

Oregon OSHA – Adopted Changes to
Walking-Working Surfaces and
Personal Protective Equipment (Fall Protection Systems) in
General Industry

Oregon OSHA Administrative Order 2-2017
Adopted May 16, 2017, effective November 1, 2017

Text removed is in [~~brackets with line through~~].

Text added is in **bold and underline**.

Federal Register

[November 18, 2016 – Walking-Working Surfaces and Personal Protective Equipment \(Fall Protection Systems\)](#)

DIVISION 2, GENERAL INDUSTRY

Division 2/A, General

437-002-0005

Adoption by Reference. In addition to, and not in lieu of, any other safety and health codes contained in OAR Chapter 437, the Department adopts by reference the following federal regulations printed as part of the Code of Federal Regulations, 29 CFR 1910, in the Federal Register:

- (1) 29 CFR 1910.1, Purpose and scope; published 6/27/74, Federal Register, vol. 39, no. 125, p. 23503.
- (2) 29 CFR 1910.2, Definitions; published 6/27/74, Federal Register, vol. 39, no. 125, p. 23503.
- (3) 29 CFR 1910.3, Petitions for the issuance, amendment, or repeal of a standard; published 6/27/74, Federal Register, vol. 39, no. 125, p. 23503.
- (4) 29 CFR 1910.4, Amendments to this part; published 6/27/74, Federal Register, vol. 39, no. 125, p. 23503.
- (5) 29 CFR 1910.5, Applicability of standards; published 6/30/93, FR vol. 58, no. 124, p. 35308.
- (6) 29 CFR 1910.6, Incorporation by reference; published [~~3/25/16, FR vol. 81, no. 58, p. 16085~~]
11/18/16, FR vol. 81, no. 223, p. 82494.
- (7) 29 CFR 1910.7, Definition and requirements for a Nationally Recognized Testing Laboratory; published 5/11/88, FR vol. 53, no. 91, p. 16838.
- (8) 29 CFR 1910.9, Compliance duties owed to each employee; published 12/12/08, Federal Register, vol. 73, no. 240, pp. 75568-75589.

These standards are on file at the Oregon Occupational Safety and Health Division, Oregon Department of Consumer and Business Services, and the United States Government Printing Office.

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stat. Implemented: ORS 654.001 through 654.295.
Hist: APD Admin. Order 17-1988, f. 11/10/88, ef. 11/10/88.
OR-OSHA Admin. Order 4-1997, f. 4/2/97, ef. 4/2/97.
OR-OSHA Admin. Order 8-1999, f. 8/6/99, ef. 8/6/99.
OR-OSHA Admin. Order 4-2005, f. 12/14/05, ef. 12/14/05.
OR-OSHA Admin. Order 4-2007, f. 8/15/07, ef. 8/15/07.
OR-OSHA Admin. Order 7-2008, f. 5/30/08, ef. 5/30/08.
OR-OSHA Admin. Order 5-2009, f. 5/29/09, ef. 5/29/09.
OR-OSHA Admin. Order 1-2010, f. 2/19/10, ef. 2/19/10.
OR-OSHA Admin. Order 2-2010, f. 2/25/10, ef. 2/25/10.
OR-OSHA Admin. Order 4-2011, f. 12/8/11, ef. 12/8/11.
OR-OSHA Admin. Order 5-2012, f. 9/25/12, ef. 9/25/12.
OR-OSHA Admin. Order 7-2012, f. 12/14/12, ef. 12/14/12.
OR-OSHA Admin. Order 7-2013, f. 12/12/13, ef. 12/12/13.
OR-OSHA Admin. Order 3-2016, f. 9/7/16, ef. 9/7/16.
OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

1910.6

(e)

...

(9) ANSI A14.3-56 Safety Code for Fixed Ladders, IBR approved for [~~§§1910.68(b)(4) and (12); 1910.179(e)(2); and~~ 1910.261(a)(3)(vi) and (c)(3)(i).

(h)

...

(8) [~~ASTM B 117-64, Salt Spray (Fog) Test, IBR approved for § 1910.268.~~] **Reserved.**

(j) ...

(1) [~~Commercial Standard, CS 202-56 (1961) "Industrial Lifts and Hinged Loading Ramps," IBR approved for §1910.30(a)(3).~~] **Reserved.**

Division 2/D, Walking-Working Surfaces

437-002-0020 Adoption by Reference. In addition to, and not in lieu of, any other safety and health codes contained in OAR Chapter 437, the Department adopts by reference the following federal regulations printed as part of the Code of Federal Regulations, 29 CFR 1910, in the Federal Register:

(1) 29 CFR 1910.21 [~~Definitions, published 6/27/74, Federal Register, vol. 39, no. 125, pp. 23505-23508~~]**Scope and definitions, published 11/18/16, Federal Register, vol. 81, no. 223, p. 82494.**

(2) 29 CFR 1910.22 General Requirements, published [~~6/27/74, FR vol. 39, no. 125, p. 23508~~]**11/18/16, Federal Register, vol. 81, no. 223, p. 82494.**

(3) 29 CFR 1910.23 [~~Guarding Floor and Wall Openings and Holes, published 2/10/84, FR vol. 49, p. 5321. Amended with Oregon OSHA AO 2-2013, f. 2/15/13, ef. 4/1/13~~]**Ladders, published 11/18/16, Federal Register, vol. 81, no. 223, p. 82494.**

(4) 29 CFR 1910.24 [~~Fixed Industrial Stairs, published 2/10/84, FR vol. 49, p. 5321~~]**Step bolts and manhole steps, published 11/18/16, Federal Register, vol. 81, no. 223, p. 82494.**

(5) 29 CFR 1910.25 [~~Portable Wood Ladders, REPEALED. In Oregon, OAR 437-002-0026 applies~~]**published 11/18/16, Federal Register, vol. 81, no. 223, p. 82494.**

(6) 29 CFR 1910.26 [~~Portable Metal Ladders, REPEALED. In Oregon, OAR 437-002-0026 applies~~]**Dockboards, published 11/18/16, Federal Register, vol. 81, no. 223, p. 82494.**

(7) 29 CFR 1910.27 [~~Fixed Ladders, REPEALED. In Oregon, OAR 437-002-0027 applies~~]**Scaffolds and rope descent systems, published 11/18/16, Federal Register, vol. 81, no. 223, p. 82494.**

(8) 29 CFR 1910.28 [~~Safety Requirements for Scaffolding, published 4/12/88, FR vol. 53, p. 12124~~]**Duty to have fall protection and falling object protection, published 11/18/16, Federal Register, vol. 81, no. 223, p. 82494.**

(9) 29 CFR 1910.29 [~~Manually Propelled Mobile Ladder Stands and Scaffolds (Towers), published 6/27/74, FR vol. 39, no. 125, pp. 23529-23530~~]**Fall protection systems and falling object protection – criteria and practices, published 11/18/16, Federal Register, vol. 81, no. 223, p. 82494.**

(10) 29 CFR 1910.30 [~~Other Working Surfaces, published 3/7/96, FR vol. 61, no. 46, p. 9235~~]**Training requirements, published 11/18/16, Federal Register, vol. 81, no. 223, p. 82494.**

[(11) 29 CFR 1910.31 Source of Standards, published 3/7/96, FR vol. 61, no. 46, p. 9235.]

[(12) 29 CFR 1910.32 Standards Organizations, published 3/7/96, FR vol. 61, no. 46, p. 9235.]

These standards are available at the Oregon Occupational Safety and Health Division, Oregon Department of Consumer and Business Services, and the United States Government Printing Office.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 to 654.295.

Hist: OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.

OR-OSHA Admin. Order 2-1991, f. 2/4/91, ef. 4/1/91.

OR-OSHA Admin. Order 4-1997, f. 4/2/97, ef. 4/2/97.

OR-OSHA Admin. Order 10-1999, f. 9/10/99, ef. 9/10/99.

OR-OSHA Admin. Order 2-2013, f. 2/15/13, ef. 4/1/13.

OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

~~§1910.21—Definitions.~~

~~(a) As used in §1910.23, unless the context requires otherwise, floor and wall opening, railing and toeboard terms shall have the meanings ascribed in this paragraph.~~

~~(1) Floor hole. An opening measuring less than 12 inches but more than 1 inch in its least dimension, in any floor, platform, pavement, or yard, through which materials but not persons may fall; such as a belt hole, pipe opening, or slot opening.~~

~~(2) Floor opening. An opening measuring 12 inches or more in its least dimension, in any floor, platform, pavement, or yard through which persons may fall; such as a hatchway, stair or ladder opening, pit, or large manhole. Floor openings occupied by elevators, dumb waiters, conveyors, machinery, or containers are excluded from this subpart.~~

~~(3) Handrail. A single bar or pipe supported on brackets from a wall or partition, as on a stairway or ramp, to furnish persons with a handhold in case of tripping.~~

~~(4) Platform. A working space for persons, elevated above the surrounding floor or ground; such as a balcony or platform for the operation of machinery and equipment.~~

~~(5) Runway. A passageway for persons, elevated above the surrounding floor or ground level, such as a footwalk along shafting or a walkway between buildings.~~

~~(6) Standard railing. A vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of persons.~~

~~(7) Standard strength and construction. Any construction of railings, covers, or other guards that meets the requirements of §1910.23.~~

~~(8) Stair railing. A vertical barrier erected along exposed sides of a stairway to prevent falls of persons.~~

~~(9) Toeboard. A vertical barrier at floor level erected along exposed edges of a floor opening, wall opening, platform, runway, or ramp to prevent falls of materials.~~

~~(10) Wall hole. An opening less than 30 inches but more than 1 inch high, of unrestricted width, in any wall or partition; such as a ventilation hole or drainage scupper.~~

~~(11) Wall opening. An opening at least 30 inches high and 18 inches wide, in any wall or partition, through which persons may fall; such as a yard-arm doorway or chute opening.~~

~~(b) As used in §1910.24, unless the context requires otherwise, fixed industrial stair terms shall have the meaning ascribed in this paragraph.~~

~~(1) Handrail. A single bar or pipe supported on brackets from a wall or partition to provide a continuous handhold for persons using a stair.~~

~~(2) Nose, nosing. That portion of a tread projecting beyond the face of the riser immediately below.~~

~~(3) Open riser. The air space between the treads of stairways without upright members (risers).~~

~~(4) Platform. An extended step or landing breaking a continuous run of stairs.~~

~~(5) Railing. A vertical barrier erected along exposed sides of stairways and platforms to prevent falls of persons. The top member of railing usually serves as a handrail.~~

~~(6) Rise. The vertical distance from the top of a tread to the top of the next higher tread.~~

~~(7) Riser. The upright member of a step situated at the back of a lower tread and near the leading edge of the next higher tread.~~

~~(8) Stairs, stairway. A series of steps leading from one level or floor to another, or leading to platforms, pits, boiler rooms, crossovers, or around machinery, tanks, and other equipment that are used more or less continuously or routinely by employees, or only occasionally by specific individuals. A series of steps and landings having three or more risers constitutes stairs or stairway.~~

~~(9) Tread. The horizontal member of a step.~~

~~(10) Tread run. The horizontal distance from the leading edge of a tread to the leading edge of an adjacent tread.~~

~~(11) Tread width. The horizontal distance from front to back of tread including nosing when used.~~

NOTE: ~~1910.21(c) through (e) were repealed by OR-OSHA Admin. Order 10-1999, filed and effective 9/10/99. In Oregon, OAR 437-002-0026 applies to Portable Ladders, and 437-002-0027 applies to Fixed Ladders.~~

~~(f) As used in §1910.28, unless the context requires otherwise, scaffolding terms shall have the meaning ascribed in this paragraph.~~

~~(1) Bearer. A horizontal member of a scaffold upon which the platform rests and which may be supported by ledgers.~~

~~(2) Boatswain's chair. A seat supported by slings attached to a suspended rope, designed to accommodate one workman in a sitting position.~~

~~(3) Brace. A tie that holds one scaffold member in a fixed position with respect to another member.~~

~~(4) Bricklayers' square scaffold. A scaffold composed of framed wood squares which support a platform limited to light and medium duty.~~

~~(5) Carpenters' bracket scaffold. A scaffold consisting of wood or metal brackets supporting a platform.~~

~~(6) Coupler. A device for locking together the component parts of a tubular metal scaffold. The material used for the couplers shall be of a structural type, such as a drop-forged steel, malleable iron, or structural grade aluminum. The use of gray cast iron is prohibited.~~

~~(7) Crawling board or chicken ladder. A plank with cleats spaced and secured at equal intervals, for use by a worker on roofs, not designed to carry any material.~~

~~(8) Double pole or independent pole scaffold. A scaffold supported from the base by a double row of uprights, independent of support from the walls and constructed of uprights, ledgers, horizontal platform bearers, and diagonal bracing.~~

~~(9) Float or ship scaffold. A scaffold hung from overhead supports by means of ropes and consisting of a substantial platform having diagonal bracing underneath, resting upon and securely fastened to two parallel plank bearers at right angles to the span.~~

~~(10) Guardrail. A rail secured to uprights and erected along the exposed sides and ends of platforms.~~

~~(11) Heavy duty scaffold. A scaffold designed and constructed to carry a working load not to exceed 75 pounds per square foot.~~

~~(12) Horse scaffold. A scaffold for light or medium duty, composed of horses supporting a work platform.~~

~~(13) Interior hung scaffold. A scaffold suspended from the ceiling or roof structure.~~

~~(14) Ladder jack scaffold. A light duty scaffold supported by brackets attached to ladders.~~

~~(15) Ledger (stringer). A horizontal scaffold member which extends from post to post and which supports the putlogs or bearer forming a tie between the posts.~~

~~(16) Light duty scaffold. A scaffold designed and constructed to carry a working load not to exceed 25 pounds per square foot.~~

~~(17) Manually propelled mobile scaffold. A portable rolling scaffold supported by casters.~~

~~(18) Masons' adjustable multiple-point suspension scaffold. A scaffold having a continuous platform supported by bearers suspended by wire rope from overhead supports, so arranged and operated as to permit the raising or lowering of the platform to desired working positions.~~

~~(19) Maximum intended load. The total of all loads including the working load, the weight of the scaffold, and such other loads as may be reasonably anticipated.~~

~~(20) Medium duty scaffold. A scaffold designed and constructed to carry a working load not to exceed 50 pounds per square foot.~~

~~(21) Midrail. A rail approximately midway between the guardrail and platform, used when required, and secured to the uprights erected along the exposed sides and ends of platforms.~~

~~(22) Needle beam scaffold. A light duty scaffold consisting of needle beams supporting a platform.~~

- (23) **Outrigger scaffold.** A scaffold supported by outriggers or thrustouts projecting beyond the wall or face of the building or structure, the inboard ends of which are secured inside of such a building or structure.
- (24) **Putlog.** A scaffold member upon which the platform rests.
- (25) **Roofing bracket.** A bracket used in sloped roof construction, having provisions for fastening to the roof or supported by ropes fastened over the ridge and secured to some suitable object.
- (26) **Runner.** The lengthwise horizontal bracing or bearing members or both.
- (27) **Scaffold.** Any temporary elevated platform and its supporting structure used for supporting workmen or materials or both.
- (28) **Single-point adjustable suspension scaffold.** A manually or power-operated unit designed for light duty use, supported by a single wire rope from an overhead support so arranged and operated as to permit the raising or lowering of the platform to desired working positions.
- (29) **Single pole scaffold.** Platforms resting on putlogs or crossbeams, the outside ends of which are supported on ledgers secured to a single row of posts or uprights and the inner ends of which are supported on or in a wall.
- (30) **Stone setters' adjustable multiple-point suspension scaffold.** A swinging-type scaffold having a platform supported by hangers suspended at four points so as to permit the raising or lowering of the platform to the desired working position by the use of hoisting machines.
- (31) **Toeboard.** A barrier secured along the sides and ends of a platform, to guard against the falling of material.
- (32) **Tube and coupler scaffold.** An assembly consisting of tubing which serves as posts, bearers, braces, ties, and runners, a base supporting the posts, and special couplers which serve to connect the uprights and to join the various members.
- (33) **Tubular welded frame scaffold.** A sectional, panel, or frame metal scaffold substantially built up of prefabricated welded sections which consist of posts and horizontal bearer with intermediate members. Panels or frames shall be braced with diagonal or cross braces.
- (34) **Two-point suspension scaffold (swinging scaffold).** A scaffold, the platform of which is supported by hangers (stirrups) at two points, suspended from overhead supports so as to permit the raising or lowering of the platform to the desired working position by tackle or hoisting machines.
- (35) **Window jack scaffold.** A scaffold, the platform of which is supported by a bracket or jack which projects through a window opening.
- (36) **Working load.** Load imposed by men, materials, and equipment.
- (g)** As used in §1910.29, unless the context requires otherwise, manually propelled mobile ladder stand and scaffold (tower) terms shall have the meaning ascribed in this paragraph.
- (1) **Bearer.** A horizontal member of a scaffold upon which the platform rests and which may be supported by ledgers.
- (2) **Brace.** A tie that holds one scaffold member in a fixed position with respect to another member.
- (3) **Climbing ladder.** A separate ladder with equally spaced rungs usually attached to the scaffold structure for climbing and descending.
- (4) **Coupler.** A device for locking together the components of a tubular metal scaffold which shall be designed and used to safely support the maximum intended loads.
- (5) **Design working load.** The maximum intended load, being the total of all loads including the weight of the men, materials, equipment, and platform.
- (6) **Equivalent.** Alternative design or features, which will provide an equal degree or factor of safety.
- (7) **Guardrail.** A barrier secured to uprights and erected along the exposed sides and ends of platforms to prevent falls of persons.
- (8) **Handrail.** A rail connected to a ladder stand running parallel to the slope and/or top step.

- ~~(9) Ladder stand. A mobile fixed size self-supporting ladder consisting of a wide flat tread ladder in the form of stairs. The assembly may include handrails.~~
- ~~(10) Ledger (stringer). A horizontal scaffold member which extends from post to post and which supports the bearer forming a tie between the posts.~~
- ~~(11) Mobile scaffold (tower). A light, medium, or heavy duty scaffold mounted on casters or wheels.~~
- ~~(12) Mobile. Manually propelled.~~
- ~~(13) Mobile work platform. Generally a fixed work level one frame high on casters or wheels, with bracing diagonally from platform to vertical frame.~~
- ~~(14) Runner. The lengthwise horizontal bracing and/or bearing members.~~
- ~~(15) Scaffold. Any temporary elevated platform and its necessary vertical, diagonal, and horizontal members used for supporting workmen and materials. (Also known as a scaffold tower.)~~
- ~~(16) Toeboard. A barrier at platform level erected along the exposed sides and ends of a scaffold platform to prevent falls of materials.~~
- ~~(17) Tube and coupler scaffold. An assembly consisting of tubing which serves as posts, bearers, braces, ties, and runners, a base supporting the posts, and uprights, and serves to join the various members, usually used in fixed locations.~~
- ~~(18) Tubular welded frame scaffold. A sectional, panel, or frame metal scaffold substantially built up of prefabricated welded sections, which consist of posts and bearers with intermediate connecting members and braced with diagonal or cross braces.~~
- ~~(19) Tubular welded sectional folding scaffold. A sectional, folding metal scaffold either of ladder frame or inside stairway design, substantially built of prefabricated welded sections, which consist of end frames, platform frame, inside inclined stairway frame and braces, or hinged connected diagonal and horizontal braces, capable of being folded into a flat package when the scaffold is not in use.~~
- ~~(20) Work level. The elevated platform, used for supporting workmen and their materials, comprising the necessary vertical, horizontal, and diagonal braces, guardrails, and ladder for access to the work platform.~~
- ~~Stat. Auth.: ORS 654.025(2) and 656.726(4).~~
- ~~Stats. Implemented: ORS 654.001 through 654.295.~~
- ~~Hist: OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.~~
- ~~—OR-OSHA Admin. Order 10-1999, f. 9/10/99, ef. 9/10/99.]~~

~~§1910.22 General Requirements.~~

~~This section applies to all permanent places of employment, except where domestic, mining, or agricultural work only is performed. Measures for the control of toxic materials are considered to be outside the scope of this section.~~

~~(a) Housekeeping.~~

~~(1) All places of employment, passageways, storerooms, and service rooms shall be kept clean and orderly and in a sanitary condition.~~

~~(2) The floor of every workroom shall be maintained in a clean and, so far as possible, a dry condition. Where wet processes are used, drainage shall be maintained, and false floors, platforms, mats, or other dry standing places should be provided where practicable.~~

~~(3) To facilitate cleaning, every floor, working place, and passageway shall be kept free from protruding nails, splinters, holes, or loose boards.~~

~~(b) Aisles and passageways.~~

~~(1) Where mechanical handling equipment is used, sufficient safe clearances shall be allowed for aisles, at loading docks, through doorways and wherever turns or passage must be made.~~

~~Aisles and passageways shall be kept clear and in good repairs, with no obstruction across or in aisles that could create a hazard.~~

~~(2) Permanent aisles and passageways shall be appropriately marked.~~

~~(c) Covers and guardrails. Covers and/or guardrails shall be provided to protect personnel from the hazards of open pits, tanks, vats, ditches, etc.~~

~~(d) Floor loading protection.~~

~~(1) In every building or other structure, or part thereof, used for mercantile, business, industrial, or storage purposes, the loads approved by the building official shall be marked on plates of approved design which shall be supplied and securely affixed by the owner of the building, or his duly authorized agent, in a conspicuous place in each space to which they relate. Such plates shall not be removed or defaced but, if lost, removed, or defaced, shall be replaced by the owner or his agent.~~

~~(2) It shall be unlawful to place, or cause, or permit to be placed, on any floor or roof of a building or other structure a load greater than that for which such floor or roof is approved by the building official.~~

~~Stat. Auth.: ORS 654.025(2) and 656.726(4).~~

~~Stats. Implemented: ORS 654.001 through 654.295.~~

~~Hist: OR OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.]~~

~~[§1910.23—Guarding Floor and Wall Openings and Holes.~~

~~(a) Protection for floor openings.~~

~~(1) Every stairway floor opening shall be guarded by a standard railing constructed in accordance with paragraph (e) of this section. The railing shall be provided on all exposed sides (except at entrance to stairway). For infrequently used stairways where traffic across the opening prevents the use of fixed standard railing (as when located in aisle spaces, etc.), the guard shall consist of a hinged floor opening cover of standard strength and construction and removable standard railings on all exposed sides (except at entrance to stairway).~~

~~(2) Every ladderway floor opening or platform shall be guarded by a standard railing with standard toeboard on all exposed sides (except at entrance to opening), with the passage through the railing either provided with a swinging gate or so offset that a person cannot walk directly into the opening.~~

~~(3) Every hatchway and chute floor opening shall be guarded by one of the following:~~

~~(i) Hinged floor opening cover of standard strength and construction equipped with standard railings or permanently attached thereto so as to leave only one exposed side. When the opening is not in use, the cover shall be closed or the exposed side shall be guarded at both top and intermediate positions by removable standard railings.~~

~~(ii) A removable railing with toeboard on not more than two sides of the opening and fixed standard railings with toeboards on all other exposed sides. The removable railings shall be kept in place when the opening is not in use.~~

~~Where operating conditions necessitate the feeding of material into any hatchway or chute opening, protection shall be provided to prevent a person from falling through the opening.~~

~~(4) Every skylight floor opening and hole shall be guarded by a standard skylight screen or a fixed standard railing on all exposed sides.~~

~~(5) Every pit and trapdoor floor opening, infrequently used, shall be guarded by a floor opening cover of standard strength and construction. While the cover is not in place, the pit or trap opening shall be constantly attended by someone or shall be protected on all exposed sides by removable standard railings.~~

~~(6) Every manhole floor opening shall be guarded by a standard manhole cover which need not be hinged in place. While the cover is not in place, the manhole opening shall be constantly attended by someone or shall be protected by removable standard railings.~~

~~(7) Every temporary floor opening shall have standard railings, or shall be constantly attended by someone.~~

~~(8) Every floor hole into which persons can accidentally walk shall be guarded by either:~~

~~(i) A standard railing with standard toeboard on all exposed sides, or~~

~~(ii) A floor hole cover of standard strength and construction. While the cover is not in place, the floor hole shall be constantly attended by someone or shall be protected by a removable standard railing.~~

~~(9) Every floor hole into which persons cannot accidentally walk (on account of fixed machinery, equipment, or walls) shall be protected by a cover that leaves no openings more than 1-inch wide. The cover shall be securely held in place to prevent tools or materials from falling through.~~

~~(10) Where doors or gates open directly on a stairway, a platform shall be provided, and the swing of the door shall not reduce the effective width to less than 20 inches.~~

~~(b) Protection for wall openings and holes.~~

~~(1) Every wall opening from which there is a drop of more than 4 feet shall be guarded by one of the following:~~

~~(i) Rail, roller, picket fence, half door, or equivalent barrier. Where there is exposure below to falling materials, a removable toeboard or the equivalent shall also be provided. When the opening is not in use for handling materials, the guard shall be kept in position regardless of a door on the opening. In addition, a grab handle shall be provided on each side of the opening with its center approximately 4 feet above floor level and of standard strength and mounting.~~

~~(ii) Extension platform onto which materials can be hoisted for handling, and which shall have side rails or equivalent guards of standard specifications.~~

~~(2) Every chute wall opening from which there is a drop of more than 4 feet shall be guarded by one or more of the barriers specified in paragraph (b)(1) of this section or as required by the conditions.~~

~~(3) Every window wall opening at a stairway landing, floor, platform, or balcony, from which there is a drop of more than 4 feet, and where the bottom of the opening is less than 3 feet above the platform or landing, shall be guarded by standard slats, standard grill work (as specified in paragraph (e)(11) of this section), or standard railing. Where the window opening is below the landing, or platform, a standard toeboard shall be provided.~~

~~(4) Every temporary wall opening shall have adequate guards but these need not be of standard construction.~~

~~(5) Where there is a hazard of materials falling through a wall hole, and the lower edge of the near side of the hole is less than 4 inches above the floor, and the far side of the hole more than 5 feet above the next lower level, the hole shall be protected by a standard toeboard, or an enclosing screen either of solid construction, or as specified in paragraph (e)(11) of this section.~~

~~(c) Protection of open-sided floors, platforms, and runways.~~

~~(1) Every open-sided floor or platform 4 feet or more above adjacent floor or ground level shall be guarded by a standard railing (or the equivalent as specified in paragraph (e)(3) of this section) on all open sides except where there is entrance to a ramp, stairway, or fixed ladder. The railing shall be provided with a toeboard wherever, beneath the open sides:~~

~~(i) Persons can pass,~~

~~(ii) There is moving machinery, or~~

~~(iii) There is equipment with which falling materials could create a hazard.~~

~~(2) Every runway shall be guarded by a standard railing (or the equivalent as specified in paragraph (e)(3) of this section) on all open sides 4 feet or more above floor or ground level.~~

Wherever tools, machine parts, or materials are likely to be used on the runway, a toeboard shall also be provided on each exposed side.

Runways used exclusively for special purposes (such as oiling, shafting, or filling tank cars) may have the railing on one side omitted where operating conditions necessitate such omission, providing the falling hazard is minimized by using a runway of not less than 18 inches wide. Where persons entering upon runways become thereby exposed to machinery, electrical equipment, or other danger not a falling hazard, additional guarding than is here specified may be essential for protection.

(3) Regardless of height, open-sided floors, walkways, platforms, or runways above or adjacent to dangerous equipment, pickling or galvanizing tanks, degreasing units, and similar hazards shall be guarded with a standard railing and toeboard.

(d) Stairway railings and guards.

(1) Every flight of stairs having four or more risers shall be equipped with standard stair railings or standard handrails as specified in paragraphs (d)(1)(i) through (v) of this section, the width of the stair to be measured clear of all obstructions except handrails:

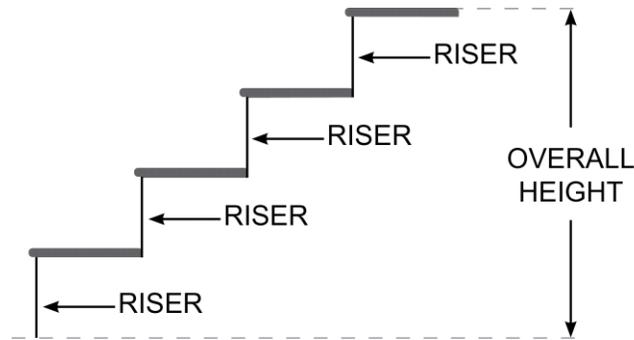
(i) On stairways less than 44 inches wide having both sides enclosed, at least one handrail, preferably on the right side descending.

(ii) On stairways less than 44 inches wide having one side open, at least one stair railing on open side.

(iii) On stairways less than 44 inches wide having both sides open, one stair railing on each side.

(iv) On stairways more than 44 inches wide but less than 88 inches wide, one handrail on each enclosed side and one stair railing on each open side.

Oregon Note: Count each vertical distance of the overall vertical height to determine the total number of risers.



(v) On stairways 88 or more inches wide, one handrail on each enclosed side, one stair railing on each open side, and one intermediate stair railing located approximately midway of the width.

(2) Winding stairs shall be equipped with a handrail offset to prevent walking on all portions of the treads having width less than 6 inches.

(e) Railing, toeboards, and cover specifications.

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

~~(2) A stair railing shall be of construction similar to a standard railing but the vertical height shall be not more than 34 inches nor less than 30 inches from upper surface of top rail to surface of tread in line with face of riser at forward edge of tread.~~

~~(3) (Reserved)~~

~~(i) For wood railings, the posts shall be of at least 2-inch by 4-inch stock spaced not to exceed 6 feet; the top and intermediate rails shall be of at least 2-inch by 4-inch stock. If top rail is made of two right-angle pieces of 1-inch by 4-inch stock, posts may be spaced on 8-foot centers, with 2-inch by 4-inch intermediate rail.~~

~~(ii) For pipe railings, posts and top and intermediate railings shall be at least 1 1/2 inches nominal diameter with posts spaced not more than 8 feet on centers.~~

~~(iii) For structural steel railings, posts and top and intermediate rails shall be of 2-inch by 2-inch by 3/8-inch angles or other metal shapes of equivalent bending strength with posts spaced not more than 8 feet on centers.~~

~~(iv) The anchoring of posts and framing of members for railings of all types shall be of such construction that the completed structure shall be capable of withstanding a load of at least 200 pounds applied in any direction at any point on the top rail.~~

~~(v) Other types, sizes, and arrangements of railing construction are acceptable provided they meet the following conditions:~~

~~(A) A smooth surfaced top rail at a height above floor, platform, runway, or ramp level of 42 inches nominal;~~

~~(B) A strength to withstand at least the minimum requirement of 200 pounds top rail pressure;~~

~~(C) Protection between top rail and floor, platform, runway, ramp, or stair treads, equivalent at least to that afforded by a standard intermediate rail;~~

~~(4) A standard toeboard shall be 4 inches nominal in vertical height from its top edge to the level of the floor, platform, runway, or ramp. It shall be securely fastened in place and with not more than 1/4 inch clearance above floor level. It may be made of any substantial material either solid or with openings not over 1-inch in greatest dimension.~~

~~Where material is piled to such height that a standard toeboard does not provide protection, paneling from floor to intermediate rail, or to top rail shall be provided.~~

~~(5)~~

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

~~(ii) The height of handrails shall be not more than 34 inches nor less than 30 inches from upper surface of handrail to surface of tread in line with face of riser or to surface of ramp.~~

~~(iii) The size of handrails shall be: When of hardwood, at least 2 inches in diameter; when of metal pipe, at least 1 1/2 inches in diameter. The length of brackets shall be such as will give a clearance between handrail and wall or any projection thereon of at least 3 inches. The spacing of brackets shall not exceed 8 feet.~~

~~(iv) The mounting of handrails shall be such that the completed structure is capable of withstanding a load of at least 200 pounds applied in any direction at any point on the rail.~~

~~(6) All handrails and railings shall be provided with a clearance of not less than 3 inches between the handrail or railing and any other object.~~

~~(7) Floor opening covers may be of any material that meets the following strength requirements:~~

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

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

~~(iii) The construction of floor opening covers may be of any material that meets the strength requirements. Covers projecting not more than 1-inch above the floor level may be used providing all edges are chamfered to an angle with the horizontal of not over 30 degrees. All hinges, handles, bolts, or other parts shall set flush with the floor or cover surface.~~

~~(8) Oregon OSHA repealed 1910.23(e)(8) with Administrative Order 2-2013, filed 2/15/13, and effective 4/1/13. In Oregon, OAR 437-002-0023 applies.~~

~~(9) Wall opening barriers (rails, rollers, picket fences, and half doors) shall be of such construction and mounting that, when in place at the opening, the barrier is capable of withstanding a load of at least 200 pounds applied in any direction (except upward) at any point on the top rail or corresponding member.~~

~~(10) Wall opening grab handles shall be not less than 12 inches in length and shall be so mounted as to give 3 inches clearance from the side framing of the wall opening. The size, material, and anchoring of the grab handle shall be such that the completed structure is capable of withstanding a load of at least 200 pounds applied in any direction at any point of the handle.~~

~~(11) Wall opening screens shall be of such construction and mounting that they are capable of withstanding a load of at least 200 pounds applied horizontally at any point on the near side of the screen. They may be of solid construction, of grillwork with openings not more than 8 inches long, or of slatwork with openings not more than 4 inches wide with length unrestricted.~~

~~(39 FR 23502, June 27, 1974, as amended at 43 FR 49744, Oct. 24, 1978; 49 FR 5321, Feb. 10, 1984)~~

~~Stat. Auth.: ORS 654.025(2) and 656.726(4).~~

~~Stats. Implemented: ORS 654.001 through 654.295.~~

~~Hist: OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.~~

~~—OR-OSHA Admin. Order 2-2013, f. 2/15/13, ef. 4/1/13.]~~

~~[§1910.24—Fixed Industrial Stairs.~~

~~(a) Application of requirements. This section contains specifications for the safe design and construction of fixed general industrial stairs. This classification includes interior and exterior stairs around machinery, tanks, and other equipment, and stairs leading to or from floors, platforms, or pits. This section does not apply to stairs used for fire exit purposes, to construction operations to private residences, or to articulated stairs, such as may be installed on floating roof tanks or on deck facilities, the angle of which changes with the rise and fall of the base support.~~

~~(b) Where fixed stairs are required. Fixed stairs shall be provided for access from one structure level to another where operations necessitate regular travel between levels, and for access to operating platforms at any equipment which requires attention routinely during operations. Fixed stairs shall also be provided where access to elevations is daily or at each shift for such purposes as gauging, inspection, regular maintenance, etc., where such work may expose employees to acids, caustics, gases, or other harmful substances, or for which purposes the carrying of tools or equipment by hand is normally required. (It is not the intent of this section to preclude the use of fixed ladders for access to elevated tanks, towers, and similar structures, overhead traveling cranes, etc., where the use of fixed ladders is common practice.) Spiral stairways shall not be permitted except for special limited usage and secondary access situations where it is not practical to provide a conventional stairway. Winding stairways may be installed on tanks and similar round structures where the diameter of the structure is not less than 5 feet.~~

~~(c) Stair strength. Fixed stairways shall be designed and constructed to carry a load of five times the normal live load anticipated but never of less strength than to carry safely a moving concentrated load of 1,000 pounds.~~

~~(d) Stair width. Fixed stairways shall have a minimum width of 22 inches.~~

~~(e) Angle of stairway rise. Fixed stairs shall be installed at angles to the horizontal of between 30 degrees and 50 degrees. Any uniform combination of rise/tread dimensions may be used that will result in a stairway at an angle to the horizontal within the permissible range. Table D-1 gives rise/tread dimensions which will produce a stairway within the permissible range, stating the angle to the horizontal produced by each combination. However, the rise/tread combinations are not limited to those given in Table D-1.~~

Angle to horizontal	Rise (in inches)	Tread run (in inches)	Angle to horizontal	Rise (in inches)	Tread run (in inches)
30°35'	6 1/2	11	41°44'	8 1/4	9 1/4
32°08'	6 3/4	10 3/4	43°22'	8 1/2	9
33°41'	7	10 1/2	45°00'	8 3/4	8 3/4
35°16'	7 1/4	10 1/4	46°38'	9	8 1/2
36°52'	7 1/2	10	48°16'	9 1/4	8 1/4
38°29'	7 3/4	9 3/4	49°54'	9 1/2	8
40°08'	8	9 1/2			

~~(f) Stair treads. All treads shall be reasonably slip resistant and the nosings shall be of nonslip finish. Welded bar grating treads without nosings are acceptable providing the leading edge can be readily identified by personnel descending the stairway and provided the tread is serrated or is of definite nonslip design. Rise height and tread width shall be uniform throughout any flight of stairs including any foundation structure used as one or more treads of the stairs.~~

~~(g) Stairway platforms. Stairway platforms shall be no less than the width of a stairway and a minimum of 30 inches in length measured in the direction of travel.~~

~~(h) Railings and handrails. Standard railings shall be provided on the open sides of all exposed stairways and stair platforms. Handrails shall be provided on at least one side of closed stairways preferably on the right side descending. Stair railings and handrails shall be installed in accordance with the provisions of §1910.23.~~

~~(i) Vertical clearance. Vertical clearance above any stair tread to an overhead obstruction shall be at least 7 feet measured from the leading edge of the tread.~~

~~(39 FR 23502, June 27, 1974, as amended at 43 FR 49744, Oct. 24, 1978; 49 FR 5321, Feb. 10, 1984)~~

~~Stat. Auth.: ORS 654.025(2) and 656.726(4).~~

~~Stats. Implemented: ORS 654.001 through 654.295.~~

~~Hist: OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.]~~

~~[§1910.25 Portable Wood Ladders — Repealed.
In Oregon, OAR 437-002-0026 applies.]~~

~~[§1910.26 Portable Metal Ladders — Repealed.
In Oregon, OAR 437-002-0026 applies.]~~

~~§1910.27 Fixed Ladders — Repealed.
In Oregon, OAR 437-002-0027 applies.]~~

~~§1910.28 Safety Requirements for Scaffolding.~~

~~(a) General requirements for all scaffolds.~~

~~(1) Scaffolds shall be furnished and erected in accordance with this standard for persons engaged in work that cannot be done safely from the ground or from solid construction, except that ladders used for such work shall conform to §1910.25 and §1910.26.~~

~~(2) The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks shall not be used to support scaffolds or planks.~~

~~(3) (Reserved)~~

~~(4) Scaffolds and their components shall be capable of supporting without failure at least four times the maximum intended load.~~

~~(5) Scaffolds and other devices mentioned or described in this section shall be maintained in safe condition. Scaffolds shall not be altered or moved horizontally while they are in use or occupied.~~

~~(6) Any scaffold damaged or weakened from any cause shall be immediately repaired and shall not be used until repairs have been completed.~~

~~(7) Scaffolds shall not be loaded in excess of the working load for which they are intended.~~

~~(8) All load-carrying timber members of scaffold framing shall be a minimum of 1,500 f. (Stress Grade) construction grade lumber. All dimensions are nominal sizes as provided in the American Lumber Standards, except that where rough sizes are noted, only rough or undressed lumber of the size specified will satisfy minimum requirements. (Note: Where nominal sizes of lumber are used in place of rough sizes, the nominal size lumber shall be such as to provide equivalent strength to that specified in tables D-7 through D-12 and D-16.)~~

~~(9) All planking shall be Scaffold Grade as recognized by grading rules for the species of wood used. The maximum permissible spans for 2- x 9-inch or wider planks are shown in the following table:~~

	Material				
	Full thickness undressed lumber			Nominal thickness lumber	
Working load (p.s.f.)	25	50	75	25	50
Permissible span (ft.)	40	8	6	8	9

The maximum permissible span for 1 1/4 x 9-inch or wider plank of full thickness is 4 feet with medium loading of 50 p.s.f.

~~(10) Nails or bolts used in the construction of scaffolds shall be of adequate size and in sufficient numbers at each connection to develop the designed strength of the scaffold. Nails shall not be subjected to a straight pull and shall be driven full length.~~

~~(11) All planking or platforms shall be overlapped (minimum 12 inches) or secured from movement.~~

- ~~(12) An access ladder or equivalent safe access shall be provided.~~
- ~~(13) Scaffold planks shall extend over their end supports not less than 6 inches nor more than 18 inches.~~
- ~~(14) The poles, legs, or uprights of scaffolds shall be plumb, and securely and rigidly braced to prevent swaying and displacement.~~
- ~~(15) Materials being hoisted onto a scaffold shall have a tag line.~~
- ~~(16) Overhead protection shall be provided for men on a scaffold exposed to overhead hazards.~~
- ~~(17) Scaffolds shall be provided with a screen between the toeboard and the guardrail, extending along the entire opening, consisting of No. 18 gauge U.S. Standard Wire 1/2-inch mesh or the equivalent, where persons are required to work or pass under the scaffolds.~~
- ~~(18) Employees shall not work on scaffolds during storms or high winds.~~
- ~~(19) Employees shall not work on scaffolds which are covered with ice or snow, unless all ice or snow is removed and planking sanded to prevent slipping.~~
- ~~(20) Tools, materials, and debris shall not be allowed to accumulate in quantities to cause a hazard.~~
- ~~(21) Only treated or protected fiber rope shall be used for or near any work involving the use of corrosive substances or chemicals.~~
- ~~(22) Wire or fiber rope used for scaffold suspension shall be capable of supporting at least six times the intended load.~~
- ~~(23) When acid solutions are used for cleaning buildings over 50 feet in height, wire rope supported scaffolds shall be used.~~
- ~~(24) The use of shore scaffolds or lean-to scaffolds is prohibited.~~
- ~~(25) Lumber sizes, when used in this section, refer to nominal sizes except where otherwise stated.~~
- ~~(26) Scaffolds shall be secured to permanent structures, through use of anchor bolts, reveal bolts, or other equivalent means. Window cleaners' anchor bolts shall not be used.~~
- ~~(27) Special precautions shall be taken to protect scaffold members, including any wire or fiber ropes, when using a heat-producing process.~~
- ~~(b) General requirements for wood pole scaffolds.~~
- ~~(1) Scaffold poles shall bear on a foundation of sufficient size and strength to spread the load from the poles over a sufficient area to prevent settlement. All poles shall be set plumb.~~
- ~~(2) Where wood poles are spliced, the ends shall be squared and the upper section shall rest squarely on the lower section. Wood splice plates shall be provided on at least two adjacent sides and shall not be less than 4 feet 0 inches in length, overlapping the abutted ends equally, and have the same width and not less than the cross-sectional area of the pole. Splice plates of other materials of equivalent strength may be used.~~
- ~~(3) Independent pole scaffolds shall be set as near to the wall of the building as practicable.~~
- ~~(4) All pole scaffolds shall be securely guyed or tied to the building or structure. Where the height or length exceeds 25 feet, the scaffold shall be secured at intervals not greater than 25 feet vertically and horizontally.~~
- ~~(5) Putlogs or bearers shall be set with their greater dimensions vertical, long enough to project over the ledgers of the inner and outer rows of poles at least 3 inches for proper support.~~
- ~~(6) Every wooden putlog on single pole scaffolds shall be reinforced with a 3/16 x 2-inch steel strip or equivalent secured to its lower edge throughout its entire length.~~
- ~~(7) Ledgers shall be long enough to extend over two pole spaces. Ledgers shall not be spliced between the poles. Ledgers shall be reinforced by bearing blocks securely nailed to the side of the pole to form a support for the ledger.~~
- ~~(8) Diagonal bracing shall be provided to prevent the poles from moving in a direction parallel with the wall of the building, or from buckling.~~
- ~~(9) Cross bracing shall be provided between the inner and outer sets of poles in independent pole scaffolds. The free ends of pole scaffolds shall be cross braced.~~

- (10) Full diagonal face bracing shall be erected across the entire face of pole scaffolds in both directions. The braces shall be spliced at the poles.
- (11) Platform planks shall be laid with their edges close together so the platform will be tight with no spaces through which tools or fragments of material can fall.
- (12) Where planking is lapped, each plank shall lap its end supports at least 12 inches. Where the ends of planks abut each other to form a flush floor, the butt joint shall be at the centerline of a pole. The abutted ends shall rest on separate bearers. Intermediate beams shall be provided where necessary to prevent dislodgment of planks due to deflection, and the ends shall be nailed or cleated to prevent their dislodgment.
- (13) When a scaffold turns a corner, the platform planks shall be laid to prevent tipping. The planks that meet the corner putlog at an angle shall be laid first, extending over the diagonally placed putlog far enough to have a good safe bearing, but not far enough to involve any danger from tipping. The planking running in the opposite direction at right angles shall be laid so as to extend over and rest on the first layer of planking.
- (14) When moving platforms to the next level, the old platform shall be left undisturbed until the new putlogs or bearers have been set in place, ready to receive the platform planks.
- (15) Guardrails not less than 2 x 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a midrail, when required, of 1 x 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.
- (16) All wood pole scaffolds 60 feet or less in height shall be constructed and erected in accordance with tables D-7 through D-12 of this section. If they are over 60 feet in height they shall be designed by a registered professional engineer and constructed and erected in accordance with such design. A copy of the typical drawings and specifications shall be made available to the employer and for inspection purposes.
- (17) Wood-pole scaffolds shall not be erected beyond the reach of effective firefighting apparatus.

Table D-7—Minimum Nominal Size and Maximum Spacing of Members of Single Pole Scaffolds—Light Duty

	Maximum height of scaffold	
	20 feet	60 feet
Uniformly distributed load	Not to exceed 25 pounds per square foot	
Poles or uprights	2 by 4 in.	4 by 4 in.
Poles spacing (longitudinal)	6 ft. 0 in.	10 ft. 0 in.
Maximum width of scaffold	5 ft. 0 in.	5 ft. 0 in.
Bearers or putlogs to 3 ft. 0 in. width	2 by 4 in.	2 by 4 in.
Bearers or putlogs to 5 ft. 0 in. width	2 by 6 in. or 3 by 4 in.	2 by 6 in. or 3 by 4 in. (rough)
Ledgers	1 by 4 in.	1 1/4 by 9 in.
Planking	1 1/4 by 9 in. (rough)	2 by 9 in.
Vertical spacing of horizontal members	7 ft. 0 in.	7 ft. 0 in.
Bracing, horizontal and diagonal	1 by 4 in.	1 by 4 in.
Tie ins	1 by 4 in.	1 by 4 in.
Toeboards	4 in. high (minimum)	4 in. high (minimum)
Guardrail	2 by 4 in.	2 by 4 in.

All members except planking are used on edge.

Table D-8—Minimum Nominal Size and Maximum Spacing of Members of Single Pole Scaffolds—Medium Duty

Uniformly distributed load	Not to exceed 50 pounds per square foot
Maximum height of scaffold	60 ft.
Poles or uprights	4 by 4 in.
Pole spacing (longitudinal)	8 ft. 0 in.
Maximum width of scaffold	5 ft. 0 in.
Bearers or putlogs	2 by 9 in. or 3 by 4 in.
Spacing of bearings or putlogs	8 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members	9 ft. 0 in.
Bracing, horizontal	1 by 6 in. or 1 1/4 by 4 in.
Bracing, diagonal	1 by 4 in.
Tie-ins	1 by 4 in.
Planking	2 by 9 in.
Toeboards	4 in. high (minimum)
Guardrail	2 by 4 in.

All members except planking are used on edge.

Table D-9—Minimum Nominal Size and Maximum Spacing of Members of Single Pole Scaffolds—Heavy Duty

Uniformly distributed load	Not to exceed 75 pounds per square foot
Maximum height of scaffold	60 ft.
Poles or uprights	4 by 4 in.
Pole spacing (longitudinal)	6 ft. 0 in.
Maximum width of scaffold	5 ft. 0 in.
Bearers or putlogs	
Spacing of bearings or putlogs	6 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members	6 ft. 6 in.
Bracing, horizontal and diagonal	2 by 4 in.
Tie-ins	1 by 4 in.
Planking	2 by 9 in.
Toeboards	4 in. high (minimum)
Guardrail	2 by 4 in.

All members except planking are used on edge.

Table D-10—Minimum Nominal Size and Maximum Spacing of Members of Independent Pole Scaffolds—Light Duty

	Maximum height of scaffold	
	20 feet	60 feet
Uniformly distributed load	Not to exceed 25 pounds per square foot	
Poles or uprights	2 by 4 in.	4 by 4 in.
Poles spacing (longitudinal)	6 ft. 0 in.	10 ft. 0 in.
Poles spacing (transverse)	6 ft. 0 in.	10 ft. 0 in.
Ledgers	1 1/4 by 4 in.	1 1/4 by 9 in.
Bearers to 3 ft. 0 in. span	2 by 4 in.	2 by 4 in.
Bearers to 10 ft. 0 in. span	2 by 6 in. or 3 by 4 in.	2 by 9 (rough) or 3 by 8 in.
Planking	1 1/4 by 9 in.	2 by 9 in.
Vertical spacing of horizontal members	7 ft. 0 in.	7 ft. 0 in.
Bracing, horizontal and diagonal	1 by 4 in.	1 by 4 in.
Tie-ins	1 by 4 in.	1 by 4 in.
Toeboards	4 in. high	4 in. high (minimum)
Guardrail	2 by 4 in.	2 by 4 in.

All members except planking are used on edge.

Table D-11—Minimum Nominal Size and Maximum Spacing of Members of Independent Pole Scaffolds—Medium Duty

Uniformly distributed load	Not to exceed 50 pounds per square foot
Maximum height of scaffold	60 ft.
Poles or uprights	4 by 4 in.
Pole spacing (longitudinal)	8 ft. 0 in.
Pole spacing (transverse)	8 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members	6 ft. 0 in.
Spacing of bearers	8 ft. 0 in.
Bearers	2 by 9 in. (rough) or 2 by 10 in.
Bracing, horizontal	1 by 6 in. or 1 1/4 by 4 in.
Bracing, diagonal	1 by 4 in.
Tie-ins	1 by 4 in.
Planking	2 by 9 in.
Toeboards	4 in. high (minimum)
Guardrail	2 by 4 in.

All members except planking are used on edge.

Table D-12 — Minimum Nominal Size and Maximum Spacing of Members of Independent Pole Scaffolds — Heavy Duty

Uniformly distributed load	Not to exceed 75 pounds per square foot
Maximum height of scaffold	60 ft.
Poles or uprights	4 by 4 in.
Pole spacing (longitudinal)	6 ft. 0 in.
Pole spacing (transverse)	8 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members	4 ft. 6 in.
Bearers	2 by 9 in. (rough)
Bracing, horizontal and diagonal	2 by 4 in.
Tie-ins	1 by 4 in.
Planking	2 by 9 in.
Toeboards	4 in. high (minimum)
Guardrail	2 by 4 in.

All members except planking are used on edge.

(c) Tube and coupler scaffolds.

(1) A light-duty tube and coupler scaffold shall have all posts, bearers, runners, and bracing of nominal 2-inch O.D. steel tubing. The posts shall be spaced no more than 6 feet apart by 10 feet along the length of the scaffold. Other structural metals when used must be designed to carry an equivalent load.

(2) A medium-duty tube and coupler scaffold shall have all posts, runners, and bracing of nominal 2-inch O.D. steel tubing. Posts spaced not more than 6 feet apart by 8 feet along the length of the scaffold shall have bearers of nominal 2 1/2-inch O.D. steel tubing. Posts spaced not more than 5 feet apart by 8 feet along the length of the scaffold shall have bearers of nominal 2-inch O.D. steel tubing. Other structural metals when used must be designed to carry an equivalent load.

(3) A heavy-duty tube and coupler scaffold shall have all posts, runners, and bracing of nominal 2-inch O.D. steel tubing, with the posts spaced not more than 6 feet apart by 6 feet 6 inches along the length of the scaffold. Other structural metals when used must be designed to carry an equivalent load.

(4) Tube and coupler scaffolds shall be limited in heights and working levels to those permitted in Tables D-13, 14, and 15, of this section. Drawings and specifications of all tube and coupler scaffolds above the limitations in Tables D-13, 14, and 15 of this section shall be designed by a registered professional engineer and copies made available to the employer and for inspection purposes.

(5) All tube and coupler scaffolds shall be constructed and erected to support four times the maximum intended loads as set forth in Tables D-13, 14, and 15 of this section, or as set forth in

the specifications by a registered professional engineer, copies which shall be made available to the employer and for inspection purposes.

Table D-13— Tube and Coupler Scaffolds— Light Duty

Uniformly distributed load		Not to exceed 25 p.s.i. 10 ft. 0 in. 6 ft. 0 in.
Post spacing (longitudinal)		
Post spacing (transverse)		
Working levels	Additional planked levels	Maximum height
4	8	125 ft.
2	4	125 ft.
3	0	91 ft. 0 in.

Table D-14— Tube and Coupler Scaffolds— Medium Duty

Uniformly distributed load		Not to exceed 50 p.s.i. 8 ft. 0 in. 6 ft. 0 in.
Post spacing (longitudinal)		
Post spacing (transverse)		
Working levels	Additional planked levels	Maximum height
4	6	125 ft.
2	0	78 ft. 0 in.

Table D-15— Tube and Coupler Scaffolds— Heavy Duty

Uniformly distributed load		Not to exceed 75 p.s.i. 6 ft. 6 in. 6 ft. 0 in.
Post spacing (longitudinal)		
Post spacing (transverse)		
Working levels	Additional planked levels	Maximum height
4	6	125 ft.

- (6) All tube and coupler scaffolds shall be erected by competent and experienced personnel.
- (7) Posts shall be accurately spaced, erected on suitable bases, and maintained plumb.
- (8) Runners shall be erected along the length of the scaffold located on both the inside and the outside posts at even height. Runners shall be interlocked to form continuous lengths and coupled to each post. The bottom runners shall be located as close to the base as possible. Runners shall be placed not more than 6 feet 6 inches on centers.
- (9) Bearers shall be installed transversely between posts and shall be securely coupled to the posts bearing on the runner coupler. When coupled directly to the runners, the coupler must be kept as close to the posts as possible.
- (10) Bearers shall be at least 4 inches but not more than 12 inches longer than the post spacing or runner spacing. Bearers may be cantilevered for use as brackets to carry not more than two planks.
- (11) Cross bracing shall be installed across the width of the scaffold at least every third set of posts horizontally and every fourth runner vertically. Such bracing shall extend diagonally from the inner and outer runners upward to the next outer and inner runners.
- (12) Longitudinal diagonal bracing shall be installed at approximately a 45-degree angle from near the base of the first outer post upward to the extreme top of the scaffold. Where the

longitudinal length of the scaffold permits, such bracing shall be duplicated beginning at every fifth post. In a similar manner, longitudinal diagonal bracing shall also be installed from the last post extending back and upward toward the first post. Where conditions preclude the attachment of this bracing to the posts, it may be attached to the runners.

~~(13) The entire scaffold shall be tied to and securely braced against the building at intervals not to exceed 30 feet horizontally and 26 feet vertically.~~

~~(14) Guardrails not less than 2 X 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a midrail, when required, of 1 X 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.~~

~~(d) Tubular welded frame scaffolds.~~

~~(1) Metal tubular frame scaffolds, including accessories such as braces, brackets, trusses, screw legs, ladders, etc., shall be designed and proved to safely support four times the maximum intended load.~~

~~(2) Spacing of panels or frames shall be consistent with the loads imposed.~~

~~(3) Scaffolds shall be properly braced by cross bracing or diagonal braces, or both, for securing vertical members together laterally, and the cross braces shall be of such length as will automatically square and aline vertical members so that the erected scaffold is always plumb, square, and rigid. All brace connections shall be made secure.~~

~~(4) Scaffold legs shall be set on adjustable bases or plain bases placed on mud sills or other foundations adequate to support the maximum intended load.~~

~~(5) The frames shall be placed one on top of the other with coupling or stacking pins to provide proper vertical alinement of the legs.~~

~~(6) Where uplift may occur, panels shall be locked together vertically by pins or other equivalent suitable means.~~

~~(7) Guardrails not less than 2 x 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a midrail, when required, of 1- x 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.~~

~~(8) All tubular metal scaffolds shall be constructed and erected to support four times the maximum intended loads.~~

~~(9) To prevent movement, the scaffold shall be secured to the building or structure at intervals not to exceed 30 feet horizontally and 26 feet vertically.~~

~~(10) Maximum permissible spans of planking shall be in conformity with paragraph (a)(9) of this section.~~

~~(11) Drawings and specifications for all frame scaffolds over 125 feet in height above the base plates shall be designed by a registered professional engineer and copies made available to the employer and for inspection purposes.~~

~~(12) All tubular welded frame scaffolds shall be erected by competent and experienced personnel.~~

~~(13) Frames and accessories for scaffolds shall be maintained in good repair and every defect, unsafe condition, or noncompliance with this section shall be immediately corrected before further use of the scaffold. Any broken, bent, excessively rusted, altered, or otherwise structurally damaged frames or accessories shall not be used.~~

~~(14) Periodic inspections shall be made of all welded frames and accessories, and any maintenance, including painting, or minor corrections authorized by the manufacturer, shall be made before further use.~~

~~(e) Outrigger scaffolds.~~

(1) ~~Outrigger beams shall extend not more than 6 feet beyond the face of the building. The inboard end of outrigger beams, measured from the fulcrum point to the extreme point of support, shall be not less than 1 1/2 times the outboard end in length. The beams shall rest on edge, the sides shall be plumb, and the edges shall be horizontal. The fulcrum point of the beam shall rest on a secure bearing at least 6 inches in each horizontal dimension. The beam shall be secured in place against movement and shall be securely braced at the fulcrum point against tipping.~~

(2) ~~The inboard ends of outrigger beams shall be securely supported either by means of struts bearing against sills in contact with the overhead beams or ceiling, or by means of tension members secured to the floor joists underfoot, or by both if necessary. The inboard ends of outrigger beams shall be secured against tipping and the entire supporting structure shall be securely braced in both directions to prevent any horizontal movement.~~

(3) ~~Unless outrigger scaffolds are designed by a licensed professional engineer, they shall be constructed and erected in accordance with Table D-16. Outrigger scaffolds designed by a registered professional engineer shall be constructed and erected in accordance with such design. A copy of the detailed drawings and specifications showing the sizes and spacing of members shall be kept on the job.~~

(4) ~~Planking shall be laid tight and shall extend to within 3 inches of the building wall. Planking shall be nailed or bolted to outriggers.~~

(5) ~~Where there is danger of material falling from the scaffold, a wire mesh or other enclosure shall be provided between the guardrail and the toeboard.~~

(6) ~~Where additional working levels are required to be supported by the outrigger method, the plans and specifications of the outrigger and scaffolding structure shall be designed by a registered professional engineer.~~

(f) ~~Masons' adjustable multiple-point suspension scaffolds.~~

(1) ~~The scaffold shall be capable of sustaining a working load of 50 pounds per square foot and shall not be loaded in excess of that figure.~~

(2) ~~The scaffold shall be provided with hoisting machines that meet the requirements of a nationally recognized testing laboratory. Refer to §1910.7 for definition of nationally recognized testing laboratory.~~

Table D-16 — Minimum Nominal Size and Maximum Spacing of Members of Outrigger Scaffolds

	Light duty	Medium duty
Maximum scaffold load	25 p.s.f	50 p.s.f
Outrigger size	2 x 10 in.	3 x 10 in.
Maximum outrigger spacing	10 ft. 0 in.	6 ft. 0 in.
Planking	2 x 9 in.	2 x 9 in.
Guardrail	2 x 4 in.	2 x 4 in.
Guardrail uprights	2 x 4 in.	2 x 4 in.
.....	4 in.	4 in.
Toeboards (minimum)		

(3) ~~The platform shall be supported by wire ropes in conformity with paragraph (a)(22) of this section, suspended from overhead outrigger beams.~~

(4) ~~The scaffold outrigger beams shall consist of structural metal securely fastened or anchored to the frame or floor system of the building or structure.~~

(5) ~~Each outrigger beam shall be equivalent in strength to at least a standard 7-inch, 15.3-pound steel I-beam, be at least 15 feet long, and shall not project more than 6 feet 6 inches beyond the bearing point.~~

(6) ~~Where the overhang exceeds 6 feet 6 inches, outrigger beams shall be composed of stronger beams or multiple beams and be installed in accordance with approved designs and instructions.~~

- (7) If channel iron outrigger beams are used in place of I-beams, they shall be securely fastened together with the flanges turned out.
- (8) All outrigger beams shall be set and maintained with their webs into vertical position.
- (9) A stop bolt shall be placed at each end of every outrigger beam.
- (10) The outrigger beam shall rest on suitable wood-bearing blocks.
- (11) All parts of the scaffold such as bolts, nuts, fittings, clamps, wire rope, and outrigger beams and their fastenings, shall be maintained in sound and good working condition and shall be inspected before each installation and periodically thereafter.
- (12) The free end of the suspension wire ropes shall be equipped with proper size thimbles and be secured by splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum and at least four turns of rope shall at all times remain on the drum.
- (13) Where a single outrigger beam is used, the steel shackles or clevises with which the wire ropes are attached to the outrigger beams shall be placed directly over the hoisting drums.
- (14) The scaffold platform shall be equivalent in strength to at least 2-inch planking. (For maximum planking spans see paragraph (a)(9) of this section.)
- (15) Guardrails not less than 2 x 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a midrail, when required, of 1 x 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.
- (16) Overhead protection shall be provided on the scaffold, not more than 9 feet above the platform, consisting of 2-inch planking or material of equivalent strength laid tight, when workers are at work on the scaffold and an overhead hazard exists.
- (17) Each scaffold shall be installed or relocated in accordance with designs and instructions, of a registered professional engineer, and supervised by a competent, designated person.
- (g) Two-point suspension scaffolds (swinging scaffolds).
- (1) Two-point suspension scaffold platforms shall be not less than 20 inches no more than 36 inches wide overall. The platform shall be securely fastened to the hangers by U-bolts or by other equivalent means.
- (2) The hangers of two-point suspension scaffolds shall be made of wrought iron, mild steel, or other equivalent material having a cross-sectional area capable of sustaining four times the maximum intended load, and shall be designed with a support for guardrail, intermediate rail, and toeboard.
- (3) When hoisting machines are used on two-point suspension scaffolds, such machines shall be of a design tested and approved by a nationally recognized testing laboratory. Refer to §1910.7 for definition of nationally recognized testing laboratory.
- (4) The roof irons or hooks shall be of wrought iron, mild steel, or other equivalent material of proper size and design, securely installed and anchored. Tiebacks of 3/4-inch manila rope or the equivalent shall serve as a secondary means of anchorage, installed at right angles to the face of the building whenever possible and secured to a structurally sound portion of the building.
- (5) Guardrails not less than 2 x 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a midrail, when required, of 1 x 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.
- (6) Two-point suspension scaffolds shall be suspended by wire or fiber ropes. Wire and fiber ropes shall conform to paragraph (a)(22) of this section.
- (7) The blocks for fiber ropes shall be of standard 6-inch size, consisting of at least one double and one single block. The sheaves of all blocks shall fit the size of rope used.

(8) All wire ropes, fiber ropes, slings, hangers, platforms, and other supporting parts shall be inspected before every installation. Periodic inspections shall be made while the scaffold is in use.

(9) On suspension scaffolds designed for a working load of 500 pounds no more than two persons shall be permitted to work at one time. On suspension scaffolds with a working load of 750 pounds, no more than three persons shall be permitted to work at one time. Each worker shall be protected by a safety lifebelt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the worker in case of a fall.

(10) Where acid solutions are used, fiber ropes are not permitted unless acid-proof.

(11) Two-point suspension scaffolds shall be securely lashed to the building or structure to prevent them from swaying. Window cleaners' anchors shall not be used for this purpose.

(12) The platform of every two-point suspension scaffold shall be one of the following types:

(i) The side stringer of ladder-type platforms shall be clear straight-grained spruce or materials of equivalent strength and durability. The rungs shall be of straight-grained oak, ash, or hickory, at least 1 1/8-inch in diameter, with 7/8-inch tenons mortised into the side stringers at least 7/8-inch. The stringers shall be tied together with the tie rods not less than 1/4-inch in diameter, passing through the stringers and riveted up tight against washers on both ends. The flooring strips shall be spaced not more than 5/8-inch apart except at the side rails where the space may be 1-inch. Ladder-type platforms shall be constructed in accordance with Table D-17.

(ii) Plank-type platforms shall be composed of not less than nominal 2-x-8-inch unspliced planks, properly cleated together on the underside starting 6 inches from each end; intervals in between shall not exceed 4 feet.

The plank-type platform shall not extend beyond the hangers more than 18 inches. A bar or other effective means shall be securely fastened to the platform at each end to prevent its slipping off the hanger. The span between hangers for plank-type platforms shall not exceed 10 feet.

(iii) Beam platforms shall have side stringers of lumber not less than 2-x-6 inches set on edge. The span between hangers shall not exceed 12 feet when beam platforms are used. The flooring shall be supported on 2- and 6-inch crossbeams, laid flat and set into the upper edge of the stringers with a snug fit, at intervals of not more than 4 feet, securely nailed in place. The flooring shall be of 1-x-6-inch material properly nailed. Floorboards shall not be spaced more than 1/2-inch apart.

Table D-17 — Schedule for Ladder-Type Platforms

	Length of platform (feet)				
	12	14 & 16	18 & 20	22 & 24	28 & 30

Side stringers, minimum cross section (finished sizes):					
—At ends (in.)	1 3/4 x 2	1 3/4 x 2	1 3/4 x 3	1 3/4 x 3	1 3/4 x 3
.....	3/4	3/4	1 3/4 x 4	1 3/4 x 4	1/2
—At middle (in.)	1 3/4 x 3	1 3/4 x 3	.....	1/4	1 3/4 x 5
.....	3/4	3/4	.....	.....	.....
Reinforcing strip (minimum) ¹	.....	.....	.....	.....	.....
.....
Rungs ²	.....	.....	.....	.....	.....
.....	.....	.....	4	.....	.....
Tie rods:			1/4 in.	5	6
—Number (minimum)	3	4	1/2 x 2 3/4	1/4 in.	1/4 in.
.....	1/4 in.	1/4 in.		1/2 x 3/4	1/2 x 2 3/4
—Diameter (minimum)	1/2 x 2 3/4	1/2 x 2 3/4			
.....					
Flooring, minimum finished size (in.)					

¹—A 1/8 x 7/8-in. steel reinforcing strip or its equivalent shall be attached to the side or underside full length.

²—Rungs shall be 1-1/8-in. minimum diameter with at least 7/8-in. diameter tenons, and the maximum spacing shall be 12 in. center to center.

(h) Stone setters' adjustable multiple-point suspension scaffolds.

(1) The scaffold shall be capable of sustaining a working load of 25 pounds per square foot and shall not be overloaded. Scaffolds shall not be used for storage of stone or other heavy materials.

(2) The hoisting machine and its supports shall be of a type tested and listed by a nationally recognized testing laboratory. Refer to §1910.399(a)(77) for definition of listed, and §1910.7 for nationally recognized testing laboratory.

(3) The platform shall be securely fastened to the hangers by U-bolts or other equivalent means.

(4) The scaffold unit shall be suspended from metal outriggers, iron brackets, wire rope slings, or iron hooks which will safely support the maximum intended load.

(5) Outriggers when used shall be set with their webs in a vertical position, securely anchored to the building or structure and provided with stop bolts at each end.

(6) The scaffold shall be supported by wire rope conforming with paragraph (a)(22) of this section, suspended from overhead supports.

(7) The free ends of the suspension wire ropes shall be equipped with proper size thimbles, secured by splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum and at least four turns of rope shall remain on the drum at all times.

(8) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a midrail, when required, of 1 by 4-inch lumber or equivalent, and toeboards, be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.

(9) When two or more scaffolds are used on a building or structure they shall not be bridged one to the other but shall be maintained at even height with platforms butting closely.

(10) Each scaffold shall be installed or relocated in accordance with designs and instructions of a registered professional engineer, and such installation or relocation shall be supervised by a competent designated person.

(i) Single-point adjustable suspension scaffolds.

~~(1) The scaffolding, including power units or manually operated winches, shall be a type tested and listed by a nationally recognized testing laboratory. Refer to §1910.399(a) (77) for definition of listed, and §1910.7 for nationally recognized testing laboratory.~~

~~(2) (Reserved)~~

~~(3) All power-operated gears and brakes shall be enclosed.~~

~~(4) In addition to the normal operating brake, all power driven units must have an emergency brake which engages automatically when the normal speed of descent is exceeded.~~

~~(5) Guards, midrails, and toeboards shall completely enclose the cage or basket. Guardrails shall be no less than 2 by 4 inches or the equivalent installed no less than 36 inches nor more than 42 inches above the platform. Midrails shall be 1 by 6 inches or the equivalent, installed equidistant between the guardrail and the platform. Toeboards shall be a minimum of 4 inches in height.~~

~~(6) The hoisting machines, cables, and equipment shall be regularly serviced and inspected after each installation and every 30 days thereafter.~~

~~(7) The units may be combined to form a two-point suspension scaffold. Such scaffold shall comply with paragraph (g) of this section.~~

~~(8) The supporting cable shall be straight for its entire length, and the operator shall not sway the basket and fix the cable to any intermediate points to change his original path of travel.~~

~~(9) Equipment shall be maintained and used in accordance with the manufacturers' instructions.~~

~~(10) Suspension methods shall conform to applicable provisions of paragraphs (f) and (g) of this section.~~

~~**(j) Boatswain's chairs.**~~

~~(1) The chair seat shall be not less than 12 by 24 inches, and of 1-inch thickness. The seat shall be reinforced on the underside to prevent the board from splitting.~~

~~(2) The two fiber rope seat slings shall be of 5/8-inch diameter, reeved through the four seat holes so as to cross each other on the underside of the seat.~~

~~(3) Seat slings shall be of at least 3/8-inch wire rope when a worker is conducting a heat producing process such as gas or arc welding.~~

~~(4) The worker shall be protected by a safety life belt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the worker in case of a fall.~~

~~(5) The tackle shall consist of correct size ball bearing or bushed blocks and properly spliced 5/8-inch diameter first-grade manila rope.~~

~~(6) The roof irons, hooks, or the object to which the tackle is anchored shall be securely installed. Tiebacks when used shall be installed at right angles to the face of the building and securely fastened to a chimney.~~

~~**(k) Carpenters' bracket scaffolds.**~~

~~(1) The brackets shall consist of a triangular wood frame not less than 2 by 3 inches in cross section, or of metal of equivalent strength. Each member shall be properly fitted and securely joined.~~

~~(2) Each bracket shall be attached to the structure by means of one of the following:~~

~~(i) A bolt no less than 5/8-inch in diameter which shall extend through the inside of the building wall.~~

~~(ii) A metal stud attachment device.~~

~~(iii) Welding to steel tanks.~~

~~**(iv) Hooking over a well-secured and adequately strong supporting member.**~~

~~The brackets shall be spaced no more than 10 feet apart.~~

~~(3) No more than two persons shall occupy any given 10 feet of a bracket scaffold at any one time. Tools and materials shall not exceed 75 pounds in addition to the occupancy.~~

~~(4) The platform shall consist of not less than two 2-by-9-inch nominal size planks extending not more than 18 inches or less than 6 inches beyond each end support.~~

(5) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a midrail, when required, of 1 by 4 inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.

(l) Bricklayers' square scaffolds.

(1) The squares shall not exceed 5 feet in width and 5 feet in height.

(2) Members shall be not less than those specified in Table D-18.

Table D-18 — Minimum Dimensions for Bricklayers' Square Scaffold Members

Members	Dimensions (inches)
Bearers or horizontal members	2 by 6
Legs	2 by 6
.....	1 by 6
Braces at corners	1 by 8
Braces diagonally from center frame	

(3) The squares shall be reinforced on both sides of each corner with 1 by 6 inch gusset pieces. They shall also have braces 1 by 8 inches on both sides running from center to center of each member, or other means to secure equivalent strength and rigidity.

(4) The squares shall be set not more than 5 feet apart for medium duty scaffolds, and not more than 8 feet apart for light duty scaffolds. Bracing 1 x 8 inches, extending from the bottom of each square to the top of the next square, shall be provided on both front and rear sides of the scaffold.

(5) Platform planks shall be at least 2 by 9 inch nominal size. The ends of the planks shall overlap the bearers of the squares and each plank shall be supported by not less than three squares.

(6) Bricklayers' square scaffolds shall not exceed three tiers in height and shall be so constructed and arranged that one square shall rest directly above the other. The upper tiers shall stand on a continuous row of planks laid across the next lower tier and be nailed down or otherwise secured to prevent displacement.

(7) Scaffolds shall be level and set upon a firm foundation.

(m) Horse scaffolds.

(1) Horse scaffolds shall not be constructed or arranged more than two tiers or 10 feet in height.

(2) The members of the horses shall be not less than those specified in Table D-19.

Table D-19 — Minimum Dimensions for Horse Scaffold Members

Members	Dimensions (inches)
Horizontal members or bearers	3 by 4
Legs	1 1/4 by 4 1/2
.....	1 by 6
Longitudinal brace between legs	1 by 8
Gusset brace at top of legs	1 1/4 by 4 1/2
.....	
Half diagonal braces	

(3) Horses shall be spaced not more than 5 feet for medium duty and not more than 8 feet for light duty.

(4) When arranged in tiers, each horse shall be placed directly over the horse in the tier below.

(5) On all scaffolds arranged in tiers, the legs shall be nailed down to the planks to prevent displacement or thrust and each tier shall be substantially cross braced.

(6) Horses or parts which have become weak or defective shall not be used.

~~(7) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high with a midrail, when required, of 1 by 4-inch lumber or equivalent and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.~~

(n) Needle beam scaffold.

~~(1) Wood needle beams shall be in accordance with paragraph (a)(5) and (9) of this section, and shall be not less than 4 by 6 inches in size, with the greater dimension placed in a vertical direction. Metal beams or the equivalent conforming to paragraph (a)(4) and (8) of this section may be used.~~

~~(2) Ropes or hangers shall be provided for supports. The span between supports on the needle beam shall not exceed 10 feet for 4 by 6-inch timbers. Rope supports shall be equivalent in strength to 1-inch diameter first-grade manila rope.~~

~~(3) The ropes shall be attached to the needle beams by a scaffold hitch or a properly made eye splice. The loose end of the rope shall be tied by a bowline knot or by a round turn and one-half hitch.~~

~~(4) The platform span between the needle beams shall not exceed 8 feet when using 2-inch scaffold plank. For spans greater than 8 feet, platforms shall be designed based on design requirements for the special span. The overhang of each end of the platform planks shall be not less than 1 foot and not more than 18 inches.~~

~~(5) When one needle beam is higher than the other or when the platform is not level the platform shall be secured against slipping.~~

~~(6) All unattached tools, bolts, and nuts used on needle beam scaffolds shall be kept in suitable containers.~~

~~(7) One end of a needle beam scaffold may be supported by a permanent structural member conforming to paragraphs (a)(4) and (8) of this section.~~

~~(8) Each person working on a needle beam scaffold 20 feet or more above the ground or floor and working with both hands, shall be protected by a safety life belt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the worker in case of a fall.~~

(o) Plasterers', decorators', and large area scaffolds.

~~(1) Plasterers', decorators', lathers', and ceiling workers' inside scaffolds shall be constructed in accordance with the general requirements set forth for independent wood pole scaffolds.~~

~~(2) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a midrail, when required, of 1 by 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.~~

~~(3) All platform planks shall be laid with the edges close together.~~

~~(4) When independent pole scaffold platforms are erected in sections, such sections shall be provided with connecting runways equipped with substantial guardrails.~~

(p) Interior hung scaffolds.

~~(1) (Reserved)~~

~~(2) The suspended steel wire rope shall conform to paragraph (a)(22) of this section. Wire may be used providing the strength requirements of paragraph (a)(22) of this section are met.~~

~~(3) For hanging wood scaffolds, the following minimum nominal size material is recommended:~~

~~(i) Supporting bearers 2 by 9 inches on edge.~~

~~(ii) Planking 2 by 9 inches or 2 by 10 inches, with maximum span 7 feet for heavy duty and 10 feet for light duty or medium duty.~~

~~(4) Steel tube and coupler members may be used for hanging scaffolds with both types of scaffold designed to sustain a uniform distributed working load up to heavy duty scaffold loads with a safety factor of four.~~

~~(5) When a hanging scaffold is supported by means of wire rope, such wire rope shall be wrapped at least twice around the supporting members and twice around the bearers of the scaffold, with each end of the wire rope secured by at least three standard wire rope clips.~~

~~(6) All overhead supporting members shall be inspected and checked for strength before the scaffold is erected.~~

~~(7) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a midrail, when required, of 1 by 4 inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with paragraph (a)(17) of this section.~~

~~(q) Ladder-jack scaffolds.~~

~~(1) All ladder-jack scaffolds shall be limited to light duty and shall not exceed a height of 20 feet above the floor or ground.~~

~~(2) All ladders used in connection with ladder-jack scaffolds shall be heavy-duty ladders and shall be designed and constructed in accordance with §1910.25 and §1910.26.~~

~~(3) The ladder jack shall be so designed and constructed that it will bear on the side rails in addition to the ladder rungs, or if bearing on rungs only, the bearing area shall be at least 10 inches on each rung.~~

~~(4) Ladders used in conjunction with ladder jacks shall be so placed, fastened, held, or equipped with devices so as to prevent slipping.~~

~~(5) The wood platform planks shall be not less than 2 inches nominal in thickness. Both metal and wood platform planks shall overlap the bearing surface not less than 12 inches. The span between supports for wood shall not exceed 8 feet. Platform width shall be not less than 18 inches.~~

~~(6) Not more than two persons shall occupy any given 8 feet of any ladder-jack scaffold at any one time.~~

~~(r) Window-jack scaffolds.~~

~~(1) Window-jack scaffolds shall be used only for the purpose of working at the window opening through which the jack is placed.~~

~~(2) Window jacks shall not be used to support planks placed between one window jack and another or for other elements of scaffolding.~~

~~(3) Window-jack scaffolds shall be provided with suitable guardrails unless safety belts with lifelines are attached and provided for the worker. Window-jack scaffolds shall be used by one man only.~~

~~(s) Roofing brackets.~~

~~(1) Roofing brackets shall be constructed to fit the pitch of the roof.~~

~~(2) Brackets shall be secured in place by nailing in addition to the pointed metal projections. The nails shall be driven full length into the roof. When rope supports are used, they shall consist of first-grade manila of at least 3/4-inch diameter, or equivalent.~~

~~(3) A substantial catch platform shall be installed below the working area of roofs more than 20 feet from the ground to eaves with a slope greater than 3 inches in 12 inches without a parapet. In width the platform shall extend 2 feet beyond the projection of the eaves and shall be provided with a safety rail, midrail, and toeboard. This provision shall not apply where employees engaged in work upon such roofs are protected by a safety belt attached to a lifeline.~~

~~(t) Crawling boards or chicken ladders.~~

~~(1) Crawling boards shall be not less than 10 inches wide and 1-inch thick, having cleats 1 x 1 1/2 inches. The cleats shall be equal in length to the width of the board and spaced at equal intervals not to exceed 24 inches. Nails shall be driven through and clinched on the underside.~~

The crawling board shall extend from the ridge pole to the eaves when used in connection with roof construction, repair, or maintenance.

(2) A firmly fastened lifeline of at least 3/4-inch rope shall be strung beside each crawling board for a handhold.

(3) Crawling boards shall be secured to the roof by means of adequate ridge hooks or equivalent effective means.

~~(u) Float or ship scaffolds.~~

~~(1) Float or ship scaffolds shall support not more than three workers and a few light tools, such as those needed for riveting, bolting, and welding. They shall be constructed in accordance with paragraphs (u)(2) through (6) of this section, unless substitute designs and materials provide equivalent strength, stability, and safety.~~

~~(2) The platform shall be not less than 3 feet wide and 6 feet long, made of 3/4-inch plywood, equivalent to American Plywood Association Grade B-B, Group 1, Exterior.~~

~~(3) Under the platform, there shall be two supporting bearers made from 2- x 4-inch, or 1- x 10-inch rough, selected lumber, or better. They shall be free of knots or other flaws and project 6 inches beyond the platform on both sides. The ends of the platform shall extend about 6 inches beyond the outer edges of the bearers. Each bearer shall be securely fastened to the platform.~~

~~(4) An edging of wood not less than 3/4 x 1 1/2 inches, or equivalent, shall be placed around all sides of the platform to prevent tools from rolling off.~~

~~(5) Supporting ropes shall be 1-inch diameter manila rope or equivalent, free from deterioration, chemical damage, flaws, or other imperfections. Rope connections shall be such that the platform cannot shift or slip. If two ropes are used with each float, each of the two supporting ropes shall be hitched around one end of a bearer and pass under the platforms to the other end of the bearer where it is hitched again, leaving sufficient rope at each end for the supporting ties.~~

~~(6) Each worker shall be protected by a safety lifebelt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the worker in case of a fall.~~

~~(v) Scope. This section establishes safety requirements for the construction, operation, maintenance, and use of scaffolds used in the maintenance of buildings and structures.~~

~~(39 FR 23502, June 27, 1974, as amended at 43 FR 49746, Oct. 24, 1978; 49 FR 5321, Feb. 10, 1984)~~

~~Stat. Auth.: ORS 654.025(2) and 656.726(4).~~

~~Stats. Implemented: ORS 654.001 through 654.295.~~

~~Hist: OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.]~~

~~[§1910.29—Manually Propelled Mobile Ladder Stands and Scaffolds (Towers).~~

~~(a) General requirements.~~

~~(1) Application. This section is intended to prescribe rules and requirements for the design, construction, and use of mobile work platforms (including ladder stands but not including aerial ladders) and rolling (mobile) scaffolds (towers). This standard is promulgated to aid in providing for the safety of life, limb, and property, by establishing minimum standards for structural design requirements and for the use of mobile work platforms and towers.~~

~~(2) Working loads.~~

~~(i) Work platforms and scaffolds shall be capable of carrying the design load under varying circumstances depending upon the conditions of use. Therefore, all parts and appurtenances necessary for their safe and efficient utilization must be integral parts of the design.~~

(ii) Specific design and construction requirements are not a part of this section because of the wide variety of materials and design possibilities. However, the design shall be such as to produce a mobile ladder stand or scaffold that will safely sustain the specified loads. The material selected shall be of sufficient strength to meet the test requirements and shall be protected against corrosion or deterioration.

(A) The design working load of ladder stands shall be calculated on the basis of one or more 200-pound persons together with 50 pounds of equipment each.

The design load of all scaffolds shall be calculated on the basis of:

Light—Designed and constructed to carry a working load of 25 pounds per square foot.

Medium—Designed and constructed to carry a working load of 50 pounds per square foot.

Heavy—Designed and constructed to carry a working load of 75 pounds per square foot.

All ladder stands and scaffolds shall be capable of supporting at least four times the design working load.

(iii) The materials used in mobile ladder stands and scaffolds shall be of standard manufacture and conform to standard specifications of strength, dimensions, and weights, and shall be selected to safely support the design working load.

(iv) Nails, bolts, or other fasteners used in the construction of ladders, scaffolds, and towers shall be of adequate size and in sufficient numbers at each connection to develop the designed strength of the unit. Nails shall be driven full length. (All nails should be immediately withdrawn from dismantled lumber.)

(v) All exposed surfaces shall be free from sharp edges, burrs or other safety hazards.

(3) Work levels.

(i) The maximum work level height shall not exceed four times the minimum or least base dimensions of any mobile ladder stand or scaffold. Where the basic mobile unit does not meet this requirement, suitable outrigger frames shall be employed to achieve this least base dimension, or provisions shall be made to guy or brace the unit against tipping.

(ii) The minimum platform width for any work level shall not be less than 20 inches for mobile scaffolds (towers). Ladder stands shall have a minimum step width of 16 inches.

(iii) The supporting structure for the work level shall be rigidly braced, using adequate cross bracing or diagonal bracing with rigid platforms at each work level.

(iv) The steps of ladder stands shall be fabricated from slip resistant treads.

(v) The work level platform of scaffolds (towers) shall be of wood, aluminum, or plywood planking, steel or expanded metal, for the full width of the scaffold, except for necessary openings. Work platforms shall be secured in place. All planking shall be 2-inch (nominal) scaffold grade minimum 1,500 f. (stress grade) construction grade lumber or equivalent.

(vi) All scaffold work levels 10 feet or higher above the ground or floor shall have a standard (4-inch nominal) toeboard.

(vii) All work levels 10 feet or higher above the ground or floor shall have a guardrail of 2- by 4-inch nominal or the equivalent installed no less than 36 inches or more than 42 inches high, with a midrail, when required, of 1- by 4-inch nominal lumber or equivalent.

(viii) A climbing ladder or stairway shall be provided for proper access and egress, and shall be affixed or built into the scaffold and so located that its use will not have a tendency to tip the scaffold. A landing platform shall be provided at intervals not to exceed 30 feet.

(4) Wheels or casters.

(i) Wheels or casters shall be properly designed for strength and dimensions to support four times the design working load.

(ii) All scaffold casters shall be provided with a positive wheel and/or swivel lock to prevent movement. Ladder stands shall have at least two of the four casters and shall be of the swivel type.

(iii) Where leveling of the elevated work platform is required, screw jacks or other suitable means for adjusting the height shall be provided in the base section of each mobile unit.

~~(b) Mobile tubular welded frame scaffolds.~~

~~(1) General. Units shall be designed to comply with the requirements of paragraph (a) of this section.~~

~~(2) Bracing. Scaffolds shall be properly braced by cross braces and/or diagonal braces for securing vertical members together laterally. The cross braces shall be of a length that will automatically square and align vertical members so the erected scaffold is always plumb, square, and rigid.~~

~~(3) Spacing. Spacing of panels or frames shall be consistent with the loads imposed. The frames shall be placed one on top of the other with coupling or stacking pins to provide proper vertical alignment of the legs.~~

~~(4) Locking. Where uplift may occur, panels shall be locked together vertically by pins or other equivalent means.~~

~~(5) Erection. Only the manufacturer of a scaffold or his qualified designated agent shall be permitted to erect or supervise the erection of scaffolds exceeding 50 feet in height above the base, unless such structure is approved in writing by a registered professional engineer, or erected in accordance with instructions furnished by the manufacturer.~~

~~(c) Mobile tubular welded sectional folding scaffolds.~~

~~(1) General. Units including sectional stairway and sectional ladder scaffolds shall be designed to comply with the requirements of paragraph (a) of this section.~~

~~(2) Stairway. An integral stairway and work platform shall be incorporated into the structure of each sectional folding stairway scaffold.~~

~~(3) Bracing. An integral set of pivoting and hinged folding diagonal and horizontal braces and a detachable work platform shall be incorporated into the structure of each sectional folding ladder scaffold.~~

~~(4) Sectional folding stairway scaffolds. Sectional folding stairway scaffolds shall be designed as medium duty scaffolds except for high clearance. These special base sections shall be designed as light duty scaffolds. When upper sectional folding stairway scaffolds are used with a special high clearance base, the load capacity of the entire scaffold shall be reduced accordingly. The width of a sectional folding stairway scaffold shall not exceed 4 1/2 feet. The maximum length of a sectional folding stairway scaffold shall not exceed 6 feet.~~

~~(5) Sectional folding ladder scaffolds. Sectional folding ladder scaffolds shall be designed as light duty scaffolds including special base (open end) sections which are designed for high clearance. For certain special applications the 6-foot folding ladder scaffolds, except for special high clearance base sections, shall be designed for use as medium duty scaffolds. The width of a sectional folding ladder scaffold shall not exceed 4 1/2 feet. The maximum length of a sectional folding ladder scaffold shall not exceed 6 feet 6 inches for a 6-foot long unit, 8 feet 6 inches for an 8-foot unit or 10 feet 6 inches for a 10-foot long unit.~~

~~(6) End frames. The end frames of sectional ladder and stairway scaffolds shall be designed so that the horizontal bearers provide supports for multiple planking levels.~~

~~(7) Erection. Only the manufacturer of the scaffold or his qualified designated agent shall be permitted to erect or supervise the erection of scaffolds exceeding 50 feet in height above the base, unless such structure is approved in writing by a licensed professional engineer, or erected in accordance with instructions furnished by the manufacturer.~~

~~(d) Mobile tube and coupler scaffolds.~~

~~(1) Design. Units shall be designed to comply with the applicable requirements of paragraph (a) of this section.~~

~~(2) Material. The material used for the couplers shall be of a structural type, such as a drop-forged steel, malleable iron or structural grade aluminum. The use of gray cast iron is prohibited.~~

~~(3) Erection. Only the manufacturer of the scaffold or his qualified designated agent shall be permitted to erect or supervise the erection of scaffolds exceeding 50 feet in height above the~~

~~base, unless such structure is approved in writing by a licensed professional engineer, or erected in accordance with instructions furnished by the manufacturer.~~

~~(e) Mobile work platforms.~~

~~(1) Design. Units shall be designed for the use intended and shall comply with the requirements of paragraph (a) of this section.~~

~~(2) Base width. The minimum width of the base of mobile work platforms shall not be less than 20 inches.~~

~~(3) Bracing. Adequate rigid diagonal bracing to vertical members shall be provided.~~

~~(f) Mobile ladder stands.~~

~~(1) Design. Units shall comply with applicable requirements of paragraph (a) of this section.~~

~~(2) Base width. The minimum base width shall conform to paragraph (a)(3)(i) of this section. The maximum length of the base section shall be the total length of combined steps and top assembly, measured horizontally, plus 5/8-inch per step of rise.~~

~~(3) Steps. Steps shall be uniformly spaced, and sloped, with a rise of not less than 9 inches, nor more than 10 inches, and a depth of not less 7 inches. The slope of the steps section shall be a minimum of 55 degrees and a maximum of 60 degrees measured from the horizontal.~~

~~(4) Handrails.~~

~~(i) Units having more than five steps or 60 inches vertical height to the top step shall be equipped with handrails.~~

~~(ii) Handrails shall be a minimum of 29 inches high. Measurements shall be taken vertically from the center of the step.~~

~~(5) Loading. The load (see paragraph (a)(2)(ii)(a) of this section) shall be applied uniformly to a 3 1/2 inches wide area front to back at the center of the width span with a safety factor of four. Stat. Auth.: ORS 654.025(2) and 656.726(4).~~

~~Stats. Implemented: ORS 654.001 through 654.295.~~

~~Hist: OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.]~~

~~[§1910.30 Other Working Surfaces.~~

~~(a) Dockboards (bridge plates).~~

~~(1) Portable and powered dockboards shall be strong enough to carry the load imposed on them.~~

~~(2) Portable dockboards shall be secured in position, either by being anchored or equipped with devices which will prevent their slipping.~~

~~(3) Powered dockboards shall be designed and constructed in accordance with Commercial Standard CS202-56 (1961) "Industrial Lifts and Hinged Loading Ramps" published by the U.S. Department of Commerce, which is incorporated by reference as specified in §1910.6.~~

~~(4) Handholds, or other effective means, shall be provided on portable dockboards to permit safe handling.~~

~~(5) Positive protection shall be provided to prevent railroad cars from being moved while dockboards or bridge plates are in position.~~

~~(b) Forging machine area.~~

~~(1) Machines shall be so located as to give (i) enough clearance between machines so that the movement of one operator will not interfere with the work of another, (ii) ample room for cleaning machines and handling the work, including material and scrap. The arrangement of machines shall be such that operators will not stand in aisles.~~

~~(2) Aisles shall be provided of sufficient width to permit the free movement of employees bringing and removing material. This aisle space is to be independent of working and storage space.~~

~~(3) Wood platforms used on the floor in front of machines shall be substantially constructed.~~

(c) Veneer machinery.

(1) Sides of steam vats shall extend to a height of not less than 36 inches above the floor, working platform, or ground.

(2) Large steam vats divided into sections shall be provided with substantial walkways between sections. Each walkway shall be provided with a standard handrail on each exposed side. These handrails may be removable, if necessary.

(3) Covers shall be removed only from that portion of steaming vats on which persons are working and a portable railing shall be placed at this point to protect the operators.

(4) Workers shall not ride or step on logs in steam vats.

(39 FR 23502, June 27, 1974, as amended at 49 FR 5322, Feb. 10, 1984)

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.

—OR-OSHA Admin. Order 4-1997, f. 4/2/97, ef. 4/2/97.]

437-002-0022 Additional Oregon General Requirements.

(1) Scope and application. This rule applies in addition those in Division 2/D Walking-Working Surfaces.

(1)2) Barriers. The employer must ensure:

(a) Protective barriers or suitable guards~~[shall be]~~ **are** erected when covers over openings are removed or excavations made in places accessible to vehicular or pedestrian traffic. Warning lights or flares shall be displayed if work is being done at night. These protective measures shall be maintained until permanent or adequate covers or barricades are in place or the hazard removed.

(b) A watchperson~~[shall be]~~ **is** stationed where temporary conditions do not permit safeguarding of employees through the use of warning signs, lights, protective barriers, or covers.

(2)3) Plant Arrangement. The employer must ensure:

(a) Provisions for safety (such as adequate work and storage space for the full needs of raw, in-process, and finished materials, and for machinery, equipment and operations)~~[shall be]~~ **are** included in plant design, layout, and operation.

(b) A vertical clearance of not less than 6 1/2 feet~~[shall be]~~ **is** provided over work areas. Where it is otherwise impractical to secure adequate head room, overhead obstructions may be padded or may be indicated by means of contrasting paint, telltales, or similar means, if such means will furnish adequate protection.

(c) Work platforms provided shall be of sufficient width to provide a safe working space.

[NOTE: 437-002-0046 was repositioned here to become 437-002-0022(3) because it was incorrectly placed under the heading of "Means of Egress."]

(3)4) Aisles, Passageways, Walkways, Inclines. The employer must ensure:

(a) Aisles, passageways, and walkways~~[shall be]~~ **are** of adequate width for their intended or actual use, and in no event shall they be less than 22 inches wide.
~~[Passageways which are elevated more than 4 feet above the ground or floor level shall be provided with standard railings.]~~

(b) ~~[Walkways or passageways equipped with standard handrails shall be provided for oilers and other workers who are regularly required to go to elevated or other hazardous locations. Whenever space will permit, they shall be not less than 22 inches wide.]~~ **Fixed inclined walkways are not less than 22 inches wide, inclined at no greater angle than 24 degrees, and are securely fastened at the top and bottom.**

(c) ~~[(A) Fixed inclined walkways shall be not less than 22 inches wide, equipped with handrails on each open side, inclined at no greater angle than 24 degrees, and they shall be securely fastened at the top and bottom.]~~
~~[(B) Moveable inclined walkways which extend to floats or floating equipment (except to vessels under Federal jurisdiction)]~~~~[shall be]~~ **are** not less than 20 inches wide, and are secured at the upper end only with clear space provided for the lower end to adjust automatically with the heights of water.

(d) An adequate antislip surface~~[shall be]~~ **is** applied to inclined walkways whenever the gradient so warrants. Adequate cleats secured at uniform intervals not to exceed 18 inches, and extending the full width of the walkway when practical, may be used for this purpose.

(e) Inclines extending from floor to floor which are used instead of stairways have standard railings in accordance with the requirements~~[for stairways]~~ **in 1910.29(b).**

(f) **In addition to the surface conditions in 1910.22(a)(3), a**~~[A]~~ aisles, passageways, walkways, and inclines~~[shall be kept in good repair and shall be]~~ **are** maintained free of holes, unevenness, ~~[loose boards, protruding nails]~~ or any unnecessary obstructions or debris **that may create a hazard.**

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 to 654.295.

Hist: WCB No. 1-1967, f. 1/12/67, ef. 1/15/67.

OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.

OR-OSHA Admin. Order 6-1994, f. 9/30/94, ef. 9/30/94.

OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

~~[437-002-0023 Covers for holes. Covers for holes in floors, roofs, and other walking/working surfaces (to include skylights and skylight screens) must be capable of supporting, without failure, at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time.~~

~~Stat. Auth.: ORS 654.025(2) and 656.726(4).~~

~~Stats. Implemented: ORS 654.001 to 654.295.~~

~~Hist: OR-OSHA Admin. Order 2-2013, f. 2/15/13, ef. 4/1/13.]~~

(1) Scope and application. This rule applies to the use of portable ladders, including job-made ladders, in addition to the rules in 1910.23 Ladders.

([1]2) Definitions. [Portable ladder terms mean:] These definitions apply to portable ladder terms in this rule. Additional terms in 1910.21(b) apply to portable ladders within 1910.23 and this rule.

Job-made ladder. A non-commercially manufactured portable ladder constructed on the worksite for temporary use.

Non-self-supporting ladder. A class of portable ladders that, by design, must be placed against a structure independent of itself, such as a wall, to remain standing for use. Single ladders, extension ladders, sectional ladders, and articulating ladders set up in a straight ladder mode are examples of non-self-supporting ladders.

Self-supporting ladder. A class of portable ladders that, by design, stand on their own when erected for use without assistance from external structures. Stepladders, double front ladders, platform ladders, trestle ladders, and articulating ladders set up in a stepladder mode are examples of self-supporting ladders.

~~***[Check.***~~ ~~A lengthwise separation of the wood, most of which occurs across the rings of annual growth.~~

~~***Compression failure.***~~ ~~A deformation (buckling) of the fibers due to excessive compression along the grain.~~

~~***Decay.***~~ ~~Disintegration of wood substance due to action of wood-destroying fungi. It is also known as rot and rot.~~

~~***Extension ladder.***~~ ~~A nonself-supporting portable ladder of adjustable length. It has two or more sections that adjust to varied lengths.~~

~~***Extension trestle ladder.***~~ ~~An adjustable, self-supporting portable ladder made of a trestle ladder base and a vertical extension section.~~

~~***Ladder.***~~ ~~A device with steps, rungs or cleats between rails, for people to climb up or down.~~

~~***Low density wood.***~~ ~~Exceptionally light in weight and usually deficient in strength for the species.~~

~~***Platform.***~~ ~~A landing surface for working or standing.~~

~~***Platform ladder.***~~ ~~A fixed length, self-supporting portable ladder with a platform at the highest permissible standing level.~~

~~***Reinforced Plastic.***~~ ~~A plastic made stronger than its base by the addition of high strength fillers, usually fibers, fabrics or mats.~~

~~***Section.***~~

~~***Bottom or base section.***~~ ~~The lowest section of a nonself-supporting portable ladder.~~

~~***Middle or intermediate section.***~~ ~~The section(s) between the top (fly) and bottom (base) sections of a nonself-supporting portable ladder.~~

~~***Top or fly section.***~~ ~~The uppermost section of a nonself-supporting portable ladder.~~

~~***Sectional ladder.***~~ ~~A nonself-supporting, fixed length, portable ladder, with two or more sections of ladder that may combine to work as a single ladder. Its size is the length of the assembled sections.~~

~~**Shake.** A separation along the grain, most of which occurs between the rings of annual growth.~~

~~**Single Section Ladder.** A fixed length, nonself-supporting portable ladder made of one section.~~

~~**Stepladder.** A fixed length, self-supporting portable ladder with a hinged back.~~

~~**Top Cap.** The very top part of a stepladder.~~

~~**Top Step.** The first step below the top cap of a stepladder. If the ladder has no top cap, the top step is the first one below the top of the rails.~~

~~**Trestle ladder.** A fixed length, self-supporting portable ladder made of two sections and hinged at the top. It can be climbed by two people at once, one per side.~~

~~**Wane.** Bark, or the lack of wood from any cause, on the corner of a piece.~~

~~**Wood irregularities.** Natural characteristics in or on wood that may lower its durability, strength, or utility.~~

~~**Working Load Rating.** The maximum load authorized by the manufacturer for the ladder.]~~

~~[(2) **Application.** This standard covers the selection, use and care of portable ladders. It does not cover orchard ladders, special ladders, combination step and extension ladders, aisle way step ladders, and shelf ladders.]~~

(3) Ladder selection. **The employer must ensure:**

(a) Wood ladders comply with American National Standard ANSI/ASC A14.1-2007.

(b) Portable metal ladders comply with American National Standard ANSI/ASC A14.2-2007.

(c) Portable reinforced plastic (fiberglass) ladders comply with American National Standard ANSI/ASC A14.5-2007.

NOTE to 437-002-0026(3): Unaltered and properly maintained ladders that meet the ANSI standard in effect at the time of their manufacture comply with this standard. This includes job-made ladders designed and built according to American National Standard A14.4-1979 and portable ladders that comply with newer versions of the particular ANSI standard.

~~[Portable reinforced plastic (fiberglass) ladders must comply with American National Standard A14.5-1992. Wood ladders must comply with American National Standard A14.1-1994. Metal ladders must comply with American National Standard A14.2-1990.~~

~~Unaltered and properly maintained ladders that meet the ANSI standard in effect at the time of their manufacture comply with this standard as do ladders that comply with newer versions of the particular ANSI standard.]~~

~~[(4) **Condition of wood ladders.** There must be no sharp edges or splinters on wood parts. Visual inspection must show no check, shake, wane, compression failures, decay, or other wood irregularities. Ladders may not be made of low density wood.~~

~~(5) **General requirements— all ladders.**~~

~~(a) **Step spacing must be uniform and not more than 12 inches. Steps must be parallel and level when the ladder is in the normal use position.**~~

~~(b) **All joints, attachments and working parts of ladders must be tight and not worn to a point that causes a hazard. Do not use ladders with damaged or bent parts.**~~

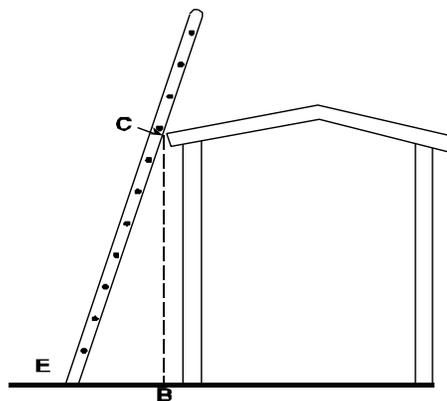
~~(c) **Replace frayed or badly worn rope.**~~

- ~~(d) Safety feet and other auxiliary equipment must in good condition.~~
- ~~(e) Inspect ladders and remove from use any with defects. Ladders awaiting repair must be tagged, "Dangerous, Do Not Use."~~
- ~~(f) There can be no dents, breaks or bends in the side rails or rungs;~~
- ~~(g) Do not make ladders by fastening cleats across a single rail.~~
- ~~(h) Portable ladders must have nonslip bases.~~
- ~~(6) General requirements — portable stepladders.~~
 - ~~(a) The minimum width between side rails at the top, inside to inside, must be not less than 11 1/2 inches. From top to bottom, the side rails must spread at least 1-inch for each foot of length of the stepladder.~~
 - ~~(b) The bottoms of the four rails must have insulating nonslip material.~~
 - ~~(c) There must be a metal spreader or locking device strong enough to hold the ladder open. The spreader must have no sharp points or edges. For Type III ladders, the pail shelf and spreader can be one unit (a shelf-lock ladder).~~
- ~~(7) Use — all ladders. Use ladders only for purposes approved or recommended by the manufacturer.~~
 - ~~(a) Do not load ladders beyond their working load rating.~~
 - ~~(b) Do not use ladders in front of doors that open toward the ladder without blocking, locking or guarding the door.~~
 - ~~(c) Do not use ladders placed on boxes, barrels, or other unstable bases to obtain additional height.~~
 - ~~(d) Do not use ladders with broken or missing steps, rungs, or cleats, broken side rails, or other faulty parts.~~
 - ~~(e) Do not splice sections of short ladders together to make a long one.~~
 - ~~(f) When used, metal reinforcers must be on the underside of rails of portable rung ladders.~~
 - ~~(g) A ladder for access to a roof must extend at least 3 feet above the top support point, at the eave, gutter, or roof line.~~
 - ~~(h) Secure ladders as necessary when used on surfaces that may allow slipping or movement. Use one of the following methods:
 - ~~(A) nonslip bases on the ladder feet; or,~~
 - ~~(B) steel points or safety shoes on the ladder feet, designed for the type of surface the ladder is on; or~~
 - ~~(C) nail the ladder to the floor, or set it against secured blocks or chocks.~~~~
- ~~NOTE: Nonslip bases are not a substitute for care in safely placing, lashing, or holding a ladder on oily, metal, concrete, or slippery surfaces.~~
- ~~(i) Use portable ladders only on a surface that gives stable, level footing.~~
- ~~(j) The climber must face the ladder and have free use of both hands when climbing up or down.~~
- ~~(k) Do not step or jump between erected ladders.~~
- ~~(l) There must be only one person at a time on a ladder unless its labeling specifically allows use by more than one person.~~
- ~~(m) Do not use ladders as planks or bridges between walking surfaces or in other horizontal applications.~~
- ~~(n) Do not use ladders to gain additional height from elevated surfaces like scaffolds, truck beds, vehicle bodies, tractor scoops or boom truck buckets.~~
- ~~(o) When working on or near electric circuits or energized lines, comply with OAR 437-002-1910.333(c).~~
- ~~(p) Unless the ladder has a single support attachment, the tops of both rails must contact an adequate support surface.~~
- ~~(q) Do not use ladders for any purpose not intended by the manufacturer nor as a brace, skid, guy or anchor point.~~
- ~~(8) Use of specific types of ladders.~~

- (a) ~~Portable stepladders. Do not use stepladders more than 20 feet long.~~
- (A) ~~Do not climb on the back section of the ladder unless it has steps meant for climbing. Do not stand on the top step or top cap of stepladders.~~
- (B) ~~There must be only one person at a time on the ladder.~~
- (C) ~~Do not use stepladders in freestanding positions when not fully opened. Do not use them as supports for working platforms or scaffolding planks.~~
- (b) ~~Portable rung ladders.~~
- (A) ~~Single ladder.~~
- (i) ~~Do not use single ladders more than 30 feet long.~~
- (ii) ~~Place these ladders at an angle shown in Figure 1.~~
- (iii) ~~The tops must be tied down or secured if there is a possibility of sliding or movement.~~
- (iv) ~~Single ladders are acceptable as fixed ladders only when they comply with 437-002-0027.~~
- (B) ~~Two-section ladder.~~
- (i) ~~Do not use two-section extension ladders more than 60 feet long. All ladders of this type must have two sections, one to fit within the side rails of the other, and arranged so that the upper section will raise and lower.~~
- (ii) ~~Set up and use extension ladders so that the top section or fly is resting on the bottom section or base. Rung locks must be in the proper position.~~
- (iii) ~~Place these ladders at an angle shown in Figure 1.~~
- (iv) ~~The tops must be tied down or secured if there is a possibility of sliding or movement.~~
- (v) ~~On two-section extension ladders the minimum overlap for the two sections in use must be as follows:~~

Size of Ladder (feet)	Overlap (feet)
Up to and including 36	3
Over 36 up to and including 48	4
Over 48 up to and including 80	5

- (C) ~~Sectional ladder.~~
 - (i) ~~Do not use assembled combinations of sectional ladders longer than lengths allowed in this subdivision.~~
- C is the top support



E is the foot of the ladder
 $EB = 1/4 EC$

Figure 1. Diagram of proper ladder pitch

- (ii) ~~Place these ladders at an angle shown in Figure 1.~~
- (iii) ~~The tops must be tied down or secured if there is a possibility of sliding or movement.~~

~~(iv) Do not use three section extension ladders longer than 72 feet.
(D) Trestle and extension trestle ladder. Do not use trestle ladders, or extension sections or base sections of extension trestle ladders more than 20 feet long.]~~

(4) Use – all portable ladders. The employer must ensure:

(a) Each self-supporting ladder or combination ladder used in a self-supporting ladder mode is equipped with a metal spreader or locking device that securely holds the front and back sections in a fully open position while the ladder is in use.

(b) Each non-self-supporting ladder is erected to the angle represented in Figure D-1 of 1910.23(c)(11) unless otherwise instructed in writing by the ladder manufacture.

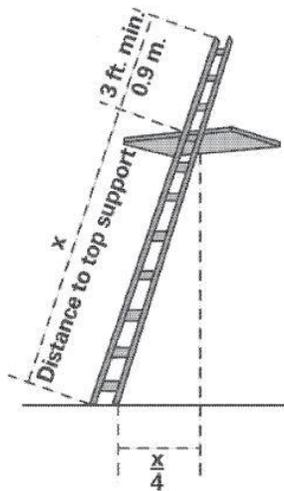


Figure D-1 -- Portable Ladder Set-up

(c) No employee steps, jumps or otherwise moves from one erected ladder to another.

(d) Ladders are not used as planks or bridges between walking-working surfaces or in other horizontal applications.

(e) Ladders are not used to gain additional height from elevated surfaces such as scaffolds, truck beds, vehicle bodies, tractor scoops or boom truck buckets.

(f) Ladders are not used as supports for working platforms or scaffolding planks unless approved for such purposes by the ladder manufacturer.

NOTE to 437-002-0026(4): When working on or near electric circuits or energized lines, comply with 1910.333(c) in Division 2/S.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 10-1999, f. 9/10/99, ef. 9/10/99.

OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

~~[437-002-0027 Fixed Ladders.~~

~~(1) Definitions. Fixed ladder terms mean:~~

~~Cage. A guard sometimes referred to as a basket guard that is an enclosure fastened to the side rails of a fixed ladder or to a structure to encircle the climbing space of the ladder.~~

~~Cleats. Ladder cross-pieces of rectangular cross-section placed on edge on which a person may step when climbing up or down.~~

~~Fastenings. A device to attach a ladder to a structure, building, or equipment.~~

~~Fixed ladder. A ladder permanently attached to a structure, building, or equipment.~~

~~Grab bars. Individual handholds adjacent to or as an extension above ladders to provide access beyond the limits of the ladder.~~

~~Individual-rung ladder. A fixed ladder with each rung individually attached to a structure, building, or equipment.~~

~~Ladder. A device with steps, rungs or cleats between rails, for people to climb up or down.~~

~~Ladder safety device. Any device, other than a cage or well, designed to eliminate or reduce the possibility of accidental falls, that may use life belts, friction brakes, and sliding attachments.~~

~~Pitch. The included angle between the horizontal and the ladder, measured on the opposite side of the ladder from the climbing side.~~

~~Rail ladder. A fixed ladder with side rails joined at regular intervals by rungs or cleats and fastened in full length or in sections to a building, structure, or equipment.~~

~~Rungs. Ladder cross-pieces of circular or oval cross-section on which a person may step when climbing up or down.~~

~~Side-step ladder. One from which a person getting off at the top must step sideways to reach the landing.~~

~~Steps. The flat cross-pieces of a ladder on which a person may step when climbing up or down.~~

~~Through ladder. A ladder from which a person getting off at the top must step through side rails to reach the landing.~~

~~Well. A permanent complete enclosure around a fixed ladder, that is attached to the walls of the well. Proper clearances for a well will give the climber the same protection as a cage.~~

~~(2) Design requirements.~~

~~(a) Design considerations. All ladders, appurtenances, and fastenings must meet these load requirements.~~

~~(A) The minimum design live load must be a single concentrated load of 200 pounds.~~

~~(B) Design consideration must include the number and position of additional concentrated live load units of 200 pounds each as determined from anticipated use.~~

~~(C) Consider the live loads caused by persons on the ladder to be concentrated at such points as will cause the maximum stress in the structural member being under evaluation.~~

~~(D) Use the weight of the ladder and attachments together with the live load when designing rails and fastenings.~~

~~(E) All wood parts of fixed ladders must meet the requirements of OAR 437-002-0027(3).~~

~~(D) For fixed ladders with wood side rails and wood rungs or cleats, used at an angle between 75 degrees and 90 degrees, and intended for use by no more than one person per section, single ladders in OAR 437-002-0026(8)(b)(A) are acceptable.~~

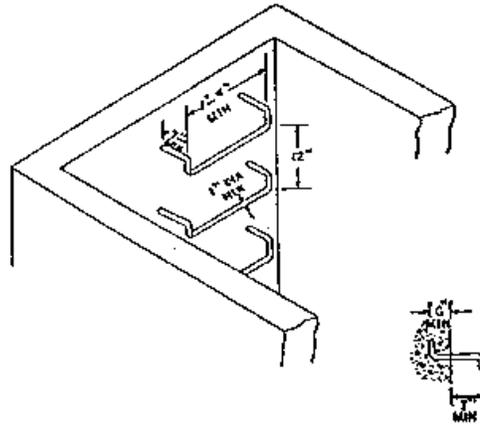
~~(3) Specific features.~~

~~(a) Rungs and cleats.~~

~~(A) All rungs must have a minimum diameter of 3/4-inch for metal ladders, except as in paragraph OAR 437-002-0027(3)(g) and a minimum diameter of 1 1/8 inches for wood ladders.~~

- (B) The distance between rungs, cleats, and steps must be uniform and not more than 12 inches.*
 - (C) The minimum clear length of rungs or cleats must be 16 inches.*
 - (D) Rungs, cleats, and steps must not have splinters, sharp edges, burrs, or projections.*
 - (E) The rungs of an individual rung ladder must not allow the climber's foot to slide off the end.*
- Figure 2 shows a suggested design.*

Figure 2. Suggested design for rungs on individual-rung ladders



- (b) Side rails. Side rails that might be used as a climbing aid must be of such cross sections as to afford adequate gripping surface without sharp edges, splinters, or burrs.*
 - (c) Fastenings. Fastenings must be an integral part of fixed ladder design.*
 - (d) Splices. All splices must meet design requirements noted in (2)(a) above. All splices and connections must have smooth transition with original members and no sharp or extensive projections.*
 - (e) Electrolytic action. Protect dissimilar metals from electrolytic action when they are joined.*
 - (f) Welding. All welding must be according to the "Code for Welding in Building Construction" (AWS D1.0-1966).*
 - (g) Protection from deterioration. Paint or treat metal ladders and attachments to resist corrosion and rusting when necessary. Ladders with individual metal rungs imbedded in concrete, that serve as access to pits and to other areas under floors, must have rungs with a minimum diameter of 1-inch or paint or treatment to resist corrosion and rusting.*
- (4) Clearance.*

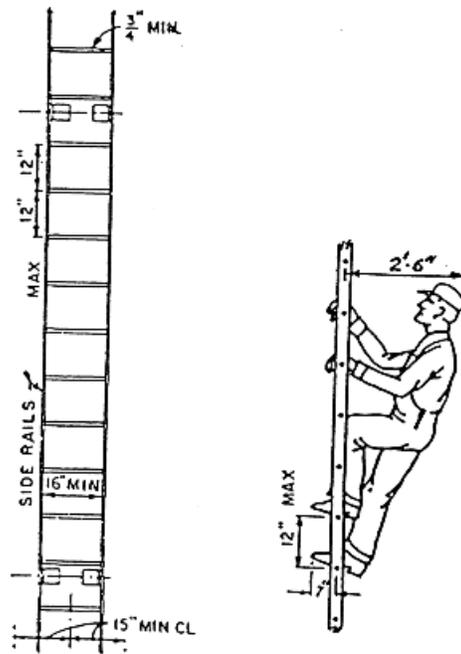


Figure 3. Rail Ladder With Bar Steel Rails and Round Steel Rungs

(a) Climbing side. On fixed ladders, the perpendicular distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder must be 36 inches for a pitch of 76 degrees, and 30 inches for a pitch of 90 degrees (Figure 3), with minimum clearances for intermediate pitches varying between these two limits in proportion to the slope, except as in (4)(c) and (e) below.

(b) Ladders without cages or wells. There must be a clear width of at least 15 inches each way from the centerline of the ladder in the climbing space, except when cages or wells are necessary.

(c) Ladders with cages or baskets. Subparagraphs (4)(a) and (b) above do not cover ladders with a cage or basket. They must conform to (5)(a)(E). Subparagraph (4)(a) above does not cover fixed ladders in smooth-walled wells. They must conform to (5)(a)(F).

(d) Clearance in back of ladder. The distance from the centerline of rungs, cleats, or steps to the nearest permanent object in back of the ladder must be not less than 7 inches, except that when there are unavoidable obstructions, there must be minimum clearances shown in Figure 4.

Minimum Ladder Clearances

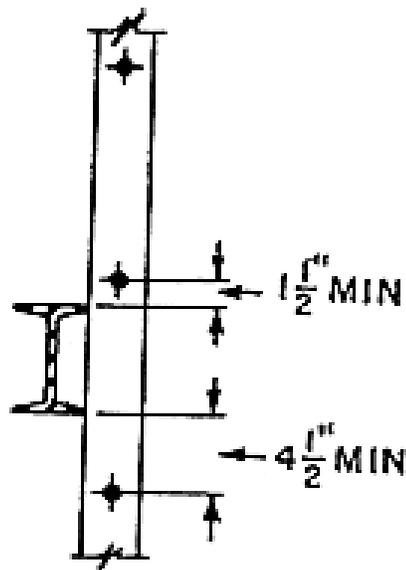


Figure 4. Clearance for Unavoidable Obstruction at Rear of Fixed Ladder

(e) *Clearance in back of grab bar.* The distance from the centerline of the grab bar to the nearest permanent object in back of the grab bars must be not less than 4 inches. Grab bars must not protrude on the climbing side beyond the rungs of the ladder that they serve.

(f) *Step-across distance.* The step-across distance from the nearest edge of the ladder to the nearest edge of equipment or structure must be not more than 12 inches, or less than 2 1/2 inches (Figure 5).

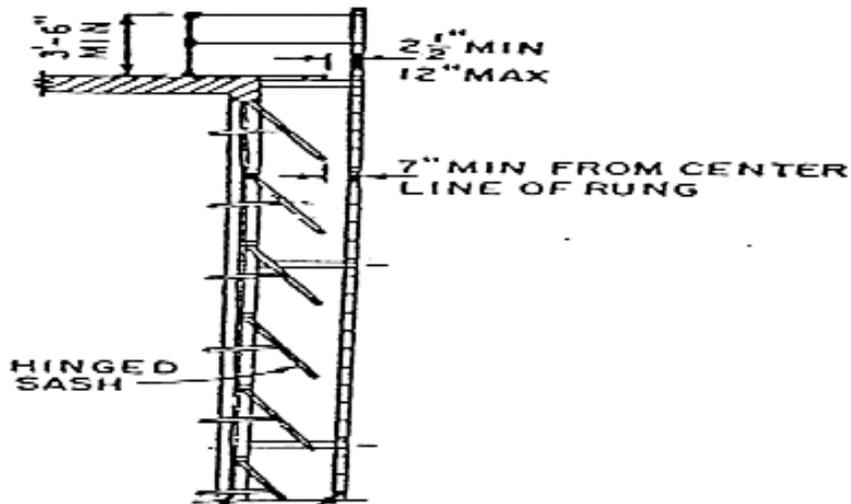


Figure 5. Ladder Far from Wall

(g) *Hatch cover.* Counterweighted hatch covers must open a minimum of 60° from the horizontal. The distance from the centerline of rungs or cleats to the edge of the hatch opening on the climbing side must be not less than 24 inches for offset wells or 30 inches for straight wells. There must be no protruding potential hazards within 24 inches of the centerline of rungs

or cleats; any such hazards within 30 inches of the centerline of the rungs or cleats must have deflector plates at an angle of 60 degrees from the horizontal as shown in Figure 6. The relationship of a fixed ladder to an acceptable counterweighted hatch cover is shown in Figure 7.

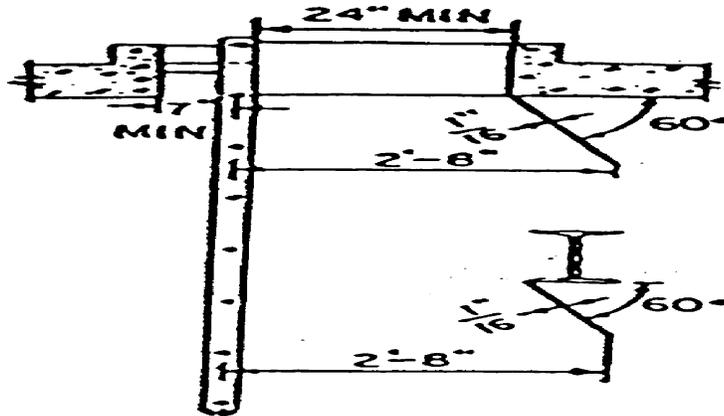
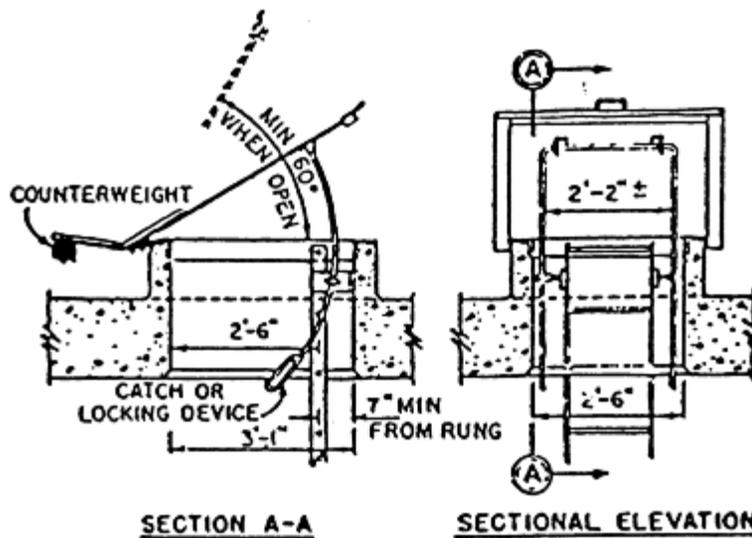


Figure 6. Deflector Plates for Head Hazards



Ladder to a Safe Access Hatch

(5) *Special requirements:*

(a) *Cages, Wells and Ladder Climbing Safety Systems:*

(A) *Cages, wells or ladder climbing safety systems must be on all ladders where the length of climb is more than 24 feet but not more than 50 feet or the top of the ladder is more than 24 feet above the ground or nearest lower landing surface.*

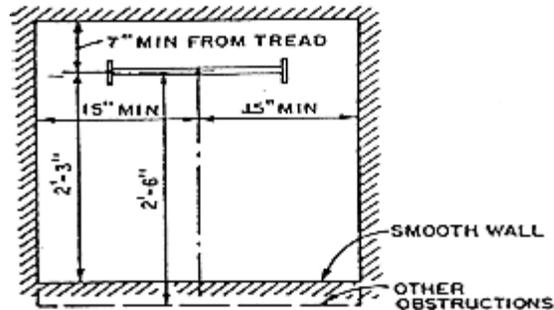
NOTE: Design specifications for cages and wells are in Figures 8, 9 and 10.

(B) *Ladders with a length of climb more than 50 feet must have a cage, well or climbing safety system and must meet one of the following two requirements:*

(i) *When using a cage or well the ladder must be in sections, horizontally offset, with rest platforms at least every 50 feet.*

~~(ii) When using a ladder climbing safety system the ladder must have rest platforms at least every 150 feet (except chimneys).~~

Figure 8. Clearance Diagram for Fixed Ladder in Well



~~(C) Cages must extend at least 42 inches above the top of the landing, unless there is other acceptable protection.~~

~~(D) Cages must extend down the ladder to a point not less than 7 feet nor more than 8 feet above the base of the ladder. The bottom must flare not less than 4 inches or the portion of the cage opposite the ladder must extend to the base.~~

~~(E) Cages must not extend less than 27 nor more than 28 inches from the center line of the rungs of the ladder. Cages must not be less than 27 inches in width. The inside must be clear of projections. Vertical bars must be at a maximum spacing of 40 degrees around the circumference of the cage; this will give a maximum spacing of approximately 9 1/2 inches, center-to-center.~~

~~(F) Ladder wells must have a clear width of at least 15 inches measured each way from the center line of the ladder. Smooth-walled wells must be a minimum of 27 inches from the center line of rungs to the well wall on the climbing side of the ladder. Where other obstructions on the climbing side of the ladder exist, there must be a minimum of 30 inches from the centerline of the rungs.~~

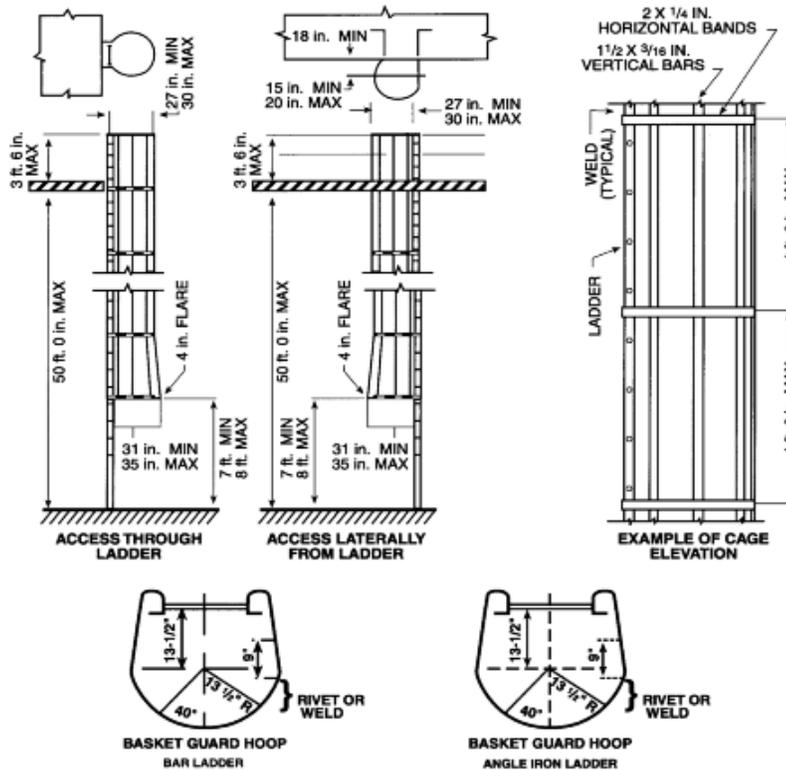


Figure 9. Cages for Ladders More Than 24 Feet High

Figure 10. Cages—Special Applications

(b) Landing platforms:

(A) Where a person has to step a distance more than 12 inches from the center line of the rung of a ladder to the nearest edge of a structure or equipment, there must be a landing platform. The minimum step-across distance is 2 1/2 inches.

(B) All landings must have standard railings and toeboards, that give safe access to the ladder. Platforms must be not less than 24 inches wide and 30 inches long.

(C) One rung of any section of ladder must be at the level of the landing laterally served by the ladder. Where access to the landing is through the ladder, the spacing from the landing platform to the first rung below the landing must be the same as the rung spacing on the ladder.

(c) Ladder extensions. The side rails of through or side step ladder extensions must extend 3 1/2 feet above parapets and landings. For through ladder extensions, omit the rungs from the extension. There must be not less than 18 nor more than 24 inches clearance between rails. For side step or offset fixed ladder sections, at landings, the side rails and rungs must extend to the next regular rung beyond or above the 3 1/2-foot minimum (Figure 11).

(d) Grab bars. Space grab bars by a continuation of the rung spacing when they are horizontal. Vertical grab bars must have the same spacing as the ladder side rails. Grab bar diameters must be the equivalent of the round rung diameters.

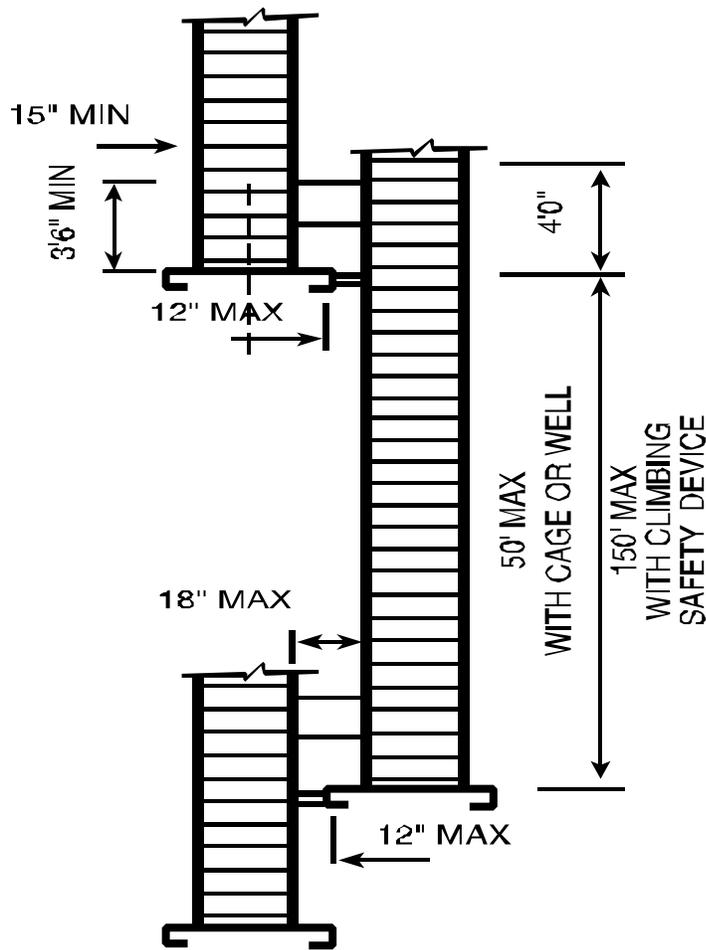


Figure 11. Offset Fixed Ladder Sections

(6) *Pitch.*

(a) *Preferred pitch.* The preferred pitch of fixed ladders is between 75 degrees and 90 degrees with the horizontal (Figure 12).

(b) *Substandard pitch.* Fixed ladders are substandard if they are between 60 degrees and 75 degrees with the horizontal. Substandard fixed ladders are allowed only where necessary to meet conditions of installation.

(c) *Scope of coverage in this section.* This section covers only fixed ladders between 60 degrees and 90 degrees with the horizontal.

(d) *Pitch more than 90 degrees.* No ladder may be more than 90 degrees with the horizontal.

(7) *Maintenance.* All ladders must be in safe condition. Inspect ladders at intervals determined by use and exposure.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 10-1999, f. 9/10/99, ef. 9/10/99.]

[437-002-0028 *Guardrails and Toeboards.* Guardrails and toeboards shall be installed on all open sides and ends of platforms more than 10 feet above the ground or floor.

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: ~~OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.]~~

~~[437-002-0030 Floors.~~

~~(1) Floors, floor supports, and required appurtenances shall be well maintained and kept in good repair. Defects should be remedied as soon as observed. Unless repaired immediately, hazardous floor openings and holes shall be fenced off or otherwise suitably guarded, and shall remain fenced off or guarded until properly repaired.~~

~~(2) Floors subject to slipping hazards due to conditions or processes of an operation or materials to which they will be exposed shall be of material and/or design which will effectively control slippery conditions.~~

~~Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: ~~OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.~~
~~OR-OSHA Admin. Order 6-1994, f. 9/30/94, ef. 9/30/94.]~~~~

~~[437-002-0031 Provisions for Window Cleaners.~~

~~(1) Every window so constructed that a worker must stand on the outside sill or ledge to clean the window and having a sill more than 10 feet above the ground or adjoining surface, shall have a sill at least 6 inches wide with a slope not greater than one to six, and shall have securely fastened at each side of the window, at a height not less than 42 inches or more than 51 inches, a safety anchorage to which may be fastened a window cleaner's safety belt. Such anchorage shall be of a metal having a corrosion resistance of 60 percent as compared to copper. The anchor shall be machined from bar stock or forged and heat-treated, and shall be capable of supporting a pull of 6,000 pounds without fracture applied in the direction which the anchor must withstand in service should a person fall.~~

~~(2) Anchor clearance shall be not less than 1 inch at either side and not less than 5 inches above or below the anchor.~~

~~(3) All anchors and anchor fastenings shall be provided with means to prevent them from turning, backing off or becoming loose.~~

~~(4) Anchor fittings having a single threaded section which is merely screwed into reinforcing plates are prohibited.~~

~~(5) Following are acceptable methods of installing anchors in various types of construction. Other methods, excepting those specifically prohibited, may be permitted, provided that they furnish at least the equivalent strength and safety:~~

~~(a) In wood construction, two through bolts of not less than 3/8-inch diameter shall pass through the entire window frame or mullion to secure each anchor, securely fastened by a washer and nut, the ends of bolts upset to prevent the nuts from loosening or being removed. The use of lag screws is specifically prohibited.~~

~~(b) In hollow metal frame construction, the anchor shall be attached by two 3/8-inch diameter bolts which shall pass through the face of the frame and through a 3/8-inch thick steel back-up plate, 3/4-inch wide extending from 5 inches above the upper bolt to 2 inches below the lower one. Bolts shall be secured by means of nuts and lock washers or equivalent means. If impractical to provide nuts and lock washers, the reinforcing plate may be tapped to receive the 3/8-inch bolts, which must pass completely through the plate and be secured with lock washers.~~

~~If the threaded bolt is an integral part of the anchor, it shall be at least 1/2-inch in diameter and be secured by a nut and lock washer or equivalent means. All screws or bolts used shall have the threads terminate far enough from the head to prevent weakening due to undercutting. In either solid or hollow aluminum frames, the reinforcing plate and bolts shall be heavily coated with a bituminous paint, and a plastic gasket shall be placed between the anchor and the aluminum metal as a means of preventing electrolytic action between unlike metals; or another acceptable means which will prevent such action may be used.~~

~~(c) In solid metal frame construction, anchors shall be attached by two 3/8-inch diameter bolts passed through the frame and secured by nuts and washers on the inside, ends of bolts upset. When this method cannot be used, it will be permissible to drill and tap the metal frame to a depth of at least 3/8-inch and install the anchor with at least two 3/8-inch screws, which shall have the threads terminate far enough from the head to prevent weakening due to undercutting. If the threaded bolt is an integral part of the anchor, it shall be at least 1/2-inch in diameter and be secured by a nut and lock washer, or equivalent means.~~

~~(d) In masonry construction, the anchor shall be either a single bolt at least 1/2-inch in diameter, or two 3/8-inch diameter bolts. Such bolt or bolts shall have a head on the inner end and shall be imbedded not less than 8 inches in solid masonry, or extend through the wall or mullion and be secured by a nut and lock washer or equivalent means. The use of masonry anchors consisting of flat metal embedded in mortar joints between brick or concrete blocks or stone is prohibited in new or existing buildings.~~

~~(6) Where sills are less than 6 inches wide, auxiliary or portable sills or other means providing equivalent safety may be permitted.~~

~~(7) Window cleaners' anchorages shall be inspected regularly and any defects found shall be remedied before workers are permitted to use them.~~

~~(8) For buildings constructed, remodeled or renovated on or after the adoption date of this rule the provisions of ANSI/ASME A39.1-1987 shall apply.~~

~~Stat. Auth.: ORS 654.025(2) and 656.726(4).~~

~~Stats. Implemented: ORS 654.001 through 654.295.~~

~~Hist: OR OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.]~~

437-002-0032 Ramps and Runways.

(1) Scope and application. This rule applies to the safe use of ramps and runways for vehicles in addition to the rules in Division 2/D. [Ramps and runways shall be substantially constructed, and shall be maintained in safe condition.]

(2) [Ramps and runways for vehicles shall have adequate width and evenness for safe operation of equipment and they shall be provided with timber guards of not less than nominal 6-inch by 6-inch material set on nominal 3-inch blocks, or the equivalent, placed parallel to and secured to the sides of the ramp or runway.] The employer must ensure ramps and runways for vehicles:

(a) Have adequate width and evenness for safe operation of equipment.

(b) Are provided with timber guards of not less than nominal 6-inch by 6-inch material set on nominal 3-inch blocks, or the equivalent, placed parallel to and secured to the sides of the ramp or runway.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.
OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

437-002-0033 Piers and Wharves.

(1) Scope and application. This rule applies to piers and wharves in addition to the rules in Division 2/D.

(2) The employer must ensure piers and wharves:

*(~~1~~)**a** With o~~o~~pen sides of piers and wharves, more than 4 feet above the ground or water level, ~~shall be provided with~~ **have** a shear or guard timber (bull rail) of not less than 6-inch by 6-inch wood material set on nominal 3-inch blocking, or material of equal strength and minimum height securely attached.*

*(~~1~~)**b** Except for areas where vessels' mooring lines are handled, the open sides, **more than 4 feet above the ground or water level**, not used for loading or unloading purposes, shall be provided with standard guardrails **in accordance with 1910.29(b)** in addition to shear timbers **in accordance with paragraph (2)(a) of this section.***

*(~~2~~)**c** Ladders or other means of access reaching from low water mark to the dock floor shall be provided for each 400 feet or portion thereof of the water side of all wharves and piers. Where portable ladders are used, a secure method of fastening them shall be provided.*

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.
OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

437-002-2021 Additional Oregon Definitions

(1) Scope and application. These definitions apply to Subdivision 2/D. Additional terms in 1910.21(b) also apply to Subdivision 2/D.

(2) Definitions.

Low-slope roof means a roof that has a slope less than or equal to a ratio of 2 in 12 (vertical to horizontal).

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

437-002-2027 Rope Descent & Rope Access Systems.

(1) Scope and application. This rule establishes safety requirements for rope descent and rope access. Rope descent and rope access systems can provide a safe way for employees to reach hard-to-reach locations, either natural or man-made. The requirements of this rule include, but are not limited to, the cleaning of buildings or structures, the inspection of dams and spillways, access to interior or exterior structural and architectural components of buildings, highway/bridge inspection and maintenance, powerplant penstocks and other difficult access areas.

(2) Definitions.

For the purposes of this rule the following definitions apply:

Access is the means of reaching a workspace of a work area.

Rope access means the use of rope access equipment where two ropes are used; one as the primary means of support and a second for fall arrest protection. The employee accesses the work area by ascending, descending, or traversing along both ropes by alternating connections and weight between the two ropes. Rope access may also be called industrial rope access but is not limited to industrial applications.

Rope descent system means a suspension system that allows an employee to descend in a controlled manner and, as needed, stop at any point during the descent. A rope descent system usually consists of a roof anchorage, support rope, a descent device, carabiner(s) or shackle(s), and a chair (seatboard). A rope descent system also is called controlled descent equipment or apparatus. Rope descent systems do not include industrial rope access systems.

(3) Personal Protective Equipment. The employer must ensure personal protective equipment is in accordance with Division 2/I when rope descent systems or rope access methods are used.

(4) Anchorages for Rope Descent and Rope Access Systems.

(a) Permanent Anchorages on Buildings.

(A) Before any rope descent or rope access system is used, the building owner must inform the employer, in writing that the building owner has identified, tested, certified, and maintained each permanent anchorage so it is capable of supporting at least 5,000 pounds (22.24kN), in any direction, for each employee attached. The information must be based on an annual inspection by a qualified person and certification of each anchorage by a qualified person, as necessary, and at least every 10 years.

(B) The employer must ensure that no employee uses any permanent anchorage before the employer has obtained written information from the building owner that each anchorage meets the requirements of 437-002-2027(4)(a)(A). The employer must keep the information for the duration of the job.

(C) The requirements of 437-002-2027(4)(a)(A) and (B) must be implemented no later than December 1, 2018.

(b) Temporary Anchorages. Anchorages for rope descent or rope access systems on structure or natural surroundings other than buildings must be independent from each other (primary support rope and secondary fall arrest system) and must be:

(A) Capable of supporting at least 5000 pounds (22.24 kN) for each employee attached: or

(B) Designed, installed, and used, under the supervision of a qualified person, as part of a complete system that maintains a safety factor of at least two.

(5) Rope descent systems. The employer must ensure:

(a) No rope descent system is used for heights greater than 300 feet (91 m) above grade unless the employer demonstrates that it is not feasible to access such heights by any other means or that those means pose a greater hazard than using a rope descent system;

(b) The rope descent system is used in accordance with instructions, warnings, and design limitations set by the manufacturer or under the direction of a qualified person;

(c) Each employee who uses the rope descent system is trained in accordance with 1910.30;

(d) The rope descent system is inspected at the start of each workshift that it is to be used. The employer must ensure damaged or defective equipment is removed from service immediately and replaced;

(e) The rope descent system has proper rigging, including anchorages and tiebacks, with particular emphasis on providing tiebacks when counterweights, cornice hooks, or similar non-permanent anchorages are used;

(f) Each employee uses a separate, independent personal fall arrest system that meets the requirements of 1910.140 in Division 2, Subdivision I;

(g) All components of each rope descent system, except seat boards, are capable of sustaining a minimum rated load of 5,000 pounds (22.2 kN). Seat boards must be capable of supporting a live load of 300 pounds (136 kg);

Note to 437-002-2027(5)(g): Oregon OSHA based this rule on federal OSHA's 1910.27(b)(2)(vii). Federal OSHA's discussion on final rule 1910.27(b)(2)(vii), as published on page 82577 of the Federal Register on November 18, 2016, states the following: "OSHA notes that the final rule does not preclude the use of lines or ropes that have knots, swage, or eye splice, which could reduce the tensile strength of a rope or line. However,

under final paragraph (b)(2)(vii), even if an employer uses a line or rope that has a knot, swage, or eye split, the rope or line still must be capable of supporting a minimum rated load of 5,000 pounds.”

(h) Prompt rescue of each employee is provided in the event of a fall, equipment malfunction or entanglement;

(i) The ropes of each rope descent system are effectively padded or otherwise protected, where they can contact edges of the building, anchorage, obstructions, or other surfaces, to prevent them from being cut or weakened;

(j) Stabilization is provided at the specific work location when descents are greater than 130 feet (39.6 m);

(k) No employee uses a rope descent system when hazardous weather conditions, such as storms or gusty or excessive wind, are present;

(l) Equipment, such as tools, squeegees, or buckets, is secured by a tool lanyard or similar method to prevent it from falling;

(m) The ropes of each rope descent system are protected from exposure to open flames, hot work, corrosive chemicals, and other destructive conditions;

(n) The ropes of each rope descent system are made from industrial synthetic fibers and classified as life-safety rope. Ropes made from natural fibers and polypropylene cannot be used for rope descent;

(o) Descent control devices include automatic locks that will engage and prevent an uncontrolled descent in case the employee lets go or loses control of the device;

(p) Anchorages for rope descent systems meet the requirements of 437-002-2027(4) of this rule; and

(q) A pre-work briefing is conducted with each employee involved in rope descent to include, but is not limited to:

(A) The objective(s) of the work to be performed.

(B) Site-specific hazards.

(C) Environmental conditions that could affect the safety of the employee using the system.

(D) Emergency procedures to be followed (e.g., employee rescue).

(6) Rope access systems.

(a) Exceptions. 437-002-2027(6) does not apply to:

(A) Emergency search and rescue operations.

(B) Entertainment performances and rehearsals. This exception does not apply to the set up, dismantling or operation of; stages, sound systems, lighting systems, pyrotechnics, associated supporting structures or props.

(C) Tree and shrub service activities covered by Division 2, Subdivision R.

(b) Written Rope Access Program. The employer must develop, implement and maintain a written Rope Access Program that includes, but not be limited to the following elements:

(A) Identification of a program administrator responsible for the overall rope access program.

(B) Methods of access and anchorage used by the employer.

(C) Listing of specific rope skills (i.e. ascending, descending, traversing, aid climbing, etc.) necessary to complete the work.

(D) Employee selection criteria.

(E) Equipment selection and inspection criteria.

(F) Roles and responsibilities of rope access team members.

(G) Communication systems.

(H) Employee training program.

(I) Rescue and emergency protocol.

(J) Identification of any unique site hazards that may affect the safety of employees using rope access equipment and methods.

(K) Pre-work briefings.

(c) Program Administration. The employer must ensure that the rope access program is administered by a program administrator knowledgeable in the elements of the written rope access program as required by subsection (6)(b) of this rule.

(d) Training and Evaluation. The employer must conduct training according to the requirements of 1910.30, and ensure:

(A) Employees who use rope access equipment and/or are engaged in rope access activities are trained and evaluated by persons with the qualifications and experience necessary to effectively instruct the employee in the proper fundamentals of rope access, equipment, and techniques described in subsection (6)(b) of this rule;

(B) Employees, prior to engaging in rope access activities, are trained in accordance with the written Rope Access Program, including applicable equipment, skills and rescue methods required of the work;

(C) Employees, prior to engaging in rope access activities, are evaluated by a hands-on demonstration by the employee of his/her skills;

(D) Employees, at a minimum, who perform rope access activities receive annual refresher training in accordance with 1910.30 and the written Rope Access Program;

(E) Employees, at a minimum, who perform rope access activities are annually re-evaluated (e.g., hands-on demonstration) of their ability to perform work in accordance with the written Rope Access Program;

(F) Employees who perform rope access are re-trained and re-evaluated before further engaging in rope access activities when the employer has reason to believe the employee does not have the understanding or skills required by 1910.30 and the written Rope Access Program. Additionally, when the employer has reason to believe the employee has violated a condition of the written Rope Access Program, the employee must be re-trained and re-evaluated. Re-training and re-evaluation under this subsection may be limited to the specific topics, concepts or skills which the employer believes, or the employee has demonstrated, are deficient;

(G) All training, re-training, evaluation and re-evaluation events are documented, and retained for three years; and

(H) Documentation of employee training, re-training, evaluation and re-evaluation include the following:

(i) Name of the employee;

(ii) Skills included in the training or evaluation;

(iii) Date(s) of the training or re-training;

(iv) Date(s) of the evaluation or re-evaluation;

(v) Identity of the person(s) performing the training or evaluation.

(e) Rope Access Use. When rope access is used, the employer must ensure:

(A) There are at least two rope access trained employees present at the physical location where rope access is being performed;

(B) No employee uses a rope access system when hazardous weather conditions, such as storms or excessive wind, are present;

(C) Anchorages for rope access systems meet the requirements of 437-002-2027(4) of this rule;

(D) Each employee using a rope access system 4 feet (1.2 m) or more above a lower level is protected from falling by a personal fall arrest system in compliance with 1910.140 in 2/l with the following exceptions to 1910.140:

- (i) **1910.140(c)(1) does not apply when aluminum carabiners meet the strength requirements of 1910.140(c)(8).**
- (ii) **1910.140(c)(10)(i) does not apply when carabiners are connected directly to rope meeting the requirements of 437-002-2027(6)(e)(E)(i) and (ii).**
- (iii) **1910.140(c)(10)(ii) does not apply during temporary rope transfer operations when carabiners are connected to each other lasting only long enough to complete the transfer and not as a part of the rigging for normal use.**
- (iv) **1910.140(c)(10)(iii) does not apply during temporary rope transfer operations when multiple carabiners are connected to a single D-ring lasting only long enough to complete the transfer and not as a part of the rigging for normal use.**

(E) Components used for rope access support, positioning, transfer and back-up (fall protection) must meet the following minimum requirements:

- (i) **Primary support ropes and secondary fall arrest ropes are made from industrial synthetic fibers and classified as life-safety rope. Ropes made from natural fibers or polypropylene cannot be used for rope access.**
- (ii) **Primary support ropes and secondary fall arrest ropes have a minimum rated breaking strength before being knotted, swaged or eye-spliced of 6,000 pounds (26.69 kN) as established by the rope manufacturer.**
- (iii) **Combination harnesses (designed and manufactured for rope access positioning and employee fall protection) are capable of sustaining a minimum rated load of 3,600 pounds (16.01 kN).**
- (iv) **Seat boards must be capable of supporting a live load of 300 pounds (136 kg).**
- (v) **Connectors must have an automatic locking feature and are capable of sustaining a minimum rated load of 5,000 pounds (22.24 kN).**
- (vi) **Descent control devices include automatic locks that will engage and prevent an uncontrolled descent in case the employee lets go or loses control of the device and are**

capable of sustaining a minimum rated load of 3,000 pounds (13.35 kN).

- (vii) Manufactured lanyards (cowstails) are capable of sustaining a minimum rated load of 5,000 pounds (22.24 kN) as established by the manufacturer.
- (viii) Job-made lanyards (cowstails), when constructed of rope, meet the requirements of 437-002-2027(6)(e)(E)(i) and (ii).
- (ix) Back-up devices (fall arrest) must be capable of sustaining a minimum rated load of 3,600 pounds (16.01 kN).
- (x) Auxiliary equipment designed to allow an employee to move along a line (rope) such as rope clamps, rope grabs, chest ascenders, foot ascender and hand ascenders must be capable of sustaining a minimum rated load of 1,000 pounds (4.49 kN).

(F) Rope access system components are used in accordance with instructions, warnings, and design limitations set by the manufacturer or under the direction of a qualified person;

(G) Rope access system components are inspected at the start of each workshift that it is to be used. The employer must ensure damaged or defective equipment is removed from service immediately and replaced;

(H) Prompt rescue of each employee is provided in the event of a fall, equipment malfunction or entanglement, or assure employees are able to rescue themselves;

(I) The ropes of each rope access system are effectively padded or otherwise protected, where they can contact edges of the building, anchorage, obstructions, structure, or other surfaces, to prevent them from being cut or weakened;

(J) The ropes of each rope access system are protected from exposure to open flames, hot work, corrosive chemicals, and other destructive conditions;

(K) Equipment, such as tools are secured by a tool lanyard or similar method to prevent it from falling where employees below are exposed to falling objects;

(L) A pre-work briefing is conducted with each employee involved in rope access to include, but is not limited to:

(i) The objective(s) of the work to be performed.

(ii) Site-specific hazards.

(iii) Environmental conditions that could affect the safety of the employee using the system.

(iv) Emergency procedures to be followed (e.g., employee rescue).

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

1910.21 Scope and definitions.

(a) Scope. This subdivision applies to all general industry workplaces. It covers all walking-working surfaces unless specifically excluded by an individual section of this subdivision.

(b) Definitions. The following definitions apply in this subdivision:

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

Anchorage means a secure point of attachment for equipment such as lifelines, lanyards, deceleration devices, and rope descent systems.

Authorized means an employee who the employer assigns to perform a specific type of duty, or allows in a specific location or area.

Cage means an enclosure mounted on the side rails of a fixed ladder or fastened to a structure behind the fixed ladder that is designed to surround the climbing space of the ladder. A cage also is called a "cage guard" or "basket guard."

Carrier means 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.

Combination ladder means a portable ladder that can be used as a stepladder, extension ladder, trestle ladder, or stairway ladder. The components of a combination ladder also may be used separately as a single ladder.

Dangerous equipment means 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 onto the equipment.

Designated area means a distinct portion of a walking-working surface delineated by a warning line in which employees may perform work without additional fall protection.

Dockboard means a portable or fixed device that spans a gap or compensates for a 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 means alternative designs, equipment, materials, or methods, that the employer can demonstrate will provide an equal or greater degree of safety for employees compared to the designs, equipment, materials, or methods specified in this subpart.

Extension ladder means a non-self supporting portable ladder that is adjustable in length.

Failure means 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.

Fall hazard means any condition on a walking-working surface that exposes an employee to a risk of harm from a fall on the same level or to a lower level.

Fall protection means any equipment, device, or system that prevents an employee from falling from an elevation or mitigates the effect of such a fall.

Fixed ladder means a ladder with rails or individual rungs that is permanently attached to a structure, building, or equipment. Fixed ladders include individual-rung ladders, but not ship stairs, step bolts, or manhole steps.

Grab bar means an individual horizontal or vertical handhold installed to provide access above the height of the ladder.

Guardrail system means a barrier erected along an unprotected or exposed side, edge, or other area of a walking-working surface to prevent employees from falling to a lower level.

Handrail means a rail used to provide employees with a handhold for support.

Hoist area means any elevated access opening to a walking-working surface through which equipment or materials are loaded or received.

Hole means a gap or open space in a floor, roof, horizontal walking-working surface, or similar surface that is at least 2 inches (5 cm) in its least dimension.

Individual-rung ladder means a ladder that has rungs individually attached to a building or structure. An individual-rung ladder does not include manhole steps.

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

Ladder safety system means a system designed to eliminate or reduce the possibility of falling from a ladder. A ladder safety system usually consists of a

carrier, safety sleeve, lanyard, connectors, and body harness. Cages and wells are not ladder safety systems.

Low-slope roof means a roof that has a slope less than or equal to a ratio of 4 in 12 (vertical to horizontal).

Note: Oregon OSHA did not adopt the federal OSHA definition of Low-slope roof. Instead, see the definition of Low-slope roof in OAR 437-002-2021(2) Additional Oregon Definitions.

Lower level means a surface or area to which an employee could fall. Such surfaces or areas include, but are not limited to, ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, materials, water, equipment, and similar surfaces and structures, or portions thereof.

Manhole steps means steps that are individually attached to, or set into, the wall of a manhole structure.

Maximum intended load means the total load (weight and force) of all employees, equipment, vehicles, tools, materials, and other loads the employer reasonably anticipates to be applied to a walking-working surface at any one time.

Mobile means manually propelled or moveable.

Mobile ladder stand (ladder stand) means a mobile, fixed-height, self-supporting ladder that usually consists of wheels or casters on a rigid base and steps leading to a top step. A mobile ladder stand also may have handrails and is designed for use by one employee at a time.

Mobile ladder stand platform means a mobile, fixed-height, self-supporting unit having one or more standing platforms that are provided with means of access or egress.

Open riser means the gap or space between treads of stairways that do not have upright or inclined members (risers).

Opening means a gap or open space in a wall, partition, vertical walking-working surface, or similar surface that is at least 30 inches (76 cm) high and at least 18 inches (46 cm) wide, through which an employee can fall to a lower level.

Personal fall arrest system means a system used to arrest an employee in a fall from a walking-working surface. It consists of a body harness, anchorage, and connector. The means of connection may include a lanyard, deceleration device, lifeline, or a suitable combination of these.

Personal fall protection system means a system (including all components) an employer uses to provide protection from falling or to safely arrest an employee's fall if one occurs. Examples of personal fall protection systems include personal fall arrest systems, positioning systems, and travel restraint systems.

Platform means a walking-working surface that is elevated above the surrounding area.

Portable ladder means a ladder that can readily be moved or carried, and usually consists of side rails joined at intervals by steps, rungs, or cleats.

Positioning system (work-positioning system) means 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 also are called “positioning system devices” and “work-positioning equipment.”

Qualified describes 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 matter, the work, or the project.

Ramp means an inclined walking-working surface used to access another level.

Riser means the upright (vertical) or inclined member of a stair that is located at the back of a stair tread or platform and connects close to the front edge of the next higher tread, platform, or landing.

Rope descent system means a suspension system that allows an employee to descend in a controlled manner and, as needed, stop at any point during the descent. A rope descent system usually consists of a roof anchorage, support rope, a descent device, carabiner(s) or shackle(s), and a chair (seatboard). A rope descent system also is called controlled descent equipment or apparatus. Rope descent systems do not include industrial rope access systems.

Rung, step, or cleat means the crosspiece of a ladder on which an employee steps to climb up and down.

Runway means an elevated walking-working surface, such as a catwalk, a foot walk along shafting, or an elevated walkway between buildings.

Scaffold means any temporary elevated or suspended platform and its supporting structure, including anchorage points, used to support employees, equipment, materials, and other items. For purposes of this subpart, a scaffold does not include a crane-suspended or derrick-suspended personnel platform or a rope descent system.

Ship stair (ship ladder) means a stairway that is equipped with treads, stair rails, and open risers, and has a slope that is between 50 and 70 degrees from the horizontal.

Side-step ladder means a type of fixed ladder that requires an employee to step sideways from it in order to reach a walking-working surface, such as a landing.

Spiral stairs means a series of treads attached to a vertical pole in a winding fashion, usually within a cylindrical space.

Stair rail or stair rail system means a barrier erected along the exposed or open side of stairways to prevent employees from falling to a lower level.

Stairway (stairs) means risers and treads that connect one level with another, and includes any landings and platforms in between those levels. Stairways include standard, spiral, alternating tread-type, and ship stairs.

Standard stairs means a fixed or permanently installed stairway. Ship, spiral, and alternating tread-type stairs are not considered standard stairs.

Step bolt (pole step) means a bolt or rung attached at intervals along a structural member used for foot placement and as a handhold when climbing or standing.

Stepladder means a self-supporting, portable ladder that has a fixed height, flat steps, and a hinged back.

Stepstool means a self-supporting, portable ladder that has flat steps and side rails. For purposes of the final rule, stepstool includes only those ladders that have a fixed height, do not have a pail shelf, and do not exceed 32 inches (81 cm) in overall height to the top cap, although side rails may extend above the top cap. A stepstool is designed so an employee can climb and stand on all of the steps and the top cap.

Through ladder means a type of fixed ladder that allows the employee to step through the side rails at the top of the ladder to reach a walking-working surface, such as a landing.

Tieback means an attachment between an anchorage (e.g., structural member) and a supporting device (e.g., parapet clamp or cornice hook).

Toeboard means a low protective barrier that is designed to prevent materials, tools, and equipment from falling to a lower level, and protect employees from falling.

Travel restraint system means a combination of an anchorage, anchorage connector, lanyard (or other means of connection), and body support that an employer uses to eliminate the possibility of an employee going over the edge of a walking-working surface.

Tread means a horizontal member of a stair or stairway, but does not include landings or platforms.

Unprotected sides and edges mean 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 an employee from falling to a lower level.

Walking-working surface means any horizontal or vertical surface on or through which an employee walks, works, or gains access to a work area or workplace location.

Warning line means a barrier erected to warn employees that they are approaching an unprotected side or edge, and which designates an area in which work may take place without the use of other means of fall protection.

Well means a permanent, complete enclosure around a fixed ladder.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

1910.22 General requirements.

(a) Surface conditions. The employer must ensure:

(1) All places of employment, passageways, storerooms, service rooms, and walking-working surfaces are kept in a clean, orderly, and sanitary condition.

(2) The floor of each workroom is maintained in a clean and, to the extent feasible, in a dry condition. When wet processes are used, drainage must be maintained and, to the extent feasible, dry standing places, such as false floors, platforms, and mats must be provided.

(3) Walking-working surfaces are maintained free of hazards such as sharp or protruding objects, loose boards, corrosion, leaks, spills, snow, and ice.

(b) Loads. The employer must ensure that each walking-working surface can support the maximum intended load for that surface.

(c) Access and egress. The employer must provide, and ensure each employee uses, a safe means of access and egress to and from walking-working surfaces.

(d) Inspection, maintenance, and repair. The employer must ensure:

(1) Walking-working surfaces are inspected, regularly and as necessary, and maintained in a safe condition;

(2) Hazardous conditions on walking-working surfaces are corrected or repaired before an employee uses the walking-working surface again. If the correction or repair cannot be made immediately, the hazard must be guarded to prevent employees from using the walking-working surface until the hazard is corrected or repaired; and

(3) When any correction or repair involves the structural integrity of the walking-working surface, a qualified person performs or supervises the correction or repair.

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

1910.23 Ladders.

(a) Application. The employer must ensure that each ladder used meets the requirements of this section. This section covers all ladders, except when the ladder is:

- (1) Used in emergency operations such as firefighting, rescue, and tactical law enforcement operations, or training for these operations; or
- (2) Designed into or is an integral part of machines or equipment.

(b) General requirements for all ladders. The employer must ensure:

- (1) Ladder rungs, steps, and cleats are parallel, level, and uniformly spaced when the ladder is in position for use;
- (2) Ladder rungs, steps, and cleats are spaced not less than 10 inches (25 cm) and not more than 14 inches (36 cm) apart, as measured between the centerlines of the rungs, cleats, and steps, except that:
 - (i) Ladder rungs and steps in elevator shafts must be spaced not less than 6 inches (15 cm) apart and not more than 16.5 inches (42 cm) apart, as measured along the ladder side rails; and
 - (ii) Fixed ladder rungs and steps on telecommunication towers must be spaced not more than 18 inches (46 cm) apart, measured between the centerlines of the rungs or steps;
- (3) Steps on stepstools are spaced not less than 8 inches (20 cm) apart and not more than 12 inches (30 cm) apart, as measured between the centerlines of the steps;
- (4) Ladder rungs, steps, and cleats have a minimum clear width of 11.5 inches (29 cm) on portable ladders and 16 inches (41 cm) (measured before installation of ladder safety systems) for fixed ladders, except that:
 - (i) The minimum clear width does not apply to 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;
 - (ii) Rungs and steps of manhole entry ladders that are supported by the manhole opening must have a minimum clear width of 9 inches (23 cm);
 - (iii) Rungs and steps on rolling ladders used in telecommunication centers must have a minimum clear width of 8 inches (20 cm); and

(iv) Stepstools have a minimum clear width of 10.5 inches (26.7 cm);

(5) Wooden ladders are not coated with any material that may obscure structural defects;

(6) Metal ladders are made with corrosion-resistant material or protected against corrosion;

(7) Ladder surfaces are free of puncture and laceration hazards;

(8) Ladders are used only for the purposes for which they were designed;

(9) Ladders are inspected before initial use in each work shift, and more frequently as necessary, to identify any visible defects that could cause employee injury;

(10) Any ladder with structural or other defects is immediately tagged "Dangerous: Do Not Use" or with similar language in accordance with § 1910.145 and removed from service until repaired in accordance with § 1910.22(d), or replaced;

(11) Each employee faces the ladder when climbing up or down it;

(12) Each employee uses at least one hand to grasp the ladder when climbing up and down it; and

(13) No employee carries any object or load that could cause the employee to lose balance and fall while climbing up or down the ladder.

(c) Portable ladders. The employer must ensure:

(1) Rungs and steps of portable metal ladders are corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize the possibility of slipping;

~~(2) Each stepladder or combination ladder used in a stepladder mode is equipped with a metal spreader or locking device that securely holds the front and back sections in an open position while the ladder is in use;~~

Note: Oregon OSHA did not adopt 1910.23(c)(2). Instead, see OAR 437-002-0026(4)(a).

(3) Ladders are not loaded beyond the maximum intended load;

Note to paragraph (c)(3): The maximum intended load, as defined in § 1910.21(b), includes the total load (weight and force) of the employee and all tools, equipment, and materials being carried.

(4) Ladders are used only on stable and level surfaces unless they are secured or stabilized to prevent accidental displacement;

(5) No portable single rail ladders are used;

(6) No ladder is moved, shifted, or extended while an employee is on it;

(7) Ladders placed in locations such as passageways, doorways, or driveways where they can be displaced by other activities or traffic;

(i) Are secured to prevent accidental displacement; or

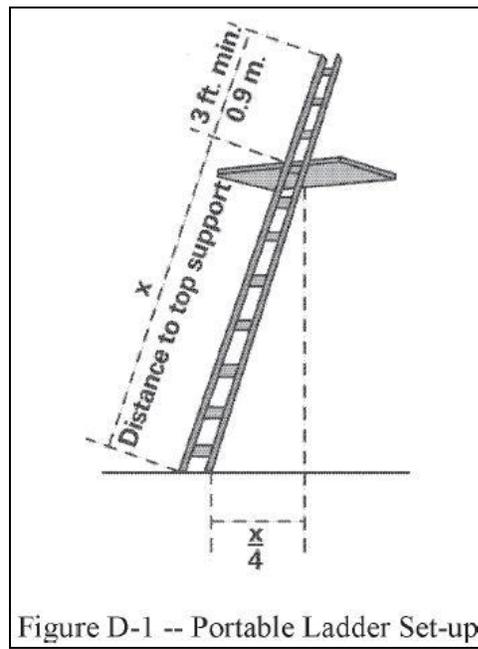
(ii) Are guarded by a temporary barricade, such as a row of traffic cones or caution tape, to keep the activities or traffic away from the ladder;

(8) The cap (if equipped) and top step of a stepladder are not used as steps;

(9) Portable ladders used on slippery surfaces are secured and stabilized;

(10) The top of a non-self-supporting ladder is placed so that both side rails are supported, unless the ladder is equipped with a single support attachment;

(11) Portable ladders used to gain access to an upper landing surface have side rails that extend at least 3 feet (0.9 m) above the upper landing surface (see Figure D-1 of this section);

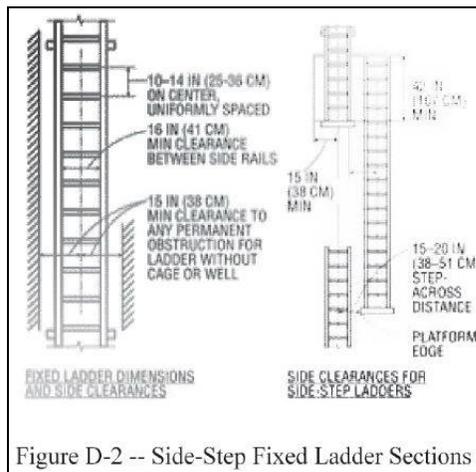


(12) Ladders and ladder sections are not tied or fastened together to provide added length unless they are specifically designed for such use;

(13) Ladders are not placed on boxes, barrels, or other unstable bases to obtain additional height.

(d) Fixed ladders. The employer must ensure:

- (1) Fixed ladders are capable of supporting their maximum intended load;**
- (2) The minimum perpendicular distance from the centerline of the steps or rungs, or grab bars, or both, to the nearest permanent object in back of the ladder is 7 inches (18 cm), except for elevator pit ladders, which have a minimum perpendicular distance of 4.5 inches (11 cm);**
- (3) Grab bars do not protrude on the climbing side beyond the rungs of the ladder that they serve;**
- (4) The side rails of through or sidestep ladders extend 42 inches (1.1 m) above the top of the access level or landing platform served by the ladder. For parapet ladders, the access level is:**
- (i) The roof, if the parapet is cut to permit passage through the parapet; or**
 - (ii) The top of the parapet, if the parapet is continuous;**
- (5) For through ladders, the steps or rungs are omitted from the extensions, and the side rails are flared to provide not less than 24 inches (61cm) and not more than 30 inches (76 cm) of clearance. When a ladder safety system is provided, the maximum clearance between side rails of the extension must not exceed 36 inches (91 cm);**
- (6) For side-step ladders, the side rails, rungs, and steps must be continuous in the extension (see Figure D-2 of this section);**

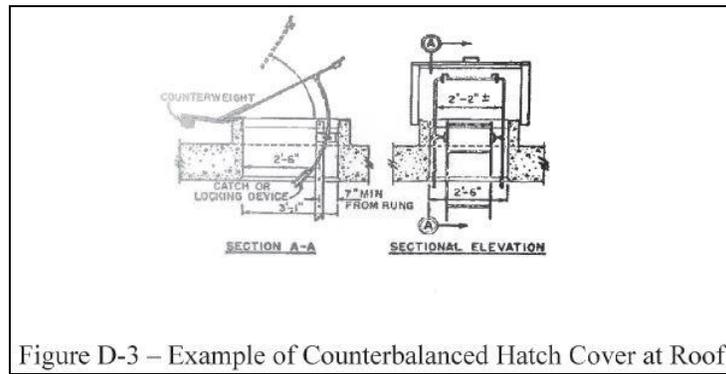


- (7) Grab bars extend 42 inches (1.1 m) above the access level or landing platforms served by the ladder;**
- (8) The minimum size (cross-section) of grab bars is the same size as the rungs of the ladder.**

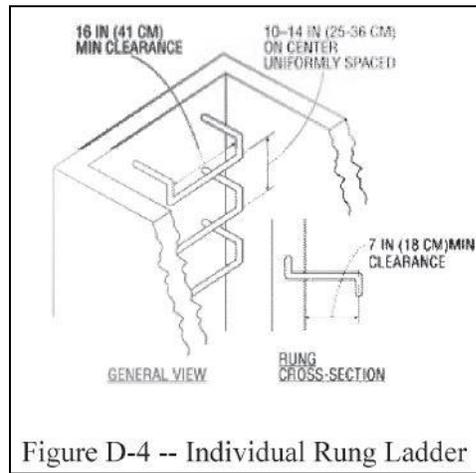
(9) When a fixed ladder terminates at a hatch (see Figure D-3 of this section), the hatch cover:

(i) Opens with sufficient clearance to provide easy access to or from the ladder; and

(ii) Opens at least 70 degrees from horizontal if the hatch is counterbalanced;



(10) Individual-rung ladders are constructed to prevent the employee's feet from sliding off the ends of the rungs (see Figure D-4 of this section);



(11) Fixed ladders having a pitch greater than 90 degrees from the horizontal are not used;

(12) The step-across distance from the centerline of the rungs or steps is:

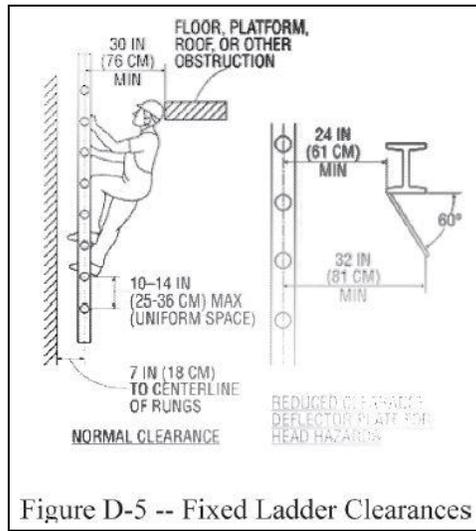
(i) For through ladders, not less than 7 inches (18 cm) and not more than 12 inches (30 cm) to the nearest edge of the structure, building, or equipment accessed from the ladders;

(ii) For side-step ladders, not less than 15 inches (38 cm) and not more than 20 inches (51 cm) to the access points of the platform edge;

(13) Fixed ladders that do not have cages or wells have:

(i) A clear width of at least 15 inches (38 cm) on each side of the ladder centerline to the nearest permanent object; and

(ii) A minimum perpendicular distance of 30 inches (76 cm) from the centerline of the steps or rungs to the nearest object on the climbing side. When unavoidable obstructions are encountered, the minimum clearance at the obstruction may be reduced to 24 inches (61 cm), provided deflector plates are installed (see Figure D-5 of this section).



Note to paragraph (d): Section 1910.28 establishes the employer's duty to provide fall protection for employees on fixed ladders, and § 1910.29 specifies the criteria for fall protection systems for fixed ladders.

(e) Mobile ladder stands and mobile ladder stand platforms

(1) General requirements. The employer must ensure:

(i) Mobile ladder stands and platforms have a step width of at least 16 inches (41 cm);

(ii) The steps and platforms of mobile ladder stands and platforms are slip resistant. Slip-resistant surfaces must be either an integral part of the design and construction of the mobile ladder stand and platform, or provided as a secondary process or operation, such as dimpling, knurling, shotblasting, coating, spraying, or applying durable slip-resistant tapes;

(iii) Mobile ladder stands and platforms are capable of supporting at least four times their maximum intended load;

(iv) Wheels or casters under load are capable of supporting their proportional share of four times the maximum intended load, plus their proportional share of the unit's weight;

(v) Unless otherwise specified in this section, mobile ladder stands and platforms with a top step height of 4 feet (1.2 m) or above have handrails with a vertical height of 29.5 inches (75 cm) to 37 inches (94 cm), measured from the front edge of a step. Removable gates or non-rigid members, such as chains, may be used instead of handrails in special use applications;

(vi) The maximum work-surface height of mobile ladder stands and platforms does not exceed four times the shortest base dimension, without additional support. For greater heights, outriggers, counterweights, or comparable means that stabilize the mobile ladder stands and platforms and prevent overturning must be used;

(vii) Mobile ladder stands and platforms that have wheels or casters are equipped with a system to impede horizontal movement when an employee is on the stand or platform; and

(viii) No mobile ladder stand or platform moves when an employee is on it.

(2) Design requirements for mobile ladder stands. The employer must ensure:

(i) Steps are uniformly spaced and arranged, with a rise of not more than 10 inches (25 cm) and a depth of not less than 7 inches (18 cm). The slope of the step stringer to which the steps are attached must not be more than 60 degrees, measured from the horizontal;

(ii) Mobile ladder stands with a top step height above 10 feet (3 m) have the top step protected on three sides by a handrail with a vertical height of at least 36 inches (91 cm); and top steps that are 20 inches (51 cm) or more, front to back, have a midrail and toeboard. Removable gates or non-rigid members, such as chains, may be used instead of handrails in special-use applications; and

(iii) The standing area of mobile ladder stands is within the base frame.

(3) Design requirements for mobile ladder stand platforms. The employer must ensure:

(i) Steps of mobile ladder stand platforms meet the requirements of paragraph (e)(2)(i) of this section. When the employer demonstrates that the requirement is not feasible, steeper slopes or vertical rung ladders may be used, provided the units are stabilized to prevent overturning;

(ii) Mobile ladder stand platforms with a platform height of 4 to 10 feet (1.2 m to 3 m) have, in the platform area, handrails with a vertical height of at least 36 inches (91 cm) and midrails; and

(iii) All ladder stand platforms with a platform height above 10 feet (3 m) have guardrails and toeboards on the exposed sides and ends of the platform.

(iv) Removable gates or non-rigid members, such as chains, may be used on mobile ladder stand platforms instead of handrails and guardrails in special-use applications.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

1910.24 Step bolts and manhole steps.

(a) Step bolts. The employer must ensure.

(1) Each step bolt installed on or after January 17, 2017 in an environment where corrosion may occur is constructed of, or coated with, material that protects against corrosion;

Note to 1910.24(a)(1): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(2)(a), the Oregon delayed effective date is January 1, 2018.

(2) Each step bolt is designed, constructed, and maintained to prevent the employee's foot from slipping off the end of the step bolt;

(3) Step bolts are uniformly spaced at a vertical distance of not less than 12 inches (30 cm) and not more than 18 inches (46 cm) apart, measured center to center (see Figure D-6 of this section). The spacing from the entry and exit surface to the first step bolt may differ from the spacing between the other step bolts;

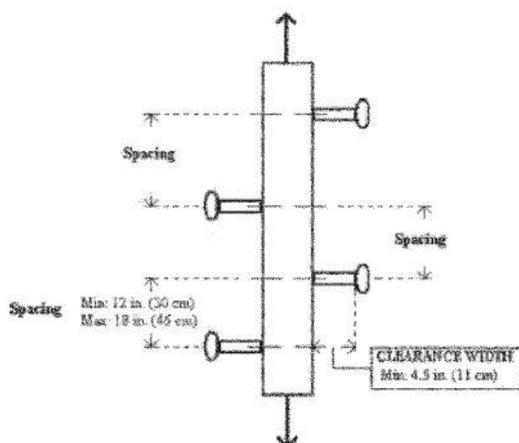


Figure D-6 -- Step Bolt Spacing

(4) Each step bolt has a minimum clear width of 4.5 inches (11 cm);

(5) The minimum perpendicular distance between the centerline of each step bolt to the nearest permanent object in back of the step bolt is 7 inches (18 cm). When the employer demonstrates that an obstruction cannot be avoided, the distance must be at least 4.5 inches (11 cm);

(6) Each step bolt installed before January 17, 2017 is capable of supporting its maximum intended load;

Note to 1910.24(a)(6): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(2)(b), the Oregon delayed effective date is January 1, 2018.

(7) Each step bolt installed on or after January 17, 2017 is capable of supporting at least four times its maximum intended load;

Note to 1910.24(a)(7): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(2)(c), the Oregon delayed effective date is January 1, 2018.

(8) Each step bolt is inspected at the start of the workshift and maintained in accordance with § 1910.22; and

(9) Any step bolt that is bent more than 15 degrees from the perpendicular in any direction is removed and replaced with a step bolt that meets the requirements of this section before an employee uses it.

(b) Manhole steps.

(1) The employer must ensure that each manhole step is capable of supporting its maximum intended load.

(2) The employer must ensure that each manhole step installed on or after January 17, 2017:

Note to 1910.24(b)(2): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(2)(d), the Oregon delayed effective date is January 1, 2018.

(i) Has a corrugated, knurled, dimpled, or other surface that minimizes the possibility of an employee slipping;

(ii) Is constructed of, or coated with, material that protects against corrosion if the manhole step is located in an environment where corrosion may occur;

(iii) Has a minimum clear step width of 10 inches (25 cm);

(iv) Is uniformly spaced at a vertical distance not more than 16 inches (41cm) apart, measured center to center between steps. The spacing from the entry and exit surface to the first manhole step may differ from the spacing between the other steps.

(v) Has a minimum perpendicular distance between the centerline of the manhole step to the nearest permanent object in back of the step of at least 4.5 inches (11 cm); and

(vi) Is designed, constructed, and maintained to prevent the employee's foot from slipping or sliding off the end.

(3) The employer must ensure that each manhole step is inspected at the start of the work shift and maintained in accordance with § 1910.22.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

1910.25 Stairways.

(a) Application. This section covers all stairways (including standard, spiral, ship, and alternating tread-type stairs), except for stairs serving floating roof tanks, stairs on scaffolds, stairs designed into machines or equipment, and stairs on self-propelled motorized equipment.

(b) General requirements. The employer must ensure:

(1) Handrails, stair rail systems, and guardrail systems are provided in accordance with § 1910.28;

(2) Vertical clearance above any stair tread to any overhead obstruction is at least 6 feet, 8 inches (203 cm), as measured from the leading edge of the tread. Spiral stairs must meet the vertical clearance requirements in paragraph (d)(3) of this section.

(3) Stairs have uniform riser heights and tread depths between landings;

(4) Stairway landings and platforms are at least the width of the stair and at least 30 inches (76 cm) in depth, as measured in the direction of travel;

(5) When a door or a gate opens directly on a stairway, a platform is provided, and the swing of the door or gate does not reduce the platform's effective usable depth to:

(i) Less than 20 inches (51 cm) for platforms installed before January 17, 2017; and

Note to 1910.25(b)(5)(i): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(3)(a), the Oregon delayed effective date is January 1, 2018.

(ii) Less than 22 inches (56 cm) for platforms installed on or after January 17, 2017 (see Figure D-7 of this section);

Note to 1910.25(b)(5)(ii): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(3)(b), the Oregon delayed effective date is January 1, 2018.

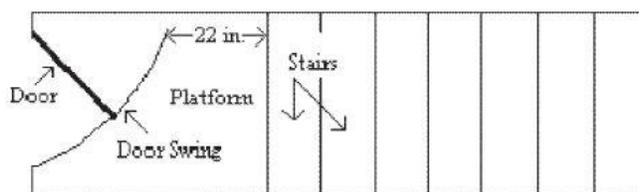


Figure D-7 -- Door or Gate Opening on Stairway

(6) Each stair can support at least five times the normal anticipated live load, but never less than a concentrated load of 1,000 pounds (454 kg) applied at any point;

(7) Standard stairs are used to provide access from one walking-working surface to another when operations necessitate regular and routine travel between levels, including access to operating platforms for equipment. Winding stairways may be used on tanks and similar round structures when the diameter of the tank or structure is at least 5 feet (1.5 m).

(8) Spiral, ship, or alternating tread-type stairs are used only when the employer can demonstrate that it is not feasible to provide standard stairs.

(9) When paragraph (b)(8) of this section allows the use of spiral, ship, or alternating tread-type stairs, they are installed, used, and maintained in accordance with manufacturer's instructions.

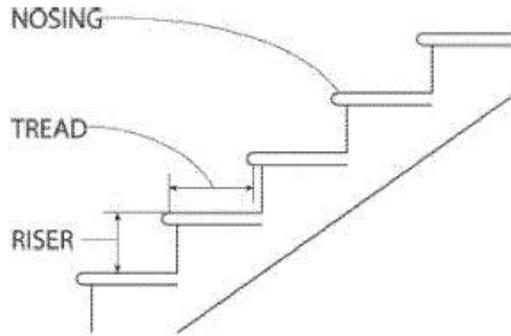
(c) Standard stairs. In addition to paragraph (b) of this section, the employer must ensure standard stairs:

(1) Are installed at angles between 30 to 50 degrees from the horizontal;

(2) Have a maximum riser height of 9.5 inches (24 cm);

(3) Have a minimum tread depth of 9.5 inches (24 cm); and

(4) Have a minimum width of 22 inches (56 cm) between vertical barriers (see Figure D-8 of this section).



MINIMUM TREAD WIDTH 22 IN (56 CM)
 MINIMUM TREAD DEPTH 9.5 IN (24 CM)
 MAXIMUM RISER HEIGHT 9.5 IN (24 CM)

(5) Exception to paragraphs (c)(2) and (3) of this section. The requirements of paragraphs (c)(2) and (3) do not apply to standard stairs installed prior to January 17, 2017. OSHA will deem those stairs in compliance if they meet the dimension requirements specified in Table D-1 of this section or they use a combination that achieves the angle requirements of paragraph (c)(1) of this section.

Note to 1910.25(c)(5): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(3)(c), the Oregon delayed effective date is January 1, 2018.

Table D-1-- Stairway Rise and Tread Dimensions

Angle to horizontal	Rise (in inches)	Tread run (in inches)
30 deg. 35'	6 1/2	11
32 deg. 08'	6 3/4	10 3/4
33 deg. 41'	7	10 1/2
35 deg. 16'	7 1/4	10 1/4
36 deg. 52'	7 1/2	10
38 deg. 29'	7 3/4	9 3/4
40 deg. 08'	8	9 1/2
41 deg. 44'	8 1/4	9 1/4
43 deg. 22'	8 1/2	9
45 deg. 00'	8 3/4	8 3/4
46 deg. 38'	9	8 1/2
48 deg. 16'	9 1/4	8 1/4
49 deg. 54'	9 1/2	8

(d) Spiral stairs. In addition to paragraph (b) of this section, the employer must ensure spiral stairs:

- (1) Have a minimum clear width of 26 inches (66 cm);**
- (2) Have a maximum riser height of 9.5 inches (24 cm);**

(3) Have a minimum headroom above spiral stair treads of at least 6 feet, 6 inches (2 m), measured from the leading edge of the tread;

(4) Have a minimum tread depth of 7.5 inches (19 cm), measured at a point 12 inches (30 cm) from the narrower edge;

(5) Have a uniform tread size;

(e) Ship stairs. In addition to paragraph (b) of this section, the employer must ensure ship stairs (see Figure D-9 of this section):

(1) Are installed at a slope of 50 to 70 degrees from the horizontal;

(2) Have open risers with a vertical rise between tread surfaces of 6.5 to 12 inches (17 to 30 cm);

(3) Have minimum tread depth of 4 inches (10 cm); and

(4) Have a minimum tread width of 18 inches (46 cm).

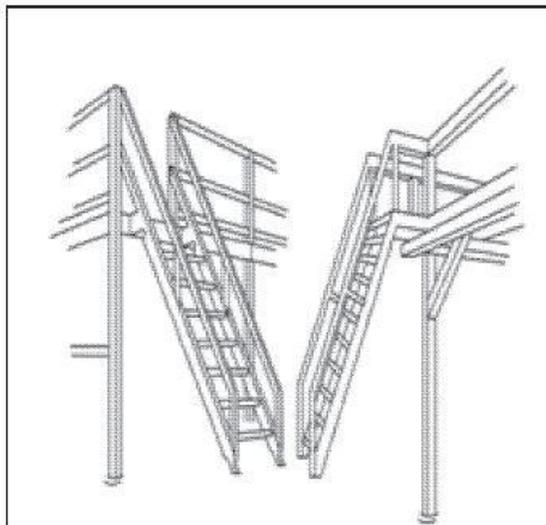


Figure D-9 – Ship Stairs

(f) Alternating tread-type stairs. In addition to paragraph (b) of this section, the employer must ensure alternating tread-type stairs:

(1) Have a series of treads installed at a slope of 50 to 70 degrees from the horizontal;

(2) Have a distance between handrails of 17 to 24 inches (51 to 61 cm);

(3) Have a minimum tread depth of 8.5 inches (22 cm); and

(4) Have open risers if the tread depth is less than 9.5 inches (24 cm);

(5) Have a minimum tread width of 7 inches (18 cm), measured at the leading edge of the tread (i.e., nosing).

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

1910.26 Dockboards.

The employer must ensure that each dockboard used meets the requirements of this section. The employer must ensure:

(a) Dockboards are capable of supporting the maximum intended load in accordance with § 1910.22(b);

(b)

(1) Dockboards put into initial service on or after January 17, 2017 are designed, constructed, and maintained to prevent transfer vehicles from running off the dockboard edge;

Note to 1910.26(b)(1): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(4), the Oregon delayed effective date is January 1, 2018.

(2) Exception to paragraph (b)(1) of this section. When the employer demonstrates there is no hazard of transfer vehicles running off the dockboard edge, the employer may use dockboards that do not have run-off protection.

(c) Portable dockboards are secured by anchoring them in place or using equipment or devices that prevent the dockboard from moving out of a safe position. When the employer demonstrates that securing the dockboard is not feasible, the employer must ensure there is sufficient contact between the dockboard and the surface to prevent the dockboard from moving out of a safe position;

(d) Measures, such as wheel chocks or sand shoes, are used to prevent the transport vehicle (e.g. a truck, semitrailer, trailer, or rail car) on which a dockboard is placed, from moving while employees are on the dockboard; and

(e) Portable dockboards are equipped with handholds or other means to permit safe handling of dockboards.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

1910.27 Scaffolds and rope descent systems.

(a) Scaffolds. Scaffolds used in general industry must meet the requirements in 29 CFR part 1926, subpart L (Scaffolds).

Note 1: The regulations for scaffolds used in general industry are located in Division 3/L.

Note 2: The following rules were repealed on 11/1/2017 with AO 2-2017:

- **OAR 437-002-0072 Manually propelled elevation aerial platforms.**
- **OAR 437-002-0074 Scissor lifts – self-propelled elevating work platforms.**
- **OAR 437-002-0076 Boom supported elevating work.**

These requirements were previously located in Division 2/F.

The regulations for these three devices used in general industry are now located in Division 3/L and are identified as:

- **OAR 437-003-0071 Manually propelled elevation aerial platforms.**
- **OAR 437-003-0074 Scissor lifts – self-propelled elevating work platforms.**
- **OAR 437-003-0073 Boom supported elevating work.**

Note: 1910.27(b) was not adopted. See OAR 437-002-2027 Rope descent & rope access systems.

~~(b) Rope descent systems—~~

~~(1) Anchorages.~~

~~(i) Before any rope descent system is used, the building owner must inform 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 (268 kg), in any direction, for each employee attached. The information must be based on an annual inspection by a qualified person and certification of each anchorage by a qualified person, as necessary, and at least every 10 years.~~

~~(ii) The employer must ensure that no employee uses any anchorage before the employer has obtained written information from the building owner that each anchorage meets the requirements of paragraph (b)(1)(i) of this section. The employer must keep the information for the duration of the job.~~

~~(iii) The requirements in paragraphs (b)(1)(i) and (ii) of this section must be implemented no later than November 20, 2017.~~

~~(2) Use of rope descent systems. The employer must ensure:~~

~~(i) No rope descent system is used for heights greater than 300 feet (91 m)~~

~~above grade unless the employer demonstrates that it is not feasible to access such heights by any other means or that those means pose a greater hazard than using a rope descent system;~~

~~(ii) The rope descent system is used in accordance with instructions, warnings, and design limitations set by the manufacturer or under the direction of a qualified person;~~

~~(iii) Each employee who uses the rope descent system is trained in accordance with § 1910.30;~~

~~(iv) The rope descent system is inspected at the start of each workshift that it is to be used. The employer must ensure damaged or defective equipment is removed from service immediately and replaced;~~

~~(v) The rope descent system has proper rigging, including anchorages and tiebacks, with particular emphasis on providing tiebacks when counterweights, cornice hooks, or similar non-permanent anchorages are used;~~

~~(vi) Each employee uses a separate, independent personal fall-arrest system that meets the requirements of subpart I of this part;~~

~~(vii) All components of each rope descent system, except seat boards, are capable of sustaining a minimum rated load of 5,000 pounds (22.2 kN). Seat boards must be capable of supporting a live load of 300 pounds (136 kg);~~

~~(viii) Prompt rescue of each employee is provided in the event of a fall;~~

~~(ix) The ropes of each rope descent system are effectively padded or otherwise protected, where they can contact edges of the building, anchorage, obstructions, or other surfaces, to prevent them from being cut or weakened;~~

~~(x) Stabilization is provided at the specific work location when descents are greater than 130 feet (39.6 m);~~

~~(xi) No employee uses a rope descent system when hazardous weather conditions, such as storms or gusty or excessive wind, are present;~~

~~(xii) Equipment, such as tools, squeegees, or buckets, is secured by a tool lanyard or similar method to prevent it from falling; and~~

~~(xiii) The ropes of each rope descent system are protected from exposure to open flames, hot work, corrosive chemicals, and other destructive conditions.~~

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

1910.28 Duty to have fall protection and falling object protection.

(a) General.

(1) This section requires employers to provide protection for each employee exposed to fall and falling object hazards. Unless stated otherwise, the employer must ensure that all fall protection and falling object protection required by this section meet the criteria in § 1910.29, except that personal fall protection systems required by this section meet the criteria of § 1910.140.

(2) This section does not apply:

(i) To portable ladders;

(ii) When employers are inspecting, investigating, or assessing workplace conditions or work to be performed prior to the start of work or after all work has been completed. This exemption does not apply when fall protection systems or equipment meeting the requirements of § 1910.29 have been installed and are available for workers to use for pre-work and post-work inspections, investigations, or assessments;

(iii) To fall hazards presented by the exposed perimeters of entertainment stages and the exposed perimeters of rail-station platforms;

(iv) To powered platforms covered by § 1910.66(j);

(v) To aerial lifts covered by § 1910.67(c)(2)(v);

(vi) To telecommunications work covered by § 1910.268(n)(7) and (8); and

(vii) To electric power generation, transmission, and distribution work covered by 1910.269(g)(2)(i) *OAR 437-002-2306(2) within Subdivision 2/RR.*

(b) Protection from fall hazards.

(1) Unprotected sides and edges.

(i) Except as provided elsewhere in this section, the employer must ensure that each employee on a walking-working surface with an unprotected side or edge that is 4 feet (1.2 m) or more above a lower level is protected from falling by one or more of the following:

(A) Guardrail systems;

(B) Safety net systems; or

(C) Personal fall protection systems, such as personal fall arrest, travel restraint, or positioning systems.

(ii) When the employer can demonstrate that it is not feasible or creates a greater hazard to use guardrail, safety net, or personal fall protection systems on

residential roofs, the employer must develop and implement a fall protection plan that meets the requirements of 29 CFR 1926.502(k) and training that meets the requirements of 29 CFR 1926.503(a) and (c).

Note to paragraph (b)(1)(ii) of this section:

There is a presumption that it is feasible and will not create a greater hazard to use at least one of the above-listed fall protection systems specified in paragraph (b)(1)(i) of this section. Accordingly, the employer has the burden of establishing that it is not feasible or creates a greater hazard to provide the fall protection systems specified in paragraph (b)(1)(i) and that it is necessary to implement a fall protection plan that complies with § 1926.502(k) in the particular work operation, in lieu of implementing any of those systems.

Note: Oregon OSHA did not adopt paragraph 1910.28(b)(1)(ii) or the corresponding note to paragraph (b)(1)(ii) of this section.

(iii) When the employer can demonstrate that the use of fall protection systems is not feasible on the working side of a platform used at a loading rack, loading dock, or teeming platform, the work may be done without a fall protection system, provided:

(A) The work operation for which fall protection is infeasible is in process;

(B) Access to the platform is limited to authorized employees; and,

(C) The authorized employees are trained in accordance with § 1910.30.

(2) Hoist areas. The employer must ensure:

(i) Each employee in a hoist area is protected from falling 4 feet (1.2 m) or more to a lower level by:

(A) A guardrail system;

(B) A personal fall arrest system; or

(C) A travel restraint system.

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

(iii) If grab handles are installed at hoist areas, they meet the requirements of § 1910.29(l).

(3) Holes. The employer must ensure:

(i) Each employee is protected from falling through any hole (including skylights) that is 4 feet (1.2 m) or more above a lower level by one or more of the following:

(A) Covers;

(B) Guardrail systems;

(C) Travel restraint systems; or

(D) Personal fall arrest systems.

(ii) Each employee is protected from tripping into or stepping into or through any hole that is less than 4 feet (1.2 m) above a lower level by covers or guardrail systems.

(iii) Each employee is protected from falling into a stairway floor hole by a fixed guardrail system on all exposed sides, except at the stairway entrance. However, for any stairway used less than once per day where traffic across the stairway floor hole prevents the use of a fixed guardrail system (e.g., holes located in aisle spaces), the employer may protect employees from falling into the hole by using a hinged floor hole cover that meets the criteria in § 1910.29 and a removable guardrail system on all exposed sides, except at the entrance to the stairway.

(iv) Each employee is protected from falling into a ladderway floor hole or ladderway platform hole by a guardrail system and toeboards erected on all exposed sides, except at the entrance to the hole, where a self-closing gate or an offset must be used.

(v) Each employee is protected from falling through a hatchway and chute floor hole by:

(A) A hinged floor-hole cover that meets the criteria in § 1910.29 and a fixed guardrail system that leaves only one exposed side. When the hole is not in use, the employer must ensure the cover is closed or a removable guardrail system is provided on the exposed sides;

(B) A removable guardrail system and toeboards on not more than two sides of the hole and a fixed guardrail system on all other exposed sides. The employer must ensure the removable guardrail system is kept in place when the hole is not in use; or

(C) A guardrail system or a travel restraint system when a work operation necessitates passing material through a hatchway or chute floor hole.

(4) Dockboards.

(i) The employer must ensure that each employee on a dockboard is protected from falling 4 feet (1.2 m) or more to a lower level by a guardrail system or handrails.

(ii) A guardrail system or handrails are not required when:

(A) Dockboards are being used solely for materials-handling operations using motorized equipment;

(B) Employees engaged in these operations are not exposed to fall hazards greater than 10 feet (3 m); and

(C) Those employees have been trained in accordance with § 1910.30.

(5) Runways and similar walkways.

(i) The employer must ensure each employee on a runway or similar walkway is protected from falling 4 feet (1.2 m) or more to a lower level by a guardrail system.

(ii) When the employer can demonstrate that it is not feasible to have guardrails on both sides of a runway used exclusively for a special purpose, the employer may omit the guardrail on one side of the runway, provided the employer ensures:

(A) The runway is at least 18 inches (46 cm) wide; and

(B) Each employee is provided with and uses a personal fall arrest system or travel restraint system.

(6) Dangerous equipment. The employer must ensure:

(i) Each employee less than 4 feet (1.2 m) above dangerous equipment is protected from falling into or onto the dangerous equipment by a guardrail system or a travel restraint system, unless the equipment is covered or guarded to eliminate the hazard.

(ii) Each employee 4 feet (1.2 m) or more above dangerous equipment must be protected from falling by:

(A) Guardrail systems;

(B) Safety net systems;

(C) Travel restraint systems; or

(D) Personal fall arrest systems.

(7) Openings. The employer must ensure that each employee on a walking-working surface near an opening, including one with a chute attached, where the

inside bottom edge of the opening is less than 39 inches (99 cm) above that walking-working surface and the outside bottom edge of the opening is 4 feet (1.2 m) or more above a lower level is protected from falling by the use of:

- (i) Guardrail systems;
- (ii) Safety net systems;
- (iii) Travel restraint systems; or,
- (iv) Personal fall arrest systems.

(8) Repair pits, service pits, and assembly pits less than 10 feet in depth. The use of a fall protection system is not required for a repair pit, service pit, or assembly pit that is less than 10 feet (3 m) deep, provided the employer:

- (i) Limits access within 6 feet (1.8 m) of the edge of the pit to authorized employees trained in accordance with § 1910.30;
- (ii) Applies floor markings at least 6 feet (1.8 m) from the edge of the pit in colors that contrast with the surrounding area; or places a warning line at least 6 feet (1.8 m) from the edge of the pit as well as stanchions that are capable of resisting, without tipping over, a force of at least 16 pounds (71 N) applied horizontally against the stanchion at a height of 30 inches (76 cm); or places a combination of floor markings and warning lines at least 6 feet (1.8 m) from the edge of the pit. When two or more pits in a common area are not more than 15 feet (4.5m) apart, the employer may comply by placing contrasting floor markings at least 6 feet (1.8 m) from the pit edge around the entire area of the pits; and
- (iii) Posts readily visible caution signs that meet the requirements of § 1910.145 and state “Caution—Open Pit.”

(9) Fixed ladders (that extend more than 24 feet (7.3 m) above a lower level).

(i) For fixed ladders that extend more than 24 feet (7.3 m) above a lower level, the employer must ensure:

(A) Existing fixed ladders. Each fixed ladder installed before November 19, 2018 is equipped with a personal fall arrest system, ladder safety system, cage, or well;

Note to 1910.28(b)(9)(i)(A): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(5)(a), the Oregon delayed effective date is November 1, 2019.

(B) New fixed ladders. Each fixed ladder installed on and after November 19, 2018, is equipped with a personal fall arrest system or a ladder safety system;

Note to 1910.28(b)(9)(i)(B): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(5)(b), the Oregon delayed effective date is November 1, 2019.

(C) Replacement. When a fixed ladder, cage, or well, or any portion of a section thereof, is replaced, a personal fall arrest system or ladder safety system is installed in at least that section of the fixed ladder, cage, or well where the replacement is located; and

(D) Final deadline. On and after November 18, 2036, all fixed ladders are equipped with a personal fall arrest system or a ladder safety system.

Note to 1910.28(b)(9)(i)(D): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(5)(c), the Oregon delayed effective date is December 1, 2036.

(ii) When a one-section fixed ladder is equipped with a personal fall protection or a ladder safety system or a fixed ladder is equipped with a personal fall arrest or ladder safety system on more than one section, the employer must ensure:

(A) The personal fall arrest system or ladder safety system provides protection throughout the entire vertical distance of the ladder, including all ladder sections; and

(B) The ladder has rest platforms provided at maximum intervals of 150 feet (45.7 m).

(iii) The employer must ensure ladder sections having a cage or well:

(A) Are offset from adjacent sections; and

(B) Have landing platforms provided at maximum intervals of 50 feet (15.2 m).

(iv) The employer may use a cage or well in combination with a personal fall arrest system or ladder safety system provided that the cage or well does not interfere with the operation of the system.

(10) Outdoor advertising (billboards).

(i) The requirements in paragraph (b)(9) of this section, and other requirements in subparts D and I of this part, apply to fixed ladders used in outdoor advertising activities.

(ii) When an employee engaged in outdoor advertising climbs a fixed ladder before November 19, 2018 that is not equipped with a cage, well, personal fall arrest system, or a ladder safety system the employer must ensure the employee:

Note to 1910.28(b)(10)(ii): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(5)(d), the Oregon delayed effective date is November 1, 2019.

(A) Receives training and demonstrates the physical capability to perform the necessary climbs in accordance with § 1910.29(h);

(B) Wears a body harness equipped with an 18-inch (46 cm) rest lanyard;

(C) Keeps both hands free of tools or material when climbing on the ladder; and

(D) Is protected by a fall protection system upon reaching the work position.

(11) Stairways. The employer must ensure:

(i) Each employee exposed to an unprotected side or edge of a stairway landing that is 4 feet (1.2 m) or more above a lower level is protected by a guardrail or stair rail system;

(ii) Each flight of stairs having at least 3 treads and at least 4 risers is equipped with stair rail systems and handrails as follows:

Table D-2 -- Stairway Handrail Requirements

Stair width	Enclosed	One open side	Two open sides	With earth built up on both sides
Less than 44 inches (1.1 m).	At least one handrail	One stair rail system with handrail on open side.	One stair rail system each open side.	
44 inches (1.1 m) to 88 inches (2.2 m).	One handrail on each enclosed side	One stair rail system with handrail on open side and one handrail on enclosed side.	One stair rail system with handrail on each open side.	
Greater than 88 inches (2.2 m).	One handrail on each enclosed side and one intermediate handrail located in the middle of the stair	One stair rail system with handrail on open side, one handrail on enclosed side, and one intermediate handrail located in the middle of the stair.	One stair rail system with handrail on each open side and one intermediate handrail located in the middle of the stair.	
Exterior stairs less than 44 inches (1.1 m).				One handrail on at least one side.

Note to table: The width of the stair must be clear of all obstructions except handrails.

(iii) Each ship stairs and alternating tread type stairs is equipped with handrails on both sides.

(12) Scaffolds and rope descent systems. The employer must ensure:

(i) Each employee on a scaffold is protected from falling in accordance 29 CFR part 1926, subpart L; and

(ii) Each employee using a rope descent system 4 feet (1.2 m) or more above a lower level is protected from falling by a personal fall arrest system.

(13) Work on low-slope roofs.

(i) When work is performed less than 6 feet (1.6 m) from the roof edge, the employer must ensure each employee is protected from falling by a guardrail system, safety net system, travel restraint system, or personal fall arrest system.

(ii) When work is performed at least 6 feet (1.6 m) but less than 15 feet (4.6 m) from the roof edge, the employer must ensure each employee is protected from falling by using a guardrail system, safety net system, travel restraint system, or personal fall arrest system. The employer may use a designated area when performing work that is both infrequent and temporary.

(iii) When work is performed 15 feet (4.6 m) or more from the roof edge, the employer must:

(A) Protect each employee from falling by a guardrail system, safety net system, travel restraint system, or personal fall arrest system or a designated area. The employer is not required to provide any fall protection, provided the work is both infrequent and temporary; and

(B) Implement and enforce a work rule prohibiting employees from going within 15 feet (4.6 m) of the roof edge without using fall protection in accordance with paragraphs (b)(13)(i) and (ii) of this section.

(14) Slaughtering facility platforms.

(i) The employer must protect each employee on the unprotected working side of a slaughtering facility platform that is 4 feet (1.2 m) or more above a lower level from falling by using:

(A) Guardrail systems; or

(B) Travel restraint systems.

(ii) When the employer can demonstrate the use of a guardrail or travel restraint system is not feasible, the work may be done without those systems provided:

(A) The work operation for which fall protection is infeasible is in process;

(B) Access to the platform is limited to authorized employees; and

(C) The authorized employees are trained in accordance with § 1910.30.

(15) Walking-working surfaces not otherwise addressed. Except as provided elsewhere in this section or by other subparts of this part, the employer must ensure each employee on a walking-working surface 4 feet (1.2 m) or more above a lower level is protected from falling by:

(i) Guardrail systems;

(ii) Safety net systems; or

(iii) Personal fall protection systems, such as personal fall arrest, travel restraint, or positioning systems.

(c) Protection from falling objects.

When an employee is exposed to falling objects, the employer must ensure that each employee wears head protection that meets the requirements of subpart I of this part. In addition, the employer must protect employees from falling objects by implementing one or more of the following:

(1) Erecting toeboards, screens, or guardrail systems to prevent objects from falling to a lower level;

(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

(3) Barricading the area into which objects could fall, prohibiting employees from entering the barricaded area, and keeping objects far enough from an edge or opening to prevent them from falling to a lower level.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

1910.29 Fall protection systems and falling object protection – criteria and practices.

(a) General requirements. The employer must:

(1) Ensure each fall protection system and falling object protection, other than personal fall protection systems, that this part requires meets the requirements in this section. The employer must ensure each personal fall protection system meets the requirements in subpart I of this part; and

(2) Provide and install all fall protection systems and falling object protection this subpart requires, and comply with the other requirements in this subpart before any employee begins work that necessitates fall or falling object protection.

(b) Guardrail systems. The employer must ensure guardrail systems meet the following requirements:

(1) The top edge height of top rails, or equivalent guardrail system members, are 42 inches (107 cm), plus or minus 3 inches (8 cm), above the walking-working surface. The top edge height may exceed 45 inches (114 cm), provided the guardrail system meets all other criteria of paragraph (b) of this section (see Figure D-11 of this section).

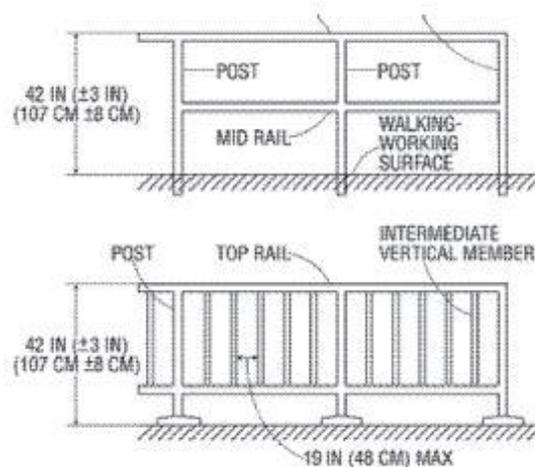


Figure D-11 – Guard Rail Systems

(2) Midrails, screens, mesh, intermediate vertical members, solid panels, or equivalent intermediate members are installed between the walking-working surface and the top edge of the guardrail system as follows when there is not a wall or parapet that is at least 21 inches (53 cm) high:

(i) Midrails are installed at a height midway between the top edge of the guardrail system and the walking-working surface;

(ii) Screens and mesh extend from the walking-working surface to the top rail and along the entire opening between top rail supports;

(iii) Intermediate vertical members (such as balusters) are installed no more than 19 inches (48 cm) apart; and

(iv) Other equivalent intermediate members (such as additional midrails and architectural panels) are installed so that the openings are not more than 19 inches (48 cm) wide.

(3) Guardrail systems are capable of withstanding, without failure, a force of at least 200 pounds (890 N) applied in a downward or outward direction within 2 inches (5 cm) of the top edge, at any point along the top rail.

(4) When the 200-pound (890-N) test load is applied in a downward direction, the top rail of the guardrail system must not deflect to a height of less than 39 inches (99 cm) above the walking-working surface.

(5) Midrails, screens, mesh, intermediate vertical members, solid panels, and other equivalent intermediate members are capable of withstanding, without failure, a force of at least 150 pounds (667 N) applied in any downward or outward direction at any point along the intermediate member.

(6) Guardrail systems are smooth-surfaced to protect employees from injury, such as punctures or lacerations, and to prevent catching or snagging of clothing.

(7) The ends of top rails and midrails do not overhang the terminal posts, except where the overhang does not pose a projection hazard for employees.

(8) Steel banding and plastic banding are not used for top rails or midrails.

(9) Top rails and midrails are at least 0.25-inches (0.6 cm) in diameter or in thickness.

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

(11) When guardrail systems are used around holes, they are installed on all unprotected sides or edges of the hole.

(12) For guardrail systems used around holes through which materials may be passed:

(i) When materials are being passed through the hole, not more than two sides of the guardrail system are removed; and

(ii) When materials are not being passed through the hole, the hole must be guarded by a guardrail system along all unprotected sides or edges or closed over with a cover.

(13) When guardrail systems are used around holes that serve as points of access (such as ladderways), the guardrail system opening:

(i) Has a self-closing gate that slides or swings away from the hole, and is equipped with a top rail and midrail or equivalent intermediate member that meets the requirements in paragraph (b) of this section; or

(ii) Is offset to prevent an employee from walking or falling into the hole;

(14) Guardrail systems on ramps and runways are installed along each unprotected side or edge.

(15) Manila or synthetic rope used for top rails or midrails are inspected as necessary to ensure that the rope continues to meet the strength requirements in paragraphs (b)(3) and (5) of this section.

Note to paragraph (b) of this section: The criteria and practices requirements for guardrail systems on scaffolds are contained in 29 CFR part 1926, subpart L.

(c) Safety net systems. The employer must ensure each safety net system meets the requirements in 29 CFR part 1926, subpart M.

(d) Designated areas.

(1) When the employer uses a designated area, the employer must ensure:

(i) Employees remain within the designated area while work operations are underway; and

(ii) The perimeter of the designated area is delineated with a warning line consisting of a rope, wire, tape, or chain that meets the requirements of paragraphs (d)(2) and (3) of this section.

(2) The employer must ensure each warning line:

(i) Has a minimum breaking strength of 200 pounds (0.89 kN);

(ii) Is installed so its lowest point, including sag, is not less than 34 inches (86 cm) and not more than 39 inches (99 cm) above the walking-working surface;

(iii) Is supported in such a manner that pulling on one section of the line will not result in slack being taken up in adjacent sections causing the line to fall below the limits specified in paragraph (d)(2)(ii) of this section;

(iv) Is clearly visible from a distance of 25 feet (7.6 m) away, and anywhere within the designated area;

(v) Is erected as close to the work area as the task permits; and

(vi) Is erected not less than 6 feet (1.8 m) from the roof edge for work that is both temporary and infrequent, or not less than 15 feet (4.6 m) for other work.

(3) When mobile mechanical equipment is used to perform work that is both temporary and infrequent in a designated area, the employer must ensure the warning line is erected not less than 6 feet (1.8 m) from the unprotected side or edge that is parallel to the direction in which the mechanical equipment is

operated, and not less than 10 feet (3 m) from the unprotected side or edge that is perpendicular to the direction in which the mechanical equipment is operated.

(e) Covers. The employer must ensure each cover for a hole in a walking-working surface:

(1) Is capable of supporting without failure, at least twice the maximum intended load that may be imposed on the cover at any one time; and

(2) Is secured to prevent accidental displacement.

(f) Handrails and stair rail systems. The employer must ensure:

(1) Height criteria.

(i) Handrails are not less than 30 inches (76 cm) and not more than 38 inches (97 cm), as measured from the leading edge of the stair tread to the top surface of the handrail (see Figure D–12 of this section).

(ii) The height of stair rail systems meets the following:

(A) The height of stair rail systems installed before January 17, 2017 is not less than 30 inches (76 cm) from the leading edge of the stair tread to the top surface of the top rail; and

Note to 1910.29(f)(1)(ii)(A): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(6)(a), the Oregon delayed effective date is January 1, 2018.

(B) The height of stair rail systems installed on or after January 17, 2017 is not less than 42 inches (107 cm) from the leading edge of the stair tread to the top surface of the top rail.

Note to 1910.29(f)(1)(ii)(B): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(6)(b), the Oregon delayed effective date is January 1, 2018.

(iii) The top rail of a stair rail system may serve as a handrail only when:

(A) The height of the stair rail system is not less than 36 inches (91 cm) and not more than 38 inches (97 cm) as measured at the leading edge of the stair tread to the top surface of the top rail (see Figure D–13 of this section); and

(B) The top rail of the stair rail system meets the other handrail requirements in paragraph (f) of this section.

(2) Finger clearance. The minimum clearance between handrails and any other object is 2.25 inches (5.7 cm).

(3) Surfaces. Handrails and stair rail systems are smooth-surfaced to protect employees from injury, such as punctures or lacerations, and to prevent catching or snagging of clothing.

(4) Openings in stair rails. No opening in a stair rail system exceeds 19 inches (48 cm) at its least dimension.

(5) Handhold. Handrails have the shape and dimension necessary so that employees can grasp the handrail firmly.

(6) Projection hazards. The ends of handrails and stair rail systems do not present any projection hazards.

(7) Strength criteria. Handrails and the top rails of stair rail systems are capable of withstanding, without failure, a force of at least 200 pounds (890 N) applied in any downward or outward direction within 2 inches (5 cm) of any point along the top edge of the rail.

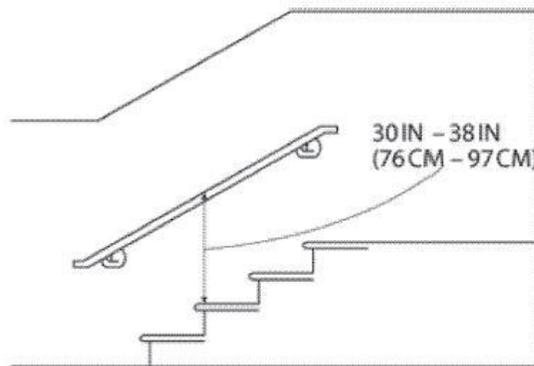


Figure D-12 – Handrail Measurement

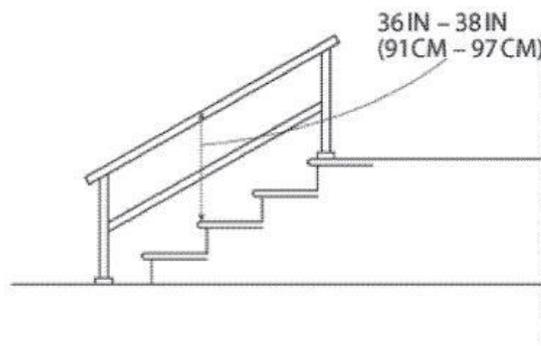


Figure D-13 – Combination Handrail and Stair Rail

(g) Cages, wells, and platforms used with fixed ladders. The employer must ensure:

(h) Outdoor advertising. This paragraph (h) applies only to employers engaged in outdoor advertising operations (see § 1910.28(b)(10)). Employers must ensure that each employee who climbs a fixed ladder without fall protection:

(1) Is physically capable, as demonstrated through observations of actual climbing activities or by a physical examination, to perform the duties that may be assigned, including climbing fixed ladders without fall protection;

(2) Has successfully completed a training or apprenticeship program that includes hands-on training on the safe climbing of ladders and is retrained as necessary to maintain the necessary skills;

(3) Has the skill to climb ladders safely, as demonstrated through formal classroom training or on-the-job training, and performance observation; and

(4) Performs climbing duties as a part of routine work activity.

(i) Ladder safety systems. The employer must ensure:

(1) Each ladder safety system allows the employee to climb up and down using both hands and does not require that the employee continuously hold, push, or pull any part of the system while climbing;

(2) The connection between the carrier or lifeline and the point of attachment to the body harness or belt does not exceed 9 inches (23 cm);

(3) Mountings for rigid carriers are attached at each end of the carrier, with intermediate mountings spaced, as necessary, along the entire length of the carrier so the system has the strength to stop employee falls;

(4) Mountings for flexible carriers are attached at each end of the carrier and cable guides for flexible carriers are installed at least 25 feet (7.6 m) apart but not more than 40 feet (12.2 m) apart along the entire length of the carrier;

(5) The design and installation of mountings and cable guides does not reduce the design strength of the ladder; and

(6) Ladder safety systems and their support systems are capable of withstanding, without failure, a drop test consisting of an 18-inch (41-cm) drop of a 500-pound (227-kg) weight.

(j) Personal fall protection systems. Body belts, harnesses, and other components used in personal fall arrest systems, work positioning systems, and travel restraint systems must meet the requirements of § 1910.140.

(k) Protection from falling objects.

(1) The employers must ensure toeboards used for falling object protection:

(i) Are erected along the exposed edge of the overhead walking-working surface for a length that is sufficient to protect employees below.

(ii) Have a minimum vertical height of 3.5 inches (9 cm) as measured from the top edge of the toeboard to the level of the walking-working surface.

(iii) Do not have more than a 0.25- inch (0.5-cm) clearance or opening above the walking-working surface.

(iv) Are solid or do not have any opening that exceeds 1 inch (3 cm) at its greatest dimension.

(v) Have a minimum height of 2.5 inches (6 cm) when used around vehicle repair, service, or assembly pits. Toeboards may be omitted around vehicle repair, service, or assembly pits when the employer can demonstrate that a toeboard would prevent access to a vehicle that is over the pit.

(vi) Are capable of withstanding, without failure, a force of at least 50 pounds (222 N) applied in any downward or outward direction at any point along the toeboard.

(2) The employer must ensure:

(i) Where tools, equipment, or materials are piled higher than the top of the toeboard, paneling or screening is installed from the toeboard to the midrail of the guardrail system and for a length that is sufficient to protect employees below. If the items are piled higher than the midrail, the employer also must install paneling or screening to the top rail and for a length that is sufficient to protect employees below; and

(ii) All openings in guardrail systems are small enough to prevent objects from falling through the opening.

(3) The employer must ensure canopies used for falling object protection are strong enough to prevent collapse and to prevent penetration by falling objects.

(l) Grab handles. The employer must ensure each grab handle:

(1) Is not less than 12 inches (30 cm) long;

(2) Is mounted to provide at least 3 inches (8 cm) of clearance from the framing or opening; and

(3) Is capable of withstanding a maximum horizontal pull-out force equal to two times the maximum intended load or 200 pounds (890 N), whichever is greater.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

1910.30 Training requirements.

(a) Fall hazards.

(1) Before any employee is exposed to a fall hazard, the employer must provide training for each employee who uses personal fall protection systems or who is required to be trained as specified elsewhere in this subpart. Employers must ensure employees are trained in the requirements of this paragraph on or before May 17, 2017.

Note to 1910.30(a)(1): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(7)(a), the Oregon delayed effective date is May 1, 2018.

(2) The employer must ensure that each employee is trained by a qualified person.

(3) The employer must train each employee in at least the following topics:

(i) The nature of the fall hazards in the work area and how to recognize them;

(ii) The procedures to be followed to minimize those hazards;

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

(iv) The correct use of personal fall protection systems and equipment specified in paragraph (a)(1) of this section, including, but not limited to, proper hook-up, anchoring, and tie-off techniques, and methods of equipment inspection and storage, as specified by the manufacturer.

(b) Equipment hazards.

(1) The employer must train each employee on or before May 17, 2017 in the proper care, inspection, storage, and use of equipment covered by this subpart before an employee uses the equipment.

Note to 1910.30(b)(1): The above referenced date does not apply in Oregon. Instead, in accordance with OAR 437-002-2031(7)(b), the Oregon delayed effective date is May 1, 2018.

(2) The employer must train each employee who uses a dockboard to properly place and secure it to prevent unintentional movement.

(3) The employer must train each employee who uses a rope descent system in proper rigging and use of the equipment in accordance with § 1910.27.

Note: Oregon OSHA did not adopt 1910.27. Instead, see OAR 437-002-2027 Rope descent and rope access systems.

(4) The employer must train each employee who uses a designated area in the proper set-up and use of the area.

(c) Retraining. The employer must retrain an employee when the employer has reason to believe the employee does not have the understanding and skill required by paragraphs (a) and (b) of this section. Situations requiring retraining include, but are not limited to, the following:

(1) When changes in the workplace render previous training obsolete or inadequate;

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

(3) When inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee no longer has the requisite understanding or skill necessary to use equipment or perform the job safely.

(d) Training must be understandable. The employer must provide information and training to each employee in a manner that the employee understands.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

437-002-2031 Delayed Effective Dates for Walking-Working Surfaces.

(1) Scope and application. The delayed effective dates in this rule apply in Oregon to 1910.24, 1910.25, 1910.26, 1910.28, 1910.29 and 1910.30 within Subdivision 2/D.

(2) Step bolts and manhole steps (1910.24). The delayed federal effective dates referenced in 1910.24 do not apply in Oregon. In Oregon, the following delayed effective dates apply:

(a) 1910.24(a)(1): Replace January 17, 2017 with January 1, 2018.

(b) 1910.24(a)(6): Replace January 17, 2017 with January 1, 2018.

(c) 1910.24(a)(7): Replace January 17, 2017 with January 1, 2018.

(d) 1910.24(b)(2): Replace January 17, 2017 with January 1, 2018.

(3) Stairways (1910.25). The delayed federal effective dates referenced in 1910.25 do not apply in Oregon. In Oregon, the following delayed effective dates apply:

(a) 1910.25(b)(5)(i): Replace January 17, 2017 with January 1, 2018.

(b) 1910.25(b)(5)(ii): Replace January 17, 2017 with January 1, 2018.

(c) 1910.25(c)(5): Replace January 17, 2017 with January 1, 2018.

(4) Dockboards (1910.26). The delayed federal effective date referenced in 1910.26(b)(1) does not apply in Oregon. In Oregon, replace January 17, 2017 with January 1, 2018.

(5) Duty to have fall protection and falling object protection (1910.28). The delayed federal effective dates referenced in 1910.28 do not apply in Oregon. In Oregon, the following delayed effective dates apply:

(a) 1910.28(b)(9)(i)(A): Replace November 19, 2018 with November 1, 2019.

(b) 1910.28(b)(9)(i)(B): Replace November 19, 2018 with November 1, 2019.

(c) 1910.28(b)(9)(i)(D): Replace November 18, 2036 with December 1, 2036.

(d) 1910.28(b)(10)(ii): Replace November 19, 2018 with November 1, 2019.

(6) Fall protection systems and falling object protection – criteria and practices (1910.29). The delayed federal effective dates referenced in 1910.29 do not apply in Oregon. In Oregon, the following delayed effective dates apply:

(a) 1910.29(f)(1)(ii)(A): Replace January 17, 2017 with January 1, 2018.

(b) 1910.29(f)(1)(ii)(B): Replace January 17, 2017 with January 1, 2018.

(7) Training requirements (1910.30). The delayed federal effective dates referenced in 1910.30 do not apply in Oregon. In Oregon, the following delayed effective dates apply:

(a) 1910.30(a)(1): Replace May 17, 2017 with May 1, 2018.

(b) 1910.30(b)(1): Replace May 17, 2017 with May 1, 2018.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

Division 2/F, Powered Platform, Manlifts and Vehicle-Mounted Platforms

437-002-0060

Adoption by Reference. In addition to, and not in lieu of, any other safety and health codes contained in OAR Chapter 437, the Department adopts by reference the following federal regulations printed as part of the Code of Federal Regulations, 29 CFR 1910, in the Federal Register:

(1) 29 CFR 1910.66 Powered Platforms for Building Maintenance, published [~~2/14/07, FR vol. 72, no. 30, p. 7136~~] **11/18/16, Federal Register, vol. 81, no. 223, p. 82494.**

(2) 29 CFR 1910.67 Vehicle-Mounted Elevating and Rotating Work Platforms, published [~~7/1/14, FR vol. 79, no. 126, p. 37189~~] **11/18/16, Federal Register, vol. 81, no. 223, p. 82494.**

(3) 29 CFR 1910.68 Manlifts, published [~~12/14/07, FR vol. 72, no. 240, p. 71061~~] **11/18/16, Federal Register, vol. 81, no. 223, p. 82494.**

These standards are on file with the Oregon Occupational Safety and Health Division, Department of Consumer and Business Services, and the United States Government Printing Office.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 4-1990, f. 1/23/90, ef. 1/23/90.
OR-OSHA Admin. Order 2-1991, f. 2/4/91, ef. 4/1/91.
OR-OSHA Admin. Order 4-1997, f. 4/2/97, ef. 4/2/97.
OR-OSHA Admin. Order 4-2007, f. 8/15/07, ef. 8/15/07.
OR-OSHA Admin. Order 7-2008, f. 5/30/08, ef. 5/30/08.
OR-OSHA Admin. Order 1-2015, f. 1/5/15, ef. 1/5/15.
OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

1910.66

(b)(2)(i)

(2) Existing installations.

(i) Permanent installations in existence and/or completed before July 23, 1990 shall comply with paragraphs (g), (h), (i), (j) and ~~[A] appendix C [of this section]~~ **to subpart I of this part.**

(c) Assurance.

...

(3) Building owners of all installations, new and existing, shall inform the employer in writing that the installation has been inspected, tested and maintained in compliance with the requirements of paragraphs (g) and (h) of this section and that all protection anchorages meet the requirements of ~~[paragraph (I)(c)(10) of Appendix C]~~ **1910.140(c)(13).**

(e) Powered platform installations – Affected parts of building.

...

(3) Roof guarding.

(i) Employees working on roofs while performing building maintenance shall be protected by a perimeter guarding system which meets the requirements ~~[of paragraph (c)(1) of §1910.23 of this Part]~~ **in subpart D of this part.**

(f) Powered platform installations – Equipment.

...

(5) Suspended equipment.

...

(ii) Two and four-point suspended working platforms.

...

(L) The platform shall be provided with a secondary wire rope suspension system if the platform contains overhead structures which restrict the emergency egress of employees. A horizontal lifeline or a direct connection anchorage shall be provided[.] as part of a **personal** fall arrest system [~~which~~]**that** meets the requirements of [~~Appendix C,~~]**subpart I of this part** for each employee on such a platform.

(M) A vertical lifeline shall be provided as part of a fall arrest system [~~which~~]**that** meets the requirements of [~~Appendix C,~~]**subpart I of this part** for each employee on a working platform suspended by two or more wire ropes, if the failure of one wire rope or suspension attachment will cause the platform to upset. If a secondary wire rope suspension is used, vertical lifelines are not required for the **personal** fall arrest system, provided that each employee is attached to a horizontal lifeline anchored to the platform.

...

(iii) Single point suspended working platforms.

(B) Each single point suspended working platform shall be provided with a secondary wire rope suspension system[.] which will prevent the working platform from falling should there be a failure of the primary means of support, or if the platform contains overhead structures which restrict the egress of the employees. A horizontal life line or a direct connection anchorage shall be provided[.] as part of a **personal** fall arrest system [~~which~~]**that** meets the requirements of [~~Appendix C,~~]**subpart I of this part** for each employee on the platform.

...

(j) Personal fall protection. Employees on working platforms shall be protected by a personal fall arrest system meeting the requirements of [~~Appendix C, Section I, of this standard,~~]**subpart I of this part** and as otherwise provided by this standard.

Appendix C to §1910.66 – [~~Personal Fall Arrest System (Section I – Mandatory; Sections II and III – Nonmandatory)] **Reserved.**~~

Appendix D to §1910.66 – Existing Installations (Mandatory)

...

(c) Type F powered platforms.

...

(4) Access to the roof car. Safe access to the roof car and from the roof car to the working platform shall be provided. If the access to the roof car at any point of its travel is not over the roof area or where otherwise necessary for safety, **then** self-closing, self-locking gates shall be provided. [~~Applicable provisions of the American National Standard Safety Requirements for Floor and Wall Openings, Railings and Toeboard, A12.1-1967, shall apply.~~]**Access to and from roof cars must comply with the requirements of subpart D of this part.**

1910.67(c)(2)(v)

...
(v) ~~[A body belt]~~ **A personal fall arrest or travel restraint system that meets the requirements in subpart I of this part** shall be worn and ~~[a lanyard]~~ attached to the boom or basket when working from an aerial lift.

~~[437-002-0072—Manually Propelled Elevating Aerial Platforms.—When using manually propelled elevating aerial platforms as covered by ANSI/SIA A92.3-1990, the manufacturer’s operating manual must be with the equipment. You must follow all manufacturers’ operating and maintenance instructions and recommendations.]~~

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 4-2009, f. 4/13/09, ef. 4/17/09.]

~~[437-002-0074—Scissor Lifts—Self-Propelled Elevating Work Platforms.—When using self-propelled elevating aerial platforms, scissor lifts, as covered by ANSI/SIA A92.6-1990, the manufacturer’s operating manual must be with the equipment. You must follow all manufacturers’ operating and maintenance instructions and recommendations.]~~

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 4-2009, f. 4/13/09, ef. 4/17/09.]

~~[437-002-0076—Boom Supported Elevating Work Platforms.]~~

~~(1) When using boom supported elevating work platforms as covered by ANSI/SIA A92.5-1996, the manufacturer’s operating manual must be with the equipment. You must follow all manufacturers’ operating and maintenance instructions and recommendations.]~~

~~(2) All occupants on platforms must use a personal fall protection system that will protect against the potential effects of ejection.]~~

Stat. Auth.: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 4-2009, f. 4/13/09, ef. 4/17/09.]

437-002-2022 Additional Oregon Rules for Powered Platforms

(1) Scope and application. This rule applies to powered platforms not regulated by 1910.66 Powered platforms for building maintenance, 1910.67 Vehicle-mounted elevating and rotating work platforms, and 1910.68 Manlifts.

(2) Powered work platforms identified in (2)(a) – (c) of this rule, used in general industry, must meet the requirements of Division 3, Subdivision L Scaffolds.

(a) Manually Propelled Elevating Aerial Platforms covered by the scope of ANSI/SIA A92.3 – 1990.

(b) Scissor lifts – Self-Propelled Elevating Work Platforms covered by the scope of ANSI/SIA A92.6 – 1990.

(c) Boom Supported Elevating Work Platform covered by the scope of ANSI/SIA A92.5 – 1996.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

Note: The following rules were repealed on 11/1/2017 with AO 2-2017:

- **OAR 437-002-0072 Manually propelled elevation aerial platforms.**
- **OAR 437-002-0074 Scissor lifts – self-propelled elevating work platforms.**
- **OAR 437-002-0076 Boom supported elevating work.**

These requirements were previously located in Division 2/F.

The regulations for these powered platforms used in general industry are now located in Division 3/L and are identified as:

- **OAR 437-003-0071 Manually propelled elevation aerial platforms.**
- **OAR 437-003-0074 Scissor lifts – self-propelled elevating work platforms.**
- **OAR 437-003-0073 Boom supported elevating work.**

1910.68(b)(8)(ii)

...

(ii) Construction. The rails shall be standard guardrails with toeboards [~~meeting the provisions of §1910.23~~]**that meet the requirements in subpart D of this part.**

...

(b)(12)

(12) Emergency exit ladder. A fixed metal ladder accessible from both the “up” and “down” run of the manlift shall be provided for the entire travel of the manlift. Such ladders shall [~~be in accordance with the existing ANSI A14.3-1956, Safety Code for Fixed Ladders, and §1910.27~~]**meet the requirements in subpart D of this part.**

Division 2/I, Personal Protective Equipment

437-002-0120

Adoption by Reference. In addition to, and not in lieu of, any other health and safety codes contained in OAR Chapter 437, the Department adopts by reference the following federal regulations printed as part of the Code of Federal Regulations, 29 CFR 1910, in the Federal Register:

- (1) 29 CFR 1910.132 General requirements. Repealed with Oregon OSHA Admin. Order 4-2011, filed and effective 12/8/11. In Oregon, OAR 437-002-0134 applies.
- (2) 29 CFR 1910.133 Eye and face protection. Repealed with Oregon OSHA Admin. Order 4-2011, filed and effective 12/8/11. In Oregon, OAR 437-002-0134 applies.
- (3) 29 CFR 1910.134 Respiratory protection, published 8/7/12, FR vol. 77, no. 152, p. 46948.
- (4) 29 CFR 1910.135 Occupational head protection. Repealed with Oregon OSHA Admin. Order 4-2011, filed and effective 12/8/11. In Oregon, OAR 437-002-0134 applies.
- (5) 29 CFR 1910.136 Occupational foot protection. Repealed with Oregon OSHA Admin. Order 4-2011, filed and effective 12/8/11. In Oregon, OAR 437-002-0134 applies.
- (6) 29 CFR 1910.137 Electrical protective equipment, published 4/11/14, FR vol. 79, no. 70, p. 20316.
- (7) 29 CFR 1910.138 Hand Protection. Repealed with Oregon OSHA Admin. Order 4-2011, filed and effective 12/8/11. In Oregon, OAR 437-002-0134 applies.
- (8) 29 CFR 1910.139 [~~Respiratory protection for M. tuberculosis. Removed, 12/3/03, FR vol. 68, p. 75776-75780 (OR-OSHA Admin. Order 1-2004, f. 3/26/04, ef. 7/1/04)]~~**Reserved.**
- (9) 29 CFR 1910.140 Personal fall protection, published 11/18/16, Federal Register, vol. 81, no. 223, p. 82494.**

([9]10) Appendices.

Appendix A – References for further information (nonmandatory).

Appendix B – Nonmandatory compliance guidelines for hazard assessment and personal protective equipment selection; amended with OR-OSHA Admin. Order 3-2015, f. 10/9/15, ef. 1/1/16.

Appendix C to Subpart I of Part 1910 – Personal Fall Protection Systems Non-Mandatory Guidelines, published 11/18/16, Federal Register, vol. 81, no. 223, p. 82494.

Appendix D to Subpart I of Part 1910 – Test Methods and Procedures for Personal Fall Protection Systems Non-Mandatory Guidelines, published 11/18/16, Federal Register, vol. 81, no. 223, p. 82494.

These standards are available from the Oregon Occupational Safety and Health Division (OR-OSHA), Department of Consumer and Business Services; and the United States Government Printing Office.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295

Hist: OR-OSHA Admin. Order 9-1993, f. 7/29/93, ef. 9/15/93.

OR-OSHA Admin. Order 3-1994, f. 8/1/94, ef. 8/1/94.

OR-OSHA Admin. Order 5-1994, f. 9/30/94 ef. 9/30/94.

OR-OSHA Admin. Order 3-1997, f. 3/28/97 ef. 3/28/97.

OR-OSHA Admin. Order 4-1997, f. 4/2/97, ef. 4/2/97.

OR-OSHA Admin. Order 3-1998, f. 7/7/98, ef. 7/7/98.

OR-OSHA Admin. Order 12-2001, f. 10/26/01, ef. 10/26/01.

OR-OSHA Admin. Order 1-2004, f. 3/26/04, ef. 7/1/04.

OR-OSHA Admin. Order 5-2004, f. 11/19/04, ef. 11/19/04.

OR-OSHA Admin. Order 10-2006, f. 11/30/06, ef. 11/30/06.
OR-OSHA Admin. Order 5-2008, f. 5/1/08, ef. 5/15/08.
OR-OSHA Admin. Order 5-2009, f. 5/29/09, ef. 5/29/09.
OR-OSHA Admin. Order 2-2010, f. 2/25/10, ef. 2/25/10.
OR-OSHA Admin. Order 4-2011, f. 12/8/11, ef. 12/8/11.
OR-OSHA Admin. Order 1-2012, f. 4/10/12, ef. 4/10/12.
OR-OSHA Admin. Order 7-2012, f. 12/14/12, ef. 12/14/12.
OR-OSHA Admin. Order 3-2015, f. 10/9/15, ef. 1/1/16.
OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

437-002-0134 Personal Protective Equipment.

Application. This rule applies to personal protective equipment and other protective equipment for the eyes, face, head, extremities and torso to include protective clothing, respiratory devices, and protective shields and barriers, wherever employees encounter hazardous processes or environments, chemical hazards, radiological hazards, or mechanical irritants that are capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

Note: The assessment for eyes, face, head, hands, and feet are currently in effect. The torso and extremities (e.g. arms and legs) element of the body assessment will not be enforced until July 1, 2012.

(1) Hazard assessment and equipment selection.

(a) The employer must assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE) or other protective equipment. If such hazards are present, or likely to be present, the employer must:

(A) Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment;

(i) All protective equipment must be of safe design and construction for the work to be performed.

(ii) Protective equipment must be worn and used in a manner which will make full use of its protective properties.

(B) Communicate selection decisions to each affected employee; and,

(C) Select PPE that properly fits each affected employee.

NOTE: Non-mandatory Appendix B contains an example of procedures that would comply with the requirement for a hazard assessment.

(b) The employer must verify that the required workplace hazard assessment has been performed through a written certification that identifies the workplace evaluated; the person certifying that the evaluation has been performed; the date(s) of the hazard assessment; and, which identifies the document as a certification of hazard assessment.

(2) Equipment.

(a) Where employees provide their own protective equipment, the employer is responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment.

(b) All personal protective equipment must be provided, used, and maintained in a sanitary and reliable condition.

(c) Defective or damaged personal protective equipment must not be used.

(d) Each employer must maintain a regular system of inspection and maintenance of personal protective equipment furnished to workers.

(3) Training.

(a) The employer must provide training to each employee who is required by this section to use PPE and each employee that is provided training must know at least the following:

- (A) When PPE is necessary;*
- (B) What PPE is necessary;*
- (C) How to properly don, doff, adjust, and wear PPE;*
- (D) The limitations of the PPE; and,*
- (E) The proper care, maintenance, useful life and disposal of the PPE.*

(b) Each affected employee must demonstrate an understanding of the training specified in paragraph (3)(a) of this section, and the ability to use PPE properly, before being allowed to perform work requiring the use of PPE.

(c) When the employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by paragraph (3)(b) of this section, the employer must retrain each such employee. Circumstances where retraining is required include, but are not limited to situations where:

- (A) Changes in the workplace render previous training obsolete; or*
- (B) Changes in the types of PPE to be used render previous training obsolete; or*
- (C) Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill.*

(4) Payment for protective equipment.

(a) Except as provided by paragraphs (4)(b) through (4)(f) of this section, the protective equipment, including personal protective equipment (PPE), used to comply with this part, must be provided by the employer at no cost to employees.

(b) The employer is not required to pay for non-specialty safety-toe protective footwear (including steel-toe shoes or steel-toe boots) and non-specialty prescription safety eyewear, provided that the employer permits such items to be worn off the job-site.

(c) When the employer provides metatarsal guards and allows the employee, at his or her request, to use shoes or boots with built-in metatarsal protection, the employer is not required to reimburse the employee for the shoes or boots.

(d) The employer is not required to pay for:

- (A) The logging boots required by OAR 437-007-0330 in Division 7.*
- (B) Everyday clothing, such as long-sleeve shirts, long pants, street shoes, and normal work boots; or*
- (C) Ordinary clothing, skin creams, or other items, used solely for protection from weather, such as winter coats, jackets, gloves, parkas, rubber boots, hats, raincoats, ordinary sunglasses, and sunscreen.*

(e) The employer must pay for replacement PPE, except when the employee has lost or intentionally damaged the PPE.

(f) Where an employee provides adequate protective equipment he or she owns pursuant to paragraph (2)(a) of this section, the employer may allow the employee to use it and is not required to reimburse the employee for that equipment. The employer must not require an employee to provide or pay for his or her own PPE, unless the PPE is excepted by paragraphs (4)(b) through (4)(e) of this section.

(5) Fall Protection.

(a) Motor and Rolling Stock Vehicles.

([a]A) All employees must be protected from fall hazards when working on ~~[unguarded surfaces]~~ **motor and rolling stock vehicle surfaces** more than 10 feet above a lower level or at any height above dangerous equipment.

([b]B) The employer must ensure that fall protection systems are provided, installed, and used according to the criteria in ~~[1926.502(d), and 437-003-0502]~~ **1910.140** in **this Subdivision**~~[Division 3/M, Construction/Fall Protection]~~.

NOTE to 437-002-0134(5)(a): The duty to provide fall protection for employees on walking-working surfaces other than motor and rolling stock vehicles is covered by 1910.28 (Duty to have fall protection and falling object protection) within 2/D. The criteria and practices for fall protection systems for walking-working surfaces other than motor and rolling stock vehicles is covered by 1910.29 within 2/D.

(b) Travel Restraint Systems. The employer must ensure each employee using a travel restraint system (personal fall restraint) is prevented from going over the edge by providing, installing and ensuring its use according to the criteria in 1910.140 in this Subdivision with the following exceptions to 1910.140:

(A) 1910.140(c)(13) does not apply when anchorages used solely for travel restraint are:

(i) Capable of supporting 3000 pounds (13.34 kN) per employee attached; or

(ii) Are designed, installed and used under the supervision of a qualified person, as part of a complete personal fall protection system that maintains a safety factor of at least two.

(B) 1910.140(c)(22) does not apply. The attachment point to the body belt or full body harness may be at the back, front or side D-ring.

(6) Work Clothing.

(a) Clothing must be worn which is appropriate to the work performed and conditions encountered.

(b) Appropriate high temperature protective clothing must be worn by workers who are exposed to possible contact with molten metals or other substances that can cause burns.

(c) Loose sleeves, ties, lapels, cuffs, or other loose clothing must not be worn near moving machinery.

(d) Clothing saturated or impregnated with flammable liquids, corrosive or toxic substances, irritants, or oxidizing agents must be removed immediately and not worn again until properly cleaned.

(e) Rings, wristwatches, earrings, bracelets, and other jewelry which might contact power driven machinery or electric circuitry, must not be worn.

(7) High Visibility Garments. Employees exposed to hazards caused by on highway type moving vehicles in construction zones and street/highway traffic must wear highly visible upper body garments. The colors must contrast with other colors in the area sufficiently to make the

worker stand out. Colors equivalent to strong red, strong orange, strong yellow, strong yellow-green or fluorescent versions of these colors are acceptable. During hours of darkness, the garments must also have reflective material visible from all sides for 1000 feet.

(8) Eye And Face Protection.

(a) The employer must ensure that each affected employee uses appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

(b) The employer must ensure that each affected employee uses eye protection that provides side protection when there is a hazard from flying objects. Detachable side protectors (e.g., clip-on or slide-on side shields) meeting the pertinent requirements of this section are acceptable.

(c) The employer must ensure that each affected employee who wears prescription lenses while engaged in operations that involve eye hazards wears eye protection that incorporates the prescription in its design, or shall wear eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.

(d) Eye and face PPE must be distinctly marked to facilitate identification of the manufacturer.

(e) The employer must ensure that each affected employee uses equipment with filter lenses that have a shade number appropriate for the work being performed for protection from injurious light radiation. The following is a listing of appropriate shade numbers for various operations.

Filter Lenses for Protection Against Radiant Energy

<i>Operations</i>	<i>Electrode Size 1/32 in.</i>	<i>Arc Current (amps)</i>	<i>Minimum* Protective Shade</i>
<i>Shielded metal arc welding</i>	<i>Less than 3</i>	<i>Less than 60</i>	<i>7</i>
	<i>3-5</i>	<i>60-160</i>	<i>8</i>
	<i>5-8</i>	<i>160-250</i>	<i>10</i>
	<i>More than 8</i>	<i>250-550</i>	<i>11</i>
<i>Gas metal arc welding and flux cored arc welding</i>		<i>Less than 60</i>	<i>7</i>
		<i>60-160</i>	<i>10</i>
		<i>160-250</i>	<i>10</i>
		<i>250-500</i>	<i>10</i>
<i>Gas Tungsten arc welding</i>		<i>Less than 50</i>	<i>8</i>
		<i>50-150</i>	<i>8</i>
		<i>150-500</i>	<i>10</i>
<i>Air carbon</i>	<i>(Light)</i>	<i>Less than 500</i>	<i>10</i>
<i>Arc cutting</i>	<i>(Heavy)</i>	<i>500-1000</i>	<i>11</i>
<i>Plasma arc welding</i>		<i>Less than 20</i>	<i>6</i>
		<i>20-100</i>	<i>8</i>
		<i>100-400</i>	<i>10</i>
		<i>400-800</i>	<i>11</i>
<i>Plasma arc cutting</i>	<i>(Light) **</i>	<i>Less than 300</i>	<i>8</i>
	<i>(Medium) **</i>	<i>300-400</i>	<i>9</i>
	<i>(Heavy) **</i>	<i>400-800</i>	<i>10</i>

<i>Torch brazing</i>	.....	3
<i>Torch soldering</i>	...	2
<i>Carbon arc welding</i>	.....	14
	...	
	
	...	

Filter Lenses for Protection Against Radiant Energy

<i>Operations</i>	<i>Plate thickness – inches</i>	<i>Plate thickness – mm</i>	<i>Minimum* Protective Shade</i>
<i>Gas Welding:</i>			
<i>Light</i>	<i>Under 1/8</i>	<i>Under 3.2</i>	<i>4</i>
<i>Medium</i>	<i>1/8 to 1/2</i>	<i>3.2 to 12.7</i>	<i>5</i>
<i>Heavy</i>	<i>Over 1/2</i>	<i>Over 12.7</i>	<i>6</i>
<i>Oxygen Cutting:</i>			
<i>Light</i>	<i>Under 1</i>	<i>Under 25</i>	<i>3</i>
<i>Medium</i>	<i>1 to 6</i>	<i>25 to 150</i>	<i>4</i>
<i>Heavy</i>	<i>Over 6</i>	<i>Over 150</i>	<i>5</i>

** As a rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade which gives sufficient view of the weld zone without going below the minimum. In oxy-fuel gas welding or cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line in the visible light of the (spectrum) operation.*

*** These values apply where the actual arc is clearly seen. Experience has shown that lighter filters may be used when the arc is hidden by the workpiece.*

(f) Protective eye and face protection devices must comply with any of the following consensus standards

(A) ANSI/ISEA Z87.1-2010, Occupational and Educational Personal Eye and Face Protection Devices, incorporated by reference in 1910.6;

(B) ANSI Z87.1-2003, American National Standard Practice for Occupational and Educational Eye and Face Protection, which is incorporated by reference in 1910.6; or

(C) ANSI Z87.1-1989 (R-1998), American National Standard Practice for Occupational and Educational Eye and Face Protection, which is incorporated by reference in 1910.6.

(g) Protective eye and face protection devices that the employer demonstrates are at least as effective as protective eye and face protection devices that are constructed in accordance with one of the above consensus standards will be deemed to be in compliance with the requirements of this section.

(h) Employees whose occupation or assignment requires exposure to laser beams shall be furnished laser safety goggles as required by Occupational Health Regulations which will protect for the specific wavelength of the laser and be of optical density adequate for the energy involved.

(9) Head Protection.

(a) The employer must ensure that each affected employee wears a protective helmet when working in areas where there is a potential for injury to the head from falling or flying objects.

(b) The employer must ensure that a protective helmet designed to reduce electrical shock hazard is worn by each such affected employee when near exposed electrical conductors which could contact the head.

(c) Head protection must comply with any of the following consensus standards:

(A) ANSI Z89.1-2009, American National Standard for Industrial Head Protection, which is incorporated by reference in §1910.6;

(B) ANSI Z89.1-2003, American National Standard for Industrial Head Protection, which is incorporated by reference in 1910.6; or

(C) ANSI Z89.1-1997, American National Standard for Industrial Head Protection, which is incorporated by reference in 1910.6.

(d) Head protection devices that the employer demonstrates are at least as effective as head protection devices that are constructed in accordance with one of the above consensus standards will be deemed to be in compliance with the requirements of this section.

(e) Employees who are exposed to power-driven machinery or to sources of ignition shall wear caps or other head covering which completely covers the hair.

(10) Foot Protection.

(a) The employer must ensure that each affected employee use protective footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, and where such employee's feet are exposed to electrical hazards, such as static-discharge or electric-shock hazard, that remains after the employer takes other necessary protective measures.

(b) Protective footwear must comply with any of the following consensus standards:

(A) ASTM F-2412-2005, Standard Test Methods for Foot Protection, and ASTM F-2413-2005, Standard Specification for Performance Requirements for Protective Footwear, which are incorporated by reference in 1910.6;

(B) ANSI Z41-1999, American National Standard for Personal Protection – Protective Footwear, which is incorporated by reference in 1910.6; or

(C) ANSI Z41-1991, American National Standard for Personal Protection – Protective Footwear, which is incorporated by reference in §1910.6.

(c) Protective footwear that the employer demonstrates is at least as effective as protective footwear that is constructed in accordance with one of the above consensus standards will be deemed to be in compliance with the requirements of this section.

(d) Special types or designs of shoes or foot guards are required where conditions exist that make their use necessary for the safety of workers.

(11) Leg protection

(a) Leggings or high boots of leather, rubber, or other suitable material must be worn by persons exposed to hot substances or dangerous chemical spills.

(b) Employees using chain saws must wear chaps or leg protectors that cover the leg from the upper thigh to mid-calf. The protector must be material designed to resist cuts from the chain saw. Employers must provide this protection at no cost to the employee. NOTE to 437-002-0134(11)(b): Employees working in the tree and shrub services industry must follow rules on this subject in Subdivision 2/R instead of the above.

(12) Hand Protection.

(a) Employers must select and require employees to use appropriate hand protection when employees' hands are exposed to hazards such as those from skin absorption of harmful substances; severe cuts or lacerations; severe abrasions; punctures; chemical burns; thermal burns; and harmful temperature extremes.

(b) Employers must base the selection of the appropriate hand protection on an evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use, and the hazards and potential hazards identified.

(c) Gloves must not be worn by persons whose hands are exposed to moving parts in which they could be caught.

(13) *Skin protection. Where the need for their use is necessary, protective covering, ointments, gloves, or other effective protection must be provided for and used by persons exposed to materials which are hazardous to the skin.*

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 4-2011, f. 12/8/11, ef. 12/8/11.

OR-OSHA Admin. Order 2-2013, f. 2/15/13, ef. 4/1/13.

OR-OSHA Admin. Order 3-2015, f. 10/9/15, ef. 1/1/16.

OR-OSHA Admin. Order 3-2016, f. 8/19/16, ef. 8/19/16.

OR-OSHA Admin. Order 4-2016, f. 9/7/16, ef. 9/7/16.

OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

1910.139 Reserved.

1910.140 Personal fall protection systems.

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

(b) Definitions. The following definitions apply to this section:

***Anchorage* means a secure point of attachment for equipment such as lifelines, lanyards, or deceleration devices.**

***Belt terminal* means an end attachment of a window cleaner's positioning system used for securing the belt or harness to a window cleaner's belt anchor.**

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

***Body harness* means straps that secure about the employee in a manner to distribute the fall arrest forces over at least the thighs, pelvis, waist, chest, and shoulders, with a means for attaching the harness to other components of a personal fall protection system.**

***Carabiner* means a connector generally comprised of a trapezoidal or oval shaped body with a closed gate or similar arrangement that may be opened to attach another object and, when released, automatically closes to retain the object.**

***Competent person* means a person who is capable of identifying existing and predictable hazards in any personal fall protection system or any component of it, as well as in their application and uses with related equipment, and who has authorization to take prompt, corrective action to eliminate the identified hazards.**

Connector means a device used to couple (connect) parts of the fall protection system together.

D-ring means a connector used:

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

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

(iii) In a positioning or travel restraint system as an attachment element.

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

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

Equivalent means alternative designs, equipment, materials, or methods that the employer can demonstrate will provide an equal or greater degree of safety for employees compared to the designs, equipment, materials, or methods specified in the standard.

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

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

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

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

Personal fall arrest system means a system used to arrest an employee in a fall from a walking-working surface. It consists of a body harness, anchorage, and

connector. The means of connection may include a lanyard, deceleration device, lifeline, or a suitable combination of these.

Personal fall protection system means a system (including all components) an employer uses to provide protection from falling or to safely arrest an employee's fall if one occurs. Examples of personal fall protection systems include personal fall arrest systems, positioning systems, and travel restraint systems.

Positioning system (work-positioning system) means 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 also are called "positioning system devices" and "work-positioning equipment."

Qualified describes 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 matter, the work, or the project.

Rope grab means a deceleration device that travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/lever locking, or both.

Safety factor means the ratio of the design load and the ultimate strength of the material.

Self-retracting lifeline/lanyard means a deceleration device containing a drum-wound line that can be slowly extracted from, or retracted onto, the drum under slight tension during normal movement by the employee. At the onset of a fall, the device automatically locks the drum and arrests the fall.

Snaphook means a connector comprised of a hook-shaped body with a normally closed gate, or similar arrangement that may be manually opened to permit the hook to receive an object. When released, the snaphook automatically closes to retain the object. Opening a snaphook requires two separate actions. Snaphooks are generally one of two types:

(i) Automatic-locking type (permitted) with a self-closing and self-locking gate that remains closed and locked until intentionally unlocked and opened for connection or disconnection; and

(ii) Non-locking type (prohibited) with a self-closing gate that remains closed, but not locked, until intentionally opened for connection or disconnection.

Travel restraint (tether) line means a rope or wire rope used to transfer forces from a body support to an anchorage or anchorage connector in a travel restraint system.

Travel restraint system means a combination of an anchorage, anchorage connector, lanyard (or other means of connection), and body support that an employer uses to eliminate the possibility of an employee going over the edge of a walking-working surface.

Window cleaner's belt means a positioning belt that consists of a waist belt, an integral terminal runner or strap, and belt terminals.

Window cleaner's belt anchor (window anchor) means specifically designed fall-preventing attachment points permanently affixed to a window frame or to a building part immediately adjacent to the window frame, for direct attachment of the terminal portion of a window cleaner's belt.

Window cleaner's positioning system means a system which consists of a window cleaner's belt secured to window anchors.

Work-positioning system (see Positioning system in this paragraph (b)).

(c) General requirements. The employer must ensure that personal fall protection systems meet the following requirements. Additional requirements for personal fall arrest systems and positioning systems are contained in paragraphs (d) and (e) of this section, respectively.

(1) Connectors must be drop forged, pressed or formed steel, or made of equivalent materials.

(2) Connectors must have a corrosion-resistant finish, and all surfaces and edges must be smooth to prevent damage to interfacing parts of the system.

(3) When vertical lifelines are used, each employee must be attached to a separate lifeline.

(4) Lanyards and vertical lifelines must have a minimum breaking strength of 5,000 pounds (22.2 kN).

(5) Self-retracting lifelines and lanyards that automatically limit free fall distance to 2 feet (0.61 m) or less must have components capable of sustaining a minimum tensile load of 3,000 pounds (13.3 kN) applied to the device with the lifeline or lanyard in the fully extended position.

(6) A competent person or qualified person must inspect each knot in a lanyard or vertical lifeline to ensure that it meets the requirements of paragraphs (c)(4) and (5) of this section before any employee uses the lanyard or lifeline.

(7) D-rings, snaphooks, and carabiners must be capable of sustaining a minimum tensile load of 5,000 pounds (22.2 kN).

(8) D-rings, snaphooks, and carabiners must be proof tested to a minimum tensile load of 3,600 pounds (16 kN) without cracking, breaking, or incurring permanent deformation. The gate strength of snaphooks and carabiners, must be proof tested to 3,600 lbs. (16 kN) in all directions.

(9) Snaphooks and carabiners must be the automatic locking type that require at least two separate, consecutive movements to open.

(10) Snaphooks and carabiners must not be connected to any of the following unless they are designed for such connections:

(i) Directly to webbing, rope, or wire rope;

(ii) To each other;

(iii) To a D-ring to which another snaphook, carabiner, or connector is attached;

(iv) To a horizontal life line; or

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

(11) The employer must ensure that each horizontal lifeline:

(i) Is designed, installed, and used under the supervision of a qualified person; and

(ii) Is part of a complete personal fall arrest system that maintains a safety factor of at least two.

(12) Anchorages used to attach to personal fall protection equipment must be independent of any anchorage used to suspend employees or platforms on which employees work. Anchorages used to attach to personal fall protection equipment on mobile work platforms on powered industrial trucks must be attached to an overhead member of the platform, at a point located above and near the center of the platform.

(13) Anchorages, except window cleaners' belt anchors covered by paragraph (e) of this section, must be:

(i) Capable of supporting at least 5,000 pounds (22.2 kN) for each employee attached; or

(ii) Designed, installed, and used, under the supervision of qualified person, as part of a complete personal fall protection system that maintains a safety factor of at least two.

NOTE to 1910.140(c)(13): In Oregon, the performance, care, and use criteria for travel restraint systems (personal fall restraint) is in OAR 437-002-0134(5)(b) in Division 2/I.

(14) Travel restraint lines must be capable of sustaining a tensile load of at least 5,000 pounds (22.2 kN).

(15) Lifelines must not be made of natural fiber rope. Polypropylene rope must contain an ultraviolet (UV) light inhibitor.

(16) Personal fall protection systems and their components must be used exclusively for employee fall protection and not for any other purpose, such as hoisting equipment or materials.

(17) A personal fall protection system or its components subjected to impact loading must be removed from service immediately and not used again until a competent person inspects the system or components and determines that it is not damaged and safe for use for employee personal fall protection.

(18) Personal fall protection systems must be inspected before initial use during each workshift for mildew, wear, damage, and other deterioration, and defective components must be removed from service.

(19) Ropes, belts, lanyards, and harnesses used for personal fall protection must be compatible with all connectors used.

(20) Ropes, belts, lanyards, lifelines, and harnesses used for personal fall protection must be protected from being cut, abraded, melted, or otherwise damaged.

(21) The employer must provide for prompt rescue of each employee in the event of a fall.

(22) Personal fall protection systems must be worn with the attachment point of the body harness located in the center of the employee's back near shoulder level. The attachment point may be located in the pre-sternal position if the free fall distance is limited to 2 feet (0.6 m) or less.

NOTE to 1910.140(c)(22): In Oregon, the performance, care, and use criteria for travel restraint systems (personal fall restraint) is in OAR 437-002-0134(5)(b) in Division 2/I.

(d) Personal fall arrest systems

(1) System performance criteria. In addition to the general requirements in paragraph (c) of this section, the employer must ensure that personal fall arrest systems:

(i) Limit the maximum arresting force on the employee to 1,800 pounds (8 kN);

(ii) Bring the employee to a complete stop and limit the maximum deceleration distance the employee travels to 3.5 feet (1.1 m);

(iii) Have sufficient strength to withstand twice the potential impact energy of the employee free falling a distance of 6 feet (1.8 m), or the free fall distance permitted by the system; and

(iv) Sustain the employee within the system/strap configuration without making contact with the employee's neck and chin area.

(v) If the personal fall arrest system meets the criteria and protocols in appendix D of this subpart, and is being used by an employee having a combined body and tool weight of less than 310 pounds (140 kg), the system is considered to be in compliance with the provisions of paragraphs (d)(1)(i) through (iii) of this section. If the system is used by an employee having a combined body and tool weight of 310 pounds (140kg) or more and the employer has appropriately modified the criteria and protocols in appendix D, then the system will be deemed to be in compliance with the requirements of paragraphs (d)(1)(i) through (iii).

(2) System use criteria. The employer must ensure that:

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

(ii) Personal fall arrest systems are rigged in such a manner that the employee cannot free fall more than 6 feet (1.8 m) or contact a lower level. A free fall may be more than 6 feet (1.8 m) provided the employer can demonstrate the manufacturer designed the system to allow a free fall of more than 6 feet and tested the system to ensure a maximum arresting force of 1,800 pounds (8 kN) is not exceeded.

(3) Body belts. Body belts are prohibited as part of a personal fall arrest system.

(e) Positioning systems

(1) System performance requirements. The employer must ensure that each positioning system meets the following requirements:

(i) General. All positioning systems, except window cleaners' positioning systems, are capable of withstanding, without failure, a drop test consisting of a 4-foot (1.2-m) drop of a 250-pound (113-kg) weight;

(ii) Window cleaners' positioning systems. All window cleaners' positioning systems must:

(A) Be capable of withstanding without failure a drop test consisting of a 6-foot (1.8-m) drop of a 250-pound (113-kg) weight; and

(B) Limit the initial arresting force on the falling employee to not more than 2,000 pounds (8.9 kN), with a duration not exceeding 2 milliseconds and any subsequent arresting forces to not more than 1,000 pounds (4.5 kN).

(iii) Positioning systems, including window cleaners' positioning systems, that meet the test methods and procedures in appendix D of this subpart are considered to be in compliance with paragraphs (e)(1)(i) and (ii).

(iv) Lineman's body belt and pole strap systems. Lineman's body belt and pole strap systems must meet the following tests:

(A) A dielectric test of 819.7 volts, AC, per centimeter (25,000 volts per foot) for 3 minutes without visible deterioration;

(B) A leakage test of 98.4 volts, AC, per centimeter (3,000 volts per foot) with a leakage current of no more than 1 mA; and

(C) A flammability test in accordance with Table I-7 of this section.

Test Method	Criteria for Passing Test
1. Vertically suspend a 19.7-inch (500-mm) length of strapping supporting a 220.5-lb (100-kg) weight;	Any flames on the positioning strap must self-extinguish. The positioning strap must continue to support the 220.5-lb (100-kg) mass.
2. Use a butane or propane burner with a 3-inch (76-mm) flame;	
3. Direct the flame to an edge of the strapping at a distance of 1 inch (25mm);	
4. Remove the flame after 5 seconds; and	
5. Wait for any flames on the positioning strap to stop burning.	

(2) System use criteria for window cleaners' positioning systems. The employer must ensure that window cleaners' positioning systems meet and are used in accordance with the following:

(i) Window cleaners' belts are designed and constructed so that:

(A) Belt terminals will not pass through their fastenings on the belt or harness if a terminal comes loose from the window anchor; and

(B) The length of the runner from terminal tip to terminal tip is 8 feet (2.44 m) or less;

(ii) Window anchors to which belts are fastened are installed in the side frames or mullions of the window at a point not less than 42 inches (106.7 cm) and not more than 51 inches (129.5 cm) above the window sill;

(iii) Each window anchor is capable of supporting a minimum load of 6,000 pounds (26.5 kN);

(iv) Use of installed window anchors for any purpose other than attaching the window cleaner's belt is prohibited;

(v) A window anchor that has damaged or deteriorated fastenings or supports is removed, or the window anchor head is detached so the anchor cannot be used;

(vi) Rope that has wear or deterioration that affects its strength is not used;

(vii) Both terminals of the window cleaner's belt are attached to separate window anchors during any cleaning operation;

(viii) No employee works on a window sill or ledge on which there is snow, ice, or any other slippery condition, or one that is weakened or rotted;

(ix) No employee works on a window sill or ledge unless:

(A) The window sill or ledge is a minimum of 4 inches (10 cm) wide and slopes no more than 15 degrees below horizontal; or

(B) The 4-inch minimum width of the window sill or ledge is increased 0.4 inches (1 cm) for every degree the sill or ledge slopes beyond 15 degrees, up to a maximum of 30 degrees;

(x) The employee attaches at least one belt terminal to a window anchor before climbing through the window opening, and keeps at least one terminal attached until completely back inside the window opening;

(xi) Except as provided in paragraph (e)(2)(xii) of this section, the employee travels from one window to another by returning inside the window opening and repeating the belt terminal attachment procedure at each window in accordance with paragraph (e)(2)(x) of this section;

(xii) An employee using a window cleaner's positioning system may travel from one window to another while outside of the building, provided:

(A) At least one belt terminal is attached to a window anchor at all times;

(B) The distance between window anchors does not exceed 4 feet (1.2 m) horizontally. The distance between windows may be increased up to 6 feet (1.8 m) horizontally if the window sill or ledge is at least 1 foot (0.31 m) wide and the slope is less than 5 degrees;

(C) The sill or ledge between windows is continuous; and

(D) The width of the window sill or ledge in front of the mullions is at least 6 inches (15.2 cm) wide.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

Appendix C to Subpart I of Part 1910 – Personal Fall Protection Systems Non-Mandatory Guidelines.

The following information generally applies to all personal fall protection systems and is intended to assist employers and employees comply with the requirements of § 1910.140 for personal fall protection systems.

(a) Planning considerations. It is important for employers to plan prior to using personal fall protection systems. Probably the most overlooked component of planning is locating suitable anchorage points. Such planning should ideally be done before the structure or building is constructed so that anchorage points can be used later for window cleaning or other building maintenance.

(b) Selection and use considerations.

(1) The kind of personal fall protection system selected should be appropriate for the employee's specific work situation. Free fall distances should always be kept to a minimum. Many systems are designed for particular work applications, such as climbing ladders and poles; maintaining and servicing equipment; and window cleaning. Consideration should be given to the environment in which the work will be performed. For example, the presence of acids, dirt, moisture, oil, grease, or other substances, and their potential effects on the system selected, should be evaluated. The employer should fully evaluate the work conditions and environment (including seasonal weather changes) before selecting the appropriate personal fall protection system. Hot or cold environments may also affect fall protection systems. Wire rope should not be used where electrical hazards are anticipated. As required by § 1910.140(c)(21), the employer must provide a means for promptly rescuing an employee should a fall occur.

(2) Where lanyards, connectors, and lifelines are subject to damage by work operations, such as welding, chemical cleaning, and sandblasting, the component should be protected, or other securing systems should be used. A program for cleaning and maintaining the system may be necessary.

(c) Testing considerations. Before purchasing a personal fall protection system, an employer should insist that the supplier provide information about its test performance (using recognized test methods) so the employer will know that the system meets the criteria in § 1910.140. Otherwise, the employer should test the equipment to ensure that it is in compliance. Appendix D to this subpart contains test methods which are recommended for evaluating the performance of any system. There are some circumstances in which an employer can evaluate a system based on data and calculations derived from the testing of similar systems. Enough information must be available for the employer to demonstrate that its system and the tested system(s) are similar in both function and design.

(d) Component compatibility considerations. Ideally, a personal fall protection system is designed, tested, and supplied as a complete system. However, it is common practice for lanyards, connectors, lifelines, deceleration devices, body belts, and body harnesses to be interchanged since some components wear out before others. Employers and

employees should realize that not all components are interchangeable. For instance, a lanyard should not be connected between a body harness and a deceleration device of the self-retracting type (unless specifically allowed by the manufacturer) since this can result in additional free fall for which the system was not designed. In addition, positioning components, such as pole straps, ladder hooks and rebar hooks, should not be used in personal fall arrest systems unless they meet the appropriate strength and performance requirements of part 1910 (e.g., §§ 1910.140, 1910.268 and 1910.269). Any substitution or change to a personal fall protection system should be fully evaluated or tested by a competent person to determine that it meets applicable OSHA standards before the modified system is put in use. Also, OSHA suggests that rope be used according to manufacturers' recommendations, especially if polypropylene rope is used.

NOTE to Paragraph (d) of Appendix C to Subpart I of 1910.140: In Oregon, 1910.269 was repealed. Instead, see Division 2/RR, Electrical Power Generation, Transmission, and Distribution.

(e) Employee training considerations. As required by §§ 1910.30 and 1910.132, before an employee uses a fall protection system, the employer must ensure that he or she is trained in the proper use of the system. This may include the following: The limits of the system; proper anchoring and tie-off techniques; estimating free fall distance, including determining elongation and deceleration distance; methods of use; and inspection and storage. Careless or improper use of fall protection equipment can result in serious injury or death. Employers and employees should become familiar with the material in this standard and appendix, as well as manufacturers' recommendations, before a system is used. It is important for employees to be aware that certain tie-offs (such as using knots and tying around sharp edges) can reduce the overall strength of a system. Employees also need to know the maximum permitted free fall distance. Training should stress the importance of inspections prior to use, the limitations of the equipment to be used, and unique conditions at the worksite that may be important.

NOTE to Paragraph (e) of Appendix C to Subpart I of 1910.140: In Oregon, 1910.132 was repealed. Instead, see Division 2/I, Personal Protective Equipment.

(f) Instruction considerations. Employers should obtain comprehensive instructions from the supplier or a qualified person as to the system's proper use and application, including, where applicable:

(1) The force measured during the sample force test;

(2) The maximum elongation measured for lanyards during the force test;

(3) The deceleration distance measured for deceleration devices during the force test;

(4) Caution statements on critical use limitations;

(5) Limits of the system;

(6) Proper hook-up, anchoring and tie-off techniques, including the proper D-ring or other attachment point to use on the body harness;

(7) Proper climbing techniques;

(8) Methods of inspection, use, cleaning, and storage; and

(9) Specific lifelines that may be used.

(g) Inspection considerations. Personal fall protection systems must be inspected before initial use in each workshift. Any component with damage, such as a cut, tear, abrasion, mold, or evidence of undue stretching, an alteration or addition that might affect its effectiveness, damage due to deterioration, fire, acid, or other corrosive damage, distorted hooks or faulty hook springs, tongues that are unfitted to the shoulder of buckles, loose or damaged mountings, nonfunctioning parts, or wear, or internal deterioration must be removed from service immediately, and should be tagged or marked as unusable, or destroyed. Any personal fall protection system, including components, subjected to impact loading must be removed from service immediately and not used until a competent person inspects the system and determines that it is not damaged and is safe to use for personal fall protection.

(h) Rescue considerations. As required by § 1910.140(c)(21), when personal fall arrest systems are used, special consideration must be given to rescuing an employee promptly should a fall occur. The availability of rescue personnel, ladders, or other rescue equipment needs to be evaluated since there may be instances in which employees cannot self-rescue (e.g., employee unconscious or seriously injured). In some situations, equipment allowing employees to rescue themselves after the fall has been arrested may be desirable, such as devices that have descent capability.

(i) Tie-off considerations. Employers and employees should at all times be aware that the strength of a personal fall arrest system is based on its being attached to an anchoring system that can support the system. Therefore, if a means of attachment is used that will reduce the strength of the system (such as an eye-bolt/snaphook anchorage), that component should be replaced by a stronger one that will also maintain the appropriate maximum deceleration characteristics. The following is a listing of some situations in which employers and employees should be especially cautious:

(1) Tie-off using a knot in the lanyard or lifeline (at any location). The strength of the line can be reduced by 50 percent or more if a knot is used. Therefore, a stronger lanyard or lifeline should be used to compensate for the knot, or the lanyard length should be reduced (or the tie-off location raised) to minimize free fall distance, or the lanyard or lifeline should be replaced by one which has an appropriately incorporated connector to eliminate the need for a knot.

(2) Tie-off around rough or sharp (e.g., “H” or “I” beams) surfaces. Sharp or rough surfaces can damage rope lines and this reduces strength of the system drastically. Such tie-offs should be avoided whenever possible. An alternate means should be used such as a snaphook/D-ring connection, a tieoff apparatus (steel cable tie-off), an effective padding of the surfaces, or an abrasion-resistant strap around the supporting member. If these alternative means of tie-off are not available, the employer should try to minimize the potential free fall distance.

(3) Knots. Sliding hitch knots should not be used except in emergency situations. The one-and-one sliding hitch knot should never be used because it is unreliable

in stopping a fall. The two-and-two, or three-and-three knots (preferable) may be used in emergency situations; however, care should be taken to limit free fall distances because of reduced lifeline/lanyard strength. OSHA requires that a competent or qualified person inspect each knot in a lanyard or vertical lifeline to ensure it meets the strength requirements in § 1910.140.

(j) Horizontal lifelines. Horizontal lifelines, depending on their geometry and angle of sag, may be subjected to greater loads than the impact load imposed by an attached component. When the angle of horizontal lifeline sag is less than 30 degrees, the impact force imparted to the lifeline by an attached lanyard is greatly amplified. For example, with a sag angle of 15 degrees the force amplification is about 2:1, and at 5 degrees sag it is about 6:1. Depending on the angle of sag, and the line's elasticity, the strength of the horizontal lifeline, and the anchorages to which it is attached should be increased a number of times over that of the lanyard. Extreme care should be taken in considering a horizontal lifeline for multiple tie-offs. If there are multiple tie-offs to a horizontal lifeline, and one employee falls, the movement of the falling employee and the horizontal lifeline during arrest of the fall may cause other employees to fall. Horizontal lifeline and anchorage strength should be increased for each additional employee to be tied-off. For these and other reasons, the systems using horizontal lifelines must be designed only by qualified persons. OSHA recommends testing installed lifelines and anchors prior to use. OSHA requires that horizontal lifelines are designed, installed and used under the supervision of a qualified person.

(k) Eye-bolts. It must be recognized that the strength of an eye-bolt is rated along the axis of the bolt, and that its strength is greatly reduced if the force is applied at right angles to this axis (in the direction of its shear strength). Care should also be exercised in selecting the proper diameter of the eye to avoid creating a roll-out hazard (accidental disengagement of the snaphook from the eyebolt).

(l) Vertical lifeline considerations. As required by § 1910.140(c)(3), each employee must have a separate lifeline when the lifeline is vertical. If multiple tie-offs to a single lifeline are used, and one employee falls, the movement of the lifeline during the arrest of the fall may pull other employees' lanyards, causing them to fall as well.

(m) Snaphook and carabiner considerations. As required by § 1910.140(c)(10), the following connections must be avoided unless the locking snaphook or carabiner has been designed for them because they are conditions that can result in rollout:

(1) Direct connection to webbing, rope, or a horizontal lifeline;

(2) Two (or more) snaphooks or carabiners connected to one D-ring;

(3) Two snaphooks or carabiners connected to each other;

(4) Snaphooks or carabiners connected directly to webbing, rope, or wire rope;
and

(5) Improper dimensions of the D-ring, rebar, or other connection point in relation to the snaphook or carabiner dimensions which would allow the gate to be depressed by a turning motion.

(n) Free fall considerations. Employers and employees should always be aware that a system's maximum arresting force is evaluated under normal use conditions established by the manufacturer. OSHA requires that personal fall arrest systems be rigged so an employee cannot free fall in excess of 6 feet (1.8 m). Even a few additional feet of free fall can significantly increase the arresting force on the employee, possibly to the point of causing injury and possibly exceeding the strength of the system. Because of this, the free fall distance should be kept to a minimum, and, as required by § 1910.140(d)(2), must never be greater than 6 feet (1.8 m). To assure this, the tie-off attachment point to the lifeline or anchor should be located at or above the connection point of the fall arrest equipment to the harness. (Otherwise, additional free fall distance is added to the length of the connecting means (i.e., lanyard)). Tying off to the walking-working surface will often result in a free fall greater than 6 feet (1.8 m). For instance, if a 6-foot (1.8-m) lanyard is used, the total free fall distance will be the distance from the walking-working level to the harness connection plus the 6 feet (1.8 m) of lanyard.

(o) Elongation and deceleration distance considerations. During fall arrest, a lanyard will stretch or elongate, whereas activation of a deceleration device will result in a certain stopping distance. These distances should be available with the lanyard or device's instructions and must be added to the free fall distance to arrive at the total fall distance before an employee is fully stopped. The additional stopping distance may be significant if the lanyard or deceleration device is attached near or at the end of a long lifeline, which may itself add considerable distance due to its own elongation. As required by § 1910.140(d)(2), sufficient distance to allow for all of these factors must also be maintained between the employee and obstructions below, to prevent an injury due to impact before the system fully arrests the fall. In addition, a minimum of 12 feet (3.7 m) of lifeline should be allowed below the securing point of a rope-grab-type deceleration device, and the end terminated to prevent the device from sliding off the lifeline. Alternatively, the lifeline should extend to the ground or the next working level below. These measures are suggested to prevent the employee from inadvertently moving past the end of the lifeline and having the rope grab become disengaged from the lifeline.

(p) Obstruction considerations. In selecting a location for tie-off, employers and employees should consider obstructions in the potential fall path of the employee. Tieoffs that minimize the possibilities of exaggerated swinging should be considered.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

Appendix D to Subpart I of Part 1910 – Test Methods and Procedures for Personal Fall Protection Systems Non-Mandatory Guidelines

This appendix contains test methods for personal fall protection systems which may be used to determine if they meet the system performance criteria specified in paragraphs (d) and (e) of § 1910.140.

Test methods for personal fall arrest systems (paragraph (d) of § 1910.140).

(a) General. The following sets forth test procedures for personal fall arrest systems as defined in paragraph (d) of § 1910.140.

(b) General test conditions.

(1) Lifelines, lanyards and deceleration devices should be attached to an anchorage and connected to the body harness in the same manner as they would be when used to protect employees.

(2) The fixed anchorage should be rigid, and should not have a deflection greater than 0.04 inches (1 mm) when a force of 2,250 pounds (10 kN) is applied.

(3) The frequency response of the load measuring instrumentation should be 120 Hz.

(4) The test weight used in the strength and force tests should be a rigid, metal cylindrical or torso-shaped object with a girth of 38 inches plus or minus 4 inches (96 cm plus or minus 10 cm).

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

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

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

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

(c) Strength test.

(1) During the testing of all systems, a test weight of 300 pounds plus or minus 3 pounds (136.4 kg plus or minus 1.4 kg) should be used. (See paragraph (b)(4) of this appendix.)

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

(3) For lanyard systems, the lanyard length should be 6 feet plus or minus 2 inches (1.83 m plus or minus 5 cm) as measured from the fixed anchorage to the attachment on the body harness.

(4) For rope-grab-type deceleration systems, the length of the lifeline above the centerline of the grabbing mechanism to the lifeline's anchorage point should not exceed 2 feet (0.61 m).

(5) For lanyard systems, for systems with deceleration devices which do not automatically limit free fall distance to 2 feet (0.61 m) or less, and for systems with

deceleration devices which have a connection distance in excess of 1 foot (0.3 m) (measured between the centerline of the lifeline and the attachment point to the body harness), the test weight should be rigged to free fall a distance of 7.5 feet (2.3 m) from a point that is 1.5 feet (46 cm) above the anchorage point, to its hanging location (6 feet (1.83 m) below the anchorage). The test weight should fall without interference, obstruction, or hitting the floor or ground during the test. In some cases a non-elastic wire lanyard of sufficient length may need to be added to the system (for test purposes) to create the necessary free fall distance.

(6) For deceleration device systems with integral lifelines or lanyards that automatically limit free fall distance to 2 feet (0.61 m) or less, the test weight should be rigged to free fall a distance of 4 feet (1.22 m).

(7) Any weight that detaches from the harness should constitute failure for the strength test.

(d) Force test.

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

(2) For lanyard systems.

(i) A test weight of 220 pounds plus or minus three pounds (100 kg plus or minus 1.6 kg) should be used. (See paragraph (b)(4) of this appendix.)

(ii) Lanyard length should be 6 feet plus or minus 2 inches (1.83 m plus or minus 5 cm) as measured from the fixed anchorage to the attachment on the body harness.

(iii) The test weight should fall free from the anchorage level to its hanging location (a total of 6 feet (1.83 m) free fall distance) without interference, obstruction, or hitting the floor or ground during the test.

(3) For all other systems.

(i) A test weight of 220 pounds plus or minus 2 pounds (100 kg plus or minus 1.0 kg) should be used. (See paragraph (b)(4) of this appendix.)

(ii) The free fall distance to be used in the test should be the maximum fall distance physically permitted by the system during normal use conditions, up to a maximum free fall distance for the test weight of 6 feet (1.83 m), except as follows:

(A) For deceleration systems having a connection link or lanyard, the test weight should free fall a distance equal to the connection distance (measured between the centerline of the lifeline and the attachment point to the body harness).

(B) For deceleration device systems with integral lifelines or lanyards that automatically limit free fall distance to 2 feet (0.61 m) or less, the test weight should free fall a distance equal to that permitted by the system in normal use. (For example, to test a system with a self-retracting lifeline or lanyard, the test weight should be supported and the system allowed to retract the lifeline or lanyard as it would in normal use. The test weight would then be released and the force and deceleration distance measured).

(4) Failure. A system fails the force test when the recorded maximum arresting force exceeds 2,520 pounds (11.2 kN) when using a body harness.

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

(e) Deceleration device tests.

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

(2) Rope-grab-type deceleration devices.

(i) Devices should be moved on a lifeline 1,000 times over the same length of line a distance of not less than 1 foot (30.5 cm), and the mechanism should lock each time.

(ii) Unless the device is permanently marked to indicate the type of lifelines that must be used, several types (different diameters and different materials), of lifelines should be used to test the device.

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

Test methods for positioning systems (paragraph (e) of § 1910.140).

(a) General. The following sets forth test procedures for positioning systems as defined in paragraph (e) of § 1910.140. The requirements in this appendix for personal fall arrest systems set forth procedures that may be used, along with the procedures listed below, to determine compliance with the requirements for positioning systems.

(b) Test conditions.

(1) The fixed anchorage should be rigid and should not have a deflection greater than 0.04 inches (1 mm) when a force of 2,250 pounds (10 kN) is applied.

(2) For window cleaners' belts, the complete belt should withstand a drop test consisting of a 250 pound (113 kg) weight falling free for a distance of 6 feet (1.83 m). The weight should be a rigid object with a girth of 38 inches plus or minus 4

inches (96 cm plus or minus 10 cm). The weight should be placed in the waistband with the belt buckle drawn firmly against the weight, as when the belt is worn by a window cleaner. One belt terminal should be attached to a rigid anchor and the other terminal should hang free. The terminals should be adjusted to their maximum span. The weight fastened in the freely suspended belt should then be lifted exactly 6 feet (1.83 m) above its “at rest” position and released so as to permit a free fall of 6 feet (1.83 m) vertically below the point of attachment of the terminal anchor. The belt system should be equipped with devices and instrumentation capable of measuring the duration and magnitude of the arrest forces. Failure of the test should consist of any breakage or slippage sufficient to permit the weight to fall free of the system. In addition, the initial and subsequent arresting forces should be measured and should not exceed 2,000 pounds (8.5 kN) for more than 2 milliseconds for the initial impact, or exceed 1,000 pounds (4.5 kN) for the remainder of the arrest time.

(3) All other positioning systems (except for restraint line systems) should withstand a drop test consisting of a 250 pound (113 kg) weight free falling a distance of 4 feet (1.2 m). The weight must be a rigid object with a girth of 38 inches plus or minus 4 inches (96 cm plus or minus 10 cm). The body belt or harness should be affixed to the test weight as it would be to an employee. The system should be connected to the rigid anchor in the manner that the system would be connected in normal use. The weight should be lifted exactly 4 feet (1.2 m) above its “at rest” position and released so as to permit a vertical free fall of 4 feet (1.2 m). Failure of the system should be indicated by any breakage or slippage sufficient to permit the weight to fall free to the ground.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

Division 2/L, Fire Protection

437-002-0182 Oregon Rules for Firefighters.

(1) *Scope and Application.* These rules apply to public and private employers who engage in structural fire service activities, including emergency first response.

Note: Employers subject to 437-002-0182 must comply with provisions of other applicable Oregon OSHA safety and health rules.

(2) *Exceptions.* These rules do not apply to the following firefighting activities:

(a) *Private industry fire brigades covered under 1910.156, Division 2/L, Fire Protection.*

(b) *Forest and uncultivated wildland firefighting covered under Division 7/N, Wildland Fire Suppression and Prescribed Fire.*

(c) *Marine firefighting and rescue covered under CFR title 33, Navigation and Navigable Waters.*

(d) *Aircraft firefighting and rescue covered under CFR title 49, Transportation.*

Note: Structural fire protection services who engage in activities listed under 437-002-0182(2)(a) through (d), must also comply with the applicable standard for the activity.

(3) *Definitions.*

Aerial device – An aerial ladder, elevating platform, aerial ladder platform, or water tower that is designed to position personnel, handle materials, provide egress and discharge water.

ANSI – American National Standards Institute.

Apparatus – A mobile piece of firefighting equipment such as pumper, water tender, etc.

Certified – Attested or confirmed in a formal written statement, or someone or something officially recognized as possessing certain qualifications or meeting certain standards.

Confined space – A space that meets all of the following:

Large enough and so configured that an employee can fully enter the space and perform work; and

Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and

Is not designed for continuous occupancy.

Designee – A person who has been officially chosen to do or be something.

DOT – Department of Transportation.

DPSST – Department of Public Safety Standards and Training.

Drill tower – A structure, which may or may not be attached to the station, that is over two stories high and primarily used for non-classroom firefighter training in fire service techniques.

Emergency incident – Any situation where a fire department delivers emergency services, rescue, fire suppression, medical treatment, and other forms of hazard control and mitigation.

Emergency scene – The site where the suppression of a fire or the emergency exists.

Enclosed structure – A structure with a roof or ceiling and at least two walls which may present fire hazards to employees, such as accumulations of smoke, toxic gases and heat, similar to those found in buildings.

Firefighter – A person involved in performing fire department duties and responsibilities, including fire suppression, who may be a career or volunteer member of a fire department and may occupy any position or rank within the fire department.

Fire ground – An emergency scene or location where firefighting or live fire training activities occur.

Fire training – Training received by firefighters to maintain proficiency in performing their assigned duties.

Hazardous material incident – The accidental release of hazardous materials from their containers.

Helmet – An element of the protective ensemble designed to provide minimum protection to the user's head against impact, flying or falling objects, electric shock, penetration, heat, and flame.

Hose tower – A vertical structure where a hose is hung to dry.

IFSTA – International Fire Service Training Association.

IMS – Incident Management System. Also referred to as an Incident Command System (ICS).

Immediately dangerous to life or health (IDLH) – An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Incipient stage fire – A fire which is in the initial or beginning stage and which can be controlled or extinguished by portable fire extinguishers, Class II standpipe or small hose systems without the need for protective clothing or breathing apparatus.

Interior structural firefighting – The physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage.

Live fire training – Any fire set within a structure, tank, pipe, pan, etc., under controlled conditions to facilitate firefighter training under actual fire conditions.

NFPA – National Fire Protection Association.

NIOSH – National Institute of Occupational Safety and Health.

Private Industry Fire Brigades – A group of employees who are required to fight interior structural fires at their place of employment.

Protective ensemble – The clothing and personal protective equipment worn to provide limited protection to the user's head, body, and extremities from thermal, physical, chemical, and health hazards. Protective ensemble elements include firefighting coats and trousers, helmets, hoods, gloves, footwear, eye and face protection devices, and respirators.

Qualified – Certified as being trained to perform a particular job or activity.

Respirators –

Atmosphere-supplying respirator is a respirator that supplies the user with air from a source independent of the ambient atmosphere and includes supplied-air respirators (SARS) and self-contained breathing apparatus (SCBA) units.

Air-purifying respirator is a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

Positive pressure demand respirator is a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

Pressure-demand respirator is a positive pressure atmosphere-supplying respirator that admits air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

Self-Contained Breathing Apparatus SCBA is a self-contained breathing apparatus designed to provide the wearer with a supply of respirable air carried in and generated by the breathing apparatus. This apparatus requires no intake of oxygen from the outside atmosphere and can be designed to be a demand or pressure-demand type respirator.

Supplied-air respirator (SAR) or airline respirator is an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

Responder – A certified person who has the responsibility to respond to an emergency incident.

Station (Fire station) – Structure to house the fire service apparatus and personnel.

Tailboard – Standing space at rear of a fire apparatus where firefighters stand to access and reload hose and/or equipment.

Training – Instruction with hands-on practice in the operation of equipment, including respiratory protection equipment, that is expected to be used and in the performance of assigned duties.

Warning light – A flashing or rotating light.

(4) Organizational statement.

(a) The employer must develop and implement a written statement or policy that includes basic organizational structure, basic functions of the organization, and type, amount, and frequency of training to be provided.

(b) This statement must be made available for inspection by Oregon OSHA and by fire department employees or their designated representatives.

(5) Personnel.

(a) The employer must review and evaluate the physical capability of each firefighter annually to determine their ability to perform duties that may be assigned. The review and evaluation will be accomplished through physical examination, stress testing, or satisfactory performance demonstrated during the performance of their assigned duties.

(b) The employer must not permit a firefighter with a known medical condition that would significantly impair their ability to engage in fire suppression activities at the emergency scene unless a physician's certificate of the firefighter's fitness to participate in such activities is provided to the employer. This will not limit the employer's ability to assign firefighters to support activities (versus fire suppression activities).

(6) Employer's Responsibility.

(a) Each employer must comply with the provisions of this Division to protect the life, safety, and health of employees.

(b) It is the responsibility of the employer to establish and supervise:

(A) A safe and healthful working environment, as it applies to nonemergency conditions or to emergency conditions at the scene after the incident has been terminated, as determined by the officer in charge.

(B) Programs for training employees in the fundamentals of accident prevention.

(C) A safe and healthful working environment as it applies to live fire training exercises.

(c) The employer must maintain all equipment in a safe condition.

(d) The employer must ensure that firefighters who participate in exempted firefighting activities listed under 437-002-0182(2) are properly trained, protected, clothed, and equipped for the known hazards of that particular emergency operation.

(7) Employee's Responsibility.

(a) Each firefighter must comply with the requirements of 437-002-0182 that are applicable to their own actions and conduct in the course of their employment.

(b) Firefighters must notify the appropriate employer or safety committee representative of unsafe practices, equipment, or workplace conditions.

(c) All firefighters, at regularly scheduled times, must attend required training and orientation programs designed to increase their competency in occupational safety and health.

(d) Firefighters and other employees must apply the principles of accident prevention in their work. They must use all required safety devices and protective equipment.

(e) Each firefighter must take proper care of their protective equipment.

(f) Firefighters who are expected to perform firefighting operations must notify their employer when health conditions arise that will limit their capability of performing those duties.

(8) Safety Committee.

(a) Fire departments must have a separate safety committee or hold safety meetings according to the requirements of Division 1, 437-001-0765, Safety Committees and Safety Meetings.

(b) When applicable, the representation on the safety committee must include both career and volunteer firefighters.

(9) Incident Management.

(a) The employer must develop and implement written procedures for incident management that meets the requirement of NFPA 1561 (2008): Standard on Emergency Services Incident Management System.

(b) These procedures must apply to all employees involved in emergency operations.

(c) Each employee involved in emergency operations must be familiar with these procedures.

(10) Accountability. The employer must develop and implement written procedures for a personnel accountability system that meets the requirement of NFPA 1561 (2008): Standard on Emergency Services Incident Management System.

(11) Firefighting Education and Training.

(a) The employer must develop and implement a policy for appropriately educating and training all department firefighting classifications (ranks) before they perform assigned duties.

(b) Firefighters who participate in interior structural firefighting activities must be trained according to NFPA 1001 (2013): Standard for Fire Fighter Professional Qualifications (Fire Fighter I), or they must meet the training levels required under 437-002-0182(11)(c) and be under the direct supervision of a firefighter trained to NFPA Fire Fighter I or higher.

Note: Department of Public Safety Standards and Training (DPSST) certification for NFPA Fire Fighter I or higher satisfies the training requirement in 437-002-0182(11)(b) but is not required by these rules.

(c) Firefighters who participate in live fire training in a structure, or only in structural firefighting activities not covered under 437-002-0182(11)(b), must be trained to meet the minimum job performance requirements for NFPA Fire Fighter I as prescribed by NFPA 1403 (2012): Standard on Live Fire Training Evolutions (Student Prerequisites).

(d) All live fire training must be conducted following the requirements of NFPA 1403 (2012): Standard on Live Fire Training Evolutions, or Appendix A (Mandatory), Minimum Requirements for Live Fire Training, of this standard.

(e) Live fire training must be conducted under the direction of the fire department's training officer or employer authorized representative.

(12) General Requirements for Protective Ensembles.

(a) Protective ensembles must protect the user's head, body, and extremities. Protective ensembles consist of the following elements: body protection; head protection; hand protection; foot and leg protection; eye and face protection; and respiratory protection.

Note: Employees must be protected from noise that exceeds the levels in Division 2/G, 1910.95, Occupational Noise Exposure.

(b) The employer must provide employees all protective ensemble elements at no cost to employees. The employer must not allow employee-owned protective ensemble elements that do not comply with the requirements under 437-002-0182(13) through (18) to be used for structural firefighting. See Appendix B (Non-mandatory), General Information and Recommendations, of this standard.

(c) Employees must wear all appropriate protective ensembles elements that meet the requirements under 437-002-0182(13) through (18) when engaged in interior structural firefighting.

(d) In situations other than interior structural firefighting, employees must wear the appropriate protective ensemble elements for the known hazards of that particular emergency operation.

(13) Body Protection. All structural firefighting coats and trousers must be at least equivalent to the requirements of NFPA 1971 (1991): Standard on Protective Clothing for Structural Fire Fighting. Structural firefighting coats and trousers purchased on or after July 1, 2016, must be at least equivalent to the requirements of NFPA 1971 (2013): Standard on Protective Ensemble for Structural Fire Fighting.

(14) Head Protection.

(a) All structural firefighting helmets must be at least equivalent to the requirements of NFPA 1971 (2000): Standard on Protective Ensemble for Structural Firefighting. Structural firefighting helmets purchased on or after July 1, 2016, must be at least equivalent to the requirements of NFPA 1971 (2013): Standard on Protective Ensemble for Structural Fire Fighting.

(b) Structural firefighting helmets must consist of a rigid shell; an energy absorbing system; a retention system; florescent and retroreflective trim; ear covers; and either a faceshield or goggles, or both.

(c) Use, care, alterations, and maintenance instructions for protective headgear must be supplied for each helmet.

(d) Care, maintenance, and alteration of helmets must conform to the manufacturer's recommendations.

(e) During structural firefighting, helmet accessories designed to provide or maintain protection from health and safety hazards must be worn in the manufacturer's recommended position. See Appendix B (Non-mandatory), General Information and Recommendations, of this standard.

(f) All flame-resistant protective hoods must be at least equivalent to the requirements of NFPA 1971 (1997): Standard on Protective Ensembles for Structural Fire Fighting. Flame-resistant protective hoods purchased on or after July 1, 2016, must be at least equivalent to the requirements of NFPA 1971 (2013): Standard on Protective Ensemble for Structural Fire Fighting.

(g) A flame-resistant protective hood that will not adversely affect the seal of a respirator facepiece must be worn during interior structural firefighting operations to protect the sides of the face and hair.

(15) Hand Protection.

(a) All structural firefighting hand protection must be at least equivalent to the requirements of NFPA 1973 (1988): Standard on Gloves for Structural Fire Fighting. Structural firefighting hand protection purchased on or after July 1, 2016, must be at least equivalent to the requirements of NFPA 1971 (2013): Standard on Protective Ensemble for Structural Fire Fighting.

(b) Hand protection for structural firefighting activities must consist of protective gloves or glove system that will provide protection against cut, puncture, and heat penetration.

(16) Foot and Leg Protection.

(a) All structural firefighting protective footwear must be at least equivalent to the requirements of NFPA 1971 (1997): Standard on Protective Ensembles for Structural Fire Fighting. Structural firefighting protective footwear purchased on or after July 1, 2016, must be at least equivalent to the requirements of NFPA 1971 (2013): Standard on Protective Ensembles for Structural Fire Fighting.

(b) Resoled firefighting footwear must comply with the applicable NFPA standard under 437-002-0182(16)(a).

Note: Employees using chain saws for non-firefighting activities must wear chaps or leg protectors in accordance with Division 2/I, 437-002-0134, Personal Protective Equipment.

(17) Eye and Face Protection.

(a) Face protection must be used where there is a reasonable probability of injury that can be prevented by such protection. When face protection does not protect the eyes from foreign objects, additional protection for the eyes must be used.

(b) The employer must make available eye and face protection devices suitable for the work performed, and employees must use such protection devices as required by 437-002-0182(17)(a).

(c) Protection devices that can be worn over corrective lenses must be available for employees who need them.

(d) Eye and face protection devices worn by firefighters at the fire ground must comply with the following minimum requirements:

(A) They must comply with any of the following consensus standards:

(i) ANSI/ISEA Z87.1-2010, Occupational and Educational Personal Eye and Face Protection Devices;

(ii) ANSI Z87.1-2003, American National Standard Practice for Occupational and Educational Eye and Face Protection; or

(iii) ANSI Z87.1-1989 (R-1998), American National Standard Practice for Occupational and Educational Eye and Face Protection.

(B) They must be reasonably comfortable when worn under the designated conditions.

(C) They must be durable.

(D) They must be capable of being disinfected.

(E) They must be easy to clean.

(e) Faceshields, when used, must be an integral part of the firefighting helmet and may be installed in a fixed position or hinged allowing adjustment of the shields. Face shields must accommodate any of the following styles:

(A) Clear transparent

(B) Colored transparent

(f) Goggles, when used, must consist of a fully flexible frame, a lens holder or a rigid frame with integral lens or lenses, and a separate cushioned fitting surface on the full periphery of the facial contact area.

(A) Materials used for goggles must be chemical-resistant, nontoxic, nonirritating and slow-burning.

(B) There must be support on the face, such as an adjustable headband of suitable material or other appropriate support to hold the frame comfortably and snugly in front of the eyes.

Note: When NIOSH approved full face respiratory equipment is being used by firefighters, additional eye and face protection is not required.

(18) Respiratory Protection. The employer must develop and implement a respiratory protection program in accordance with Division 2/I, 1910.134, Respiratory Protection.

The following note refers to the Respiratory Protection Standards, 1910.134(g)(3) Procedures for IDLH atmospheres and 1910.134(g)(4) Procedures for interior structural firefighting, ("two-in/two-out rule").

NOTE: If, upon arriving at the emergency scene, firefighters find an imminent life threatening situation where immediate action may prevent the loss of life or serious injury, the requirements for firefighters in the outside standby mode may be suspended, when notification is given by radio to incoming responders that they must provide necessary support and backup upon their arrival.

(19) Criteria for Approved Self-Contained Breathing Apparatus (SCBA).

(a) All compressed air cylinders used with approved SCBAs must meet DOT and NIOSH criteria.

(b) In emergency and lifesaving situations, approved SCBAs may be used with approved cylinders from other approved SCBAs provided that such cylinders are of the same capacity and pressure rating. Once the emergency is over, return SCBAs to their original approved condition.

(c) Approved SCBAs must be provided with at least one indicator that automatically sounds an alarm when the remaining air supply of the SCBA is reduced to within a range of 25 percent of its rated service time.

(20) Personal Alert Safety System (PASS).

(a) Each member involved in rescue, fire suppression, or other hazardous duties, must be provided with and must use a PASS device in the hazardous area when self-contained breathing apparatus is in use.

(b) All PASS devices must be at least equivalent to the requirements of NFPA 1982 (1983): Standard on Personal Alert Safety Systems (PASS). PASS devices purchased on or after July 1, 2016 must be at least equivalent to the requirements of NFPA 1982 (2013): Standard on Personal Alert Safety Systems (PASS).

(c) Each PASS device must be tested at least monthly and must be maintained according to the manufacturer's instructions.

(21) Breathing Air Compressors and Cylinders.

(a) In addition to the requirements contained in Division 2/I, 1910.134(i), breathing air quality and use, air samples must be taken every six months from the compressor and analyzed by the employer or an independent laboratory for Grade D breathing air.

(b) Air samples must also be taken and analyzed when the system is installed or repaired.

(c) Analysis required by 437-002-0182(21)(a) and (b) must be conducted according to ANSI/CGA Standard G7.1 (2011): Commodity Specification for Air.

(22) Hazardous Material Response Plan.

(a) Fire departments that expect or plan to respond to hazardous material incidents must develop and implement a written response plan, and comply with additional requirements of Division 2/H, 1910.120(q), Emergency response to hazardous substance releases.

(b) The written response plan must contain the policies and procedures for:

- (A) Pre-emergency planning and coordination with outside parties,*
- (B) Personnel roles, lines of authority, training, and communication,*
- (C) Emergency recognition and prevention,*
- (D) Safe distances,*
- (E) Scene security and control,*
- (F) Evacuation procedures,*
- (G) Decontamination,*
- (H) Emergency medical treatment and first aid,*
- (I) Personnel withdrawal procedures,*
- (J) Critique of response and follow-up, and*
- (K) Personal protective equipment and emergency equipment and response procedures.*

- (c) *The incident commander must be responsible for:*
- (A) *Identifying of the hazardous substance and condition,*
 - (B) *Implementing emergency operations,*
 - (C) *Ensuring personal protective equipment is worn,*
 - (D) *Limiting access of hot zone to those with a specific mission assignment,*
 - (E) *Implementing decontamination procedures,*
 - (F) *Designating a safety officer,*
 - (G) *Using appropriately trained personnel, and*
 - (H) *Providing on-scene medical surveillance for emergency responders.*

(23) Fire Apparatus Area.

- (a) *Walkways around apparatus must be kept free of obstructions.*
- (b) *The station's apparatus floors must be kept free of grease, oil, and tripping hazards.*
- (c) *Exhaust gases from apparatus within buildings must be maintained within the limits of Division 2/Z, 437-002-0382, Oregon Air Contaminant Rules. See Appendix B (Non-mandatory), General Information and Recommendations, of this standard.*

(24) Fire Apparatus Design and Construction.

- (a) *Employers who have acquired used fire apparatus or used military equipment prior to July 1, 1985 are not required to bring them under a more stringent code than the one in force at the time the apparatus was manufactured. The exceptions to 437-002-0182(24)(a) are:*
- (A) *Restraint systems as required by 437-002-0182(25)(e); and*
 - (B) *Roll-over protective structures (ROPS) on all open top off-road vehicles as required by 437-002-0182(24)(f).*
- (b) *There must be steps, ladders or railing to allow safe access to and exit from areas on vehicles that employees access.*
 - (c) *Vehicle tailboards must not project outboard of the vehicle sides or fenders and must be designed to provide safe footing.*
 - (d) *Exhaust systems must be installed and properly maintained, and must be designed to minimize the exposure of exhaust gases by employees.*
 - (e) *The loaded gross weight and empty height of the vehicle must be posted in the vehicle such that it can be clearly read by the driver.*
 - (f) *Roll-over protective structures (ROPS) must be provided, installed and maintained on all open top off-road vehicles.*
 - (g) *Vehicles with an obstructed view to the rear of the vehicle when backing must be equipped or provided with:*

(A) An automatic back-up alarm that must sound when backing and can be heard over the surrounding noise;

(B) A video camera that provides the driver a full and clear view of the path of travel behind the vehicle; or

(C) A spotter who stands to the rear of the vehicle, is visible to the driver in the driver-side mirror and uses unassisted voice communication, portable radio communication or hand signal communication to guide the driver while backing.

(25) Fire Apparatus Operation.

(a) Employees must be trained in the safe operation of each type of vehicle they are authorized to drive.

(b) The employer must not allow an employee to drive a vehicle on a public highway or road unless they have a valid driver's license.

(c) Any item found that may affect the safe operation of a vehicle must be reported immediately to the officer in charge or other appropriate person.

(d) Employees must not drive or ride in any vehicle known to be unsafe.

(e) Employees being transported by fire department vehicles must ride in designated seat-belted or safety-harnessed positions.

(f) The employer must not allow employees to ride on tailboards, tail steps or running boards.

(g) Vehicles must come to a full stop before employees disembark.

(h) All equipment on a vehicle must be adequately secured when the vehicle is in motion.

(i) When traffic flow is inhibited, vehicles equipped with emergency warning lights must be used to control traffic at emergency scenes. The use of traffic cones, fire department personnel, police, or other traffic control measures must be used as soon as practical.

(26) Fire Apparatus Maintenance and Repair. Each employer must establish written records and procedures whereby apparatus has:

(a) At a minimum, a scheduled monthly maintenance check; or

(b) A maintenance check each time the apparatus is returned to the station following an emergency response, drill, or test drive.

(27) Tires.

(a) No motor vehicle must be operated on any tire that:

(A) Has body ply or belt material exposed through the tread or sidewall;

(B) Has any tread or sidewall separation;

(C) Is flat or has an audible leak; or

(D) Has a cut to the extent that the ply or belt material is exposed.

(b) Any tire on the front wheels of a bus, truck, or truck tractor must have a tread groove pattern depth of at least 4/32 of an inch when measured at any point on a major tread groove. The measurements must not be made where tie bars, humps, or fillets are located.

(c) Except as provided in 437-002-0182(27)(b), tires must have a tread groove pattern depth of at least 2/32 of an inch when measured in a major tread groove. The measurement must not be made where tie bars, humps or fillets are located.

(28) Aerial Devices.

(a) Aerial devices used for firefighting must be annually inspected and tested by a person qualified in performing such inspections and tests according to NFPA 1911 (2007): Standard for the Inspection, Maintenance, Testing, and Retirement of In-service Automotive Fire Apparatus.

(b) Where structural defects are found in critical components of an aerial device, the repairs must be tested and certified according to NFPA 1911 (2007): Standard for the Inspection, Maintenance, Testing, and Retirement of In-service Automotive Fire Apparatus, by a registered professional engineer, the manufacturer of the apparatus, or an American Welding Society (AWS) Certified Welding Inspector.

(c) A permanent record of tests and repairs under 437-002-0182(28)(b) must be maintained for each aerial device.

(29) Hose Drying Towers.

(a) Floor openings on hose tower platforms must be equipped with a guardrail meeting the requirements of Division 2/D[, 1910.23, Guarding Floor and Wall Openings and Holes].

Note: The toeboard requirements for elevated work platforms in Division 2/D[, 1910.23,] do not apply to hose drying towers unless hand tools or objects other than hoses are carried onto the platforms.

(b) Fixed ladders must meet the requirements of Division 2/D[, 437-002-0027, Fixed Ladders].

(c) Ropes used to hoist hose in the hose towers must have a working load limit that maintains a minimum safety factor of 3:1.

(30) Drill Towers. Permanent fixed ladders on the outside of drill towers and drill buildings are exempt from offset platform landings and ladder cage guards requirements of Division 2/D[, 437-002-0027, Fixed Ladders].

(31) Testing, Maintenance and Inspection of Fire Service Equipment.

(a) The employer must inspect and maintain fire service equipment at least annually and perform all tests recommended by the manufacturer at the date of manufacture.

(b) When the manufacturer's recommendations required under 437-002-0182(31)(a) are not available from the manufacturer, the employer must identify and follow the recommendations of an applicable consensus standard or curriculum that is nationally recognized and generally accepted by the fire service industry.

Note: Examples of a consensus standard or curriculum under 437-002-0182(31)(b) include, but are not limited to, NFPA standards and IFSTA manuals.

(32) Confined spaces.

(a) Employers must comply with Division 2/J, 437-002-0146, Confined Spaces, for their own confined spaces.

(b) Employers must comply with Division 2/J, 437-002-0146, Confined Spaces, when they agree to serve as a designated rescue service provider.

(c) Employers that will respond to emergency calls for rescue from confined spaces must:

(A) Train responders to recognize inherent confined space hazards before assigning or attempting any related duties in confined space rescues.

(i) Provide responders with understanding, knowledge, and skills necessary for safe performance of confined space rescues.

(ii) Practice a confined space rescue operation at least once every year from a real or simulated confined space.

(B) Responders must be certified in writing to Department of Public Safety Standards and Training (DPSST) Firefighter 1 or equivalent.

(C) Use the Incident Management System (IMS) during confined space rescue incidents that meet the requirements of NFPA 1561 (2008): Standard on Emergency Services Incident Management System.

(D) Assess the situation and determine if it qualifies as a confined space incident.

(i) Classify the operation as a rescue or body recovery.

(ii) Assess and control physical hazards related to the incident or rescue.

(iii) Assess atmospheric hazards.

(I) Use calibrated direct-reading instruments to test the atmosphere in confined spaces for oxygen content, flammable gases and vapors, and toxic air contaminants.

(II) When calibrated direct-reading instruments are not available, the Incident Commander must assume the situation is IDLH and ensure that responders who enter are equipped with appropriate respiratory protective equipment that comply with Division 2/I, 1910.134, Respiratory Protection.

(iv) Determine if the space should be ventilated.

(v) Determine the precautions and procedures to follow for safe entry into the space.

(E) Provide the appropriate rescue, emergency, and personal protective equipment for safe entry into and rescue from confined spaces.

(F) Provide necessary equipment to facilitate non-entry retrieval for responders, unless the retrieval equipment would increase the overall risk or would not contribute to the rescue operations.

Note: For the reader's convenience, the following paragraphs are provided from Division 2/I, 1910.134(g)(3) and (g)(4), Respiratory Protection:

(g)(3) Procedures for IDLH atmospheres. For all IDLH atmospheres, the employer shall ensure that:

(i) One employee or, when needed, more than one employee is located outside the IDLH atmosphere;

(ii) Visual, voice, or signal line communication is maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere;

(iii) The employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue;

(iv) The employer or designee is notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue;

(v) The employer or designee authorized to do so by the employer, once notified, provides necessary assistance appropriate to the situation;

(vi) Employee(s) located outside the IDLH atmospheres are equipped with:

(A) Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either

(B) Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or

(C) Equivalent means for rescue where retrieval equipment is not required under paragraph (g)(3)(vi)(B).

(g)(4) Procedures for interior structural firefighting. In addition to the requirements set forth under paragraph (g)(3), in interior structural fires, the employer shall ensure that:

- (i) At least two employees enter the IDLH atmosphere and remain in visual or voice contact with one another at all times;
- (ii) At least two employees are located outside the IDLH atmosphere; and
- (iii) All employees engaged in interior structural firefighting use SCBAs.

Note 1 to paragraph (g): One of the two individuals located outside the IDLH atmosphere may be assigned to an additional role, such as incident commander in charge of the emergency or safety officer, so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any firefighter working at the incident.

Note 2 to paragraph (g): Nothing in this section is meant to preclude firefighters from performing emergency rescue activities before an entire team has assembled.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 14-1993, f. 8/27/93, ef. 11/1/93.

OR-OSHA Admin. Order 2-1998, f. 3/11/98, ef. 3/11/98.

OR-OSHA Admin. Order 2-2000, f. 1/28/00, ef. 1/28/00.

OR-OSHA Admin. Order 12-2001, f. 10/26/01, ef. 10/26/01.

OR-OSHA Admin. Order 3-2005, f. 6/10/05, ef. 6/10/05.

OR-OSHA Admin. Order 9-2008, f. 9/19/08, ef. 1/1/09.

OR-OSHA Admin. Order 8-2009, f. 7/9/09, ef. 10/1/09.

OR-OSHA Admin. Order 6-2012, f. 9/28/12, ef. 4/1/13.

OR-OSHA Admin. Order 4-2015, f. 10/23/15, ef. 7/1/16.

OR-OSHA Admin. Order 3-2016, f. 8/19/16, ef. 8/19/16.

OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

Division 2/N, Materials Handling and Storage

437-002-0220

Adoption by Reference. In addition to, and not in lieu of, any other safety and health codes contained in OAR Chapter 437, the Department adopts by reference the following federal regulations printed as part of the Code of Federal Regulations, 29 CFR 1910, in the Federal Register:

- (1) 29 CFR 1910.176 Handling materials - general, published 10/24/78, FR vol. 43, p. 49749.
 - (2) 29 CFR 1910.177 Servicing of multi-piece and single piece rim wheels; published 12/27/11, FR vol. 76, no. 248, p. 80735.
 - (3) 29 CFR 1910.178 Powered industrial trucks, published ~~[4/3/06, FR vol. 71, no. 63, p. 16669]~~ **11/18/16, FR vol. 81, no. 223, p. 82494.**
 - (4) 29 CFR 1910.179 Overhead and gantry cranes, published ~~[3/7/96, FR vol. 61, no. 46, p. 9239]~~ **11/18/16, FR vol. 81, no. 223, p. 82494.**
 - (5) 29 CFR 1910.180 Crawler, locomotive and truck cranes, published 3/7/96, FR vol. 61, no. 46, p. 9239.
 - (6) 29 CFR 1910.181 Derricks, published 3/7/96, FR vol. 61, no. 46, p. 9240.
 - (7) 29 CFR 1910.182 Removed. Published 3/7/96, Federal Register, vol. 61, no. 46, p. 9240.
 - (8) 29 CFR 1910.183 Helicopters, published 6/18/98, FR vol. 63, no. 117, p. 33467.
 - (9) 29 CFR 1910.184 Slings, published 6/8/11, Federal Register, vol. 76, no. 110, p. 33590.
 - (10) 29 CFR 1910.189 Removed. Published 3/7/96, Federal Register, vol. 61, no. 46, p. 9240.
 - (11) 29 CFR 1910.190 Removed. Published 3/7/96, Federal Register, vol. 61, no. 46, p. 9240.
- These rules are on file at the Oregon Occupational Safety and Health Division, Department of Consumer and Business Services, and the United States Government Printing Office.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: APD Admin. Order 2-1989, f. 3/1/89, ef. 3/1/89 (Single & Multi).
OR-OSHA Admin. Order 13-1993, f. 8/20/93, ef. 11/1/93 (Remainder of 2/N).
OR-OSHA Admin. Order 4-1997, f. 4/2/97, ef. 4/2/97.
OR-OSHA Admin. Order 4-1999, f. 4/30/99, ef. 4/30/99.
OR-OSHA Admin. Order 6-1999, f. 5/26/99, ef. 5/26/99.
OR-OSHA Admin. Order 12-2001, f. 10/26/01, ef. 10/26/01.
OR-OSHA Admin. Order 7-2003, f. 12/5/03, ef. 12/5/03.
OR-OSHA Admin. Order 4-2006, f. 7/24/06, ef. 7/24/06.
OR-OSHA Admin. Order 3-2011, f. 11/1/11, ef. 11/1/11.
OR-OSHA Admin. Order 4-2011, f. 12/8/11, ef. 12/8/11.
OR-OSHA Admin. Order 1-2012, f. 4/10/12, ef. 4/10/12.
OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

1910.178 Powered industrial trucks.

...

(j) Dockboards (bridge plates). See ~~§ 1910.30(a)~~ **subpart D of this part.**

...

1910.179 Overhead and gantry cranes.

...

(c) Cabs.

...

(2) Access to crane. Access to the ~~[cab]~~**car** and/or bridge walkway shall be by a conveniently placed fixed ladder, stairs, or platform requiring no step over any gap exceeding 12 inches **(30cm)**. Fixed ladders ~~[shall be in conformance with the American National Standard Safety Code for Fixed Ladders, ANSI A14.3-1956, which is incorporated by reference as specified in §1910.6]~~**must comply with subpart D of this part.**

...

(d) Footwalks and ladders.

...

(3) Toeboards and handrails for footwalks. Toeboards and handrails ~~[shall be in compliance with §1910.23 of this part]~~**must comply with subpart D of this part.**

(4) Ladders and stairways.

...

(iii) Ladders shall be permanently and securely fastened in place and ~~[shall be]~~constructed in compliance with ~~[§1910.27]~~**subpart D of this part.** [NOTE: In Oregon, OAR 437-002-0027 applies.]

Division 2/R, Special Industries

437-002-0300

Adoption by Reference. In addition to and not in lieu of, any other health and safety codes contained in OAR Chapter 437, the Department adopts by reference the following federal regulations printed as part of the Code of Federal Regulations, 29 CFR 1910, in the Federal Register:

- (1) Reserved for 29 CFR 1910.261 Pulp, Paper, and Paperboard Mills
 - (2) 29 CFR 1910.262 Textiles, published [~~6/18/98, FR vol. 63, no. 117, p. 33467~~] **11/18/16, FR vol. 81, no. 223, p. 82494.**
 - (3) 29 CFR 1910.263 Bakery Equipment, published 3/7/96, FR vol. 61, no. 46, p. 9241.
 - (4) 29 CFR 1910.264 Laundry Machinery and Operations, published 11/7/78, FR vol. 43, p. 51760.
 - (5) 29 CFR 1910.265 Sawmills, published [~~9/13/05, FR vol. 70, no. 176, p. 53925~~] **11/18/16, FR vol. 81, no. 223, p. 82494.**
 - (6) Reserved for 29 CFR 1910.266 Pulpwood Logging. (NOTE: In Oregon, Pulpwood Logging rules are Oregon-initiated rules provided in Division 7, Forest Activities.)
 - (7) Reserved for 29 CFR 1910.267 Agricultural Operations
 - (8) 29 CFR 1910.268 Telecommunications, published [~~6/18/98, FR vol. 63, no. 117, p. 33467~~] **11/18/16, FR vol. 81, no. 223, p. 82494.**
 - (9) 29 CFR 1910.269 Electric power generation, transmission and distribution. Repealed with Oregon OSHA Admin. Order 3-2015, f. 10/9/15, ef. 1/1/16. In Oregon, Division 2/RR applies.
 - (10) 29 CFR 1910.272 Grain Handling Facilities, and Appendices A, B and C, published 3/7/96, FR vol. 61, no. 46, p. 9242.
 - (11) 29 CFR 1910.274 Removed. Published 3/7/96, Federal Register, vol. 61, no. 46, p. 9242.
 - (12) 29 CFR 1910.275 Removed. Published 3/7/96, Federal Register, vol. 61, no. 46, p. 9242.
- These standards are available from the Oregon Occupational Safety and Health Division (OR-OSHA), Department of Consumer and Business Services; and the United States Government Printing Office.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

- Hist: APD Admin. Order 10-1988, f. 7/7/88, ef. 7/7/88 (Grain Handling).
OR-OSHA Admin. Order 23-1990, f. 9/28/90, ef. 12/1/90 (Grain Handling).
OR-OSHA Admin. Order 27-1990, f. 12/12/90, ef. 2/1/91 (Tree and Shrub Services).
OR-OSHA Admin. Order 14-1991, f. 10/10/91, ef. 11/1/91 (Textiles, Bakeries, Laundries).
OR-OSHA Admin. Order 7-1993, f. 6/8/93, ef. 8/1/93 (Sawmills).
OR-OSHA Admin. Order 11-1993, f. 8/4/93, ef. 10/1/93 (Telecommunications).
OR-OSHA Admin. Order 3-1994, f. 8/1/94, ef. 8/1/94.
OR-OSHA Admin. Order 3-1996, f. 7/22/96, ef. 7/22/96 (Grain Handling Facilities).
OR-OSHA Admin. Order 4-1997, f. 4/2/97, ef. 4/2/97.
OR-OSHA Admin. Order 3-1998, f. 7/7/98, ef. 7/7/98.
OR-OSHA Admin. Order 3-1999, f. 4/30/99, ef. 4/30/99 (Telecommunications).
OR-OSHA Admin. Order 4-1999, f. 4/30/99, ef. 4/30/99.
OR-OSHA Admin. Order 5-2001, f. 4/6/01, ef. 4/6/01 (Elec. Power Gen., Trans. & Dist.).
OR-OSHA Admin. Order 4-2005, f. 12/14/05, ef. 12/14/05.
OR-OSHA Admin. Order 6-2012, f. 9/28/12, ef. 4/1/13.
OR-OSHA Admin. Order 3-2015, f. 10/9/15, ef. 1/1/16.

OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

437-002-0309 *Hand Tools.*

(1) General.

- (a) The correct tool shall be selected for the job.*
- (b) Tools that have been made unsafe by damage or defect shall not be used.*
- (c) When climbing a tree, workers shall not carry tools in their hands other than tools that are used to assist them in climbing.*
- (d) Workers shall maintain a safe working distance from other workers when using hand tools.*
- (e) Tools shall be properly stored or placed in plain sight out of the immediate work area when not in use.*
- (f) Workers shall not throw or drop tools from trees unless warning has been given and the ground area is clear, and the act of dropping will not endanger personnel.*

(2) Pruners and hand saws.

- (a) Pole pruners, pole saws, and other similar tools shall be equipped with wood or nonmetallic poles. Actuating cord shall be of nonconducting material.*
- (b) When inserting a blade in a bow-saw frame, workers shall keep their hands and fingers in the clear when the tension lever snaps into or against the saw frame. When removing a bow-saw blade from the frame, the operator shall stay clear of the blade.*

(3) Chopping tools – axes, brush hooks, machetes, and others.

- (a) Chopping tools that have loose or cracked heads or splintered handles shall not be used.*
- (b) Chopping tools shall never be used while working aloft.*
- (c) Chopping tools shall be swung away from the feet, legs, and body, using the minimum power practical for control.*
- (d) Chopping tools shall not be driven as wedges or used to drive metal wedges unless specifically designed to be driven or to be used to drive wedges.*

(4) Injector tools for applying herbicides.

- (a) The bit of injector tools shall be covered with a shield when not in use.*
- (b) Injectors shall be laid flat on the ground when not in use.*
- (c) The injector shall not be carried on the shoulders but shall be carried by the loop handle on the downhill side, with the bit properly shielded and facing to the rear.*

(5) Grub hoes, mattocks and picks.

- (a) The blade eye shall be tight-fitting and wedged so that it cannot slide down the handle.*
- (b) When swinging grub hoes, mattocks, and picks, the worker shall have a secure grip and firm footing.*

(6) Cant hooks, cant dogs, tongs, and carrying bars.

- (a) Hooks shall be firmly set before applying pressure.*
- (b) Tools with cracked, splintered, or weakened handles shall not be used.*
- (c) Workers shall be warned and shall be in the clear before logs are moved.*
- (d) The points of hooks shall be at least 2 inches long and kept sharp.*
- (e) Workers shall stand to the rear and uphill when rolling logs.*

(7) Wedges, chisels, and gouges.

- (a) Wedges, chisels, and gouges shall be inspected for cracks and flaws before use.*
- (b) Wedges and chisels shall be properly pointed and tempered. Tools with mushroomed heads shall not be used.*
- (c) Only wood, plastic, or soft-metal wedges shall be used with power saws.*
- (d) Wood-handled chisels shall be protected with a ferrule on the striking end.*

- (8) *Hammers, mauls, and sledges. Wood, rubber or high-impact plastic mauls, sledges, or hammers shall be used when striking wood-handled chisels or gouges.*
- (9) *Ropes.*
- (a) *Climbing ropes shall be used when working aloft in trees. Climbing ropes shall have a minimum diameter of 1/2-inch and be a 3- or 4-strand first-grade manila with a nominal breaking strength of 2385 pounds or its equivalent in strength and durability. Synthetic rope shall have a maximum elasticity of not more than 7 percent.*
- (b) *Rope made unsafe by damage or defect, or for any other reason, shall not be used.*
- (c) *Rope shall be stored away from all cutting edges and sharp tools. Corrosive chemicals, gas, and oil shall be kept away from rope.*
- (d) *Climbing ropes and safety lines shall not be used to lower limbs or other parts of trees or to raise or lower equipment.*
- (e) *When stored, rope shall be coiled and piled, or suspended, so that air can circulate through the coils.*
- (f) *Rope ends shall be secured to prevent unraveling.*
- (g) *Climbing and safety rope shall not be spliced to effect repair.*
- (h) *Safety snaps shall be rotated from one end of the rope to the other, as needed, and the worn end cut off.*
- (i) *A handline shall be used for raising or lowering tools and limbs.*
- (10) *Tackle blocks and pulleys. Tackle blocks and pulleys shall be inspected immediately before use and shall be condemned if defective, in accordance with procedures given in ANSI/ASME B30.9-1984, B30.9a-1985, and B30.9b-1987, Safety Standard for Slings.*
- (11) *Ladders.*
- (a) *When using portable ladders to climb trees, the ladder shall be tied to the tree or supported by another worker. When working from a ladder during cutting operations, the ladder shall be securely tied or braced, and the worker tied in as required by OAR 437-002-0310(1)(a)(A).*
- (b) *Ladders, platforms, and aerial devices, including insulated aerial devices, shall not be placed in a position where they could contact an electrical conductor. Reliance shall not be placed on their dielectric capabilities.*
- (c) *Ladders made of metal or other conductive material shall not be used where an electrical hazard exists. Only approved wood ladders (constructed in accordance with ANSI A14.1-1982, Safety Requirements for Portable Wood Ladders, or nonconductive ladders made of synthetic material equal to or exceeding the strength of approved wood ladders, shall be used.*
- (d) *Metal ladders used where no electrical hazard exists shall conform to ANSI A14.2-1982, Safety Requirements for Portable Metal Ladders.*
- (e) *All ladders shall be inspected daily before use. Unsafe ladders shall not be used.*
- (f) *The attaching of cleats, metal points, and safety feet; lashing; or other effective means of securing the ladder shall be used if there is danger of its slipping.*
- (g) *Ladders shall be supported while in storage so they will not sag. Except when on mobile equipment, ladders shall be stored under suitable cover, protected from the weather, and kept in a dry location away from excessive heat.*
- (h) *Ladders shall not be used as bridges or inclined planes to load or handle logs or other material.*
- (12) *Climbing spurs. Climbing spurs shall be of the tree-climbing type and have gaffs suitable for the tree being climbed.*

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 to 654.295.

Hist: OR-OSHA Admin. Order 27-1990, f. 12/12/90, ef. 2/1/91.

OR-OSHA Admin. Order 1-1996, f. 2/16/96, ef. 2/16/96.

OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

437-002-0310 Work Procedures.

(1) Climbing.

(a) A tree worker shall be tied in with an approved type of climbing rope and safety saddle when working [40]4 feet above the ground. ~~[The climbing rope shall always be used even when working from a ladder or scaffold and the employee is 10 feet or more above the adjacent ground line.]~~ A safety strap or rope with snaps may be used for additional protection.

(A) When working from a ladder more than 10 feet above the adjacent ground line, the worker must be tied in with an approved type of climbing rope and safety saddle.

(B) When working from a scaffold more than 10 feet above the adjacent ground line, and an exposure to a fall hazard exists, the employee shall be tied in with the climbing rope and safety saddle.

(b) Limbs shall be inspected, while climbing, before applying weight. The climber shall not trust the capability of a dead branch to support his/her weight. Dead branches shall be broken off on the way up, if possible. Hands and feet shall be placed on separate limbs, if possible.

(c) The climbing rope shall be passed around the trunk of the tree as high as possible using branches with a wide crotch to prevent any binding of the safety rope. The crotch selected for tying in shall be over the work area as much as possible, but located in such a way that a slip or fall would swing the worker away from any electrical conductor. The rope shall also be passed around the main leader or an upright branch, using the limb as a stop. Feet, hands, and ropes shall be kept out of tight V-shaped crotches.

(d) The location of all electrical conductors shall be noted in relation to work procedures. The worker shall climb on the side of the tree that is away from electrical conductors, if possible.

(e) A figure-eight knot shall be tied in the end of the rope, particularly in the case of high trees. This will prevent pulling the rope accidentally through the taut line-hitch and possible serious injury from a fall.

(f) The climbing line shall be crotched as soon as practical after the worker is aloft, and a taut line-hitch tied and checked.

(g) The worker shall be completely secured with the climbing line before starting operations.

(h) The worker shall remain tied in until the work is completed and the worker has returned to the ground. If it is necessary to recrotch the rope in the tree, the worker shall retie the rope or use the safety strap before releasing the previous tie.

(2) Pruning and Trimming.

(a) Pole pruners and pole saws shall be hung securely in a vertical position to prevent dislodging. Pole pruners or pole saws shall not be hung on utility wires or cables, or left in the tree overnight. Pole saws shall be hung so that the sharp edge is away from the worker.

(b) A scabbard or sheath shall be hooked to the belt or safety saddle to carry the handsaw when not in use.

(c) Warnings, when necessary, shall be given by the worker in the tree before a limb is dropped.

(d) A separate line shall be attached to limbs which cannot be dropped or are too heavy to be controlled by hand. The line shall be held by workers on the ground end of the rope. Use of the same crotch for both safety rope and work rope shall be avoided.

(e) Cut branches shall not be left in trees overnight.

(f) A climbing rope shall never be left in a tree overnight. A service line shall be put up for overnight or longer.

(g) The climber shall inspect the rope for cuts or abrasions before starting work. If any cuts or serious abrasions are found, the rope shall be discarded, used for some other purpose, or the defective section cut off.

(h) During all tree working operations aloft, there shall be a second worker in the vicinity. This shall not apply to utility workers engaged in tree trimming incidental to their normal occupation, or to one-man service crews.

(3) Cabling.

(a) In cabling operations, branches which are to be cabled shall be brought together to the proper distance by means of a block and tackle, a hand winch, a rope, or a rope with a come-along.

(b) Not more than two persons shall be in the tree working at opposite ends during cabling installation.

(c) When releasing the block and tackle, workers in trees shall be off to one side in case the lag hooks pull out under strain.

(d) Ground workers shall not stand under the tree when cable is being installed.

(e) Tools used for cabling, bark tracing, cavity work, etc., shall be carried in a bag or belt designed to hold tools, not put in the pocket or stuck in the top of a boot.

(4) Topping.

(a) Workers doing topping shall make sure the trees are able to stand the strain of a topping procedure. If not, some other means of lowering the branches shall be provided, such as a tree crane.

(b) If large limbs are lowered in sections, the worker in the tree shall be above the limb being lowered.

(c) Guidelines, handlines, or tag lines shall be used when conditions warrant their use.

(5) Felling.

(a) Before beginning any felling operation, a safety plan shall be developed which shall consider:

(A) The tree and the surrounding area for anything that may create a hazard when the tree falls;

(B) The shape of the tree;

(C) The lean of the tree;

(D) Wind force and direction;

(E) Decayed or other weak spots; and

(F) The location of other persons or structures.

(b) The work area shall be cleared to permit safe working conditions, and an escape route shall be planned before any cutting is started.

(c) Each tree worker shall be instructed as to exactly what is to be done during the felling operation. All workers not directly involved shall be at least two tree lengths away from the tree being felled.

(d) A notch and backcut shall be used in felling trees over 5 inches diameter breast high. No tree shall be felled by "ripping" or "slicing" cuts.

(e) The depth or penetration of the notch shall be approximately one-third the diameter of the tree.

(f) The opening or height of the notch shall be approximately 2-1/2 inches for each foot in diameter of the tree.

(g) The backcut shall be made higher than the point or apex of the notch to prevent kickback.

(h) Just before the tree is ready to fall, an audible warning shall be given to those in the area.

(i) If there is danger that the tree being felled may fall the wrong way or damage property; wedges, block and tackle, rope, or wire cable (except where an electrical hazard exists) shall be used. All limbs shall be removed from trees to a height and width sufficient to allow the tree to fall clear of any wires and other objects in the vicinity.

(j) Special precautions in roping rotten or split trees shall be taken to prevent the tree from falling in an unexpected direction even though the cut is made on the proper side.

(k) The faller shall retreat to a safe location when a tree is committed to fall.

(6) Chipper equipment and operation.

Equipment Design

- (a) Enclose chipper rotating components in a housing capable of retaining broken chipper knives or foreign material.*
- (b) Chipper feed chutes and side members must be designed to prevent operator contact with rotating blades during normal operation.*
- (c) Chippers without a mechanical infeed system must have:*
 - (A) An infeed hopper that measures at least 85 inches from the blades or knives to ground level at the centerline of the hopper.*
 - (B) A flexible antikickback device in the feed hopper. This device must protect the operator and other persons in the area from flying chips and debris.*
 - (C) A shut-off switch within convenient reach of the worker feeding the chipper.*
- (d) Chippers with a mechanical infeed system must have a quick stop reversing device on the infeed. The quick stop reversing device control lever must be across the top and along each side of the hopper, as close to the feed end of the hopper as practicable within easy reach of the operator.*

Worker Apparel

- (e) Employees in the immediate area of an operating chipper must wear personal protective equipment as required by Subdivision I of this Division.*
- (f) Workers feeding chippers must not wear loose clothing, gauntlet-type gloves, rings or watches.*

Work Practices

- (g) Prevent accidental restart of equipment shut down for adjustment or repair as required by Division 2/J, 1910.147, Lockout/Tagout.*
 - (h) Guard exposed adjacent blades when replacing chipper blades.*
 - (i) Close and secure all access panels before operating the chipper.*
 - (j) The chipper operator must have a coworker in the immediate vicinity when feeding chipper.*
 - (k) Do not feed foreign objects into chipper.*
 - (l) Feed chippers from the side of the centerline. The operator must immediately turn away from the feed table as brush is drawn into the rotor. Feed chippers from curbside whenever practical.*
 - (m) Feed and discharge chutes must be in place to prevent contact with rotating blades during chipper operation.*
 - (n) Chipper operators must be familiar with the manufacturer's operating instructions, maintenance and safe work practices.*
 - (o) When trailer chippers are detached from trucks they must be chocked or otherwise secured.*
 - (p) Before towing chipper, cross safety chains under the tongue of the chipper and attach them to the towing vehicle.*
- (7) Limbing and bucking.*
- (a) The tree worker shall work on the side opposite the side on which the limb is being cut.*
 - (b) The tree worker shall stand on the uphill side of the work.*
 - (c) Branches bent under tension shall be considered hazardous.*
 - (d) The tree worker shall block the log to prevent rolling, when necessary.*
 - (e) When bucking up trunks of trees, wedges shall be used as necessary to prevent binding of the guide bar or chain.*
- (8) Storm work and emergency conditions.*
- (a) Since storm work and emergency conditions create special hazards, only authorized representatives of the electric utility system operator/owner may perform tree work in these situations where energized electrical power conductors are involved.*
 - (b) When an emergency condition develops due to tree operations, work shall be suspended and the system operator/owner shall be notified immediately.*

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 27-1990, f. 12/12/90, ef. 2/1/91.

OR-OSHA Admin. Order 5-2001, f. 4/6/01, ef. 4/6/01.

OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

437-002-0311 Mobile Equipment.

(1) All vehicles shall comply with OAR 437-002-0223 in Division 2/N, Material Handling and Storage.

(2) All aerial lifts shall comply with Division 2/F, 1910.67, Vehicle-Mounted Elevating and Rotating Work Platforms.

(3) When an aerial lift device contacts an electrical conductor, the truck supporting the aerial lift device shall be considered as energized.

(4) Sprayers and related equipment.

(a) Working and walking surfaces of all sprayers and related equipment shall be covered with slip-resistant material.

(b) Equipment on which workers stand and spray while the vehicle is in motion shall be equipped with guardrailing around the working area. The guardrailings shall be constructed in accordance with [~~OAR 437-002-01910.23(e), Railing, Toeboards, and Cover Specifications in~~] Division 2/D.

(5) Stump cutters.

(a) Stump cutters shall be equipped with enclosures or guards that effectively protect the operator.

(b) The operator and workers in the immediate area shall wear eye protection.

Stat. Auth.: ORS 654.025(2) and 656.726(4).

Stats. Implemented: ORS 654.001 to 654.295.

Hist: OR-OSHA Admin. Order 27-1990, f. 12/12/90, ef. 2/1/91.

OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

437-002-0312 Oregon Rules for Pulp, Paper and Paperboard Mills.

(1) General Requirements.

(a) Application. This section applies to establishments where pulp, paper, and paperboard are manufactured or converted. This section does not apply to logging and the transportation of logs to pulp, paper, and paperboard mills.

(b) Standards incorporated by reference. Standards covering issues of occupational safety and health which have general application without regard to any specific industry are incorporated by reference in sections (2) through (14) of this rule and in subsections (c) and (d) of this rule and made applicable under this rule. Such standards shall be construed according to the rules set forth in §1910.5, Applicability of Standards, in Subdivision A.

(c) General incorporation of standards. Establishments subject to this section shall comply with the following standards of the American National Standards Institute:

(A) Safety Requirements for Floor and Wall Openings, Railings, and Toeboards, A10.18-1983.

(B) Scheme for the Identification of Piping Systems, A13.1-1981 (R1993).

(C) Safety Code for Portable Wood Ladders, A14.1-1990.

(D) Safety Code for Portable Metal Ladders, A14.2-1990.

- (E) Safety Code for Fixed Ladders, A14.3-1990.*
- (F) Safety Code for Cranes, Derricks, and Hoists, B30.2-1990.*
- (G) Overhead and Gantry Cranes, B30.17-1992.*
- (H) Crawler, Locomotive, and Truck Cranes, B30.8-1993.*
- (I) Safety Code for Woodworking Machinery, ANSI O1.1-1992.*
- (J) Method of Measurement of Real-Ear Protection of Hearing Protectors – Physical Attenuation of Ear Muffs, ANSI S3.19-1974 (R1990).*
- (K) Practice for Occupational and Educational Eye and Face Protection, ANSI Z87.1-1989.*
- (L) Requirements for Sanitation in Places of Employment, ANSI Z4.1-1986.*
- (M) Fundamentals Governing the Design and Operation of Local Exhaust Systems, Z9.2-1979 (R 1991).*
- (N) Practices for Respiratory Protection, ANSI Z88.2-1992.*
- (O) Safety Requirements for Industrial Head Protection, ANSI Z89.1-1986.*
- (P) Safety Color Code, ANSI Z535.1-1991.*
- (Q) Practice for the Inspection of Elevators (Inspector's Manual), ANSI/ASME A17.2-1988.*
- (R) Safety Code for Elevators, Dumbwaiters, and Moving Walks, ANSI/ASME A17.1-1990.*
- (S) Safety Code for Mechanical Power-Transmission Apparatus, ANSI/ASME B15.1-1992.*
- (T) Safety Code for Conveyors, Cableways, and Related Equipment, ANSI/ASME B20.1-1993.*
- (U) Power Piping, ANSI/ASME B31.1-1992.*
- (V) Safety Code for Powered Industrial Trucks, ANSI/ASME B56.1.*
- (W) Practice for Industrial Lighting, ANSI/IES RP-990.*
- (X) Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying, ANSI/NFPA 91-1992.*
- (Y) Fire Department Self-Contained Breathing Apparatus Program, ANSI/NFPA 1404-1989.*
- (Z) Safety Code for Ventilation and Operation of Open-Surface Tanks, ANSI/UL 641-1985.*
- (d) Other standards. The following standards shall be considered standards under this section:*
 - (A) ASME Boiler and Pressure Vessel Code, Section VIII, Unfired Pressure Vessels 1992, including addenda.*
 - (B) Building Exits Code for Life Safety from Fire, NFPA 101-1991.*
 - (C) NFPA Code for Prevention of Sulfur Fires and Explosions, NFPA 655-1993.*
 - (D) Safety in the Transportation, Storage, Handling and Use of Explosives, IME Pamphlet No. 17, March 1987, Institute of Makers of Explosives.*

(2) Employee Training.

- (a) Employees shall not be permitted to operate any machine or equipment until they have received proper training and are familiar with safe operating procedures.*
- (b) Employees shall be trained in proper lifting or moving techniques and methods. Mechanical devices should be used or employees should ask for assistance in lifting or moving heavy objects.*
- (c) In each area where hazardous substances may be encountered, personnel shall be trained to cope with emergencies arising from breaks, ruptures, or spills which would create a hazardous condition.*
- (d) Any faulty equipment or hazardous condition shall be promptly reported to the person in charge.*
- (e) When an employee is assigned to work alone in a remote or isolated area, a system shall be instituted whereby such employee reports to someone or a designated person shall check on his or her safety. The procedure shall designate the method of contact and the frequency. All persons will be trained on the procedures.*

(3) Safe Practices.

- (a) *Guards.* All driving mechanisms, power transmission apparatus, and prime movers shall be constructed, guarded, and used in conformity with Subdivision O, Machinery and Machine Guarding.
- (b) *Inspection of controls and safety devices.* Brakes, back stops, antirunaway devices, overload releases, and other safety devices shall be inspected and tested frequently to insure that all are operative and maintained in good repair.
- (c) *Personal protective clothing and equipment.* Personal protective clothing and equipment shall be provided and worn in accordance with Subdivision I, Personal Protective Equipment. Respiratory protection must conform to the requirements of §1910.134 of Subdivision I.
- (d) *Floors and platforms.* Floors, platforms, and work surfaces shall be guarded and maintained in accordance with ~~§1910.23, in~~ Subdivision D, Walking-Working Surfaces.
- (e) *Lockouts.* Lockout/tagout shall be in accordance with the requirements of §1910.147, in Subdivision J, with the exception that:
- (A) There will be no tagouts allowed in lieu of lockout for that which can be locked out. Tags are provided for identification and information purposes only.
- (B) Persons engaged in repair, inspection, maintenance, or clean-up shall lockout the affected equipment, retain possession of the keys to the locks, and personally remove the lock and tag upon completion of the work.
- (C) *Group lockout.* (See Appendices A and B.)
- (i) When servicing and/or maintenance is performed by a crew, craft, department or other group, they shall utilize a procedure which affords the employees a level of protection equivalent to that provided by the implementation of a personal lockout device.
- (ii) Group lockout devices shall be used in accordance with the procedures required by §1910.147(c)(4) including, but not necessarily limited to, the following specific requirements.
- (I) Primary responsibility is vested in an authorized employee for a set number of employees working under the protection of a group lockout device (such as an operations lock);
- (II) Provision for the authorized employee to ascertain the exposure status of individual group members with regard to the lockout of the machine or equipment; and
- (III) When more than one crew, craft, department, etc. is involved, assignment or overall job-associated lockout control responsibility to an authorized employee designated to coordinate affected work forces and ensure continuity of protection; and
- (IV) Each authorized employee shall affix a personal lockout device to the group lockout device, group lockbox, or comparable mechanism when he or she begins work, and shall remove those devices when he or she stops working on the machine or equipment being serviced or maintained; and
- (V) Any person involved in the lockout process shall have the right to place their own lock at each lockout location where group lockout procedures have been allowed.
- (f) **Confined space entry.** Confined space entry shall be in accordance with 437-002-0146 Confined Spaces, in Subdivision J.
- (g) **Industrial power trucks.**
- (A) All industrial power trucks and operations shall conform to §1910.178, Powered Industrial Trucks, Subdivision N, Material Handling and Storage. All forklift trucks shall be provided with overhead guards. Design requirements shall provide protection for the liquid petroleum gas tank. All guards shall be designed in compliance with §1910.178, Powered Industrial Trucks, in Subdivision N.
- (B) Mirrors or other methods to ensure visibility shall be installed at blind corners or intersections which will allow operators to observe oncoming traffic.
- (C) Every power truck operated from an end platform or standing position shall be equipped with a platform extending beyond the operator's position, strong enough to withstand a compression load equal to the weight of the loaded vehicle applied along the longitudinal axis of the truck with the outermost projection of the platform against the flat vertical surface.

(D) Pushing of vehicles or rail cars with the forks or clamps of a lift truck is prohibited.

(h) Emergency lighting.

(A) Emergency lighting shall be provided wherever it is necessary for employees to remain at their machines or stations to shut down equipment in case of power failure. Emergency lighting shall be provided at stairways and passageways or aisleways used by employees for emergency exit in case of power failure. Emergency lighting shall be provided in all plant first aid and medical facilities.

(B) Emergency lighting shall be maintained in accordance with the manufacturer or engineering specifications, and shall be checked at least every 30 days for defects.

(i) Electrical equipment. *All electrical installations and electrical utilization equipment shall comply with the National Electrical Code requirements and the provisions of Subdivision S, Electrical.*

(4) Handling and Storage of Pulpwood and Pulp Chips.

(a) Handling pulpwood with forklift trucks. Where large forklift trucks, or lift trucks with clam-jaws, are used in the yard, the operator's enclosed cab shall be provided with an escape hatch, whenever the hydraulic arm blocks escape through the side doors.

(b) Handling pulpwood with cranes or stackers.

(A) Where locomotive cranes are used for loading or unloading pulpwood, the pulpwood shall be piled so as to allow a clearance of not less than 24 inches between the pile and the end of the cab of any locomotive crane in use, when the cab is turned in any working position.

(B) The minimum distance of the pulpwood pile from the centerline of a standard-gage track shall be maintained at not less than 8-1/2 feet.

(C) Logs shall be piled in an orderly and stable manner, with no projection into walkways or roadways.

(D) Rail cars shall not be spotted on tracks adjacent to the locomotive cranes unless a 24-inch clearance is maintained, as required in section (4)(b)(A) of this rule.

(E) The handling and storage of other materials shall conform to sections (4)(b)(A) and (B) of this rule with respect to clearance.

(F) Equipment and practices shall conform to American National Standards B30.2-1990 and B30.2.0-1967.

(G) Personal protective equipment for such uses as foot, head, and eye protection shall be required for workers on a job basis.

(H) No person shall be permitted to walk beneath a suspended load, bucket, or hook.

(c) Pulpwood storage and handling.

(A) Unauthorized vehicles and unauthorized foot traffic shall not be allowed in any active sorting, storing, loading, or unloading areas.

(B) Unloading lines shall be so arranged that it is not necessary for the workers to attach them on the pond or dump side of the load.

(C) Jackets or vests of fluorescent or other high visibility material shall be worn by persons working on dry land log storage.

(D) Wire rope doglines used for towing or rafting shall not be used when:

(iii) They acquire jiggers to the extent that they present a hazard to the workers handling them; or

(iv) When they are weakened to the extent that they are hazardous.

(E) Boom sticks shall be capable of safely supporting the weight imposed upon them.

(F) Stiff booms shall be made by fastening not less than two boom sticks together. The width of the stiff boom shall be not less than 36 inches measured from outside to outside of the outer logs. The boom sticks shall be fastened together with not less than 4-inch by 6-inch cross ties or cable lashing properly recessed into notches in the boom sticks and secured.

(G) Pike poles shall be kept in good repair. Conductive pike poles shall not be used where it is possible that they may come in contact with electrical conductors.

(H) All log dumps shall be periodically cleared of bark and other debris.

(I) When cutting bands on bundled logs, workers shall position themselves in a safe location. Double-bitted axes shall not be used for cutting bands. Caution shall be used to prevent being struck by ends of bands being cut and, if needed, personal protective equipment shall be worn.

(J) Storing or sorting on water, or any boom work other than boom boat operations, shall require a minimum of two persons.

(d) Handling pulpwood from ships.

(A) Ladders and gangplanks with railings to boat docks shall meet the requirements of American National Standards A10.18-1983, A14.1-1990, A14.2-1990, and A14.3-1990, and shall be securely fastened in place.

(B) The hatch tender shall be required to signal the hoisting engineer to move the load only after the employees working in the hold are in the clear.

(C) The air in the ship's hold, tanks, or closed vessels shall be tested for oxygen deficiency and for toxic, explosive and combustible gases and vapors.

(e) Handling pulpwood from flatcars and all other rail cars.

(A) Railroad flatcars for the conveyance of pulpwood loaded parallel to the length of the car shall be equipped with safety-stake pockets.

(B) Where pulpwood is loaded crosswise on a flatcar sufficient stakes of sizes not smaller than 4 by 4 inches shall be used to prevent the load from shifting.

(C) When it is necessary to cut stakes, those on the unloading side should be partially cut through first, and then the binder wires cut on the opposite side. Wire cutters equipped with long extension handles shall be used. No person shall be permitted along the dumping side of the car after the stakes have been cut.

(D) When steel straps without stakes are used, the steel straps shall be cut from a safe area to prevent employees from being struck by the falling logs.

(E) Flatcars and all other cars shall be chocked during unloading. Where equipment is not provided with hand brakes, rail clamping chocks shall be used.

(F) A derailer shall be used to prevent movement of other rail equipment into cars where persons are working.

(f) Handling pulpwood from trucks.

(A) Cutting of stakes and binder wires shall be done in accordance with section (4)(e)(C) of this rule.

(B) Where binder chain and steel stakes are used, the binder chains shall be released and the stakes tripped from the opposite side of the load spillage.

(C) Where binder chains and crane slings are used, the crane slings shall be attached and taut before the binder chains are released. The hooker shall see that the helper is clear before signaling for the movement of the load.

(D) The truck driver shall leave the truck cab and be in the clear, in a designated area, and shall be in clear view of the unloading equipment operator while the unloader is approaching the loaded truck.

(E) The truck driver shall remain outside the cab and clear of the load while logs are being unloaded except that, after a complete load is lifted as a unit and held stationary, the driver may enter the cab and drive forward from under the suspended load.

(F) Log unloaders shall not be moved about the premises with loads raised higher than absolutely necessary.

(g) Handling pulp chips from rail cars.

(A) All cars shall be securely fastened in place and all employees in the clear before dumping is started.

- (B) Personal protective equipment for such uses as foot, head, and eye protection shall be provided, and employees shall wear the equipment when working in the woodyard. Ear protection shall be provided when the noise level may be harmful.*
- (C) When a rollover-type unloading device is used for removing chips from cars, the cars shall be properly secured in place, and all employees shall be in the clear before dumping operation is started.*
- (h) Handling pulp chips and hog fuel from trucks and trailers.***
- (A) All trucks and trailers shall be secure and all employees in the clear before dumping is started.*
- (B) Personal protective equipment necessary to protect workers from hazards shall be provided and worn.*
- (C) Elevating platform-type or cable-lift type unloading devices shall have adequate back bumper stops.*
- (D) Side rails or other positive means to prevent the truck and/or trailer from falling shall be used while unloading the single trailer units.*
- (E) All persons shall be clear of all hoisting or elevating mechanisms before dumping commences.*
- (F) No person shall remain in any truck while the truck is being elevated.*
- (G) A safe area and suitable device shall be provided for the chip tester to use while taking chip samples.*
- (H) Rolled chip nets shall not be positioned where they cover the ladders on rail cars or trucks.*
- (I) Chip and hog fuel storage.***
- (i) When mobile equipment is used on top of hog fuel or chip piles, a roll-over protection system shall be installed on the equipment. If the cab is of the enclosed type, windshield wipers shall be installed.*
- (ii) Hog fuel bins shall be provided with standard railed platform or walkways near the top or other equally effective means shall be provided for use by employees engaged in dislodging hog fuel.*
- (iii) Extreme care shall be taken to prevent chips or hog fuel from creating an overhang or bridging.*
- (iv) Employees shall be prohibited from working under overhangs or bridges.*
- (J) Chip and sawdust bins.*** *Steam or compressed-air lances, or other facilities, shall be used for breaking down the arches caused by jamming in chip lofts. No worker shall be permitted to enter a bin unless done in accordance with §1910.146, Permit-Required Confined Spaces, in Subdivision J.*
- (i) Crane operations.***
- (A) Crane boom and load capacities as specified by the manufacturer shall be posted in the cab of the crane in accordance with §1910.180, Crawler, Locomotive and Truck Cranes, in Subdivision N, Material Handling and Storage.*
- (B) A safety device such as a heavy chain or cable at least equal in strength to the lifting cables shall be fastened to the boom and to the frame of the boom crane (if it is other than locomotive) at the base. Alternatively, a telescoping safety device shall be fastened to the boom and to the cab frame, so as to prevent the boom from snapping back over the cab in the event of lifting cable breakage.*
- (C) A crane shall not be operated where any part thereof may come within 10 feet of overhead powerlines (or other overhead obstructions) unless the powerlines have been de-energerized, or clearances are maintained as specified in §1910.303, General Requirements, in Subdivision S, Electrical.*
- (D) Standard signals for the operation of cranes shall be established for all movements of the crane, in accordance with American National Standards B30.2-1990 and B30.8-1988.*
- (E) Only one member of the crew shall be authorized to give signals to the crane operator.*

(F) All cranes shall be equipped with a suitable warning device such as a horn or whistle.

(G) A sheave guard shall be provided beneath the head sheave of the boom.

(H) Grapples, tongs, and buckets shall not be left suspended when not in use.

(j) Traffic warning signs or signals.

(A) A flagger shall direct the movement of cranes or locomotives being moved across railroad tracks or roads, and at any points where the vision of the operator is restricted. The flagger must always remain in sight of the operator when the crane or locomotive is in motion. The blue flag policy shall be used to mark stationary cars day and night. This policy shall include marking the track in advance of the spotted cars (flag for daytime, light for darkness).

(B) After cars are spotted for loading or unloading, warning flags or signs shall be placed in the center of the track at least 50 feet away from the cars and a derail set to protect workers in or on the car.

(k) Rail car operations and railroad warning devices.

(A) On a dead end spur, a blue signal may be displayed adjacent to the switch opening while cars are being loaded or unloaded. When such warning devices are displayed, the equipment shall not be coupled to or moved.

(B) Equipment which would obscure the blue signal shall not be placed on the track.

(C) Each maintenance crew shall display and remove its own set of blue signals.

(D) A flashing warning light or other device shall be installed near any opening which leads to a passageway crossing railroad tracks adjacent to the building. Such light or device shall be activated prior to any switching or movement of railroad equipment to warn workers of the dangerous condition in the area.

(E) Workers shall not crawl under or pass between coupled rail cars to cross tracks.

(F) An audible whistle, horn, or bell shall be sounded by the locomotive engineer to give adequate warning prior to switching across any road crossing.

(G) When switching railroad equipment in congested areas or across roadways or walkways, "flying switches" shall be prohibited.

(H) All freight car doors shall be inspected before workers open or close them. A safe method shall be used to open or close the door.

(I) **Illumination.** Artificial illumination shall be provided when loading or unloading is performed after dark, in accordance with American National Standard ANSI/IES-RP-1990, Practice for Industrial Lighting.

(m) Bridge or dock plates.

(A) The construction and use of bridge or dock plates shall conform to requirements of ~~§1910.30(a), Walking-Working Surfaces, in]~~Subdivision D.

(B) The sides of bridge or dock plates shall have an upturn or lip of at least 4 inches covering the area between the edge of the loading dock and edge of car or truck floor whenever the distance exceeds 18 inches to prevent wheeled equipment from running off the sides.

(C) Bridge or dock plates shall have at least 6 inches bearing surface on the loading dock.

(D) Bridge or dock plates intended to be moved by mechanized equipment shall be designed for this purpose or attachments for safe handling shall be used.

(n) **Hand tools.** Handles of wood hooks shall be locked to the shank to prevent them from rotating.

(o) Removal of pulpwood.

(A) The ends of a woodpile shall be properly sloped and cross-tiered into the pile. Upright poles shall not be used at the ends of woodpiles. To knock down wood from the woodpile, mechanical equipment shall be used to permit employees to keep in the clear of loosened wood.

(B) If dynamite is used to loosen the pile, only authorized personnel shall be permitted to handle and discharge the explosive. An electric detonator is preferable for firing; if a fuse is used, it shall be an approved safety fuse with a burning rate of not less than 120 seconds per yard and

a minimum length of 3 feet, in accordance with "Safety in the Transportation, Storage, Handling and Use of Explosives", IME Pamphlet No. 17, March 1987.

(p) Log hauls, slips and carriages.

(A) Controls shall be arranged to operate from a position where the operator will at all times be in the clear of logs, machinery, lines, and rigging.

(B) Controls shall be marked to indicate their function.

(C) An effective method of disengaging the head rig saws from the power unit shall be installed on all head rigs where the power unit is not directly controlled by the sawyer. The saws shall be disengaged from the source of power which shall be locked out before repairs or changes are made.

(D) When needed for protection of personnel, an automatic stop or interlocking device shall be installed on log hauls or slips.

(E) A barricade or other positive stop of adequate strength shall be provided to protect the sawyer from rolling logs.

(F) A guard shall be provided to prevent logs from rolling off the log deck into the well.

(G) The sawyer shall be safeguarded either by his or her location or by use of substantial screens or approved safety glass.

(H) A substantial stop or bumper shall be installed at each end of the carriage run.

(I) Canting gear or other equipment shall not be allowed to hang over the log deck in such a manner as to endanger employees.

(J) Canting gear controls shall be marked to indicate their function.

(K) The sawyer shall be primarily responsible for the safety of the carriage crew and offbearers. He or she shall exercise due care in the operation of the carriage and log turning devices.

(L) A control device shall be provided so that the sawyer may stop the head rig section of the mill without leaving his or her stand.

(M) The feed control lever of friction or belt-driven carriage feed works shall be designed to operate away from the saws or carriage track.

(N) Feed works and log turning control levers shall be so arranged that they may be secured when not in use and shall be adequately guarded against accidental activation.

(O) Carriages upon which persons are required to work shall be solidly decked over and the employees properly protected.

(P) Substantial sweeps shall be installed in front of each carriage wheel. Such sweeps shall extend to within 1/4 inch of the rails.

(Q) Where power-operated log turners are used, carriage knees shall be provided with goosenecks or other substantial means of protecting the carriage crew.

(q) Belt conveyors.

(A) The sides of the conveyor shall be constructed so that the pulpwood will not fall off.

(B) Where conveyors cross passageways or roadways, a horizontal platform shall be provided under the conveyor extending out from the sides of the conveyor a distance equal to 1-1/2 times the length of the wood handled. The platform shall extend the width of the road plus 2 feet on each side and shall be kept free of wood and rubbish. The edges of the platform shall be provided with toeboards or other protection to prevent wood from falling, in accordance with American National Standard A10.18-1983.

(C) All conveyors for pulpwood shall have the in-running nips between chain and sprockets guarded; also, turning drums shall be guarded.

(D) Every belt conveyor shall have an emergency stop cable extending the length of the conveyor so that it may be stopped from any location along the line, or conveniently located stop buttons within 10 feet of each work station, in accordance with American National Standard ANSI/ASME B20.1-1993.

(r) **Signs.** Where conveyors cross walkways or roadways in the yards, signs reading “Danger – Overhead Conveyor” or an equivalent warning shall be erected, in accordance with American National Standard for Safety Color Code, ANSI Z535.1-1991 or ANSI Z535.2-2011.

(5) Handling and Storage of Raw Materials Other Than Pulpwood or Pulp Chips.

(a) Personal protective equipment.

(A) Whenever possible, all dust, fumes, and gases incident to handling materials shall be controlled at the source, in accordance with OAR 437-002-0382, Oregon Rules for Air Contaminants, in Subdivision Z. Where control at the source is not possible, respirators with goggles or protective masks shall be provided, and employees shall wear them when handling alum, clay, soda ash, lime, bleach powder, sulfur, chlorine, and similar materials, and when opening rag bales.

(B) When handling liquid acid or alkali, workers shall be provided with approved eye and face protection and protective clothing, in accordance with Subdivision I, Personal Protective Equipment.

(b) Clearance.

(A) When materials are being piled inside a building and upon platforms, an aisle clearance at least 3 feet greater than the widest truck in use shall be provided.

(B) Baled paper and rags stored inside a building shall not be piled closer than 18 inches to walls, partitions, or sprinkler heads.

(c) Piling and unpling pulp.

(A) Piles of wet lap pulp (unless palletized) shall be stepped back one-half the width of the sheet for each 8 feet of pile height. Sheets of pulp shall be interlapped to make the pile secure. Pulp shall not be piled over pipelines to jeopardize pipes, or so as to cause overloading of floors, or to within 18 inches below sprinkler heads.

(B) Piles of pulp shall not be undermined when being unplied.

(C) Floor capacities shall be clearly marked on all floors.

(d) Chocking rolls.

(A) Where rolls are pyramided two or more high, chocks shall be installed between each roll on the floor and at every row. Where pulp and paper rolls are stored on smooth floors in processing areas, rubber chocks with wooden core shall be used.

(B) When rolls are decked two or more high, the bottom rolls shall be chocked on each side to prevent shifting in either direction.

(6) Preparing Pulpwood.

(a) **Gang and slasher saws.** A guard shall be provided in front of all gang and slasher saws to protect workers from wood thrown by saws. A guard shall be placed over tail sprockets.

(b) **Slasher tables.** Saws shall be stopped and power switches shall be locked out and tagged whenever it is necessary for any person to be on the slasher table.

(c) **Slasher drive belts, pulleys, and shafts.** All belts, pulleys, and shafts shall be guarded in accordance with American National Standard ANSI/ASME B15.1-1992.

(d) **Runway to the jack ladder.** The runway from the pond or unloading dock to the table shall be protected with standard handrails and toeboards. Inclined portions shall have cleats or equivalent nonslip surfacing, in accordance with Subdivision D, Walking-Working Surfaces. Protective equipment shall be provided for persons working over water.

(e) **Guards below table.** Where not protected by the frame of the machine, the underside of the slasher saws shall be enclosed with guards.

(f) **Conveyors.** The requirements of section (4)(q) of this rule shall apply.

(g) **Circular saws (not slasher saws).** Saws shall be provided with standard guards, in accordance with American National Standard ANSI O1.1-1992.

(h) **Fixed chain saws, circular cut-off saws, drag and swing saws.**

- (A) Saws shall be so arranged that they will not project into any passageway when in an idle or working position. When existing conditions do not leave clear passage the saws shall be fenced off in order to make it impossible for anyone to walk into them.
- (B) Drag saws and fixed chain saws shall be equipped with a device that will safely lock them in an "UP" position.
- (C) All persons shall be in the clear before starting operations of a drag, chain, or swing saw.
- (D) Log decks shall be equipped with a device to hold the material stable while being cut.
- (i) **Barker feed.** Each barker shall be equipped with a feed and turnover device which will make it unnecessary for the operator to hold a bolt or log by hand during the barking operation. Eye, ear, and head protection shall be provided for the operator, in accordance with section (3)(c) of this rule.
- (j) **Guards.** A guard shall be installed around barkers to confine flying particles, in accordance with ANSI/ASME B15.1-1992.
- (k) **Stops.** All control devices shall be locked out and tagged when knives are being changed.
- (l) **Speed governor.** Water wheels, when directly connected to barker disks or grinders, shall be provided with speed governors, if operated with gate wide open.
- (m) **Continuous barking drums.**
- (A) When platforms or floors allow access to the sides of the drums, a standard railing shall be constructed around the drums. When two or more drums are arranged side by side, proper walkways with standard handrails shall be provided between each set, in accordance with section (3)(d) of this rule.
- (B) Sprockets and chains, gears, and trunnions shall have standard guards, in accordance with section (3)(a) of this rule.
- (C) Whenever it becomes necessary for a worker to go within a drum, the driving mechanism shall be locked and tagged, at the main disconnect switch, in accordance with section (3)(e) of this rule.
- (D) This subsection (m) also applies to barking drums employed in the yard.
- (n) **Intermittent barking drums.** In addition to motor switch, clutch, belt shifter, or other power disconnecting device, intermittent barking drums shall be equipped with a device which may be locked to prevent the drum from moving while it is being emptied or filled.
- (o) **Hydraulic barkers.**
- (A) Hydraulic barkers shall be enclosed with strong baffles at the inlet and the outlet. The operator shall be protected by at least five-ply laminated glass.
- (B) The high pressure hoses of hydraulic barkers shall be secured in such a manner that the hose connection ends will be restrained if a hose connection fails.
- (p) **Splitter block.** The block upon or against which the wood is rested shall have a corrugated surface or other means provided that the wood will not slip. Wood to be split, and also the splitting block, shall be free of ice, snow, or chips. The operator shall be provided with eye and foot protection. A clear and unobstructed view shall be maintained between equipment and workers around the block and the workers' help area.
- (q) **Power control.** Power for the operation of the splitter shall be controlled by a clutch or equivalent device.
- (r) **Knot cleaners.** The operators of knot cleaners of the woodpecker type shall wear eye protection equipment.
- (s) **Chipper spout.** The feed system to the chipper spout shall be arranged in such a way that the operator does not stand in a direct line with the chipper spout. All chipper spouts shall be enclosed to a height of at least 42 inches from the floor or operator's platform. When other protection is not sufficient, the operator shall be protected from falling into the chipper by the use of a safety belt and lanyard. Ear protection equipment shall be worn by the operator and others in the immediate area if there is any possibility that the noise level may be harmful (see §1910.95, Occupational Noise Exposure, in Subdivision G).

*(t) **Feeding material/clearing jams in machines.** Appropriate safety belts and lanyards and face protection shall be used by employees who manually feed material or clear jams in machines unless other provisions are made which will protect the employees.*

*(u) **Carriers for knives.** Carriers shall be provided and used for transportation of knives.*

(7) Rag and Old Paper Preparation.

(a) Ripping and trimming tools.

(A) Hand knives and scissors shall have blunt points, shall be fastened to the table with chain or thong, and shall not be carried on the person but placed safely in racks or sheaths when not in use.

(B) Hand knives and sharpening steels shall be provided with guards at the junction of the handle and the blade. Utility knives with blade exposure of 2-1/2 inches or less are exempted from this requirement.

(b) Shredders, cutters, and dusters.

(A) Rotating heads or cylinders shall be completely enclosed except for an opening at the feed side sufficient to permit only the entry of stock. The enclosure shall extend over the top of the feed rolls. It shall be constructed either of solid material or with mesh or openings not exceeding 1/2-inch and substantial enough to contain flying particles and prevent accidental contact with moving parts. The enclosure shall be bolted or locked into place.

(B) A smooth-pivoted idler roll resting on the stock or feed table shall be provided in front of feed rolls except when arrangements prevent the operator from standing closer than 36 inches to any part of the feed rolls.

(C) Any manually fed cutter, shredder, or duster shall be provided with an idler roll as per section (7)(b)(B) of this rule or the operator shall use special hand-feeding tools.

(D) Hoods of cutters, shredders, and dusters shall have exhaust ventilation, in accordance with §1910.94, Ventilation, in Subdivision G.

(c) Blowers.

(A) Blowers used for transporting rags shall be provided with feed hoppers having outer edges located not less than 48 inches from the fan.

(B) The arrangement of the blower discharge outlets and work areas shall be such as to prevent material from falling on workers.

*(d) **Conveyors.** Conveyors and conveyor drive belts and pulleys shall be fully enclosed or, if open and within 7 feet of the floor, shall be constructed and guarded in accordance with section (4)(q) of this rule, and Subdivision N, Material Handling and Storage.*

(e) Guarding requirements.

(A) Traveling sections of conveyors and other equipment with wheels which run on rails or guides shall be guarded by sweep guards, installed in front of the traveling wheels in all areas where workers may be exposed to contact. Sweep guards shall have not greater than 1/4 inch clearance above the rail or guide.

(B) When using mechanical equipment to elevate the front end of the chip containers for dumping into a hopper, the shear area between the floor and the elevated section shall be safeguarded.

*(f) **Dust.** Measures for the control of dust shall be provided, in accordance with American National Standard ANSI/NFPA 91-1992 and Subdivision I, Personal Protective Equipment.*

(g) Rag cookers.

(A) When cleaning, inspection, or other work requires that persons enter rag cookers, all steam and water valves, or other control devices, shall be locked and tagged in the closed or "off" position. Blank flanging of pipelines is acceptable in place of closed and locked valves.

(B) When cleaning, inspection, or other work requires that persons must enter the cooker, one person shall be stationed outside in a position to observe and assist in case of emergency, in accordance with section (3)(f) of this rule.

(C) Rag cookers shall be provided with safety valves in accordance with the ASME Boiler and Pressure Vessel Code, Section VIII, Unfired Pressure Vessels – 1992.

(8) Chemical Processes of Making Pulp.

(a) **Industrial kiln guns and ammunition.** Management shall develop written instructions, including safety procedures, for storing and operating industrial kiln guns and ammunition. All persons working with this equipment shall be instructed in these procedures and shall follow them.

(b) Sulfur burners.

(A) Sulfur-burner houses shall be safely and adequately ventilated, and every precaution shall be taken to guard against dust explosion hazards and fires, in accordance with American National Standard Z9.2-1979 (R1991), and NFPA 655-1993.

(B) Nonsparking tools and equipment shall be used in handling dry sulfur.

(C) Sulfur storage bins shall be kept free of sulfur dust accumulation, in accordance with American National Standard ANSI Z9.2-1979 (R1991).

(D) Electric equipment shall be of the explosion-proof type, in accordance with the requirements of Subdivision S, Electrical.

(E) Sulfur-melting equipment shall not be located in the burner room.

(c) Protection for employees (acid plants).

(A) Gas masks, fitted with canisters containing absorbents for the particular acids, gases, or mists involved, shall be provided for employees of the acid department.

(B) Supplied air respirators shall be strategically located for emergency and rescue use.

(C) During inspection, repairs, or maintenance of acid towers, the worker shall be provided with eye protection, a supplied air respirator, a safety belt, and an attached lifeline. The line shall be extended to an attendant stationed outside the tower opening.

(d) **Acid tower structure.** Outside elevators shall be inspected daily during winter months when ice materially affects safety. Elevators, runways, stairs, etc., for the acid tower shall be inspected monthly for defects that may occur because of exposure to acid or corrosive gases.

(e) **Tanks (acid).** Entering acid tanks shall be in accordance with 437-002-0146 Confined Spaces, in Subdivision J.

(f) **Clothing.** Where lime slaking takes place, employees shall be provided with rubber boots, rubber gloves, protective aprons, and eye protection. A deluge shower and eye fountain shall be provided to flush the skin and eyes to counteract lime or acid burns.

(g) **Lead burning.** When lead burning is being done within tanks, fresh air shall be forced into the tanks so that fresh air will reach the face of the worker first and the direction of the current will never be from the source of the fumes toward the face of the workers. Supplied air respirators (constant-flow type) shall be provided.

NOTE: (For specifics refer to Subdivision Q, Welding, Cutting and Brazing; and §1910.1025, Lead, in Subdivision Z.)

(h) **Hoops for acid storage tanks.** Hoops of tanks shall be made of rods rather than flat strips and shall be safely maintained by scheduled inspections.

(i) **Quicklime stoppages.** Water shall not be used to unplug quicklime stops or plugs in pipes or confined spaces.

(j) **Digester building exits.** At least one unobstructed exit at each end of the room shall be provided on each floor of a digester building.

(k) **Digester building escape respirators.** Escape respirators shall be available for escape purposes only. These respirators shall meet the requirements of §1910.134 in Subdivision I, including the requirement to be inspected at frequent intervals, not to exceed one month.

(l) Elevators.

(A) Elevators shall be constructed in accordance with American National Standard A17.1-1990.

- (B) Elevators shall be equipped with escape respirators for the maximum number of passengers.
- (C) Elevators shall be equipped with an alarm system to advise of failure.
- (m) Blowoff valves and piping.**
- (A) The blowoff valve of a digester shall be arranged so as to be operated from another room, remote from safety valves.
- (B) All fasteners used to secure digester piping shall conform to ANSI/ASME B31.1-1992.
- (C) Digester blow valves shall be pinned or locked in closed position throughout the entire cooking period. This rule applies only to manually operated valves in batch digestors.
- (n) Blow lines.**
- (A) When blow lines from more than one digester lead into one pipe, the cock or valve of the blow line from the tank being inspected or repaired shall be locked and tagged out, or the line shall be disconnected and blocked off.
- (B) Test holes in piping systems. Test holes in blow lines of piping systems shall not be covered with insulation or other materials.
- (o) **Inspection and repair of tanks.** All piping leading to tanks shall be blanked off or valved and locked in accordance with §1910.147, Lockout/Tagout, in Subdivision J.
- (p) Blow pits and blow tanks.**
- (A) Blow-pit openings shall be preferably on the side of the pit instead of on top. When located on top, openings shall be as small as possible and shall be provided with railings, in accordance with Subdivision D, Walking-Working Surfaces.
- (B) Entrance into blow pits must be done in accordance with 437-002-0146, Subdivision J.
- (C) A signaling device shall be installed in the digester and blow-pit rooms and chip bins to be operated as a warning before and while digestors are being blown.
- (D) Blow-pit hoops shall be maintained in a safe condition.
- (q) Blowing batch digester.**
- (A) Blowoff valves shall be opened slowly.
- (B) After the digester has started to be blown, the blowoff valve shall be left open, and the hand plate shall not be removed until the digester cook signals the blowpit person that the blow is completed. Whenever it becomes necessary to remove the hand plate to clear stock, operators shall wear eye protection equipment and protective clothing to guard against burns from hot stock.
- (C) Means shall be provided whereby the digester cook shall signal the person in the chip bin before starting to load the digester.
- (r) Inspecting and repairing digester.**
- (A) Valves controlling lines leading into a digester shall be locked out and tagged in accordance with §1910.147, Lockout/Tagout, in Subdivision J.
- (B) Sources of energy associated with a digester shall be isolated in accordance with §1910.147, Lockout/Tagout, in Subdivision J.
- (C) Entry into the digester shall be in accordance with 437-002-0146 Confined Spaces, in Subdivision J.
- (D) The concentration of lead in the air shall not exceed the limits specified in §1910.1025, Lead, Subdivision Z.
- (E) All employees entering digestors for inspection or repair work shall be provided with protective headgear.
- (F) Eye protection and dust respirators shall be provided to workers while the old brick lining is being removed, in accordance with Subdivision I, Personal Protective Equipment.
- (G) Sanitary facilities shall be provided as specified in §1910.141, Sanitation, in Subdivision J.
- (s) Pressure tanks-accumulators (acid).**
- (A) Safety regulations governing inspection and repairing of pressure tanks-accumulators (acid) shall be the same as those specified in section (8)(t) of this rule.

(B) The pressure tanks-accumulators shall be inspected twice annually and more frequently if required by the manufacturer or engineer's recommendations. (Refer to Boiler and Pressure Vessel Safety Laws of the State Building Codes Division, Department of Consumer and Business Services.)

*(t) **Pressure vessels (safety devices).***

(A) Each unfired pressure vessel shall have a pressure relieving device or devices installed and operated in accordance with ASME Boiler and Pressure Vessel Code, Section VIII (Unfired Pressure Vessels – 1992). In the case of batch digesters with safety pressure relieving devices installed directly to the pressure vessel, means shall be devised to verify regularly that the safety devices have not become plugged or corroded to the point of being inoperative.

(B) All safety devices shall conform to Paragraph U-2 in the ASME Boiler and Pressure Vessel Code, Section VIII, Unfired Pressure Vessels – 1992.

*(u) **Miscellaneous.** Insofar as the processes of the sulfate and soda operations are similar to those of the sulfite processes, sections (8)(a) through (t) of this rule shall apply.*

(A) Quick operating showers, bubblers, etc., shall be available for emergency use in case of caustic soda burns.

(B) Rotary tenders, smelter operators, and those cleaning smelt spouts shall be provided with eye protection equipment (fitted with lenses that filter out the harmful rays emanating from the light source) when actively engaged in their duties, in accordance with OAR 437-002-0134, in Subdivision I.

(C) Piping, valves and fittings between the digester, blowpit, and blow tanks shall be in accordance with ANSI/ASME B31.1-1992. These shall be inspected at least semi-annually to determine the degree of deterioration and repaired or replaced when necessary, in accordance with American National Standards ANSI/ASME B31.1-1992.

*(v) **Welding.** Welding on blow tanks, accumulator tanks, or any other vessels where turpentine vapor or other combustible vapor could gather shall be done only after the vessel has been completely purged of fumes. Fresh air shall be supplied workers inside of vessels.*

***NOTE:** See Subdivision Q, Welding, Cutting and Brazing, for additional welding requirements.*

*(w) **Turpentine systems and storage tanks.** Nonsparking tools and ground hose shall be used when pumping out the tank. The tank shall be surrounded by a berm or moat.*

*(x) **Recovery furnace area.***

(A) An audible warning system shall be installed in kraft and soda base sulfite recovery furnace areas and shall be activated whenever an emergency exists.

(B) All personnel working in recovery furnace areas shall be instructed on procedures to be followed when emergency warning systems are activated.

(C) Emergency warning systems in the recovery furnace areas shall be kept in proper working condition and shall be tested or checked weekly.

(D) Workers shall stand to the side while opening a furnace or boiler firebox door.

(E) Smelt-dissolving tanks shall be covered and the cover kept closed, except when samples are being taken.

(F) Smelt tanks shall be provided with vent stacks and explosion doors, in accordance with American National Standard ANSI/UL 641-1985.

(G) An emergency shutdown procedure as currently recommended by the boiler manufacturer shall be implemented and used when an emergency shutdown is required. Both normal and emergency shutdown procedures shall be posted.

(H) Recovery furnaces and power boilers are to be constructed, maintained, and serviced as required by the State Building Codes Division of the Department of Consumer and Business Services.

(I) Open pipes shall not be used as punch bars if the use would create a hazard.

*(J) **Furnace room.** Exhaust ventilation shall be provided where niter cake is fed into a rotary furnace and shall be so designed and maintained as to keep the concentration of*

hydrogen sulfide gas below the limits listed in OAR 437-002-0382, Oregon Rules for Air Contaminants, in Subdivision Z.

(9) Bleaching.

(a) Bleaching containers. Bleaching containers, such as cells, towers (bleaching engines), etc., except the Bellmer type, shall be completely covered on the top, with the exception of one small opening large enough to allow filling but too small to admit a person. Platforms leading from one engine to another shall have standard guardrails, in accordance with Subdivision D, Walking-Working Surfaces.

(b) Bleach plant alarm system. An audible alarm system shall be installed and it shall be activated whenever a serious leak or break develops in the bleach plant area which creates a health or fire hazard.

(c) Bleach mixing rooms.

(A) Areas where dry bleach powder is mixed shall be provided with adequate exhaust ventilation, located at the floor level, in accordance with ANSI/UL 641-1985.

(B) Respiratory protection shall be provided for emergency use, in accordance with American National Standards ANSI/NFPA 1404-1989, and Z88.2-1980. Respiratory protection must conform to the requirements of §1910.134 of Subdivision I.

(C) For emergency and rescue work, self-contained air masks or supplied air equipment shall be provided in accordance with American National Standards Z88.2-1980. Respiratory protection must conform to the requirements of §1910.134 of Subdivision I.

(d) Liquid chlorine.

(A) Tanks of liquid chlorine shall be stored in an adequately ventilated unoccupied room, where their possible leakage cannot affect workers.

(B) Gas masks capable of absorbing chlorine shall be supplied, conveniently placed, and regularly inspected, and workers who may be exposed to chlorine gas shall be instructed in their use.

(C) For emergency and rescue work, independent self-contained breathing apparatus or supplied air equipment shall be provided.

(D) At least two exits, remote from each other, shall be provided for all rooms in which chlorine is stored.

(E) Spur tracks upon which tank cars containing chlorine and caustic are spotted and connected to pipelines shall be protected by means of a derail in front of the cars.

(F) All chlorine, caustic, and acid lines shall be marked for positive identification, in accordance with American National Standard A13.1-1981 (R 1985).

(e) Handling chlorine dioxide.

(A) Chlorine dioxide generating and storage facilities shall be placed in areas which are adequately ventilated and are easily kept clean of wood, paper, pulp, etc., to avoid contamination which might cause a reaction. This can be accomplished by placing these facilities in a separate room or in a designated outside space.

(B) Safety showers and/or jump tanks and eyewash fountains shall be provided for persons working around sodium chlorate and the other hazardous chemicals involved in this process.

(C) Water hoses for flushing spills shall be adequate in size and located where needed.

(D) The generating area shall have signs in accordance with Subdivision J, General Environmental Controls, warning of the hazard and restricting entrance to authorized personnel only.

(E) Facilities handling sodium chlorate and chlorine dioxide shall be declared "No Smoking" areas and shall have signs posted accordingly.

(F) All equipment involved in the chlorine dioxide process where pressure may be generated shall be provided with adequate pressure relief devices.

(G) Respiratory protective equipment approved for use in exposures to chlorine and chlorine dioxide gases shall be provided.

(H) Management shall be responsible for developing written instructions including safety procedures for operating and maintaining the generator and associated equipment. All personnel working on this equipment shall be thoroughly trained in these procedures and shall follow them.

(I) Only authorized personnel shall be allowed in close proximity to the chlorine dioxide generating equipment.

(J) When reasonably possible, the sample station should be located on the outside of the generating room. Goggles must be worn when taking samples.

(K) Welding or burning shall not be performed on the generator system while it is operating. Immediately before maintenance can be performed on the inside of any of this equipment, it shall be thoroughly flushed with water and purged of hazardous gases.

(L) Chlorine and chlorine dioxide gas shall be carried away from the work place and breathing area by an exhaust system. The gas shall be rendered neutral or harmless before being discharged into the atmosphere. The requirements of American National Standard Z9.2-1979 (R1991) shall apply to this subdivision.

(f) Handling sodium chlorate.

(A) Workers handling and working with sodium chlorate shall be thoroughly trained in precautions to be used in handling and special work habits.

(B) Workers exposed to direct contact with sodium chlorate shall wear appropriate personal protective equipment.

(C) Facilities for storage and handling of sodium chlorate shall be constructed so as to eliminate possible contact of dry or evaporated sodium chlorate with wood or other material which could cause a fire or explosion.

(D) Chlorine gas shall be carried away from the work place and breathing area by an exhaust system. The gas shall be rendered neutral or harmless before being discharged into the atmosphere. The requirements of American National Standard Z9.2-1979 (R1991) shall apply to this subdivision.

(E) Sodium chlorate facilities shall be constructed with a minimum of packing glands, stuffing boxes, etc.

(g) **Bagged or drummed chemicals.** Bagged or drummed chemicals require efficient handling to prevent damage and spillage. Certain oxidizing chemicals used in bleaching pulp and also in some sanitizing work require added precautions for safety in storage and handling. In storage, these chemicals shall be isolated from combustible materials and other chemicals with which they will react such as acids. They shall also be kept dry, clean and uncontaminated.

(10) Mechanical Pulp Process.

(a) Pulp grinders.

(A) Water wheels directly connected to pulp grinders shall be provided with speed governors limiting the peripheral speed of the grinder to that recommended by the manufacturer.

(B) Doors of pocket grinders shall be arranged so as to keep them from closing accidentally.

(b) **Butting saws.** Hood guards shall be provided on butting saws, in accordance with American National Standard ANSI O1.1-1992.

(c) **Floors and platforms.** The requirements of section (3)(d) of this rule shall apply.

(d) **Personal protection.** Persons exposed to falling material shall wear eye, head, foot, and shin protection equipment, in accordance with Subdivision I, Personal Protective Equipment.

(11) Stock Preparation.

(a) Pulp shredders.

- (A) Cutting heads shall be completely enclosed except for an opening at the feed side sufficient to permit only entry of stock. The enclosure shall be bolted or locked in place. The enclosure shall be of solid material or with mesh or other openings not exceeding 1/2-inch.
- (B) Either a slanting feed table with its outer edge not less than 36 inches from the cutting head or an automatic feeding device shall be provided.
- (C) Repairs for cleaning of blockage shall be done only when the shredder is shutdown and control devices locked.
- (D) All power-driven mechanisms shall be guarded in accordance with section (3)(a) of this rule.
- (b) **Pulp conveyors.** Pulp conveyors and conveyor drive belts and pulleys shall be fully enclosed, or if open and within 7 feet of the floor, shall be constructed and guarded in accordance with Subdivision N, Material Handling and Storage, and Subdivision O, Machinery and Machine Guarding.
- (c) **Floors, steps, and platforms.** The requirements of section (3)(d) of this rule shall apply.
- (d) **Beaters.**
- (A) Beater rolls shall be provided with covers.
- (B) Guardrails 42 inches high shall be provided around beaters where tub tops are less than 42 inches from the floor, in accordance with section (3)(d) of this rule and Subdivision D, Walking-Working Surfaces.
- (C) When cleaning, inspecting, or other work requires that persons enter the beaters, all control devices shall be locked and tagged out, in accordance with §1910.147, Lockout, in Subdivision J.
- (D) When beaters are fed from the floor above, the chute opening, if less than 42 inches from the floor, shall be provided with a complete rail or other enclosure. Openings for manual feeding shall be sufficient only for entry of stock and shall be provided with at least two permanently secured crossrails, in accordance with Subdivision D, Walking-Working Surfaces.
- (E) Floors around beaters shall be provided with sufficient drainage to remove wastes.
- (e) **Pulpers.**
- (A) All pulpers having the top or any other opening of the vessel less than 42 inches from the floor or work platform shall have such openings guarded by railed or other enclosures. For manual charging, openings shall be sufficient only to permit the entry of stock and shall be provided with at least two permanently secured crossrails, in accordance with ~~§1910.23, Guarding Floor and Wall Openings and Holes, in]~~Subdivision D.
- (B) When cleaning, inspecting or other work requires persons to enter the pulpers it shall be in accordance with 437-002-0146 Confined Spaces, in Subdivision J. All power mechanisms shall be guarded as required in Subdivision O, Machinery and Machine Guarding.
- (C) Cleaning or inspecting pulpers or other work, including work above the pulper in a dangerous position, shall be in accordance with §1910.147, Lockout, in Subdivision J.
- (D) All power mechanisms shall be guarded in accordance with Subdivision O, Machinery and Machine Guarding.
- (f) **Pulping devices.**
- ~~[(A)]~~Emergency stop controls shall be provided at the feed point when pulping devices are fed manually from the floor above.
- (g) **Guillotine-type roll splitters.** Rolls shall be centered and in a horizontal position directly below the guillotine-type blade while being split. No part of the body shall be under the guillotine-type blade.
- (h) **Stock chests and tanks.**
- (A) All control devices shall be locked when persons enter stock chests, in accordance with §1910.147, Lockout/Tagout, in Subdivision J.
- (B) All power mechanisms shall be guarded in accordance with Subdivision O, Machinery and Machine Guarding.

(C) When cleaning, inspecting, or other work requires that persons enter stock chests, they shall be provided with a low-voltage extension light.

(12) Machine Room.

(a) Controls and safety devices.

(A) Electrically or manually operated power disconnecting devices for all power-operated equipment shall be provided within easy reach of the operator while in his or her normal operating position. If necessary for safety of the operation, the machine shall be so equipped that retarding or braking action can be applied at the time of or after the source of power is deactivated.

(B) Pulp and paper machines shall be equipped with stopping devices. The devices shall be located where they can be used readily to stop the machines or sections of the machine. Power disconnect devices and retarding or braking controls provided for in section (12)(a)(A) of this rule are required for the safe operation of a pulp and paper machine.

(C) Brakes, back stops, antirunaway devices, overload releases, and other safety devices shall be inspected and tested frequently to insure that all are operative and maintained in good repair.

(D) An audible alarm shall be sounded prior to starting up any section of a pulp or paper machine. Sufficient time shall be allowed between activation of the alarm system and start-up of the equipment to allow any persons to clear the hazardous area.

(E) In starting up a dryer section, dryers shall be preheated and steam for heating the drums shall be introduced slowly, while the drums are revolving.

(F) Employees shall not attempt to remove a broken carrier rope from a dryer while the section is running at operating speed.

(G) Employees shall not feed a stack with any hand-held device which is capable of going through the nip.

(H) Employees shall stop dryer to remove a wrap except in cases where it can be safely removed by using air or other safe means.

(I) Special protective gloves shall be provided and shall be worn by employees when filing or handling sharp-edged doctor blades.

(J) Employees shall not place their hands between the sharp edge of an unloaded doctor blade and the roll while cleaning the doctor blade.

(K) The crane operator shall ascertain that reels are properly seated at winder stand or at reel arms before he or she disengages the hooks.

(L) Shaftless winders shall be provided with a barrier guard of sufficient strength and size to confine the rolls in the event they become dislodged while running.

(M) Employees shall keep clear of hazardous areas around the lowerator, especially all lowerator openings in a floor and where roll is being discharged.

(N) If a powered roll ejector is used it should be interlocked to prevent accidental actuation until the receiving platform or roll lowering table is in position to receive the roll.

(O) Provision shall be made to hold the rider roll when in a raised position unless counterbalancing eliminates the hazard.

(b) Drives.

(A) All drives, pulleys, couplings, and shafts on equipment requiring service while operating shall have standard guards in accordance with section (3)(a) of this rule.

(B) All drives shall be provided with lockout devices at the power switch which interrupts the flow of current to the unit.

(C) All ends of rotating shafts including dryer drum shafts shall be completely guarded.

(D) All accessible disengaged doctor blades should be covered.

(E) All exposed shafts shall be guarded. Crossovers shall be provided.

(F) Oil cups and grease fittings shall be placed in a safe area remote from nip and heat hazards.

- (c) **Protective equipment.** Face shields, aprons and rubber gloves shall be provided for workers handling acids in accordance with sections (3)(c) and (5)(a) of this rule.
- (d) **Walkways.** Steps and footwalks along the fourdrinier and press section shall have nonslip surfacing and be complete with standard handrails, when practical, in accordance with ~~§1910.23, in~~ Subdivision D, Walking-Working Surfaces.
- (e) **Steps.** Steps of uniform rise and tread with nonslip surfaces shall be provided at each press in accordance with Subdivision D, Walking-Working Surfaces.
- (f) **Plank walkways.** A removable plank shall be provided along each press, with standard guardrails installed. The planks shall have nonslip surfaces in accordance with Subdivision D, Walking-Working Surfaces.
- (g) **Dryer lubrication.** If a gear bearing must be oiled while the machine is in operation, an automatic oiling device to protect the oiler shall be provided, or oil cups and grease fittings shall be placed along the walkways out of reach of hot pipes and dryer gears.
- (h) **Levers.** All levers carrying weights shall be constructed so that weights will not slip or fall off.
- (i) **First dryer.** Either a permanent guardrail or apron guard or both shall be installed in front of the first dryer in each section in accordance with Subdivision O, Machinery and Machine Guarding.
- (j) **Steam and hot-water pipes.** All exposed steam and hot-water pipes within 7 feet of the floor or working platform or within 15 inches measured horizontally from stairways, ramps, or fixed ladders shall be covered with an insulating material, or guarded in such manner as to prevent contact.
- (k) **Dryer gears.** Dryer gears shall be guarded except where the oilers' walkway is removed out of reach of the gears' nips and spokes and hot pipes in accordance with Subdivision O, Machinery and Machine Guarding.
- (l) **Broke hole.**
- (A) A guardrail shall be provided at broke holes in accordance with Subdivision D, Walking-Working Surfaces.
- (B) Where pulpers are located directly below the broke hole on a paper machine and where the broke hole opening is large enough to permit a worker to fall through, any employee pushing broke down the hole shall wear a safety belt and lanyard. The lanyard shall be fastened in such a manner that it is impossible for the person to fall into the pulper.
- (C) An alarm bell or a flashing light shall be actuated before dropping material through the broke hole.
- (m) **Feeder belt.** A feeder belt or other effective device shall be provided for starting paper through the calender stack.
- (n) **Steps.** Steps or ladders of uniform rise and tread with nonslip surfaces shall be provided at each calender stack. Handrails and hand grips shall be provided at each calender stack in accordance with Subdivision D, Walking-Working Surfaces.
- (o) **Grounding.** All calender stacks and spreader bars shall be grounded in accordance with Subdivision S, Electrical, as protection against shock induced by static electricity.
- (p) **Sole plates.** All exposed sole plates between dryers, calenders, reels, and rewinders shall have a nonskid surface.
- (q) **Nip points.** The hazard of the nip points on all calender rolls shall be eliminated or minimized by means of an effective barrier device, or by feeding the paper into the rolls by means of a rope carrier, air jets, or hand feeding devices.
- (r) **Scrapers.** Alloy steel scrapers with pullthrough blades approximately 3 by 5 inches in size shall be used to remove "scabs" from calender rolls.
- (s) **Illumination.** Permanent lighting shall be installed in all areas where employees are required to make machine adjustments and sheet transfers in accordance with American National Standard ANSI/IES RP-1990.

- (t) **Control panels.** All control panel handles and buttons shall be protected from accidental contact.
- (u) **Lifting reels.**
- (A) The reels shall stop rotating before being lifted from bearings.
- (B) All lifting equipment (clamps, cables, and slings) shall be maintained in a safe condition and inspected regularly.
- (C) Reel shafts with square block ends shall be guarded.
- (v) **Feeder belts.** Feeder belts, carrier ropes, air carriage, or other equally effective means shall be provided for starting paper into the nip or drum-type reels.
- (w) **In-running nip.**
- (A) Where the nipping points of all drum winders and rewinders is on the operator's side, it shall be guarded by barrier guards interlocked with the drive mechanism.
- (B) A zero speed switch or locking device shall be installed to prevent the guard from being raised, lowered, or removed while the roll is turning.
- (x) **Core collars.** Set screws for securing core collars to winding and unwinding shafts shall not protrude above the face of the collar. All edges of the collar with which an operator's hand comes in contact shall be beveled to remove all sharp corners.
- (y) **Slitter knives.** Slitter knives shall be guarded so as to prevent accidental contact. Carriers shall be provided and used for transportation of slitter knives.
- (z) **Winder shaft.** The winder shall have a guide rail to align the shaft for easy entrance into the opened rewind shaft bearing housings.
- (aa) **Handling rolls, winders and core shafts.** Mechanical handling equipment shall be provided for handling rolls, winder shafts, and core shafts that are too heavy for safe manual handling based on the NIOSH Work Practice Guide for Manual Lifting – 1981.
- (bb) **Winder area.** A nonskid surface shall be provided in front of the winder to prevent accidental slipping.
- (cc) **Radiation.** Special standards regarding the use of radiation equipment shall be posted and followed as required by §1910.1096, Ionizing Radiation, in Subdivision Z.
- (13) **Finishing Room.**
- (a) **Cleaning rolls.** Rolls shall be cleaned only on the outrunning side.
- (b) **Emergency stops.** Electrically or manually operated quick power disconnecting devices, interlocked with braking action, shall be provided on all operating sides of the machine within easy reach of all employees. These devices shall be tested by making use of them when stopping the machine.
- (c) **Core collars.** The requirements of section (12)(x) of this rule, and the requirements in Subdivision O, Machinery and Machine Guarding, shall apply.
- (d) **Elevators.** These shall be in accordance with American National Standard ANSI/ASME A17.1-1990.
- (e) **Control panels.** The requirements of section (12)(t) of this rule shall apply.
- (f) **Guillotine-type cutters.**
- (A) Each guillotine-type cutter shall be equipped with a control which requires the operator and helper, if any, to use both hands to engage the clutch when operated from within reach of blade.
- (B) Each guillotine-type cutter shall be equipped with a nonrepeat device.
- (C) Carriers shall be provided and used for transportation of guillotine-type cutter knives.
- (g) **Rotary cutter.**
- (A) On single-knife machines a guard shall be provided at a point of contact to the knife.
- (B) On duplex cutters the protection required for single-knife machines shall be provided for the first knife, and a hood shall be provided for the second knife.

(C) Safe access shall be provided to the knives of a rotary cutter by means of catwalks with nonslip surfaces, railings, and toeboards in accordance with Subdivision D, Walking-Working Surfaces.

(D) A guard shall be provided for the spreader or squeeze roll at the nip side on sheet cutters.

(E) Electrically or manually operated quick power disconnecting devices with adequate braking action shall be provided on all operating sides of the machine within easy reach of all operators.

(F) The outside slitters shall be guarded.

(h) Platers.

(A) A guard shall be arranged across the face of the rolls to serve as a warning that the operator's hand is approaching the danger zone.

(B) A quick power disconnecting device shall be installed on each machine within easy reach of the operator.

(i) Finishing room rewinders.

(A) The nipping points of all drum winders and rewinders located on the operator's side shall be guarded by either automatic or manually operated barrier guards of sufficient height to protect fully anyone working around them. The barrier guard shall be interlocked with the drive mechanism to prevent operating above jog speed without the guard in place. A zero speed switch should be installed to prevent the guard from being raised while the roll is turning.

(B) A nonskid surface shall be provided in front of the rewriter to prevent an employee from slipping in accordance with section (3)(d) of this rule.

(C) Mechanical lifting devices shall be provided for placing and removing rolls from the machine.

(j) **Control panels.** The requirements of section (12)(t) of this rule shall apply.

(k) **Roll-type embosser.** The nipping point located on the operator's side shall be guarded by either automatic or manually operated barrier guards interlocked with the drive.

(l) Converting machines.

(A) When using a crane or hoist to place rolls into a backstand and the operator cannot see both ends of the backstand, appropriate means will be implemented to eliminate hazards involved. The operator shall ascertain that rolls are properly seated at winder stand or at roll arms before he or she disengages the hooks.

(B) All power closing sections shall be equipped with an audible warning system which will be activated when closing the sections.

(C) Slitters, slotters, and scorers not in use shall be properly stored so as not to create a hazard.

(D) Mechanical handling equipment shall be provided for handling rolls or devices that are too heavy for safe manual handling based on the NIOSH Work Practice Guide for Manual Lifting – 1981.

(E) Sheer and pinch points. Sheer and pinch points at the feed mechanism shall be color-coded orange and/or identified by signs in accordance with Subdivision J, General Environmental Controls.

(m) Sorting and counting tables.

(A) Tables shall be smooth and free from splinters, with edges and corners rounded.

(B) Paddles shall be smooth and free from splinters.

(n) **Roll splitters.** The nip point and cutter knife shall be guarded by either automatic or manually operated barrier guards.

(o) Corrugators.

(A) Rails of rail-mounted devices such as roll stands shall be flush with the adjacent floor, and so installed to provide a minimum of 18 inches clearance between the equipment and walls or other fixed objects.

(B) All corrugating and pressure rolls shall be equipped with appropriately designed and installed threading guides so as to prevent contact with the infeed nip of the various rolls by the operator.

- (C) Lower elevating conveyor belt rolls on the single facer bridge shall have a minimum nip clearance of 4 inches.
- (D) Web shears at the discharge end of the double facer shall be equipped with barrier-type guards.
- (E) Slitter stations not in use shall be disconnected from the power source by positive means.
- (F) The adhesive system shall be so designed and installed as to keep fumes and airborne dust within limits in accordance with OAR 437-002-0382, Oregon Rules for Air Contaminants, in Subdivision Z.

(14) Materials Handling.

- (a) **Hand trucks.** No person shall be permitted to ride on a powered hand truck unless it is so designed by the manufacturer. A limit switch shall be on operating handle – 30° each way from a 45° angle up and down.
- (b) **Power trucks.** Power trucks shall comply with Subdivision N, Material Handling and Storage. Adequate ventilation shall be provided and the trucks properly maintained, so that dangerous concentrations of carbon monoxide cannot be generated, especially in warehouses or other isolated areas of a plant.
- (c) **Carton-stitching machine.** The carton-stitching machine shall be guarded to prevent the operator from coming in contact with the stitching head.
- (d) **Banding of skids, cartons, cases, etc.** Banders and helpers shall wear eye protection equipment in accordance with section (3)(c) of this rule.
- (e) **Unloading cars or trucks.**
 - (A) Loading and unloading materials. Platforms with ladders or stairways shall be installed or alternative methods made available when needed so that workers may safely gain access to and perform work on the top of rail cars or trucks when ladders are not installed on such equipment.
 - (B) Where steel bands or wires are used in boxcars or trucks, all loaders and helpers shall wear eye protection in accordance with Subdivision I, Personal Protective Equipment.
 - (C) The construction and use of bridge or dock plates shall conform to the requirements of American National Standard B56.1-1988.
 - (D) Flag signals, derails, or other protective devices shall be used to protect workers during switching operations. The blue flag policy shall be invoked according to section (4)(j) of this rule.

Stat. Auth.: ORS 654.025(2) and ORS 656.726(4).

Stats. Implemented: ORS 654.001 to 654.295.

Hist: OR-OSHA Admin. Order 7-1994, f. 11/4/94, ef. 1/3/95.

OR-OSHA Admin. Order 3-1998, f. 7/7/98, ef. 7/7/98.

OR-OSHA Admin. Order 2-2001, f. 2/5/01, ef. 2/5/01.

OR-OSHA Admin. Order 1-2012, f. 4/10/12, ef. 4/10/12.

OR-OSHA Admin. Order 6-2012, f. 9/28/12, ef. 4/1/13.

OR-OSHA Admin. Order 7-2013, f. 12/12/13, ef. 12/12/13.

OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

1910.262 Textiles.

...

(r) Gray and white bins. On new installations guardrails [~~conforming to §1910.23~~]**that comply with subpart D of this part** shall be provided where workers are required to plait by hand from the top of the bin so as to protect the worker from falling to a lower level.

1910.265 Sawmills

...

(c) Building facilities, and isolated equipment.

...

(4)

...

(v) Elevated platforms. Where elevated platforms are used routinely on a daily basis, they shall be equipped with stairways [~~as in 1910.24,~~] or fixed ladders [~~as in OAR 437-002-0027~~]**that comply with subpart D of this part.**

...

(5)

(i) Construction. Stairways shall be constructed in accordance with [~~§1910.24~~]**subpart D of this part.**

...

(f) Dry kilns and facilities.

...

(6) Ladders. A fixed ladder[~~, in accordance~~]**complying** with the requirements of [~~OAR 437-002-0027~~]**subpart D of this part,** or other adequate means, shall be provided to permit access to the roof. Where controls and machinery are mounted on the roof, a permanent stairway with standard handrail shall be installed in accordance with the requirements [of §1910.24]**in subpart D.**

1910.268 Telecommunications.

...

(g) Personal climbing equipment.

(1) General. Safety belts and straps shall be provided and the employer shall ensure their use when work is performed at positions more than 4 feet above ground, on poles, and on towers, except as provided in paragraphs (n)(7) and (n)(8) of this section. No safety belts, safety straps or lanyards acquired after July 1, 1975 may be used unless they meet the tests set forth in paragraph (g)(2) of this section. The employer shall ensure that all safety belts and straps are inspected by a competent person prior to each day's use to determine that they are in safe working condition.

~~[(2) Telecommunication lineman's body belts, safety straps, and lanyards.~~

~~(i) General requirements.~~

~~(A) Hardware for lineman's body belts, safety straps, and lanyards shall be drop forged or pressed steel and shall have a corrosion resistant finish tested to meet the requirements of the American Society for Testing and Materials B117-64, which is incorporated by reference as specified in §1910.6 (50-hour test). Surfaces shall be smooth and free of sharp edges. Production samples of lineman's safety straps, body belts and lanyards shall be approved by a nationally recognized testing laboratory, as having been tested in accordance with and as meeting the requirements of this paragraph.~~

~~(B) All buckles shall withstand a 2,000-pound tensile test with a maximum permanent deformation no greater than 1/64-inch.~~

~~(C) D-rings shall withstand a 5,000-pound tensile test without cracking or breaking.~~

~~(D) Snaphooks shall withstand a 5,000-pound tensile test, or shall withstand a 3,000-pound tensile test and a 180° bend test. Tensile failure is indicated by distortion of the snaphook sufficient to release the keeper; bend test failure is indicated by cracking of the snaphook.~~

~~(ii) Specific requirements:~~

~~(A)~~

~~(1) All fabric used for safety straps shall be capable of withstanding an A.C. dielectric test of not less than 25,000 volts per foot "dry" for 3 minutes, without visible deterioration.~~

~~(2) All fabric and leather used shall be tested for leakage current. Fabric or leather may not be used if the leakage current exceeds 1 milliampere when a potential of 3,000 volts is applied to the electrodes positioned 12 inches apart.~~

~~(3) In lieu of alternating current tests, equivalent direct current tests may be performed.~~

~~(B) The cushion part of the body belt shall:~~

~~(1) Contain no exposed rivets on the inside. This provision does not apply to belts used by craftsmen not engaged in line work.~~

~~(2) Be at least 3 inches in width;~~

~~(3) Be at least 5/32-inch thick, if made of leather; and~~

~~(C) (Reserved)~~

~~(D) Suitable copper, steel, or equivalent liners shall be used around the bars of D rings to prevent wear between these members and the leather or fabric enclosing them.~~

~~(E) All stitching shall be done with a minimum 42-pound weight nylon or equivalent thread and shall be lock stitched. Stitching parallel to an edge may not be less than 3/16-inch from the edge of the narrowest member caught by the thread. The use of cross stitching on leather is prohibited.~~

~~(F) The keepers of snaphooks shall have a spring tension that will not allow the keeper to begin to open when a weight of 2-1/2 pounds or less is applied, but the keepers shall begin to open when a weight of 4 pounds is applied. In making this determination, the weight shall be supported on the keeper against the end of the nose.~~

~~(G) Safety straps, lanyards, and body belts shall be tested in accordance with the following procedure:~~

~~(1) Attach one end of the safety strap or lanyard to a rigid support, and the other end to a 250-pound canvas bag of sand;~~

~~(2) Allow the 250-pound canvas bag of sand to free fall 4 feet when testing safety straps and 6 feet when testing lanyards. In each case, the strap or lanyard shall stop the fall of the 250-pound bag;~~

~~(3) Failure of the strap or lanyard shall be indicated by any breakage or slippage sufficient to permit the bag to fall free from the strap or lanyard.~~

~~(4) The entire "body belt assembly" shall be tested using a D ring. A safety strap or lanyard shall be used that is capable of passing the "impact loading test" described in paragraph (g)(2)(ii)(G)(2) of this section and attached as required in paragraph (g)(2)(ii)(G)(1) of this section. The body belt shall be secured to the 250-pound bag of sand at a point which simulates the waist of a man and shall be dropped as stated in paragraph (g)(2)(ii)(G)(2) of this section. Failure of the body belt shall be indicated by any breakage or slippage sufficient to permit the bag to fall free from the body belt.]~~

~~([3]2) Pole climbers.~~

~~(i) Pole climbers may not be used if the gaffs are less than 1-1/4 inches in length as measured on the underside of the gaff. The gaffs of pole climbers shall be covered with safety caps when not being used for their intended use.~~

~~(ii) The employer shall ensure that pole climbers are inspected by a competent person for the following conditions: Fractured or cracked gaffs or leg irons, loose or dull gaffs, broken straps or buckles. If any of these conditions exist, the defect shall be corrected before the climbers are used.~~

(iii) Pole climbers shall be inspected as required in this paragraph (g)(3) before each day's use and a gaff cut-out test performed at least weekly when in use.

(iv) Pole climbers may not be worn when:

(A) Working in trees (specifically designed tree climbers shall be used for tree climbing),

(B) Working on ladders,

(C) Working in an aerial lift,

(D) Driving a vehicle, nor

(E) Walking on rocky, hard, frozen, brushy or hilly terrain.

(h) Ladders. **Ladders, step bolts, and manhole steps shall meet the applicable requirements in subpart D of this part.**

~~(1) The employer shall ensure that no employee nor any material or equipment may be supported or permitted to 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, in good condition, and properly secured in place, as required in Subpart D of this part and as required in this section.~~

~~(2) The spacing between steps or rungs permanently installed on poles and towers shall be no more than 18 inches (36 inches on any one side). This requirement also applies to fixed ladders on towers, when towers are so equipped. Spacing between steps shall be uniform above the initial unstepped section, except where working, standing, or access steps are required. Fixed ladder rungs and step rungs for poles and towers shall have a minimum diameter of 5/8 inch. Fixed ladder rungs shall have a minimum clear width of 12 inches. Steps for poles and towers shall have a minimum clear width of 4-1/2 inches. The spacing between detachable steps may not exceed 30 inches on any one side, and these steps shall be properly secured when in use.~~

~~(3) Portable wood ladders intended for general use may not be painted but may be coated with a translucent nonconductive coating. Portable wood ladders may not be longitudinally reinforced with metal.~~

~~(4) Portable wood ladders that are not being carried on vehicles and are not in active use shall be stored where they will not be exposed to the elements and where there is good ventilation.~~

~~(5) The provisions of OAR 437-002-0026 shall apply to rolling ladders used in telecommunications centers, except that such ladders shall have a minimum inside width, between the side rails, of at least 8 inches.~~

~~(6) Climbing ladders or stairways on scaffolds used for access and egress shall be affixed or built into the scaffold by proper design and engineering, and shall be so located that their use will not disturb the stability of the scaffold. The rungs of the climbing device shall be equally spaced, but may not be less than 12 inches nominal nor more than 16 inches nominal apart. Horizontal end rungs used for platform support may also be utilized as a climbing device if such rungs meet the spacing requirement of this paragraph (h)(6), and if there is sufficient clearance between the rung and the edge of the platform to afford an adequate handhold. If a portable ladder is affixed to the scaffold, it shall be securely attached and shall have rungs meeting the spacing requirements of this paragraph (h)(6). Clearance shall be provided in the back of the ladder of not less than 6 inches from center of rung to the nearest scaffold structural member.~~

~~(7) When a ladder is supported by an aerial strand, and ladder hooks or other supports are not being used, the ladder shall be extended at least 2 feet above the strand and shall be secured to it (e.g. lashed or held by a safety strap around the strand and ladder side rail). When a ladder is supported by a pole, it shall be securely lashed to the pole unless the ladder is specifically designed to prevent movement when used in this application.~~

~~(8) The following requirements apply to metal manhole ladders.~~

- ~~(i) Metal manhole ladders shall be free of structural defects and free of accident hazards such as sharp edges and burrs. The metal shall be protected against corrosion unless inherently corrosion-resistant.~~
- ~~(ii) These ladders may be designed with parallel side rails, or with side rails varying uniformly in separation along the length (tapered), or with side rails flaring at the base to increase stability.~~
- ~~(iii) The spacing of rungs or steps shall be on 12-inch centers.~~
- ~~(iv) Connections between rungs or steps and siderails shall be constructed to insure rigidity as well as strength.~~
- ~~(v) Rungs and steps shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize the possibility of slipping.~~
- ~~(vi) Ladder hardware shall meet the strength requirements of the ladder's component parts and shall be of a material that is protected against corrosion unless inherently corrosion-resistant. Metals shall be so selected as to avoid excessive galvanic action.]~~

437-002-0314 Veneer and Plywood Machinery.

NOTE: 1910.265(c) and (d) also apply to Veneer and Plywood Machinery. (See OAR 437-002-0313(1).)

(1) Purpose. *The purpose of this rule is to prescribe minimum requirements for veneer and plywood operations.*

(2) Veneer Lathe.

- (a) A mechanical lock shall be provided to prevent the back-up roll from closing until activated by the operator.*
- (b) A guard or positive interlock and necessary hydraulic or air controls shall be provided to prevent forward movement of the charger, if such movement may be hazardous.*
- (c) Positive means shall be provided to hold the head in the open position while servicing the knife.*
- (d) A protective device for the knife edge shall be provided for use when transporting the knife.*
- (e) Where there is a hazard from "exploding" logs, both lathe operator's and charger operator's stations shall be protected against flying slabs and chips.*
- (f) Means shall be provided in the knife grinding area to drain cleaning or cooling liquids from the work station.*
- (g) Knives and other cutting equipment shall be stored in planned storage areas.*
- (h) The area under the elevating ramp (tipple) from the lathe to the stock trays shall be guarded to prevent entrance while the lathe is in operation.*

(3) Veneer Slicer. *The veneer slicer knife shall be guarded at front and rear to prevent accidental contact with the knife edge.*

(4) Veneer Clipper.

- (a) Clippers shall be provided with a guard on both infeed and outfeed sides to protect the employees.*
- (b) Each operating treadle for veneer clippers shall be covered by a device which is adequate to avoid accidental activation or tripping.*

(5) Veneer Cutter.

(a) *Power-driven guillotine veneer cutters (except continuous feed trimmers) shall be equipped with the following:*

(A) *A starting device which requires the simultaneous action of both hands to start the cutting motion, and at least one hand on a control during the complete stroke of the knife; or*

(B) *An automatic device which will remove the hands of the operator from the danger zone at every descent of the blade used in conjunction with one-hand starting devices which require two distinct movements of the device to start the cutting motion.*

(b) *All power-driven veneer cutters shall be so designed that the knife positively returns to the starting position after each complete cycle of the knife.*

(c) *Where two or more workers are employed at the same time on the same power-driven guillotine veneer cutter equipped with two-hand control, the device shall be so arranged that each worker shall be required to use both hands shall be required to use both hands simultaneously on the controls to start the cutting motion, and at least one hand on a control to complete the cut.*

Note: The controls should be of a type that cannot be defeated by tying down one of them.

(d) *In addition to the brake or other stopping mechanism, a nonrepeat device shall be provided which will prevent the machine from operating in the event of a mechanical failure.*

(e) *Where no other device serves as protection, a guard running the length of the knife shall be installed on the infeed side.*

(f) *A protective device, such as side shields, shall be provided on the outfeed side.*

(g) *A protective device for the knife edge shall be provided for use when transporting the knife.*

(h) *Positive means of opening and locking the control circuit and supporting the mechanism in the "up" position shall be provided for use during knife changes.*

(i) *When the hold-down clamp and knife are in their uppermost positions, the knife edge shall not extend below the lower edge of the hold-down clamp.*

(6) *Tray System.*

(a) *The tray system shall be equipped with controls at each end so that the system cannot be operated unless both switches are in the "on" position.*

(b) *A walkway shall be constructed the entire length of the trays so that the top tray can be reached in the event of a "plug-up" without having to climb up the frames.*

(7) *Veneer Dryer.*

(a) *A standard stairway and catwalk across the tray lines shall be constructed to provide safe access in the event of a "plug-up" and dryer feed controls, including a positive lockout, shall be provided at the feeders' station.*

(b) *Steam lines outside the dryer which may be contacted by personnel shall be insulated or enclosed.*

(c) *Suitable gloves and aprons shall be worn by workers off-bearing veneer from chain or table.*

(d) *Where a band saw is used to trim panel core, it shall be guarded in accordance with 1910.265(e)(2)(ii)(C).*

(8) *Hot Press or Veneer Press.*

(a) *Steam lines which may be contacted by personnel shall be insulated or enclosed.*

(b) *Standard guardrails shall be provided on the ends of loading and unloading elevators or hoist platforms or both. (See [OAR 437,]Division 2/D[, 1910.23(e)(4)].)*

(c) *Hot-press hoists shall be provided with a braking and holding mechanism which will operate automatically in case of failure of lifting chains or cables.*

- (d) On a hot-press equipped with an automatic charger, an electrically interlocked gate or chain shall be provided across the opening between the charger and the press which, when opened, will open the circuit to prevent the charger from moving.
- (e) Where two workers are employed in loading the press, closing control devices shall be provided within reach of each work station, so interconnected as to require activation of both controls to operate the press, and a quick opening device shall be provided at each station on the press hoist platform.
- (f) Floor openings on non-working sides of press and pit shall be protected with standard guardrails. (See [OAR 437,]Division 2/D[-1910.23(a)(8)].)
- (g) Means shall be provided for safe access into the press pit, the top of the press, and each side, and a positive means of blocking up the hoist platform.

(9) *Stripsaw and Patch Machine.*

- (a) An antikickback device and hood guard shall be provided on the veneer stripsaw.
- (b) The patch machine shall be guarded to prevent operator's hands from entering the punch area, and the foot treadle shall be guarded.

(10) *Veneer Chipper and Hogs.*

- (a) The top feed roll shall be equipped with a guard and a shield or panel shall be provided on the operator's side to prevent operator from reaching the roll.
- (b) Chippers and hogs shall be guarded in accordance with 1910.265(c)(20)(i) through (c)(21)(ii)(C). Feed conveyors to chippers and hogs shall be guarded in accordance with OAR 437-002-0313(2).

(11) *Electronic Laminating Press and Edge Gluer.*

- (a) Interlocked gates shall be provided on infeed and outfeed sides of batch-type presses which are interlocked to prevent power being activated until gates are completely lowered.
- (b) Shielding shall be provided to protect against harmful exposure to radiation that may be emitted.
- (c) All screens and filters shall be equipped with interlocks which will shut off all power in the event they are removed.

(12) *Edge Gluer Jointer.*

- (a) A barrier shall be installed at the end of the travel of the head to prevent flying splinters from injuring personnel.
- (b) A gate shall be installed to prevent access between the edge gluer jointer and the grasshopper, so arranged that when the gate is opened, all electricity, air, and hydraulic lines will be shut off and the cylinders bled.
- (c) A device should be positioned across the front of the infeed nip point, so arranged as to shut off the equipment if contact is made with it.

(13) *Wide Belt Sanders.* Wide-belt sanders shall be equipped with non-kickback fingers and a barrier at the infeed side adjusted to prevent more than one panel entering the sander at a time.

Stat. Auth.: ORS 654.025(2) and 656.726(4)

Stats. Implemented: ORS 654.001 through 654.295.

Hist: WCB Admin. Order No. 37-1974, f. 9/16/74, ef. 11/15/74.

OR-OSHA Admin. Order 7-1993, f. 6/8/93, ef. 8/1/93.

OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

Division 2/RR, Electric Power Generation, Transmission, and Distribution

437-002-2306 Personal protective equipment

- (1) General. For employers engaged in general industry activities, personal protective equipment must meet the requirements of ~~[437-002-0134]~~**Division 2/I**. For employers engaged in construction activities, personal protective equipment must meet the requirements of ~~[437-003-0134]~~**Division 3/E**.

Note 1: 437-002-0134 (4) and 437-003-0134 (4) set employer payment obligations for the personal protective equipment required by this rule, including, but not limited to, the fall protection equipment required by paragraph (2) of this rule, the electrical protective equipment required by 437-002-2311(3) of Division 2/RR, and the flame-resistant and arc-rated clothing and other protective equipment required by 437-002-2311(8) of Division 2/RR.

Note 2: For general industry activities, refer to Division 2/I, 1910.137, for Electrical Protective Equipment requirements. For construction activities, refer to Division 3/E, 1926.97, for Electrical Protective Equipment requirements.

(2) Fall protection.

- (a) **For employers engaged in general industry activities, p[P]Personal fall arrest systems must meet the requirements of Division [3/M]2/I[, as required by 437-002-0134(5) of Division 2 and 437-003-0134(5) of Division 3]. For employers engaged in construction activities, personal fall arrest systems must meet the requirements of Division 3/M.**
- (b) Personal fall arrest equipment used by employees who are exposed to hazards from flames or electric arcs, as determined by the employer under 437-002-2311(8)(a) of Division 2/RR, must be capable of passing a drop test equivalent to that required by paragraph (2)(c)(L) of this rule after exposure to an electric arc with a heat energy of 40 ± 5 cal/cm².
- (c) Body belts and positioning straps for work-positioning equipment must meet the following requirements:
- (A) Hardware for body belts and positioning straps must meet the following requirements:
- (i) Hardware must be made of drop-forged steel, pressed steel, formed steel, or equivalent material.
 - (ii) Hardware must have a corrosion-resistant finish.
 - (iii) Hardware surfaces must be smooth and free of sharp edges.
- (B) Buckles must be capable of withstanding an 8.9-kilonewton (2,000-pound-force) tension test with a maximum permanent deformation no greater than 0.4 millimeters (0.0156 inches).

- (C) D rings must be capable of withstanding a 22-kilonewton (5,000-pound-force) tensile test without cracking or breaking.
- (D) Snaphooks must be capable of withstanding a 22-kilonewton (5,000-pound-force) tension test without failure.

Note to paragraph (2)(c)(D) of this rule: Distortion of the snaphook sufficient to release the keeper is considered to be tensile failure of a snaphook.

- (E) Top grain leather or leather substitute may be used in the manufacture of body belts and positioning straps; however, leather and leather substitutes may not be used alone as a load-bearing component of the assembly.
- (F) Plied fabric used in positioning straps and in load-bearing parts of body belts must be constructed in such a way that no raw edges are exposed and the plies do not separate.

(G) Positioning straps must be capable of withstanding the following tests:

- (i) A dielectric test of 819.7 volts, AC, per centimeter (25,000 volts per foot) for 3 minutes without visible deterioration;
- (ii) A leakage test of 98.4 volts, AC, per centimeter (3,000 volts per foot) with a leakage current of no more than 1 mA;

Note to paragraphs (2)(c)(G)(i) and (2)(c)(G)(ii): Positioning straps that pass direct-current tests at equivalent voltages are considered as meeting this requirement.

- (iii) Tension tests of 20 kilonewtons (4,500 pounds-force) for sections free of buckle holes and of 15 kilonewtons (3,500 pounds-force) for sections with buckle holes;
- (iv) A buckle-tear test with a load of 4.4 kilonewtons (1,000 pounds-force); and
- (v) A flammability test in accordance with Table RR-1.

Table RR 1 Flammability Test

Test method	Criteria for passing the test
Vertically suspend a 500-mm (19.7-inch) length of strapping supporting a 100-kg (220.5-lb) weight.	
Use a butane or propane burner with a 76-mm (3-inch) flame.	Any flames on the positioning strap must self extinguish.
Direct the flame to an edge of the strapping at a distance of 25 mm (1 inch).	The positioning strap must continue to support the 100-kg (220.5-lb) mass.
Remove the flame after 5 seconds.	
Wait for any flames on the positioning strap to stop burning.	

- (H) The cushion part of the body belt must contain no exposed rivets on the inside and must be at least 76 millimeters (3 inches) in width
- (I) Tool loops must be situated on the body of a body belt so that the 100 millimeters (4 inches) of the body belt that is in the center of the back, measuring from D ring to D ring, is free of tool loops and any other attachments.

(J) Copper, steel, or equivalent liners must be used around the bars of D rings to prevent wear between these members and the leather or fabric enclosing them.

(K) Snaphooks must be of the locking type meeting the following requirements:

(i) The locking mechanism must first be released, or a destructive force must be placed on the keeper, before the keeper will open.

(ii) A force in the range of 6.7 N (1.5 lbf) to 17.8 N (4 lbf) must be required to release the locking mechanism.

(iii) With the locking mechanism released and with a force applied on the keeper against the face of the nose, the keeper may not begin to open with a force of 11.2 N (2.5 lbf) or less and must begin to open with a maximum force of 17.8 N (4 lbf).

(L) Body belts and positioning straps must be capable of withstanding a drop test as follows:

(i) The test mass must be rigidly constructed of steel or equivalent material with a mass of 100 kg (220.5 lbm). For work-positioning equipment used by employees weighing more than 140 kg (310 lbm) fully equipped, the test mass must be increased proportionately (that is, the test mass must equal the mass of the equipped worker divided by 1.4).

(ii) For body belts, the body belt must be fitted snugly around the test mass and must be attached to the test structure anchorage point by means of a wire rope.

(iii) For positioning straps, the strap must be adjusted to its shortest length possible to accommodate the test and connected to the test-structure anchorage point at one end and to the test mass on the other end.

(iv) The test mass must be dropped an unobstructed distance of 1 meter (39.4 inches) from a supporting structure that will sustain minimal deflection during the test.

(v) Body belts must successfully arrest the fall of the test mass and must be capable of supporting the mass after the test.

(vi) Positioning straps must successfully arrest the fall of the test mass without breaking, and the arrest force may not exceed 17.8 kilonewtons (4,000 pounds-force). Additionally, snaphooks on positioning straps may not distort to such an extent that the keeper would release.

Note to paragraph (2)(c) of this rule: When used by employees weighing no more than 140 kg (310 lbm) fully equipped, body belts and positioning straps that conform to American Society of Testing and Materials Standard Specifications for Personal Climbing Equipment, ASTM F887-12e1, are deemed to be in compliance with paragraph (2)(c) of this rule.

(d) The following requirements apply to the care and use of personal fall protection equipment.

(A) Body belts and positioning straps must never be stored with sharp or edged tools.

- (B) Small tools carried in the belt must be placed so they present the least danger of coming in accidental contact with energized parts. Sharp or pointed tools must not be carried unless in scabbards, or are otherwise effectively safeguarded.
- (C) Work-positioning equipment must be inspected before use each day to determine that the equipment is in safe working condition. Work-positioning equipment that is not in safe working condition may not be used.

Note to paragraph (2)(d)(C): Appendix F to Division 2/RR contains guidelines for inspecting work-positioning equipment.

- (D) The use of chainsaws is prohibited on all overhead work where workers are supported by a single climbing belt or rope.
- (E) Workers must not place positioning straps around the pole above the top crossarm except where adequate protection is taken to prevent it from slipping over the top of the pole. Workers must not allow either end of a strap to hang loose, either in climbing or descending poles or other structures.
- (F) Gaffs and Climbers.
 - (i) Gaffs and climbers must be maintained according to the manufacturer's recommendations.
 - (ii) Workers must remove climbers before driving any vehicle.
 - (iii) Climbers must not be worn except when required. Workers must not continue to wear their climbers while working on the ground except for brief periods when a worker is necessarily off the pole.
 - (iv) While climbers are not being worn, the gaffs must be properly guarded.
- (G) Safety lines must be readily available while working aloft to be used for emergency rescue such as lowering a worker to the ground. Such safety lines must be a minimum of one-half-inch diameter and three or four strand first-grade manila or its equivalent in strength (2,650 lb.) and durability.
- (H) **For employers engaged in general industry activities, personal fall arrest systems must be used in accordance with [1926.502(d)] Division 2/I. For employers engaged in construction activities, personal fall arrest systems must be used in accordance with Division 3/M.**

Note to paragraph (2)(d)(H): Fall protection equipment rigged to arrest falls is considered a fall arrest system and must meet the applicable requirements for the design and use of those systems. Fall protection equipment rigged for work positioning is considered work-positioning equipment and must meet the applicable requirements for the design and use of that equipment.

- (I) The employer must ensure that employees use fall protection systems as follows:
 - (i) Each employee working from an aerial lift must use a ~~fall~~**travel** restraint system or a personal fall arrest system. Paragraph (c)(2)(v) of 1910.67 and paragraph (b)(2)(v) of 1926.453 do not apply.

- (ii) Except as provided in paragraph (2)(d)(l)(iii) of this rule, each employee in elevated locations more than 1.2 meters (4 feet) above the ground on poles, towers, or similar structures must use a personal fall arrest system, work-positioning equipment, or fall restraint system, as appropriate, if the employer has not provided other fall protection meeting Division 2/D, Walking-Working Surfaces; or Division 3/M, Fall Protection.
 - (iii) Each qualified employee climbing or changing location on poles, towers, or similar structures must use fall protection equipment unless the employer can demonstrate that climbing or changing location with fall protection is infeasible or creates a greater hazard than climbing or changing location without it.
- (l) The employer must ensure that employees use fall protection systems as follows:
- (i) Each employee working from an aerial lift must use a fall restraint system or a personal fall arrest system. Paragraph (c)(2)(v) of 1910.67 and paragraph (b)(2)(v) of 1926.453 do not apply.
 - (ii) Except as provided in paragraph (2)(d)(l)(iii) of this rule, each employee in elevated locations more than 1.2 meters (4 feet) above the ground on poles, towers, or similar structures must use a personal fall arrest system, work-positioning equipment, or fall restraint system, as appropriate, if the employer has not provided other fall protection meeting Division 2/D, Walking-Working Surfaces; or Division 3/M, Fall Protection.
 - (iii) Each qualified employee climbing or changing location on poles, towers, or similar structures must use fall protection equipment unless the employer can demonstrate that climbing or changing location with fall protection is infeasible or creates a greater hazard than climbing or changing location without it.

Note 1 to paragraphs (2)(d)(l)(ii) and (2)(d)(l)(iii) of this rule: These paragraphs apply to structures that support overhead electric power transmission and distribution lines and equipment. They do not apply to portions of buildings, such as loading docks, or to electric equipment, such as transformers and capacitors. Division 2/D, and Division 3/M contain the duty to provide fall protection associated with walking and working surfaces.

- (J) Work-positioning equipment must be rigged so that an employee can free fall no more than 0.6 meters (2 feet).
- (K) Anchorages for work-positioning equipment must be capable of supporting at least twice the potential impact load of an employee's fall, or 13.3 kilonewtons (3,000 pounds-force), whichever is greater.

Note to paragraph (2)(d)(K): Wood-pole fall-restriction devices meeting American Society of Testing and Materials Standard Specifications for Personal Climbing Equipment, ASTM F887-12e1, are deemed to meet the anchorage-strength requirement when they are used in accordance with manufacturers' instructions.

- (L) Unless the snaphook is a locking type and designed specifically for the following connections, snaphooks on work-positioning equipment may not be engaged:
 - (i) Directly to webbing, rope, or wire rope;
 - (ii) To each other;

- (iii) To a D ring to which another snaphook or other connector is attached;
- (iv) To a horizontal lifeline; or
- (v) To any object that is incompatibly shaped or dimensioned in relation to the snaphook such that accidental disengagement could occur should the connected object sufficiently depress the snaphook keeper to allow release of the object.

Stat. Auth.: ORS 654.025(2) and 656.726(4)

Stats. Implemented: ORS 654.001 through 654.295.

Hist.: OR-OSHA Admin. Order 3-2015, f. 10/9/15, ef. 1/1/16.

OR-OSHA Admin. Order 2-2017, f. 5/16/17, ef. 11/1/17.

437-002-2307 Portable ladders and platforms

- (1) General. For employers involved in general industry activities, requirements for portable ladders contained in Division 2/D apply in addition to the requirements of this rule, except as specifically noted in paragraph (2) of this rule. For employers involved in construction activities, requirements for portable ladders contained in Division 3/X apply in addition to the requirements of this rule, except as specifically noted in paragraph (2) of this rule.
- (2) Special ladders and platforms. For general industry activities, portable ladders used on structures or conductors in conjunction with overhead line work need not meet ~~[1910.25(d)(2)(i) and (d)(2)(iii) or 1910.26(e)(3)(iii)]~~ **OAR 437-002-0026(4)(b)**. For construction activities, portable ladders and platforms used on structures or conductors in conjunction with overhead line work need not meet 1926.1053(b)(5)(i) and (b)(12). Portable ladders and platforms used on structures or conductors in conjunction with overhead line work must meet the following requirements:
 - (a) In the configurations in which they are used, portable platforms must be capable of supporting without failure at least 2.5 times the maximum intended load.
 - (b) Portable ladders and platforms may not be loaded in excess of the working loads for which they are designed.
 - (c) Portable ladders and platforms must be secured to prevent them from becoming dislodged.
 - (d) Portable ladders and platforms may be used only in applications for which they are designed.
- (3) Conductive ladders. Portable metal ladders and other portable conductive ladders may not be used near exposed energized lines or equipment. However, in specialized high-voltage work, conductive ladders must be used when the employer demonstrates that nonconductive ladders would present a greater hazard to employees than conductive ladders.

Stat. Auth.: ORS 654.025(2) and 656.726(4)

Stats. Implemented: ORS 654.001 through 654.295.

Hist.: OR-OSHA Admin. Order 3-2015, f. 10/9/15, ef. 1/1/16.

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