

SAFETY INSTRUCTION WHILE WORKING AT HEIGHT

1. FOREWARD :

Working at heights has the potential to cause serious injuries due to fall for which safeguards like fencing, use of toe boards, safe access to working platforms, safety nets, safety belts etc are needed. Different types of protective measures need to be adopted suiting the particular task with proper planning and thorough understanding of protective measures and its limitations.

Three meters is the limiting height above which the work should be carried out with utmost care and Work Permit System has to be followed. Moreover the job should also be carried out under the strict supervision of an experienced person, well conversant with the work and the use of proper PPEs.

Following are some examples of working at height.

- Repair/replacement of cranes and alignment of their gantries.
- Repairs to exhaust fans /sky jet fans.
- Repairs/ replacement of electrical fittings.
- Cutting of trees and their branches fouling with overhead electrical lines.
- Cutting of wild growth of trees on the walls of buildings.
- Cleaning of high roofs.
- Painting of Walls, roof trusses and chimneys & etc.
- Plastering of roof, walls, stairs.
- Casting of R.C.C. roof, beam and columns.
- Demolition of old building and structures.
- Replacement/ repair of fragile roof.

Management shall ensure that :

- Appropriate PPE & safety gadgets /equipments required for work at heights is made available and used;
- Workers are trained in the use of safety equipments and are properly supervised;
- Inspection and proper maintenance of safety equipments are undertaken regularly.

2. NECESSARY DOCUMENTATIONS :

2.1. Height Pass (work permit to work at height)

2.2. Safety requirement precautions: Before starting a work at height, all the safety requirement (like use of safety belts/full body harness, life line protection, helmets and safety nets etc.) shall be decided as per the need of the area / site by the executing agency in consultation with safety officer and the contractor where applicable. The list of PPEs and other safety devices is as per Annexure C.

The work planning may be done in advance and necessary safety gadgets, life line etc. may be fixed at site.

2.3. Safety talk : Before commencement of work all workers shall be given a safety talk by giving details of work planned as in 3.2 above.

2.4. Shut Down of Process, moving equipments etc.: Before commencement, all moving equipments under the roof sheet where work is to be carried out shall be shut.

2.5. Warning sign : Sign boards in Hindi, English and local languages shall be placed at conspicuous places indicating that work is under progress.

3. REQUIREMENTS FOR WORKERS FOR WORKING AT HEIGHT :

3.1 Medical Examination of the worker: Every worker to be deployed for working height shall be examined for physical and mental fitness and to be certified by a registered medical practitioner at least once in six months. The fitness will include freedom from (a) epilepsy (b) High BP (c) Obesity (d) Vertigo etc along with general fitness and also a fairly good eyesight.

3.2. Post training certification (in case of contractor's labourer) : After successful completion of training and tests, the workers should be issued a height pass which shall be valid for a maximum period of one year. On expiry, it shall be renewed after the worker passes the tests once again. (Format II).

3.3. Workers should be conversant with the use of Fall arrester, Life line, Shock absorber retraceable fall arrestor, safety work ladder, duck ladder crawling board etc. The work of fixing safety net be carried out by experienced riggers and precaution be taken so that the net is fixed to a structural member sufficiently strong to bear at least one ton load and on sagging under the load of fall the net should not strike a machine structure, part of building or crane etc.

3.4. Each worker should keep one lifeline always intact and use preferably two lifelines to avoid any risk to life due to failure of one. Each life line should be strong enough to bear the shock load due to fall.

3.5. Use of hydraulic / power elevators if used should be known to supervisor & workers.

4. PPES AND SAFETY GADGETS :

4.1. Use of helmet, proper shoes and other PPEs like safety belts, lifelines with shock absorber, full body harness etc. is necessary to prevent a fall and to reduce severity of injuries consequent to it in case of an accident. PPEs and other safety equipment should be provided as per the recommendation of safety officer/ site engineer. Use of retractable fall arrester can eliminate almost all risks and dangers of fall down.

4.2. Examination of PPEs & gadgets e.g. Fall arrestor, Safety belts, Full Body Harness and Safe work ladders etc will be done in presence of Safety Officer at least once in six months.

4.3. Each ladder should have a nylon rope for tying on top and bottom with suitable self locking hooks, karabiner screws, rings etc.

4.4. If situation permits the use of fall arrester and shock absorber can be made taking lifeline from a firm structure/ structural member of suitable strength or by tying rope of web of adequate strength with it for this purpose.

4.5. A safety net of suitable strength below the working area should invariably be fixed to cover 2.5 meters all round the work area to arrest a fall. The fixing of such a net should be carried out by experienced riggers and precautions be taken to have minimum distance of fall and that the likely sag of safety net will not cause collision with any plant or machine or a part thereof cranes, structure etc.

5. EXECUTION OF WORK AT HEIGHT :

5.1. Safety net should be used wherever considered necessary and feasible by the executing officer and safety officer.

5.2. Before starting the day's work, the site should be inspected for ensuring compliance of all safety instruction, regulations and other aspects. After ensuring the compliance, the contractor (when engaged), the site engineer/ site in charge/ executing officer and the safety officer will sign the relevant documents before giving clearance for starting the work. In the event of discontinuation of work and before restarting, the site inspection shall be redone on the same lines.

5.3. Use of anchor plates to fix the lifeline etc should be done wherever necessary/ feasible.

5.4. In case the site condition demands, a safety net may be fixed firmly on the fragile roof with the help of J bolts and this may be used for taking a life line. In case there is any problem in getting a life line otherwise, this may also be used for walking for the purpose of repair to be carried out on a fragile roof with the safe work ladder and crawling, board depending upon site condition. Proper training for the above should be imparted to workers working on fragile roof and in any case fragile roof should not be relied upon for taking load unless proved otherwise. Safety belt should be avoided as far as possible and full body harness should be used to avoid problem during the rescue operation.

6. LADDER :

The use of ladders is so common that we are apt to take them for granted, however they are involved in many accidents in industry which could easily be prevented by observing four simple rules.

- Don't use ladders where the job calls for something bigger and safer.
- Use the right kind of ladder for the job.
- Use only a ladder in a good condition.
- Use ladders safely
- Don't use a ladder too long or too short for the job. For the scaffolding and ladders the following maximum lengths be permitted.

For a single ladder	:	30 ft.
For a step ladder	:	18 ft.
For a trestle ladder	:	16 ft.
For lengths of fixed ladders between	:	20 ft.

- Don't use two ladders spliced together (unless the resulting ladder is just as strong as a single or extension ladder would be).
- Don't use light ladders for a heavy construction job.
- Don't use metal ladders near electrical circuits or power lines to the excellent performance & if unavoidable their insulating rubber shoes should be checked before use.
- To set up a ladder safety, the base should be one fourth the ladder length from the vertical plane of the top support (1:4). Tie-off should be adequate to prevent any tipping of the ladder if the climber leans to the side.
- Don't use a ladder if the side rails are broken or cracked, or if a rung or tread is missing, broken, weakened or in any way defective.
- Ladders should never be painted because paint tends to hide cracks. They should be kept free of dirt, splashing of paint and moisture. If any preservative is needed it should be a clear varnish or some other transparent coating.

- The horizontal distance from the wall to the foot of the ladder should be about a quarter of the ladder's length.
- Don't place the ladder on an uneven footing or on loose objects. Where possible, fix it so that the top and bottom ends cannot move;
- Don't place the ladder in front of a door unless the door is fastened open or locked or guarded.
- Don't work above the second top rung on a straight ladder. Hold on with one hand and don't push, pull or over-reach. Don't straddle the space between the ladder and another object.
- When going up or coming down have both hands free and face the ladder.
- Ladders are built to hold only one person at a time. Remember this when using ladders.
- When leaning a ladder against a window frame fix a board to the top so that the weight is spread safety over the window frame.
- Ladders should be tied off or stabilized at the earliest opportunity in such a way that they cannot tip to the side or slide in any way.
- The three point control while climbing helps ensure that a worker's center of gravity is within the side rails and capacity exists for holding the ladder if a fall occurs. When ladders are provided with slip –resistance, it should be remembered that the end of the rung is probably the best place to hold a ladder, if the ladder rung is rough at these points, gloves are required, but the user may still prefer to hold the side rail which does not usually provide a graspable element.
- The portable ladder is preferred to be sloped at the appropriate angle for stability and this slope provides a measure of fall protection when a fall occurs.
- Fixed ladders and temporary ladders which have fixed. Ladder characteristics require a positive method of fall protection because free fall to the ground is a likely consequence. The use of ladders at any time when applied for working and not solely access to another level calls for serious consideration of appropriate fall protection. The higher the ladder used the more fall protection consideration must be given.
- Since metal ladders conduct electricity do not use them around energized electrical circuits equipment, or in places where they may come in contact with electrical circuits. The importance of these electrical hazards, cannot be overemphasized. Warn workers using metal ladders about these dangers. Plastic or glass-fiber ladders, as well as wood ladders, should be considered for use near electrical hazards. Many construction projects forbid metal ladders.

7. SPECIAL SAFETY PRECAUTIONS FOR REPAIR OF O.H. CRANES :

A safe system of work should be ensured before any maintenance repair or adjustment is required to carry out work on a crane, a permit to work system may be necessary to achieve safe system of work. To achieve the above following precautions should be ensured.

- Electrical power to crane should be disconnected before undertaking any repair etc.

- After repair it should be ensured that all tools, oil, grease etc have been removed from work place/site. And also guard has been replaced.
- Should be ensured that all limit switches are working to avoid overrun of the crane.
- Edges should be provided at wheels to avoid undesirable movement of crane.
- Parallelism of the gantry should be checked at specified periodicity.
- After every major repair crane should be subjected to load test.
- For climbing on cranes ladders should be provided with safety cage guard.
- During repair warning note should be provided both at the switching box of crane and work site.

8. SPECIAL PRECAUTIONS :

- During climbing on roof or on electric pole using ladder or otherwise precautions should be taken to use two self locking hooks with lifelines and as climbing these hooks should be alternatively attached and detached with the cross bars/ foot bars to prevent any eventual fall due to slippage etc leaving no room for a fall. After reaching the roof the top end of the ladder should be tied to the pole/ same fixed structure on top of the roof and work should be started thereafter.
- A safe way of climbing on a roof is to use a hydraulic / electric lift platform which is commercially available for climbing up to 7 meters height and to carry up to 250 kgs. Load. These platforms are provided with railings all round which may be used for fixing lifelines with detachable hooks with shock absorbers or else a retractable fall arrester.
- The workers working at height should be cautioned not to allow leaving of loose items like broken sheets over the roof after completion of work which can be flown off during heavy winds. While climbing they should take their tools in a tool box firmly fixed to the safety belt and should ensure that nothing is left loose on the roof at the close of work.
- In case of welding or drilling the use of approved quality of cable should be done to lay the electrical lines for connection.
- They broken sheets and new sheets should be taken up the roof or lowered from it in properly tied bunches with rope and not many sheets should be taken at a time. The hydraulic platforms and ladders should never be overloaded.
- A safety net be spread and fixed over the roof with j-bolts for safe movement of workers and transportation of materials.

DO's AND DONT's WHILE WORKING AT HEIGHT

Do's

1. While going to work at height for more than 3 meter, wear safety helmet & antiskid shoes.
2. Use crawling boards or roof ladders while working on the roof of the building.
3. Safety belt should be worn by the individual while working at a height more than 3 meter. Lifeline should be tightened to a fixed structure.
4. Safety net should be placed below the place of work at height.
5. Safety items like safety belt, safety net, safety helmet and lifeline should be inspected periodically by the staff or Site In charge.
6. Ladders should be tightened to a fixed structure and have antiskid shoes.
7. Responsible staff should be present continuously at the work spot.
8. Scaffolds should be of good construction, sound material and adequate strength.
9. Only trained and experienced workmen should be allowed to work at height.
10. Ladder should always be held by helper.

Don't's

1. Do not work without Work Permit and follow the safety instructions enumerated therein.
2. Do not leave the tools on the roof top and other places where they are liable to fall and cause injuries.
3. Do not use loose clothing while at work.
4. Do not smoke while working at height.
5. Do not forget to position First aid equipment in the work place.
6. Do not allow individuals having heart problems, giddiness Vertigo, epilepsy, high BP, to work at height.
7. Work on the roof of the building shall not be carried out in rainy season, windy condition and hot summer.
8. Do not allow anyone to work in the Shop floor area below the roof work so that accidents can be avoided due to hit by fallen material from height.
9. Do not bend/ stretch the body outside the ladder/ platform.
10. Do not place the ladder where they can be struck by doors, vehicles.
11. Ladder should not have slope more than 4 vertical and 1 horizontal.