



Risktopics

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Preventing ladder incidents in construction

Introduction

Incidents involving ladders and scaffolds account for nearly 20% of all slip, trip and fall (STF) worker's compensation losses annually. The average claim cost is over twice as much as all other fall claims. Falls from ladders occur within a few feet or from several stories high and result in serious injuries or death.

As in prior years, ladders (CFR 1926.1053) continue to make OSHA's Top 10 list of most cited violations, coming in at eighth rank in 2008. Most common violations included:

- Failure to extend ladder side rails at least 3 feet above the upper landing surface
- Using ladders for purpose other than for which they are designed
- Using the top of a stepladder as a step
- Failure to clearly mark portable ladders that are structurally defective or withdrawing them from service
- Failure to use ladders on stable and level surfaces

OSHA standards are specific about the type, construction and application of ladders, but do little to regulate or identify the conditions that ladders are used. So why do workers keep falling from ladders and scaffolds? Can these accidents be prevented? Answering these questions requires a root cause analysis approach for better understanding of the causes of these falls and corrective actions needed for prevention.

Ladder accidents

Many ladder accidents are a result of improper selection and use. Tasks are not well planned to determine the right equipment for the conditions; compressed schedules and not having the right tools on the job often lead to misuse of what is available. Poor maintenance and condition of ladders can increase the risk of injuries. Although OSHA regulations require ladder safety training, the lack of proper employee training contributes to many falls from ladders.

Selecting the right ladder

Formal preplanning helps determine the means, methods, material, manpower and time required to safely accomplish any given task. Selecting the appropriate ladder or other means to access working areas is an integral part of the preplanning process. To determine the right ladder for the job, you must know the height of the work, weight and bulk of the material and tools handled, weight and skill of the worker, and surface conditions

where the ladder is placed. In some cases where the working surfaces are soft or uneven, a ladder may be inappropriate and fixed scaffolding or articulating lift may be needed. The ladder must be rated to carry the weight of the material, tools and worker. Portable ladders should be high enough so the work can be done at eye level without using the top two steps. Extension ladders should extend above the landing surface and secured to prevent movement. Non-conductive ladders must be used in close proximity to energized electrical equipment.

Workers must be trained in the selection, inspection and use of ladders. Supervisors must ensure the worker is qualified to perform, knows the scope of work and the hazards associated with the task.

Inspection and use

Ladders must be inspected by a competent person for visible defects on a periodic basis and after any incident that could affect their safe use. Ladders with bent, broken or splintered parts must be tagged "Do Not Use" and removed from service until restored to the manufacturers original design criteria. Treads must be slip resistant and free of mud, oil, grease, or other slippery materials.

Ladders must be positioned on a stable and level surface. Stepladders that rock on flat surfaces should be inspected for warped rails or bent spreaders and removed from service. Extension ladders should be positioned so feet are $\frac{1}{4}$ the working height from the supporting surface. They should extend three rungs above the landing area whenever possible and securely fastened to prevent movement. Areas around the top and bottom of ladders must be kept clear.

Employees should not climb ladders with tools and materials that could cause them to fall. They must face the ladder when ascending or descending and use at least one hand to grasp the ladder. Work should be at eye level and as close to the ladder whenever possible. A good rule of thumb is never allowing your belt buckle to go beyond the side rails of the ladder. Never step on the cross bracing of a stepladder and never jump from a ladder.

Root cause analysis

Determining the root cause of accidents involves looking at not only the immediate actions and conditions, but also the circumstances leading up to the accident. Often times the blame falls on employee misconduct or lack of training. Procedural, environmental, behavioral, even cultural factors such as pre-planning, worker ability, schedule and cost pressures, material and weather conditions have a much greater impact on why an accident occurred. The attached checklist identifies some of those factors that may contribute to ladder incidents. Checking these additional items on a regular basis and during a root cause investigation may help reduce the exposure and the risk of future incidents.

Conclusion

Ladders are a vital tool in our everyday life, both at work and at home. Many factors increase the risk of ladder accidents but only a few that an employee can control. Only through root cause investigations and effective preplanning, adequate supervision, and employee training can the risk of ladder injuries be reduced. See www.osha.gov/Publications/ladders/osh3124.html for additional information.

Checklist for safe ladder use

Preplanning

- Is a ladder the correct tool to access the work?
- Can the ladder be staged to reach all the work areas?
 - Stable and level surface or secured to prevent accidental movement?
- Is the ladder the correct height to reach the work without over extending above or to either side?
- Is the correct size and type of ladder available on site?
 - Rated for the intended load?
 - Non-conductive for use near exposed energized electrical equipment?

- Is the ladder used as working platform?
 - Can materials and tools be handled without the worker losing balance?

Supervisor accountability

- Did the supervisor review the scope of work with the worker?
- Did the supervisor provide the appropriate tools and material?
- Is there sufficient time to accomplish the task?
- Did the supervisor verify the worker was physically and mentally fit for duty?

Worker ability

- Is the worker properly trained in ladder use?
- Is the worker physically capable of working from a ladder or elevated surface?
- Does the worker understand scope of the work?
- Did the worker review the pre-planning Job Hazard Analysis?
- Is the worker physically and mentally ready to do the work?

Ladder condition

- Is the ladder inspected prior to use?
 - Are side rails and rungs straight and free of defects?
 - Are the spreaders straight and fully locked in place?
 - Are the treads free of oil, grease, or other slippery material?
- Is the ladder positioned correctly?
 - Stable and level surface?
 - Secured to prevent accidental movement?
- Is the ladder staged away from a leading edge or guardrail?

Working conditions

- Is the job behind schedule? Have work hours been extended or changed?
- Is the job on budget or over budget?
- Is the weather too extreme to do the work? Hot, cold, humid, rain, ice, snow, wind?

References

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<http://www.osha.gov/SLTC/etools/construction/falls/4ladders.html>
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