

# Use of PPE on construction sites

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## ABSTRACT

As we know that construction industry is the most hazardous place, a construction site is any piece of land where a particular structure is to be developed, in this work on construction sites are required large tools, lifting machine and many heavier machines for work. Many times, we can see worker work at height, due to this there are many hazards takes place because of the nature of such work, working on construction sites can be dangerous.

Many reports published that construction was found to be the main industry for fatal injuries to workers, normally construction hazards are highly dependent upon the construction work that is being carried out. There are many risks which are takes place on construction sites they may be- slip and falls, working at height, noise, moving objects, electricity and so on. And to avoid such type of hazards at construction there are many organizations who works for this- how can mitigate such type of hazards? And what are the main cause behind this type of hazards? Overall the conclusion of this type of hazards is that less awareness, less knowledge and less education.

OSHA (Occupational Safety and Health Administration) was created within the department of labor, OSHA is responsible for worker safety and health protection. The main objective of OSHA to ensures a minimum standard of job safety and health that all employers must follow to protect employees. OSHA organize many program and training session in order to minimize the hazards.

The main cause of construction hazards is working with height, excavation, noise and so on. And the most fatalities are caused by the fatal four- falls, moving object, working at height, and being caught in between two objects. Does this type of hazards occur due to less awareness, less education, and less knowledge? Does this type of hazards take place because employees don't know meaning of PPE? Does this type of hazards occur because there is no prior safety training is given to employees? due to this the employees can not analyses the amount of risk.

Therefore, it can be evaluating that this type of hazards can be minimize by providing proper training as per safety standard, use of PPE (Personal Protective Equipment). Construction work has been increasing in developing countries over the past years, as construction play an important role in today modern age of technology, no field of engineering is conceivable without their use, construction industry plays a vital role in national economy as its output governs both the rate and quality. Thus, with an increasing this type of work occupational fatalities have increased. With in the field of job safety comes first.

**Keywords:** - Workplace safety, Construction Industry, PPE, Occupational injuries

## 1. INTRODUCTION

Building materials is to be consider the leading source of construction accident injuries in this category with structural metal materials. One of the leading hazards on the construction sites are fall from height, fall and slip, being stuck by falling objects. To prevent such type of hazards safety measures

must be followed in construction sites, before starting the construction work training should be provided as per industry standard. Every worker should be provided with a personal protective equipment so that risk can be minimized and should be aware each worker how can identify risk. Identify and assess anything that may be considered unsafe or hazardous which are present in the workplace to prevent further accidents.

As we know that every year thousand construction workers are injured working on construction sites, according to the Health and Safety Executive during 2016-2017 around more than 1300 of these injuries were due to slips or falls.

Therefore, it can be analyzed that these types of hazards take place because of –

1. Less awareness,
2. No knowledge of PPE,
3. No prior safety training,
4. Workers working on scaffold with no guardrails in place,
5. Scaffold not being erected correctly,
6. Access routes blocked with site materials,
7. No respiratory protection being worn during the cutting,
8. No fall protection on open stairwells.

Effective controls protect workers from construction hazards, help and avoid injuries, illnesses and incidents, mitigate safety and health risks, and provide a helpful working environment for workers, which is an integral part for every employee. To effectively control and prevent such types of hazards at workplace employers should identify and evaluate options for controlling hazards, develop a plan with measures to protect workers during emergencies.

Personal Protective Equipment includes protective eye wear- goggles with side shielded, helmet, boots, proximity suits, hair cover, PPE should be used by all supporting staff, workers.

The objective of this study was to evaluate the appropriate use of PPE, why PPE is an integral part at the workplace, how can we identify risk without using PPE.

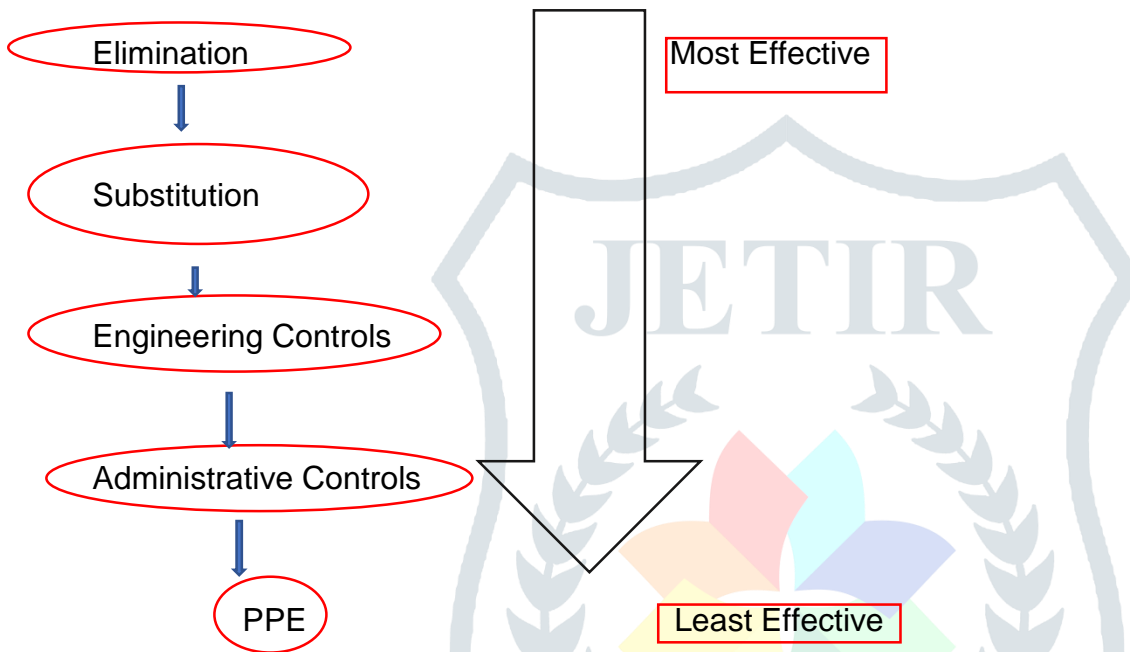
## 2. PROCEDURE

To minimize such types of hazard in workplace we should use PPE, and create awareness for risk, except this each and every worker should know its duty and responsibility so that work can be done effectively without any hazard and illness, PPE is an integral part for each worker. Before using PPE, every employee should know its value and identify the risk without PPE. And this type of awareness can be generated by organizing a safety training session.

Here is the process how can mitigate such types of hazard and illness in workplace-

**Table 1**  
**Activity vs Control**

S. N	Activity	Control
1	Elimination	Physically remove the hazard
2	Substitution	Replace the hazard
3	Engineering Controls	Isolate people from hazard
4	Administrative Controls	Change the way people work
5	PPE	Protect the worker with personal protective equipment



### 3. RESPONSIBILITY

Use of PPE to reduce employee exposure to hazards when there is engineering controls and administrative controls are not feasible. In order to work effectively employer and employee both having its own responsibility

#### 3(a)-Employer responsibility

- Training employees how to use and care PPE.
- Replacing the damaged PPE.
- Prepare a PPE list.
- Perform a hazard assessment at the work place so that employees easily identify the risk.

#### 3(b)-Employee Responsibility

- Attend the training session of PPE.
- Cleaning and maintain the PPE.
- Replace the worn and damaged PPE.
- Work in construction sites by using the PPE.

So far, the PPE standard does not specifically require education on Why PPE is important. Normally PPE having following types- Eye and face protection, respiratory protection, gloves, helmet, and so on.

## 4. PPE TRAINING

For an example once you are told to mix a relative amount of chemical (acid such as hydrofluoric acid) with water, which act as a cleaning agent to wash down the company transportation trucks, you check out chemical without using the PPE, and you don't feel that PPE is necessary, when you mixing both acid and water together without the using of PPE your hand going to wet, at that time you don't feel any pain, after some hour later you feel it hurting a lot, you think you should go to hospital as soon as possible, by the time you reach the hospital its too late and hydrofluoric acid showing its effect in your body and now Calcium ion in bone is replaced by Fluorine ions, and the doctor was unable to save your hand.

This incident showing that why PPE is so important in order to protect yourself from any damage and illness, prior to use of PPE at the workplace training should be given to all employees why PPE is so important and without this what type of damage and illness can be takes place, so that we can say that PPE is an integral part of all employees at the workplace, without using PPE their will be high risk and less safety.

You can not eliminate all physical hazards with the help of engineering controls and administrative controls PPE provide a last line of defense. Normally as per many reports and publication showing that many of illness related to eyes, hearing and foot injuries takes place because of not using personal protective equipment. Therefore, it can be saying that without PPE there is high risk at the construction sites we can mitigate such type of risk by using this.

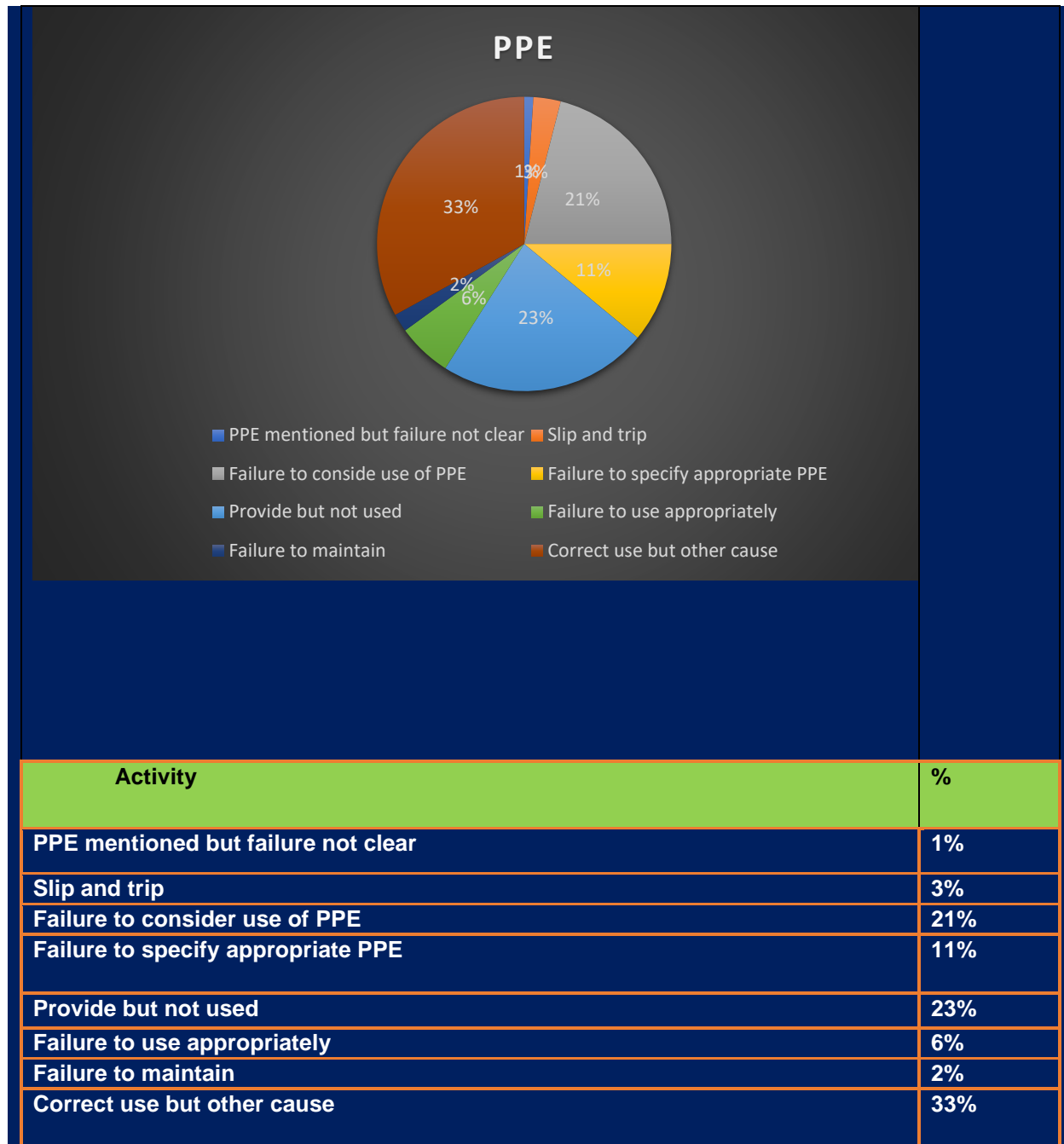
This type of PPE training includes-

1. Do a PPE hazard assessment of the workplace.
2. Reduce the severity of injuries by using PPE.
3. Introduce various type of PPE and how to use them.
4. Identify the risk without using PPE.

Some of the accidents cause at workplace due to the following reason we should identify these types of risk so that work can be done effectively.

PPE is helpful in order to safety controls, if hazards can not be eliminated then PPE act as a barrier between you and hazards more often this is an integral part of the construction industry.

As we know that human hearing is more sensitive to frequency between 3000-4000 Hz, noise is also a hazard which cause loss of hearing, so that your workplace should have a hearing conservation program if the noise level is equal and greater than the 85 dBA average an over 8 hours period.



The analysis determine that engineering controls and administrative controls cannot eliminate an exposure, the first step is that to select PPE in order to minimize the hazards, up to more than 23% accidents are cause due to provide but not used.

### 5. Construction hazards and PPE case study

According to the annual labor force survey there are many fetal injuries during a year, these type of injuries takes place because of many reasons such as no prior knowledge of equipment, how it to be use? No training program for the employees, overtime works, fatigue, less awareness for the PPE.

There are many causes for construction hazards such as lack of safety awareness, poor working condition, lack of PPE and others.

## Cause of hazards

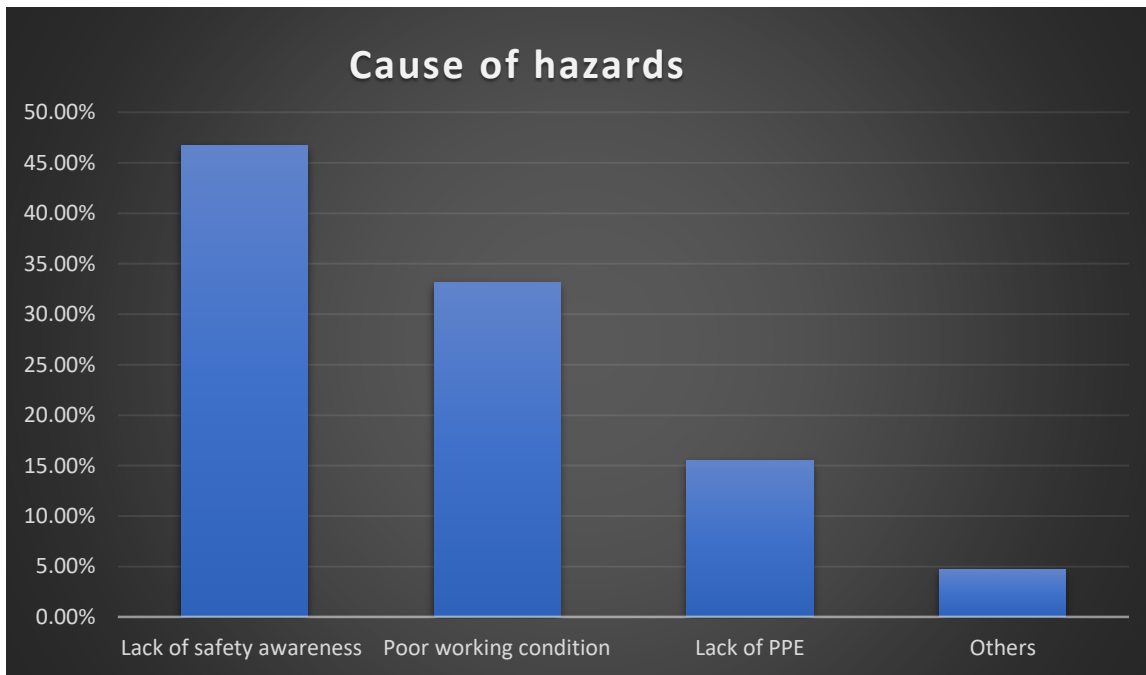


Fig 1

## 6. JOB SAFETY SHEET ANALYSIS

A job safety analysis is one of the risk assessment tools which is usually used for the identifying the workplace hazards and controlled them, the main objective of the job safety analysis is that to prevent job related injuries and some time it is called job hazard analysis.

Job safety analysis play an important role in order to minimize the construction hazards and it keep daily records. JSA is not only helpful to prevent injuries but apart from this it is also helpful for the define particular job descriptions and identifying the physical tasks.

Now a question arises how can we perform such type of task there is following steps in JSA-

1. Choose a job to analyze.
2. Break the job into tasks.
3. Identify hazards associated with each step.
4. Now discuss Job Safety Analysis with your employees

One think should be kept in mind each JSA must be site specific.

JSA having some component which are helpful to complete the task they are:-

(basic steps)- in this step stage of task consist such as start machine, load machine and so on,

(Hazards)- it is the next step which helpful to define the individual task hazards, it is important for safety,

(Procedure)- This provide step by step instruction so that work can be done effectively without any hazards and damage.

These are the important component of the JSA analysis.

In a Job Safety Analysis each basic step of the job defined a task and this task of the job is identify the potential hazards and recommend the safest way to manipulate certain job. Normally the term job and task create a link of relationship with each other. Some individual prefers to expend the analysis into all aspects of the job, not just safety, this approach is known as total job analysis. According to the U.S Department of Labor 4836 workers are killed on the job in 2015 it means that 13 deaths every day. A job Safety Analysis is a process that identify the risk within the tasks, and also provide many benefits they are-

**Job Safety Analysis benefits**

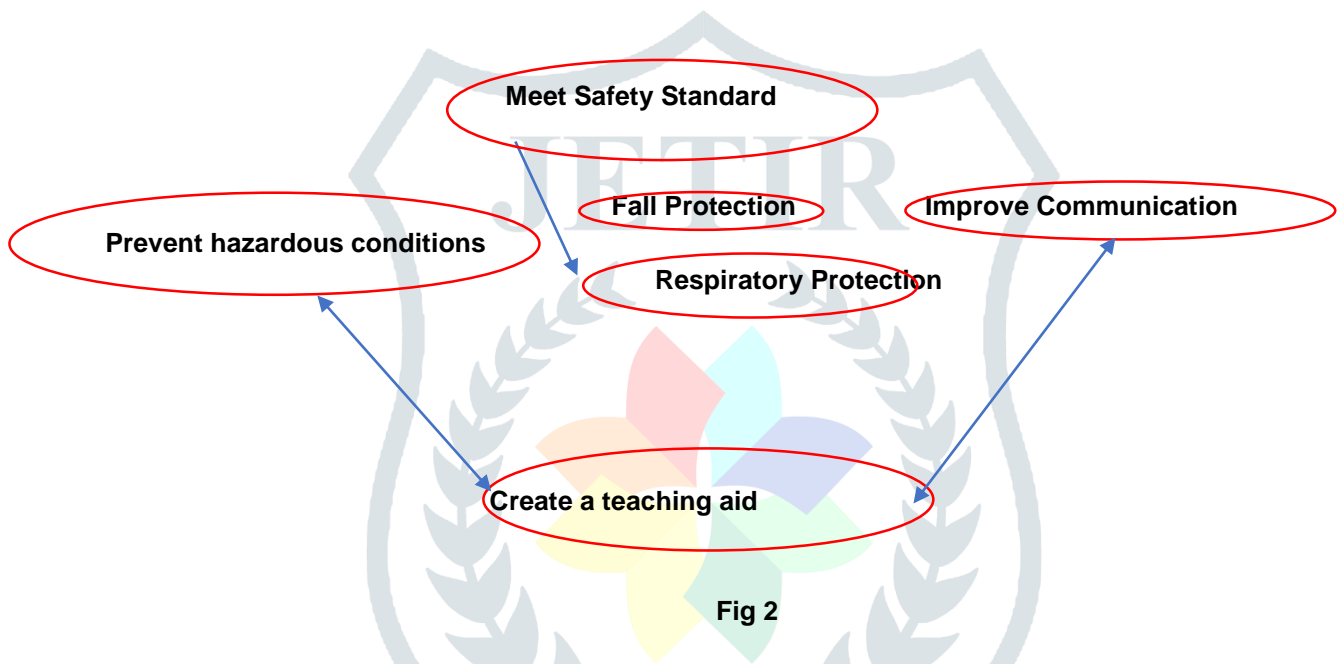


Fig 2

Table 2  
**Job Safety Analysis**

**JOB SAFETY ANALYSIS WORKSHEET**

Title of operation: -	SOP/SWP Number: -
Position/Title:	Building: -
Department: -	Section: -
Required Personal Protective Equipment for entire job	
<input type="checkbox"/> Safety Glass	<input type="checkbox"/> Safety Shoes
<input type="checkbox"/> Gloves	<input type="checkbox"/> Goggles
<input type="checkbox"/> Face shield	
<input type="checkbox"/> Helmet	<input type="checkbox"/> Proximity dress
<input type="checkbox"/> Safety Belt	<input type="checkbox"/> Others

Basic Steps	Potential Hazards	Procedure to be followed (Dos)	Safety Precaution (DON'Ts)
Prepared BY:  Approved by:			Date:

## 7. RESULTS

Personal Protective Equipment are helpful for employee's safety it includes all equipment even those used to protect against adverse weather conditions, the main objective of the PPE is that to protect workers from health and safety risks. As we know that safety is the major issue in the construction, each year accidents happen frequently in the industry and most of the time we seen these type of hazards takes place because of the absence of the personal protective equipment or failure to wear the provide PPE. The main motive of the PPE is to reduce employee exposure to hazards when engineering and administrative controls are not feasible. Therefore, we can say that without PPE construction sites are full of hazards with the help of PPE training we can identify the risk. Thus, PPE is an integral part both for the employee and industry.

## 8. CONCLUSION

The present study showed that PPE and Job Safety Analysis is necessity in the construction industry, with the help of this the amount of risk and hazards can be mitigating, these studies show that what type of risk generate without using the PPE.



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