

Ladder Safety in Construction



Falls from ladders are one of the leading causes of injuries in the construction trade. The majority of the falls are caused by misuse, faulty ladders or carelessness. L & I - DOSH ladder safety rules (WAC 296-876) were written to reduce or eliminate these ladder mishaps. The following presentation provides some safety practices for ladder use based on these rules.

Causes of falls from ladders

- Lack of training on safe ladder use
- Using the wrong type ladder for the job
- Exceeding the ladder weight capacity
- Climbing ladder with tools or material in hands
- Climbing or descending not facing the ladder
- Oil, grease or mud on ladder rungs
- Ladder not secure at the base or top
- Ladder not set up at the proper angle
- Ladder not extended three feet above upper surface
- Using the top step of a step ladder
- Placing ladder on unstable surfaces to increase height
- Over-reaching from the sides of the ladder

Ladder training

Every employee that uses a ladder must be trained by a competent person in the use, placement and construction of the ladder and the hazards associated with them.

A competent person is one that is knowledgeable of the ladders to be used, can recognize hazards associated with ladders and has the authority to take the necessary action to eliminate the hazards.



Types of ladders

Non-self supporting ladders

These include straight ladders and extension ladders. “Non-self supporting” means that they are leaned against a solid structure for support.

In the photo on the right, the ladder will be supported by the building.



Leaning extension ladder against building for support

Types of ladders

Self-supporting ladders

These include stepladders and have one or two legs that are attached to the ladder for support. They do not require a structure to support them.



Orchard Ladder



Selecting the right ladder for the job

Before using a ladder, select the right ladder for the job at hand.

For example, a step ladder is not the proper tool for access to or from a higher work surface.

A straight ladder or extension ladder would be your best choice.

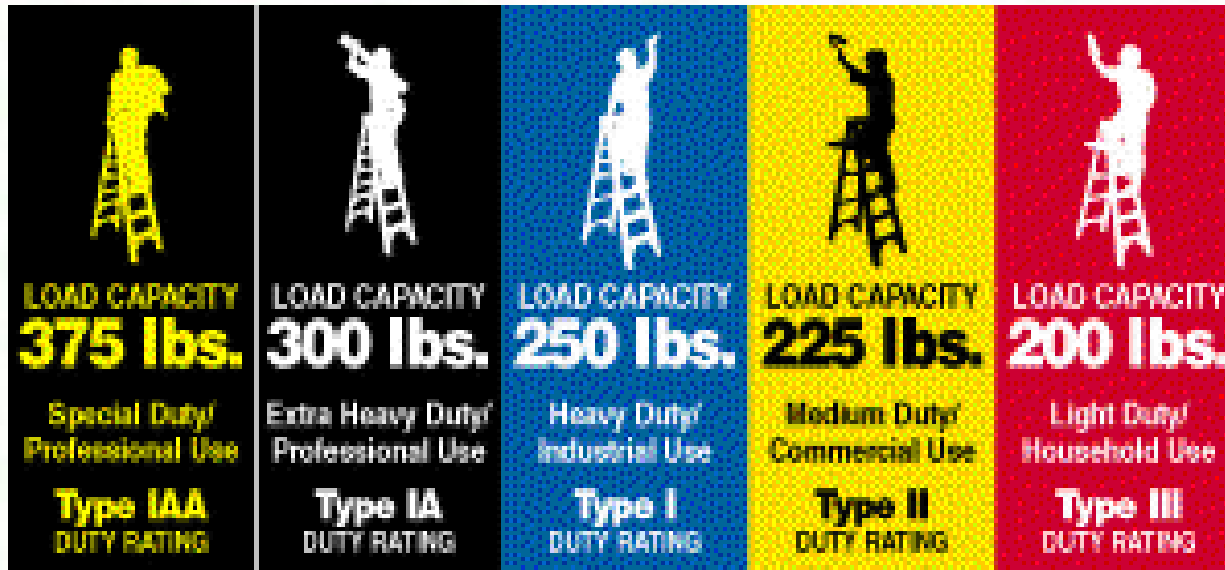


Safe access



Unsafe access with stepladder

Ladder load capacity



Each ladder type has a load capacity rating based on the type of ladder and is labeled as above.

The rated maximum weight includes the weight of the worker and the equipment they are carrying.

Exceeding the load capacity may cause the ladder to collapse.

Ladder Inspection

Inspect ladder rungs for oil, grease or mud.



Make sure that the bottoms of your shoes/boots are free of slippery substances.



Ladder inspection for damage

Inspect ladder for defects or damage before use.

Look for cracks, splits, corrosion, dents, bends, and missing hardware.



All of these ladders are unsafe and could fail if used by employees.



Positioning

Position ladders so that they are:

- Not in the paths of workers walking through,
- Not in front of unblocked exits,
- Not in front of doors that can open out into the ladder,
- Not on boxes, barrels or other unstable surfaces,
- On solid footing and level at the bottom,
- Stable at the top with each rail supported equally,
- Against a structure capable of supporting the intended load,
- Away from debris and other hazards.

Ladder Placement

Place ladders on solid surfaces that will support the ladder and prevent displacement by other workers.

Block, lock or guard a door if the ladder is placed where the door will hit it when opened.



Step-Ladder Setup

Open up step ladder legs completely and lock the braces.



Never use the top of a step ladder

Most ladders have a warning stating that the top rung and the top plate are not to be used as a step. The higher you are on a step ladder, the less stable it becomes.



This step ladder is too short for the job.



Don't let this happen to you!

Secure ladder base

Don't place a ladder on unstable footing or soft ground. As the ladder sinks into the ground or slips from where it is positioned, it becomes very unstable. If you are on the ladder at the time, you may end up on the ground.



Position the ladder on solid ground or shoring to ensure stability.



This unstable base could result in an accident

Secure Ladder Top

Anchor or secure the top of the ladder when used on slippery surfaces or use top stabilizers.



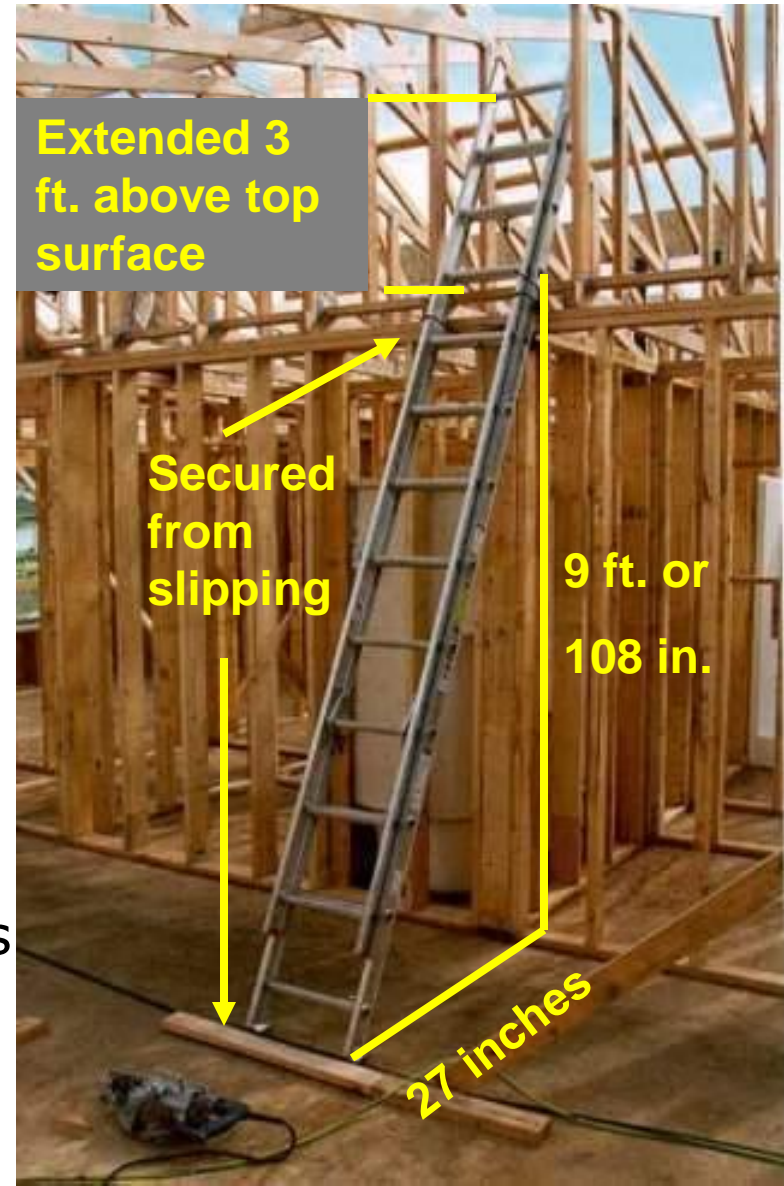
Ladders with top stabilizers

Proper Ladder Setup – 4 to 1 angle

For every four feet of ladder length measured from where the ladder contacts the support point, the base of the ladder should be one foot from away from the supporting structure.

The ladder in the photo contacts the supporting structure at 9 feet. This means that the base of the ladder should be 27 inches back from the support.

Additionally, the ladder should be secured from slipping at the top and bottom and the top of the ladder should be at least three feet above the top surface to provide safe access to the top of the structure.



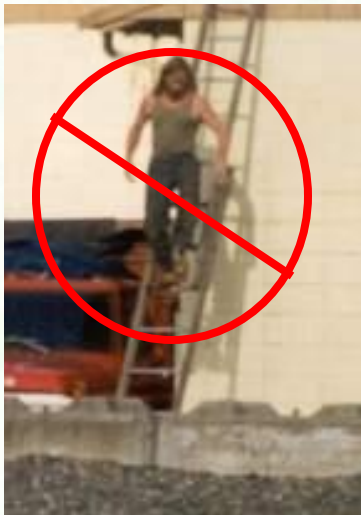
Ladder Setup



One way to ensure proper angle is to stand with your feet at the base of the ladder and extend your arms straight out. If your hands just touch, the ladder will be very close to the 4 to 1 ratio.

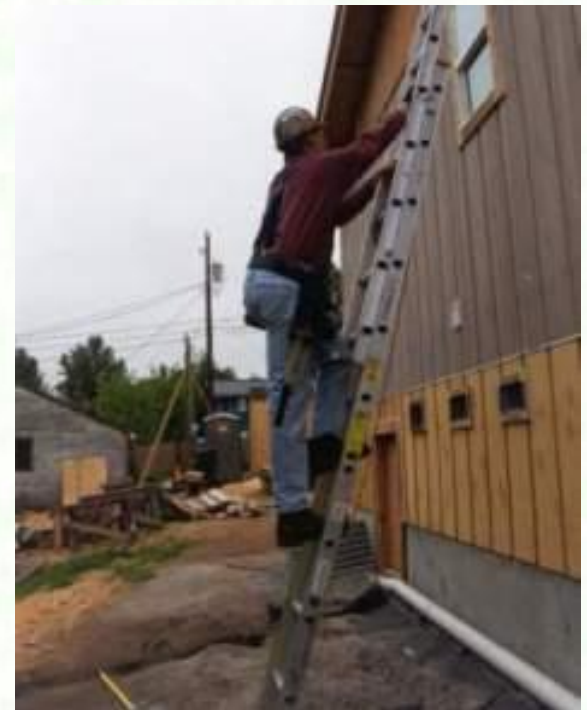
Climbing or descending a ladder

When climbing a ladder, you must have both hands free and face the ladder. This allows for three points of contact with the ladder at all times and reduces the chances of falling. The three point contact is two hands and one foot or one hand and two feet.



Not this way

This way



Climbing and descending

This worker does not have both hands free to hold onto the ladder while climbing or descending the ladder.

Additionally, the top of the ladder does not extend at least 3 ft. above the upper landing surface.



LADDER HAZARDS

Don't use ladders with missing or broken parts.



Don't use a ladder as a working or walking horizontal platform.



Unintended purpose



A ladder must be used only for purposes specifically recommended by the manufacturer. The ladder in this photo is being improperly used as a gangway to access the upper floor.

Unintended purpose

This ladder is being used improperly as a suspended scaffold plank.

Also, the workers are not protected from falling and the combined weight of the workers and equipment likely exceeds the maximum intended load.



Electrical Hazards and Ladders

Don't use metal ladders near energized electrical equipment since fatal shock can result.



Step ladder misuse

This stepladder is being misused at both ends. It is positioned on an unstable surface, is not secured and doesn't extend three feet above the top surface.



This stepladder is being misused to gain entrance into this building.



Step ladder misuse

This was not the intended purpose of the step ladder. It is not fully opened and the feet are not placed on secure footing.



Extension ladders

Unless the manufacturer specifically endorses the modification, you can not tie or fasten ladder sections together to make a longer ladder.

Even with an endorsement, you must use hardware fittings especially designed for the purpose.



Overreaching from the sides



Doing this....



Could result in this!

Summary

Train workers on ladder hazards and how to avoid them

Use the right ladder for the job

Never exceed the maximum rated load capacity of the ladder

Use the three point contact when climbing

Face the ladder when climbing or descending the ladder

Inspect for oil, grease and other slippery substances

Make sure ladder is secured at the top and bottom before climbing

Position the ladder at the proper angle using the 4 to 1 ratio

Extend ladder at least three feet above the elevated surface

Never use the top rung of a step ladder as a step

Never place ladders on unstable surfaces to increase the height

Work within the rails of the ladder and do not overreach

Keep metal ladders away from electrical lines or equipment