

**GOVERNMENT POLYTECHNIC FOR GIRL'S
AHMEDABAD**

CIVIL ENGINEERING DEPARTMENT

“CONSTRUCTION PROJECT MANAGEMENT”

(3360603)

Safety Management

- Prepared by:R.M.Patel

Causes of accident

- There are as many possible causes of accident as there are occasions among these are : technical defects in equipment and methods of work, defects in organisation and dangerous acts by workers.
- To these have to be added those causes that come from the nature of construction constant changes in workplace and task and the friction often found when workers from different trades are working in close proximity to each other.

- In the following list, the causes of accident have been grouped according to their nature.

1. Planning, organisation

- a) Defects in technical planning
- b) Fixing unsuitable time limits

2. Execution of work

- a) Construction defects
- b) Use of unsuitable material

3. Equipment

- a) Lack of equipment
- b) Unsuitable equipment

4. Management and conduct of work

- a) Inadequate preparation of work
- b) Inadequate examination of equipment

Important of safety

The construction industry, employing the largest labour force in the country, has accounted for about 11% of all occupational injuries and 20% of all deaths resulting from occupational accidents. The cost of accidents is expensive. However, economic cost is not the only reason for which A contractor should be conscious of construction safety.

The Reasons for Considering Safety Include

1. **Humanitarian Concern:** When The Accident Happens, The Resulting Suffering Of The Injured Workers And Their Families Is Difficult To Quantify In Economic Terms. The Contractor Should Never Ignore This Even If He Has Insurance Against Accident.
2. **Economic Reasons:** Even If A Contractor Has Insurance, He Will Find Out That The Cost Of Accident Will Come Out Of His Own Pocket Through An Increase In Insurance Premiums. In Addition, There Are Other Indirect Costs That Result From Accident. The Direct And Indirect Cost Of Accident Can Be.
 1. **Direct Cost:**
 1. Medical Care Expenses For Injured.
 2. Workmen's Compensation Costs.
 3. Fees For Legal Counsel.
4. **Organisation Image:** A Good Safety Record Can Produce Higher Moral And Productivity And Stronger Employee Loyalty. It Will Also Improve The Company's Public Image And Therefore, Make It Easier To Acquire Negotiated Jobs.
5. **Laws And Regulations:** As Per Different Acts And Laws, The Employer Should Look After The Safety Of The Employee. Violation Of These Laws Will.

Safety Equipment's

- There are some safety which must be used the workers performing jobs on A project. The accident hazards to a great extent
- The various safety equipment used are:
 1. Helmet
 2. Gumboot
 3. Apron
 4. Safety Belts
 5. Gloves
 6. Safety Sandals
 7. Fire Extinguisher
 8. First Aid Box
 9. Portable Light Or Lantern
 10. Goggles



Safety measures for scaffolding

1. Scaffolding is required for all types of structures constructed above ground level and maintenance of such works. E.G. Bricks, stone, masonry ,plastering etc.
2. Every scaffold should be securely supported or depending upon the strutted or braced ensure stability.
3. The vertical standard be embedded into the ground sufficiently deep so that many loads coming on them.
4. On pukka floors and streets the may be placed in empty drums and packed stones and bricks etc.
5. Various stages of construction should be erected at convenient heights.
6. All scaffolds and working platforms should be securely fastened to building or structure.
7. While connecting ledgers to a standard and putlogs to ledgers, lashing should done securely. The rope used should be thick and stout.
8. The size of different members should be properly designed according to the supposed to carry.
9. Only small quantity of materials should be put on the scaffolding.
10. No body should be allowed to stand below the scaffolding as bricks stones may fall down from top.

Safety measures for ladders

1. All the ladders should be designed for the loads these are required to carry.
2. In bamboo ladders, the rungs may be fixed to the rails with spikes of proper design and strength.
3. Safety shoes shall be used to avoid danger of slipping.
4. Ladders used for heavy works should not be more than 6m long.
5. Before use, all ladders should be tested for the designed loads.
6. To prevent slipping, a ladder should be secured at the bottom end.
7. The ladder should not be supported against window panes, sashes etc.
8. Metal stairs should not be used around electrical equipment.
9. The splicing of ladder should be avoided.
10. A defective ladder with missing rung should never be used.

Safety measures during excavation

1. In all works, an experienced and competent foreman or supervisor should look after the excavation work.
2. Before doing the excavation complete knowledge of underground structure is essential and proper should be taken to prevent accident.
3. Safety helmets should be worn by all persons entering a trench.
4. Excavated material should be kept away from edge of the trench in order to prevent sliding of sides of trenches.
5. Heavy equipment, such as excavated machinery, trucks, dumpers, etc. Should be kept away excavated sides distance not less than depth of teach.
6. At places where public is likely to trespass, fences or barricates should be erected to avoid accident.
7. At night, excavated areas should be adequately lighted.
8. Pathways and gangways should be non slippery and should be sufficient width. Planks should be provided with cleats.
9. The workers should be spaced be spaced not wounded by tools fellow while doing excavation work.
10. Breathing should against the sides trench with planks held vertically. The shearing should be firmly embedded into the bottom of trench in loose soils.

Safety measures for demolition of Building

1. On every demolition work, danger signs should be provided all around the structure and doors giving access to the structure. Barricades should be erected around the structure and at least two exits must be provided for the escape of workman during any emergency.
2. During night time, red lights should be placed around the barricades and unauthorized persons restricted.
3. At the time of demolition work, workers should all safety appliances such as helmets, goggles, gloves etc.
4. In case any danger is anticipated to the adjoining structure during the process demolition, the same should be vacated avoid any danger to human life.
5. The process of demolition may weaken the walls an adjoining structure prevent possible damage, these walls should be supported in until permanent protection is provided.
6. The power on all electrical service lines must be shut off all such lines disconnected before the demolition work is started.
7. All gas, water, steam and other services lines must be shut before demolition work is started.
8. If a structure to be demolished has been partially wrecked fire, or other catastrophe, the walls and damaged roofs should be braced suitably.

Safety precautions for erection of steel structures

1. All equipment such as gas cutting and welding sets, drills, power hacksaws, grinders etc. Should be checked periodically to ensure their safe working.
2. Moving parts of all equipment should be provided with safety guards.
3. Rubber pipe lines for oxygen and acetylene gas should regularly checked for leakage or damage leakage of gas from regulators, pipe lines or connection with the gas torch should be rectified immediately.
4. Workers engaged in gas cutting and welding operation should wear suitable gloves and aprons and use welding screens.
5. Power cables for all equipment should be properly insulated and protected from damage and cuts.
6. Danger signs should be prominently displayed on all poles of overhead electric lines/ conductors used at site.
7. Cut pieces and scrap should be stored at an appropriate place to avoid accidents.
8. All lifting tools and tackles such as wire ropes, u- clamps, shackles, chain-pulley blocks, hook etc. Should be checked thoroughly before undertaking erection work.

Safety measures during piling and other deep foundation

1. All the works should be carried out under supervision of qualified and competent foreman/ supervision.
2. The site of work should be barricaded or watchman should be engaged at the site.
3. If work is to be carried out at night, minimum 100 lux illuminance lights should be used.
4. Safety recommendations should be brought to the knowledge of all the persons working at the site. Safety sign boards should be placed at the site.
5. Before starting the work, a complete knowledge of construction underground structures is essential.
6. Safety equipment like safety helmets, safety shoes, safety belt should be kept at the site and should be used and when required.
7. First aid box should be kept at site.
8. Pile drivers should not be kept near electricity line.
9. Pile driver should be kept on wooden platform on hard and strong ground or on concrete piles.
10. Open gear and fly wheels should be covered.

Safety measures for hot Bituminous works

1. On all major works, an experienced foreman or supervisor should be placed in charge of the work who guard the use defective/ unsafe appliance, equipment and tools and should stock fire extinguishing equipment and first aid kit etc.
2. Workers engaged on jobs involving handling of hot bitumen should use protective wares such as boots, gloves, goggles and helmets.
3. Bitumen plants should be provided with safe means of access. Working platforms should be provided with platform hand rails, and pulleys, belts and drive mechanisms should all be protected by suitable guards.
4. When bitumen plants are working on a public road, an adequate traffic control system must be established.
5. Only trained and experienced workers should be employed at site.
6. At the time of strong winds or cyclone work should be stopped avoid danger of fire.
7. First aid box should be kept at site.
8. Do not use open flame to check bitumen content in the boiler.
9. Do not open inspection openings when there is pressure in the boiler.
10. The vessels for heating kept away materials.

Safety measures for erection of concrete framed structures

1. The construction site should be barricaded by fencing or guide rails.
2. Loading and unloading materials should be carried out when intensity of traffic is low.
3. Supervision of work should be done by an experienced engineer.
4. Before placing concrete in forms slab, beam, column etc. The amount and spacing reinforcement must be checked.
5. In case of cantilever beam, reinforcement must be placed at the top of the member.
6. At site all the workmen should wear helmets, safety shoes etc.
7. No body should be allowed to go below slab when concreting is in position.
8. First aid box should be kept at site.

THANK YOU