Introduction to Construction Safety

An Online Continuing Education Course for Engineers

Course Number: C-1019

Credit: 1 Hour / 1 PDH / 1 CPD

Introduction to Construction Safety

Construction

Nearly 6.5 million people work at approximately 252,000 construction sites across the nation on any given day. The fatal injury rate for the construction industry is higher than the national average in this category for all industries.

Some potential hazards for workers in construction include:

- Falls (from heights);
- Trench collapse;
- Scaffold collapse;
- Electric shock and arc flash/arc blast;
- Failure to use proper personal protective equipment; and
- Repetitive motion injuries.

Hazards & Solutions

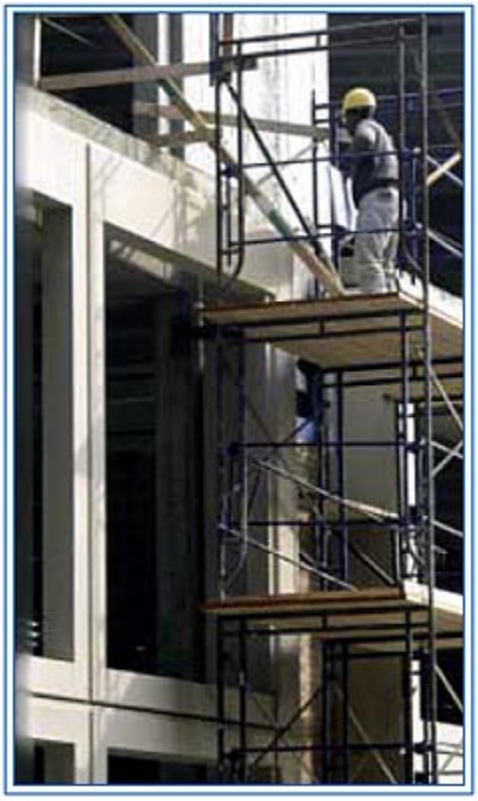
Below is a list of the areas in the construction industry that are most frequently cited by the U.S. Occupational Safety and Health Administration (OSHA) for violations:

1. Scaffolding
2. Fall protection (scope, application, definitions)
3. Excavations (general requirements)
4. Ladders
5. Head protection
6. Excavations (requirements for protective systems)
7. Hazard communication
8. Fall protection (training requirements)
9. Construction (general safety and health provisions)
10. Electrical (wiring methods, design, and protection)

In this course, we'll review some of the most prevalent hazards in the construction industry, along with OSHA requirements and safe work practices designed to mitigate the hazards. Areas that will be covered include: scaffolding, fall protection, stairs and ladders, trenching, hazard communication, and forklift operations.

Scaffolding

Hazard: When scaffolds are not erected or used properly, fall hazards can occur. About 2.3 million construction workers frequently work on scaffolds. Protecting these workers from scaffold-related accidents would prevent an estimated 4,500 injuries and 50 fatalities each year.



Solutions:

- Scaffold must be sound, rigid and sufficient to carry its own weight plus four times the maximum intended load without settling or displacement. It must be erected on solid footing.
- Unstable objects, such as barrels, boxes, loose bricks, or concrete blocks, must not be used to support scaffolds or planks.
- Scaffold must not be erected, moved, dismantled or altered except under the supervision of a competent person.
- Scaffold must be equipped with guardrails, midrails, and toeboards.
- Scaffold accessories such as braces, brackets, trusses, screw legs or ladders that are damaged or weakened from any cause must be immediately repaired or replaced.
- Scaffold platforms must be tightly planked with scaffold plank grade material or equivalent.
- A "competent person" must inspect the scaffolding and, at designated intervals, reinspect it.
- Rigging on suspension scaffolds must be inspected by a competent person before each shift and after any occurrence that could affect structural integrity to ensure that all connections are tight and that no damage to the rigging has occurred since its last use.
- Synthetic and natural rope used in suspension scaffolding must be protected from heat-producing sources.

- Employees must be instructed about the hazards of using diagonal braces as fall protection.
- Scaffolds can be accessed by using ladders and stairwells.
- Scaffolds must be at least 10 feet from electric power lines always.

Three main points to remember to ensure scaffolding safety:

1. The scaffold must be built under the supervision of a competent person;
2. Workers must be trained by a qualified person before they use the scaffold; and
3. The scaffold and its components should be checked by a competent person and properly tagged before the start of the shift to ensure its integrity and safety.

A Competent vs. A Qualified Person

According to OSHA, a *competent* person is "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions, which are unsanitary, hazardous to employees, and who has authorization to take prompt corrective measures to eliminate them." This is typically someone who holds a scaffolding high-risk work license.

A *qualified* person is one who "has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project." A qualified person has the right background such as education or degree in designing safe scaffolding, such as a representative from the scaffold manufacturer or a trained scaffold engineer.

The Bureau of Labor Statistics cites that 72% of scaffold injuries were due to scaffold planking or support giving way, slips, or falling objects. With regular inspections performed by a competent person, adequate scaffold safety training provided by a qualified person and compliance with local regulatory standards, these dangers can be controlled.

Guidelines for Tagging Scaffolds

Scaffold tags are used to protect the workers' lives. They identify if a scaffold is safe or unsafe for use. Follow the guidelines below when tagging scaffolds.

1. Inspection and tagging of the scaffold are to be performed by a competent person experienced in the erection of scaffold.
2. A unique scaffold identification tag number must be clearly identified on all tags for tracking purposes.
3. All scaffolds shall be inspected after the erection per regulatory requirements.
4. All scaffold identification tags will be a solid green, yellow, or red color with black lettering.
5. Front information displayed and completed for each tag.

6. It is common practice to use the following color schemes: Green, Yellow, Red

Green - tags will be hung on scaffolds that have been inspected and are safe for use. A green "SAFE FOR USE" tag(s) should be attached to the scaffold at each access point after the initial inspection is complete.

Erection & Inspection Record Scaffold Tag

Scaffold Safe For Use Do Not Alter Tag

Scaffolding Safe For Use Do Not Alter Tag

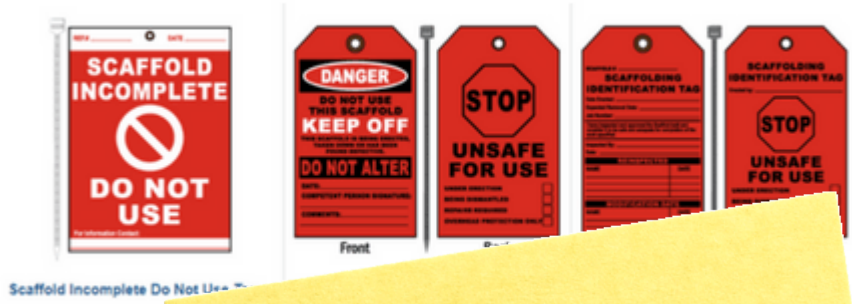
Yellow - "CAUTION" tag(s) will replace all green "Safe Scaffold" tag(s) whenever the scaffold has been modified to meet work requirements, and as a result, could present a hazard to the user. This tag indicates special requirements for safe use. NOTE: Use of the "yellow tag" status is not intended to override the green tag system. All efforts should be made to return the scaffold to a "Green Tag" status as soon as possible.

Erection & Inspection Record Scaffold Tag

Does Not Meet OSHA Specifications Tag

Potential or Unusual Hazard Scaffold Tag

Red - “DANGER – UNSAFE FOR USE” tag(s) will be used during erection or dismantling when the scaffold is left unattended and replace all green "Safe for Use " tag(s) or yellow “Caution / Hazard “ tag(s) in the event a scaffold has been deemed unfit for use.



Hazard: Each y of fatalities in the construction ind ng unstable working surfaces, misuse error. Studies have shown that using and restraint syst falls.

Solutions:

- Consider u safer eleva
- Erect guardr ystems with toeboards and warning lines or install control line systems to protect workers near the edges of floors and roofs;
- Cover floor holes; and/or
- Use safety net systems or personal fall arrest systems (body harnesses).

The OSHA rules concerning fall protection are addressed in several Subparts of the regulations. Listed below is a summary of the primary construction industry fall protection standards. It is