29 CFR 1910.21-.68 Walking-Working Surfaces **, 29 CFR 1926.1060** Construction Ladders

Ladder Safety

Preparation

1. Read Applicable Background information and related Company Policy Chapter.
2. Make _____ Copies of this Lesson Plan for Personnel
3. Make Transparency, procure transparency pens, etc.
4. Coffee, tea, snacks

Other:

Material

1. Ladders that will be used
2.

Objective

By the end of this session, personnel will be able to discuss

1. Company Ladder Requirements to include:
   a) Allowable Lengths
   b) Wooden Ladders
   c) Electrical Concerns and Issues
2 The proper use of Ladders
3. The proper care of Ladders
4. Ladder Hazards, Inspection and Storage

Background

These procedures are designed to prevent the injury of Company personnel due to falls or slips any time personnel are working on stairs

Ladders present unique opportunities for unsafe acts and unsafe conditions. Employees who use ladders must be trained in proper selection, inspection, use and storage. Improper use of ladders has cause a large percentage of accidents in the workplace are of accidents.

Notes

Lesson

Notes

Ladder Requirements

Portable ladders procured for the Company shall meet the design and construction specification of OSHA 29 CFR 1910.25 for wood ladders and 29 CFR 1910.26 for metal ladders. Portable ladders constructed of reinforced plastic shall meet the specifications of ANSI A14.5-1974.

Allowable Lengths

The maximum allowable lengths of portable ladders are:

Stepladders - 8 feet
Platform stepladders - 12 feet
Straight ladders - 20 feet
Extension ladders - 36 feet – with minimum overlap of 3 feet

Ladder Requirement Specifics

(1) Ladders shall be capable of supporting the following loads without failure:

(i) Each self-supporting portable ladder: At least **four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladder shall sustain at least 3.3 times the maximum intended load.**

(ii) Each fixed ladder: At least two loads of 250 pounds (114 kg) each, concentrated between any two consecutive attachments (the number and position of additional concentrated loads of 250 pounds (114 kg) each, determined from anticipated usage of the ladder, shall also be included), plus anticipated loads caused by ice buildup, winds, rigging, and impact loads resulting from the use of ladder safety devices. Each step or rung shall be capable of supporting a single concentrated load of at least 250 pounds (114 kg) applied in the middle of the step or rung.

(2) Ladder rungs, cleats, and steps shall be parallel, level, and uniformly spaced when the ladder is in position for use.

(3)

(i) Rungs, cleats, and steps of portable ladders (except as provided below) and fixed ladders (including individual rung/step ladders) shall be spaced not less than 10 inches (25 cm) apart, nor more than 14 inches (36 cm) apart, as measured between center lines of the rungs, cleats and steps.

(ii) Rungs, cleats, and steps of step stools shall be not less than 8 inches (20 cm) apart, nor more than 12 inches (31 cm) apart, as measured between center lines of the rungs, cleats, and steps.

(iii) Rungs, cleats, and steps of the base section of extension trestle ladders shall be not less than 8 inches (20 cm) nor more than 18 inches (46 cm) apart, as measured between center lines of the rungs, cleats, and steps. The rung spacing on the extension section of the extension trestle ladder shall be not less than 6 inches (15 cm) nor more than 12 inches (31 cm), as measured between center lines of the rungs, cleats and steps.

(4)

(i) The minimum clear distance between the sides of individual-rung/step ladders and the minimum clear distance between the side rails of other fixed ladders shall be 16 inches (41 cm).

(ii) The minimum clear distance between side rails for all portable ladders shall be 11½ inches (29 cm).

(5) The rungs of individual-rung/step ladders shall be shaped such that employees' feet cannot slide off the end of the rungs.

(6)

(i) The rungs and steps of fixed metal ladders manufactured after March 15, 1991, shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.

(ii) The rungs and steps of portable metal ladders shall be corrugated, knurled, dimpled, coated with skid-resistant material, or other-wise treated to minimize slipping.

(7) Ladders shall not be tied or fastened together to provide longer sections unless they are specifically designed for such use.

(8) A metal spreader or locking device shall be provided on each stepladder to hold the front and back sections in an open position when the ladder is being used.

(9) When splicing is required to obtain a given length of side rail, the resulting side rail must be at least equivalent in strength to a one-piece side rail made of the same material.

(10) Except when portable ladders are used to gain access to fixed ladders (such as those on utility towers, billboards, and other structures where the bottom of the fixed ladder is elevated to limit access), when two or more separate ladders are used to reach an elevated work area, the ladders shall be offset with a platform or landing between the ladders.

Notes

(11) Ladder components shall be surfaced so as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.
(12) Wood ladders shall not be coated with any opaque covering, except for identification or warning labels which may be placed on one face only of a side rail.

Proper Use of Ladders

The following requirements apply to the use of all ladders, including job-made ladders, except as otherwise indicated:
(1) When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least 3 feet (.9 m) above the upper landing surface to which the ladder is used to gain access; or, when such an extension is not possible because of the ladder's length, then the ladder shall be secured at its top to a rigid support that will not deflect, and a grasping device, such as a grabrail, shall be provided to assist employees in mounting and dismounting the ladder. In no case shall the extension be such that ladder deflection under a load would, by itself, cause the ladder to slip off its support.
(2) Ladders shall be maintained free of oil, grease, and other slipping hazards.
(3) Ladders shall not be loaded beyond the maximum intended load for which they were built, nor beyond their manufacturer's rated capacity.
(4) Ladders shall be used only for the purpose for which they were designed.
(5)

(i) Non-self-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).

(ii) Wood job-made ladders with spliced side rails shall be used at an angle such that the horizontal distance is one-eighth the working length of the ladder.
(6) Ladders shall be used only on stable and level surfaces unless secured to prevent accidental displacement.

Notes

(7) Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement. Slip-resistant feet shall not be used as a substitute for care in placing, lashing, or holding a ladder that is used upon slippery surfaces including, but not limited to, flat metal or concrete surfaces that are constructed so they cannot be prevented from becoming slippery.

(8) Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.

(9) The area around the top and bottom of ladders shall be kept clear.

(10) The top of a non-self-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment.

(11) Ladders shall not be moved, shifted, or extended while occupied.

(12) Ladders shall have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized electrical equipment.

(13) The top or top step of a stepladder shall not be used as a step.

(14) Cross-bracing on the rear section of stepladders shall not be used for climbing unless
the ladders are designed and provided with steps for climbing on both front and rear sections.

(15) Ladders shall be inspected by a competent person for visible defects on a periodic basis and after any occurrence that could affect their safe use.

(16) Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, corroded components, or other faulty or defective components, shall either be immediately marked in a manner that readily identifies them as defective, or be tagged with "Do Not Use" or similar language, and shall be withdrawn from service until repaired.

(17) Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.

(18) Single-rail ladders shall not be used.

Notes

(19) Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, or corroded components, shall be withdrawn from service until repaired. The requirement to withdraw a defective ladder from service is satisfied if the ladder is either:

(i) Immediately tagged with "Do Not Use" or similar language.

(ii) Marked in a manner that readily identifies it as defective;

(iii) Or blocked (such as with a plywood attachment that spans several rungs).

(20) When ascending or descending a ladder, the user shall face the ladder.

(21) Each employee shall use at least one hand to grasp the ladder when progressing up and/or down the ladder.

(22) An employee shall not carry any object or load that could cause the employee to lose balance and fall.

Care of Ladders

a) Handle ladders with care. Do not drop, jar or misuse them.

b) Ladders shall be stored in a manner that will provide easy access for inspection and will permit safe withdrawal for use. They shall not be stored in a manner that presents a tripping hazard not where they can fall on someone. They should be stored in a manner that will prevent sagging.

c) Lubricate metal bearings of locks, wheels, pulleys, etc., as required to keep them working.

d) Replace frayed or badly worn rope.

e) Keep safety feet and other parts in good condition to ensure they work.

f) Maintain ladders in good usable condition. Inspect ladders prior to use.

g) Ladders with defects which cannot be immediately repaired, shall be removed from service for repair or destruction, and shall be tagged with a danger tag. Do not attempt to straighten or use a bent ladder made of reinforced plastic.

h) Rungs or steps on metal ladders that are not corrugated, knurled, or dimpled will have skid-resistant materials applied.

Ladder Hazards, Inspection and Storage

Ladder Hazards

Falls from ladders can result in broken bone and death. Ladder safety is a life saving program at our company.

Notes

Hazards include:

- Ladders with missing or broken parts.
- Using a ladder with too low a weight rating
- Using a ladder that is too short for purpose.
- Using metal ladders near electrical wires.
- Using ladders as a working platform
- Objects falling from ladders

Ladder Inspection

Inspect ladders before each use.

- All rungs and steps are free of oil, grease, dirt, etc.
- All fittings are tight.
- Spreaders or other locking devices are in place.
- Non-skid safety feet are in place.
- No structural defects, all support braces intact.

Do not use broken ladders. Most ladders cannot be repaired to manufacturer specifications. Throw away all broken ladders.

Ladder Storage

Store ladders on sturdy hooks in areas where they cannot be damaged. Store to prevent warping or sagging. Do not hang anything on ladders that are in a stored condition.

Ladder Maintenance and Setup Procedures

Ladder Maintenance

- Keep ladders clean
- Never replace broken parts unless provided by the original manufacturer
- Do not attempt to repair broken side rails
- Keep all threaded fasteners properly adjusted
- Replace worn steps with parts from manufacturer

Notes

~

Ladder Setup

The following procedure must be followed to prevent ladder accidents:

- Place ladder on a clean slip free level surface.
- Extend the ladder to have about 4 feet above the top support or work area.
- Anchor the top and bottom of the ladder
- Place the ladder base 1/4 the height, of the ladder, from the wall when using an extension ladder.
- Never allow more than one person on a ladder
- Use carriers and tool belts to carry objects up a ladder
- Do not lean out from the ladder in any direction
- If you have a fear of heights - don't climb a ladder
- Do not allow other to work under a ladder in use.

Closure

Falls are the primary hazard associated with the use of ladders. Falls result from a number of unsafe acts and conditions such as:

1) Ladders being set on unstable surfaces.
2) Personnel reaching too far out to the sides.
3) Personnel standing too high to maintain balance.
4) Personnel using defective ladders (e.g., broken rails, rungs, missing hardware).

These hazards are minimized if workers adhere to proper ladder safety practices and if supervisors ensure equipment is used, inspected, and maintained in good condition.

Tasks which require frequent use of ladders and involve significant climbing effort must be accomplished by workers capable of the physical exertion required under these conditions.

What questions do you have?

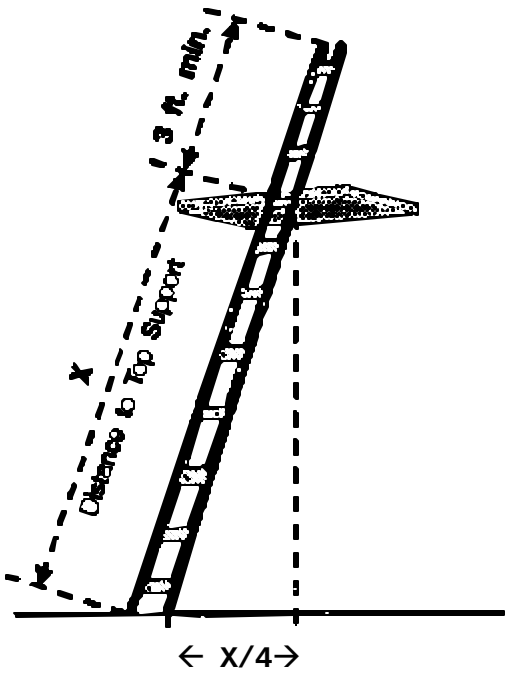
Notes

- **Extension ladders** longer than 60 feet shall not be used.

- Ladders shall be maintained in good condition at all times

- Ladders shall be inspected frequently and those which have developed defects shall be withdrawn from service for repair or destruction and tagged or marked as "Dangerous, Do Not Use."

Proper use of ladders is essential in preventing accidents. Even a good ladder can be a serious safety hazard when used by workers in a dangerous way.



OSHA standards require the following safety precautions for ladder use:

- Ladders shall be placed with a secure footing, or they shall be lashed, or held in position.

- Ladders used to gain access to a roof or other area shall extend **at** least 3 feet above the point **of** support.

- The foot of a ladder 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 support). See figure above.