

USE OF SAFETY IN CONSTRUCTION

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ABSTRACT

Construction safety involves any safety procedure that is related to the construction industry or construction sites. Construction safety aims to ensure that a construction site or the industry as a whole is not the cause of immediate danger to the public around a construction site, or the workers at a construction site, as well as making sure that the finished product of construction meets required safety standards

Construction safety is a major cause for concern in the working world, as it is one of the most dangerous. It is, according to the Bureau of labour statistics (BLS), the fourth most dangerous profession with the second most fatal injuries. It is possibly the second most dangerous land-based profession after the fishing industry. The Occupational Safety and Health Administration (OSHA) provides health and safety regulations and standards specific to the construction industry.

1.SAFETY

Safety is the state of being "safe", the condition of being protected from harm or other non-desirable outcomes. Safety can also refer to the control of recognized hazards in order to achieve an acceptable level of risk.

2. SAFETY IN CONSTRUCTION

The leading safety hazards on construction sites include falls, being caught between objects, electrocutions, and being struck by objects. These hazards have caused injuries and deaths on construction sites throughout the world. Failures in hazard identification are often due to limited or improper training and supervision of workers. Areas where there is limited training include tasks in design for safety, safety inspection, and monitoring safety. Failure in any of these areas can result in an increased risk in exposing workers to harm in the construction environment.

Falls are the leading cause of injury in the construction industry, in particularly for elder and untrained construction workers. In the Occupational Safety and Health Administration (OSHA) Handbook (29 CFR) used by the United States, fall protection is needed in areas including but not limited to ramps, runways, and other walkways; excavations; hoist areas; holes; form-work; leading edge work; unprotected sides and edges; overhand bricklaying and related work; roofing; precast erection; wall openings; floor openings such as holes; residential construction; and other walking/working surfaces. Other countries have regulations and guidelines for fall protections to prevent injuries and deaths.



Construction safety informatics

Li (2019) proposes that there are three generations of construction safety informatics which are relevant to construction safety enhancement:

1. The first generation of construction safety informatics consisted of technologies that relied completely on control by human beings; for example, structural equation modelling requires the work of an analyst.
2. The second generation of construction safety informatics included smart features such as the Internet of Things which can send information to human operators, without human intervention — from sensors, etc. Yet, these “smart” tools cannot learn and improve on their own capabilities.
3. The third generation of construction safety informatics uses state-of-the-art AI, to mimic human behavior and think, act, learn and improve on its own decision making. All that is required is that the relevant information is fed to these systems, so that they can be ‘taught

Every employer is responsible for safeguarding the health and safety of their staff irrespective of the industry and the nature of work being performed. In case of construction workers, they work in a high risk environment that is subject to electrical hazards and the dangers of construction machinery. In fact, according to SafeWork NSW, “around 25,000 workers suffered injuries on NSW construction sites in the last 3 years due to unsafe work conditions. 23 workers were killed and 1700 were left with permanent disabilities”.

These alarming stats make it evident that it is very important to take appropriate safety measures on a construction site and protect the construction crew from fatalities.

SAFETY IN ROAD CONSTRUCTION

1. Use Personal Protective Equipment Every Day

Every road construction worker faces the risk of personal injury on the job. While there are always dangers in a work zone, one strategy to avoiding injury rests with wearing the proper safety equipment all the time within the work zone.

2. Start Each Day With A Team Safety Meeting

The emphasis on safety at a job site provides a focus on the preparation of each worker for an accident-free day on the job. Starting each day out with a full training session provides the instruction on skills that each worker needs as a qualification for road construction.

3. Control Traffic Flow

The most significant risk to construction workers is the dangers of getting hit by oncoming traffic. Motorists deserve to know when to expect changes in a traffic route in time to safely accomplish maneuvers that prevent accidents or disruptions during road work construction.

4. Designate A Site-Specific Safety Program

The conditions that define each road construction project vary according to the unique hazards and challenges that may exist in each work zone.

5. Ensure All Workers Have A Clean Line Of Site

Blind spots can create dangers that remove the safeguards that work zone safety tips provide. With the numerous pieces of equipment that construction jobs require, the potential for job site accidents tends to increase.

6. Make Safety A Personal Responsibility

With the high level of activity that exists in a work zone, each road construction worker needs to take precautions for personal safety. Whenever possible, workers must face on-coming traffic to maintain eye contact with approaching vehicles.

Designated workers can serve as spotters who alert others to moving vehicles or the

7. Designate A Job Site Safety Officer

A highly responsible person must perform intensive supervision of all activities on a job site to ensure worker safety. The Occupational Health and Safety Administration requires a designated person to identify hazards or dangers in working conditions and to eliminate them.



SAFETY IN BUILDING CONSTRUCTION

1. Wear your PPE at all times

When you enter the site, make sure you have the PPE you need. PPE is important, it's your last line of defence should you come into contact with a hazard on site. Hi-viz helps make sure you are seen. Safety boots give you grip and protect your feet. Hard hats are easily replaced, but your skull isn't.

2. Do not start work without an induction

Each site has its unique hazards and work operations. No two sites are exactly the same. Make sure you know what is happening so that you can work safely. Inductions are a legal requirement on every construction site you work on. Your induction is important. It tells you where to sign in, where to go, what to do, and what to avoid. Don't start work without one.

3. Keep a tidy site

Construction work is messy. Slips and trips might not seem like a major problem compared to other high-risk work happening on the site, but don't be fooled.

According to HSE statistics, slips and trips accounted for 30% of specified major injuries on construction sites (2016/17 – 2018/19).

4. Do not put yourself or others at risk

Actions speak louder than words. Especially on construction sites where one wrong move could put you in harm's way. Set a good example, think safe and act safely on site.

5. Follow safety signs and procedures

Follow [construction safety signs](#) and procedures. These should be explained to you in your induction (rule number 2). Your employer should ensure a risk assessment is carried out for your activities. Make sure you read and understand it.

Control measures are put in place for your safety. Make sure they are in place and working before you start.

6. Never work in unsafe areas

Make sure your work area is safe. Know what is happening around you. Be aware.

According to [HSE statistics](#), 14% of fatalities in construction were caused by something collapsing or overturning, and 11% by being struck by a moving vehicle (2014/15-2018/19).

7. Report defects and near misses

If you notice a problem, don't ignore it, report it to your supervisor immediately.

Fill out a near-miss report, an incident report, or simply tell your supervisor.

Whatever the procedure in place on your site for reporting issues, use it.

Action can only be taken quickly if the management has been made aware of the problem. The sooner problems are resolved the less chance for an accident to occur.

8. Never tamper with equipment

If something's not working, or doesn't look right, follow rule number 7 and report it. Don't try and force something, or alter something, if you're trained to or supposed to.

9. Use the right equipment

One tool does not fit all. Using the correct tool for the job will get it done quicker, and most importantly, safer. Visually check equipment is in good condition and safe to use before you start.

10. If in doubt, ask

Unsure what to do? Or how to do something safely? Or you think something is wrong? Stop work, and ask. It takes 5 minutes to check, but it might not be so easy

to put things right if things go wrong. It's better to be safe than sorry. Mistakes on construction sites can cost lives, don't let it be yours.



SAFETY IN HYDRO CONSTRUCTION

1. Designing safety into hydropower stations

When designing and implementing a new hydropower scheme, or when upgrading an existing station, we need to carefully consider the required standard of workplace health and safety, and the scope of work necessary to achieve that standard.

2. Planning ahead to control risks

A general approach taken to minimise workplace risks involves *planning ahead to prevent* workplace accidents, injuries and illnesses. We do this by ensuring that systems of work are safe and that equipment is properly maintained. Employees must receive health and safety information, training and appropriate supervision.

3. Safety upgrades for older hydropower stations

Typically, new hydropower stations are well designed and comply with appropriate safety standards and local building codes. Larger hydropower stations can have safety systems as complex and thorough as those in modern multi-floor commercial buildings. However, older plants were often designed with little regard to safety, and now need urgent attention to comply with modern workplace health and safety standards.

4. Station evacuation

Whatever the nature of the crisis, people must be able to get out of a hydropower station safely. All stations should have at least two independent ways to exit. If one route becomes inaccessible, an alternative emergency escape route should always be available. Adequate lighting is essential for emergency escapes.

5. Flood protection

Hydropower stations can and do flood. Failure of drainage pumps can lead to a slow increase in the water level and eventual flooding of the station. Alternatively, a plant failure and leakage that drainage pumps cannot manage can cause rapid flooding of the station. This makes water-level, flood and evacuation alarms an absolute necessity.

6. Fire and smoke control

We need to detect fires as early as possible, prevent them from spreading, alert all personnel, and provide safe and well-lit means of evacuation as soon as possible.

7. Emergency and crisis management

Safety at hydro stations involves more than simply having the correct equipment or hardware present at the site. It involves an ongoing commitment by the owner, management, operator and employees to provide and maintain a safe and healthy work environment



SAFETY MEASURES EQUIPMENTS

1.BASIC SAFETY EQUIPMENT

FOR CONSTRUCTION WORKERS

Construction companies should ensure a safety workplace for its employees, while its workers should follow strict safety regulations. Safety equipment, along with construction safety plan, protect workers from injury.

2.CHAINS AND HARNESS

PROVIDE SAFETY FROM FALLING. FAST FACT: “FALLS ARE THE LEADING CAUSE OF WORKER FATALITIES.”

3.SAFETY VEST

MADE OF BRIGHT, NEON COLORED FABRIC DESIGNED FOR HIGH VISIBILITY.

Safety vests are basically used for high visibility as these are usually reflective. However, depending on the use, variation of safety vests includes extra measure of protection from mesh, breakaway, and flame.

4.HARD HATS

TO PROTECT THE HEAD FROM INJURY DUE TO FALLING OBJECTS, IMPACT WITH OBJECTS, AND ELECTRIC SHOCK.

5.SAFETY GLOVES

PROTECT THE HANDS FROM WIRE PUNCTURES, CUTS & ABRASIONS.

6.SAFETY SHOES

PROTECT THE FEET FROM CUTS AND INJURY DUE TO FALLING OBJECTS.

7.SAFETY GLASSES & GOGGLES

PROTECT EYES FROM PARTICULATES, CORROSIVE CHEMICALS, WIND BLASTS & RADIATION.

8.SAFETY EARMUFFS

PROTECT EARS FROM HEARING LOSS DUE TO EXTREME NOISE FROM ENGINES, DRILLS, FORGING, ETC.

9.SAFETY MASKS

PROTECTION AGAINST RESPIRATORY HAZRDS LIKE GASES, FUMES, MISTS

CONCLUSION

One of the most important parts of safety on a construction site is clear and effective communication at all times. An easy way employers can communicate with workers in different areas on a job site is through safety signs and labels. Comply with OSHA and ANSI standards and reinforce safety anywhere on the work site with easy to install premade construction labels and signs. For on-demand custom, site-specific procedures and instructions, DuraLabel printers and supplies are a reliable safety communication solution. All supplies are built to last in the harsh conditions that exist in the construction industry.

Thoughtfully implementing each of these strategies will help to prevent downtime, chances of injury, and improve overall safety on a construction site. OSHA's Safety and Health Regulations for Construction: OSHA 29 CFR 1926 serves as a baseline for safety requirements. Safety management in construction must reinforce these regulations and go beyond by continuously leading by example and making safety a priority before work begins.

REFERENCE

- 1. Construction Safety Handbook: A Practical Guide to OSHA**
- 2. Construction Safety Engineering Principles (McGraw-Hill Construction Series)**
- 3. Principles of Construction Safety (By Allan St John Holt · 2008)**