

## FALL PROTECTION IN CONSTRUCTION

Falls from heights are a leading cause of fatalities in the construction industry. Each year hundreds of workers fall from heights. Since 1992, over 600 workers die every year according to the Bureau of Labor and Statistics (BLS). Several factors contribute to this statistic including stepping through improperly covered holes or sky lights, exposure to unguarded leading edges, and falls from improperly constructed scaffolding. The impact of these deaths on families and employers is devastating both in emotional distress and the resulting financial burdens. The Occupational Safety and Health Administration (OSHA) has developed standards for employers to follow to help prevent injuries from falls. These standards can be found in 29CFR1926 Subpart M – Fall Protection. Fall injury hazard examples include:

- Working at heights of 6 feet or greater,
- Working on roofing projects, near leading edges,
- Working near sky lights or holes in the walking/working surface,
- Working on scaffolding, and mobile lifts,
- Not being trained to identify fall hazards,
- Lack of supervision around elevated work surfaces.

This standard sets forth guidelines for the use of guardrail systems, safety net systems, personal fall arrest systems, warning line systems, controlled access zones, safety monitoring systems, and the use of covers for holes in the working surface. Recently, OSHA canceled the “Interim Fall Protection Compliance Guidelines for Residential Construction, dated June 18, 1999” and replaced it with STD 03-11-002, Compliance Guidance for Residential Construction with an enforcement

date of June 16, 2011. This instruction clarifies OSHA's citation policy with regard to the requirement that employers engaged in residential construction demonstrate the infeasibility of required fall protection systems, or that such systems create a greater hazard, prior to implementing alternative measures under 29 CFR 1926.501(b)(13) and 1926.502(k). This instruction also clarifies OSHA's enforcement policy regarding the requirements in 29 CFR 1926.502(k) that fall protection plans, when used, be written and site-specific. Residential construction is defined as covering construction work that satisfies the following two elements: (1) the end-use of the structure being built must be as a home, i.e., a dwelling; and (2) the structure being built must be constructed using traditional wood frame construction materials and methods. The limited use of structural steel in a predominantly wood-framed home, such as a steel I-beam to help support wood framing, does not disqualify a structure from being considered residential construction.

**Fall hazard  
- any work  
performed where  
the worker could  
fall from a height  
of 6 feet or greater  
to a lower level.**

So what type of fall protection should be used on the job site? First off, employers have to determine if the walking/working surface has the strength and structural integrity to support the employees, material, and equipment. This can be accomplished by making sure the surface is rated at twice the maximum intended load. If there are holes in the walking/working surface, these holes must also be covered. Holes that are 2”x 2” or greater must be covered with a surface that will support at least twice the weight of employees, material, and equipment. All covers for holes must be marked with the word “HOLE” or “COVER” or colored coded and securely affixed to the hole so they will

not be accidentally displaced during employee activity. If employees are working near sky lights, they must also be protected by a cover, a guard rail system, skylight guards or employees must use a fall arrest system. When employees are working near excavations, they must be protected from falling into the excavation if it is not readily seen. The protection can be guardrails, barricades, or fences. If the excavation is easily seen, then no protection is necessary, however, it is always good to identify excavations and ensure all employees on site are fully aware of the open excavation and educated on the hazards of working near such activity. Employees working near a well, pit, or shaft which is 6 feet or more in depth must be protected from falling into such hole by use of a guardrail system, fence, barricade, or cover. Again, employee education is necessary to help reduce the potential of injury due to a fall in this environment. When employees are working above dangerous equipment, such as gears, fan blades, rotating machinery, chemical pits, electrical hazards, or any other recognized hazard, regardless of the height, they must be protected from falling into the equipment by use of fall protection systems or barricades.

For fall protection on low sloped roofs, a roof sloped at 4 in 12 vertical to horizontal, the employer may use a guardrail system, safety net system, personal fall arrest systems, or a combination of warning line system and guardrail system, warning line system and safety net system, or warning line system and personal fall arrest systems, or warning line system and safety monitoring system. On low sloped roofs 50 feet or less in width, a safety monitoring system alone is permitted. On unprotected roofs greater than a 4 in 12 vertical to horizontal, employees must be protected from falling by use of a guardrail

**When employees are working above dangerous equipment regardless of height, they must be protected from falling into such equipment.**

system with toe boards, safety net system, or personal fall arrest system.

When employees are engaged in precast concrete work 6 feet or more above a lower level, they must be protected from falling by use of a guardrail system, safety net system, or personal fall arrest system. If the employer can demonstrate that such fall protection systems would increase the hazard of a fall, the employer must implement a written fall protection plan. This plan must be developed by a qualified person and be site specific. Any changes to the plan must be approved by the qualified person before they are implemented. A copy of the plan must be maintained on the work site and the plan must document why conventional fall protection systems are infeasible and would create a greater hazard to employees. The plan must include a written discussion of other measures that could be taken to reduce or eliminate the fall hazard for workers who cannot be provided with protection from the conventional fall protection systems. As an example, the employer shall discuss the extent to which scaffolds, ladders, or vehicle mounted work platforms could be used to provide a safer working surface and thereby reduce the hazard of falling. This fall protection plan must identify each location where conventional fall protection methods cannot be used.

These locations must then be classified as controlled access zones. The fall protection plan must include a statement which provides the name or other method of identification for each employee who is designated to work in controlled access zones. No other employees are allowed to enter the controlled access zones. Should an employee fall, or some other related serious incident occurs, (e.g., a near miss) the employer must investigate the circumstances of the incident to determine if the fall protection plan needs to be changed (e.g. new practices, procedures, or

training) and then must have these changes approved by the qualified person and then must implement those changes to prevent similar types incidents.

When employees are working near wall openings, including chutes, where the bottom edge of the wall opening is less than 39 inches, they must be protected by use of a guardrail system, safety net system, or fall arrest system.

Where employees could be hit by falling objects, the employer must require the use of hard hats. The employer must also require the installation of toe boards, screens, or guardrail system to prevent objects from falling to a lower level, or, erect a canopy structure which will withstand the maximum expected impact from a falling object and keep objects away from the edge so if they were accidentally displaced they would not fall. The employer could also prohibit employees and other persons from entering the area directly below the falling hazard by installing barricades and signage to prevent and warn people of the falling object hazard.

The criteria for fall protection systems are vast and very detailed. Some highlights are presented below.

Guardrail systems must have a top rail height between 39 and 42 inches. This top rail must withstand 200 lbs of force applied in any outward or downward direction. There must be a midrail midway between the top rail and walking/working surface. This midrail must with stand 150 lbs of force applied in any downward or outward direction. Intermediate members such as balusters when used must not be more than 19 inches apart.

Other useful resources include:

<http://www.osha.gov/index.html> or [National Institute for Occupational Safety and Health \(NIOSH\)](http://www.niosh.gov)

Personal fall arrest systems must be manufactured in accordance with ANSI A10.32-2004. Some of the requirements for personal fall arrest systems include the following; the anchorage point for the system must be able to withstand 5000 lbs of applied force per employee attached to it. Deerings and snap hooks must be proof tested to a minimum of 3,600 lbs without deforming or cracking. Lanyards and vertical life lines must have a minimum breaking strength of 5000 lbs. Self-retracting lanyards must be capable of withstanding a minimum tensile load of 5000 lbs. The maximum arresting force of a fall arrest system on the body must not exceed 1,800 lbs for a full body harness and be rigged so the employee will not fall more than 6 feet or contact a lower level and must bring an employee to a complete stop within 3.5 feet. A full body harness must be rigged on the employee so that the D-ring is in the center of the back near shoulder level. Full body harnesses, lanyards and lifelines must be inspected prior to each use by the user. They must also be inspected by a competent person in accordance with the manufacturer's instructions. This inspection should be documented. The tag on the equipment must be punched the first time the equipment is placed into service. Should a fall arrest system be involved in a fall, it must be taken out of service and destroyed. It should never be used again.

The employer must provide for prompt rescue in the event an employee is involved in a fall or ensure employees are able to rescue themselves.

For additional information or questions regarding the control of fall hazards at your workplace, please don't hesitate to utilize our "[Ask the Expert](#)" feature on our website at [www.ehscompliance.com](http://www.ehscompliance.com)