



TCM 2430 – Construction Safety

Week 2

Part 1: Hazards in the Construction Industry

Part 2: OSHA's Inspections

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Part 1

Hazards in the Construction Industry



Why is there a significant need to improve safety in construction industry?

- Construction is full of potential hazards.
- Year after year construction is one of the most dangerous industries, with approximately almost 1000 construction workers dying on the job each year.
- Although construction employment equals just over 5% of the workforce, construction injuries account for in excess of 17% of all occupational deaths.
- 1 One out of every seven construction workers is injured each year and one out of every fourteen will suffer a disabling injury.
- The occupational illnesses affecting construction workers have not been accurately measured, but an educated guess is that construction workers suffer both acute (short-term) and chronic (long-term) illnesses from their exposure to chemicals, dusts, fibers, noise, radiation, vibration, and temperature extremes.
- Precautions need to be taken to limit exposures which have the potential to cause detrimental health effects to construction workers

Watch the video to begin

- **Workplace Falls and Injuries, Deaths, Accidents, Fatality**
- <https://youtu.be/BEDSOYfGPzw>



Think of each of the following construction potential hazards...

- premature explosions
- rollover
- electrocution
- mounting and dismounting heavy equipment
- noise
- dust
- whole body vibration
- exhaust emissions and carbon monoxide
- whipping air hoses and other hazards of compressed air equipment
- cave-in
- burns
- working on areas without guards
- hand/arm vibration
- moving of heavy equipment
- concrete handling
- working with sharp objects
- using hand and power tools
- wet/slippery surfaces
- mists
- ladder and scaffolds
- fumes
- vapors
- radiation
- gases
- lifting and carrying heavy materials
- working off precarious surfaces

What makes practicing safety on a construction site a challenge?

1. Contractors perform their specialties at unique worksites, such as building skyscrapers or paving highways.
2. The equipment varies with the task being performed, from small tools to large earthmoving equipment.
3. The variety of materials needed to complete the project greatly varies and can include anything from 2 × 4 studs to large steel I-beams.
4. There is a great variety of procedures used during the work being performed, like tying rebar (Figure 1.1) or digging a trench.
5. Each construction process has its own safety or health hazards which can dictate different precautions, from the need for fall protection to the need for respirators for asbestos abatement.
6. The workers or trades (electricians, roofers, etc.) possess special skills and training to perform their specific tasks. This might include operating engineers using cranes or carpenters performing framing.

What challenges will owners, construction managers, contractors, and subcontractors may face if safety standards are not practiced on the field?

1. Hazardous conditions may go unchecked, which can cause death or serious injuries.
2. Subcontractors who have bad safety records or perform their work in an unsafe manner are very culpable.
3. Courts may take a jaundiced view of prime contractors, owners, or managers who cannot separate their control and responsibility over production and safety.
4. Legal actions can result in large awards.
5. Legal fees, increased insurance costs, and loss of other resources (e.g., lost time, lost production) are outcomes of poor control.

What are some actions that can be undertaken to mitigate legal liability about safety for contractor?

1. Make sure that all parties are aware of the content of the contract and knowledgeable of everyone's responsibilities regarding safety.
2. Maintain the power to inspect and monitor safety and health, and work practices to assure safe completion of the project.
3. Hold each contractor and subcontractor accountable for the daily activities of its workforce and the workers' safety.
4. Employ only reputable contractors who can verify their work quality and safety practices.
5. Have a safety policy in place with job safety and health provisions clearly spelled out.
6. Use Hold Harmless/Indemnity provision to waive worker's compensation while assuring certification of insurance and worker's compensation programs.
7. Comply with OSHA Regulations and require all others to do so.

Watch the video in the following link and identify the top 10 safety hazards in construction

- **Top 10 safety hazards in construction - Safety Training**
- <https://youtu.be/3eCKfBkSUMU>



Think of the ways the safety of each of the following trades must be protected in a common construction project?

- Asbestos workers and insulators
- Bricklayers
- Boilermakers
- Carpenters
- cement Mason finishers
- construction laborers
- Electricians
- elevator constructors
- floor covering installers
- Glaciers
- iron workers
- Lathers
- cabinet workers
- Plumbers
- Painters
- pile drivers
- pipe fitters
- Plasters
- Roofers
- sheet metal workers
- stone Masons
- Teamsters
- tile setters

What is the advantage of hiring union workers for a project?

- The unions' contributions to the construction industry include providing productive, quality, and highly trained workers.
- All of the Building and Construction Trade Unions are dedicated to selecting the best individuals to enter their apprentice training programs and assuring that those individuals coming out of their programs are highly trained and some of the most skilled and productive workers in the world.
- A contractor who uses a union crane operator knows that operating a crane is what that worker does for a living on a regular basis and is not a nonunion laborer who only operates a crane at times. Thus, contractors who use union workers have a sense of confidence that they have experienced and trained workers to do specific tasks at the jobsite.

Name the unions that are part of the Building and Construction Trades Department

- International Association of Heat and Frost Insulators and Asbestos Workers
- International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers, and Helpers
- International Union of Bricklayers and Allied Craftworkers
- United Brotherhood of Carpenters and Joiners of America
- International Brotherhood of Electrical Workers
- International Union of Elevator Constructors
- International Association of Bridge, Structural, and Ornamental Iron Workers • Laborers' International Union of North America
- International Union of Operating Engineers
- Operative Plasterers' and Cement Masons' International Association of the United States and Canada
- International Brotherhood of Painters and Allied Trades
- United Union of Roofers, Waterproofers, and Allied Workers
- Sheet Metal Workers' International Association
- International Brotherhood of Teamsters
- United Association of Journeymen and Apprentice of the Plumbing and Pipe Fitting Industry of the United States and Canada.

Why does construction differs from other industries when it comes to safety?

- 1. Worksites are dynamic (constantly changing) and temporary as work progresses and other construction trade workers enter the process
- 2. Each worksite may involve several small contractors (subcontractors) performing different types of work in close proximity to each other.
- 3. Several trades may be present on the worksite at the same time, bring with them the specific hazards of their trade, such as operating engineers with heavy equipment or painter with their exotic paints. Thus, there is the potential for exposure to all workers at the worksite not just those of that specific trade.
- 4. At times, on small sites one trade ends up doing all of the tasks usually performed by another trade; therefore, the workers may not be familiar with the hazards involved in performing tasks that are not part of their normal job.
- 5. Working surfaces, equipment, machinery, trenching, and scaffolding are regularly being moved, being assembled and disassembled, or modified. Thus, new hazards are constantly emerging.
- 6. Construction workers frequently change worksites and employers over the course of a year. This results in using new procedures and equipment for which they have not been trained.
- 7. The work is often seasonal which results in both contractors and workers feeling rushed due to a sense of urgency to quickly complete projects. This increases the chances that an accident might occur or that occupational exposure to harmful agents will go unnoticed.
- 8. Construction regulations are often difficult to understand. Sometimes the safety standards or standards governing chemicals do not exist for construction or are designed for factory workplaces, such as the use of asphalt, for which no specific regulation exists.

Why do accidents on the jobsite happen?

- 1. Actual physical hazards such as an unstable wall that is being erected.
- 2. Environmental hazards such as toxic atmospheres, oxygen deficiency, noise, radiation, and dust.
- 3. Human factors such as a supervisor's or worker's failure to follow safe work practices
- 4. Lack of or poorly designed safety standards such as no standard for confined space entry or a construction standard or a chemical that is never used in the construction industry.
- 5. Failure to communicate within a single trade such as one equipment operator not following the standard travelway rules and colliding with another operator's equipment, resulting in potential injuries and damage.
- 6. Failure to communicate between two or more trades such as a crane operator contacting high voltage lines while another trade (construction worker) is guiding the piece with a tagline on the material being hoisted.

STATISTICS IN PERSPECTIVE: CONSTRUCTION FATALITIES

CONSTRUCTION
ACCOUNTS
FOR ONLY ABOUT
5% OF EMPLOYEES
IN BRITAIN...



... BUT IS RESPONSIBLE
FOR 22% OF
FATAL
INJURIES

1 IN 3
FATAL SLIP, TRIP OR FALLS
INVOLVES

A CONSTRUCTION WORKER



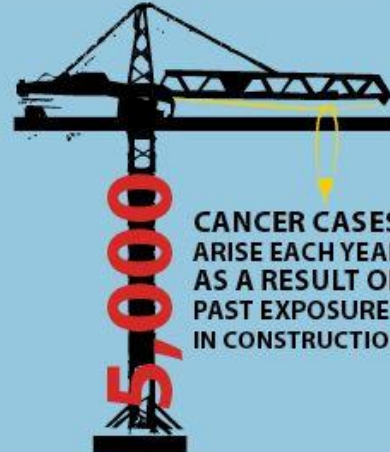
15%

OF ALL SLIP, TRIP
AND FALL DEATHS ARE
FROM **ROOFERS** ALONE



36,000

NEW CASES OF
CONSTRUCTION
WORK-RELATED
ILL HEALTH
PER YEAR



CANCER CASES
ARISE EACH YEAR
AS A RESULT OF
PAST EXPOSURES
IN CONSTRUCTION

What are the 5 construction equipment are involved in most jobsite accidents?

1

Ladders

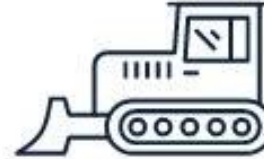
Ladders are the leading cause of death for construction workers, with falls accounting for approximately 40% of construction deaths each year.



2

Bulldozers

Bulldozers are the second most dangerous piece of equipment or machinery on a construction site. They contribute to many crushing injuries and can damage workers' hearing over time without proper ear protection.



3

Power Saws

Power saws are known to cause injuries because they tend to kick back when used.



4

Backhoes

Backhoes are dangerous because they have a shovel at the front, a bucket at the back, and carry a lot of weight. Workers can be struck by the front or back of the machine or caught beneath it.



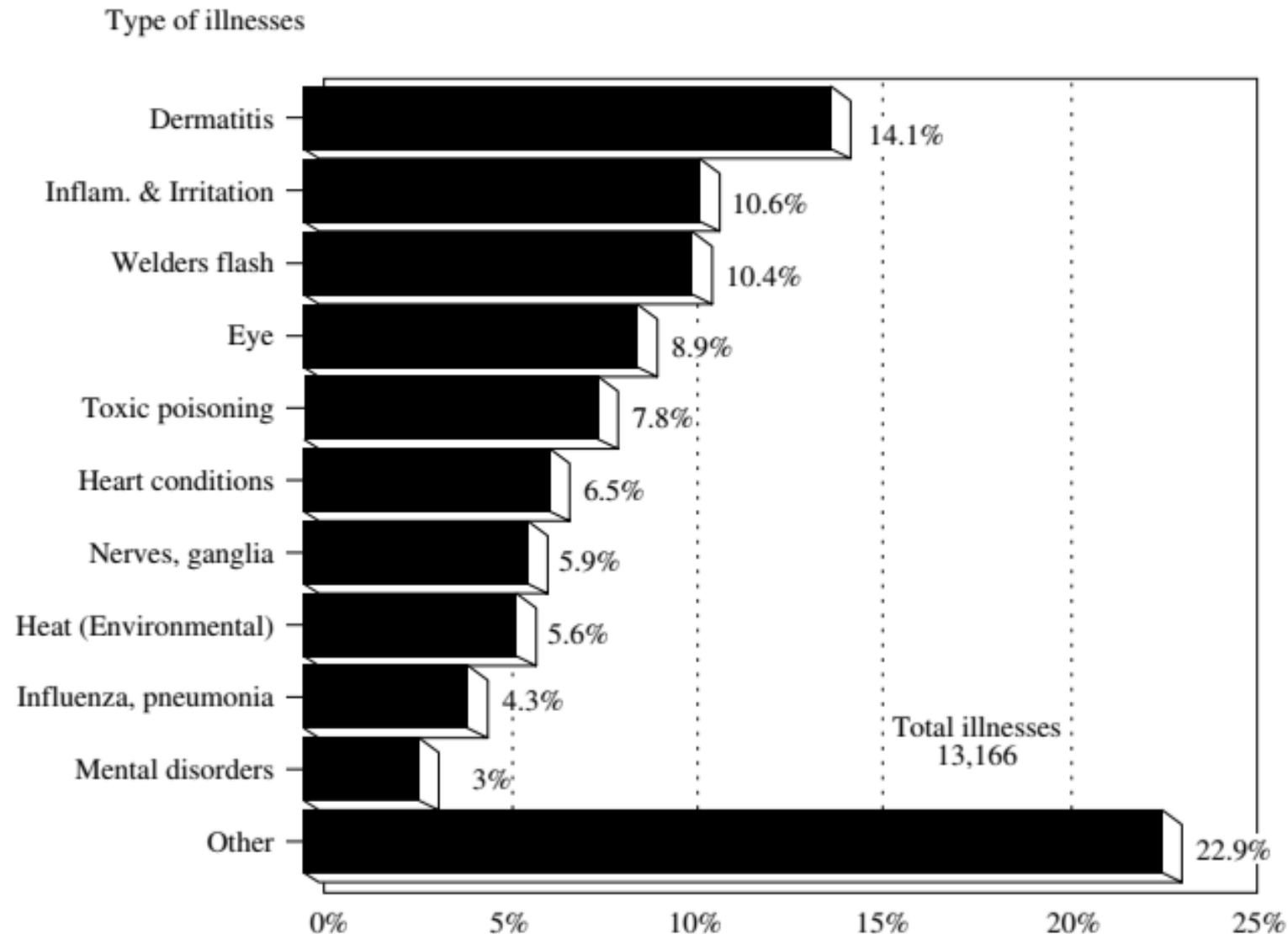
5

Cranes

Cranes are another dangerous piece of heavy equipment on the jobsite for construction workers. They can cause injuries through electrocution, being struck by crane loads, being struck by the crane itself, and collapsing.



Statistics on illnesses in the construction sector



Think of the potential hazard the following equipment can cause

Scrapers

Graders

Bulldozers

End-loaders

Drills

Cranes

Trucks

Ditch Witches

Derricks

Backhoes

Forklifts

Helicopters

Pumps

Generators

Ventilation fans

Ladders

Scaffolds

Tampers

Jackhammers

Chain saws

Think of the potential hazard the following tools can cause

Radial saws

Table saws

Drills

Chippers

Grinders

Powder-actuated guns

Lathes

Planners

Riveters

Sanders

Hammers

Crowbars

Chisels

Screwdrivers

Axes

Shovels

Tin snips

Pliers

Knives

Knee kickers

Staplers

Think of the potential hazard the following materials can cause

All wood products

Steel beams

Stone products

Bricks

Concrete blocks

Tiles

Electrical wire

Nails

Bolts and nuts

Rebar

Sheetrock

Sheet metal

Insulation

Soils

Pipes

Fiberglass

Paneling

Glass

Fixtures

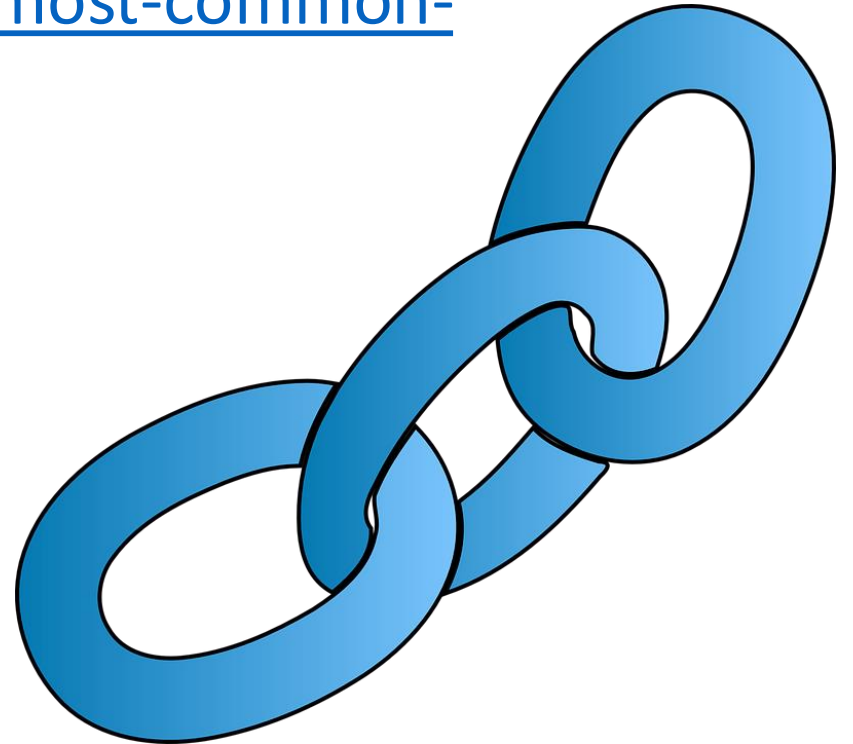
Concrete

Chemicals

Compressed gases

Useful links

- <https://www.bergerlawsc.com/library/construction-accident-injury-statistics-sc-construction-injury-attorney.cfm>
- <https://www.xamax.co.uk/blog/what-are-the-most-common-construction-site-accidents.html>



Explain the construction industry relationship to OSHA

- The Construction Industry is regulated by the US Department of Labor's Occupational Safety and Health Administration (OSHA) regarding workplace safety and health.
- As a part of the Occupational Safety and Health Act of 1970, OSHA was mandated to develop a set of regulations specifically for the construction industry that would safeguard those working in the construction industry.
- These standards and regulations have been developed to guide and direct the construction industry in developing and maintaining safe and healthy workplaces for themselves and their workers.

Are OSHA's standards sufficient to establish safety on site?

- The standards or regulations are minimum requirements, and the construction industry should strive to go beyond these minimum requirements in order to insure a safe and healthy jobsite.
- A safe site can be accomplished by adhering to and going beyond the intent of the standard.

Part 2:

OSHA's Inspections



Does OSHA inspector have to give a notice prior to their inspection?

- OSHA conducts inspections without advance notice, except in rare circumstances (for example, when there is a report of an Imminent Danger).
- Persons making advance notice to an employer can receive fines and a jail term.



What are OSHA's inspection priorities?

Priority	Category of Inspection
1 st	Imminent Danger
2 nd	Fatality/Catastrophe
3 rd	Complaints/Referrals
4 th	Programmed Inspections

How do OSHA's follow-up inspections work?

- These inspections are made as needed, and take priority over Programmed Inspections.
- A follow-up is made to see if violations cited on an earlier inspection were fixed.
- Monitoring inspections are made to make sure hazards are being corrected and workers are protected whenever a long period of time is needed for a hazard to be fixed.
- Workers and their representatives may request an informal conference with OSHA to discuss the inspection, citations, penalties, notice of contest but they cannot contest citations or penalties.

What are the four stages of an inspection?

- Four major stages of an OSHA inspection:

Presenting Credentials

Opening Conference

Walk-Around

Closing Conference

OSHA inspection Stage 1. Presenting Credentials

- When arriving at the workplace, the CSHO finds out who is in charge and presents his or her credentials.
- An employer can require OSHA to get a warrant before an inspection is made.



OSHA inspection Stage 2.

Opening Conference

- Explains why OSHA selected the worksite for inspection;
- Obtains information about the company and PPE needed etc.
- Explains the purpose, scope, procedures, worker representation, privacy, closing conference, etc.
- Determines any inspection exemption (e.g. if OSHA- funded consultation visit is in progress).
- Checks the injury and illness records, OSHA poster, OSHA 300A (if applicable) and other records related to safety and health issues may be requested.

OSHA inspection Stage 3.

The Walk-Around

- The inspector, the employer and worker representatives, proceed through the workplace, inspecting work areas for potentially hazardous working conditions.
- Apparent violations are identified documented.
- The inspector may also interview workers, take photographs or video, and monitor worker exposure to noise, air contaminants, or other substances.
- The inspector will conduct all worker interviews in private, although workers may request that a union representative be present.

OSHA inspection Stage 4.

Closing Conference

- Held with the employer and the worker representatives, either jointly or separately.
- Apparent violations and estimated times for correction discussed.
- Both employer and worker representatives are told of their rights to take part in any future meetings and their contest rights.
- No citations are given out at this time.
- Citations are sent in the mail at a later date (no later than 6 months after the inspection).



What happens if OSHA's inspector find incompliance with their standards on the project?

- OSHA expects the contractor to follow the intent of these rules. If OSHA comes to your jobsite for an inspection, the OSHA Compliance Officer (Inspector) will be looking for compliance with the construction standards.
- If the inspector finds violations of the OSHA Standards, you will receive citations which ultimately can be costly both in the form of real dollars and losses to workplace deaths, injuries, and illnesses.