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CITY OF LOS ANGELES  
LADDER INSPECTION GUIDELINES

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American National Standards Institute (ANSI)  
Standard Ladder Specifications

Type <sup>3</sup>	Designation <sup>3</sup>	Working Load <sup>3</sup>	Max Length <sup>3</sup>
	Wood <sup>3</sup> Metal <sup>3</sup>	Step <sup>3</sup> Single <sup>3</sup>	Extension
I	Industrial Heavy <sup>3</sup>	250 lbs	20' <sup>3</sup> 30'    60'
II	Commercial Medium <sup>3</sup>	225 lbs	12' <sup>3</sup> 24'    48'
III	Household Light <sup>3</sup>	200 lbs	6' <sup>3</sup> 16'    32'

Miscellaneous Specifications

Safety Factor = 4 times the working load.  
Bucket Shelf Rating = 25 lbs.

Minimum Extension Ladder Overlap

0' to 36' = 3'  
36' to 48' = 4'  
48' - up = 5'

## PROPERTIES OF WOOD

Every tree, every log, every piece of lumber has its individual characteristics that separate it from the others. Less than ten percent of the lumber marketed has any of the defects mentioned in these guidelines. A given piece of wood may lack several characteristics considered to be desirable without affecting its strength, durability, or appearance.

### GRADE

A lumber grade is a grouping of these slightly different pieces with regard to the end use for which the grade is intended. A grade is generally determined by the number, size, type, and position of knots, shakes, wane, or other visible characteristics based on the character of each piece examined.

### DEFECTS

Lumber is subject to about a dozen important natural defects. The following defects are of special importance and their presence may adversely affect the strength of a ladder.

Knots    Compression Failure    Cross Grain  
Shakes    Pitch Defects    Wanes & Back Pockets

Wood is also subject to five primary defects that arise from the drying or seasoning process and preparation of wood for market (falling, transporting, sawing, handling). The following are most important in ladder inspection:

Warping    Checking    Compression    Failure

Finally, wood is subject to three load categories of defects caused by foreign organisms. These are generally of little concern in the manufacture or care of ladders because of the careful selection, grading, and high quality of ladder wood.

Fungi    Insect Infestation    Marine Borers

### LADDER WOODS

Many soft and hard woods may be used for the manufacture of ladders. Some varieties may be subject to limiting factors such as weight, flexibility, durability, etc. For example, oak is widely used for library ladders and stepladders for moderate weight, yet it is generally unsuitable for extension ladders and long stepladders because of its weight, poor weathering qualities and strength characteristics.

Several woods predominate in the manufacture of ladders - Douglas fir, West Coast hemlock, Sitka spruce and Hem-fir, a combination species that includes Hemlock, Red fir, Grand fir, Silver fir, and White fir.

Pound for pound, Douglas Fir is one of the strongest woods ever tested and enjoys a world-wide reputation as an all purpose wood. It has superior characteristics of strength, warping, cupping or twisting.

West Cost hemlock and Hem-fir are similar to Douglas fir, slightly lower in strength and a widely used ladder material. It should be remembered that the species of wood used is not as important as conforming to grading rules for the use intended.

Ladder woods are categorized into two primary grades - Ladders and pole stock, and ladder rails. The latter is further separated into three groups, vertical grain, mixed grain and ladder rail stock, suitable for short components. The primary strength for the highest grade ladder rail stock is described below:

- Slope of grain 1 in 12
- Six or more annual rings per inch
- torn grain - - very light
- Burls - - less than 1/2" diameter
- Seasoning checks - - small, one in any 3 linear feet
- Compression wood - - 1/2" wide or equivalent narrow streaks
- Pitch or bark pockets - - small, one in any 3 linear feet.

The City of Los Angeles buys high quality wood ladders conforming to Type I OSHA requirements and ANSI standards. These are made from fine woods and will normally have few defects in the woods used or those resulting from manufacturing processes.

Fig. 1

#### YEARLY WOOD LADDER INSPECTION

NOTE: Conduct inspections in a well lighted location.

Look for these items in portable wood ladders:

##### A. General

1. Wood irregularities: Cross grain, pitch and bark pockets, checks, shakes, waness, compression failure, compression wood, decay or rot knots. Knots shall not appear in the narrow faces of siderails, backlegs, flat steps or cleats.
2. Loose steps or rungs (they are considered loose if they can be moved at all with the hand).
3. Cracked, split or broken uprights, braces, steps or rungs.
4. Splinters or uprights, rungs or steps.
5. Loose or missing nails, screws, bolts, rivets or other metal parts.
6. Metal parts shall be free of sharp cutting edges and burrs and shall not be damaged.
7. Damaged or worn nonslip bases.
8. Steps should be free of grease and oil.
9. Truss rods - Tight? Missing?
10. DO NOT TEST WOOD LADDERS BY PLACING ON BLOCKS AND JUMPING ON RUNGS.

##### B. Step Ladders

1. Wobbly (due to side strain).

2. Loose and bent hinge spreaders.
3. Stop broken on hinge spreaders.
4. Broken, split or worn steps.
5. Loose hinges.

C. Extension Ladders

1. Loose, broken or missing extension locks.
2. Defective locks that do not seat properly when ladder is extended.
3. Nonslip bases shall be securely bolted, riveted or attached by equivalent construction to the side rails.
4. Condition of rope - check whether worn or frayed.
5. Condition and attached of pulley and side guides.

D. Trestle Ladders

1. Loose in hinges.
2. Wobbly.
3. Loose or bent hinge spreaders.
4. Stop broken on hinge spreader.
5. Center section guide for extension out of alignment.
6. Defective locks for extension.

#### YEARLY METAL LADDER INSPECTION

A. All metal ladders must be legibly marked with a sign reading "CAUTION - DO NOT USE AROUND ELECTRICAL EQUIPMENT" or equivalent wording.

B. Check for bent steps and side rails. Examine for evidence of straightening of steps or rails. These members are not weakened if no permanent defection results from testing or use; however, if a member is permanently defected and then straightened, it would have only a small portion of its original strength.

C. Inspect for cracks at sharp bents where rung is attached to rail.

D. Inspection for corrosion damage and damage due to caustic materials.

E. Examine for dents in side rails and rung; rung-to-siderails connections; hardware connections; missing or sheared rivets. Cracks or deformations in rail or step flanges are particularly critical.

F. Check extension ladder rail guides and rungs locking devices for deformation, security and longitudinal cracks at angle bends. Examine rope and pulleys for condition.

G. Inspect ladder levelers and safety shoes for condition.