

# Raising Awareness About Scaffold Safety

## Introduction

According to OSHA, 65% of the construction industry, or 2.3 million construction workers, frequently work on scaffolds. Protecting these workers from scaffold-related accidents could prevent 4,500 injuries and 50 deaths each year. That's a savings for American employers of \$90 million or, looked at another way, 500,000 workdays. And that figure does not include costs associated with rework, rescheduling or worker training – not to mention the human cost of injuries or death of workers, pedestrians or innocent bystanders.

This TIPS combines The Hartford's industry-leading loss control expertise with industry research to help you reduce accidents. It was developed based on our discussions with leading experts in the field of scaffold design and use, consultations with many construction clients who use scaffolds, and our investigation of many scaffold accidents.

## Develop a Safety Program

The key to preventing scaffold accidents is to implement an effective scaffolding safety program. This safety program should address, in writing, the person(s) responsible for the scaffold's assembly, use, maintenance and supervision. The program should also address whether you will allow other tradesmen to use your scaffolding. While we understand that this is common business practice, The Hartford strongly discourages the use of your scaffolding equipment by other tradesmen, for two key reasons. First, many scaffold accidents are attributed to individuals who are not qualified to use them. Second, in many jurisdictions there are specific statutes that govern responsibility for scaffolding-related injuries. As the scaffold's owner, you may be absolutely liable by statute. As a result, contracts that you have negotiated to address your company's indemnification may be unenforceable. The Hartford strongly suggests that you do not sign any contracts unless you understand the legal implications of what you are signing. For more information about contractual issues, refer to The Hartford's TIPS *Managing Contracts Improves Your Risk Management*.

## About Scaffolds

A scaffold is any temporary elevated platform and its supporting structure used for holding people, materials or both. It is designed to provide an elevated work area that is more efficient than other means. Scaffolding can be used for a variety of jobs in new construction, maintenance and repairs, and renovation. When properly erected and maintained, scaffolds provide employees with safe access to a work location that would normally be out of reach.

LOSS CONTROL TIPS

## Who Is at Risk and Why

Even when they are properly used, scaffolds present risks to employees and those who are passing or working under the scaffold. In addition to the operations exposure, serious injuries can occur during the erection, dismantling and alteration of a scaffolding system. Your safety procedures should address the setup and dismantling phases.

Our research and investigation indicates that the three main causes of scaffolding accidents are:

- Equipment failure
- Incorrect operating procedures
- Environmental conditions

All of these situations can cause people and material to fall from a scaffold, or can contribute to the collapse of a scaffold.

The first step in implementing a scaffold safety program is to understand the various types of scaffolding commonly in use.

## Supported Scaffolds

Supported scaffolds hold up one or more platforms with outrigger beams, brackets, poles, legs, uprights, posts, frames or similar rigid support. The different types of supported scaffolds include:

**Frame or Fabricated** – This work platform is supported on fabricated end frames with integral posts, horizontal bearers and intermediary members.

**Manually Propelled/Mobile** – This scaffold is unpowered, portable and set on casters or wheels.

**Pump Jack** – This work platform is supported by movable brackets on vertical poles.

**Ladder Jack** – This platform rests on brackets attached to ladders.

**Tube and Coupler** – This platform is supported by tubing and erected with coupling devices that connect uprights, braces, bearers and runners.

**System** – This platform's posts are fixed at connection points that accept runners and diagonals interconnected at predetermined levels.

This TIPS further discusses frame, or fabricated, scaffolds for two reasons. First, this type of scaffold is used more than 90 percent of the time and is the most economical, versatile and easy to use. Second, many of the same basic scaffolding requirements apply to the other types of support scaffolds as well. For information about other types of scaffolding, including suspension, talk with your Hartford loss control consultant.

## Frame Scaffolds

A frame scaffold is a platform supported on fabricated end frames with integral posts, horizontal bearers and intermediary members. These modular frame units are used by a variety of trade contractors and can be stacked several stories high for use on large-scale construction jobs.

### Frame Safety Requirements

Eight basic requirements should be addressed when using scaffolding. The frame safety requirements can be broken down into three sections – equipment, operations, and environment – as follows:

#### Equipment

**Base Section** – A stable structure can only be built upon a foundation that is square and level. To ensure stability, set supported scaffolds on base plates, mudsills or some other adequate firm foundation. This is critically important. Footings must support the scaffold – including the expected load – without settling or displacement. Supported scaffold poles, frames, uprights, etc., must be plumb and braced to prevent swaying and displacement. Use a level to achieve the desired right angles.

**Support Structure** – To prevent a scaffold from falling, ensure that it is built within OSHA regulations relating to strength and structural integrity. You can access OSHA standards at OSHA (29CFR 1926.450). The four key considerations for adequate support are:

1. Capacity – Scaffolds and their components must support, without failure, their own weight and at least four times their maximum intended load. Do not overload a scaffold by allowing too many people or material on the platform, or by concentrating too much of the load in one area.
2. Bracing – Connect frames and panels with cross, horizontal or diagonal braces, alone or in combination, which secure vertical members together laterally. As frames are stacked, cross braces must keep the scaffold plumb, level and square. All brace connections must be secured to prevent dislodging.
3. Pinning – Join frames and panels together vertically by coupling or stacking pins, or equivalent means. Frames and panels should also be locked together to prevent uplift (the separation of a frame from the one below it).
4. Components – Scaffold components made by different manufacturers should not be intermixed unless they fit together without being forced. The scaffold's structural integrity must be maintained. In addition, scaffold components of dissimilar metals should not be used

together unless a competent person has determined that the galvanic action will not reduce the strength of any component below standards.

**Access** – Our experience shows that workers are most vulnerable to falls when they are climbing on or off the scaffold. While OSHA has specific requirements regarding access, in general, employees must have safe access at any level of a scaffold that is two feet above or below an access point. This does not include the use of cross bracing as a means of access, which is forbidden by OSHA. Means of safe access include hook-on or attachable ladders, stair towers, ramps, and walkways. Cross bracing was not designed for accessing a scaffold.

**Fall Protection** – Falls are the leading cause of injuries and deaths associated with scaffold use. As an employer, you are required to provide fall protection for employees through a personal fall arrest or guardrail system. This requirement applies to any scaffold that is 10 feet or more above a lower level. Although OSHA mandates protection at 10 feet, The Hartford recommends that protection be in place at six feet.

**Personal Fall Arrest Systems** – Lanyards should be attached to a vertical lifeline, horizontal lifeline or scaffold structural member. When vertical lifelines are used, fasten them to a fixed safe point of anchorage, independent of the scaffold, and protect the line against sharp edges and abrasion. In addition, you should not attach two or more vertical lifelines to each other or to the same point of anchorage. Horizontal lifelines should also be secured to two or more structural members of the scaffold.

**Guardrail Systems** – Standard rails are required on all scaffold platforms. They should be installed along all open sides and at both ends of platforms.

- Guardrails should be removed only when materials are being on-loaded or off loaded. Once the materials have been positioned, replace the guardrails immediately. Whenever employees are assigned within six feet from an area with a removed guardrail, they should be protected with the use of a personal fall arrest system.
- Ensure that each top rail, or equivalent member of a guardrail system, can withstand a force of at least 200 pounds. The top edge height of all top rails must be between 38-45 inches.
- Ensure that mid rails, screens, mesh, intermediate vertical members, and solid panels can withstand a force of at least 150 pounds. Screens and mesh must extend from the

top edge of the guardrail system to the scaffold platform and along the entire opening between the supports.

- In lieu of guardrails, you may use cross bracing as a top rail or mid rail, as long as the crossing point is between 20-30 inches above the work platform for a mid rail, or between 38-48 inches for a top rail.

**Platform** – Except when used as a walkway, the platform is the main work area of the scaffold. Before any work begins, have a qualified person inspect the scaffold. Based upon OSHA's analysis, many accidents could be avoided through proper inspection. Please note that OSHA issues many citations to contractors for improper inspection of scaffolds. In performing a safety check of both the platform structure and how it will be used, the platform decking should:

- Be fully planked or decked.
- Not have gaps greater than one inch between adjacent planks or deck units, or between the platform and the uprights (unless you can demonstrate that a wider space is necessary; in such cases the gap should be as small as possible and cannot exceed 9/16 inches.)
- Be at least 18 inches wide, unless it is used in areas that you can demonstrate are so narrow that it must be less than 18 inches wide.
- Be kept clear of anything that could cause a worker to slip, trip or fall, such as tools, scrap material, ice, mud, etc.
- Be left undisturbed when platforms are moved to the next level, until the new end frames are in place and braced.
- Be cleated, or otherwise restrained, at each end when overlap is necessary, or overlapped at the centerline support by at least six inches.
- To protect passersby from falling objects, use debris nets or canopy structures, and barricade the areas below the scaffolding to prevent people from entering the area.

### Operations

**Stability** – As a general rule, a scaffold becomes inherently unstable when its height is four times its minimum base dimension. In addition, even if a scaffold is plumb and square, extreme weather or damage to a structural component can affect a scaffold's stability. To reduce the likelihood of an accident, consider the following:

- Guys, Ties and Braces – When a scaffold reaches more than four times its minimum base dimension, restrain it with guys, ties or braces to prevent it from tipping. These devices should be installed where horizontal scaffold components support both inner and outer legs.

- *Moving Scaffolds* – Moving scaffolds should not be moved horizontally while employees are on them, unless a registered professional engineer has designed them for that purpose. Our analysis of actual accidents shows that even experienced scaffold operators have made this mistake.
- *Weather* – Do not allow employees to work on or from a scaffold during storms or high winds.

**Employee Training** – A qualified person should be assigned the responsibility for the design, erection, dismantling, use, and maintenance of the scaffolding. In addition, this person should be responsible for training and supervising workers who use scaffolding. A qualified person should also be responsible for providing fall protection for employees who erect or dismantle supported scaffolds.

You may rely on the expertise of employees or other persons, such as consultants and scaffold systems representatives, to design, erect and dismantle scaffolds. The key consideration is that the individual actually supervises the work being done, has authority to correct hazards, and fulfills the competent persons' standard responsibilities. When more than one employer erects and uses a scaffold, it must be determined who the controlling and exposing employers are and document factors related to OSHA's multi-employer citation policy.

**Design and Erection** – Scaffolds must be designed by a qualified person and constructed and loaded in accordance with that design. Erecting, moving, dismantling or altering of scaffolds should be done only under the supervision of a competent person. Scaffolds that are more than 125 feet above their base plates should be designed by a registered professional engineer and constructed and loaded in accordance with such design.

**Training** – Accountability is key. You'll need to identify and train a competent person who will train and work with your employees to recognize hazards associated with erecting, dismantling, repairing and inspecting scaffolds. Training should be documented and address pertinent requirements, such as:

- The nature of scaffold hazards
- Correct procedures for the safe use of scaffolding and related equipment
- Design criteria

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- Maximum intended load capacity
- Intended use of the scaffold

In addition, train those who work on scaffolds to understand the dangers and procedures for electrical hazards, material handling, fall protection and falling objects. If, at any time, you believe that an employee lacks the skill or understanding to safely erect, use, maintain or dismantle a scaffold, you should remove that employee from scaffold work until refresher training has been satisfactorily completed.

### Environment

**Electrical Hazards** – Because scaffolds are often made of metal and used near overhead power lines, workers are at risk of electrocution. You can reduce this risk through proper clearance and by observing standard electrical safety guidelines.

**Overhead Power Lines** – Scaffolds should not be placed closer than 10 feet to a power line. If the nature of the work requires that the scaffolding be closer, contact the electric company or electrical system operator. You should not proceed with work until you are certain that the electrical lines have been de-energized or relocated, or that a protective covering has been installed to prevent accidental line contact.

**Portable Electric Tools** – When a power tool or cord fails, it can electrify a metal frame scaffold, posing a risk of electrocution to the worker holding the tools – and to those who contact the scaffold. Protect your workers by using GFCI (ground-fault circuit interrupters) on all portable electric equipment, or by using an equipment grounding conductor program that complies with OSHA.

### Training is Key to Scaffold Safety

When properly maintained and used within their design limits, scaffolds are a cost-effective and safe method for providing temporary elevated work areas. This is true only if the scaffolds are in good repair, properly erected, maintained and used within their design limits.

For more information, contact your local Hartford agent or your Hartford Loss Control Consultant. Visit The Hartford's Loss Control web site at <http://www.thehartford.com/corporate/losscontrol/>