

(xi) Rungs should be kept free of grease and oil.

(2) *Use.* The following safety precautions shall be observed in connection with the use of ladders:

(i) Portable rung and cleat ladders shall, where possible, be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is one-quarter of the working length of the ladder (the length along the ladder between the foot and the top support). The ladder shall be so placed as to prevent slipping, or it shall be lashed, or held in position. Ladders shall not be used in a horizontal position as platforms, runways, or scaffolds;

(ii) Ladders for which dimensions are specified should not be used by more than one man at a time nor with ladder jacks and scaffold planks where use by more than one man is anticipated. In such cases, specially designed ladders with larger dimensions of the parts should be procured;

(iii) Portable ladders shall be so placed that the side rails have a secure footing. The top rest for portable rung and cleat ladders shall be reasonably rigid and shall have ample strength to support the applied load;

(iv) Ladders shall not be placed in front of doors opening toward the ladder unless the door is blocked upon, locked, or guarded;

(v) Ladders shall not be placed on boxes, barrels, or other unstable bases to obtain additional height;

(vi)-(vii) [Reserved]

(viii) Ladders with broken or missing steps, rungs, or cleats, broken side rails, or other faulty equipment shall not be used; improvised repairs shall not be made;

(ix) Short ladders shall not be spliced together to provide long sections;

(x) Ladders made by fastening cleats across a single rail shall not be used;

(xi) Ladders shall not be used as guys, braces, or skids, or for other than their intended purposes;

(xii) Tops of the ordinary types of stepladders shall not be used as steps;

(xiii) On two-section extension ladders the minimum overlap for the two sections in use shall 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 60 .....	5

(xiv) Portable rung ladders with reinforced rails (see paragraphs (c)(3)(ii)(c) and (iii)(d) this section) shall be used only with the metal reinforcement on the under side;

(xv) No ladder should be used to gain access to a roof unless the top of the ladder shall extend at least 3 feet above the point of support, at eave, gutter, or roofline;

(xvi) [Reserved]

(xvii) Middle and top sections of sectional or window cleaner's ladders should not be used for bottom section unless the user equips them with safety shoes;

(xviii) [Reserved]

(xix) The user should equip all portable rung ladders with nonslip bases when there is a hazard of slipping. Nonslip bases are not intended as a substitute for care in safely placing, lashing, or holding a ladder that is being used upon oily, metal, concrete, or slippery surfaces;

(xx) The bracing on the back legs of step ladders is designed solely for increasing stability and not for climbing.

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

#### § 1910.26 Portable metal ladders.

(a) *Requirements*—(1) *General.* Specific design and construction requirements are not part of this section because of the wide variety of metals and design possibilities. However, the design shall be such as to produce a ladder without structural defects or accident hazards such as sharp edges, burrs, etc. The metal selected shall be of sufficient strength to meet the test requirements, and shall be protected against corrosion unless inherently corrosion-resistant.

(i)-(ii) [Reserved]

(iii) The spacing of rungs or steps shall be on 12-inch centers.

(iv) [Reserved]

(v) Rungs and steps shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise

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treated to minimize the possibility of slipping.

(2) *General specifications—straight and extension ladders.* (i) The minimum width between side rails of a straight ladder or any section of an extension ladder shall be 12 inches.

(ii) The length of single ladders or individual sections of ladders shall not exceed 30 feet. Two-section ladders shall not exceed 48 feet in length and over two-section ladders shall not exceed 60 feet in length.

(iii) Based on the nominal length of the ladder, each section of a multisection ladder shall overlap the adjacent section by at least the number of feet stated in the following:

Normal length of ladder (feet)	Overlap (feet)
Up to and including 36 .....	3
Over 36, up to and including 48 .....	4
Over 48, up to 60 .....	5

(iv) Extension ladders shall be equipped with positive stops which will insure the overlap specified in the table above.

(3) *General specifications—step ladders.*

(i)-(ii) [Reserved]

(iii) The length of a stepladder is measured by the length of the front rail. To be classified as a standard length ladder, the measured length shall be within plus or minus one-half inch of the specified length. Stepladders shall not exceed 20 feet in length.

(iv)-(vi) [Reserved]

(vii) The bottoms of the four rails are to be supplied with insulating nonslip material for the safety of the user.

(viii) A metal spreader or locking device of sufficient size and strength to securely hold the front and back sections in the open position shall be a component of each stepladder. The spreader shall have all sharp points or edges covered or removed to protect the user.

(4) *General specifications—trestles and extension trestle ladders.* (i) Trestle ladders or extension sections or base sections of extension trestle ladders shall be not more than 20 feet in length.

(ii) [Reserved]

(5) *General specifications—platform ladders.* (i) The length of a platform ladder shall not exceed 20 feet. The length of

a platform ladder shall be measured along the front rail from the floor to the platform.

(ii) [Reserved]

(b) [Reserved]

(c) *Care and maintenance of ladders—*

(1) *General.* To get maximum serviceability, safety, and to eliminate unnecessary damage of equipment, good safe practices in the use and care of ladder equipment must be employed by the users.

The following rules and regulations are essential to the life of the equipment and the safety of the user.

(2) *Care of ladders.*

(i)-(iii) [Reserved]

(iv) Ladders must be maintained in good usable condition at all times.

(v) [Reserved]

(vi) If a ladder is involved in any of the following, immediate inspection is necessary:

(a) If ladders tip over, inspect ladder for side rails dents or bends, or excessively dented rungs; check all rung-to-side-rail connections; check hardware connections; check rivets for shear.

(b)-(c) [Reserved]

(d) If ladders are exposed to oil and grease, equipment should be cleaned of oil, grease, or slippery materials. This can easily be done with a solvent or steam cleaning.

(vii) Ladders having defects are to be marked and taken out of service until repaired by either maintenance department or the manufacturer.

(3) *Use of ladders.* (i). A simple rule for setting up a ladder at the proper angle is to place the base a distance from the vertical wall equal to one-fourth the working length of the ladder.

(ii) Portable ladders are designed as a one-man working ladder based on a 200-pound load.

(iii) The ladder base section must be placed with a secure footing.

(iv) The top of the ladder must be placed with the two rails supported, unless equipped with a single support attachment.

(v) When ascending or descending, the climber must face the ladder.

(vi) Ladders must not be tied or fastened together to provide longer sections. They must be equipped with the

hardware fittings necessary if the manufacturer endorses extended uses.

(vii) Ladders should not be used as a brace, skid, guy or gin pole, gangway, or for other uses than that for which they were intended, unless specifically recommended for use by the manufacturer.

(viii) See §1910.333(c) for work practices to be used when work is performed on or near electric circuits.

[39 FR 23502, June 27, 1974, as amended at 43 FR 49745, Oct. 24, 1978; 49 FR 5321, Feb. 10, 1984; 55 FR 32014, Aug. 6, 1990]

#### § 1910.27 Fixed ladders.

(a) *Design requirements*—(1) Design considerations. All ladders, appurtenances, and fastenings shall be designed to meet the following load requirements:

(i) The minimum design live load shall be a single concentrated load of 200 pounds.

(ii) The number and position of additional concentrated live-load units of 200 pounds each as determined from anticipated usage of the ladder shall be considered in the design.

(iii) The live loads imposed by persons occupying the ladder shall be considered to be concentrated at such points as will cause the maximum stress in the structural member being considered.

(iv) The weight of the ladder and attached appurtenances together with the live load shall be considered in the design of rails and fastenings.

(2) *Design stresses*. Design stresses for wood components of ladders shall not exceed those specified in §1910.25. All wood parts of fixed ladders shall meet the requirements of §1910.25(b).

For fixed ladders consisting of wood side rails and wood rungs or cleats, used at a pitch in the range 75 degrees to 90 degrees, and intended for use by no more than one person per section, single ladders as described in §1910.25(c)(3)(ii) are acceptable.

(b) *Specific features*—(1) *Rungs and cleats*. (i) All rungs shall have a minimum diameter of three-fourths inch for metal ladders, except as covered in paragraph (b)(7)(i) of this section and a minimum diameter of 1½ inches for wood ladders.

(ii) The distance between rungs, cleats, and steps shall not exceed 12 inches and shall be uniform throughout the length of the ladder.

(iii) The minimum clear length of rungs or cleats shall be 16 inches.

(iv) Rungs, cleats, and steps shall be free of splinters, sharp edges, burrs, or projections which may be a hazard.

(v) The rungs of an individual-rung ladder shall be so designed that the foot cannot slide off the end. A suggested design is shown in figure D-1.

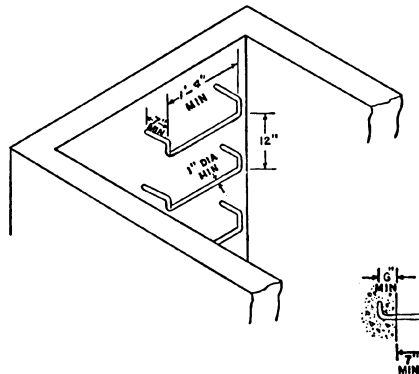


FIGURE D-1—SUGGESTED DESIGN FOR RUNGS ON INDIVIDUAL-RUNG LADDERS.

(2) *Side rails*. Side rails which might be used as a climbing aid shall be of such cross sections as to afford adequate gripping surface without sharp edges, splinters, or burrs.

(3) *Fastenings*. Fastenings shall be an integral part of fixed ladder design.

(4) *Splices*. All splices made by whatever means shall meet design requirements as noted in paragraph (a) of this section. All splices and connections shall have smooth transition with original members and with no sharp or extensive projections.

(5) *Electrolytic action*. Adequate means shall be employed to protect dissimilar metals from electrolytic action when such metals are joined.

(6) *Welding*. All welding shall be in accordance with the "Code for Welding in Building Construction" (AWS D1.0-1966).

(7) *Protection from deterioration*. (i) Metal ladders and appurtenances shall