
Standard Operating Procedures (SOPs) for ensuring Safety & other Working Conditions at Construction Site

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Introduction:

The purpose of these SOPs is to carry out the Building & Other Construction works in order to ensure the safety and other working conditions of the workers engaged in such works and others who may be affected by such works.

Scope:

These SOPs shall apply to Building & Other Construction works carried out in the State of Haryana.

Responsibility

It is the responsibility of Employers and Contractors and all associated in Building & Other Construction works to ensure that the guidelines included in this procedure and relevant legislation are adhered to.

Important Definitions

- 1) **“access” or “egress”** means passageways, corridors, stairs, platforms, ladders and any other means to be used by a building workers for normally entering or leaving the workplace or for escaping in case of danger;
- 2) **“base plate”** means a plate for distributing the load from a standard in the case of metal scaffolds;
- 3) **“bay”** in relation to scaffolds, means that portion of the scaffold between horizontal or vertical supports whether standards or supports from which the portion is suspended, which are adjacent longitudinally;
- 4) **“brace”** means a member incorporated diagonally in a scaffold for stability;
- 5) **“bulkhead”** means an airtight structure separating the working chamber from free air or from another chamber under a lower pressure than the working pressure ;
- 6) **“caisson”** means an air and watertight chamber in which it is possible for men to work under air pressure greater than atmospheric pressure at sea level to excavate material below water level;
- 7) **“cofferdam”** means a structure constructed entirely or in part below water level or below the level of the water Table in the ground and intended to provide a place for work that is free of water;

- 8) **“competent person”** means a person so approved by the State Government, who belongs to a testing establishment in State possessing adequate qualification, experience and skill for the purposes of testing, examination or annealing and certification of lifting appliances, lifting gears, wire ropes or pressure plant or equipment;
- 9) **“compressed air”** means air mechanically raised to a pressure higher than atmospheric pressure at sea level;
- 10) **“construction site”** means any site at which any of the processes or operations, related to building or other construction work, are carried on;
- 11) **“conveyor”** means a mechanical device used in building or other construction work for transport of building material, articles, or packages or solid bulk from one point to another point;
- 12) **“danger”** means danger of accident or of injury or to health;
- 13) **“decanting”** means the rapid decompression of person in a man-lock to atmospheric pressure at sea level followed promptly by their recompression in a decant lock, where they are then decompressed according to the appropriate decompression table in accordance with approved decompression procedures;
- 14) **“demolition work”** means the work incidental to or connected with the total or partial dismantling or razing of a building or a structure other than a building and includes the removing or dismantling of machines or other equipment;
- 15) **“excavation”** means the removal of earth, rock or other material in connection with construction or demolition work;
- 16) **“false works”** means the structural supports and bracing for formworks or forms;
- 17) **“flashpoint”** means the minimum liquid temperature at which a spark or flame causes an instantaneous flash in the vapour space above the liquid;
- 18) **“forms”** means the form appended to these rules;
- 19) **“frame or modular scaffold”** means a scaffold manufactured in such a way that the geometry of the scaffold is predetermined and the relative spacings of the principal members are fixed;
- 20) **“guardrail”** means a horizontal rail secured to uprights and erected along the exposed sides of scaffolds, floor openings, runways and gangways to prevent persons from falling;
- 21) **“hazard”** means danger or potential danger;
- 22) **“hazardous substance”** means any substance which due to its explosiveness, inflammability, radio-activity, toxic or corrosive properties, or other similar characteristics, may— (i) cause injury; or (ii) affect adversely the human system; or (iii) cause loss of life or

damage to property on work environment, while handling, transporting or storing and classified as such under the national standards or in case such national standards do not exist to the generally accepted international standards;

- 23) **“high pressure air”** means air used to supply power to pneumatic tools and devices
- 24) **“independent tied scaffold”** means a scaffold, the working platform of which is supported from the base by two or more rows of standards and which apart from the necessary ties stands completely free of the building;
- 25) **“ledger”** means a member spanning horizontally and typingscaffolding longitudinally and which acts as a support for putlogs or transoms;
- 26) **“lifting appliance”** means a crane, hoist, derrick, winch, gin pole, sheer legs, jack, pulley block or other equipment used for lifting materials, objects or, building worker;
- 27) **“lifting gear”** means ropes, chains hooks, sling and other accessories of a “ lifting appliance”
- 28) **“lock attendant”** means the person in charge of a man-lock or medical lock and who is immediately responsible for controlling the compression, recompression or decompression or persons in such locks ;
- 29) **“low pressure air”** means air supplied to pressurize working chamber and man-locks and medical locks;
- 30) **“magazine”** means a place in which explosives are stored or kept, whether above or below ground;
- 31) **“man-lock”** means any lock, other than a medical lock, used for the compression or decompression of persons entering or leaving a working chamber;
- 32) **“material hoist”** means a power or manually operated and suspended platform or bucket operating in guide rails and used for raising or lowering material exclusively and operated and controlled from a point outside the conveyance;
- 33) **“materials lock”** means a chamber through which materials and equipments pass from one air pressure environment into another;
- 34) **“national standards”** means standards as approved by Bureau of Indian Standards and in the absence of such standards of Bureau of Indian Standards, the standards approved by the State Government for a specific purpose;
- 35) **“outrigger”** means a structure projecting beyond the façade of a building with the inner end being anchored and includes a cantilever or other support:
- 36) **“plant or equipment”** includes any plant, equipment, gear, machinery, apparatus or appliance, or any part thereof;

- 37) **“pressure”** means air pressure in bars above atmospheric pressure;
- 38) **“pressure plant”** means the pressure vessel alongwith its piping and other fittings operated at a pressure greater than the atmospheric pressure;
- 39) **“putlog”** means a horizontal member on which the board, plank or decking of a working platform are laid;
- 40) **“responsible person”** means a person appointed by the employer to be responsible for the performance of specific duty or duties and who has sufficient knowledge and experience and the requisite authority for the proper performance of such duty or duties;
- 41) **“reveal tie”** means the assembly of a tie tube and a fittings used for tightening a tube between two opposite surfaces;
- 42) **“right angle coupler”** means a coupler, other than a swivel or putlog coupler, used for connecting tubes at right angles;
- 43) **“rock bolt”** means a mechanical expansion bolt or a bolt used with cementitious or resin anchoring system which is set in drilled hole in the arch or wall of a tunnel to improve rock competency;
- 44) **“roofing bracket”** means a bracket used in sloped roof construction and having sharp points or other means for fastening to prevent slipping;
- 45) **“safety screen”** means an air and water tight diaphragm placed across the upper part of a compressed air tunnel between the face and hulkhead, in order to prevent flooding the crown of tunnel between the safety screen and the bulkhead to provide a safe means of refuge and exit from a flooding or flooded tunnel;
- 46) **“safe working load”** in relation to an article of lifting gear or lifting appliance, means the load which is the maximum load that may be imposed on such article or appliance with safety in the normal working conditions as assessed and certified by a competent person.;
- 47) **“scaffold”** means any temporarily provided structure on or from which building workers perform work in connection with building or other construction work to which these rules apply, and any temporarily provided structure which enables building workers to obtain access to or which enables materials to be taken to any place at which such work is performed, and includes any working platform, gangway, run, ladder or stepladder (other than a ladder or step-ladder which does not form part of such structure) together with any guardrail, toe board or other safeguards and all fixing, but does not include lifting appliance or a lifting machine or a structure used merely to support such an appliance or such a machine or to support other plant or equipment;

- 48) **“segment”** includes a cast iron or precast concrete segmented structure formed to the curvature of the tunnel cross-section and used to support the ground surrounding the tunnel:
- 49) **“service shaft”** means a shaft for the passage of building workers or materials to or from a tunnel under construction;
- 50) **“shaft”** means an excavation having a longitudinal axis at an angle greater than forty five degree from the horizontal- (i) for the passage of building workers or materials to or from a tunnel; or (ii) leading to an existing tunnel; (
- 51) **“shield”** means a movable frame which supports the working face of a tunnel and the ground immediately behind it and includes equipment designed to excavate and support the excavated areas in a tunnel;
- 52) **“sole plate”** means a member used to distribute the load from the base plate or the standard of wooden scaffolds to the supporting surface;
- 53) **“sound or good construction”** means construction conforming to the relevant national standards or in case such national standards do not exist, to other generally accepted international engineering standards or code of practices;
- 54) **“sound or good material”** means materials of a quality conforming to the relevant national standards or in case such national standards do not exist, to other generally accepted international engineering standards or code of practices;
- 55) **“standard”** means a member used as a vertical support or column in the construction of scaffolds which transmits a load to the ground or to the solid construction;
- 56) **“steel rib”** includes all steel beams and other structural members shaped to conform to the requirements of a particular tunnel cross section, used for the purpose of supporting and stabilizing the excavated areas;
- 57) **“suspended scaffold”** means a scaffold suspended by means of ropes or chains and capable of being raised or lowered but does not include a boatswain’s chair or similar appliance;
- 58) **“testing establishment”** means an establishment with testing and examination facilities as approved by the State Government for carrying out testing, examination, annealing or similar other test or certification of lifting appliances or lifting gear or wire rope as required under these rules;
- 59) **“tie”** means an assembly used to connect a scaffold to a rigid anchorage;

- 60) **“toe board”** means a member fastened above a working platform access landing access way, wheel barrow run, ramp or other platform to prevent building workers and materials falling there from;
- 61) **“transom”** means a member placed horizontally and used to tie transversely one ledger to another or one standard to another in an independent tie scaffold;
- 62) **“trestle scaffold”** includes a scaffold in which the supports for the platform are any of the following which are self supporting, namely;- (i) split heads; (ii) folging; (iii) step-ladder (iv) tripods; or (v) movable contrivances similar to any of the foregoing;
- 63) **“tobular scaffold”** means a scaffold constructed from tubes and couplers;
- 64) **“tunnel”** means a subterranean passage made by excavating beneath the over-burden into which a building worker enters or is required to enter to work;
- 65) **“underground”** means any space within the confines or a shaft, tunnel, caisson or cofferdam;
- 66) **“vehicle”** means a vehicle propelled or driven by mechanical or electrical power and includes a trailer, traction engine, tractor, road-building machine and transport equipment;
- 67) **“working chamber”** means the part of construction site where work in a compressed air environment is carried out but does not include a manlock or medical lock;
- 68) **“working platform”** means a platform which is used to support building workers or materials and includes a working stage;
- 69) **“working pressure”** means pressure, in a working chamber, to which building worker is exposed;
- 70) **“workplace”** means all places where building workers are required to be present or to go for work and which are under the control of an employer;
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Standard Operating Procedures for safety aspects at different stages of Construction

(1)
**STANDARD OPERATING PROCEDURE
FOR
DEMOLITION WORK**

- 1. Preparation :-** The employer shall ensure at a construction site of a building or other construction work that all glass or similar material or article in exterior openings are removed before commencing any demolition work and all water, steam electric gas and other similar supply lines are put off and suitably gapped and the concerned department of the appropriate Government or local authority is informed and permission obtained wherever required before commencing such demolition work and wherever it is necessary to maintain water, gas or electric line or power during such demolition, such line shall be so located or protected with substantial coverings so as to protect it from damage and to afford safety to the building workers and the general public.
- 2. Protection of adjacent structure:-**The employer responsible for a demolition work at a construction site of a building or other construction work shall , during demolition process of such demolition work, examine the walls of all structures adjacent to the structure to be demolished to determine the thickness, method of support to such adjacent structures and in case, such employer has reason to believe that any of such adjacent structure is unsafe or may become unsafe during such demolition process, he shall not perform demolition activity affecting such unsafe adjacent structure unless and until remedial measures like sheet piling, shoring, bracing, or similar other means so as to ensure safety and stability to such unsafe adjacent structure from collapsing are taken.
- 3. Demolition of walls, partitions, etc:-** The employer shall ensure at a construction site of a building or other construction work that:-
 - (a) any demolition of walls or partitions is proceeded in a systematic manner as per the standard safe operating practices and all work above each tier of any floor beams is completed before the safety of the supports of such beam is impaired;
 - (b) masonry is neither loosened nor permitted to fall in such masses or volume or weight as to endanger the structural stability of any floor or structural support;

(c) no wall, chimney or other structure or part of a structure is left unguarded in such a condition that it may fall, collapse or weaken due to wind pressure or vibration;'

(d) in the case of demolition of exterior walls by hand, safe footing is provided for the building workers employed for such demolition, in the form of sound flooring or scaffolds; and

(e) walls or partitions which are to be demolished by hand are not left standing more than one storey high above the uppermost floor on which persons are working.

4. Methods of operation:-The employer shall ensure at a construction site of a building or other construction work that debris, bricks and other materials or articles are removed - (a) by means of chutes; (b) by means of buckets or hoists; (c) through openings in the floors; or (d) by any other safe means;

5. Access of floors:- The employer shall ensure at a construction site of a building or other construction work that safe access to and egress from every building is provided at all times in the course of demolition of such building by means of entrances, hallways, stairways or ladder runs which are so protected as to safeguard the building workers using such means from falling material or articles.

6. Demolition of structural steel :-The employer shall ensure at a construction site of a building or other construction work that:-

(a) all steel structures are demolished column by column and tier by tier and every structural member which is being demolished is not under any stress and such structural member is suitably lashed to prevent it from any uncontrolled swinging or dropping or falling;

(b) large structural members are not thrown or dropped from the buildings but are carefully lowered by adopting suitable safe method;

(c) where a lifting appliance like a derrick is used for demolition, the floor on which such lifting appliance rests is completely planked over or supported and such floor is of adequate strength to sustain bearing load for such lifting appliance and its operation.

7. Storage of material or article The employer shall ensure at a construction site of a building or other construction work that:-

(a) all materials or articles are not stored or kept on platform, floor or stairways of a building being demolished; Provided that this clause shall not apply to the floor of a building when such floor is of such strength as to support safely the load to be superimposed by storing such materials or articles;

(b) an access to any stairway or passage way is not affected or blocked by storing any material or article;

(c) suitable barricades are provided so as to prevent materials or articles from sliding or rebounding into any space used by the building workers.

8. Floor opening:-The employer shall ensure at a construction site of a building or other construction work that every opening used for the removal of debris from every floor which is not closed to access, except the top or working floor is provided with an enclosure from such floor to its ceiling or such opening is so barricaded that no building worker has access to within a horizontal distance of six meters from such opening through which debris is being dropped.

9. Inspection:- The employer shall ensure at a construction site of a building or other construction work that a person responsible for demolition work makes continuous inspections during demolition process of such demolition work so as to detect any hazard resulting from weakened or deteriorated floors or walls or loosened materials or articles during such demolition process and that no building worker is permitted to work where such hazard exist unless remedial measures like shoring or bracing are taken to prevent such hazards.

10. Warning signs, barricades, etc :- The employer shall ensure at a construction site of a building or other construction work that:-

(a) barricades and warning signs are erected along every side throughout the length and breadth of a building or other construction work to be demolished to prevent unauthorized persons from entering into the side of such building or other construction work during demolition operations;

(b) during the demolition of an exterior masonry wall or a roof from a point more than twelve meters above the adjoining ground level of such wall or roof. If persons below such wall or roof are exposed to falling objects, suitable and safe catch platforms shall be provided and maintained at a level not more than six meters below the working level except where an exterior built up scaffold is provided for safe and adequate protection of such persons;

(c) suitable and standard warning signs in accordance with national standards are displayed or erected at conspicuous places or position at the workplace.

11. Mechanical methods of demolition:- The employer shall ensure at a construction site of a building or other construction work that the following requirements are fulfilled in case the mechanical method of demolition like use of swinging weight, clamshell bucket, power shovel, bulldozer or other similar mechanical methods are used for the purpose of demolition; namely:-

- (a) that the building or structure or remaining portion thereof shall be not more than twenty- four meters in height;
- (b) that where a swinging weight is used for demolition, a zone of such demolition having a radius of at least one and a half times the height of the structure or portion thereof being so demolished shall be maintained around the points of impact of such swinging weight;
- (c) where a clamshell bucket is being used for demolition a zone of demolition shall be maintained within eight meters of the line of travel of such bucket;
- (d) that where other mechanical methods are being used to affect total or partial collapse of a building or other construction work, there shall be maintained, in the area into which the affected portion of such building or other construction work may fall a zone of demolition at least one and a half times the height of such affected portion thereof; and
- (e) no person other than building workers or other persons essential to the operation of demolition work shall be permitted to enter a zone of demolition referred to in clause (a) which shall be provided with substantial barricades.

(2)
STANDARD OPERATING PROCEDURE
FOR
EXCAVATION AND TUNNELLING WORKS

1. Notification of intention to carry out excavation and tunneling work :-

(1) Every employer carrying out any excavation or tunnelling work at a construction site of a building or other construction work shall prepare the detailed layout plans, method of construction and Schedule of such excavation or tunnelling work.

(2) In case compressed air is used in such excavation or tunnelling work or any work incidental to or required for such excavation or tunnelling work, the technical details and drawings of all man locks and medical locks together with names and addresses of all construction medical officers having qualification as prescribed and so appointed by such employer for the purpose of such excavation or tunnelling work .

2. Project Engineer :-

(1) Every employer undertaking any excavation or tunnelling work shall appoint a project engineer for safe operation of such projects of such excavation or tunnelling work for which such engineer is appointed.

(2) Such project engineer shall exercise overall control of operation and the activities at such project and be responsible for carrying out the activities safely.

3. Responsible person:-

(1) Every employer undertaking excavation or tunnelling work at a construction site of a building or other construction work shall appoint a responsible person for safe operation for such excavation or tunnelling work.

(2) Duties and responsibilities of the responsible person as prescribed, person shall include-

(a) to carry out smoothly such excavation or tunnelling work;

(b) to inspect and rectify any hazardous situation relating to such excavation or tunnelling work;

(c) to take remedial measures to avoid any unsafe practice or conditions relating to such excavation or tunnelling work;

4. **Warning signs and notices:-** The employer shall ensure at a construction site of a building or other construction work that -
- (a) suitable warning signs or notices, required for the safety of building workers carrying out the work of an excavation or tunnelling, shall be displayed or erected at conspicuous places in Hindi and in a language understood by the majority of such building workers at such excavation or tunnelling work;-
- (b) such warning signs and notices with regard to compressed air working shall include – (i) the danger involved in such compressed air work; (ii) fire and explosion hazards; (iii) the emergency procedures for rescue from such danger or hazards.
5. **Register of employment etc :-**
- (1) Every employer shall ensure that at a construction site of a building or other construction work where an excavation or tunnelling work is being carried on, a register of employment of building workers carrying out such excavation or tunnelling work, is maintained.
- (2) periods of work of such excavation or tunnelling work; in which such building worker are employed shall be maintained in a register on day to-day basis.
6. **Illumination :-**
- (1) Every employer shall ensure that at a construction site of a building or other construction work that all work places where excavation or tunnelling works are carried out shall be adequately illuminated in accordance with a relevant national standards.
- (2) Every employer carrying out excavation or tunnelling works at a construction site of building or other construction work shall provide for emergency generators on such construction site to ensure adequate illumination at all work places where such excavation or tunnelling work is being carried out, in case of power failure.
7. **Stability of structure:-**Every employer shall ensure that at a construction site of a building or other construction work that--
- (a) where there is any doubt as to the stability of any structure adjoining the work place or other areas to be excavated or where tunnelling work is to be carried out, the project engineer arranges for measures like underpinning, sheet piling, shoring, bracing or other similar means to support such structure and to prevent injury to any building worker working adjacent to such structure or damage to property or equipment adjacent to such structure;
- (b) where any building worker engaged in excavation is exposed to hazard of falling or sliding material or article from any bank or side of such excavation which is more than one and a

half metre above his footing, such workers is protected by adequate piling and bracing against such bank or side;

(c) the excavation and its vicinity are checked by a responsible person after every rain, storm or other occurrences carrying hazards and in case a hazard is noticed at such checking adequate protection against slides and cave into prevent such hazard is provided;

(d) temporary sheet piling installed for the construction of a retaining wall after excavation is not removed except on the advice of the responsible person after an inspection carried out by such responsible person;

(e) where banks of an excavation are undercut, adequate shoring is provided to support the material or article over hanging such bank;

(f) excavated material is not stored at least zero point six five meters from the edge of an open excavation or trench and the banks of such excavation or trench are stripped of loose rocks and other materials which may slide, roll or fall upon a building worker working below such bank;

(g) adequate and suitable warning signs are put up at conspicuous places at the excavation work to avoid any person falling in to the excavations or trenches;

(h) the responsible person as prescribed ensures at the excavation work that no building worker is permitted to work where such building worker may be struck or endangered by the excavation machinery or material or article used in such excavation;

8. Pilling, shoring and bracing :- Every employer shall ensure that at a construction site of a building or other construction work that –

(a) plank used for sheet piling in excavation or tunnelling work is of sound material with adequate strength;

(b) shores and braces used in excavation or tunnelling work are of adequate dimensions and are so placed as to be effective for their intended purposes;

(c) earth supported shores or braces used in, excavation or tunnelling work bear against a footing of sufficient area and stability to prevent the shifting of such shores or braces.

9. Safe access:- The employer shall ensure at a construction site of a building or other construction work that ladders, stair cases or ramps are provided, as the case may be, for safe access to and egress from excavation where the depth of such excavation exceeds one point five metres and such ladders, stair cases or ramps comply with the relevant national standards.

10. Trenches The employer shall ensure at a construction site of a building or other construction work that a trench or excavation is protected against falling of a person by suitable

measures if the depth of such trench or excavation exceeds one and a half metre and such protection is an improved protection in accordance with the design and drawing of a professional engineer, where such depth exceeds four metres.

11. **Depth of trenches:-** The employer shall ensure at a construction site of a building or other construction work that-
 - (a) where the depth of a trench requires two lengths of sheet piling, one above the other, the lower piling is set inside the bottom strings or wales of the upper piling and such sheet piling is driven down and braced as the excavation continues;
 - (b) all metal sheet piles used in excavation or a trench are welded end to end and secured by other similar means.
12. **Positioning and use of machinery** The employer shall ensure at a construction site of a building or other construction work that any machinery used in excavation and tunnelling work is positioned and operated in such a way that such machinery does not endanger the operator of such machinery or any other person in the vicinity.
13. **Breathing apparatus** The employer shall ensure at a construction site of a building or other construction work that-
 - (a) suitable breathing apparatus is provided to a building worker while working in compressed air environment for his use at excavation or tunnelling work; and
 - (b) such breathing apparatus is maintained in good working condition at all times.
14. **Safety measures for tunneling operation :-** The employer shall ensure at a construction site of a building or other construction work that.-
 - (a) where there is a danger of falling or sliding of material from the roof face or wall of a tunnel, adequate measures such as shoring, supporting by means of rock bolts, segments or steel sets are taken for the safety of building workers;
 - (b) the excavated areas are made safe by use of suitably designed and installed steel sets, rock bolts or similar other safe means;
 - (c) the responsible person as prescribed examines and inspects the workplaces in a tunnel before the commencement of work in such tunnel, and at regular intervals thereafter, to ensure safety of the building workers in such tunnel; and
 - (d) the portal areas of a tunnel with loose soil or rock, likely to cause injury to a person are adequately protected with supports.
15. **Pneumatic tools:-** The employer shall ensure at a construction site of a building or other construction work that supply lines to pneumatic tools used within a tunnel are fitted with water trap or safety chain or safety wire, as the case may be.

- 16. Shafts:-** The employer shall ensure at a construction site of a building or other construction work that-
- (a) surroundings of a shaft used in excavation or tunnel work are protected from being washed away by construction of sufficient height;
 - (b) where a building worker is required to enter a shaft at an excavation or tunnelling work, safe means of access is provided for such entry;
 - (c) every shaft at excavation or tunnelling work is provided with a steel casing, concrete piping, timber shoring or other materials of adequate strength for the safety of building workers working in such shaft;
 - (d) such casing and bracing are provided to a shaft at an excavation or tunnelling work up to the depth of such shaft at an excavation or tunnelling work according to the appropriate design for such casing and bracing; and
 - (e) a reinforced concrete raft and beam is provided around the opening of a shaft at an excavation or tunnelling work if the ground surrounding such opening is unstable or unsafe.
- 17. Lift for shafts:-** The employer shall ensure at a construction site of a building or other construction work that lift is provided for transport of building workers and materials or articles at an excavation or tunnelling work required to descend more than fifty metres in a shaft.
- 18. Means of communication:-** The employer shall ensure at a construction site of building or other construction work that-
- (a) reliable and effective means of communication such as telephone or walkie-talkie are provided and are maintained in working order for arranging better and effective communication at an excavation or tunnelling work at the following locations, namely,- (i) working chamber at the face of an excavation; (ii) intervals of hundred metres along the tunnel; (iii) working chamber side of a man lock near the door of such man lock; (iv) interior of each chamber of a man lock; (v) location conspicuous a lock attendant's station; (vi) a compressor plant; (vii) a first-aid station; and (viii) outside the portal or the top of a shaft;
 - (b) such number of bells and whistles are made available at all time at the locations referred to in sub-clause (i) to sub-clause (viii) of clause (a) as are necessary for the safety of person at such locations.
- 19. Signals:-** The employer shall ensure at a construction site of a building or other construction work that the standard audio or video signals are used in excavation or tunnelling work and are conspicuously located or displayed near entrance to the workplace and in such other

locations as may be necessary to bring such signals to notice of all building workers employed in such excavation or tunnelling work.

- 20. Clearance:-** The employer shall ensure at a construction site of a building or other construction work that-
- (a) the minimum lateral clearance of half a metre is maintained between any part of a vehicle and any fixture or any equipment used in an excavation or tunnelling work after allowing the throw or swing of such fixture or equipment.
 - (b) the overhead clearance for a locomotive drive at excavation or tunnelling work is not less than one point one zero meters above the seat of such driver and not less than two meters above the platform where such driver stands or of any other dimension in accordance with the relevant national standard.
- 21. Shelter:-** The employer shall ensure at a construction site of a building or other construction work that the adequate number of shelters for the safeguards of the building workers are provided where, in the course of working, they are liable to be struck by a moving vehicle or other material handling equipment in a tunnel.
- 22. Use of internal combustion engine:-**The employer shall ensure at a construction site of a building or other construction work that no internal combustion engine is used under ground in excavation or tunnelling work unless such engine is so constructed that-
- (a) the air entering the engine gets cleared before entry; and
 - (b) no fumes or sparks are emitted by the engine.
- 23. Inflammable oils:-**The employer shall ensure at a construction site of a building or other construction work that inflammable oils with the flash point below the working temperature that is likely to be encountered in a tunnel are not used in excavation or tunnelling work.
- 24. Coupling and hoses:-** The employer shall ensure at a construction site of a building or other construction work that only high pressure hydraulic hoses and couplings are used on hydraulic plants underground and such hoses and couplings are adequately protected against any possible damage in excavation or tunnelling work.
- 25. Hose installation:-** The employer shall ensure at a construction site of a building or other construction work that all hydraulic lines and plants working at a temperature exceeding seventy degree Celsius are protected by adequate insulation or otherwise against accidental human contact in excavation or tunnelling work.
- 26. Fire resistant hoses:-** The employer shall ensure at a construction site of a building or other construction work that no fire hydraulic hoses other than fire resistant hydraulic hoses are used when hydraulically activated machinery and equipment is employed in tunnels.

- 27. Flame proof equipment:-** The employer shall ensure at a construction site of a building or other construction work that only flame proof equipment of appropriate type as per relevant national standards is used where there is a danger of flammable or explosive atmosphere being prevalent inside the tunnel.
- 28. Storing of oil and fuel underground:-** The employer shall ensure at a construction site of a building or other construction work that- (a) all oils, greases or fuels stored ground under in excavation or tunnelling work are kept in tightly sealed containers and in fire resistant areas at safe distances away from explosive and other flammable chemicals; (b) appropriate flame proof installation is used in such storage areas as specified in clause(a).
- 29. Use of gases under ground:-** The employer shall ensure at a construction site of a building or other construction work that-
- (a) petrol or liquefied petroleum gas or any other flammable substances are not used, stored inside the tunnel except with the prior approval of the project engineer as prescribed;
 - (b) after the use of the petroleum or liquefied petroleum gas, or highly inflammable substances referred to in clause(a) all remaining petroleum or liquefied petroleum gas or highly inflammable substances are removed immediately from such tunnel; and
 - (c) no oxy acetelene is used in a compressed air environment in excavation or tunnelling work.
- 30. Water for fire fighting:-** The employer shall ensure at a construction site of a building or other construction work that-
- (a) adequate number of water outlets are provided on excavation or tunnelling work and are readily made accessible throughout the tunnel for fire fighting purposes and such water outlets are maintained for effective fire fighting;
 - (b) all air locks are equipped with fire fighting facilities at excavation or tunnelling work;
 - (c) an audible fire alarm is provided to warn the building workers whenever a fire breaks out on an excavation or tunnelling work;
 - (d) adequate number and types of fire extinguishers; in accordance with relevant national standards, are provided and made readily available to fight any outbreak of fire at an excavation or tunnelling work;
 - (e) fire extinguishers with vapourising liquids and high pressure carbon dioxide are not used in tunnels or other confined spaces;
 - (f) the instructions regarding steps to be followed to fight out break of fire, at an excavation or tunnelling work, written in Hindi or local language understood by the majority of the

building workers employed on such excavation or tunnelling work are displayed at conspicuous and vulnerable places of such excavation or tunnelling work.

- 31. Flooding:-** The employer shall ensure at a construction site of a building or other construction work that –
- (a) water tight bulkhead doors are installed at the entrance of a tunnel to prevent flooding during a tunnelling work where more than one tunnel is driven from a shaft.
 - (b) all necessary measures are taken to ensure that no building worker is trapped in any isolated section of a tunnel when any bulkhead door of such tunnel is closed.
 - (c) where there is likelihood of flooding or water rushing into a tunnel during a tunnelling work, arrangements are made for immediate starting of water pumps to take out water of such flooding or water rushing and for giving alert signals to the building workers and other persons to keep them away from danger.
- 32. Steel curtains:-** The employer shall ensure at a construction site of a building or other construction work that air tight steel curtains are provided in areas liable to flooding at tunnelling work and in case of descending tunnel to ensure the retention of pockets of air for rescue purpose.
- 33. Rest shelters:-** The employer shall ensure at a construction site of a building or other construction work that-
- (a) where building workers employed in a compressed air environment in a tunnelling work are required to remain at the work site for one hour or more after de-compression from pressure exceeding one bar, adequate and suitable facilities are provided for such building workers to rest;
 - (b) every man-lock medical -lock and any other facility inside these locks at an excavation a tunnelling work is maintained in a clean state and in good repairs;
 - (c) a first-aid room is provided and is readily available at a construction site of a tunnelling work;
 - (d) each man-lock attendant station is provided with a first-aid box at a construction site of a tunnelling work.
- 34. Permissible limits of exposure of chemicals:-** The employer shall ensure at a construction site of a building or other construction work that-
- (a) the working environment in a tunnel or a shaft in which building workers are employed does not contain any of the hazardous substances in concentrations beyond the permissible limits as prescribed;

(b) the responsible person as prescribed conducts necessary test before the commencement of a tunnelling work for the day and at suitable intervals to ensure that the permissible limits of exposure are not exceeded and a record of such test is maintained.

35. Ventilation The employer shall ensure at a construction site of a building or other construction work that all working areas in a free air tunnel are provided with ventilation system and the fresh air supplied in such tunnel is not less than six cubic, metre per minute for each building worker employed underground in such tunnel and the free air-flow movement inside such tunnel is not less than nine metres per minute.

36. Air supply intake point:-The employer shall ensure at a construction site of a building or other construction work that the air intake points for all air compressors are located at places where such intake air does not get contaminated with dust, fumes, vapor and exhaust gases or other contaminants.

37. Emergency generator:- The employer shall ensure at a construction site of a building or other construction work that-

(a) every compressed air system in a tunnel is provided with emergency power supply system for maintaining continued supply of compressed air in such compressed air system and is capable of operating air compressor and ancillary systems of such compressed air system ; and

(b) the emergency power supply system is maintained and is readily available at all times at an excavation or tunnelling work.

38. Air mains:- The employer shall ensure at a construction site of a building or other construction work that every air main supplying air to the working chamber, man lock or medical-lock used at an excavation or tunnelling work is protected against accidental damage and where it is not practicable to provide such protection, a stand-by air main is provided.

39. Bulk head and air locks:- The employer shall ensure at a construction site of a building or other construction work that-

(a) a bulk head or air tight diaphragms retaining compressed air, when used within a tunnel or a shaft, is constructed to withstand the maximum pressure at one point to five times the maximum working pressure of such bulk head or diaphragm is tested before its each use by a responsible person to ensure that such bulk head or diaphragm is in proper working order;

(b) such responsible person keeps the record of each test referred to in clause (a);

(c) the bulk head or diaphragm referred to in clause(a) are made of sound material of adequate strength and are able to withstand the maximum pressure on which they are subjected to at any time of their use;

(d) bulk-head anchorage and air lock is tested at its work place at an excavation or tunnelling work immediately after their installation at such place.

40. Diaphragms:- The employer shall ensure at a construction site of a building or other construction work that all diaphragms which are in the form of horizontal decks across a shaft used at excavation or tunnelling work are securely anchored.

41. Potable electrical hand tools:-The employer shall ensure at a construction site of building or other construction work that all portable electrical hand tools and inspection lamps used underground or in a confined space at an excavation or tunnelling work are operated at a voltage not exceeding twenty four volts.

42. Circuit breakers:- The employer shall ensure at a construction site of a building or other construction work that-

(a) adequate numbers of differential ground fault circuit breakers are installed for every electrical distribution system and its sub-systems used at an excavation or tunnelling work and the sensitivity of each of circuit breakers is adjusted in accordance with the requirement set out in accordance with the relevant national standards;

(b) no semi-enclosed fuse unit is used in underground place at an excavation or tunnelling work.

43. Transformer- The employers shall ensure at a construction site of a building or other construction work that no transformer is used in any section of a tunnel under compressed air unless such transformer is of the dry type and conforms to the relevant national standard.

44. Live wires:- The employers shall ensure at a construction site at a building or other construction work that there is no exposed live wire in working areas at an excavation or tunnelling work which are accessible to building workers other than those authorised to work on such live lines.

45. Welding sets:- The employer shall ensure at a construction site at of building or other construction work that all welding sets used in a tunnel are of adequate capacity and of suitable type.

46. Quality and quantity of air:- The employer shall ensure at a construction site of a building or other construction work that,-

- (a) every working chamber at an excavation or tunnelling work where compressed air is used, the supply of such air is maintained not less than zero point three cubic meters per minute per person working therein;
- (b) a reserve supply of compressed air is made available at all time for man-locks and medical locks used at a tunnelling work;
- (c) the air supplied in a compressed air environment at a tunnelling work is as far as practicable free from odour and other contaminants, namely, dust, fumes and other toxic substances.

47. Working temperature :-The employer shall ensure at a construction site of a building or other construction work that the temperature in any working chamber at an excavation or tunnelling work where building workers are employed does not exceed twenty nine degree celsius and that the arrangement is maintained for keeping records in which the temperatures, measured by dry bulb and wet bulb inside such working chamber once in every hour.

48. Man-lock and working in compressed air environment The employer shall ensure at a construction site of a building or other construction work that-

- a. man-locks used at a tunnelling work are of adequate strength, made of sound material and designed to withstand any air pressure, internal or external, to which it may be subject to in the normal use or in an emergency;
- b. (i) doors of man locks at an excavation or tunnelling work are made of steel; (ii) man-locks used at a tunnelling work are airtight and devices are provided for sealing the doors when such locks are under pressure; (iii) the anchorage of man-lock used at tunnelling work have adequate strength to withstand the pressure exerted by air on the man-locks; (iv) there is adequate room available for the building worker for working in the man-lock used at tunnelling work; (v) where work is carried out in any compressed air tunnel, a manlock in accordance with the relevant national standards is used for such tunnel.
 - i. where a man-lock is used at tunnelling work, safety instructions in Hindi and in local language understood by majority of building workers employed therein are displayed at conspicuous place at such tunnelling work;
 - ii. except in an emergency, compression and decompression operations are carried out in a man-lock used at tunnelling work;
 - iii. in an emergency any material lock may be used at tunnelling work for compression and decompression of building worker and a record is kept in writing;

- iv. material lock is used for compression and decompression of building workers, where it is impracticable to install both the man-lock and the material lock at a tunnelling work;
- v. de-compression of all building worker to atmospheric condition at tunnelling work is carried out in accordance with a decompression.
- vi. the man-lock at tunnelling work is not used for any purpose other than compression or de-compression of building workers;
- vii. no de-canting of building workers at tunnelling work is carried out except in an emergency;
- viii. in case a building worker collapses or is taken ill during his decompression in a man-lock used at tunnelling work, the lock attendant of such man-lock raises the pressure in such man lock until such pressure is equal to the maximum pressure which that building worker was exposed to in the working chamber prior to such de-compression and such lock attendant immediately reports the matter relating to such collapse to the medical lock attendant and medical officer on duty at such tunnelling work;
- ix. a building worker who had previously received training with a trained building worker to work in a compressed air environment at tunnelling work is employed to work independently in such a compressed air environment;
- x. a building worker who had undergone three de-compressions from a pressure exceeding one bar in a period of eight hours at tunnelling work is not allowed to enter a compressed air environment except for the purpose of carrying out rescue work;
- xi. a building worker employed in a compressed air environment for a period of eight hours in a day at tunnelling work is not employed again in such environment unless he has spent not less than twelve consecutive hours of rest at atmospheric pressure.;
- xii. no building worker is engaged in a compressed air environment at a pressure which exceeds three bars at tunnelling work;
- xiii. no building worker is employed in a compressed air environment for more than fourteen consecutive days in a month at tunnelling work;
- xiv. a register of employment of all building workers employed in compressed air environment at tunnelling work, is maintained;
- xv. an identification badge is supplied to a building worker employed in compressed air environment at tunnelling work;
- xvi. the badge of a building worker referred to in sub-clause- xv contains particulars of his name, location of the Medical lock allotted to him for work the telephone number of

the Construction Medical Officer concerned for his treatment and the instructions in case of his illness of unknown and doubtful causes;

- xvii. record of all identification badges supplied to building workers under sub-clause(xvi) is kept in a register;
 - xviii. every building worker whose name appears in the register referred to in sub-clause(xvii) wears the badge supplied to him under sub-clause(xv), at all time during his duty hours at tunnelling work;
 - xix. suitable warning signs are displayed, in the compressed air environment at tunnelling work, for the prohibition of following, namely:- (a) use of alcoholic drinks; (b) use and carrying of lighters, matches or other sources of ignition; (c) smoking; and (d) an entry to person who has consumed alcoholic drinks.
49. **Safety instruction**:-The employer shall ensure at a construction site of a building or other construction work that all building workers employed in compressed air environment at tunnelling work follow the instructions issued for their safety in the course of such employment.
50. **Medical lock**:-The employer shall ensure at a construction site of a building or other construction work that,-
- a. a suitably constructed medical lock is maintained at tunnelling work where building workers are employed in a working chamber at a pressure exceeding one bar;
 - b. where more than one hundred building workers are employed in a compressed air working environment exceeding one bar at tunnelling work, one medical lock is provided for every one hundred building workers or part thereof and such medical lock is situated as near as possible to the main lock used at such tunnelling work.

(3)
STANDARD OPERATING PROCEDURE
FOR
CONSTRUCTION, REPAIR AND MAINTENANCE OF STEEP ROOF

1. **Work on steep roof:-** The employer shall ensure at a construction site of a building or other construction work that all practicable measures are provided to protect the building workers against sliding when carrying out work on steep roofs.
2. **Construction and installation of roofing brackets:-** The employer shall ensure at a construction site of a building or other construction work that- (a) roofing brackets are constructed to fit the pitch of steep roof and such brackets are used to provide level working platform; (b) a roofing bracket referred to in clause (a) is secured in its place by nailing pointed metal projections attached to the underside of such bracket and securely driven in to a steep roof on which it is used or secured by a rope passed over the ridge pole and tie of such roof.
3. **Crawling boards:-**The employer shall ensure at a construction site of a building or other construction work – (a) all crawling boards used for work on steep roofs are of adequate strength, made of sound material and of the type approval for the purpose of their use as per relevant national standards; (b) crawling board referred to in clause (a) are kept in good repairs and inspected by a responsible person before being taken into use; (c) crawling board referred to in clause(a) is secured to a steel roof on which it is used by ridge hooks or other effective means; (d) a firmly fastened life line of adequate strength is strung beside each crawling board referred to in clause(a) throughout its length while using such crawling boards.

(4)
STANDARD OPERATING PROCEDURE
For
LADDERS AND STEP-LADDERS

1. **Construction and safe use** :-The employer shall ensure at a construction site of a building or other construction work that
 - a. every ladder or step-ladder used in building or other construction work is of good construction, made of sound material and of adequate strength for the purpose for which such ladder or step-ladder is used;
 - b. when a ladder is used as a means of communication, such ladder is lashed to a fixed structure so that while working on such ladder it does not slip;
 - c. a ladder or step-ladder does not stand on loose bricks or other loose packing and has a level and firm footing;
 - d. where it is required, in case of used of fixed ladders, sufficient foothold and hand-hold are provided for use by the building worker;
 - e. every ladder is- (i) secured so as to prevent undue swaying; (ii) equally and properly supported on each of its upright ; (iii) so used as not to cause undue sagging; and (iv) placed as nearly as possible at an inclination of four in one; (v) the use of all ladders and step-ladders conform to the relevant national standards for their use.
2. **Rungs**:- The employer shall ensure at a construction site of a building or other construction work that no ladder is used which has a missing or defective rung or a rung which depends for its support solely on nails, spikes or other similar fixing.
3. **Material for ladders**:- The employer shall ensure at a construction site of a building or other construction work that all wooden ladders used in building work- (a) are constructed upright of adequate strength and are made of straightgrained wood, free from defects and having the grain of such wood running lengthwise; (b) have rungs made of straight-grained wood free from defects and mortised or securely notched into the upright; and (c) have reinforcing metal ties, if the tenons of such ladders are not secured by wedge.

(5)
STANDARD OPERATING PROCEDURE
For
CATCH PLATFORM AND HOARDINGS, CHUTES, SAFETY
BELTS AND NETS

1. **Catch platform:-** The employer shall ensure at a construction site of building or other construction work that- (a) catch platform is not used for storage of material or as a working platform; (b) catch platform is at least two meters wide and is inclined so that the position of outer edge of such platform is fifteen hundred millimeters higher than the inner edge; (c) the open end of catch platform is properly fenced to the height not less than one meter.
2. **Hoarding:-** The employer shall ensure at a construction site of building or other construction work that hoardings are constructed
3. **Chutes, its construction and use :-** The employer shall ensure at a construction site of a building or other construction work that; (a) wooden or metal chutes which are at an angle of more than forty five degrees to the horizontal and used for the removal of materials are closed on all sides except at their openings used for receiving or discharging of materials or articles; (b) all openings of chutes except their top openings are closed when not in use; (c) every chute- (i) is constructed of sound material, adequate strength and is suitable for the purpose it is intended for use; (ii) exceeding twelve meters in height is constructed in accordance with the design and drawings of a professional engineer for such construction; (d) a suitable warning notice is displayed at conspicuous location, written in Hindi and in a local language, at the discharge end of every chute; 119 (e) every chute is cleared when debris has accumulated to a height which can pose danger to building worker but such clearance is done in no case less frequently than once a day.
4. **Safety belt and its use :-**The employer shall ensure at a construction site of building or other construction work that- (a) safety belt, life lines and devices for the attachment of such life lines conform to the relevant national standards; (b) every building worker is supplied with safety belt and safety life lines for his protection and such building worker uses such belts and life lines during the performance of his work; (c) all building workers using safety belts and safety life lines have the knowledge of safe use and maintenance of such belts and life lines and are supplied

with necessary instructions; (d) the responsible person for supervising the use of safety belts and safety life lines referred to in clause (b) inspects and ensure that such safety belts and life lines are fit for use before taken into use at every time.

5. **Safety net and its use:-** The employer shall ensure at a construction site of a building or other construction work that- (a) every safety net is of adequate strength, made of sound material and is suitable for use and conforms to the relevant national standards; (b) the responsible person for maintenance of safety nets and their use ensures safe fixing of such safety nets and provides such safety nets with suitable and sufficient anchorage so that the purposes for which such safety net is intended for use, is served.
6. **Storage of safety belts nets etc :-**The employer shall ensure at a construction site of a building or other construction work that proper arrangement is made for the safe storage of safety belts, safety life lines and safety nets when they are not in use and are protected against mechanical damage, damages from chemicals and damages from biological agents.

(6)
STANDARD OPERATING PROCEDURE
For
STRUCTURAL FRAME AND FORM WORK

- 1. General provision:-** The employer shall ensure at a construction site of a building or other construction work that- (a) the trained building worker under the direct supervision of a person, responsible for structural frame and form-work, are employed for erection of such structural frame or form work, dismantling of building and structure and performance of an engineering work form work, false work and shoring work; (b) adequate measures are taken to guard against hazards arising from any temporary state of weakness or unsuitability of a structure.
- 2. Form work, false work and shoring :-**The employer shall ensure at a construction site of a building or other construction work that- (a) form-work and false work are so designed, constructed and maintained that such form work and false work support the load that may be imposed on them; (b) Such form -work is so erected that working platform, means of access bracing, means of handling and stabilizing could easily be fixed with such form work.
- 3. Erection or dismantling steel and prefabricated structure:-** The employer shall ensure at a construction site of a building or other construction work that-
 - (a) the safety of building workers employed for the erection or dismantling of steel structures and prefabricated structures is ensured from danger by using appropriate means such as the following, namely-
 - i.** ladders, gangways or fixed platforms;
 - ii.** platforms buckets, boatswain's chair or other appropriate means suspended from lifting appliances;
 - iii.** safety harness, life lines, catch net or catch platform;
 - iv.** power-operated mobile working platforms;
 - (b) the work of erection or dismantling of buildings of structures or formwork or false work or shoring or any other civil engineering work is carried out by trained building workers under the supervision of a person responsible for such work;

(c) Steel or prefabricated structures are so designed and made that such structures can be safely transported or erected; and weight of each unit of such structures is clearly marked on such unit;

(d) the design of each such part maintains stability of each part of the structures referred to in clause (a), clause(b) and clause(c), when erected, and to prevent danger, the design shall explicitly take into account-

- i.** the relevant conditions and methods of attachment in the operations of stripping, transport, storing and temporary support during erection of such parts; and
- ii.** safeguards, such as provision of railings with working platforms and for mounting such railings and platforms easily on the structural steel or prefabricated parts;

(e) the hooks and other devices built in or provided on the structural steel or prefabricated parts that are required for lifting and transporting such parts are so shaped, dimensioned and positioned to withstand the stresses to which such hooks or other devices are subjected;

(f) prefabricated parts made of concrete are not stripped or erected before such concrete has set and hardened sufficiently to the extent provided for in the plans, and such parts are examined by the responsible person for any sign of damage before their use;

(g) Storeplaces are so constructed that- (i) there is no risk of structural steel or prefabricated parts falling or overturning; (ii) storage conditions generally ensure stability and avoid damage having regard to the method of storage and atmospheric conditions; and (iii) racks are set on firm ground and designed so that units cannot move accidentally in such store places;

(h) structural steel or prefabricated parts are not subjected to stresses prejudicial to their stability while they are stored or transported or raised or set down ;

(i) tongs, clamps and other appliances for lifting structural steel and prefabricated parts are- (a) in such shape and dimensions as to ensure a secure grip without damaging such parts; and (b) marked with the maximum permissible load in the most unfavorable lifting conditions;

- (j) Structural steel or prefabricated parts are lifted by such methods and appliances that prevent them from spinning accidentally;
- (k) structural steel or prefabricated parts are provided with railing and working platforms before raising such parts to prevent any danger of falling of building workers, materials or articles at the time of any work with such parts;
- (l) all reasonably practical measures are taken to avoid injury to building workers, building structure or equipment while structural steel or prefabricated parts are handled or stores at transported or raised or lowered;
- (m) structures are not worked on during violent storms or high winds or any other such hazardous situation;
- (n) the risk of falling to which building workers, moving on high or slopping girders, may be exposed is limited by all means of adequate collective protection or by the use of a safety harness which is well secured to a sufficiently strong support;
- (o) structural steel parts which are to be erected at a great height are, as far as practicable, assembled on the ground;
- (p) when structural steel or pre-fabricated parts are being erected, a sufficiently extended area underneath the workplace shall be barricade or guarded;
- (q) steel trusses which are being erected are adequately shored, braced or guyed until they are permanently secured in position;
- (r) Structural members are not forced in to place by the hoisting machine while any building worker is in such a position that he is likely to be injured by such operation.

4. Form Work The employer shall ensure at a construction site of a building or other construction work that-

- (a) all form work are properly designed keeping in view the safety of building workers, building or structures;
- (b) a responsible person for structural frame and form work-
 - i.** inspects and examines the material, timber structural steel and scaffolding for its strength and suitability before being taken into use;

(7)
STANDARD OPERATING PROCEDURE
for
STACKING AND UNSTACKING

- 1. Stacking and unshackling of material and articles:-** The employer shall ensure at a construction site of a building or other construction work that, (a) where stacking un-stacking, stowing or un-stowing of construction material or article, or handling in connection therewith cannot be safely carried out unaided, reasonable measures to guard against accident or dangerous occurrences are taken by shoring or otherwise to prevent any danger likely to be caused by such handling; (b) stacking of material or article is made on firm foundation not liable to settle and deviate such material or article and does not overload the floor on which such stacking is made; (c) the material or articles, are not stacked against partition or walls of a warehouse or store place unless it is known that such partition or the wall is of sufficient strength to withstand the pressure of such materials or articles; (d) the materials or articles are not stacked to such a height and in such a manner as would render the pile of such stack unstable and cause hazards to the building workers or the public in general; (e) where the building workers are working on stack exceeding one point five meters in height, safe means of access to the stack is provided.; (f) all stacking or un-stacking operations are performed under the supervision of a responsible person for such stacking or un-stacking; (g) the stacking of construction materials or articles is not made near the site of excavation shaft, pit or any other such opening; and (h) stacks which may lean heavily or become unstable or collapse are barricaded.
- 2. Stacking of cement and other material bags:-** The employer shall ensure at a construction site of a building or other construction work that,-

 - a.** a stack pile is not more than ten bags in height unless such stack pile is stacked in a suitable enclosure or otherwise adequately supported ;
 - b.** while removing bags from the stack pile, the stability of such stack pile is ensured;
 - c.** bags containing cement or lime are stored in dry places;
 - d.** the materials like bricks, tiles or blocks are stored on a firm ground;

- e.** reinforcing steel is stored according to its shape, size and length;
- f.** stack of reinforcing steel is kept as low as possible;
- g.** no pipe is stored on rack or in stack where such pipe is likely to fall by rolling;
- h.** the angle of repose is maintained where loose materials are stacked;
- i.** when dust laden material is to be stored or handled, measures are taken to suppress the dust produced by such storing or handling and suitable personal protective equipment are supplied to and used by the building workers working for such storing or handling.

(8)
STANDARD OPERATING PROCEDURE
For
SCAFFOLD

- 1. Scaffold Construction** :-The employer shall ensure at a construction site of a building other construction work that- (a) every scaffold and every component thereof is of adequate construction, made of sound material and free from defects and is safe for the purposes for which it is intended for use; (b) in case bamboo used for scaffolding, such bamboo is of suitable quality, good condition, free from protruding knots and stripped off to avoid any injury to building workers during handling such bamboo; (c) all metal scaffolds used in building or other construction work conform to the relevant national standards.
- 2. Supervision by a responsible person**:- The employer shall ensure at a construction site of a building or other construction work that no scaffold is erected, added, altered or dismantled except under the supervision of a responsible person for such erection, addition, alteration of dismantling.
- 3. Maintenance**:- The employer shall ensure at a construction site of a building or other construction work that-
 - (a) the scaffold used in building or other construction work is maintained in good repairs and the measures are taken against its accidental displacement or any other hazard;
 - (b) no scaffold or part thereof is partly dismantled and allowed to remain in such a condition unless:-
 - (i)** the stability or safety of the remaining portion of such scaffolding has been ensured by a responsible person for the safety of such scaffolds;
 - (ii)** in case the remaining part of such scaffold cannot be used by the building workers, necessary warning notice written in Hindi and in a language understood by the majority of the building workers that such scaffold is unfit for use, is displayed at the place where such scaffold is erected.
- 4. Standards, ledger, putlogs**:- The employer shall ensure at a construction site of a building or other construction work that.-

- (a) standard of a scaffold are- (i) plumb, where practicable; (ii) fixed sufficiently close together to secure the stability of such scaffold having regard to all the possible working situations and conditions for the intended use of such-scaffold; (iii) spaced, as close as practicable, to ensure safety and stability of such scaffold;
- (b) adequate measures are taken to prevent displacement of a standard of a scaffold either by providing sole plate or a base plate, as necessary;
- (c) ledgers of metal scaffold are placed at vertical intervals with due regard to safety and stability of such scaffold;
- (d) bamboo ledgers are kept as nearly as possible and are placed and fastened to the standards of a scaffold with due regard to the stability of such scaffold.

5. Working platform:- The employer shall ensure at a construction site of a building or other construction work that-

- (a) working platform is provided around the face or edge of a building adjoining at every upper most permanent floor of such building under construction and at any level where construction work of such building is carried out;
- (b) a platform is designed to suit the number of building workers to be employed on each bay of a scaffold work on such platform and the materials or articles and tools to be carried with them in such bay;
- (c) the safe working load and the number of building workers to be employed in each bay of a scaffold are displayed for the information of all the building workers employed at such construction site.

6. Board plank and decking:-The employer shall ensure at a construction site of a building or other construction work that-

- (a) board, plank and decking used in the construction of a working platform is of uniform size and strength and is capable of supporting the load and number of building workers in accordance with the relevant national standards keeping in view the safety of such building workers;
- (b) metal decking, which forms part of a working platform, is provided with non-skid surface;
- (c) no board or plank which forms the working platform is projected beyond its end support unless it is effectively prevented from tripping or lifting;
- (d) board, plank or decking is fastened and secured;
- (e) at any one time, not more than two working platforms per bay, are used to support building workers or materials or articles at such bay;

(f) adequate measures are taken to prevent injury which may be caused by falling material and objects by using safety nets or other suitable means;

(g) concrete, other debris or materials are not allowed to accumulate at any platform on a scaffold;

(h) Where a work is to be done at the end of a wall, working platform at such workplace is faced or, wherever practicable, at least zero point sixty meters beyond the end of such wall.

7. Repair of damaged scaffold:-The employer shall ensure at a construction site or a building or other construction work that-

(a) no building worker is permitted to work on a scaffold which has been damaged or weakened unless adequate safety measures have been taken to ensure the safety of such building worker;

(b) necessary warning signs are displayed at such places where repairs of scaffold are undertaken.

8. Opening:-The employer shall ensure at a construction site of a building or other construction work that-

(a) there is no opening in any working platform except for allowing access to such working platform;

(b) wherever opening on a platform is unavoidable, necessary measures for protection against falling of objects or building workers from such platform are taken by providing suitable safety nets, belts or any other similar means;

(c) access from one working platform to another platform on a scaffold, if required, is provided with suitable and safe ladder for the use of a building workers working on such platform.

9. Guardrails:- The employer shall ensure at a construction site of a building or other construction work that every side of a working platform from which a person liable to fall is provided with suitable and safe guardrails and toe-board of adequate strength to prevent fall of any building worker, material or tools from such platform.

10. Scaffold used by building workers of different employers:- The employer shall ensure at a construction site of a building or other construction work that,-

(a) where a scaffold or a part of a scaffold is used, which has previously been used by another employer for his building workers, such scaffold or part thereof is used only after its inspection and examination by a responsible person for its use that such scaffold or part is safe and fit for such use;

(b) if any rectification, alteration or modification in a scaffold or part thereof is needed to suit its use, such rectification, alteration or modification is made in consultation with the responsible person referred to in clause (a) before using such scaffold or part.

11. Protection against electric power line:- The employer shall ensure at a construction site of a building or other construction work that all necessary and practical measures for protection are taken to prevent any building worker, working on a scaffold, from coming into contact with the electric wires or dangerous equipment.

12. Screening net and wire net :-The employer shall ensure at a construction site of a building or other construction work that where a scaffold is erected in an area where the construction activities may pose hazards to pedestrians or vehicular traffic nearby from the falling of objects, wire nets or screening nets are used to envelope such scaffold.

13. Tower scaffold:- The employer shall ensure at a construction site of a building or other construction work that-

(a) the height of every tower scaffold used in building or other construction work is not more than eight times, the lesser of a base dimension of such scaffold;

(b) a tower scaffold is lashed to a building or a fixed structure before being used by the building workers;

(c) any tower scaffold which can be moved or castered is – (i) constructed with due regard to the stability and, if necessary ; (ii) used only on plain and even surface; and (iii) has casters provided with positive locking devices to hold such scaffold in position;

(d) no building worker remains on board scaffold, tools material when it is being shifted from one position to another position.

14. Gear for suspension of scaffold :- The employer shall ensure at a construction site of a building or other construction work that-

(a) chains, ropes or lifting gears used for suspension of a scaffold are of adequate strength, made of sound material and suitable for the purpose of their use and are maintained in good repairs;

(b) chains, wires, ropes or metal tubes used for the suspension of a scaffold are-

- (i) properly and securely fastened to every anchorage point and to the scaffold ledgers of other main supporting members used for the support of such scaffold; and
- (ii) so positioned as to ensure stability of the scaffold.

15. Trestle scaffold and cantilever:- The employer shall ensure at a construction site of a building or other construction work that-

- (a) no trestle scaffold is constructed with more than three tiers or if its working platform is more than four point five meters above the ground or floor or other surface upon which such scaffold is erected, such trestle scaffold is designed by professional engineer;
- (b) no trestle scaffold is erected on a suspended scaffold;
- (c) no cantilever of jib scaffold is used unless it is adequately supported, fixed and anchored on opposite side of its support has out-riggers of adequate length and where necessary sufficiently supported and braced to ensure safety and stability of such scaffold;
- (d) no working platform resting on bearers let into a wall at one end and without other support is used unless such bearers are of adequate strength, braced through the wall and securely fastened on the other side.

16. Scaffold supported by building :- The employer shall ensure at a construction site of a building or other construction work that-

- (a) no part of a building is used as support or part of a scaffold unless such part of the building is made of sufficient strength and made of sound material to afford safe support;
- (b) overhanging eaves gutters are not used for supporting scaffold ;
- (c) suspended scaffold is made of in accordance with the relevant national standards before being used by the building workers.

17. Use of winches and climbers for suspended scaffold:- The employer shall ensure at a construction site of a building or other construction work that-

- (a) no suspended scaffold is raised or lowered by winches or climbers unless such scaffold is made of sound material, adequate strength and has been tested and certified safe for use of winches or climber of such raising of lowering by a competent person before being taken into use;
- (b) all suspended scaffolds counter-balanced by counter weights are of types;

(c) the working platform of a suspended scaffold is securely fastened to the building or structure as to be safe and to prevent such platform from swing;

(d) the safe working load which a suspended scaffold can carry, is displayed where such scaffold is being used.

18. Safety devise for suspended scaffold :- The employer shall ensure at a construction site of a building or other construction work that every suspended scaffold, raised or lowered by the winches or climbers, is provided at each of its suspension point with a safety rope with automatic safety devices mounted on each of such rope so that such safety rope with such automatic safety device supports the platform of such scaffold in the event of failure of the primary suspension wire ropes, winches, climbers or any part of the mechanism used for raising or lowering such suspended scaffold;

Provided that this clause shall not apply-

(a) where the platform of such scaffold is supported at two independent suspension wire rope at or near each end of such platform so that in the vent of failure of one of such suspension wire rope, the other wire rope is capable of sustaining the weights of such platform and its load and prevent it from tilting ; or

(b) where a system is incorporated which operates automatically to support the platform of such scaffold and its load in the event of failure of the primary suspension wire rope of such scaffold.

(9)
STANDARD OPERATING PROCEDURE
For
COFFERDAMS AND CAISSONS

- 1. General provision:-** The employer shall ensure at a construction site of a building or other construction work that-
- (a) every cofferdam and caisson is-
 - i. of good construction, sound material and of adequate strength;
 - ii. provided with adequate means for building workers to reach safely at the top of such cofferdam or caisson, as the case may be, in the event of an in rush of water;
 - iii. provided with safe means of access to every place where building workers are employed in such cofferdam and caisson, as the case may be;
 - (b) the work relating to construction, positioning, modification or dismantling of cofferdam or caissons is carried out under the supervision of a responsible person;
 - (c) all cofferdams and caissons are inspected by a responsible person at regular intervals;
 - (d) a building worker is allowed to work in a cofferdam or caisson after such cofferdam or caisson is periodically inspected and found safe by responsible person and a record of such inspection is maintained in a register;
 - (e) the work is compressed air in a cofferdam or caisson is- (i) carried out in accordance with the procedure laid down in the relevant national standards; (ii) carried out by such building workers who have completed eighteen years of age and are medically examined as prescribed; and (iii) carried out under the supervision of a responsible person;
 - (f) if the work in cofferdam or caisson is carried out in shifts, a record of the time spent by each building worker in each such shift for carrying out the work is maintained in a register with particulars of time taken for the compression of such building worker, if any ;
 - (g) at every work site or project in a cofferdam or caisson, where building workers are employed to work in compressed air environment, a construction medical officer

assisted by a nurse or trained first-aid attendant, is available at all times at such site or project during such work;

(h) there is one stand by reserve compression to meet the emergency at each work place or project in a cofferdam or caisson.

2. Pressure Plant and equipment:- The employer shall ensure at a construction site of a building or other construction work that-

(a) The pressure plant and equipment-

(i) are examined and tested by the competent person before being put into use for such work;

(ii) is of proper design and construction, sound material and adequate strength to platform the work for which it is used;

(iii) is properly maintained in good repairs and working condition;

(b) the pressure plant and equipment referred to in clause(a) is fitted with-

(i) a suitable safety valve or other effective device to provide maximum safe discharge pressure from being exceeded at any time;

(ii) a suitable pressure gauge with a dial range not less than one point five times and not exceeding twice the maximum working pressure, easily visible and designed to show at all times, the internal pressure in kilogram per square centimeter and marked with the maximum safe working pressure at such plant and equipment;

(iii) a suitable stop valve or valves by which the pressure plant or the system of the pressure plant may be isolated from the source of supply of pressure or otherwise;

(c) every pressure plant or equipment shall be thoroughly examined by the competent person-

(i) externally, once in every period of six months;

ii) internally, once in every period of twelve months; and

(iii) by hydraulic test once in a period of four years.

(10)
STANDARD OPERATING PROCEDURE
for
SAFETY ORGANISATION

1. Safety Committee: (1) Every establishment wherein five hundred or more building workers are ordinarily employed, there shall be a safety committee constituted by the employer which shall be represented by equal number of representatives of employer and building workers employed in such establishment. In no case the number of representative of the employer shall exceed the representatives of building workers. The Committee shall be represented by representatives of the recognised unions wherever such unions exists.

(2) The main functions of the Safety Committee shall be-

- a. to identify probable causes of accident and unsafe practices in building or other construction work and to suggest remedial measures;
- b. to stimulate interest to employer and building workers in safety by organizing safety weeks, safety competition, talks and film shows on safety, preparing posters or taking similar other measures as and when required or as necessary;
- c. to go round the construction site with a view to check unsafe practices and detect unsafe conditions and to recommend remedial measures for their rectification including First Aid Medical and Welfare Facilities;
- d. to look into the health hazards associated with handling different types of explosives, chemicals and other construction material and to suggest remedial measures including use of proper personal protective equipment;
- e. to suggest measures for improving welfare amenities in the construction site and other miscellaneous aspects of safety, health and welfare in building or other construction work;
- f. to bring to the notice of the employer the hazards associated with use, handling and maintenance of the equipment used during the course of building and other construction work.

(3) The safety committee shall meet at regular intervals at least once in a month and it shall be chaired by the senior person having over all control over the affairs of the construction site.

(4) The agenda and minutes of the meeting shall be circulated to all concerned and it shall be in the language understood by majority of the building workers.

(5) The decisions and recommendation of the safety committee shall be complied with by the employer within reasonable time limits.

2. Safety Officer:-

(1) In every establishment wherein five hundred or more building workers are ordinarily employed, the employer shall also appoint safety officers as per the scale as prescribed. Such safety officers may be assisted by suitable and adequate staff.

(2) Duties, qualifications and the condition of service of safety officers appointed shall be as provided as prescribed.

(3) Wherever number of workers employed by single employer is less than five hundred, such employers may form a group and appoint a common, such safety officer for such group of employers.

3. Reporting of accidents:-

(1) Notice of any accident on the construction site which either-

(a) causes loss of life; or

(b) disables a building worker from working for a period of forty eight hours or more immediately following the accident, shall forthwith be sent by telegram, telephone, fax or similar other means including special messenger within four hours in case of fatal accidents and seventy two hours, in case of other accidents involving building workers, to concerned authorities.

(2) In case of an accident, the injured building worker shall be given first-aid and immediately thereafter be transferred to a hospital or other place for medical treatment.

(3) Where any accident causing disablement subsequently results in death of a building worker, notice in writing of such death shall be communicated to the authorities as prescribed within seventy two hours of such death.

(4) The following classes of dangerous occurrences shall be reported to the concerned authorities, whether or not any death or disablement is caused to a building worker, in the manner prescribed in sub-Clause(1), namely:-

a) collapse or failure of lifting appliances or hoist or conveyors or other similar equipment for handling building or construction material or breakage or failure of rope, chain or loose gears; over turning of cranes used in building or other construction work; falling of objects from height;

- b) collapse or subsidence of soil, any wall, floor, gallery, roof or any other part of any structure, platform staging, scaffolding or any means of access including form-work;
 - c) contact work, excavation, collapse of transmission;
 - d) explosion of receiver or vessel used for storage, at a pressure greater than atmospheric pressure, of any gas or gases or any liquid or solid use as building material;
 - e) fire and explosion causing damage to any place on construction site where building workers are employed;
 - f) spillage or leakage of hazardous substances and damage to their container;
 - g) collapse, capsizing, toppling or collision of transport equipment;
 - h) leakage or release of harmful toxic gases at the construction in site.
- (6) In case of failure of a lifting appliance, loose gear, hoist or building and other construction work machinery and transport equipment at a construction site of a building or other construction work, such appliances, gear, hoist, machinery or equipment and the site of such occurrence shall, as far as practicable, be kept undisturbed.
- (7) Every notice given as prescribed shall be followed by a written report to the concerned authorities under proper acknowledgement.

(11)
STANDARD OPERATING PROCEDURE
FOR
EXPLOSIVES

- 1. Handling of explosives** :- The employer shall ensure at a construction site of a building or other construction work that-
 - (a) all explosives are handled, used or stored in accordance with the instructions and the material data sheet supplied by the manufacturer of such explosives;
 - (b) the use of explosives is carried out in safe manner to avoid injury to any person and under the direct supervision of a responsible person;
 - (c) before using any explosive, necessary warning and danger signals are erected, at conspicuous places of such use to warn the building workers and the general public of the danger involved in such use.

- 2. Precautions**:-The employer shall ensure at a construction site of a building or other construction work that-
 - (a) the following precautions are to be observed at the places of transporting, handling, storage and use of such explosives, namely-
 - i. prohibition of smoking, naked lights and other sources of ignition in the vicinity where explosives are handled, stored and used;
 - ii. to keep safe distance and to use non-sparking tools while opening packages containing explosives.
 - iii. to stop the use of explosives and handling thereof while the weather conditions are not suitable for such use or handling.
 - (b) in addition to the provisions of this SOP, all measures and precautions required to be observed for use, handling, storing or transportation of explosives under the rule framed under the Explosives Act, 1884(4 of 1884), are observed.

(12)
STANDARD OPERATING PROCEDURE
for
PILING

- 1. General Provisions:-** The employer shall ensure at a construction site of a building or other construction work that-

 - (a) all pile driving equipment are of good design and sound construction, taking into account the ergonomic principles and are properly maintained.
 - (b) a pile driver is firmly supported on a heavy timber sill, concrete bed or other secured foundation;
 - (c) in case a pile driver is required to be erected in dangerous proximity to an electrical conductor all necessary precautions are taken to ensure safety.
 - (d) the houses of steam and air hammer are securely lashed to such hammer so as to prevent them from whipping in case of connection or break;
 - (e) adequate precautions is taken to prevent the pile driver from over turning;
 - (f) all necessary precaution is taken to prevent hammer from missing the pile;
 - (g) a responsible person for inspecting pile driving equipment, inspects such equipment before taking it into use and takes all appropriate measures as required for the safety of building workers before commencing piling work by such equipment.
- 2. Stability of adjacent structure:-** The employer shall ensure at a construction site of a building or other construction work that where there is any question of stability of a structure for its adjoining areas to be piled, such structure is supported, where necessary, by underpinning, sheet piling, shoring, bracing or by other means to ensure safety and stability of such structure and to prevent injury to any person.
- 3. Protection of operator:-** The employer shall ensure at a construction site of a building or other construction work that an operator of every pile driving equipment is protected from falling objects, steam, cinders or water by substantially covering or otherwise or by other means.
- 4. Instruction to and supervision of building workers working on a pile driving equipment:-** The employer shall ensure at a construction site of a building or other construction work that every building worker working on a pile driving equipment is

given instructions regarding safe work procedure to be followed in piling operation and is supervised by a responsible person throughout such work.

- 5. Entry of unauthorized person:-**The employer shall ensure at a construction site of a building or other construction work that all piling areas where pile driving equipment is used are effectively cordoned off to prevent entry of unauthorized persons.
- 6. Inspection and Maintenance of pile driving equipment:-** The employer shall ensure at a construction site of a building or other construction work that-
 - (a) pile -driving equipment is not taken into use until it has been inspected by a responsible person and found to be safe for such use;
 - (b) pile-driving equipment in use is inspected by a responsible person for such inspection at suitable intervals to ensure safety to the building worker working on such equipment;
 - (c) all pile lines and pulley blocks are inspected by a responsible person before the beginning of each shift of piling operations.
- 7. Operator pile driving equipment:-** The employer shall ensure at a construction site of a building or other construction work that-
 - (a) only experienced and trained building worker operates pile-driving so as to avoid any probable danger from such operation.
 - (b) pile-driving operations are governed by generally prevalent and accepted signals so as to prevent any probable danger from such operations;
 - (c) every building worker employed in pile driving operation or in the vicinity of such pile driving operation wears car protection and safety helmet or hard hat and safety shoes.
 - (d) piles are prepared at a distance , at-least equal to twice the length of the longest pile, from the place of pile driving operations.
 - (e) when a pile driver is not in use, the hammer of such pile driver is blocked at the bottom of the heads of such pile driver.
- 8. Working platform on piling frames:-** The employer shall ensure at a construction site of a building or other construction work that where a structural tower supports the lead of a pile driver, suitable working platforms of adequate strength are provided on levels of such leads at which it is necessary for the building workers to work and such platforms are provided with a safety railing and toe boards on each side or such platforms except on the hammer of such pile driver or lead sides of such

platform and where such platforms cannot be provided with such railing and toe boards, a safety belt is provided to each such building worker.

9. Pile testing:- The employer shall ensure at a construction site of a building or other construction work that-

(a) the testing of pile is conducted under the supervision of a responsible person for such testing;

(b) all practicable measures like displaying of warning notices, barricading, the area and other similar measures are taken to protect the area where the pile testing is carried out;

(c) entry to a pile testing area is prohibited to general public to ensure safety.

(13)
STANDARD OPERATING PROCEDURE
for
CONCRETE WORK

1. General provisions regarding use of concrete:- The employer shall ensure at a construction site of a building or other construction work that:-

(a) all construction with the use of concrete or reinforced concrete are based on plans as –

- (i) include specifications of steel and concrete and other material to be used in such construction;
- (ii) give technical details regarding methods for safe placing and handling of such materials as specified in sub-clause(i);
- (iii) indicate the type, quality and arrangement of each part of a structure of such construction; and
- (iv) explain the sequence of steps to be taken for completion of such construction.

(b) form work and shores used for concrete work are structurally safe and are properly braced or tied together so as to maintain position and shape of such form work or shares;

(c) form work structure used for concrete work has sufficient cat walks and other secure access for inspection of such structure if such structure is in two or more tiers.

2. Preparation and pouring of concrete and erection of concrete structure:-

The employer shall ensure at a construction site of a building or other construction work that:-

(a) a building worker handling cement or concrete –

- (i) wears close fitting clothing, gloves, helmet or hard hat, safety goggles, proper foot wear and respirator or mask to protect him from danger in such handling;
- (ii) keep as much of his body covered as is required to protect him from danger in such handling;
- (iii) takes all necessary precautions to keep cement and concrete away from his skin in such handling ;

- (b) lime pits are fenced or enclosed;
- (c) lime pits are filled and emptied by such devices which do not require workers to go into the pit;
- (d) moving parts of the elevators, hoists, screens, bunkers, chutes, grouting equipment used for concrete work and of other equipment used for storing, transport and other handling ingredients of concrete are securely fenced to avoid contact of building workers with such moving parts;
- (e) screw conveyors used for cement, lime and other dusty materials are completely enclosed.

3. Buckets:- The employer shall ensure at a construction site of a building or other construction work that –

- (a) concrete buckets used with cranes or aerial cableways are free from projections from which accumulations of concrete could fall;
- (b) movements of concrete buckets are governed by signals necessary to avoid any danger by such movements.

4. Pipes and pumps:- The employer shall ensure at a construction site of a building or other construction work that:-

- (a) a scaffolding carrying a pipe for pumped concrete is strong enough to support such pipe at time when such pipe is filled with concrete or water or any other liquid and to bear all the building workers who may be on such scaffold at such time, safely;
- (b) every pipe for carrying pumped concrete is –
 - (i) securely anchored at its end point and at each curve on it;
 - (ii) provided near the top of such pipe with an air release valve; and
 - (iii) securely attached to a pump nozzle by a bolted collar or other adequate means;
- (c) the operation of concrete pumps are governed by standard signals relevant in accordance with the relevant national standards;
- (d) building workers employed around a concrete pump wear safety goggles.

5. Mixing and pouring of concrete:- The employer shall ensure at a construction site of a building or other construction work that:-

- (a) the concrete mixture does not contain, any material which may unduly affect the setting of such concrete weaken such concrete or corrode steel used with such concrete;

(b) when dry ingredients of concrete are being mixed in confined spaces such as silos;

(i) the dust shall be exhausted at the time of such mixing; and

(ii) in case the dust cannot be exhausted, as specified in sub clause (i) the building workers shall wear respirators at the time of such mixing;

(c) when concrete is being tipped from buckets, building workers are kept out of the range of any kickbacks of such buckets;

(d) loads are not dumped or placed on settling concrete.

6. Concrete panels and slabs:- The employer shall ensure at a construction site of a building or other construction work that:-

(a) all parts of a concrete panel or concrete slab are hoisted uniformly;

(b) concrete panels are adequately braced in their final positions and such bracings shall remain in such position until such panels are adequately supported by other parts of the construction for which such panels are used;

(c) temporary bracing of concrete panels are securely fastened to prevent any part of such panels from falling when such panels are being moved.

7. Stressed and tensioned elements:- The employer shall ensure at a construction site of a building or other construction work that:-

(a) building workers do not stand directly over jacking equipment while stressing of concrete girders and beams is being done;

(b) a prestressed concrete unit is not handled except at points on such unit and by the devices specified for such work by the manufacturer of such devices;

(c) during transport prestressed concrete girders or concrete beams are kept upright by bracing or other effective means;

(d) anchor fittings for pretensioned strands of prestressed concrete girders or concrete beams are kept in a safe condition in accordance with the instructions of manufacturer of such anchor fittings;

(e) building workers do not stand behind jacks or in line with tensioning elements and jacking equipment during tensioning operations of prestressed concrete girders or concrete or concrete beams;

(f) Building workers do not cut wires of prestressed concrete beams under tension before such concrete used for such girders or beams is sufficiently hardened.

- 8. Vibrators:-** The employer shall ensure at a construction site of a building or other construction work that:-
- (a) a building worker, who is in good physical condition, operates vibrators used in concreting work;
 - (b) all practical measures are taken to reduce the amount of vibration transmitted to the operators working in concreting work;
 - (c) when electric vibrators are used in concreting work:-
 - (i) such vibrators shall be earthed;
 - (ii) the leads of such vibrators shall be heavily insulated; and
 - (iii) the current shall be switched off when such vibrators are not in use.
- 9. Inspection and supervision:-** The employer shall ensure at a construction site of a building or other construction work that:-
- (a) a person responsible for a concreting work supervises the erection of the formwork, shores, braces and other supports used for such concreting work;
 - (b) a person responsible for concreting work makes a thorough inspection of every formwork after erection of such formwork in such concreting work to ensure that such formwork is safe;
 - (c) a person responsible for a concreting work regularly inspects the formwork, shores, braces, reshores and other supports during the placing of concrete;
 - (d) any unsafe condition which is discovered during the inspections mentioned under clause (b) and (c) is remedied immediately;
 - (e) a person responsible for a concreting work keeps all record of inspections referred to in clause (a) and clause (b) at the workers place relating to such inspection.
- 10. Beams, floors and roofs:-** The employer shall ensure at a construction site of a building or other construction work that:-
- (a) horizontal and diagonal bracings are provided to both longitudinal and transverse directions as may be necessary to provide structural stability to formwork used in concreting work and shores used in such concreting work are properly seated top and bottom and are secured in their places;
 - (b) where shores used in concreting work rest upon the ground, base plates are provided for keeping such shores firm and in level;

(c) where the floor to ceiling height of a concreting work exceeds nine meters or where the formwork deck used in such concreting work is supported by shores constructed in two or more tiers, or where the dead live and impact loads on the formwork used in such concreting work exceed seven hundred kilogram per square meter., the structure of such formwork is designed by a professional engineer in the relevant field and the specifications and drawings of such form work are kept at such construction site;

(d) where the structure of the formwork used in concreting work is designed by a professional engineer, such engineer shall be responsible for the supervision of construction and stability of such structure.

11. Stiffing:- The employer shall ensure at a construction site of a building or other construction work that:-

(a) stripping of formwork used in concreting work commences until the concrete on such formwork is fully set, examined and certified to this effect by the responsible person and record of such examination and certification is maintained;

(b) stripped forms in concreting work are removed or stock piled promptly after stripping from all areas in which building workers are required to work or pass;

(c) protruding nails wire ties and other formwork accessories not required for subsequent concreting work are pulled, cut or otherwise made safe.

12. Reshoring:- The employer shall ensure at a construction site of a building or other construction work that:-

(a) reshoring used in concreting work is provided to a slab or beam for its safe support after its stripping or where such slab or beam is subjected to superimposed loads due to construction above such slab or beam;

(b) the provisions applicable to shoring in a concreting work under this chapter shall also be applicable to reshoring in such work.

(14)
STANDARD OPERATING PROCEDURE
for
LIFTING APPLIANCES AND GEAR

- 1. Construction and maintenance of lifting appliances:**-The employer shall ensure at a construction site of a building or other construction work that –
- a.** all lifting appliances, including their parts and working gear, whether fixed or moveable and any plant or gear used in anchoring or fixing of such appliances, are—
 - (i) of sound construction, sound material, and of adequate strength to serve the purpose for which these are to be used and all such appliances shall be free from patent defects; and
 - (ii) maintained in good repair and working condition.
 - b.** (i) every drum or pulley around which the rope of any lifting appliance is carried, is of adequate diameter and sound construction in relation to such rope;
 - (ii) any rope which terminates at the winding drum of a lifting appliance is securely attached to such drum and at least three dead turns of such rope remain on such drum in every operating position of such lifting appliance;
 - (iii) the flange of a drum projects twice the rope diameter beyond the last layer of such rope and if such projection is not available, other measures like anti-slackness guards shall be provided to prevent such rope from coming off such drum;
 - c.** Every lifting appliance is provided with adequate and efficient brakes which-
 - (i) are capable of preventing fall of a suspended load (including any test load) and of effectively controlling such load while it is being lowered;
 - (ii) act without shock;
 - (iii) have shoes that can be easily removed for running; and
 - (iv) are provided with simple and easily accessible means of adjustment:Provided that nothing contained in this clause shall apply to steamwinch which can be operated as safely as with brakes as provided in accordance with this clause.

d. Controls of every lifting appliance-

- (i) are so situated that the driver of such appliance at his stand or seat has ample room for operating and has an unrestricted view of building or other construction work, as far as practicable, and that he remains clear of the load and ropes, and that no load passes over him;
- (ii) are positioned with due regard to ergonomic considerations for proper operations of such appliance;
- (iii) are so located that the driver of such appliance remains above the height of the heel block during the whole operation of such appliance;
- (iv) have upon them or adjacent to them clear markings to indicate their purpose and mode of operations;
- (v) are provided, where necessary, with a suitable locking device to prevent accidental movement or displacement;
- (vi) move, as far as practicable, in the direction of the resultant load movement; and
- (vii) whenever automatic brakes are provided, automatically come to the neutral position in case of power failure.

2. Test and periodical examination of lifting appliances :-The employer shall

ensure at construction site of a building or other construction work that,-

- (a) all lifting appliances including all parts and gears thereof, whether fixed or moveable, are tested and examined by a competent person before being taken into use for the first time or after it has undergone any alterations or repairs liable to affect its strength or stability or after erection on a construction site and also once at least in every five years, in the manner as prescribed;
- (b) all lifting appliances are thoroughly examined by a competent person once at least in every twelve months and where the competent person making such examination forms the opinion that the lifting appliance cannot continue to function safely, he shall forthwith give notice in writing of his opinion to the owner of the lifting appliance.

3. Automatic safe lead indicators

(1) The employer shall ensure at a construction site of a building or other construction work that—

- i. every crane, if so constructed that the safe working load may be varied by raising or lowering of the jib or otherwise, is attached with an automatic indicator of safe working loads which gives a warning to the operator wherever the load exceeds the safe working load;
- ii. cut-out is provided which automatically arrests the movements of the lifting parts of every crane if the load exceeds the safe working load, wherever possible;

(2) The provisions of above clause (1) apply, except where it is not possible to install an automatic safe load indicator, in which case, provision of a table showing the safe working loads at the corresponding inclinations or radii of the jib on the crane shall be considered sufficient.

4. Installation

(1) The employer shall ensure at a construction site of a building or other construction work that—

(a) fixed lifting appliances are installed—

- i.** by competent persons;
- ii.** in a manner that such appliances cannot be displaced by the load, vibration or other influences;
- iii.** in a manner that the operator of such appliances is not exposed to danger from loads, ropes or drums; and ;
- iv.** in a manner that the operator can either see over the zone of operation or communicate with all loading and unloading points by signal, or other communication system;

(b) adequate clearance is provided between parts or loads of lifting appliances and—

- i. the fixed objects such as walls and posts; or
- ii. electrical conductors;

(c) the lifting appliances, when exposed to wind loading are given sufficient additional strength, stability and rigidity to withstand such loading safely;

(d) no structural alterations or repairs are made on any part of the lifting appliances that affect the safety of such appliances without obtaining the opinion of the competent person to this effect.

5. Winches:- The employer shall ensure at a construction site of a building or other construction work that.—

(a)

- i. winches are not used if control levers operate with excessive friction or play;
- ii. double gear winches are not used unless a positive means of locking the gear shift is provided;
- iii. there is no load other than the fall and the hook assembly on the winch while changing gears on a two gear winch ;
- iv. adequate protection is provided to winch operator against abnormal weather ;
- v. temporary seats or shelter for winch operators which may pose hazard to the winch operator or any other building workers are not allowed to be used;

(b) in use of every steam winch—

- i. measures are taken to prevent escaping steam from obscuring any part of the construction site or other work place or from otherwise hindering or injuring any building worker;
- ii. extension control levers which tend to fall of their own weight are counter balanced;
- iii. winch operators are not permitted to use the winch control extension levers except for short handles on wheel type controls and that such levers are of adequate strength, secure and fastened with metal connections at the fulcrum and at the permanent control lever;

(c) in use of every electric winch, a building or other construction worker is not permitted to transfer, alter or adjust electric control circuits in case of any defect in such winch.

(d) electric winches are not used for building work where—

- i. the electro- magnetic brake is unable to hold the load; or
- ii. one or more control points, either hoisting or lowering, are not operating properly.

6. **Buckets:-** The employer shall ensure at a construction site of a building or other construction work that tip-up buckets are equipped with a device that effectively prevents accidental-tipping.
7. **Identification and marking of safe working load:-** The employer shall ensure at a construction site of a building or other construction work that-- (a) every lifting appliance and loose gear is clearly marked for its safe working load and identification by stamping or other suitable means; (b) (i) every derrick (other than derrick crane) is clearly marked for its safe working load when such derrick is used either in single purchase with a lower block or in union purchases in all possible block positions; (ii) the lowest angle to the horizontal, to which the derrick may be used, is legibly marked; (c) every lifting appliance having more than one working load is fitted with effective means to enable the operator to determine safe working load at each point under all condition of use; 65 (d) means to ascertain the safe working load for lifting gears under such conditions in which such gears may be used are provided to enable a worker using such gears and such means shall consist of— (i) marking the safe working load in plain figures or letters upon the sling or upon a table or ring of durable material attached securely thereto in case of chain slings; and (ii) either the means specified in sub-clause (i) or notices so exhibited as can be easily read by any concerned building worker stating the safe working load for the various sizes of the wire rope slings used in case of wire rope slings.
8. **Loading of lifting appliance and lifting gears:-** The employer shall ensure at a construction site of a building or other construction work that—
 - (a) no lifting appliance, lifting gear or wire rope is used in an unsafe way and in such a manner as to involve risk to life of building workers, and that they are not loaded beyond their safe working load except for testing purposes under the direction of a competent person in the prescribed.
 - (b) no lifting appliance, lifting gear or any other material handling appliance is used, if they are not safe for use & properly tested.
9. **Operator's cab or cabin:-** The employer shall ensure at a construction site of a building or other construction work that the operator of every lifting machine in outdoor service is provided with a cab or cabin which—
 - i. is made of fire resistant material;

- ii. has a suitable seat, a foot rest and protection from vibration; (
- iii. affords the operator an adequate view of the area of operation.
- iv. affords the necessary access to working parts in cab;
- v. affords the operator adequate protection against the weather;
- vi. is adequately ventilated; and
- vii. is provided with a suitable fire extinguisher.

10. Operation of lifting appliance:- The employer shall ensure at a construction site of a building or other construction work that—

- (a) every crane driver or lifting operator possess adequate skill and training in the operation of the particular lifting appliance;
- (b) no person under eighteen years of age is in control of any lifting appliance, scaffold winch, or to give signals to the operator;
- (c) precaution is taken by the trained operator to prevent lifting appliance from being set in motion;
- (d) the operation of lifting appliance is governed by signals, in conformity with the relevant national standards;
- (e) the lifting appliance operator's attention is not distracted while he is working;
- (f) no crane, hoist, winch or other lifting appliance or any part of such crane, hoist, winch or other lifting appliance is, except for testing purposes, loaded beyond the safe working load;
- (g) during the hoisting operations effective precaution is taken to prevent any person from standing or passing under the load in such operations;
- (h) operator does not leave lifting appliance unattended while power is on or load is suspended to such appliance;
- (i) no person rides on a suspended load or on any lifting appliance;
- (j) every part of a load in course of being hoisted or lowered is adequately suspended and supported to prevent danger;
- (k) every receptacle used for hoisting bricks, tiles, slates or other material is suitably enclosed as to prevent the fall of any such materials;
- (l) the hoisting platform is enclosed when loose materials or loaded wheel-barrows are placed directly on such platform or lowering, such materials or wheel-barrows;

- (m) no material is raised, lowered or slowed with any lifting appliance in such a way as to cause sudden jerks to such appliance;
- (n) in hoisting a barrow , any wheel of such barrow is not used as a means of support unless adequate steps are taken to prevent the axle of such wheel from slipping out of its bearing;
- (o) long objects like planks or girders are provided with a tag line to prevent any possibility of danger while raising or lowering such objects;
- (p) during the process of landing of material, a building worker is not permitted to lean out into empty space for finding out the loading and unloading of such material;
- (q) the hoisting of loads at places where there is regular flow of traffic is carried out in an enclosed space, or in case such hoisting is impracticable in enclosed space measures are taken to hold up or divert the traffic during the time of such hoisting;
- (r) adequate steps are taken to prevent a load, in the course of being hoisted or lowered from coming into contact with any object to avoid any displacement of such load;
- (s) appliances are provided and used for guiding heavy loads when raising or lowering heavy loads to avoid crushing of hands of building workers during such raising or lowering of loads.

11. Hoists:- The employer shall ensure at a construction site of a building or other construction work that—

- (a) hoist towers are designed according to relevant national standards;
- (b) hoist shafts are provided with right panels or other adequate fencing-- (i) at the ground level on all sides of such shafts; and (ii) at all other levels on all sides of the access to such shafts;
- (c) the walls of hoist shafts, except at approaches, extend at least two meters above the floor or platform of access to such shafts;
- (d) approaches to a hoist are provided with gates which are—
 - i. girded to maintain visibility;
 - ii. at least of two meters height; and
 - iii. equipped with a device which requires such gate to be closed before the platform of such hoist can leave the landing and prevents the gate from being opened unless such platform, is at the landing;

- (e) approaches to a hoist are adequately lit;
- (f) the guides of hoist platforms offer sufficient resistance to bending and, to bucking, in the case of jamming, by providing a safety catch;
- (g) overhead beams and their supports are capable of holding the total maximum live and dead loads that such beams and supports will be required to carry, with a safety factor of at least five;
- (h) a clear space is provided-
 - i. above the highest stopping place of a cage or platform to allow sufficient unobstructed travel of such cage or platform in case of over winding; and
 - ii. below the lowest stopping place of such cage or platform;
- (i) adequate covering is provided above the top of hoist shafts to prevent materials from falling into such shafts;
- (j) outdoor hoist towers are erected on adequately firm foundations and are securely braced, guyed and anchored;
- (k) a ladderway extends from the bottom to the top of every outdoor hoist tower in case no other ladder way exists within easy reach and such ladderway comply with the relevant national standards;
- (l) the rated capacity of a hoisting engine is at least one and a half times the maximum load that such engine will be required to move;
- (m) all gearing on a hoisting engine is securely enclosed;
- (n) steam piping of a hoisting engine is adequately protected against accidental contact of such piping with a building worker;
- (o) electrical equipment of a hoisting engine is effectively earthed;
- (p) a hoist is provided with suitable devices to stop a hoisting engine as soon as the platform of such hoist reaches its highest stopping place;
- (q) a hoisting engine is protected by a suitable cover against weather and falling objects;
- (r) a hoisting engine set up in a public thoroughfare is completely enclosed;
- (s) all exhaust steam pipes discharge steam in such a manner that the steam so discharged does not scald any person or obstruct the operator's view;
- (t) the motion of a hoist is not reversed without first bringing it to rest to avoid any harm from such reverse motion;

- (u) a hoist, not designed for the conveyance of persons, is not set in motion from the platform of such hoist;
- (v) pawls and ratchet wheels of a hoist, requiring disengagement of such pawls from such ratchet wheels, before the platform of such hoist is lowered, are not used;
- (w) a platform of a hoist is capable of supporting such maximum load, that such platform may carry, with a safety factor of at least three;
- (x) a platform of a hoist is equipped with suitable safety gear which can hold such platform with its maximum load in case its hoisting rope breaks;
- (y) on platform of a hoist, the wheelbarrows or truck are efficiently blocked in a safe position;
- (z) a cage of a hoist or a platform, where the building workers are required to enter into such cage or to go on such platform at landing level, is provided with a locking arrangement to prevent such cage or platform from moving during the time a worker enters or leaves such cage or platform;
- (za) the sides of a platform of a hoist which, are not used for loading or unloading, are provided with toe-board and enclosures of a wire mesh or any other suitable means to prevent the fall of any part of a load from such platform;
- (zb) a platform of a hoist, which has any probability of falling and part of load from it, is provided with an adequate covering with such fall;
- (zc) the counter-weights of a hoist consisting of an assemblage of several parts are so constructed that such parts are rigidly connected together;
- (zd) the counter-weights of a hoist run between guides;
- (ze) at every level of work and building worker are provided with adequate platforms for performing such work;
- (zf) a legible notice in Hindi as well as in a local language is displayed at—
 - i. a conspicuous place of the platforms of a hoist and that such notice states the maximum carrying capacity of such hoist in kilograms;
 - ii. a conspicuous place on the hoisting engine and that such notice states maximum lifting capacity of such hoist in kilograms;
 - iii. a conspicuous place on a hoist authorized and certified for the conveyance of the person on the platform or cage and such notice

states the maximum number of persons to be carried on such hoist at one time;

- iv. a conspicuous place on a hoist carrying goods and other materials and such notice states that such hoist is not meant for carriage of persons.

12. Fencing of means of access to lifting appliances:- The employer shall ensure at a construction site of a building or other construction work that—

- (a) safe means of access is provided to every part of a lifting appliance;
- (b) the operator's platform on every crane or tip driven by mechanical power is securely fenced and is provided with safe means of access and where access to such platform is by a ladder,-

- i. the sides of such ladder extend to a reasonable height beyond such platforms or some other suitable handhold is provided in lieu thereof to prevent any falling of persons from such platforms;
 - ii. the handling place on such platform is maintained free from obstruction and slipping; and
 - iii. in case the height of such ladder exceeds six meters, the resting platform are provided on such ladder at every six metres of its height and where the distance between last platform so provided and the top end of such ladder is more than two meters then on such top end.

13. Rigging of derricks:- The employer shall ensure at a construction site of a building or other construction work that every derrick has current and relevant rigging plans 71 and any other information necessary for the safe rigging of such derricks and its gear.

14. Securing of derrick foot :- The employer shall ensure at a construction site of a building or other construction work that appropriate measures are taken to prevent the foot of a derrick being lifted out of its socket or support.

15. Construction and maintenance of lifting gears:- The employer shall ensure at a construction site of a building or other construction work that—

- (a) every lifting gear is-- (i) of good design and construction, sound material and adequate strength to perform the work for which it is used; (ii) free

from patent defects; and (iii) properly maintained in good repair and working order;

(b) components of the loose gear, at the time of its use, are renewed if one of its dimensions at any point has decreased by ten per cent or more by user;

(c) a chain is withdrawn from use when it is stretched and increased in length which exceeds five per cent of its length or when a link of such chain is deformed or is otherwise damaged or raised scrafs of defective welds is appeared on it;

(d) rings, hooks, swivels and end links attached to a chain are of the same material as that of such chain;

(e) the voltage of electric supply to any magnetic lifting device does not fluctuate by more than plus ten per cent or minus ten per cent.

16. Test and periodical examination of lifting gears:- The employer shall ensure at a construction site of a building or other construction work that—

(a) a lifting gear is initially tested for the manufacturer by a competent person, in a prescribed manner before taking into use or after undergoing any substantive alterations which renders its any part liable to affect its safety and such gear alters such test shall subsequently be retested for the use of its owner at least once in every five years.

(b) a lifting gear in use is thoroughly examined once at least in every twelve months by a competent person in the prescribed annexures ;

(c) a chain in use is thoroughly examined once at least every month by a responsible person for its use;

(d) certificates of initial and periodical tests and examinations of loose gears under this clause are obtained in prescribed form;

17. Ropes:- The employer shall ensure at a construction site of a building or other construction work that—

(a) no rope is used for building or other construction work unless-- (i) it is of good quality and free from patent defects; and (ii) in the case of wire rope, it has been tested and examined by a competent person in the manner as prescribed;

(b) every wire rope of lifting appliance or lifting gear used for building or other construction work is inspected by a responsible person for such use,

once at least in every three months: Provided that after any such wire is broken in such rope, it shall thereafter be inspected once at least in every month by the responsible person.

(c) no wire rope is used for building or other construction work if in any length of eight diameters of such wires, the total number of visible broken wires exceed ten per cent of the total number of wires in such rope, or such rope shows sign of excessive wear, corrosion or other defects if is unfit for use.

(d) eye splices and loops of ropes for the attachment of hooks, rings and other such parts to wire ropes are made with suitable thimble.

(e) a thimble or loop splice made in any wire rope sling conforms to the following standards, namely:-

- i.** wire rope sling shall have at least three tucks with full strand of rope and two tucks with one-half of the wires cut out of each of such strand in all cases, such strands shall be tucked against the lay of the rope;
- ii.** protruding end of such strands in any splice of wire rope slings shall be covered or treated so as to leave no sharp points;
- iii.** a fiber rope or a rope sling shall have at least four tucks; tail of such tuck being whipped in a suitable manner; and
- iv.** a synthetic fiber rope or rope sling shall have at least four tucks with full strand followed by further tuck with one half filaments cut out of each of such strand and final tuck with one-half of the remaining filaments cut-out from such strands. Any portion of the splices containing such tucks, with reduced number of filaments, shall be securely covered with suitable tape or other materials: Provided that nothing contained in this sub-clause shall apply where any other form of splice, which may be shown to be as efficient as the splice with above standards, is used.

18. Heat treatment of lifting gears:- The employer shall ensure at a construction site of a building or other construction work that—

(a) all chains other than bridle chains attached to derricks and all rings, books, shackles and swivels used in hoisting or lowering of such derricks are

effectively annealed under supervision of a competent person and at the following intervals, namely :-

- i. such chains, rings, hooks, shackles and swivels which are not more than twelve and a half millimeter of length are so annealed at least once in every six months; and
- ii. all other such chains, rings, hooks, shackles and swivels are so annealed at least once in every twelve months:

In case of such chains, rings hooks, shackles and swivels used solely on such derricks and other hoisting appliances which are worked by hand, the provisions of sub-clause(i) and sub-clause(ii), as the case may be, shall apply as if for the period of six months and twelve months the periods of twelve months and two years have respectively been substituted therein.

Provided further that in case when the size, design material or frequency of use of any such chains, rings, hooks, shackles and swivels, the requirement of this clause for annealing is not necessary for the protection of building worker,

Provided further that this clause shall not apply to-- (i) pitched chains, working on sprocket or sprocketed wheels; (ii) rings, hooks and swivels permanently attached to pitched chains, pulley blocks or weighing machines; and (iii) hooks and swivels having ball bearings or other case hardened parts;

(b) a chain or a loose gear made of high tensile steel or alloy steel is plainly marked with a mark indicating that it is so made;

(c) no chain or loose gear made of high tensile steel or alloy steel is subjected to any form of heat treatment except where such treatment is necessary for the purpose of repair of such chain or loose gear and that such repair is made under the direction of the competent person.

(d) that the wrought iron gear, the past history of which is not traceable, is suspected of being heat treated at incorrect temperature, is normalized before using it on any building or other construction work.

19. Certificate is to be issued after actual testing and examination:- The employer shall ensure at a construction site of a building or other construction work that a competent person issues a certificate only after

actual testing or, as the case may be, examination of the apparatus as prescribed.

20. Register of periodical test, examination and certificates:- The employer shall ensure at a construction site of a building or other construction work that—

1. a register as prescribed is maintained and particulars of such test and examination of lifting appliances, lifting gears and heat treatment are entered in such register;
2. certificate in respect of the following is obtained from competent person in the forms as mentioned below, namely:-
 - (i) in case of initial and periodical test and examination as prescribed for—
 - (a) winches, derricks and their accessory gears in prescribed form;
 - (b) cranes or hoists and their accessory gears in prescribed;
 - (ii) in case of test, examination and re-examination of loose gears as prescribed.
 - (iii) in case of test and examination of wire ropes as prescribed.
 - (iv) in case of heat treatment and examination of loose gears as prescribed;
 - (v) in case of annual thorough examination of the loose gears as prescribed except where required particulars of such exemption have been enclosed in the register as prescribed, and such certificates are attached to the register.
3. the register referred to in clause (a) and the certificates referred to in clause (b) attached to such register are—
 - (i) kept at such construction site in case such register and certificate relate to lifting appliances, loose gear and wire ropes;
 - (ii) retained for at least five years after the date of the last entry made in such register;
4. no lifting appliance or lifting gear in respect of which an entry is required to be made in register referred to in clause (a) and certificate of test and examination are required to be attached in such register in the manner as specified in clause (a) or clause (b), as the case may be, is used for building

or other construction work unless the required entries have been made in such register and certificates.

21. Vacuum and magnetic lifting gears:- The employer shall ensure at a construction site of a building or other construction work that-- (a) no vacuum lifting gear, magnetic lifting gear or any other lifting gear where the load on it is held by adhesive power, is used while workers are performing operations beneath such gear; (b) a magnetic lifting gear used in connection with building or other construction work is provided with an alternative supply of power, such as batteries, which may come into operation immediately in the event of failure of the main power supply; (c) no building worker shall work within the swinging zone of the lifting gear or load or building or other construction material suspended to such lifting gear.

22. Knotting of chains and wire ropes:-The employer shall ensure at a construction site of a building or other construction work that no chain or wire rope with a knot in it is used in building or other construction work.

23. Carrying of persons by means of lifting appliance:-

(1) The employer shall ensure at a construction site of a building or other construction work that no building worker is raised, lowered or carried by a power driven lifting appliance except-- (a) on the driver's platform in the cage of a crane; or (b) on a hoist; or (c) on an approved suspended scaffold: Provided that a building worker may be raised, lowered or carried by a power driven lifting appliance— (i) in circumstances where the use of a hoist or of a suspended scaffold is not reasonably practicable and the requirements of sub-clause (2) are complied with; or (ii) on an aerial cableway or aerial ropeway in case where the requirements of sub-clause(2) are complied with.

(2) The requirements referred to in proviso to sub-Clause(1) are as below, namely:-

- i.** that the appliance referred to in such proviso can be operated from one position only;
- ii.** that any winch used in connection with the appliance referred to in such proviso comply with the requirements as prescribed.
- iii.** that no person shall be carried by the appliance referred to in such proviso except-- (a) in a chair or cage, or (b) in a skip or other

receptacle at least three feet deep which is suitable for safe carriage of a person and any such chair, cage, skip or other receptacle is made of good construction sound material, and has adequate strength and is properly maintained with suitable means to prevent any occupant therein from falling out of it and is free from any material or tools which may interfere with the handhold or foothold of such occupant or otherwise endanger him; and

- iv. that suitable measures shall be taken to prevent the chair, cage, skip or other receptacle from spinning or tipping in a manner dangerous to any occupant therein.

24. Hoists carrying persons:- The employer shall ensure at a construction site of a building or other construction work that—

- (a) no building worker is carried by a hoist unless it is provided with a cage which-- (i) is so constructed as to prevent, when its gates are shut, any building worker carried by such hoist from falling out of it or from being trapped between any part of such cage and any fixed structure or other moving part of such hoist or from being struck by articles or materials falling down the hoistway on which such hoist is moving; and (ii) is fitted on each of its side from which, access is provided to a landing placed with a gate which has efficient interlocking or other devices to secure so that such gate cannot be opened except when such cage is at a landing place and that such cage cannot be moved away from any such place until such gate is closed;
- (b) every gate in the hoistway enclosure of such hoist used for carrying persons is fitted with efficient inter-locking or other devices to secure so that gate cannot be opened except when the cage of such gate is at the landing place, and that such cage cannot be moved away from the landing place until such gate is closed;
- (c) in every hoist used for carrying building workers these are provided suitable and efficient automatic devices to ensure that the cage of such hoist comes to rest at a point above the lowest point to which such cage may travel.

25. Attachment of loads:- The employer shall ensure at a construction site of a building or other construction work that—

- (a) when a sling is used to hoist long materials, a lifting beam is used to space the sling legs for proper balance and when a load is suspended at two or more points with slings, the eyes of the lifting legs of such slings are shackled together and such shackle or eyes of the shackled slings are placed on the hook or the eyes of such lifting legs are shackled directly to the hoisting block, ball or balance beam, as the case may be;
- (b) every container or receptacle used for raising or lowering stone, bricks, tiles, slates or other similar objects is so enclosed with the hoist as to prevent the fall of such objects;
- (c) a loaded wheel barrow placed directly on a platform of a hoist for raising or lowering of such wheel barrows is so secured that such wheel barrows cannot move and such platform is enclosed to prevent the fall of the contents kept in such wheel barrows;
- (d) landings of a hoist are so designed and arranged that building workers on such hoist are not required to lean out into empty space for loading and unloading any material from such hoist.

26. Tower Cranes :- The employer shall ensure at a construction site of a building or other construction work that—

- (a) no person other than the operator trained and capable to work at heights are employed to operate tower cranes;
- (b) the ground on which a tower crane stands has adequate bearing capacity;
- (c) bases for tower cranes and trucks for rail-mounted tower cranes are firm and leveled and such cranes are erected at a reasonably safe distance from excavations and are operated within gradient limits as specified by the manufacturer of such cranes;
- (d) tower cranes are sited where there is a clear space available for erection, operation and dismantling of such cranes;
- (e) tower cranes are sited in such a way that the loads on such cranes are not handled over any occupied premises, public thoroughfares, railways or near power cables, other than construction works for which such cranes are used;

(f) where two or more tower cranes are sited and operated every care is taken to ensure positive and proper communication between operators of such cranes to avoid any danger or dangerous occurrences;

(g) tower cranes are used for loading magnet or demolition ball service, piling operation or other similar operations which could impose excessive load stress on the crane structure of such cranes;

(h) the instructions of the manufacturer of a tower crane and standard safe practices regarding such crane are followed while operating or using such crane.

27. Qualification of operator of lifting winches and of signaler, etc:- The employer shall ensure at a construction site of a building or other construction work that no person is employed to drive or operate a lifting appliance whether driven by mechanical power or otherwise or to give signals to drive or operator of such lifting appliance or to work as a operator of a rigger or derricks unless he—

(i) is above eighteen years of age;

(ii) is sufficiently competent and reliable;

(iii) possesses the knowledge of the inherent risks involved in the operation of lifting appliances; and

(iv) is medically examined periodically as prescribed.

(15)
STANDARD OPERATING PROCEDURE
for
RUNWAYS AND RAMPS

- 1. Use of runways and ramps by building works:-** The employer shall ensure at a construction site of a building or other construction work that-- (a) runway or ramp provided for use by building workers is not less than four hundred and thirty millimeters in width and is constructed of not less than twenty five millimeter thick planking or any other material of adequate strength to withstand the required load supported substantially in relation to the span and braced of such runway or ramp 81 and design and construction of such runway or ramp is in accordance with the relevant national standards; (b) every runway of ramp provided for use of building workers located more than three meters above the floor or ground is on open sides provided with a guard rail of adequate strength and height of not less than one thousand millimeters.
- 2. Use by Vehicles:-** The employer shall ensure at a construction site of a building or other construction work that-- (a) all runways and ramps are of sound construction strength and are securely braced and supported; (b) every runway or ramp for the use of transport equipment like trailers, trucks or heavier vehicles has a width of not less than three point seven meters and is provided with timber curbs or any other material of adequate strength with not less than two hundred millimeters by two hundred millimeters in width placed parallel to, and secured to, the sides of such runway or ramp and such runways or ramps are designed in accordance with the relevant national standards.
- 3. Slope of Ramps:-** The employer shall ensure at a construction site of a building or other construction work that every ramp has a slope not exceeding one in four and the total rise of a continuous ramp used by building workers carrying material or using wheel-barrows does not exceed three point seven meters, unless broken by horizontal landing of at least one

point two meters in length or as provided in accordance with the relevant national standards.

4. Use by wheel barrows, etc:- The employer shall ensure at a construction site of a building or other construction work that—

(a) every runway or ramp used for wheel barrows, hand carts or hand trucks is not less than one meter in width and is constructed of not less than fifty millimeters thick planking and is supported and braced suitably for such use;

(b) every runway or ramp located more than three meters above the floor or ground is provided on the open sides with suitable guard rails of adequate strength.

(16)
STANDARD OPERATING PROCEDURE
for
WORK ON OR ADJACENT TO WATER

1. Transport by water:-

(1) The employer shall ensure at a construction site of a building or other construction work that—

- a.** when any building worker has to proceed to or from any working place by water for purposes of carrying on a building or other construction work, proper measures are taken to provide for his safe transportation and vessels used for such purpose are used in charge of a responsible person, and are properly equipped for safe navigation and are maintained in good condition;
- b.** maximum number of persons which can be safely carried in a vessel as certified under the relevant law in force is marked plainly and conspicuously on such vessel and such number is not exceeded during use of such vessel for carrying persons.

(2) The vessel referred to in part (a) of sub-clause (1) shall conform to the following, namely:

- i. that adequate protection is provided to the building workers in such vessel from inclement weather;
- ii. that such vessel is manned by adequate and experienced crew, as per the relevant law for the time being in force;
- iii. that in case the bulwarks of such vessel are lower than sixty centimeters from the level of the deck of such vessel, the open edge of such bulwarks are fitted with suitable fencing to a height of at least one meter above such deck and the post and stanchions and similar parts used in such fencing are not spaced more than two meters apart;

- iv. that the number of life buoys on deck of such vessel is at least equal to the number of crew members of such vessel and is not less than two;
- v. that all life buoys on deck of such vessel are kept in good state of maintenance and are so placed that if such vessel sinks then they remain to float and one of such buoys is within the immediate reach of the Steerman of such vessel and another is situated after part of such vessel; and
- vi. that the position of the Steerman of the vessel is such that he has a reasonably free view of all sides.

2. Prevention from drowning:- The employer shall ensure at a construction site of building or other construction work that where, on or adjacent to the work place of any construction site to which these SOP apply, there is water into which a building worker employed for work on such site is, in the course of his employment, may fall and has the risk of drowning, suitable rescue equipment is provided and kept in an efficient state for ready use and measures are taken to arrange for the prompt rescue of such building worker from the danger of drowning and where there is a special risk of such fall from the edge of adjacent land or from a structure adjacent to or above the water or from floating stage on such water, secure fencing is provided near the edge of such land, structure or floating stage, as the case may be, to prevent such fall, and such fencing may be removed or allowed to remain unerected for the time and to the extent necessary for the access of building workers to such work or the movement of material for such work.

(17)
STANDARD OPERATING PROCEDURE
for
TRANSPORT AND EARTH MOVING EQUIPMENT

- 1. Earth moving equipment and vehicles:-** The employer shall ensure at a construction site of building or other construction work that—
- (a) all vehicles and earth moving equipment are made of good material, proper design and sound construction and are sufficiently strong for the purpose for which such equipment are used and are maintained in good state of repair and are properly used in accordance with standard safe operating practices: Provided that the truck or trailer employed for transporting freight containers are of the size sufficient to carry the containers, without overhanging and are provided with twist locks conforming to national standards, at all the four corners of each of such truck or trailers and such truck or trailers are certified for such use by an authority under the relevant law for the time being in force and is inspected by a responsible person, at least once in a month and record of such inspection is maintained;
 - (b) all transport or earth moving equipment and vehicles are inspected atleast once a week by a responsible person and in case any defect is noticed in such equipment or vehicle, it is immediately taken out of use;
 - (c) power trucks and tractors are equipped with effective brakes, head lights and tail lamps and are maintained in good repair and working order;
 - (d) side stanchions on power trucks and trailers for carrying heavy and long objects are—
 - i.** of sound construction and free from defects;
 - ii.** provided with tie chains attached to the top across the loads for preventing such stanchions from spreading out; and
 - iii.** Kept in position while loading and unloading;
 - (e) safe gangways are provided for to and fro movement of building workers engaged in loading and unloading of lorries, trucks, trailers and wagons;

(f) trucks and other equipment are not loaded beyond their safe carrying capacity which shall be clearly marked on such trucks and other equipment;

(g) handles of hand trucks are so designed as to protect the hands of the building workers working on such trucks, or such handles are provided with knuckles guards;

(h) no unauthorized person rides the transport equipment employed in such work;

(i) a driver of a transport equipment manoeuvres such equipment under the direction of a signaller;

(j) adequate precaution such as isolating the electric supply or erecting overhead barriers of a safe height is taken when earth moving equipment or vehicles are required to operate in dangerous proximity to any live electric conductor;

(k) vehicles and earth moving equipments are not left on a slope with the engine of such vehicles or equipment running;

(l) all earth moving, equipments, vehicles or other transport equipment are operated only by such person who are adequately trained and possess such skill as are required for safe operation of such equipment, vehicle or other transport equipment.

2. Power shovels and excavator:- The employer shall ensure at a construction site of building or other construction work that—

(a) a shovel or an excavator whether operated, by steam or electric or by internal combustion, used for such work is constructed, installed, operated, tested and examined as required under any law for the time being in force and the relevant national standards;

(b) excavator equipped for use as a mobile crane is—

i. examined and tested in accordance with the requirements for such mobile crane as prescribed; and

ii. fitted with an automatic safe working load indicator;

(c) buckets or grabs of powers shovels are propped to restrict the movement of such buckets or grabs while being repaired or while the teeth of such buckets or grabs are being changed.

- 3. Bulldozers:-**The employer shall ensure at a construction site of a building or other construction work that—

 - (a) an operator of a bulldozer before leaving such bulldozer-- (i) applies the brakes; (ii) lowers the blade and sipper; and (iii) puts the shift lever into neutral;
 - (b) a bulldozer is left on level ground at the close of the work for which such bulldozer is used;
 - (c) the blade of a bulldozer is kept low when such bulldozer is moving uphill;
 - (d) the bulldozer blades are not used as brakes except in an emergency.
- 4. Scrapers:-**The employer shall ensure at a construction site of a building or other construction work that-- (a) a tractor and scraper is joined by safety line at the time of its operation; (b) the scraper bowls are propped while blades of such scraper are being replaced; (c) a scraper moving downhill is left in gear.
- 5. Mobile asphalt layer and finishers:-** The employers shall ensure on a construction site of a building or other construction work that-

 - (a) a mixture elevator is within a wooden or sheet metal enclosure with a window for observation, lubrication and maintenance;
 - (b) bitumen scoops have adequate covers;
 - (c) when asphalt plants are working on a public road, adequate traffic control is established on such road and the building workers working with such plant are provided with reflecting jackets;
 - (d) a sufficient number of fire extinguishers are kept in readiness on such work place where fire hazards may exist;
 - (e) the materials are loaded on the elevator after the drying drain has warmed up of such elevator;
 - (f) no open light is used for ascertaining the level of asphalt;
 - (g) inspection opening is not opened till there is a pressure in the boiler which may cause injury to a building worker;
- 6. Paves:-** The employer shall ensure at a construction site of a building or other construction work that pavers are equipped with guards suitable to prevent building workers from walking under the skip of such pavers.
- 7. Road rollers:-** The employer shall ensure at a construction site of a building or other construction work that-

(a) before a road roller is used on the ground, such ground is examined for its bearing capacity and general safety, especially at the edges of slopes such as embankments on such grounds;

(b) a roller is not moved downhill with the engine out of gear.

8. General Safety:-The employer shall ensure at a construction site of a building or other construction work that:-

(a) every vehicle or earth moving equipment is equipped with - (i) silencers; (ii) tail lights; (iii) power and hand brakes; (iv) reversing alarm; and (v) search light for forward and backward movement, which are required for safe operation of such vehicle or earth moving equipment;

(b) the cab of vehicle or earth moving equipment is kept at least one meter from the adjacent face of a ground being excavated; and

(c) When a crane or shovel are traveling, the boom of such crane or shovel is in the direction of such travel and the bucket of scoop attached to such crane or shovel is raised and without load, except when such traveling is downhill.

STANDARD OPERATING PROCEDURE
for
MEDICAL FACILITIES

- 1. Medical examination of building workers, etc:-** The employer shall ensure at a construction site of a building or other construction work that –
- (a)
 - i. a building worker who is employed for a work involving such risk or hazards inherent , the periodical medical examination of such workers, is medically examined at prescribed intervals;
 - ii. Every operator of a crane, winch or other lifting appliance, transport equipment or vehicle, is medically examined before employing such operator and again periodically, at prescribed intervals;
 - iii. the medical examination is conducted by such medical officers or at such hospitals as are approved by the State Government for the purpose from time to time;
 - iv. in case of a building worker who is exposed to special occupational health hazard owing to job or work assigned to such worker, the periodical medical examination referred to in sub-clause(i) or sub-clause(ii) includes such special investigation as may be deemed necessary by the construction medical officer examining such building worker for the diagnosis of a occupational disease ;
 - (b) no building worker is charged for the medical examination referred to in sub-section(i) or sub clause (ii) of clause(a) and the cost of such examination is borne by the employer employing such building workers.
 - (c) certificate of medical examination;
 - (d) the record of the medical examination of every building worker employed by him is maintained in a register;
 - (e) in case a construction medical officer examining a building worker under sub-clause (i) or sub clause (ii) of clause (a) is of the opinion that such building worker so examined is required to be taken away from the building or other construction work at which he is employed for health protection, such medical officer shall inform the employer of such building worker

accordingly and such employer shall inform such opinion to the Board where such worker is registered as a beneficiary.

2. Duties of construction medical officers

(1) The medical examination shall be carried out by a construction medical officer.

(2) The duties and responsibilities of such construction medical officer shall be as given below, namely-

- a. medical examination of building workers;
- b. first-aid care including emergency medical treatment;
- c. notification of occupational diseases to the concerned authorities in accordance with prescribed provisions;
- d. immunization services;
- e. medical record upkeep and maintenance;
- f. health education including advisory services on family planning, personal hygiene, environmental sanitation and safety;
- g. referral service.

3. Occupational health centers:-The employer shall ensure at a construction site of a building or other construction work involving hazardous processes as prescribed that-

- (a) an occupational health centre, mobile or static, is provided and maintained in good order at such site;
- (b) services and facilities as per the prescribed scale are provided at the occupational health centre referred to in clause(a) ;
- (c) a construction medical officer appointed at a occupational health enter possesses the qualification as prescribed.

4. Ambulance Rooms:- The employer shall ensure at a construction site of a building or other construction work that –

- (a) in case five hundred or less workers are employed at such construction site there is an ambulance room at such construction site or an arrangement with a nearby hospital for providing an ambulance room and such ambulance room is in the charge of a qualified nurse and the service of such ambulance room is available to building worker employed at such construction site at every time when he is at work;

(b) in case more than five hundred building workers are employed at such construction site there is an ambulance room with effective communication system and such ambulance room is in the charge of a qualified nurse and the service of such ambulance room is available to a building worker employed at such construction site at every time when he is at work, and such ambulance room is in overall charge of a construction medical officer;

(c) an ambulance room referred to in clause (a) or clause (b) is equipped with the articles as prescribed;

(d) record of all cases of accidents and sickness treated at the ambulance room referred to in clause(a) or clause(b) is maintained.

5. Ambulance Van:- The employer shall ensure at a construction site of a building or other construction work that an ambulance van is provided at such construction site or an arrangement is made with a nearby hospital for providing such ambulance van for transportation of serious cases of accident or sickness of the building workers to the hospital promptly and such ambulance van is maintained in good repair and is equipped with standard facilities as prescribed.

6. Stretchers:- The employer shall ensure at a construction site of a building or other construction work that sufficient number of stretchers is provided at such construction site so as to be readily available in an emergency.

7. Occupational health services for building workers:-

(1) The employer shall ensure at a construction site of a building or other construction work, where more than five hundred building workers are employed that-

(a) a special medical service or an occupational health service is available at such construction site at all times and such service shall-

- i.** provide first-aid and emergency treatment;
- ii.** conduct special medical examination for occupational hazards to such building workers before their employment and thereafter at prescribed intervals;
- iii.** conduct training of first-aid personnel of such medical service;
- iv.** render advice to such employer on conditions of work and improvement required to avoid hazards to the health of such building worker;

- v. promote health education, including family welfare among such building workers;
 - vi. undertake immunization for all such building workers against tetanus, typhoid, cholera and other infectious diseases;
- (b) the special medical service referred to in clause (a) collaborates with the Labour department or any other concerned department or service of the State Government in matters of treatment, job placement, accident prevention and welfare of such building workers;
- (c) the special medical service referred to in clause (a) is headed by a construction medical officer and is provided with adequate staff, laboratory and other equipments;
- (d) the premises of the special medical service referred to in clause(a) are conveniently accessible, comprise at least a waiting room a consulting room a treatment room, a laboratory and suitable accommodation for nurses and other staff of such service;
- (e) the special medical service referred to in clause a) maintains records pertaining to its activities referred to in sub-clause(i) to (vii) of clause(a) and sends to the concerned authorities once in every three months, information in writing on-
- i. the state of health of such building workers ;and
 - ii. the nature and causes of occupational injuries or disease suffered by any of such building workers, treatment provided to such worker and measures taken to prevent recurrence of such injuries or disease.
- 8. Notice of poisoning or occupational diseases:-** The employer shall ensure at a construction site of a building or other construction work that-
- (a) when a building worker contracts any disease as prescribed, a notice as prescribed is sent without delay to the concerned authorities, and to the Board with which such building worker is registered as a beneficiary ;
 - (b) If any medical practitioner or construction medical officer attends on a building worker suffering from any disease referred to in clause (a) such medical practitioner or construction medical officer sends information regarding the name and full particulars of such building worker and the disease suffered by him, to the concerned authorities.

9. First aid boxes:- The employer shall ensure at a construction site of a building or other construction work that-

(a) sufficient number of first aid boxes or cupboards are provided and maintained for providing first aid to the building workers;

(b) every first-aid box or cupboard is distinctly marked "First-Aid" and is equipped with the articles as prescribed;

(c) nothing except appliances or requisites for first-aid is kept in a first-aid box or cupboard and such box or cupboard is so kept as to protect it against contamination by dust or other foreign matter and against penetration of moisture and such box or cupboard is kept in the charge of a person trained in first-aid and is always readily available during working hours.

10. Emergency care services or emergency treatment:- The employer shall ensure at a construction site of a building or other construction work that-

(a) essential life saving aids and appliances required to handle- (i) head injuries and spinal injuries; (ii) bleeding; (iii) fractures and dislocations of bones and joints; (iv) crush injuries; (v) shock including electric shock; (vi) dehydration due to any cause; (vii) snake bite, insect bite, scorpion and bee stings; (viii) burns including chemical burn; (ix) bends or divers paralysis; (x) other surgical, gynecological, obstetric, or pediatric emergencies; (xi) drowning (xii) sunstroke and frost bite to building workers, are provided and properly maintained under the supervision of a construction medical officer.

(b) the essential life saving aids for any emergent situation referred to in sub-clause (i) to (xii) of clause (a) are provided to an injured or a sick building worker during his transportation from such building site to a hospital and till such building worker is attended by a doctor in such hospital;

(c) any other equipment or facilities required for emergency care or treatment to the building workers arising from special local conditions and construction processes of such building site, as specified by the State Government from time to time, are provided.

(19)
STANDARD OPERATING PROCEDURE
for
GENERAL SAFETY AND HEALTH PROCEDURES

1. **Excise Noise, Vibration etc.:-** An employer shall ensure at a construction site of a building or other construction work that adequate measures are taken to protect building workers against the harmful effects of excessive noise or vibration at such construction site and the noise level in no case exceeds the prescribed limits.
2. **Fire Protection:-** An employer shall ensure at a construction site of a building or other construction work that—
 - (a) such construction site is provided with—
 - i. fire extinguishing equipment sufficient to extinguish any probable fire at such construction site;
 - ii. an adequate water supply at ample pressure as per national standards;
 - iii. number of trained persons required to operate the fire extinguishing equipment provided under sub-clause (i) of clause (a) is properly maintained and inspected at regular intervals of not less than once in a year by the responsible person and a record of such inspections is maintained ; and
 - (b) in case of every launch or boat or other craft used for transport of building workers and the cabin of every lifting appliance including mobile crane, adequate number of portable fire extinguishing equipment of suitable type shall be provided at each of such launch or boat or craft or lifting appliance.
3. **Emergency Action Plans:-** An employer shall ensure at a construction site of a building or other construction work that in case more than five hundred building workers are employed at such construction site emergency action plan to handle the emergencies like- (a) fire and explosion; (b) collapse of lifting appliances and transport equipment; (c) collapse of building, sheds or structures etc.; (d) gas leakage or spillage or dangerous goods or chemicals; (e) drowning of building workers, sinking of vessels; and (f) land slides getting

building worker buried, floods, storms, and other natural calamities, is prepared.

4. Fencing of Motors:- An employer shall ensure at a construction site of a building or other construction work that—

(a) all motors, cogwheels, chains, and friction gearing, flywheels, shafting, dangerous and moving parts of machinery (whether or not driven by mechanical power) and steam pipes are securely fenced or lagged;

(b) the fencing of dangerous parts of machinery is not removed while such machinery is in motion or in use;

(c) no part of any machinery which is in motion and which is not securely fenced is examined, lubricated, adjusted or repaired except by a person skilled for such examination, lubrication, adjustment or repairs;

(d) machine parts are cleaned when such machine is stopped;

(e) when a machine is stopped for servicing or repairs, adequate measures are taken to ensure that such machine does not re-start inadvertently.

5. Lifting and carrying of excessive weights:- An employer shall ensure at a construction site of a building or other construction work that,--

(a) no building worker lifts by hand or carries overhead or over his back or shoulders any material article, tool or appliances exceeding in weight the maximum limits set out in the following Table: Person Maximum Weight Load Adult-man 55kg Adult-woman 30kg Adolescent-male 30kg Adolescent-female 20kg Unless aided by any other building worker or a mechanical device.

(b) no building worker aided by other building workers, lift by hand or carry overhead or over their back or shoulders, any material, article, tool or appliance exceeding in weight the sum total of maximum limits set out for each building worker separately under clause (a) unless aided by a mechanical device.

6. Health and Safety Policy

(1)

a. Every establishment employing fifty or more building workers shall prepare a written statement of policy in respect of safety and health of building workers.

b. the policy referred to in clause (a) shall contain the following, namely:-

- i. the intentions and commitments of the establishment regarding health, safety and environmental protection of building workers;
 - ii. organizational arrangements made to carry out the policy referred to in clause (a) specifying the responsibility at different levels of hierarchy;
 - iii. responsibilities of the principal employer, contractor, subcontractor, transporter or other agencies involved in the building or other construction work;
 - iv. techniques and methods for assessment of risk to safety, health and environmental and remedial measures therefore;
 - v. arrangements for training of building workers, trainers, supervisors or other persons engaged in the construction work;
 - vi. other arrangements for making the policy referred to in clause (a), effective;
- c. the intention and commitment referred to in sub clause (i) of clause (b) shall be taken into account in making decisions relating to plant, machinery, equipment, materials and placement of building workers.

(2) A copy of the policy referred to in part(a) of sub-clause (1), shall be signed by an authorized signatory.

(3) The establishment shall revise the policy referred to in clause (a) of sub-Clause (1) as often as necessary under the following circumstances, namely:-

(i) whenever any expansion or modification having implication on safety and health of the building workers is made in such, building or other construction work; or (ii) whenever any new building or other construction work, substances, articles or techniques are introduced having implication on health and safety of building workers.

(4) A copy of the policy referred to in Point (a) of sub-clause(1) shall be displayed at the conspicuous places in Hindi and local language understood by the majority of building workers at a construction site.

7. Dangerous and harmful environment:- An employer shall ensure at a construction site of a building or other construction work that,-

- a. When an internal combustion engine exhausts into a confined space or excavation or tunnel or any other work place where neither natural ventilation nor artificial ventilation system is adequate to keep the carbon

monoxide content of the atmosphere below fifty parts per million, adequate and suitable measures are taken at such work place in order to avoid exposure of building workers to health hazards.

- b. No building worker is allowed to enter any confined space or tank or trench or excavation wherein there is given off any dust, fumes or other impurities of such nature and to such extent as is likely to be injurious or offensive to the building worker or in which explosives, poisonous, noxious or gaseous material or other harmful articles have been carried or stored or in which dry ice has been used as a refrigerant, or which has been fumigated or in which there is a possibility of oxygen deficiency, unless all practical steps have been taken to remove such dust, fumes, or other impurities and dangers which may be present and to prevent any further ingress thereof, and such work place or tank or trench or excavation is certified by the responsible person to be safe and fit for the entry of such building workers.

8. Overhead Protection :-

(1)The employer shall ensure at the building or other construction work that overhead protection is erected along the periphery of every building under construction which shall be of fifteen meters or more in height when completed.

(2) Overhead protection referred to in point (1) shall not be less than two meters wide and shall be erected at a height not more than five meters above the base of the building and the outer edge of such overhead protection shall be one hundred fifty milli meters higher than the inner edge thereof or shall be erected at an angle of not more than twenty degrees to its horizontal sloping into the building.

(3) The employer shall ensure at the building and other construction work that any area exposed to risk of falling material, articles or objects is roped off or cordoned off or otherwise suitably guarded from inadvertent entry of persons other than building workers at work in such area.

9. Slipping, tripping, cutting, drowning and falling hazards:-

(1) Passageways, platform and other places of construction work at the building or other construction work shall be kept by the employer free from accumulations of dust, debris or similar material and from other obstructions that may cause tripping.

- (2) Any sharp projections or protruding nails or similar projections which may cause any cutting hazard to a building worker at the building or other construction work shall be removed or otherwise made safe by taking suitable measures by the employer.
 - (3) No employer shall allow any building worker at building or other construction work to use the passageway, or a scaffold, platform or any other elevated working surface which is in a slippery and dangerous condition and shall ensure that water, grease, oil or other similar substances which may cause the surface slippery, be removed or sanded, saw dusted or covered with suitable material to make it safe from slipping hazard at a building or other construction work.
 - (4) Wherever building workers at a building or other construction work are exposed to the hazard of falling into water, they shall be provided by the employer with adequate equipment for saving themselves from drowning and rescuing from such hazard.
 - (5) Every open side or opening into or through which a building worker, vehicle or lifting appliance or other equipments may fall at a building or other construction work shall be covered or guarded suitably by the employer to prevent such fall except where free accesses necessary by reasons of the nature of the work.
 - (6) Wherever building workers at a building or other construction work are exposed to the hazards of falling from height while employed on such work, they shall be provided by the employer with adequate equipment or means for saving them from such hazards. Such equipment or means shall be in accordance with the national standards.
 - (7) Whenever there is a possibility of falling of any material, equipment or building worker at a construction site relating to a building or other construction work, adequate and suitable safety net shall be provided by employer in accordance with the national standards.
- 10. Dust, gases, fumes etc.:-** An employer shall prevent concentration of dust, gases or fumes by providing suitable means to control their concentration within the permissible limit so that they may not cause injury or pose health hazard to a building worker at a building or other construction work.

11. Corrosive substances:-The employer shall ensure that corrosive substances, including alkalis and acids, shall be stored and used by a person dealing with such substances at a building or other construction work in such a manner that it does not endanger the building worker and suitable protective equipment shall be provided by the employer to a building worker during handling or use of such substances at a building or other construction work and in case of spillage of such substances on the building worker, immediate remedial measures shall be taken by the employer.

12. Eye Protection:- Suitable protective equipment for the protection of eyes shall be provided by an employer and used by the building worker engaged in operations like welding, cutting, chipping, grinding or similar operations which may cause hazard to his eyes at a building or other construction work.

13. Head Protection and other protection

(1) Every building worker required to pass through or work within the areas as building or other construction work where there is hazard of his being struck by falling objects or materials shall be provided by the employer with Safety helmets of type and tested in accordance with the national standards.

(2) Every building worker required to work in water or in wet concrete or in other similar work at a building or other construction work, shall be provided with suitable water-proof boots by the employer.

(3) Every building worker required to work in rain or in similar wet condition at building or other construction work, shall be provided with water-proof coat with hat by the employer.

(4) Every building worker required to use or handle alkalies, acid or other similar corrosive substances at a building or other construction work shall be provided with appropriate protective equipment by an employer, in accordance with the national standards.

(5) Every building worker engaged in handling sharp objects or materials at a building or other construction work which may cause hand injury, shall be provided with suitable hand-gloves by the employer, in accordance with the national standards.

14. Electrical hazards

(1) Before commencement of any building or other construction work, the employer shall take adequate measures to prevent any worker from coming

into physical contact with any electrical equipment or apparatus, machines or live electrical circuit which may cause electrical hazard during the course of his employment at a building or other construction work.

(2) The employer shall display and maintain suitable warning signs at conspicuous places at a building or other construction work in Hindi and in a local language understood by the majority of the building workers.

(3) In workplaces at a building or other construction work where the exact location of underground electric power line is not known, the building workers using jack hammers, crow bars or other hand tools which may come in contact with a live electrical line, shall be provided by the employer with insulated protective gloves and foot-wear of the type in accordance with the national standards.

(4) The employer shall ensure that, as far as practicable, no wiring, which may come in contact with water or which may be mechanically damaged, is left on ground or floor, at a building or other construction work.

(5) The employer shall ensure that all electrical appliances and current carrying equipment used at a building or other construction work are made of sound material and are properly and adequately earthed.

(6) The employer shall ensure that all temporary electrical installations at a building or other construction work are provided with earth-leakage circuit breakers.

(7) The employer shall ensure that all electrical installations at a building or other construction work comply with the requirements of any law for the time being in force.

15. Vehicular Traffic:-

(1) Whenever any building or other construction work is being carried on, or is located in close proximity to a road or any other place where any vehicular traffic may cause danger to building workers, the employer shall ensure that such building or other construction work is barricaded and suitable warning signs and lights displayed or erected to prevent such danger and if necessary, he may make a request in writing to the concerned authorities to control such traffic.

(2) The employer shall ensure that all vehicles used at construction site of a building or other construction work comply with the requirements of the Motor Vehicles Act, 1988 (59 of 1988), and the rules made thereunder.

(3) The employer shall ensure that a driver of a vehicle of any class or description operating at a construction site of a building or other construction work holds a valid driving licence under the Motor Vehicles Act, 1988 (59 of 1988).

16. Stability structures:-The employer shall ensure that no wall, chimney or other structure or part of a structure is left unguarded in such condition that it may fall, collapse or weaken due to wind pressure, vibration or due to any other reason at a site of a building or other construction work.

17. Illumination of passageways etc:- The employer shall ensure that illumination sufficient for maintaining safe working conditions at a site of a building or other construction work is provided where building workers are required to work or pass and for passageways stairways and landing, such illumination is not less than that provided in the relevant national standards.

18. Stacking of materials:- The employer shall ensure, at a construction site of a building or other construction work that-

(a) all building materials are stored or stacked in a safe and orderly manner to avoid obstruction of any passageway or place of work;

(b) material piles are stored or stacked in such a manner as to ensure stability;

(c) material of equipment is not stored upon any floor or platform in such quantity as to exceed its safe carrying capacity;

(d) material or equipment is not stored or placed so close to any edge or a floor or platform as to endanger the safety of persons below or working in the vicinity.

19. Disposal of debris:-The employer shall ensure at a construction site of a building or other construction work that—

(a) debris are handled and disposed of by a method which does not cause danger to the safety of a person;

(b) debris are not allowed to accumulate so as to constitute a hazard;

(c) debris are kept sufficiently moist to bring down the dust within the permissible limit;

(d) debris are not thrown inside or outside from any height of such building or other construction work;

(e) on completion of work, left over building material, article or other substance or debris are disposed of as soon as possible to avoid any hazard to any traffic or person.

20. Numbering and marking of floors:-The employer shall ensure that each floor or level of a building or other construction work is appropriately numbered or marked at the landing of such floor or level.

21. Use of Safety helmets and shoes:-The employer shall ensure that all persons ; who are performing any work or services at a building or other construction work, wear safety shoes and helmets conforming to the national standards.