Fall Protection vs. Fall Prevention

Solutions for Workplace Safety

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Risks are inherent in the activities we perform every day whether driving, flying, walking, or working. Every job has its risks although some outweigh others.

"People exaggerate spectacular, but rare risks and downplay common risks. They worry more about earthquakes than they do about slipping on the bathroom floor, even though the latter kills far more people than the former." – Bruce Schneier *Beyond Fear*

Fall Protection Laws and Standards

When working with both feet on the ground it is still possible to obtain injuries by slipping, tripping and falling; anything above ground level is going to bring intrinsic risks. Per OSHA regulations, "Fall protection must be provided at four feet in general industry, five feet in maritime and six feet in construction." [1]

Because this distance does not seem very high workers often do not realize the true danger of fall hazards. It's easy to picture the dangers of falling when you are working several stories off the ground but maybe not so much when the height is not as tall as you are. A fall from this height can still result in serious injury; therefore well planned and executed safety measures should be taken no matter what the height.

Employers have a lawful duty to keep their workers safe in every workplace. There are rules for all types of businesses. Here the discussion analyzes fall protection and fall prevention types – what excels in certain scenarios as well as the disadvantages of some fall protection.

Legal Regulations – OSHA

In 1971, The Occupational Safety and Health Administration (OSHA) was established due to public outcry against rising injury and death rates on the job. The agency focuses its resources on reducing injuries, illnesses, and deaths in the workplace. For the past forty years OSHA and its state partners have seen a positive effect on workplace safety. "It's estimated that in 1970 approximately 14,000 workers were killed on the job. By 2009 that number fell to around 4,340. Also during that time United States employment almost doubled to include over 130 million workers at more than 7.2 million worksites." [2]

Consensus Standards – ANSI

Founded in 1918, the American National Standards Institute (ANSI) is a private non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems and personnel in the United States. OSHA regulations are the law but ANSI publishes consensus standards to provide a more current and thorough view of how to plan, implement and manage a fall protection program. OSHA and ANSI both work to reduce the threat of fall fatalities. [3]

The Importance of a True Fall Protection Program

Once you grasp the magnitude of fall hazards and the risks associated with them, an initial budget can be created. Next comes a phased implementation plan based on priorities and budget. Without a true fall protection program, you'll be spending on solutions that do little to reduce overall risk. Not evaluating all pieces of the program together can become costly, ineffective and inefficient. [3]

The Big Three

The three types of fall protection are:

- Fall Prevention
- Work Positioning
- Fall Arrest

Each type has an intended use; however, the best for any job with height would be fall prevention since the worker is "prevented" from falling.

Fall Prevention

Fall prevention is the ideal solution when it comes to workplace safety. Anytime a hazard can be engineered out to completely remove the risk of falling, it becomes the ideal approach and should be taken if possible. One type of fall prevention is a guardrail system. This can be added to platforms, gangways, stairs and more. Guardrails have a top rail and a midrail installed halfway between the top edge of the guardrail and the walking or working level. Guardrails must also be able to withstand impact in any direction. "Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds." [4]

In order to reduce slipping there should also be a non-slip surface for walking which is often accomplished with an open patterned, grating type, walking surface which provides traction and allows water and debris to drain through. Non-slip coatings are used in industrial and marine applications on flat horizontal stair treads and other walk surfaces to provide greater traction for users. [5]

A guardrail system is certainly the most preferred solution for fall prevention since the worker can move about freely while performing his/her job and won't require additional safety equipment such as a body harness, lifeline, or anchorage.

Another form of fall prevention is the tether system, a rope fastened on one end to a harness and the other to an anchorage. A caveat for using the tether system is that the anchorage has to be able to support 3000 pounds and the tether must be short enough as to not allow the employee to reach the edge of an unguarded elevated surface; therefore preventing the fall. [6]

Work Positioning

A work positioning system secures a worker to a location keeping him/her from falling. The system consists of two items – a harness and a lanyard. The body harness has a D ring on each side of the waist. The lanyard attaches to one D ring then around a stationary item and back to the D ring on the other side. The lanyard must be long enough to allow the worker sufficient movement for the job without leaving slack in the system. [6]

Fall Arrest

A typical fall arrest system is made up of three items: a body harness, a lanyard that will limit the fall to six

feet and an anchorage.
Some lanyards are a fixed length of six feet or less and some are retractable; known as a SRL or self-retracting lifeline. The lanyard can be attached to a fixed non-movable point or consist of a rope grab attached to a horizontal life line which would be anchored at each end. The three pieces working together must be able to resist the shock load caused by a fall. OSHA and ANSI require anchorages to be strong enough to support at least a 5,000 pounds static load per worker or be engineered to provide a 2 to 1 safety factor.

An important point to note is that the worker should remain in close proximity to the anchorage because the further he/she moves horizontally, the larger arc created in the pendulum swing if a fall occurs. If there's any contact with a stationary object during a fall a serious injury could occur regardless of the fall arrest system's shock absorbing device. [6]

Harness Hang

Further considerations should be taken before using a fall arrest system. A fall can turn into an emergency situation quickly. When a worker has fallen, they may be unconscious, and there should be a rescue plan to bring the worker to safety quickly. There are a couple of major life-threatening syndromes that can occur after a fall. Harness hang is one very deadly situation that can occur when the body is held upright without any movement for a period of time. If the worker is strapped into a harness they will eventually faint. If the person faints but remains vertical, oxygen is restricted from the brain and can result in death. [7] Harness hang can begin just a few minutes after the fall with symptoms including: abnormally high blood pressure, rapid pulse, faintness, sweating and breathlessness.

Crush Syndrome

Compression or crush syndrome can have the same effect as having a leg trapped under a rock cutting off the circulation. The person seems fine, yet circulation is not occurring in the trapped leg. Toxins (waste by-products of the cells) are building up inside the vessels of the trapped leg, below the compression. Once the crushed extremity is released, the trapped toxins suddenly flow into the circulatory system and create a shock on the body. This can also result in death if not treated quickly and properly. Contrary to harness hang, crush syndrome can take an hour or two to occur and gives rescue workers more time to pull together the necessary supplies and safely lower the worker. [8]

Harness hang is a life-threatening situation. A person that has experienced a fall and is suspended must be rescued immediately. Usually, harness hang will kill the worker before compartmental or crush syndrome will. The best treatment for harness hang is to get the

person off the rope and on the ground as quickly as possible. [8]

Creating a Safer Workplace

There are several steps to take in making the workplace safer for employees and visitors. First evaluate all activities that go on during a normal workday and see where improvements might be beneficial. Where fall protection is needed select what's appropriate focusing on "preventing" falls when at all possible, then on "protecting" workers who do fall in areas where prevention isn't an option. Whether conducting a hazard assessment or developing a comprehensive fall protection plan, thinking about fall hazards **before** they occur will help to manage workplace safety and focus attention on prevention efforts. If using personal fall protection systems, particular attention should be given to identifying attachment points and ensuring that employees know how to properly don and inspect their equipment.

- Make improvements to the workplace by creating non-slip surfaces, making sure there are no floor holes, unprotected sides, wall openings and other hazards.
- Develop a written fall prevention plan that can be read and followed by all employees.
- Perform daily evaluations focusing on hazards associated with routine and non-routine tasks.
- Eliminate the need for fall protection when possible by rescheduling, isolating or changing the task.
- Make sure fall protection equipment is appropriate, inspected regularly and used properly.
- Conduct mandatory fall prevention training for employees on a routine basis.
- Train workers on how to identify fall hazards and on the correct personal protection equipment (PPE) to use for each situation.
- Fall protection equipment needs to be inspected regularly (another reason to focus on prevention) in accordance with OSHA requirements and manufacturer's recommendations.
- Partner with other employers to find out what their best practices are and to share fall prevention tactics.
- Visit OSHA's website at www.osha.gov and ANSI's website at www.ansi.org to ensure that you are compliant with all rules. [9]

For more information call Carbis at 800.948.7750 in the US or 843.669.6668 for international calls.

ENDNOTES

[1] Fall Protection www.osha.gov/SLTC/fallprotection/index.html
[2] Timeline of OSHA's 40-Year History www.osha.gov/osha40/timeline.html
[3] Kramer, Thomas P.E., C.S.P."Fall Protection 101: OSHA vs ANSI" www.safety.com/articles/fall-protection-101-osha-vs-ansi-good-bad-overlooked
[4] "Fall protection systems criteria and practices" www.osha.gov/pls/oshaweb/owadisp.show_document? p_id=10758&p_table=STANDARDS
[5] "Slips-Falls: A Threat to Safety" www.astantislip.com/reference/slipfall.html
[6] "Safety Issues, Fall Protection" www.safway.com
[7] "Suspension Trauma" en.wikipedia.org/wiki/Suspension_trauma
[8] Green, John "Harness Hang Pathology" © 1998 www.members.tripod.com/ferforge/saglik006.htm
[9] "Fall Prevention Safety Tips for Employers" www.ieci.org/uploads/Fall.Prevention.Tips.Sheets.pdf