that employers ensure a ladder is not moved, shifted, or extended while a worker is on it. Moving, shifting, or extending an occupied ladder is dangerous to workers, whether it is the worker on the ladder who moves (hops) it or a worker on the ground who moves the ladder while a worker in on the ladder.

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Section 1910.23 Ladders

Final Paragraph (c) Portable Ladders (Cont.)

■ **1910.23(c)(7)** requires that employers ensure ladders placed in locations where other activities or traffic can displace them (e.g., passageways, doorways, and driveways) are:

- **1910.23(c)(7)(i)** secured to prevent accidental displacement.
- **1910.23(c)(7)(ii)** guarded by a temporary barricade, such as a row of traffic cones or caution tape, to keep activities or traffic away from the ladder.

Final paragraph (c) (7) is consistent with the existing rule, which requires that employers must not place ladders in front of doors, unless the door is blocked, locked, or guarded.

■ **1910.23(c)(8)** requires that employers ensure that employees do not use the cap, if equipped, and the top step of a step ladder as steps. Using either surface as a step may decrease the ladder's stability and cause it to fall over, injuring the worker.

■ **1910.23(c)(9)** requires that employers ensure portable ladders used on slippery surfaces are secured and stabilized. For the purposes of this paragraph, slippery surfaces include, but are not limited to, environmental (e.g., rain, snow, ice) and workplace conditions (e.g., oil, grease, solvents).

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Section 1910.23 Ladders

Final Paragraph (c) Portable Ladders (Cont.)

■ **1910.23(c)(10)** requires that employers ensure that employees place the top of non-self-supporting ladders so that both side rails are supported, unless the ladders are equipped with single support attachments.

■ **1910.23(c)(11)** require that employers ensure portable ladders used to gain access to an upper landing surface have side rails that extend at least 3 feet above the upper landing surface. Requiring the ladder side rails to extend 3 feet above the upper landing surface ensures that workers have adequate support and hand holds so they can access the upper landing surfaces safely. OSHA notes that employers may use after-market ladder extensions to increase the length of a ladder provided:

- The after-market extensions ‘are securely attached (that is, secured to the extent necessary to stabilize the extension and not expose the employee to a falling hazard from the extensions displacement”:
- The ladder to which the ladder extensions is attached is “specifically designed for the application” in accordance with paragraph 1910.23(c)(14)

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Section 1910.23 Ladders

Final Paragraph (c) Portable Ladders (Cont.)

■ **1910.23(c)(12)** requires that employers do not use ladders and ladder sections tied together or fastened together to provide added length unless the ladder specifically permits such use. This is to prevent unsafe rigging methods and to use ladders only as they were intended.

■ **1910.23(c)(13)** prohibits placing ladders on boxes, barrels or other unstable bases to obtain additional height. Unstable bases include surfaces such as vehicles, truck flatbeds, scaffolds, and stairs.

Final Paragraph (d) Fixed Ladders

Final paragraph (d) establishes requirements that apply to fixed ladders, in addition to the requirements in paragraph (b). The final rule defines “fixed ladder” as a ladder with side rails or individual rungs, that is permanently attached to a structure, building or equipment. Fixed ladders do not include ship stairs, stepbolts, or manhole steps.

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Section 1910.23 Ladders

Final Paragraph (d) Fixed Ladders

■ **1910.23(d)(1)** Establishes a performance based provision requiring that employers ensure any fixed ladder a worker uses is capable of supporting the maximum intended load. This final paragraph requires that employers ensure that a fixed ladder meets the minimum load that a designer specifically established for a particular fixed ladder. OSHA believes following the load requirement established for a particular ladder is at least as safe as a general specification (200 to 250 pounds) applied to all fixed ladders.

■ **1910.23(d)(2)** requires that employers ensure the minimum perpendicular distance from the ladder to the nearest permanent object in back of the ladder is 7 inches. The final rule requires that this distance be measured from the centerline of the fixed ladder steps and rungs or grab bars, or both, to the object in back of the ladder (e.g., wall). OSHA believes the 7 inch minimum will ensure that workers have adequate space to get a safe foothold on fixed ladders. Final paragraph (d) (2) adds a new exception that reduces the minimum perpendicular clearance in elevator pits to 4.5 inches.

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Section 1910.23 Ladders

Final Paragraph (d) Fixed Ladders (cont.)

■ **1910.23(d)(3)** requires that employers ensure grab bars on the climbing side do not protrude beyond the rungs of the ladder they serve. The final rule defines grab bars as individual vertical or horizontal handholds that provide access above the ladder height. Grab bars that protrude beyond the rungs of the ladder can be hazardous because they make it more difficult to climb and transition to landing surfaces.

■ **1910.23(d)(4)** requires that employers ensure the side rails of through and side-step ladders extend 42 inches above the top of the access level or platform served by the ladder. This final rule specifies “access level” for through and side-step ladders on buildings that have parapets. OSHA added this language to clarify the intent that workers must have sufficient handholds at least 42 inches above the highest level on which they will step when reaching the access level, regardless of the location of the access level, (i.e. roof or top of parapet).

■ **1910.23(d)(4)(i)** when a parapet has an opening that permits passage through it (i.e. through ladder) the final rule specifies that the access level is the roof.

■ **1910.23(d)(4)(ii)** for parapets without such an opening (i.e. side-step ladders), the final rule specifies the access level is the top of the parapet.

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Section 1910.23 Ladders

Final Paragraph (d) Fixed Ladders (cont.)

■ **1910.23(d)(5)** specifies that employers ensure that there are no steps or rungs on the portion of the through ladder extending above the access level. In addition 1910.23(d)(5) also requires flared extensions of the side rails above the access level to provide clearance of not less than 24 inches and not more than 30 inches. OSHA believes the additional clearance will help to ensure that workers equipped with personal fall protection systems, tools, and other items have adequate space to negotiate the pass-through area and reach the upper landing safely. Final paragraph (d) (5) adds a new clearance width requirement for through ladders equipped with ladder safety systems. In those cases, the final rule requires employers ensure the clearance between the side rails of the extensions does not exceed 36 inches .

■ **1910.23(d)(6)** requires that employers ensure the side rails, rungs, and steps of side-step ladders be continuous in the extension.

■ **1910.23(d)(7)** requires that employers ensure grab bars extend 42 inches above the access level or landing platforms of the ladder, which is the same height required for side rails in the extension area of through and side-step ladders.

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Section 1910.23 Ladders

Final Paragraph (d) Fixed Ladders (cont.)

■ **1910.23(d)(8)** requires employers ensure the minimum size (i.e. cross-section or diameter) of the grab bars are the same size as the rungs on that ladder.

■ **1910.23(d)(9)** establishes two requirements for ladders that terminate at hatch covers.

■ **1910.23(d)(9)(i)** requires that employers ensure the hatch cover opens with sufficient clearance to provide easy access to or from the ladder.

■ **1910.23(d)(9)(ii)** now requires that employers ensure counterbalanced hatch covers open at least 70 degrees from the horizontal. In essence, this provision defines in “objective” terms what constitutes “sufficient clearance.”

■ **1910.23(d)(10)** requires that employers ensure that the construction of individual rung ladders will prevent workers feet from sliding off the ends of the rungs.

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Section 1910.23 Ladders

Final Paragraph (d) Fixed Ladders (cont.)

■ **1910.23(d)(11)** requires that employers ensure workers do not use fixed ladders that have a pitch greater than 90 degrees from the horizontal. A ladder that exceeds a pitch of 90 degrees makes the ladder dangerous to climb because pitch greater than 90 degrees requires climbers to exert considerable extra force to maintain their grip on the ladder against the gravitational force.

■ **1910.23(d)(12)** addresses step across distance for through and side-step ladders.

■ **1910.23(d)(12)(i)** requires that employers ensure that the step across distance for through ladders is not less than 7 inches and not more than 12 inches, to the nearest edge of the structure, building, or equipment accessed from the ladder, measured from the centerline of the ladder.

■ **1910.23(d)(12)(ii)** requires that employers ensure that the step across of side-step ladders is at least 15 inches, but not more than 20 inches, measured from the centerline of the ladder to the nearest point of access on the platform edge.

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Section 1910.23 Ladders

Final Paragraph (d) Fixed Ladders (cont.)

- **1910.23(d)(13)** addresses fixed ladders that do not have cages or wells.
- **1910.23(d)(13)(ii)** require that employers ensure there is a minimum perpendicular distance of 30 inches from the centerline of the steps or rungs to the nearest object on the climbing side of the ladder. This final rule provides an exception to the minimum perpendicular clearance requirement “when unavoidable obstructions are encountered.” The final rule allows a reduction of the minimum clearance to 24 inches in those cases, provided that employers install deflector plates. The deflector plate will protect workers on fixed ladders by guiding them around the obstruction.

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Section 1910.23 Ladders

Final Paragraph (e) Mobile Ladder Stands and Mobile Ladder Stand Platforms

These requirements apply to mobile ladder stands and mobile ladder stand platforms in addition to the requirements specified in paragraph (b) that cover all ladders.

- **1910.23(e)(1)** establishes general design and use requirements that apply to both mobile ladder stands and mobile ladder stand platforms.
- **1910.23(e)(1)(i)** requires that employers ensure that the minimum width of steps on mobile ladder stands and platforms is 16 inches.

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Section 1910.23 Ladders

Final Paragraph (e) Mobile Ladder Stands and Mobile Ladder Stand Platforms

■ **1910.23(e)(1)(ii)** requires that employers ensure that steps and platforms of mobile ladder stands and platforms be slip resistant. Employers may meet the slip-resistance requirement by providing mobile ladder stands and platforms where the slip-resistance surfaces either are (1) an integral part of the design and construction of the mobile ladder stand and platform, or (2) provide a secondary process or operation. For the purpose of this final rule, processes include things such as dimpling, knurling, shot blasting, coating, spraying the walking working surface, or adding durable slip resistant tape to steps and platforms. For example, in outdoor, icy conditions, grated steps and platforms may provide better slip resistance than steps and platforms with a spray-on finish. Employers have both an initial and continuing obligation to ensure that steps and platforms on mobile ladder stands and platforms remain slip-resistant. If the slip resistance on steps of stands or platforms wears down or is in need of repair, the final rule requires that employers treat those surfaces with additional process to restore their resistance.

■ **1910.23(e)(1)(iii)** requires that employers ensure mobile stands and platforms are capable of supporting at least four (4) times their maximum intended load.

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Section 1910.23 Ladders

Final Paragraph (e) Mobile Ladder Stands and Mobile Ladder Stand Platforms

■ **1910.23(e)(1)(iv)** requires that employers ensure wheels and casters of mobile ladder stands and platforms under load are capable of supporting (1) their proportional share of four times the maximum intended load, plus (2) their proportional share of the units weight.

■ **1910.23(e)(1)(v)** requires that employers ensure mobile ladder stands and platforms have handrails when the height of the top step is 4 feet or higher above lower levels. Where handrails are required, employers must ensure that the handrails have a vertical height of at least 29.5 inches but not more than 37 inches, as measured from the front edge of the step, unless specified elsewhere in this section. This final rule is to assist the worker while climbing the ladder stands and platforms and also provide a handhold they can grab to steady themselves if they slip or start to fall off the unit.

■ **1910.23(e)(1)(vi)** requires that employers ensure the maximum working surface height of mobile ladder stands and platforms does not exceed four (4) times the shortest dimension of the base, without additional support. The final rule also specifies when mobile ladder stands and platforms need to reach greater heights, the employer must provide additional support such as outriggers, counterweights or comparable means to stabilize the base and prevent the unit from overturning.

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Section 1910.23 Ladders

Final Paragraph (e) Mobile Ladder Stands and Mobile Ladder Stand Platforms

■ **1910.23(e)(1)(vii)** requires that employers ensure wheels and casters on mobile ladder stands and platforms are equipped with a system that will impede horizontal movement when a worker is on the unit. OSHA believes the requirement in final paragraph (e)(1)(vii) is necessary to prevent accidental or inadvertent movement of a mobile ladder or platform. If the stand or platform suddenly moves, it may cause the worker to fall off the unit.

■ **1910.23(e)(1)(vii)** requires that employers ensure mobile ladder stands and platforms do not move while workers are on them. This final rule will prevent workers from falling from mobile ladder stands and platforms.

■ **1910.23(e)(2)** establishes design requirements for mobile ladder stands and platforms in addition to the general mobile ladder stand and platforms requirements stated in paragraph (e)(1).

■ **1910.23(e)(2)(i)** the employer must ensure that steps are uniformly spaced and arranged, have a maximum rise of 10 inches, and have a maximum depth of 7 inches. The final rule also requires that the employer ensures the slope (angle) of the “step stringer” to which the steps are attached is not more than 60 degrees from horizontal.

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Section 1910.23 Ladders

Final Paragraph (e) Mobile Ladder Stands and Mobile Ladder Stand Platforms

■ **1910.23(e)(2)(ii)** requires that employers ensure these mobile ladder stands have handrails on three sides of the top step. The employer must ensure that the handrail has a vertical height of at least 36 inches. Also, top steps with a length (depth) of at least 20 inches, front to back, must have midrails and toeboards.

■ **1910.23(e)(2)(iv)** requires that employers ensure the standing area of mobile ladder stands are within the base frame. OSHA believes this requirement is necessary to ensure the stability of mobile ladder stands. Keeping the center of gravity within the base frame increases the stability of the mobile ladder stand. This requirement reduces the potential for the mobile ladder stand to tip when a worker is using it.

■ **1910.23(e)(3)(i)** like the proposed paragraph and final paragraph (e)(2)(i), requires employers ensure that steps of mobile ladder stand platforms:

- Are uniformly spaced and arranged;
- Have a maximum rise of 10 inches; and,
- Have a maximum depth of 7 inches.

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Section 1910.23 Ladders

Final Paragraph (e) Mobile Ladder Stands and Mobile Ladder Stand Platforms

The final rule also requires that the employer ensures the slope (angle) of the “step stringer” to which the steps are attached is not more than 60 degrees from horizontal.

Final paragraph (e)(3)(i) differs from final paragraph (e)(2)(i) in one respect. It includes an exception when the employer demonstrates that the final requirement is not feasible. In that circumstance, the employer may use mobile ladder stand and platforms that have steeper slopes or vertical rung ladders, providing the employer stabilizes the alternative unit to prevent it from overturning. The final rule includes this exception because OSHA recognizes that there may be situations or locations where, for example, the slope of the step stringer on a mobile ladder stand platform may need to be greater than the 60 degree limit. When employers demonstrate the final rule is not feasible, OSHA notes that employers will be in compliance with the final paragraph (e)(3)(i) if they use mobile ladder stand platforms with a slope up to 70 degrees.

■ **1910.23(e)(3)(ii)** requires that employers ensure the platform areas have handrails and midrails. Employers also must ensure the handrails on the platforms in this height range have a vertical height of at least 36 inches. As discussed on final paragraph (e)(2)(ii), these requirements are necessary to protect workers from falling of walking-working surfaces that are 4 feet or more above a lower level.

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Section 1910.23 Ladders

Final Paragraph (e) Mobile Ladder Stands and Mobile Ladder Stand Platforms

■ **1910.23(e)(3)(iii)** establishes requirements for mobile ladder stand platforms that are more than 10 feet above a lower level. For these units, the final rule requires that employers must ensure that the exposed sides and ends of the platforms have both guardrails and toeboards. OSHA notes that all fall protection and falling object protection requirements must meet the systems criteria in final 1910.29.

The toeboards must, consistent with the requirements of 1910.29:

- Have vertical height of at least 3.5 inches;
- Not have more than a 0.25 inch clearance above the platform surface;
- Be solid, or have openings that do not exceed 1 inch at the greatest dimension; and
- Be capable of withstanding a force of at least 50 pounds applied at any downward or outward direction at any point along the toeboard (see final 1910.29(k)(1)(ii)).

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Chapter 5

Step Bolts and Manhole Steps

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Section 1910.24 Step Bolts and Manhole Steps

Final 1910.24, like the proposed rule, establishes new design, strength, and use requirements for step bolts and manhole steps:

Paragraph (a) Step Bolts

Paragraph (b) Manhole Steps

Final Paragraph (a) Step Bolts

■ **1910.24(a)(1)** requires that employers ensure step bolts installed in any environment where corrosion may occur are constructed of, or coated with, material that protects against corrosion. Although national consensus standard specifies that hot-dip galvanizing is the preferred method, employers may use other equivalent methods.

■ **1910.24(a)(2)** requires that employers ensure step bolts are designed, constructed, and maintained to prevent workers foot from slipping off the end of it. If a workers foot slips off the end of a step bolt, the worker could fall or sustain an injury from slipping. Designing the head of the step bolt to prevent the workers foot from slipping off will provide the requisite protection.

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Section 1910.24 Step Bolts and Manhole Steps

■ **1910.24(a)(3)** requires that employers ensure step bolts are uniformly spaced of a vertical distance of not less than 12 inches and not more than 18 inches apart, measured center to center. This final paragraph also notes that the spacing from the entry and exit surface to the first step bolt may differ from the spacing between other step bolts.

■ **1910.24(a)(4)** requires that employers ensure step bolts have a minimum clear width of 4.5 inches.

■ **1910.24(a)(5)** requires that employers ensure the minimum perpendicular distance between the centerline of each step bolt to the nearest permanent object in back of the step bolt is at least 7 inches. When employers can demonstrate that they cannot avoid an obstruction, the final rule permits them to reduce the minimum clear space to 4.5 inches.

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Section 1910.24 Step Bolts and Manhole Steps

- **1910.24(a)(6)** requires that employers ensure each step bolt installed **before** the effective date of the final rule is capable of supporting the maximum intended load. The final provision is based upon the Telecommunications standard requirement that employers shall ensure that no employee nor any material or equipment may be supported on any portion of a ladder unless it is first determined by inspections and checks conducted by a competent person that such ladder is adequately strong, and in good condition.
- **1910.24(a)(7)** requires employers ensure each step bolt installed **on or after** the effective date of the final rule is capable of supporting at least four times its maximum intended load.
- **1910.24(a)(8)** requires that employers ensure step bolts are inspected at the start of each work shift and maintained in accordance with 1910.22.
- **1910.24(a)(9)** requires that employers ensure any step bolt that is bent more than 15 degrees from the perpendicular, in any direction, is removed and replaced with a bolt that meets the requirements of the section, before a worker uses it.

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Section 1910.24 Step Bolts and Manhole Steps

Paragraph (b) Manhole Steps

- **1910.24(b)(1)** requires that employers ensure manhole steps are capable of supporting their maximum intended load , as defined in 1910.21(b).
- **1910.24(b)(2)** establishes requirements for manhole steps installed ***on or after the effective date*** of the final rule.
 - **1910.24(b)(2)(i)** requires that employers ensure manhole steps have a corrugated, knurled, dimpled, or other surface that minimized the possibility of a worker slipping.
 - **1910.24(b)(2)(ii)** requires that employers ensure manhole steps are constructed of, or coated with materials that protects against corrosion if the manhole steps are in an environment where corrosion may occur.
 - **1910.24(b)(2)(iii)** requires that employers ensure manhole steps have a minimum clear step width of 10 inches.

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Section 1910.24 Step Bolts and Manhole Steps

Final Paragraph (b) Manhole Steps

■ **1910.24(b)(2)(iv)** requires that employers manhole steps are uniformly space at a vertical distance of not more than 16 inches apart, measured center to center between steps. Like paragraph 1910.24(a)(3) OSHA allows spacing from entry to exit surface to the final manhole step to be different from the spacing between the other steps.

■ **1910.24(b)(2)(v)** requires that employers ensure manhole steps have a minimum perpendicular distance of at least 4.5 inches measured between the centerline of the manhole step and the nearest permanent object in back of it.

■ **1910.24(b)(2)(vi)** requires that employers ensure manhole steps are designed, constructed and maintained to prevent the workers foot from slipping or sliding off the end of the manhole step which can result in a fall or slip.

■ **1910.24(b)(3)** requires that employers ensure manhole steps are inspected at the start of the work shift, and maintained in accordance with 1910.22. Final paragraph (b)(3) also requires employers to inspect walking-working surfaces regularly and as necessary, and to maintain them in safe condition.

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Chapter 6

Stairways

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Section 1910.25 Stairways

Stairways

Section 1910.25 of the final rule establishes requirements for the design and installation of stairways:

- Paragraph (a), Application, which specified which stairs the final rule covers and excepts;
- Paragraph (b), now titled General Requirements, establishes the requirements that apply to all covered stairways;
- Paragraph (c), Standard Stairs

Paragraph (a) Requirements for Design and Installation

1910.25(a) Final paragraph (a) lists certain stairways that 1910.25 does not cover, specifically:

- Stairs serving floating roof tanks;
- Stairs on scaffolds;
- Stairs designed into machines or equipment; and
- Stairs on self-propelled motorized equipment (e.g. motor vehicles, powered industrial trucks)

1910.25(a) eliminates the following existing exceptions: Stairs to construction operations a private residence, articulated stairs installed on dock facilities and stairs used for fire exit purposes.

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Section 1910.25 Stairways

Paragraph (b) General Requirements

Paragraph (b) of the final rule sets forth general requirements for all stairways covered by this section, while other provisions of 1910.25 specify requirements for specific types of stairways.

■ **1910.25(b)(1)** requires that employers ensure handrails, stair rail systems, and guardrail systems are provided in accordance with final 1910.28. This provision is intended to protect workers from falling off stairways.

■ **1910.25(b)(2)** requires that employers ensure the vertical clearance above any stair tread to any overhead obstruction is at least 6 feet, 8 inches, as measured from the leading edge of the stair tread.

■ **1910.25(b)(3)** incorporates the requirement in existing 1910.24(f) that employers ensure that stairs have uniform riser height and tread depths between landings.

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Section 1910.25 Stairways

Paragraph (b) General Requirements (Cont.)

■ **1910.25(b)(4)** requires that employers ensure the size of stairway landings and platforms is not less than the stair width and not less than 30 inches in depth, as measured in the direction of travel.

■ **1910.25(b)(5)** requires that , when a door or gate opens directly onto a stairway, employers must provide a platform and ensure the swing of the door or gate does not reduce the effective usable depth of the platform to less than:

- 20 inches from platform installed before the effective date of the final rule; and
- 22 inches for platforms installed on or after the effective date of the final rule.

■ **1910.25(b)(6)** requires that employers ensure stairs can support at least five times the normal anticipated live load, and never less than a concentrated load of 1000 pounds, applied at any point on the stairway.

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Section 1910.25 Stairways

Paragraph (b) General Requirements (Cont.)

■ **1910.25(b)(7)** requires employers to provide standard stairs to allow workers to travel from one walking-working surface to another. The existing and final rules both recognize that standard stairs are the principal means of providing safe access in workplaces and employers must provide them when operation necessitate “regular and routine travel between levels,” including accessing operating platforms to use or operate equipment.

■ **1910.25(b)(8)** allows employers to use spiral stairs and alternating tread-type stairs (collectively referred to as “non-standard stairs”), but only when employers can demonstrate that it is not feasible to provide standard stairs.

■ **1910.25(b)(9)** which is a new provision, requiring employers to ensure that non-standard stairs are installed, used, and maintained in accordance with manufacturer’s instruction.

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Section 1910.25 Stairways

Paragraph (c) Standard Stairs

■ **1910.25(c)(1)** requires employers to install standard stairs at angles between 30 and 50 degrees from the horizontal.

■ **1910.25(c)(2)** requires that employers ensure standard stairs have a maximum riser height and minimum tread depth of 9.5 inches. The final rule also includes an exception (final paragraph (c)(5)) on riser height and tread depths for standard stairs installed prior to the effective date of the final rule, which is January 17, 2017.

■ **1910.25(c)(3)** OSHA removed from final paragraph (c)(3) the proposed exception from the minimum tread-depth requirement for stairs with open risers. OSHA adopted the proposal exception from the 9.5 inch tread depth requirement for open risers from A1264.1-2007. A note to that standard explained: “Open risers are needed on certain narrow tread-depth and steep angle stair systems and exterior structures.”

■ **1910.25(c)(4)** requires that employers ensure standard stairs have a minimum width of 22 inches between vertical barriers. Example of vertical barriers include stair rails, guardrails and walls.

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Chapter 7

Dockboards

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Section 1910.26 Dockboards

Section 1910.26 of the final rule establishes requirements for the design, performance, and the use of dockboards. Dockboards may be powered or manual, and include but are not limited to, bridge plates, dock levelers, and dock plates. “Loading platforms,” as used in the definition of dockboards, include loading docks, interior floors, driveways or other walking or working surfaces. “Transport vehicles,” as used in the definition and in the final rule, are cargo carrying vehicles that workers may enter or walk onto to load or unload cargo and materials. Transport vehicles include, but not limited to, trucks, trailers, semi-trailers and rail cars.

■ **1910.26(a)** requires that employers ensure that the dockboards are capable of supporting their maximum intended load.

■ **1910.26(b)(1)** requires employers ensure that dockboards put into service on or after the effective date of the final rule, January 17, 2017, are designed, constructed and maintained to prevent transfer vehicles from running off the dockboard edge. In other words, dockboards put into service for the first time starting on the effective date of the final rule must have run-off protection, guards, or curbs.

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Section 1910.26 Dockboards

- **1910.26(c)** requires anchoring or equipping portable dockboards with devices that prevent the dockboards from slipping. Dockboards of all types be designed and maintained so the ends have “substantial contact” with the dock and transport vehicle to prevent the dockboard from “rocking or sliding”

- **1910.26(d)** requires that employers provide and use measures (e.g. wheel chocks, sand shoes) to prevent transport vehicles from moving while dockboards are in place and workers are using them.

- **1910.26(e)** requires that employers equip portable dockboards with handholds or other means that permit workers to safely handle the dockboard. Handholds and other means of gripping are necessary so workers can move and place dockboards without injuring themselves or others.

- **1910.26(f)** when handling a portable dockboard mechanically, employers must provide forklift loops, lugs, or other effective means to move or place the dockboard.

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Chapter 8

Scaffolds and Rope Descent Systems

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Section 1910.27 Scaffolds and Rope Descent Systems

1910.27, like the proposed rule, addresses scaffolds and rope descent systems (RDS) used in general industry. For two reasons, OSHA divided the final rule into separate paragraphs for scaffold and RDS. First, the record shows that the hazards involved in working on scaffolds are different from the hazards associated with using an RDS. Second, based on comments received in the record, OSHA believes that the final rule should not regulate RDS as a type of suspended scaffold.

Paragraph (a) Scaffolds

■ **1910.27(a)** requires that employers ensure scaffolds used in general industry meet the requirements in the construction scaffold standards (29 CFR 1926, subpart L (scaffolds)), and, as a result, the final rule deletes the existing general industry requirements (existing 1910.28 and 1910.29).

Paragraph (b) Rope Descent Systems

■ **1910.27(b)** The final rule defines an RDS as a “suspension system that supports an employee in a chair (seat board) and allows the employee to descend in a controlled manner and, as needed, stop at any point during the descent. An RDS usually consists of a roof anchorage, support rope, descent device, carabiner(s) or shackle(s) and a chair (seat board), 1910.21(b).

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Section 1910.27 Scaffolds and Rope Descent Systems

Paragraph (b) Rope Descent Systems (cont.)

■ **1910.27(b)(1)** add new requirements for anchorages to secure RDS. The final rule defines anchorage as a secure point of attachment for equipment such as lifelines, lanyards, deceleration devices, and rope descent systems (final 1910.21(b))

■ **1910.27(b)(1)(i)** requires that before the employer uses any rope descent system, the building owner informs the employer in writing that the building owner has identified, tested, certified, and maintained each anchorage so it is capable of supporting at least 5,000 pounds in any direction, for each worker attached. The final rule also requires that the building owner base the information provided to the employer on:

- An annual inspection; and
- A certification of each anchorage as necessary, and at least every 10 years.

The building owner must also ensure that a “qualified” person conducts both the inspection and certification.

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Section 1910.27 Scaffolds and Rope Descent Systems

Paragraph (b) Rope Descent Systems (cont.)

■ **1910.27(b)(1)(ii)** establishes a new provision that requires employers ensure that no employee uses any anchorage before the employer obtains written information from the building owner that the anchorage meets the requirements of the final paragraph 1910.27(b)(1)(i). In other words, the final rule requires that employers ensure no employee uses an RDS until the employer obtains written information that the building owner identified, tested, certified, and maintained each anchorage so it is capable of supporting 5,000 pounds in any direction for each worker attached. The final rule also requires that the employer keep the written information from the building owner for the duration of the job.

■ **1910.27(b)(1)(iii)** provides employers and building owners with additional time to implement the requirements in final paragraphs 1910.27(b)(1)(i) and 1910.27(b)(1)(ii). The final rule gives employers and building owners one year from November 18, 2016 to meet the new requirements in paragraphs 1910.27(b)(1)(i) and 1910.27(b)B1)(ii). This means that the building owners must identify, inspect, certify and maintain each anchorage by the compliance date.

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Section 1910.27 Scaffolds and Rope Descent Systems

Paragraph (b) Rope Descent Systems (cont.)

- **1910.27(b)(2)** establishes RDS design and work-practice requirements that employers must follow to ensure their workers safety when using an RDS.

- **1910.27(b)(2)(i)** requires that employers ensure no RDS is used at heights greater than 300 feet above grade. The final rule includes two exceptions to the 300 foot height limit. Employers may use RDS above 300 feet when they demonstrate (1) it is not feasible to access heights above 300 feet by any other means; or (2) other means pose a greater hazard than using an RDS.

- **1910.27(b)(2)(ii)** requires employers to ensure RDS use is:
 - In accordance with manufacturer instructions, warnings, and design limitations (hereafter collectively referred to as “instructions”), or:
 - Under the direction of a qualified person.

- **1910.27(b)(2)(iii)** requires employers ensure that each worker who uses an RDS receives training in accordance with 1910.30. This requirement means an employer must train each worker who uses a DRS in the proper rigging use, inspection and storage of an RDS before the worker uses the RDS.

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Section 1910.27 Scaffolds and Rope Descent Systems

Paragraph (b) Rope Descent Systems (cont.)

- **1910.27(b)(2)(iv)** in addition, since the final rule requires that each worker who uses an RDS also uses an independent personal fall arrest system, the employer must ensure that each worker receives fall hazard training before that worker uses an RDS in an area where the worker may be exposed to a fall hazard 1910.30(a)(1).

- **1910.27(b)(2)(v)** requires that employers ensure the RDs has proper rigging, including proper anchorages and tiebacks.

- **1910.27(b)(2)(vi)** requires that each worker uses a separate independent personal fall arrest system when using an RDS. A personal fall arrest system consists of at least an anchorage, connector and body harness, but may also include a lanyard, deceleration device, lifeline or suitable combination of these devices.

- **1910.27(b)(2)(vii)** requires that employers ensure all components of each RDS, except seat boards, are capable of supporting a minimum rated load of 5,000 pounds. For seat boards, the final rule requires that they be cable of sustaining a live load of 300 pounds.

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Section 1910.27 Scaffolds and Rope Descent Systems

Paragraph (b) Rope Descent Systems (cont.)

■ **1910.27(b)(2)(viii)** requires that employers provide for prompt rescue of each worker in the event of a fall. This final paragraph establishes two fundamental points--(1) employers must provide for the rescue of workers when a fall occurs, and (2) the rescue must be prompt. First, providing for rescue means employers need to develop and put in place a plan or procedures for effective rescue. The plan needs to include making rescue resources available (i.e. rescue equipment, personnel) and ensuring that workers understand the plan. Appendix C to **1910.140** provides guidance to employers on developing a rescue plan.

■ **1910.27(b)(2)(ix)** requires that employers ensure the ropes of each RDS are effectively padded or otherwise protected where they contact edges of the building, anchorage, obstruction, or other surfaces to prevent them from being cut or weakened. Padding protects RDS ropes from abrasion that can weaken the strength of the rope.

■ **1910.27(b)(2)(x)** requires that employers provide stabilization at the workers specific work location whenever descents are greater than 130 feet. The purpose for stabilization is to reduce the risk of worker injury when longer descents are made using an RDS.

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Section 1910.27 Scaffolds and Rope Descent Systems

Paragraph (b) Rope Descent Systems (cont.)

■ **1910.27(b)(2)(xi)** is a new provision added to the final rule that requires employers to ensure no worker uses an RDS when “hazardous weather conditions” are present. The final provision also identifies some examples of weather conditions that OSHA considers hazardous for workers using RDS: storms and gusty or excessive winds.

■ **1910.27(b)(2)(xii)** requires that employers ensure equipment is secured by a tool lanyard or similar method to prevent it from falling. Examples of equipment include tools, squeegees, and buckets. The purpose of this provision is to protect workers and the public below from being struck by falling equipment.

■ **1910.27(b)(2)(xiii)** requires that employers protect RDS ropes from exposure to open flames, hot work, corrosive chemicals, and other destructive conditions that could damage or weaken the ropes. This requirement will prevent damage to ropes that could lead to failure.

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Chapter 9

Duty to have Fall protection and Falling Object Protection

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Section 1910.28 is the first of three new sections in subpart D that consolidate requirements pertinent to fall protection and falling object protection.

Paragraph (a) General

■ **1910.28(a)(1)** requires employers to provide protection to workers exposed to falls and falling object hazards. It also specifies that, unless otherwise, the protection employers provide must comply with the criteria and work practices in 1910.29. In addition this final paragraph clarifies that personal fall protection system must comply with the criteria and work practices in 1910.140, Personal Fall Protection Systems.

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

■ **1910.28(a)(2)** Lists seven situations in which the requirements in 1910.28 do *not* apply:

- **1910.28(a)(2)(i)** portable ladders
- **1910.28(a)(2)(ii)** when the employer is inspection, investigation, or assessing workplace conditions or the location at which work is to be performed prior to the start of work or after all work has been completed. However, this exemption does not apply when fall protection systems or equipment meeting the requirements of 1910.29 have been installed and available for workers to use. If fall protection systems are present, workers must use them while conduction pre-work and post-work inspections, investigations, or assessments of workplace conditions.
- **1910.28(a)(2)(iii)** fall hazard presented by the exposed perimeters of stages and the exposed perimeters of rail-station platforms.
- **1910.28(a)(2)(iv)** powered platforms covered by 1910.66(j)
- **1910.28(a)(2)(v)** aerial lifts covered by 1910.67(c)(2)(v)
- **1910.28(a)(2)(vi)** telecommunications work covered by 1910.268(n)(7) and 1910.268(n)(8)
- **1910.28(a)(2)(vii)** electrical power generation, transmission and distribution work covered by 1910.269(g)(2)(i)

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Paragraph (b) Protection From Fall Hazards

■ **1910.28(b)** sets forth the requirements on the types of fall protection systems that employers must select and use to protect workers from fall hazards, while working in specific workplace areas, situations, and activities. The final rule allows employers to use any one or more of the fall protection systems listed for the particular area, situation, or activity, including:

- Guardrail Systems
- Safety Net Systems
- Personal Fall Protection Systems
- Personal Fall Arrest Systems
- Travel Restraint Systems
- Ladder Safety Systems
- Hand Rails
- Designated Areas

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Paragraph (b) Unprotected Sides and Edges

■ **1910.28(b)(1)** establishes fall protection requirements employers must follow to protect workers from falling off unprotected sides and edges of walking-working surfaces that are four feet or more above a lower level.

■ **1910.28(b)(1)(i)** specifies that employers may use one or more of the following fall protection options to protect workers from fall hazards at unprotected sides and edges

- **1910.28(b)(1)(i)(A)** guardrail systems
- **1910.28(b)(1)(i)(B)** safety net systems
- **1910.28(b)(1)(i)(C)** personal fall protection systems, such as positioning, travel restraint, and personal fall arrest systems

■ **1910.28(b)(1)(ii)** specifies that when employers can demonstrate it is infeasible or creates a greater hazard to use any type of conventional fall protection (i.e. guardrail, safety net, or personal fall protection system) when working residential roof they must take specific alternative measures to eliminate or reduce fall hazards.

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

■ **1910.28(b)(1)(iii)** excepts employers from providing the fall protection specified on 1910.28(b)(1)(i) when employers can demonstrate that it is not feasible for workers to use fall protection on the working side of platforms used at loading racks, loading docks and teeming platforms, The “working side” is the side of the platform where workers are in the process of performing a work operation.

- **1910.28(b)(1)(iii)(A)** the work operation for which fall protection is infeasible is in process

- **1910.28(b)(1)(iii)(B)** the employer limits access to the platform to “authorized” workers, which the final rule defines as a worker who the employer assigns to perform a specific type of duty, or allows to be in a specific location or area

- **1910.28(b)(1)(iii)(C)** the employer trains authorized workers in accordance with the final **1910.30**

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Hoist Areas

■ **1910.28(b)(2)** establishes requirements for workers in hoist areas that are four feet or more above a lower level. This final rule defines a “hoist area” as an elevated access opening to a walking-working surface through which equipment or materials are loaded or received.

■ **1910.28(b)(2)(i)** requires employers to protect workers in hoist areas from falling by:

- **1910.28(b)(2)(i)(A)** guardrail systems
- **1910.28(b)(2)(i)(B)** personal fall arrest system
- **1910.28(b)(2)(i)(C)** travel restraint system

■ **1910.28(b)(2)(ii)** requires that, if removing any portion of a guardrail system, gate, and chain and if the worker leans through or over the edge of the access opening to facilitate hoisting, the employer must protect the worker from falling by a personal fall arrest system.

■ **1910.28(b)(2)(iii)** specifies that if grab handles are installed at hoist areas, they must meet the requirement of 1910.29(1). Employers are not required to install grab handles at hoist areas; however, if they do install grab handles, the handles must meet the criteria specified in 1910.29(l)

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Holes

■ **1910.28(b)(3)** requires that employers protect workers from falling into or through any hole, including skylights, stairway floor holes, ladderway floor holes, hatchway and chute-floor holes, and other holes on roofs. The final rule defines a “hole” as a gap or open space in the floor, roof, horizontal walking-working surface or other similar surfaces that is at least 2 inches in its least dimension.

■ **1910.28(b)(3)(i)** requires that employers ensure workers are protected from falling through any hole (including skylights) that is four feet or more above a lower level using one or more of the following:

- **1910.28(b)(3)(i)(A)** a cover over the hole
- **1910.28(b)(3)(i)(B)** a guardrail system around the hole
- **1910.28(b)(3)(i)(C)** a travel restraint system
- **1910.28(b)(3)(i)(D)** a personal fall arrest system

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Dockboards

■ **1910.28(b)(4)** adds fall protection requirements to protect workers on dockboards. Dockboards include, but are not limited to, bridge plates, dock plates and dock levelers.

■ **1910.28(b)(4)(i)** requires that employers ensure each worker on a dockboard is protected from falling four feet or more to a lower level by guardrail system or handrails. The final rule limits the number of fall protection options that employers can use. OSHA believes guardrail and handrails will provide adequate protection for workers. In addition employers can use them on dockboards while other options may not work. OSHA notes that in some situations there may be insufficient space between the dock and the transport vehicle for a worker to fall and, therefore, no fall hazard would exist. In that situation this final paragraph (b)(4)(i) does not apply.

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Dockboards

■ **1910.28(b)(4)(ii)** includes an exemption specifying that employers do not have to provide a guardrail system or handrails when:

- **1910.28(b)(4)(ii)(A)** using the dockboard solely for materials handling operations using motorized equipment .
- **1910.28(b)(4)(ii)(B)** workers engaged in motorized material handling operations are not exposed to fall hazards greater than ten feet.
- **1910.28(b)(4)(ii)(C)** employers train those workers in accordance with 1910.30.

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Runways and Similar Walkways

■ **1910.28(b)(5)** requires that employers must protect workers on runways or similar walkways from falling four feet to a lower level by a guardrail system.

■ **1910.28(b)(5)(i)** no longer includes the requirement that employers provide toeboards on both sides of runways if workers are likely to use tools, machine parts, or other objects on the runway.

■ **1910.28(b)(5)(ii)** the final paragraph requires that when the employer can demonstrate that it is not feasible to have guardrail on both sides of special purpose runways, the employer may omit the guardrail on one side, provided the employer:

• **1910.28(b)(5)(ii)(A)** ensures that the runway is at least 18 inches wide: and

• **1910.28(b)(5)(ii)(B)** provides each worker with, and ensures that each worker uses, a personal fall arrest system or travel restraint system.

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Dangerous Equipment

■ **1910.28(b)(6)** addresses the hazards associated with working above dangerous equipment. Dangerous equipment includes, vats, tanks, electrical equipment, machinery, machinery with protruding parts, or similar units that, because of their function or form, may harm a worker who falls into or onto the equipment.

■ **1910.28(b)(6)(i)** when workers are less than four feet above dangerous equipment, requires that employers protect workers from falling into or onto the dangerous equipment using a guardrail system or a travel restraint system, unless the equipment is covered or guarded to eliminate the hazard.

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Openings

■ **1910.28(b)(7)** requires that employers protect workers on walking-working surfaces near openings (including openings with a chute attached) if the inside bottom edge of the opening is less than 39 inches above the walking-working surface and the outside bottom edge of the opening is four feet or more above a lower level. The employer must protect workers from falling through those openings by providing:

- **1910.28(b)(7)(i)** guardrail system;
- **1910.28(b)(7)(ii)** safety net system;
- **1910.28(b)(7)(iii)** travel restraint system;
- **1910.28(b)(7)(iv)** personal fall arrest system

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Repair, Service and Assembly Pits Less Than 10 Feet Deep

■ **1910.28(b)(8)** only applies to service, repair, and assembly pits that are less than ten feet deep. The final rule specifies that employers do not have to provide fall protection systems for service, repair, or assembly pits that are less than ten feet deep. For deeper pits, employers must provide a conventional fall protection system as specified in final paragraph (b)(1).

■ **1910.28(b)(8)(i)** limits access within six feet of the pit edge to authorized workers trained in accordance with final 1910.30;

■ **1910.28(b)(8)(ii)** applies floor markings or warning lines and stanchions, or a combination thereof, at least six feet from the pit edge;

■ **1910.28(b)(8)(iii)** posts readily visible caution signs that state “Caution – Open Pit” and meets the requirements of 1910.145 specification for accident prevention signs.

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Fixed Ladders (that extend more than 24 feet above a lower level)

- **1910.28(b)(9)** only requires that employers provide fall protection to those fixed ladders more than 24 feet above a lower level.

- **1910.28(b)(9)(i)** establishes a new framework to protect workers from fall hazards on fixed ladders that allows employers gradually over 20-years, phase in ladder safety/personal fall protection systems and phase out the use of cages and wells as a means of fall protection.
 - **1910.28(b)(9)(i)(A)** for fixed ladders erected before November 19, 2018, employers have up to 20 years to install ladder safety or personal fall arrest systems;

 - **1910.28(b)(9)(i)(B)** for new fixed ladders erected on or after November 19, 2018, the employer must equip the ladder with a ladder safety or personal fall arrest system;

 - **1910.28(b)(9)(i)(C)** for ladder repairs and replacements, when an employer replaces any portion of a fixed ladder the replacement must be equipped with a ladder safety or personal fall arrest system;

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Fixed Ladders (that extend more than 24 feet above a lower level)

- **1910.28(b)(9)(i)(D)** the final deadline for all fixed ladders. After November 18, 2036 all fixed ladders must be equipped with a ladder safety or personal fall arrest system.

- **1910.28(b)(9)(ii)** adds new requirements for one-section fixed ladders that are equipped with personal fall arrest systems or ladder safety systems and fixed ladders equipped with those systems on more than one ladder section. For these ladders the final rule requires employers ensure:
 - **1910.28(b)(9)(ii)(A)** the personal fall arrest or ladder safety system provides protection throughout the vertical distance of the ladder, including all ladder sections; and

 - **1910.28(b)(9)(ii)(B)** the ladder has rest platform provided at least every 150 feet.

- **1910.28(b)(9)(iv)** is a new provision OSHA added to the final rule that allows employers to use cages and wells in combination with personal fall arrest and ladder safety systems, provided the cages and wells do not interfere with the operation of the system.

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Fixed Ladders (that extend more than 24 feet above a lower level)

■ **1910.28(b)(9)(iii)** applies during the gradual phase out of cages and wells. The final rule requires that employers ensure ladder sections that have cages or wells:

- **1910.28(b)(9)(iii)(A)** are offset from adjacent sections; and

- **1910.28(b)(9)(iii)(B)** have landing platforms provided at maximum intervals of 50 feet.

■ **1910.28(b)(9)(iv)** is a new provision OSHA added to the final rule that allows employers to use cages and wells in combination with personal fall arrest and ladder safety systems, provided the cages and wells do not interfere with the operation of the system.

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Outdoor Advertising

■ **1910.28(b)(10)** addresses fall hazards on fixed ladders used in outdoor advertising billboards. Final paragraph 1910.28(b)(10) in combination with (b)(9) requires that employers ensure their workers use fall protection while climbing fixed ladders that extend more than 24 feet above a lower level.

■ **1910.28(b)(10)(i)** specifies the fall protection requirements for fixed ladders in final paragraph (b)(9) also apply to fixed ladders in outdoor advertising. In addition, they must follow the schedule in final paragraph (b)(9)(i) for gradually phasing in the installation of ladder safety and personal fall arrest systems on fixed ladders. Final paragraph (b)(10)(i) also requires that employers in outdoor advertising follow other provisions in revised subparts D and I, such as the inspection and maintenance requirements in final 1910.22, the training requirements in final 1910.30, and criteria for personal fall protection in 1910.140.

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Outdoor Advertising

■ **1910.28(b)(10)(ii)** establishes the requirements outdoor advertising employers must follow during the phase in period (two years) they have to install a cage, well, ladder safety system or personal fall arrest system. During this period when outdoor advertisers have not yet installed fall protection, employers must ensure that each worker:

- **1910.28(b)(10)(ii)(A)** receives training and demonstrates the physical capability to perform the necessary climbs in accordance with 1910.29(h);
- **1910.28(b)(10)(ii)(B)** wears a body harness equipped with an 18 inch rest lanyard;
- **1910.28(b)(10)(ii)(C)** keeps both hands free of tools and material while climbing the fixed ladder; and
- **1910.28(b)(10)(ii)(D)** is protected by a fall protection system upon reaching the work position

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Stairways

- **1910.28(b)(11)** requires that employers protect workers from falling off stairway landings and exposed sides of all stairways.
- **1910.28(b)(110)(i)** requires that employers ensure each worker exposed to an unprotected sides or edge of a stairway landing that is four feet or more above a lower level is protected by a guardrail or stair rail system. The final requirement is consistent with the requirements for stairway landings specified by the existing general industry standard in 1910.24(h)
- **1910.28(b)(11)(ii)** requires that employers ensure each flight of stairs having at least three treads and at least four risers is equipped with stair railing system and handrails as specified in Table D-2. Table D-2 specifies the type and number of stair rails and hand rails employers must provide based upon the width and configuration of the stairs.
- **1910.28(b)(11)(iii)** requires that employers ensure ship stair and alternating tread type stairs are equipped with handrails on both sides. Both types of stairs have slopes that are 50 to 70 degrees from the horizontal, and OSHA believes workers need handrails on both sides to safely climb those stairs.

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Scaffolds and Rope Descent Systems

■ **1910.28(b)(12)** requires that employers protect workers from falls who are working on scaffolds and who are using rope descent systems.

■ **1910.28(b)(12)(i)** makes the general industry standard consistent with the construction standard by requiring the employer to ensure that workers on scaffolds are protected from falling in accordance with 29 CFR part 1926, subpart L

■ **1910.28(b)(12)(ii)** requires that employers ensure workers using rope descent systems four feet or more above lower levels are protected from falling by a personal fall arrest system. OSHA reminds employers that if they use vertical lifelines to protect workers using RDS, the lifeline must be attached to a separate anchorage.

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Work on Low Slope Roofs

■ **1910.28(b)(13)** Final paragraph (b)(13) is a new provision that establishes fall protection requirements when employees perform work on low slope roofs. OSHA is adding this provision to make the general industry standard more consistent with the construction standard. The type of fall protection measures employers must use on low-slope roofs depends upon the distance they work from the roof edge. The final rule divides work on low slope roofs into three zones;

- **1910.28(b)(13)(i)** Work performed less than 6 feet from the edge requires that employers use conventional fall protection systems (i.e. guardrail systems, safety net systems, personal fall protection systems) when they work less than 6 feet from the edge of a low slope roof.

- **1910.28(b)(13)(ii)** when workers perform work 6 feet to less than 15 feet from the roof edge requires employers protect workers from falling by using:

- A conventional fall protection system; or
- A designated area, but only when the employer is performing work “that is both infrequent and temporary.”

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Work on Low Slope Roofs

■ **1910.(b)(13)(iii)** Work performed 15 feet or more from the roof edge, requires employers protect workers from falling by:

- Using a conventional fall protection system or a designated area. If, however, the work is both infrequent and temporary, employers do not have to provide any fall protection; and
- Implementing and enforcing a work rule prohibiting employer from going within 15 feet of the roof edge without using fall protection in accordance with paragraph (b)(13)(i) and (ii).

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Walking-Working Surfaces Otherwise Not Addressed

■ **1910.28(b)(15)** applies to walking-working surfaces that other paragraphs in final 1910.28(b) do not address specifically, such as ramps. Final paragraph (b)(15) requires that employers must protect each worker on a walking-working surface not addressed elsewhere in final paragraph(b) or other subparts in 29 CFR part 1910 from falling four feet or more to a lower level using:

- **1910.28(b)(15)(i)** guardrail system; or
- **1910.28(b)(15)(ii)** safety net system; or
- **1910.28(b)(15)(iii)** personal fall protection systems, such as personal fall arrest systems, travel restraint systems, and positioning systems.

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Section 1910.28 Duty to Have Fall Protection and Falling Object Protection

Paragraph (c) Protection From Falling Objects

■ **1910.28(c)** requires that employers protect workers from being struck by falling objects, such as objects falling through holes or off the sides or edges of walking-working surfaces onto workers below. When workers are at risk of being struck by falling objects, this final rule requires that employers ensure that workers wear head protection meeting the requirement of 29 CFR part 1910 subpart I. In addition final paragraph (c) requires that employers protect workers using one or more of the following:

- **1910.28(c)(1)** erecting toeboards, screens, or guardrail systems to prevent objects from falling to a lower level;
- **1910.28(c)(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; or
- **1910.28(c)(3)** barricading the area into which objects could fall, prohibiting workers from entering the barricaded area, and keeping objects far enough from the edge or opening to prevent them from falling to a lower level.

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Chapter 10

Fall protection and Falling Object: Criteria and Practices

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■ **1910.29** requires that employers ensure the fall protection system and falling objects protection they select meet the specific criteria and practice provisions.

Paragraph (a) General Requirements

1910.29(a)(1) specifies that employers ensure those systems meet the application requirements in 29 CFR part 1910, subpart I, namely final 1910.132, general requirements, general requirements and 1910.140, personal fall protection equipment.

1910.29(a)(2) specifies that employers must provide and install all fall protection systems and falling object protection required by final subpart D, and comply with all other applicable requirements of final subpart D, before any worker begins work that necessitates fall or falling object protection. This provision requires that employers take a proactive approach to managing fall and falling object hazards by installing, for example fall protection systems or components (e.g. vertical lifeline), so the systems are in place and available for use whenever there is potential worker exposure to fall hazards.

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Paragraph (b) Guardrail Systems

■ **1910.29(b)** contains system requirements that employers must follow to ensure guardrail systems they use will protect workers from falling to lower levels.

■ **1910.29(b)(1)** specifies requirements for the minimum and maximum height of guardrail systems. Final paragraph (b)(1) carries forward the existing requirement (existing 1910.23(e)(1)) that employers must ensure the top edge of the top rails or guardrail systems is 42 inches above the walking-working surface. The final rule allows the height of guardrails to deviate from the 42 inch required height by up to three inches, plus or minus, which also is consistent with the construction standard.

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■ **1910.29(b)(2)** requires that employers install intermediate protective members, such as midrails, screens, mesh, intermediate vertical members, solid panels, or equivalent intermediate members between the walking-working surface and the top edge of the guardrail system when there is not a wall or parapet that is at least 21 inches high. Whatever intermediate protective member used, the final rule requires that employers install them as follows:

- **1910.29(b)(2)(i)** install midrails midway between the top edge of the guardrail system and the walking-working surface. Since the final rule requires that guardrail systems be 42 inches high (plus or minus three inches), employers must install midrails approximately 21 inches above the walking-working surface;
 - **1910.28(b)(2)(ii)** install screens, mesh, and solid panels from the walking-working surface to the top rail and along the entire opening between top rail supports.
 - **1910.29(b)(2)(iii)** install intermediate vertical members, such as balusters, no more than 19 inches apart; and
- **1910.29(b)(2)(iv)** install other equivalent members, such as midrails and architectural panels, so that openings are not more than 19 inches wide.

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■ **1910.29(b)(3)** requires that employers ensure guardrail systems are 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)(4)** requires that employers ensure that when the 200 pound test load is applied in a downward direction, the top rail of the guardrail system does not deflect to a height of less than 39 inches above the walking-working surface.

■ **1910.29(b)(5)** requires that employers ensure midrails, screens, mesh, intermediate vertical members, solid panels and other equivalent members, are 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.

■ **1910.29(b)(6)** requires that employers ensure guardrail systems are smooth-surface to protect workers from injury, such as punctures or lacerations, and to prevent catching or snagging of workers clothing.

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■ **1910.29(b)(7)** requires that employers ensure the ends of top rails and midrails do not overhang the intermediate posts, except where the overhang does not pose a projection hazard for workers. Top and midrails that extend past the terminal post may cause a workers clothing or tool belt to catch which could result in a fall. However, the final rule allows top rails and midrails to overhang the terminal post provided they do not pose a projection hazard.

■ **1910.29(b)(8)** prohibits employers from using steel and plastic banding for top rails or midrails in guardrail systems. This final paragraph does not prohibit the use of steel or synthetic rope on top rails and midrails because rope does not have sharp edges.

■ **1910.29(b)(9)** requires that employers ensure top rails and midrails of guardrail systems are at least one-quarter inch in diameter or thickness. The final rule applies to all top rails and midrails regardless of the material the employers use for those rails. The final rule uses both “diameter” and “thickness” because top rails and midrails have different shapes (e.g. cylindrical or rectangular).

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■ **1910.29(b)(10)** requires that employers using guardrail systems at hoist areas place a removable guardrail section or, in the alternative, chains or a gate consisting of a top rail and midrails, across the access opening between guardrail sections when workers are not performing hoisting operations. The final rule clarifies that employers may use any of the following three alternatives to guard openings to hoist areas:

- Removable guardrail section;
- Chains that provide protection at least at the top and midrail level; or
- A gate consisting of a top rail and midrail.

■ **1910.29(b)(11)** requires that employers ensure that when guardrail systems are used around holes, they are installed on all unprotected sides or edges of the hole.

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■ **1910.29(b)(12)** establishes requirements for guardrail systems erected around holes through which material may be passed. The final rule requires:

- **1910.29(b)(12)(i)** when workers are passing materials through holes, employers must ensure that not more than two sides of the guardrail system are removed; and

- **1910.29(b)(12)(ii)** when workers are not passing materials through the hole, employers must ensure a guardrail system is installed on all unprotected sides and edges, or close the hole with a cover.

■ **1910.29(b)(13)(i)** requires that employers using guardrail systems around holes that are points of access, such as ladderway openings, protect workers from walking or falling into the hole by installing gates at the opening in the guardrail system

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■ **1910.29(b)(13)(ii)** or offsetting the opening from the hole so workers cannot walk or fall into the hole. The final rule also revises criteria for such gates by specifying that they;

- Must be self-closing;
- Must either slide or swing away from the hole; and
- Be equipped with top rails and midrails or equivalent intermediate members that meet the requirements in final paragraph 1910.29(b)(13)(i)

■ **1910.29(b)(14)** requires that employers ensure guardrail systems on ramps and runways are installed along each unprotected side or edge.

■ **1910.29(b)(15)** requires that employers ensure manila and synthetic rope used for top rails or midrails of guardrail systems are inspected as frequently as necessary to ensure that the rope continues to meet the strength requirements in final paragraphs (b)(3) (top rails) and (b)(5) (midrails) of this section.

■ **1910.29(b)(16)** is an informational note reminding employers that criteria and practice requirements for guardrail systems on scaffolds used in general industry are in the construction scaffold standards (29 CFR part 1926, subpart L, Scaffolds).

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Paragraph(c) Safety Net Systems

■ **1910.29(c)** requires that general industry employers ensure all safety net systems they use meet the criteria and practice requirements in 29 CFR part 1926, subpart M, Fall Protection. Final 1910.28 allows employers to use safety net systems to protect workers on several types of elevated walking-working surfaces, including unprotected sides and edges, wall openings, and low-slope roofs. OSHA requires employers working in general industry to follow construction criteria and practice requirements for safety net systems.

Paragraph (d) Designated Areas

■ **1910.29(d)** establishes criteria and practices for “designated areas,” which the final rule in 1910.21(b) defines as “a distinct portion of a walking working surface delineated by a warning line in which employees may perform work without additional fall protection. “

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Paragraph (d) Designated Areas

■ **1910.29(d)(1)(i)** requires that employers ensure workers remain within the designated area during work operations. If workers must go outside the designated area, they must be protected by conventional fall protection systems.

■ **1910.29(d)(1)(ii)** requires that employers delineate the perimeter of designated areas with a warning line. Warning lines may consist of ropes, wires, tape, or chains that employers ensure meet the requirements of final paragraphs (d)(2) and (d)(3).

■ **1910.29(d)(2)** establishes criteria and practices requirements for warning lines.

■ **1910.29(d)(2)(i)** specifies that employers ensure warning lines have a minimum breaking strength of 200 pounds.

■ **1910.29(d)(2)(ii)** requires that employers install warning lines so the lowest point, including any sag, is not less than 34 inches or more than 39 inches above the walking-working surface.

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Paragraph (d) Designated Areas

■ **1910.29(d)(2)(iii)** requires that employers ensure warning lines are supported in such a manner that pulling on one section of the line will not result in slack being taken up in any adjacent sections causing the line to fall below the limit of 34 inches at any point, as specified in (d)(2)(ii).

■ **1910.29(d)(2)(iv)** requires that employers ensure warning lines are clearly visible from a distance of 25 feet away and anywhere within the designated area.

■ **1910.29(d)(2)(v)** requires that employers erect warning lines as close to the work areas as the task permits.

■ **1910.29(d)(2)(vi)** requires that employers erect warning lines not less than 6 feet from the roof edge for work that is both temporary and infrequent, or not less than 15 feet for other work.

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Paragraph (d) Designated Areas

■ **1910.29(d)(3)** establishes minimum distances from an unprotected side or edge for erecting warning lines when workers use mobile mechanical equipment to perform work that is both temporary and infrequent in an designated area. In such cases, the final rule requires that employers erect warning lines:

- (1) not less than 6 feet from the unprotected side or edge that is parallel to the direction in which workers are using the mechanical equipment; and
- (2) not less than 10 feet from the unprotected side or edge that is perpendicular to the direction in which the workers are operating the mechanical equipment. When mobile mechanical equipment is used to perform other work, a warning line must be erected at least 15 feet from the roof edge.

■ **1910.29(d)(4)** which the final does not retain, required employers to provide clear access paths to designated areas. OSHA decided not to retain paragraph (d)(4) in the final rule.

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Paragraph (e) Covers

■ **1910.29(e)** addresses criteria and practices for covers that employers use to protect workers from falling into a hole in a walking-working surface, including, holes in floors, roofs, skylights, roadways, vehicle aisles, manholes, pits and other walking-working surfaces.

■ **1910.29(e)(1)** requires that employers ensure any cover they use to prevent workers from falling into a hole in walking-working surface is capable of supporting, without failure, at least twice the maximum intended load that may be on the cover at any one time.

■ **1910.29(e)(2)** requires that employers secure covers to prevent accidental displacement.

Paragraph (f) Handrail and Stair Rail Systems

■ **1910.29(f)** sets criteria and practices for handrails and stair rail systems. These requirements cover height, finger clearances, surfaces, stair rail openings, handholds, projection hazards, and strength.

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Paragraph (f) Handrail and Stair Rail Systems

■ **1910.29(f)(1)** OSHA revised the language on measuring height criteria to make it uniform and consistent.

■ **1910.29(f)(1)(i)** requires that employers ensure each handrail is not less than 30 inches and not more than 38 inches high, as measured from the leading edge of the stair tread to the top surface of the handrail.

■ **1910.29(f)(1)(ii)** establishes the height requirement for stair rail systems. Employers must ensure:

- **1910.29(f)(1)(ii)(A)** the height of stair rail systems installed before the effective date of the final rule, January 17, 2017, is not less than 30 inches as measured from the leading edge of the stair tread to the top surface of the top rail; and

- **1910.29(f)(1)(ii)(B)** the height of stair rail systems installed on or after the effective date, January 17, 2017, is not less than 42 inches as measured from the leading edge of the stair tread to the top surface of the top rail.

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Paragraph (f) Handrail and Stair Rail Systems

■ **1910.29(f)(1)(iii)** permits employers to use the top rail of stair rail systems as a handrail only when:

- **1910.29(f)(1)(iii)(A)** the height of the stair rail system, is not less than 36 inches and not more than 38 inches as measured at the leading edge of the stair tread to the top edge of the top rail; and
- **1910.29(f)(1)(iii)(B)** the top rail of the stair rail system meets the other handrail requirements in final paragraph (f) of this section.

■ **1910.29(f)(2)** requires that employers ensure there is a finger clearance of at least 2.25 inches between handrails (including the top rail of a stair rail system being used as handrails) and any other object (such as a wall).

■ **1910.29(f)(3)** requires that employers ensure handrails and stair rail systems are smooth-surfaced to protect workers from injury, such as punctures or lacerations, and to prevent catching or snagging of clothing, including protective clothing.

■ **1910.29(f)(4)** requires that employers ensure no opening in a stair rail system exceeds 19 inches in its least dimension.

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Paragraph (f) Handrail and Stair Rail Systems

- **1910.29(f)(5)** requires that employers ensure handrails (including top rails of stair rail systems serving as handrails (final paragraph 1910.29(f)(1)(iii)), have the shape and dimensions necessary so workers can grasp the handrail firmly.
- **1910.29(f)(6)** requires that employers ensure the end of handrails and stair rails systems do not present any projection hazard.
- **1910.29(f)(7)** requires that employers ensure handrails, and top rails of stair rail systems, are capable of withstanding, without failure, a force of at least 200 pounds applied in any downward or outward direction within 2 inches of any point along the top edge of the rail.

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Paragraph (g) Cages, Wells and Platforms Used With Fixed Ladders

- **1910.29(g)** establishes criteria and practice requirements for cages, wells, and platforms used with fixed ladders.

- **1910.29(g)(1)** requires that employers ensure cages and wells installed on fixed ladders are designed, constructed, and maintained to permit easy access to, and egress from the ladder that they enclose.

- **1910.29(g)(2)** both the general industry and construction standards require that cages extend along the fixed ladder to a point that is not less than 7 feet nor more than 8 feet above the base of the ladder (see 1910.27(d)(1)(iii) and 1926.1053(a)(20)(vii)). These standards also require that the tops of cages extend at least 42 inches above the top of the platform or the point of access at the top of the ladder (see 1910.27(d)(1)(iii) and 1926.1053(a)(20)(viii)).

- **1910.29(g)(3)** requires that employers ensure cages and wells are designed, constructed, and maintained so they contain workers in the event of a fall and direct them to a lower landing.

- **1910.29(g)(4)** requires that employers ensure landing platforms used with fixed ladders provide workers with a horizontal surface that is at least 24 inches by 30 inches.

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Paragraph (h) Outdoor Advertising

1910.29(h) establishes temporary criteria and practice requirements for employers engaged in outdoor advertising (billboard) operations (hereafter referred to as “outdoor advertising operations” and “outdoor advertising employers”), during the phase out period.

1910.29(h)(1) requires that outdoor advertising employers ensure that each worker who climbs fixed ladders without fall protection is physically capable to perform those duties that employers may assign. To ensure that workers are physically capable, final paragraph (h)(1) requires that employers either observe workers performing actual climbing activities, or ensure workers undergo a physical examination.

1910.29(h)(2) requires that outdoor advertising employers ensure their workers who climb fixed ladders without fall protection (1) successfully complete a training or apprenticeship program that includes hands-on training for the safe climbing of ladders (including fixed ladders without fall protection and portable ladders); and (2) receive retraining as necessary to ensure they maintain necessary skills.

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Paragraph (h) Outdoor Advertising

■ **1910.29(h)(3)** requires that outdoor advertising employers ensure workers possess the skill to climb ladders safely as demonstrated through;

- Formal classroom training; and

- Performance observations

■ **1910.29(h)(4)** requires that employers permit workers to climb fixed ladders without fall only if such climbing is part of their routine work activities.

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Paragraph (i) Ladder Safety Systems

■ **1910.29(i)** establishes criteria and practice requirements for ladder safety systems permanently attached to fixed ladders or immediately adjacent to such ladders.

■ **1910.29(i)(1)** requires that employers must ensure each ladder safety system allows workers to climb up and down the fixed ladder with both hands free for climbing. The final rule also specifies that the design of the ladder safety system must be such that it does not require that workers continuously hold, push, or pull any part of the system while they are climbing.

■ **1910.29(i)(2)** requires that the employer ensure the connection between the carrier or lifeline and the point of attachment to the body harness or belt does not exceed 9 inches in length. The purpose of this provision is to limit the length of any fall and resulting arrest forces. The final rule ensures that no fall exceeds 18 inches, which will limit the arresting forces.

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Paragraph (i) Ladder Safety Systems

■ **1910.29(i)(3)** requires employers to ensure that mountings for rigid carriers are attached at each end of the carrier, with intermediate mounting spaced, as necessary, along the entire length of the carrier so the system has the strength to stop workers fall.

■ **1910.29(i)(4)** requires that employers ensure flexible carriers have mounting attached at each end of the carrier. The final rule also requires the installation of cable guides for flexible carriers, at least 25 feet apart, but no more than 40 feet apart, along the entire length of the carrier.

■ **1910.29(i)(5)** requires employers to ensure that the design and installation of mountings and cable guides do not reduce the design strength of the ladder.

■ **1910.29(i)(6)** requires that employers ensure ladder safety systems and their support systems are capable of withstanding, without failure, a drop test consisting of an 18 inch drop of a 500 pound weight. This drop test, therefore, must arrest and suspend the 500 pound weight without damage to or failure of the ladder safety system and its support system and without the test weight hitting a lower level.

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Paragraph (j) Personal Fall Protection Systems

■ **1910.29(j)** requires that body belts, body harnesses, and other components used in personal fall arrest systems, work positioning systems, and travel restraint systems meet the applicable requirements in final 1910.140.

Paragraph (k) Protection From Falling Objects

■ **1910.29(k)** establishes criteria and practice requirements for the measures that final 1910.28(c) requires.

■ **1910.29(k)(1)** establishes criteria and practice requirements for toeboards, which the final rule in 1910.21(b) defines as a low protective barrier that is designed to prevent materials, tools, and equipment from falling to a lower level.

■ **1910.29(k)(1)(i)** requires that employers ensure toeboards, when used for falling object protection, are erected along the exposed edge of the overhead walking-working surface for a length that is sufficient to protect workers below.

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Paragraph (k) Protection From Falling Objects

- **1910.29(k)(1)(iii)** requires that employers ensure toeboards do not have an opening or clearance of more than 0.25 inches above the walking-working surface.
- **1910.29(k)(1)(iv)** is a companion provision to final paragraph 1910.29 (k)(1)(iii) requiring that employers ensure toeboards are solid or, if they have openings, the openings do not exceed 1 inch at their greatest dimension.
- **1910.29(k)(1)(v)** requires that employers ensure toeboards used around vehicle repair, service, and assembly pits (pits) have a minimum height of 2.5 inches. The height is measured from the walking-working surface to the top edge of the toeboard. The final rule also includes an exception, which specifies that employers do not have to erect toeboards along the exposed edges of a pit if they can demonstrate the toeboard would prevent access to a vehicle that is over the pit.
- **1910.29(k)(1)(vi)** requires that employers ensure toeboards are 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.

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Section 1910.29 Fall Protection Systems and Falling Object Protection Criteria and Practices

Paragraph (k) Protection From Falling Objects

- **1910.29(k)(2)** establishes criteria and practice requirements where tools, equipment, or materials are piled higher than the toeboard.
- **1910.29(k)(2)(i)** requires that employers use guardrail systems equipped with paneling or screening” rather than vertical members specified in 1910.29(b).
- **1910.29(k)(2)(ii)** requires that employers ensure openings in guardrail systems are small enough to prevent objects from falling through the openings.
- **1910.29(k)(3)** establishes requirements for using canopies as falling object protection. The final rule establishes a performance-based provision requiring that employers ensure canopies are strong enough to prevent collapse and penetration when struck by any falling object. The final rule clarifies that the strength requirements in final paragraph 1910.29(k)(3) only applies to canopies that employers use to protect workers from falling objects, not all canopies.

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Section 1910.29 Fall Protection Systems and Falling Object Protection Criteria and Practices

Paragraph (I) Grab Handles

■ **1910.29(I)** specifies criteria and practice requirements for grab handles that employers provide, such as at a hoist area.

■ **1910.29(I)(1)** requires that grab handles employers provide must be at least 12 inches in length.

■ **1910.29(I)(2)** specifies that grab handles employers install at hoist access openings must provide at least three inches of clearance from the framing or opening.

■ **1910.29(I)(3)** specifies that grab handles employers provide must be capable of withstanding a maximum horizontal pull-out force equal to two times the maximum intended load or 200 pounds.

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Chapter 11

Training Requirements

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Section 1910.30 Training Requirements

1910.30 adds training requirements to 29 CFR part 1910, subpart D and requires training on fall and equipment hazards and, in certain situations, retraining. The final training requirements are performance based and give employers flexibility to tailor the requirements and training methods to their workforce and workplace.

Paragraph (a) Fall Hazards

■ **1910.30(a)** contains training requirements related to fall hazards. Final paragraph (a)(1) requires that employers train each employee who uses a personal fall protection system.

■ **1910.30(a)(1)** requires that employers train each worker required to receive training under subpart D. Subpart D requires worker training in several situations, including:

- When employees use a rope descent system (1910.27(b)(2)(iii));
- When employees work on an unguarded side of a platform used on slaughtering facilities, loading racks, loading docks or teeming platforms (1910.28(b)(1)(iii) and 1910.28(b)(14)(ii)(C)); and
- When employees operate motorized equipment on dockboards not equipped with fall protection (e.g., guardrails) (1910.28(b)(4)(ii)(C)).

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Section 1910.30 Training Requirements

Paragraph (a) Fall Hazards

■ **1910.30(a)(2)** does not require or prohibit a specific format for delivering training to workers. OSHA supports the use of different formats (e.g., classroom, audio-visual, demonstration, practical exercise, field training, written) and new technology (e.g., online, interactive computer-based, web-based) to train workers in accordance with 1910.30. Thus, final paragraph (a)(2) allows employers to use video-based training and computer-based training, provided that:

- A qualified person, as defined in 1910.21(b), developed or prepared the training;
- The training content complies with the requirements in final 1910.30; and
- The employer provides the training in a manner each worker understands (1910.30(D)).

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Section 1910.30 Training Requirements

Paragraph (a) Fall Hazards

■ **1910.30(a)(3)** specifies the minimum subjects and topics that fall hazard training must cover. Final paragraph (a)(3) requires that employers provide training in at least the following topics:

- **1910.30(a)(3)(i)** the nature of fall hazards in the work area and how to recognize them;
- **1910.30(a)(3)(ii)** the procedures that must be followed to minimize the hazards;
- **1910.30(a)(3)(iii)** the correct procedures for installing, inspecting, operating, maintaining, and disassembling the personal fall protection systems that the worker uses; and
- **1910.30(a)(3)(iv)** the correct use of personal fall protection systems and equipment, including, but not limited to, anchoring, and tie-off techniques, and methods of equipment inspection and storage as specified by the manufacturer.

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Section 1910.30 Training Requirements

Paragraph (b) Equipment Hazards

■ **1910.30(b)** contains training requirements related to equipment hazards. The provisions require that employers ensure workers are trained in the following:

- **1910.30(b)(1)** the proper care, inspection, storage, and use of equipment covered in subpart D, under this provision employers must train workers in equipment as well as fall protection systems that final paragraph (a) does not cover;
- **30(b)(2)** how to properly place and secure dockboards to prevent unintentional movement;
- **1910.30(b)(3)** how to properly rig and use a rope descent system; and
- **1910.30(b)(4)** How to properly set up and use designated areas.

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Section 1910.30 Training Requirements

Paragraph (c) Retraining

■ **1910.30(c)** requires that employers retrain workers when they have reason to believe that those workers do not have the understanding and skill that final paragraphs (a) and (b) require. In particular, final paragraph (c) requires that employers train workers in situations including, but not limited to, the following:

- **1910.30(c)(1)** when workplace changes render previous training obsolete or inadequate;
- **1910.30(c)(2)** when changes in the type of fall protection systems or equipment workers use renders previous training obsolete or inadequate; or
- **1910.30(c)(3)** when inadequacies in a workers knowledge or use of fall protection systems or equipment indicates the worker does not have the requisite understanding or skill necessary to use the equipment or perform the job safely.

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Section 1910.30 Training Requirements

Paragraph (c) Retraining

The training requirements in this section impose an ongoing responsibility on employers to maintain worker proficiency. As such, when workers are no longer proficient, the employer must retrain them in the requirements of final paragraphs (a) and (b) before workers perform the job again. Examples of when retraining is necessary include:

- When the worker performs the job or uses equipment in an unsafe manner;
- When the worker or employer receives an evaluation or information that the worker is not performing the job safely; or
- When the worker is involved in an incident or near-miss.

Paragraph (d) Training Must Be Understandable

1910.30(d) requires that employers provide information and training to each worker in a manner that the employee understands.

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Chapter 12

Personal Fall Protection Systems

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Section 1910.140 Personal Fall Protection Systems

Paragraph (a) Scope and Application

1910.140(a) specifies that employers must ensure each personal fall protection system that part 1910 requires complies with the performance, care, and use criteria specified in 1910.140. OSHA notes that not only does 1910.140 apply to the new and revised requirements in subpart D, but also it applies to existing requirements in part 1910 that mandate or allow employers to protect workers from fall hazards using personal fall protection systems (1910.33; 1910.67; 1910.268; and 1910.269)

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Section 1910.140 Personal Fall Protection Systems

Paragraph (d) Definitions

Belt Terminal: an end attachment of a window cleaner's positioning system used to secure the body harness or belt to the window cleaner's belt anchor.

Body Belt: a strap with means both for securing it about the waist and for attaching it to other components such as a lanyard used with positioning, travel restraint, or ladder safety systems.

Body Harness: straps that secure about a worker in a manner that distributes fall arrest forces over at least the workers thighs, pelvis, waist, chest, and shoulders should a fall occur. The final rule specifies a body harness also is a means for attaching it to other components of a personal fall protection system.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (d) Definitions

Carabiner: a connector comprised generally of a trapezoidal or oval shaped body with a closed gate or similar arrangement that may be opened to attach another object. When released, the carabiner gate automatically closes to retain the object. There are generally three types of carabiners:

- Automatic locking, with a self-closing, self-locking gate that remains closed and locked until intentionally unlocked and opened for connection or disconnection;
- Manual locking, with a self-closing gate that must be manually locked by the user and that remains closed and locked until intentionally unlocked and opened by the user for connection and disconnection; and
- Non-locking, with a self-closing gate cannot be locked.

Competent person: In the final rule, OSHA defines “a competent person” as a person who:

- Is capable of identifying existing and predictable hazards in any personal fall protection system or component as well as in their application and uses with related equipment; and
- Has the authorization to take prompt corrective measures to eliminate the identified hazards.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (d) Definitions

Connector: a device used to couple or connect together parts of a personal fall protection system. Examples of connectors include snaphooks, carabiners, buckles, and D-rings.

D-ring: is a connector used in:

- Harnesses, as a integral attachment element or fall arrest attachment;
- Lanyards, energy absorbers, lifelines, or anchorage connectors as an integral connector; or
- A positioning or travel restraint system as an attachment element.

Note: “integral” means the D-ring cannot be removed from the harness without using a special tool.

Deceleration device: any mechanism that serves to dissipate energy during a fall.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (d) Definitions

Deceleration distance: a vertical distance a falling worker travels before stopping, that is, the distance from the point at which the deceleration device begins to operate to the stopping point, excluding lifeline elongation and free fall distance.

Equivalent: alternative designs, equipment, materials, or methods that the employer can demonstrate will provide equal or greater degree of safety for workers compared to the designs, equipment, materials, or methods the final rule specifies.

Free fall: the act of falling before the personal fall arrest system begins to apply force to arrest the fall.

Lanyard: a flexible line of rope, wire rope, or strap that generally has a connector at each end to connect a body harness or body belt to a deceleration device, lifeline, or anchorage.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (d) Definitions

Lifeline: a component of a personal fall protection system that connects other components of the system to the anchorage. A lifeline consists of a flexible line that either connects to an anchorage at one end to hang vertically (a vertical lifeline), or connects to an anchorage at both ends to stretch horizontally (a horizontal lifeline).

Personal fall arrest system: a system used to arrest a workers fall from a walking-working surface. As the final rule specifies, a personal fall arrest system consists of a body harness, anchorage, and connector. The means of connecting the body harness and the anchorage may be a lanyard, deceleration device, lifeline, or suitable combination of these means.

Personal fall protection system: a system (including all its components) that employers use to provide protection for employees from falling or to safely arrest a fall if one occurs. The final definition identifies examples of personal fall protection systems, including personal fall arrest systems, positioning systems, and travel restraint systems.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (d) Definitions

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.”

Qualified: a person who by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject, work or project.

Rope grab: a deceleration device that travels on a lifeline and automatically, using friction, engages the lifeline and locks to arrest a workers fall. A rope usually employs the principle of inertial locking, cam or lever locking, or both.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (d) Definitions

Safety factor: the ratio of the design load and ultimate strength of the material. Generally, the term refers to the structural capacity of a member, material, equipment, or system beyond actual or reasonably anticipated loads; that is, how much stronger the member, material, equipment, or system is than it usually needs to be to support the intended load without breaking or failing.

Self-retracting lifeline: a drum-wound line that a worker can slowly extract from, or retract onto, a drum under slight tension during normal movement. At the onset of a fall, the device automatically locks the drum and arrests the fall.

Snaphook: a connector comprised of a hook shaped body with a normally closed gate, or a similar arrangement, that the user may open manually to permit the hook to receive an object. When the user releases a snaphook, it automatically closes to retain the object. Opening a snaphook requires two separate actions, meaning the user must squeeze the lever on the back before engaging the front gate.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (d) Definitions

Travel restraint (tether) line: a component of a travel restraint system. Specifically the final rule defines it as a rope or wire rope used to transfer forces from a body support to an anchorage or anchorage connector in a travel restraint system. The purpose of a travel restraint (tether) line is to secure workers in such a way as to prevent them from reaching an unprotected edge and falling off the elevated surface on which they are working.

Travel restraint system: is a type of personal fall protection system that consists of combinations of an anchorage, anchorage connector, lanyard (or other means of connection), and body support that an employer uses to eliminate the possibility of a worker going over the edge of a walking-working surface.

Window cleaner's belt: a component of a window cleaner's positioning system. It is a positioning belt that consists of a waist belt, an integral terminal runner or strap, and belt terminals.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (d) Definitions

Window cleaner's belt anchor: a specifically designed fall-preventing attachment point permanently affixed to a window frame or a part of a building immediately adjacent to the window frame, for direct attachment of the terminal portion of a window cleaner's belt. Workers attach the terminals of the window cleaner's belt to the window anchors to prevent falling while cleaning windows.

Window cleaner's positioning system: a system that consists of a window cleaner's belt secured to window anchors.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (c) General Requirements

■ **1910.140(c)** specifies the general requirements employers must ensure that each personal fall protection system meets. The general requirements are criteria for the common components of personal fall protection systems, such as connectors, anchorages, lanyards and body harnesses.

■ **1910.140(c)(1)** requires that employers ensure connectors used in fall protection systems are made of drop forged, pressed or formed steel, or equivalent materials.

■ **1910.140(c)(2)** requires connectors to have corrosion resistant finishes, as well as smooth surfaces and edges to prevent damage to interfacing parts of the personal fall protection system.

■ **1910.140(c)(3)** when employers use vertical lifelines, paragraph (c)(3) of the final rule requires that employers ensure each worker is attached to a separate lifeline. OSHA believes that allowing more than one worker on the same vertical lifeline would create additional hazards.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (c) General Requirements

■ **1910.140(c)(4)** requires that employers ensure lanyards and vertical lifeline have a minimum breaking strength of 5,000 pounds. Breaking strength refers to the point at which a lanyard or vertical lifeline will break because of the stress put on it.

■ **1910.140(c)(5)** provides an exception to the 5,000 strength requirement for SRL's that automatically limit free fall distance to 2 feet or less. The final provision allows a lower strength requirement because the fall arrest requirements are less when free falls are limited to 2 feet. These lifelines and lanyards must have components capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position. Tensile load means a force that attempts to pull apart, stretch an object, while tensile strength means the ability of an object or material to resist forces that attempt to pull apart or stretch the object or material.

■ **1910.140(c)(6)** requires that a competent or qualified person must inspect each knot in lanyards and vertical lifelines, before a worker uses the lanyard or lifeline, to ensure they still meet the minimum strength requirements in paragraphs (c)(4) and (c)(5). This new requirement is based on the note OSHA included in proposed paragraph (c)(4) warning employers that the use of knots "may significantly reduce the breaking strength" of lanyards and vertical lifelines.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (c) General Requirements

■ **1910.140(c)(7)** is the same as the strength requirements in OSHA's other fall protection standards (1910.66 appendix C, Section I, paragraph (d)(6); 1915.159(a)(3); 1926.205(d)(3)).

■ **1910.140(c)(8)** requires that D-rings, snaphooks, and carabiners be proof tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or incurring permanent deformation. OSHA also added a new requirement to paragraph (c)(8) specifying the gate strength of snaphooks, and carabiners also must be proof tested to 3,600 pounds in all directions.

■ **1910.140(c)(9)** requires employers to use automatic locking snaphooks and carabiners in personal fall protection systems.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (c) General Requirements

■ **1910.140(c)(10)** prohibits employers from using snaphooks and carabiners for certain connections unless they are designed for that connection. Accordingly, the final rule specifies that employers may connect snaphooks, or carabiners to the following objects only if the snaphooks and carabiners are designed to be connected:

- Directly to webbing, wire, or wire rope;
- To each other;
- To a D-ring to which another snaphook, carabiner, or connector is attached;
- To a horizontal lifeline; or
- To any object that is incompatibly shaped or dimensioned in relation to the snaphook or carabiner such that the unintentional disengagement could occur when the connected object depresses the snaphook or carabiner gate and allows the components to separate.

■ **1910.140(c)(11)** establishes two requirements for horizontal lifelines. The provision specifies that employers must ensure horizontal lifelines are:

- **1910.140(c)(11)(i)** designed, installed and used under the supervision of a qualified person; and
- **1910.140(c)(11)(ii)** are a part of a complete fall arrest system that maintains a safety factor of at least two.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (c) General Requirements

■ **1910.140(c)(12)** requires that employers ensure anchorages used to attach to personal fall protection equipment are independent of any anchorage used to suspend workers or work platforms. This requirement ensures that if the anchorage holding other equipment (such as powered platforms or RDS) fails, the worker will still be protected by the separate, independent anchorage to which the personal fall protection system is secured.

■ **1910.140(c)(13)** adopts strength requirements for anchorages for personal fall protection systems, and includes a performance based alternative. The final provision requires that anchorages either, (1) be capable of supporting at least 5,000 pounds for each worker attached, or (2) be designed, installed, and used under the supervision of a qualified person as part of a complete personal fall protection system safety factor of at least two. The anchorage strength requirement applies to personal fall arrest, travel restraint, and positioning position anchorages, but not to window cleaner's belt anchors, which are addressed separately in paragraph (e).

■ **1910.140(c)(14)** requires that restraint lines in travel restraint systems be capable of sustaining a tensile load of at least 5,000 pounds. OSHA existing fall protection standards do not include any requirements that specifically address travel restraint systems or lines.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (c) General Requirements

- **1910.140(c)(15)** requires that employers ensure lifelines are not made of natural fiber rope. Natural fiber rope of the same size is weaker than its synthetic counterpart and may burn under friction. When the employer uses polypropylene rope, the final rule requires that it must contain an ultraviolet (UV) light inhibitor.
- **1910.140(c)(16)** requires that all personal fall protection systems and components be used only for worker fall protection. This paragraph also prohibits personal fall protection systems from being used for anything other purpose, such as hoisting materials or equipment.
- **1910.140(c)(17)** requires that any fall protection system or its components subjected to impact loading must be removed from service immediately. This final rule also specifies that the employer must not use the system or component again until a competent person inspects the system or component and determines that it is not damaged and is safe to use for worker personal fall protection.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (c) General Requirements

- **1910.140(c)(18)** requires that before initial use during each workshift, personal fall protection systems must be inspected for mildew, wear, damage, and other deterioration. The provision also requires that employers remove from service any defective components.
- **1910.140(c)(19)** requires employers ensure that ropes, lanyards, harnesses, and belts used for personal fall protection are compatible with the connectors being used.
- **Final appendix C to 1910.140** states the ideal way for employers to ensure the compatibility of components of personal fall protection system is to supply workers with complete systems. “All equipment used in a fall protection system shall be compatible to limit force levels, maintain system strength, and prevent accidental disengagement.”

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Section 1910.140 Personal Fall Protection Systems

Paragraph (c) General Requirements

- **1910.140(c)(20)** requires that employers ensure all ropes, lanyards, lifelines, harnesses, and body belts used for personal fall protection systems are protected from being cut, abraded, melted, or otherwise damaged.

- **1910.140(c)(21)** requires that employers provide for the prompt rescue of workers in the event of a fall. This requirement is necessary because workers suspended after a fall are in danger of serious injury due primarily to suspension trauma.

- **1910.140(c)(22)** requires that workers wear personal fall protection systems with the attached point of the body harness in the center of a workers back near shoulder level. The final rule includes one exception, the attachment point may be located in the pre-sternal position if the free fall distance is limited to 2 feet or less.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (d) Personal Fall Arrest Systems

- **1910.140(d)** establishes specific requirements for using personal fall arrest systems.
- **1910.140(d)(1)** establishes performance criteria for personal fall arrest systems.
- **1910.140(d)(1)(i)** requires that employers ensure personal fall arrest systems limit the maximum arrest force on a worker to 1,800 pounds.
- **1910.140(d)(1)(ii)** limits the maximum deceleration distance to 3.5 feet. This requirement pertains only to the operation of the deceleration device itself and not to the 6 foot free fall distance specified in paragraph (d)(2)(ii). The 3.5 foot deceleration distance in the paragraph is in addition to the 6-foot free fall distance. Accordingly, once the free fall ends and the deceleration device begins to operate, the personal fall arrest system must bring the worker to a complete stop within 3.5 feet. Combining the free fall distance with the deceleration distance means that the total maximum distance a worker may travel during a fall could be 9.5 feet.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (d) Personal Fall Arrest Systems

- **1910.140(d)(1)(iii)** requires personal fall arrest systems have sufficient strength to withstand twice the potential impact energy of the worker free falling a distance of 6 feet, or the free fall distance permitted by the system.
- **1910.140(d)(1)(iv)** is a new paragraph added to the final rule requiring that fall arrest systems be capable of sustaining the worker within the system or strap configuration without making contact with the workers neck and chin area.
- **1910.140(d)(1)(v)** personal fall arrest systems meeting the criteria and protocols set out in appendix D to 1910.140 will be deemed to be in compliance with the requirements of paragraphs 1910.140(d)(1)(i); 1910.140(d)(1)(ii); and 1910.140(d)(1)(iii) when used by a worker who has a combined tool and body weight of less than 310 pounds.
- **1910.140(d)(2)** establishes criteria for the use of personal fall arrest systems.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (d) Personal Fall Arrest Systems

- **1910.140(d)(2)(i)** OSHA, requires that, for horizontal lifelines that may become vertical lifelines, the device used to connect to the horizontal lifeline must be capable of locking in both directions on the lifeline.

- **1910.(d)(2)(ii)** requires the personal fall arrest system to be rigged so that a worker cannot free fall more than 6 feet, nor contact a lower level. The system strength and deceleration criteria for personal fall arrest systems are based on a maximum free fall distance of 6 feet.

- **1910.140(d)(3)** prohibits employers from using body belts as part of a personal fall arrest system.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (e) Positioning Systems

■ **1910.140(e)** establishes specific requirements for positioning systems, including window cleaner's positioning systems. These requirements apply in addition to the general requirements in paragraph (c), which apply to all types of personal fall protection systems.

■ **1910.140(e)(1)** establishes performance criteria for positioning systems.

■ **1910.140(e)(1)(i)** requires employers to ensure positioning systems, except window cleaner's positioning systems, are capable of withstanding, without failure, a drop test consisting of a 250 pound weight dropped 4 feet.

■ **1910.140(e)(1)(ii)** requires employers to ensure that window cleaner's positioning systems are capable of withstanding, without failure, a drop test consisting of a 6 foot drop of a 250 pound weight.

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Section 1910.140 Personal Fall Protection Systems

Paragraph (e) Positioning Systems

■ **1910.140(e)(1)(ii)(B)** requires that these systems limit the initial fall arresting force on the falling worker to not more than 2,000 pounds with a duration not exceeding 2 milliseconds, and any subsequent fall arrest forces do not exceed 1,000 pounds.

■ **1910.140(e)(1)(iii)** proposed as a note, applicable to paragraphs (e)(1)(i) and (e)(1)(ii) and explains that positioning systems, including window cleaner's positioning systems, meeting the test methods and procedures outlined in appendix D to 1910.140 are considered to be in compliance with these provisions.

■ **1910.140(e)(1)(iv)** addresses criteria application to lineman's body belt and pole strap systems.

■ **1910.140(e)(1)(iv)(A) & (B)** requires employers to ensure that a lineman's body belt and pole strap system be capable of passing dielectric and leakage tests, as well as a flammability test.

■ **1910.140(e)(1)(iv)(C)** is a new paragraph added to the final ruling requiring that a lineman's body belt and pole strap systems meet the flammability test in table I-7.

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Section 1910.140 Personal Fall Protection Systems

Profile of Affected Industries, Firms, Workers, and Other Factors of Production

Affected Industries and Employees

Revised subparts D and I apply to employers and industries covered by OSHA's standards for general industry in 29 CFR part 1910. Similarly, all other subparts in part 1910 affected by these revisions to OSHA's walking-working surfaces standards would impose requirements on employers in general industry under OSHA's jurisdiction. The general industry category excludes establishments in agriculture, maritime (longshoring, marine terminal, and shipyards), and mining industries (except for oil and gas extraction). Also excluded from the final standard are employee tasks on surfaces that fall outside of OSHA's jurisdiction due to location or operational status, or those tasks that are subject to unique industry-specific fall protection requirements addressed elsewhere in part 1910, including 1910.268, Telecommunications, Electric power generation, transmission, and distribution. An example of a jurisdiction category excluded from the scope of the final rule based on location or operational status is employee exposure to fall hazards when railroad rolling stock is traveling on rails or trucks are traveling on highways; the Department of Transportation regulates these operations

**Properly protect your employees and
your business.**

**Speak with a fall protection expert today:
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