



# STUDY OF SAFETY MANAGEMENT ON HIGH RISE BUILDINGS THROUGH WORKERS BEHAVIORS

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**Abstract:** Safety during a high-rise construction project is affected in large part by decisions made during the planning and design stage. Some designs or construction plans are inherently difficult and dangerous to put into practice, whereas other, similar plans may considerably reduce the possibility of dangerous accidents. Beyond these design decisions, safety also depends largely upon education, alertness and cooperation during the construction process. Workers should be always alert to the possibilities of accidents and avoid taken unnecessary risks.

**Index term–** Introduction, concept, requirement, problem statements, benefits, awareness program, preparation of report.

## OVERVIEW ON SAFETY MANAGEMENT

### Accidents

Overloading is one of the factors that will cause the cranes collapse in the high-rise building construction. During the operation, the amount of allowable handling load by the crane is always not proper control by the supervisor. Accident is an event of unpredictable and it may occur due to the following causes, lack of training, improper equipment and working platform, wrong safety attitude, inadequate housekeeping, failure to use personal protective equipment (PPE), and problem procurement method and subcontracting method. The lack of training can caused

accidents at construction site. Because of the lack of training in safety and technology knowledge, workers are haven't ability and sufficient knowledge to predicts the potential risk and the way to avoid the accidents. The use of unsafe working platforms also may put workers at risk when the equipment is not properly used, maintained or stored. Construction worker's safety attitude is influence by their understanding and realizing of risk, management, safety rules and the working procedures. The unsafe actions are include do not follow the standard safety procedures, constructing barbarously and

deciding to proceed work in an unsafe conditions.

### **Earthquake Resistance**

It can be said with a fair degree of certainty that the developers have become quite cautious these days. Most of them conscientiously follow the guidelines for the construction of earthquake-resistant buildings. Every high-rise building in India must mandatorily adhere to prescribed structural standards to ensure that they are safe and earthquake resistant. This means that the developers must conform to all earthquake-related measures.

### **Fire Hazard Safety**

However, it is undoubtedly possible to inquire about and study the essential fire safety and emergency evacuation facilities available in the project. Fire safety of a building does not only depend on the safety and evacuation measures undertaken by the developer and the project management agency retained to manage the building. The dynamics of the location and infrastructure also play a huge role. This can be a challenge in highly congested areas having chronic traffic issues.

### **SCOPE OF THE PROJECT**

In each type and stage (like substructure, superstructure) of construction, the hazards & risks vary to a great extent.

Following mentioned points can be considered as generic scope of construction safety:

- Safety management system
- Training, awareness, competence and behavior
- Hazard Communication
- Reporting of accidents & diseases

- Subcontractor safety management
- PPE & lifesaving equipment
- Scaffolds & Ladders
- Lifting appliances
- Earth moving & material handling equipment
- Plant & machinery
- Electrical safety including Power Transmission and Distribution
- Construction Activities
- Excavations, shafts, earthwork, underground work & tunnel
- Fires and emergencies
- Protecting the public

This above points shows the scope of the project discussing the safety measures during high rise building construction-related accidents.

### **PROBLEM STATEMENT -**

This chapter will give brief introduction of Investigation in safety measures of high rise building is a vast topic having an huge research going on several aspects of this topic. Various authors have different contribution in their own respective method or technique. It becomes intense need to learn and understand the view of various authors from various parts to give our own contribution on this topic.

### **OBJECTIVES OF PROJECT**

- To study the concept of safety management in construction of high-rise buildings.
- To study various hazards, accidents and its preventive measures.

- To analyze applicability of safety management in construction of high rise building through accidental case studies.
- To study the various safety and prevention measures used at construction site.
- To study safety management through workers behavior on site.

## METHODOLOGY

We will first study the journals related to safety management of high rise building and prepare our literature review which will help us to decide the objective of the project and also to set questionnaire. Then we will visit the project site and observe the safety management of the site, also collect data through interview of the head of safety management of the site. We will analyze the whole collected data i.e. from journal and visit and prepare the result and conclusion of project. We will also add our suggestions to improvise the safety management at site in current scenario.

## STUDY OF SAFETY RULES AND REGULATIONS

This part covers the requirements of the protection for the multistoried buildings (high rise buildings) and the buildings, which are of 15 m. and above in height and low occupancies of categories such as Assembly, Institutional., Educational (more than two storeyed and built-up area exceeds 1000 sq m)., Business (where plot area exceeds 500 sq m.), Mercantile (where aggregate covered area exceeds 750 sq m.), Hotel, Hospital, Nursing Homes, Underground Complexes, Industrial Storage, Meeting / Banquet Halls, Hazardous Occupancies in city.

## SAFETY TOOLS AND EQUIPMENTS

Personal Protective Equipment : Personal Protective Equipment protects users against potential health and safety risks at work. The equipment protects the wearer's body from injuries or infection. The hazards that PPE protects site workers from include electrical, chemical, physical, heat, biohazards and airborne particles.

1)SAFETY HELMET

2)SAFETY SHOES

3)EAR PLUGS

4)SAFETY GOGGLES

5)SAFETY BELT

6)SAFETY JACKETS

7)HEALTH AND SAFETY SIGNS

8)FIRST AID BOX

## CASE STUDY OF HIGH RISE BUILDING AT SOFIA DEVELOPERS, PUNE

Cases of construction site accidents always happen. In line with the efforts to reduce accidents at construction sites in Pune, the objectives of this study is to determine the current safety practices at construction sites, to identify the safety practices related problems, and to identify the strategies to reduce the safety practices related problems. Case study were conducted for data collection. Data were collected through semi-structured interviews with the safety officer of the respective project.

### Observation On Pune's Construction Site For PPE:

- No worker was allowed to enter the construction site unless he/she is wearing a suitable safety helmet.

- It seemed to be not in suitable sizes for every worker
- Helmet was not fitted to the worker's head by proper adjustment.
- Only it was compulsory to wear helmets, workers were using it but not in proper way, therefore, showing the lack of supervision of safety officer.
- Workers seemed to be careless while using helmets & also were not taking proper care of it, thus safety awareness and training seemed to be not conducted.
- Safety officials claimed that every worker is provided with helmets. Were wearing their daily normal clothing
- Procured quieter equipment.
- Safety officer claimed regular proper maintenance of equipment and tools is being carried out, which also helps to reduce the noise level.
- Workers were not using any sort of ear protection, while working.
- Every worker on site was not using proper type of footwear.
- Workers were not wearing any eye & face protection.

#### **Observations On Pune's Construction Site For Fire Safety:**

- Fire extinguishers were provided but not in sufficient numbers.
- Enough space was provided for entry of fire brigade, if any hazard happens.
- Training and awareness to tackle various fires were not conducted among workers.
- Plastic Waste materials and oily or greasy cleaning rags were not disposed immediately which can be harmful.

- Combustible materials, flammable liquids were stored properly.
- Electrical installations were inspected by skilled workers regularly over a fixed interval.
- Hot works were done in open spaces where accidents occurrence are likely to be least.
- Fire hydrants were not provided nearby.
- Provisions were made for automatic sprinklers and fire alarming systems.

#### **Observations On Pune's Construction Site For Working At Heights:**

- Scaffolding was provided.
- Scaffolding was erected by skilled workers according to site supervisor.
- Safety nets were provided so that it is raised when the work gets shifted to higher floors than the current one.
- According to site officials, safety nets were strong enough to support the loads of falling material or workers leading to less injury or accidents.
- Workers were not using safety belts or harnesses.

#### **Observations On Pune's Construction Site For Moving Objects:**

- Site officials claimed that only qualified, competent and trained workers were allowed to operate machinery.
- The machinery were properly parked away from slopes and excavations, on the leveled ground when are not in use
- Also site officials stated that maintenance of equipment has been kept in check.
- Workers were cautious while using it.
- Task was carried out under the supervisor control.

**CONCLUSIONS**

Safety is vital element of every industry. Safety measures at construction sites of high rise building helps to prevent unforeseen accidents. Accidents at construction sites may lead to loss of life and involve huge cost. Safety and precautions should therefore be an integral part of the operations of each construction site. This will enhance the success of the program as well as ensure project activities are completed as scheduled without delay. Each operation has its own peculiar hazards and a safety program should be developed to suit the particular hazards. Thus, following conclusions are drawn by our study, as stated below:

**1. This conclusion related to Site observation**

- i. It has been observed that workers are not much aware of safety and its measures, which is worrisome. Thus, training and awareness among workers is the main concern which can be achieved by timely meetings, safety drills and follow up of same during work progress. The use of safety equipment or control measures of accidents should be highly enforced on all workers on site.
- ii. At construction site, it has been observed that they were aware of flammable materials, their proper handling & storage.
- iii. Provision of lifts were made which is necessary with the view of safety.
- iv. Refugee area is provided i.e. it's a great benefactor with respect to safety management of high rise building.
- v. Good housekeeping provision also counts for reduction of many hazards at site.

- vi. Air conditioning ducts were not provided, so if fire outbreaks it will have harmful effects on occupants such as suffocation etc.
  - vii. It has been seen that electrical services was properly managed on site.
  - viii. To summarize, High-rise construction project execution is impossible without proper health and safety management.
2. Also we had estimated the safety cost for protection which turned out to be **7,55,440.00rs** which is nearly to 1.5% of total construction cost.
  3. Whenever workers require working at height more than 2m suitable fall protection measures must be taken to free fall of person also wearing safety belts the accident due to lack safety awareness and lack of safety education.
  4. Also Arranged TBT by safety officer on site for safety precautions.

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