FPST 2023 Industrial and Occupational Safety
Walking and Working Surfaces – Part 1

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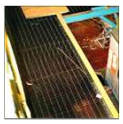
Source: OSHA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Objectives

1. Describe common hazards associated with walking and working surfaces
2. Describe general requirements (e.g., housekeeping, aisles and passageways, covers and guardrails, floor loading protection) for walking-working surfaces
3. Describe requirements for guarding floor and wall openings, including holes.
4. Describe requirements for stairways and railings
5. Describe requirements for use of ladders (fixed and portable)
6. Describe requirements for scaffolding (i.e., elevated working surfaces).

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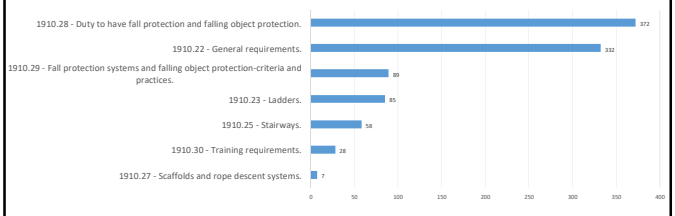
SUBPART D - WALKING/WORKING SURFACES [1910.21 – .30]

Standards cited by Federal OSHA for Manufacturing facilities during the period October 2018 through September 2019



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Walking and Working Surfaces and Fall Protection Standards

Walking-Working Surfaces and Fall Protection

Slips, Trips, and Fall Hazards

- Second-leading cause of fatalities in workplace
- 800 deaths
- 80% of fatalities related to falls lower levels.

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Walking and Working Surfaces and Fall Protection Standards

- 2016 – OSHA issued a final rule on Walking-Working Surfaces and Personal Fall Protection Systems to better protect workers in general industry from these hazards by updating and clarifying standards and adding training and inspection requirements.
- Provides greater flexibility to employers when choosing a fall protection system

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Walking and Working Surfaces and Fall Protection Standards

Source: OSHA

- Requires fall protection along unprotected sides or edges that are at least 4 feet above lower level
- Sets requirements for fall protection in specific situations, such as hoist areas, runways, areas above dangerous equipment, wall openings, repair pits, stairways, scaffolds, and slaughtering platforms
- Establishes requirements for performance, inspection, use, and maintenance of personal fall protection systems.

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Walking and Working Surfaces and Fall Protection Standards

- Requires protection of workers from falling off fixed or portable ladders, mobile ladder stands, and platforms
  - Requirements for load capabilities
  - Inspection before initial use in a work shift
  - Fixed ladder requirements
  - Portable ladder requirements.

Source: OSHA

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Walking and Working Surfaces and Fall Protection Standards

- Training/retraining requirements for workers who:
  - Use personal fall protection
  - Work in other specified high hazard situations
  - Have a change in workplace operations or equipment
  - Would benefit from additional training due to lack of knowledge or skill.

Source: OSHA

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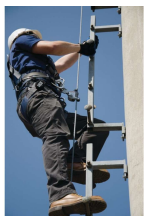
Walking and Working Surfaces and Fall Protection Standards

- Key compliance date
  - Replacing cages and wells (used a fall protection) with ladder safety or personal fall arrest systems on all fixed ladders over 24 feet (11/18/2036).



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Walking and Working Surfaces and Fall Protection Standards

- All workplaces subject to General Industry Standards
- Not limited to just walking-working surfaces
- Applies to any "walking-working surface" (WWS)
  - Any horizontal or vertical surface on or through which an employee walks, works, or gains access to a work area or workplace location.

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Source: OSHA

REQUIREMENTS FOR WALKING-WORKING SURFACES

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1910.21 Scope and Definitions

- (a) Scope
- (b) Definitions

Source: OSHA

Source: OSHA

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1910.22
General Requirements

- (a) Surface conditions
  - (a)(1)-(3) Housekeeping provisions
  - (b) Walking-working surfaces must be designed to meet their maximum intended load, free of recognized hazards, and routinely inspected
  - (c) Access and egress
  - (d)(1)-(3) Inspection, maintenance, and repair. Structural integrity repairs to be done, or overseen, by qualified person.

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1910.23 Ladders

- Covers
  - General Requirements
  - Portable Ladders
  - Stepstools
  - Fixed Ladders
  - Mobile Ladder Stands
- Requires inspection before use

Portable Ladders and Step Stools

Fixed Ladders

Mobile Ladder Stand Platform

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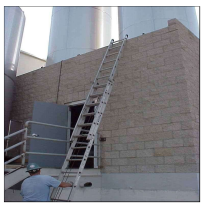
1910.23 Ladders

- (a) Application
- (a)(1) & (a)(2) Exceptions



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Are there any safety issues in the use of these ladders?

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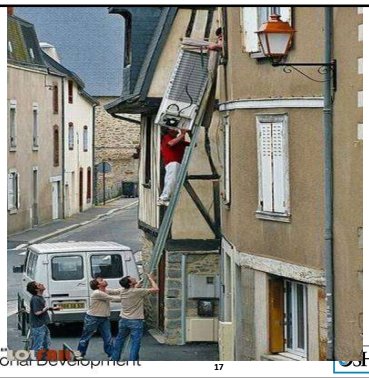

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1910.23 - Ladders

- (b) General requirements for all ladders
  - (b)(1) Ladder rungs, steps and cleats are uniformly spaced
  - (b)(2) Not less than 10" nor more than 14" apart
  - (b)(3) Stepstools
    - Steps are not less than 8" nor more than 12" apart.

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1910.23 - Ladders

- (b) General requirements for all ladders
  - (b)(4) Step clearance
  - (b)(5) Wooden ladders are not coated with any material that may obscure structural defects
  - (b)(7) Free from rough surfaces.

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Ladders - 1910.23

- (b)(8) Used for designed purposes
- (b)(9) Inspected before each use
- (b)(10) Tagged "Do not Use" if defective (**ideally…remove from service)**
- (b)(11) Face ladder when climbing
- (b)(12) Use at least one hand to grip when climbing.

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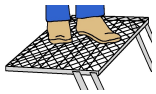
1910.23 - Ladders

- (c) Portable ladders
  - (c)(1) Rungs shall be corrugated, knurled, dimpled, or coated with skid resistant material
  - (c)(2) Used with metal spreader or locking devices
  - (c)(3) Not loaded beyond the maximum intended load.



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Corrugated

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Knurled

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Dimpled

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1910.23 - Ladders

- (c)(4) Placed only on stable bases
- (c)(7) Not placed in front of doors or other passageways, unless the door is locked, or guarded.

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1910.23 - Ladders

- (C)(8) The cap & tops of the ordinary stepladders shall not be used as steps.

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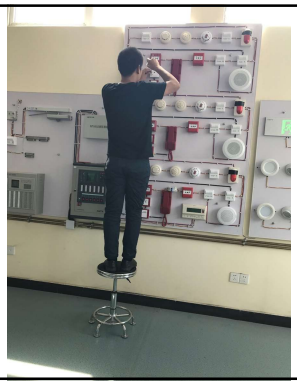

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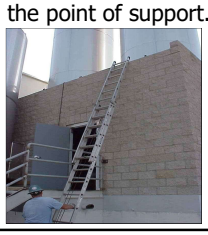
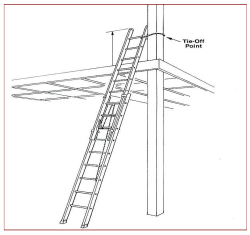
1910.23 - Laddders

- (C)(11) Ladders used to gain access to a landing surface must extend at least 3 feet above the point of support.





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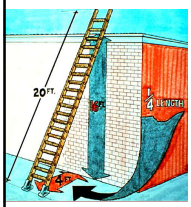
Ladder Angle

Portable Rung and Cleat Ladders



Use at angle where the horizontal distance from the top support to the foot of the ladder is ¼ the working length of the ladder (length along ladder between the foot and top support)

Shall be lashed, or held in position.

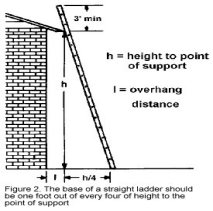


Figure 2. The base of a straight ladder should be one foot out of every four of height to the point of support

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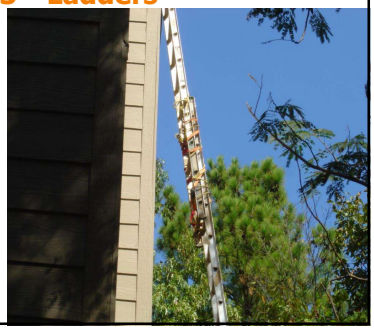
1910.23 - Ladders

- (C)(12) Short ladders should not be lashed together.



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1910.23 - Ladders

- (C)(13) Not be placed on boxes, barrels, or other unstable bases for additional height.

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1910.23 - Ladders

Would this be called an Extension Ladder?

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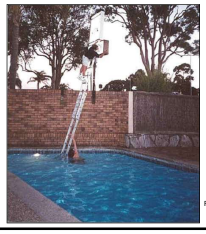
1910.23 - Ladders

- Never use metal ladders when work is performed on or near electric circuits.



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Significant Near Miss Involving a Fiberglass Extension Ladder

Ladder Inspections -
Why they are so Important!!!

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Here's What Happened

- 30-foot extension ladder
- Type IA Fiberglass ladder rated for 300 pounds
- Technician weighed 160 pounds
- Ladder had been inspected and was less than 2 months old
- Ladder had not been damaged or subjected to any harsh conditions.

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Here's What Happened

- Employee climbing the ladder felt the ladder start to give from underneath him
- He was able to grab and hold onto the roof edge as the ladder collapsed
- Another employee was able to get a second ladder from their service truck, set it up, and get the first employee down safely.

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Investigation

- All fiberglass ladders immediately brought in from the field and closely examined for any possible defects or damage
- The company found that approximately 20% of their fiberglass extension ladders had very small cracks in the fiberglass on the side rails immediately next to the rungs.

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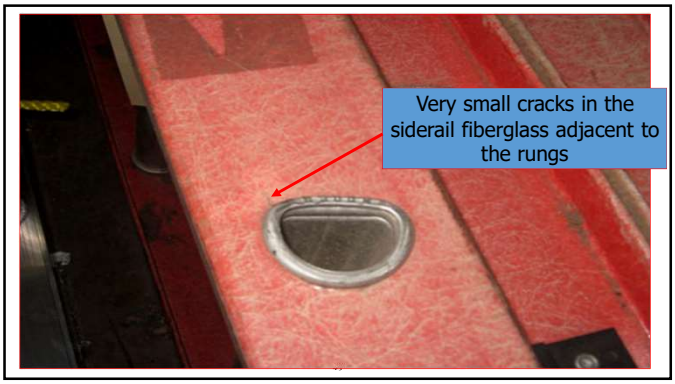

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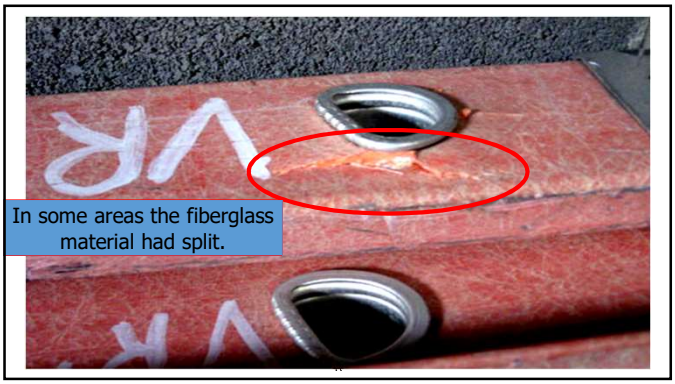

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Follow-up

- The small cracks found in the side rails were not in any regular pattern
- The cracks and splits were immediately next to the rungs on the outside portion of the side rail
- It is believed the fiberglass may have been damaged or fatigued during the manufacturing process when the rungs were crimped into the siderail of the ladder.

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1910.23 - Ladders

(d) Fixed Ladders

- (d)(1) Capable of supporting maximum intended load
- (d)(3) Side rails of through or side-step ladders extend 42" above the top of the access level
- (d)(11) Pitch greater than 90 deg. From the horizontal are not used.

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1910.23 - Ladders

- (d)(12) Step across distance from the centerline of the rungs or steps between 7" & 12" (see figure d-3).

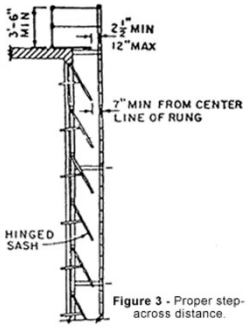

Figure 3 - Proper step-across distance.

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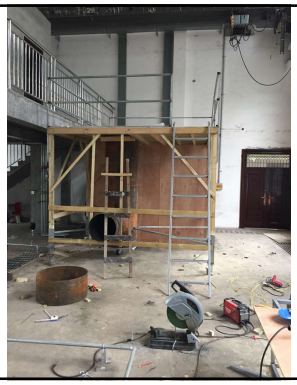

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1910.23 - Ladders

- (e) Mobile ladder stands and mobile ladder stand platform
  - (e)(1) General requirements
    - (e)(1)(i) Have a step width of at least 16 inches
    - (e)(q)(iii) Capable of supporting at least four times their maximum intended load.

Mobile Scaffold

Mobile Work Platform

Mobile Ladder Stand

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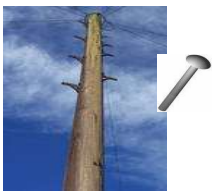
1910.24 – Step Bolts and Manhole Steps

- Step bolts and manhole steps



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Step Bolts 1910.24

- (a)(1) Protected against corrosion
- (a)(2) Corrugated, knurled, dimpled or other slip resistant surface
- (a)(6) Capable of support max. intended load
- (a)(8) Step bolts: inspect at start of each shift.

Stepbolts on pole

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Manhole Steps 1910.24

- (b)(1) Capable of support max. intended load
- (b)(2)(i) Corrugated, knurled, dimpled or other slip resistant surface
- (b)(2)(ii) Protected against corrosion
- (b)(2)(iii) Minimum clear step width of 10 inches.

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Manhole Steps 1910.24

- (b)(2)(iv) Uniformly spaced at a vertical distance not more than 16 inches
- (b)(2)(v) Minimum perpendicular distance of at least 4.5 inches
- (b)(3) Each manhole step is inspected at the start of the work shift.

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Manhole Steps
1910.24

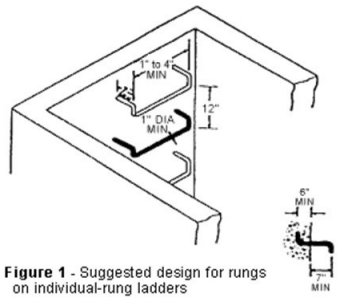

Figure 1 - Suggested design for rungs on individual-rung ladders

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