



FEDERAL SUBSIDIARY LEGISLATION

FACTORIES AND MACHINERY ACT 1967 [ACT139]

P.U. (A) 328/1986

FACTORIES AND MACHINERY (BUILDING OPERATIONS AND WORKS OF ENGINEERING CONSTRUCTION) (SAFETY) REGULATIONS 1986

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Preamble

IN exercise of the powers conferred by subsection (1) of section 56 of the Factories and Machinery Act 1967 [Act 139], the Minister makes the following regulations:

PART I PRELIMINARY

1. Citation and Commencement.

These Regulations may be cited as the **Factories and Machinery (Building Operations and Works of Engineering Construction (Safety) Regulations 1986** and shall come into force on the 1st day of October 1986.

2. Definition.

In these Regulations, unless the context otherwise requires-

"approved" means approved by the Chief Inspector in writing;

"bearer" in a tabular scaffold means the cross-wise member carrying the platform planking.

"boatswain's chair" means a seat to support a workman in a sitting position by rope slings attached to a suspension rope.

"contract of service" includes a apprenticeship agreement;

"contractor" means a person who has entered into a contract for the purpose of carrying out any building operations or works of engineering construction and includes a main contractor or sub-contractor;

"contractor's safety supervisor" means a contractor's safety supervisor appointed under regulation 26;

"crawling board" means a single plank or board to which cross strips or cleats are nailed at equal intervals for crawling up and down steep inclines;

"demolition work" means any 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 machinery or other equipments;

"designated person" means a competent person appointed by an employer to carry out any supervision or inspection or to perform any tasks or duty prescribed by these Regulations;

"employee" means a person who has entered into a contract of service with an employer;

"employee's hoist" means a powered car operating in guides and used primarily to carry employees in a substantially vertical direction;

"employer" means any person who employs another person under a contract of service;

"excavation" means the removal of earth, rock or other material in connection with construction or demolition work;

"independent scaffold" means a scaffold supported from the base by a double row of uprights, independent of support from the walls and constructed of uprights, ledgers, horizontal platform bearers, and diagonal bracing;

"ladder jack scaffold" means a scaffold, the platform of which is supported by jacks attached to ladders;

"ledger" means a scaffold member which extends horizontally from post to post, at right angles to the putlogs, supports the putlogs, forms a tie between the posts, and becomes a part of the scaffold bracing;

"main contractor" means a person who has entered into a contract with an owner or lessee of a property or his agent for the purpose of carrying out any building operation or work of engineering construction;

"material hoist" means a power or manually operated 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;

"outrigger scaffold" means a scaffold, the platform of which is supported by outriggers or thrustouts projecting from the wall of the building, the inner end of which is secured inside the building;

"plant" includes any plant or equipment, gear machinery apparatus or appliance, or any part thereof;

"plasterers inside scaffold" means a scaffold constructed for light work inside a building, the platform of which is supported by trestle ladders, or a light pole scaffold;

"posts" in a tubular scaffold means the vertical supporting members;

"Professional Engineer" means a "registered Professional Engineer" as defined by section 2 of the Registration of Engineers Act 1967 [Act 138];

"putlog" or "bearer" means that part of the scaffold upon which the platform rests;

"roofing bracket" means a bracket used in sloped roof construction and having sharp points or other means for fastening to prevent slipping;

"runner" in a tubular scaffold means the lengthwise horizontal member;

"scaffold" means any temporarily provided structure on or from which persons perform work in connection with operations or works to which this Regulation apply, and any temporarily provided structure which enables persons 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, skip, ladder or step-ladder which does not form part of such structure together with any guard-rail, toe-board or other safeguards and all fixing, but does not include a lifting appliance or a lifting machine or a structure used merely to support such an appliance or such a machine as to support other plant or equipment;

"single line scaffold" means a platform resting on putlogs or crossbeams, the outer ends of which are supported on ledgers secured to a single row of posts or uprights and the inner ends on a wall or holes in a wall;

"site safety supervisor" means a site safety supervisor appointed under regulation 25;

"sub-contractor" means a person who has entered into a contract with another contractor for the purpose of carrying out any building operations or works of engineering construction,

"suspended scaffold" means a scaffold support from above, the platform of which is supported at more than two points by steel wire cables suspended from overhead outriggers which are anchored to the steel or concrete frame of the building and it may be equipped with a hoisting drum or machine, so that the platform can be raised or lowered.

"swinging scaffold" means a scaffold, the platform of which is supported by stirrups or hangers at not more than two points, suspended from overhead supports in a manner to permit raising or lowering to suit required position;

"toe-board" means a barrier placed along the edge of a scaffold platform, runway, etc., and secured thereto to guard against the falling of materials;

"trestles scaffold" means a scaffold, the platform of which is supported by trestles;

"wales" means a horizontal planks placed in front of the sheet pilings which form part of the supporting structure for the sides of trenches after excavation;

"window jack scaffold" means a scaffold, which platform is supported by jacks which projects through a window openings;

"working platform" includes a working stage.

3. Application.

(1) These Regulations shall apply-

(a) to building operations; and

(b) to works of engineering construction,

undertaken by way of trade or business, or for the purpose of any industrial or commercial undertaking, or by on behalf of any Government or any statutory or public authority and to any line or siding which is used in connection therewith and for the purposes thereof and is not part of a railway:

Provided that the Minister may suspend, by notification in the *Gazette* in part or in whole the application of these Regulations to any type of building operations and works of engineering construction which he thinks fit and may from time to time as he may consider reasonable in the circumstances revoke or vary the order.

(2) The provisions of these Regulations shall be in addition to and not in substitution for or in diminution of other requirements imposed by or under the Factories and Machinery Act 1967.

4. Obligation.

(1) It shall be the duty of every contractor and every employer, who undertakes any of the operation or works to which these Regulations apply -

(a) to comply with such of the requirements of these Regulations as affect him or any person employed by him.

Provided that the requirements of these Regulations shall be deemed not to affect any employee if and so long as his presence in any place is not in the course of performing any work on behalf of his employer and is not expressly or impliedly authorized or permitted by his employer;

(b) to comply with such of the requirements of these Regulations as relate to any work, act or operations performed or about to be performed by any such contractor or employer,

and it shall be the duty of every contractor and every employer who erects or alters any scaffold to comply with such of the requirements of these Regulations as relate to erection or alteration of scaffold having regard to the purpose for which the scaffold is designed at the time of erection or alteration; and of every contractor and every employer who erects, installs, works or uses any plant or equipment to which any of the provisions of these Regulations applies, to erect, install, work or use such plant or equipment in a manner which complies with those provisions.

(2) Where a contractor, who is undertaking any of the operations or works to which these Regulations apply, appoints any artisan, tradesman or other person not being a sub-contractor to perform any work or service under a contractor for service, it shall be the duty of the contractor to comply with such of the requirements of these Regulations, as affect the said artisan, tradesman or other person and for this purpose any reference in these Regulations to any employee shall include a reference to such artisan, tradesman or other person and the contractor shall be deemed to be his employer.

(3) It shall be the duty of every employee to comply with the requirements of such these Regulations as relating to the performance of or the refraining from an act by him.

(4) No contractor or employer shall permit an employee to do anything not in accordance with the generally accepted principles of sound and safe practice.

(5) No employee shall do anything not in accordance with the generally accepted principles of sound and safe practice.

(6) No person shall wilfully do any unsafe which may cause injury to himself or to others.

PART II GENERAL PROVISIONS

5. Application of Factories and Machinery (Fencing Of Machinery And Safety) Regulations 1983.

Unless otherwise provided, all the provisions of the Factories and Machinery (Fencing of Machinery and Safety) Regulations 1983 [P.U. (A) 113/1983] shall apply to every machinery used in connection with or for the purpose of building operations and works of engineering construction.

6. Machinery Installed on Any Floor Above The Ground Floor.

(1) No machinery shall be used or caused to be used on any floor above the ground floor of any building or structure unless such floor or structure has been so designed and constructed as to support the load imposed by the machinery or alternatively strengthened for the purpose.

(2) Any floor or working level surrounding any machinery shall be maintained in good and safe condition and shall, as is practicable, be free from any loose material and in non-slippery condition.

7. Drowning Hazards.

Where employees are exposed to the hazard of falling into the water in which one may drown, there shall be provided at all times during the exposure, adequate equipment and personnel with appropriate training for keeping persons afloat and for promptly rescuing persons. A manned and properly equipped boat shall be provided if the Chief Inspector deems it necessary.

8. Slipping Hazards.

No employer shall suffer or permit an employee to use a passageway, or a scaffold, platform or other elevated working surface which is in a slippery condition, oil, grease, water and other substances causing slippery footing shall be removed, sanded or covered to provide slip-safe footing.

9. Tripping and Cutting Hazards.

(1) All passageways, platforms and other places of work shall be kept free from accumulations of dirt and debris and from other obstructions that could cause tripping.

(2) Any projection which could cut an employee shall be removed or otherwise made safe

10. Access to Workplace.

(1) Stairways, ramps or runways shall be provided as the means of access to working levels above or below ground except where nature of progress of the work prevents their installation in which case ladders or other safe means shall be provided.

(2) All buildings under construction of more than two storeys high shall be provided with well-defined access at the ground floor with adequate overhead protective cover for persons entering or leaving the building.

11. Dust and Gases.

Dust and gases shall be controlled by ventilation or otherwise so as to prevent concentrations tending to injure health or obstruct vision or from exceeding safe levels.

12. Corrosive Substances.

All alkalis, acid and other corrosive, toxic or hazardous substances shall be stored and used as not to endanger employees. Suitable protective equipment for the use of such substances shall be provided. Clean water or appropriate cleansing materials shall be readily available for washing off spillage of any corrosive substances on employees.

13. Eye Protection.

Suitable eye protection equipment shall be provided by the employer and shall be used by employees while engaged in welding or cutting operations or in chipping, cutting or grinding any material from which particles may fly, or while engaged in any other operation which may endanger the eyes.

14. Respirators.

Where these Regulations require respirators to be provided, the employer shall provide and the employee shall use a respirator suitable for the type of operation for which it is to be used. The employer shall maintain such respirator in good repair and shall furnish the means for its continued efficient working condition; and he shall provide regular inspection, cleansing and sterilisation of such equipment when not in use shall be stored in closed containers

15. Protective Apparel.

(1) Every employee required to pass or work within areas where there is danger of being struck by falling objects or materials shall be provided with safety helmet of a type approved by the Chief Inspector.

(2) Every employee required to work in water, wet concrete or other wet footing shall be provided with a waterproof boots.

(3) Every employee required to work in rain or similar wet conditions shall be provided with a waterproof coat and hat.

(4) Every employee required to use corrosive or toxic substances shall be provided with appropriate protective apparel and equipment.

16. Electrical Hazards.

(1) Before work is begun, the employer shall ascertain by inquiry or direct observation, or by instruments, where any part of an electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool or machine into physical or electrical contact with it.

(2) The employer shall post and maintain proper warning signs in the national language where such a circuit exists.

(3) The employer shall advise his employees of the location of such lines, the hazards involved and the protective measures to be taken and shall, if practicable, de-energize the electric power circuit.

(4) No employer shall suffer or permit an employee to work in such proximity to any part of an electric power circuit which exposes him to contact with the same in the course of his work unless the employee is protected against electric shock by de-energizing the circuit and earthing it or by guarding it by effective insulation or other means acceptable to the Chief Electrical Inspector.

(5) In work areas where exact location of underground electric power lines is unknown, employees using jack-hammers, bars or other hand tools which may come into contact with such lines shall be provided with insulated protective gloves and insulated protective footwear.

(6) All wiring shall be supported on proper insulators and not looped over nails or brackets.

(7) No wiring shall be left on the ground or the floor of a building unless it is unavoidable and where it is necessary to lay electric wiring on the ground or the floor of a building, the wiring shall be of the weatherproof types and shall be provided with adequate mechanical protection to withstand the wear and tear to which it may be subjected and it shall be maintained in good and safe working order.

(8) No bare wires or other unprotected conductors shall be located within 4 metres of any surface where employee may work or pass, unless completely guarded by a fence or other barrier.

(9) Where electrical appliances and current-carrying equipment have provisions made for earthing, they shall be properly earthed.

(10) All temporary electrical installations in building and engineering construction worksites shall be provided with earth leakage circuit breakers.

(11) Elevated power lines shall have a sufficient vertical clearance where they cross highways, access roads or areas travelled by trucks, cranes, shovels or other similar equipment and shall not be lower than 5.2 metres from the ground surface.

(12) All electrical installations in building and engineering construction worksites shall comply with the requirements of the appropriate authority.

(13) All electrical installations shall be tested and approved by the Chief Electrical Inspector or his representative, before they are commissioned and such installations shall be maintained in good and safe working order at all times.

17. Power-Driven Saws.

(1) All portable power-driven hand operated saws which are not mounted with saw tables except chain saws shall be equipped with guards above the base plate which will completely protect the operator from contact with the saw blade when in motion and with self-adjusting guards below the base plate which will completely cover the saw to the depth of the teeth when the saw is removed from the cut.

(2) Every power-driven saw which is mounted with a saw table shall be equipped with a guard which shall cover the saw blade to such an extent as will prevent contact with any part of the teeth which are more than 50 millimetres above the saw table and which are not protected by the spreader or similar device. When in operation, the guard shall automatically rise by pressure from the material, the distance from the material to the underside of the guard does not exceed 12 millimetres. The exposed teeth of the saw beneath the table shall be effectively guarded.

(3) Every table circular saw used for ripping shall be provided with a spreader securely fastened in position and with an effective device to prevent the kicking back of material.

18. Public Vehicular Traffic.

(1) Whenever any work is being performed over, on or in close proximity to a highway or any other place where public vehicular traffic may cause danger to men at work, the working area shall be so barricaded and suitable warning signs and warning lights shall be set up to direct traffic away from it, and when necessary, the traffic shall be specially controlled by designated persons.

(2) (a) All vehicles used at construction worksites must be roadworthy and registered with the appropriate authority in accordance with the Road Traffic Ordinance 1958 [*Ord. 48 of 1958*].

(b) No person shall drive a vehicle of any class or description in a construction worksite unless he is the holder of a driving licence authorising him to drive a vehicle of that class or description.

19. Stability of Structure.

No wall, chimney or other structure or part of a structure shall be left unguarded in such condition that it may fall, collapse or weaken due to wind pressure or vibration.

20. Illumination of Passageways, etc.

Illumination sufficient for maintaining safe working conditions shall be provided wherever persons are required to work or pass. For passageways, stairways and landings, the illumination shall be not less than 50 lux.

21. Storage of Materials and Equipment.

(1) All building materials shall be stored or stacked in a safe and orderly manner so as not to obstruct any passageway or place of work.

(2) Material piles shall be stored or stacked in such manner as to ensure stability.

(3) Material or equipment shall not be stored upon any floor or platform in such quantity as to exceed its safe carrying capacity.

(4) Material or equipment shall not be stored or placed so close to any edge of a floor or platform as to endanger persons below.

22. Disposal of Debris.

(1) Debris shall be handled and disposed off by a method which will not endanger persons.

(2) Debris shall not be allowed to accumulate so as to constitute a hazard.

(3) Debris shall be kept sufficiently moist to lay the dust.

23. Numbering and Marking of Floors.

Each floor of every building under construction shall be appropriately numbered or marked at the landing at every floor of every staircase or other means of access.

24. Use of Safety Helmets.

All persons who are performing any work or services in a worksite shall wear safety helmets

25. Site Safety Supervisors.

(1) The main contractor of a worksite shall appoint a part-time site safety supervisor who shall spend at least fifteen hours per week exclusively on safety supervision and on promoting the safe conduct of work generally within the site.

(2) The site safety supervisor shall be a person who is competent to perform the duties specified in sub-regulations (3) and (4), possess such qualifications as are approved by the Chief Inspector and has a minimum of two year's experience as a site foreman.

(3) The site safety supervisor shall-

(a) ensure that the provisions of the Act and any regulations made thereunder are complied with; and

(b) promote the safe conduct of work generally within the worksite.

(4) The duties of a site safety supervisor shall include-

(a) inspecting and rectifying any unsafe place of work;

(b) correcting any unsafe practice;

(c) checking sub-constructors' work to ensure compliance with the Act and the regulations made thereunder; and

(d) to liaise with contractor's safety supervisors appointed under regulation 26 with respect to safety of work undertaken by sub-contractors.

26. Contractor Safety Supervisors.

(1) Every contractor other than the main contractor in charge of worksite who employs more than twenty persons to carry out work on a worksite shall appoint a part-time contractor's safety supervisor, who shall spend at least five hours per week exclusively on safety supervision and a promoting the safe conduct of work generally by his employees.

(2) The contractor's safety supervisor shall be a person competent to perform the duties specified in sub-regulation (3) and has a minimum of two years' experience as a site foreman.

(3) The contractor's safety supervisor shall –

(a) ensure that the provisions of the Act and the regulation made thereunder are complied with; and

(b) promote the safe conduct of the work by the other employees of his employee employed on that worksite.

27. Safety Committee.

(1) The main contractor of a worksite in which fifty or more persons are for the time being employed (whether by him or by other contractors) shall established a safety committee (on which both employees and management are represented) for the purpose of keeping under review conditions in the worksite which may affect the safety and health of the persons employed therein.

(2) The safety committee shall consist of a senior member of the main contractor's staff at the site, the site safety supervisor, all the contractor's safety supervisors and such other site workers who are appointed as members.

(3) The safety committee shall meet at least once a month.

PART III CONCRETE WORK

28. General Requirements.

(1) Formwork and reshores shall be certified structurally safe by a Professional Engineer and shall be properly braced or tied together so as to maintain position and shape.

(2) Where the formwork structure is of two or more tiers it shall have sufficient cat-walks and other secure access for inspection purpose.

29. Inspection and Supervision.

(1) A designated person shall supervise the erection of the formwork including the shores, braces and other supports.

(2) Upon the erection of the formwork, the designated person shall make a thorough inspection to ensure that the formwork is safe.

(3) A designated person shall regularly inspect the formwork, shores, braces and other supports during the placing of concrete. Reshores shall be similarly inspected.

(4) Any unsafe condition discovered during the inspection mentioned in sub-regulations (2) and (3) shall be remedied immediately.

(5) The designated person shall keep all records of such inspections at the worksite and shall produce them for examination at the request of the Inspector.

30. Beams, Floors And Roofs.

(1) Horizontal and diagonal bracing shall be provided in both longitudinal and transverse directions, as may be necessary to provide structural stability. Shores shall be properly seated top and bottom, and shall be secured in place.

(2) Where shores rest upon the ground, base plates shall be used.

(3) Where the floor to ceiling height does not exceed 9.14 metres the props to the formwork shall be of adequate size and spacing.

(4) Where the floor to ceiling heights exceeds 9.14 metres or where the formwork deck is supported by shores constructed in two or more tiers, or where the dead, live and impact loads on the formwork exceed 732,2 kgf per square metre the formwork structure shall be designated by a Professional Engineer and the specification and drawings shall be kept on the job for use by an Inspector and a copy of the said design and drawing shall be submitted to the Chief Inspector before work commences.

(5) Where the formwork structure is designed by a Professional Engineer, he shall be responsible for the supervision of the construction and the stability of such structure.

31. Stripping.

(1) Stripping shall not commence until the concrete is fully set in accordance with the Professional Engineer's specification and approved by him prior to such stripping.

(2) Stripped forms shall be removed or stock-piled promptly after stripping in all areas in which persons are required to work or pass.

(3) Protruding nails, wire-ties and other form of accessories not necessary to subsequent work shall be pulled, cut or otherwise made safe.

32. Reshoring.

(1) Reshoring shall be provided when necessary to safety support slabs and beams after stripping, or where such members are subjected to superimposed loads due to construction above these slabs and beams.

(2) The requirements of sub-sections (1) and (2) of regulation 30 shall apply to reshores.

PART IV STRUCTURAL STEEL AND PRECAST CONCRETE ASSEMBLY

33. Placing Of Structural Members.

During the final placing of structural members, the load shall not be released from the hoisting rope until the members are securely fastened in place.

34. Holding or Cutting of Structural Members.

No load-bearing structural members shall be materially weakened by cutting, holding or other means except in accordance with the written instruction of a Professional Engineer.

35. Tag Lines.

While panels or structural members are being hoisted, tag lines shall be used to prevent uncontrolled movement.

36. Erection of Lintels.

Where exterior lintels are erected on steel or concrete frame buildings after the permanent floors have been installed, a suitable scaffold shall be used unless each worker engaged in the erection of such lintels wears a safety belt.

37. Permanent Flooring---Skeleton Steel Construction In Tiered Buildings.

(1) The permanent floors of skeleton steel construction in tiered buildings shall be installed as the erection of structural member progresses and there shall not be more than eight storeys between the erection floor and the uppermost permanent floor.

38. Temporary Flooring - Skeleton Steel Construction In Tiered Buildings.

(1) The erection floor shall be solidly planked over its entire surface except for excess openings. Planking shall be of adequate strength to carry the working load and shall be laid tight and secured to prevent movement.

(2) There shall also be provided a closely boarded and substantial floor within two storeys or 8 metres, whichever is less, below and directly under the portion of each tier of beam on which bolting, rivetting, welding or painting is being done.

PART V CLEANING, REPAIRING AND MAINTENANCE OF ROOF, GUTTERS, WINDOWS, LOUVRES AND VENTILATORS

39. Duties of Employer.

(1) Every employer shall provide and require his employee to use while engaged in the cleaning, repairing and maintenance of roof, gutters, windows, louvres and ventilators, properly maintained equipment and safety devices that are required by these Regulations.

(2) All means of access to roofs, gutters, windows, louvres, ventilators and other fixtures, parts or equipment which require periodical cleaning or maintenance shall be maintained in good and safe order and condition.

40. Work On Steep Roofs.

(1) Where work is being performed on roofs having a slope greater than one in four, there shall be provided protection against sliding, consisting of roofing brackets or crawling boards.

(2) The provision of sub-regulation (1) shall not apply where every employee engaged in work upon such roofs is protected by a safety belt.

41. Construction and Installation Of Roofing Brackets.

(1) Roofing brackets shall be constructed to fit the pitch of the roof and when in use shall provide a level working platform.

(2) Roofing brackets shall be secured in place by nailing pointed metal projections attached to the underside of the bracket and securely driven into the roof or by a secure rope passed over the ridge pole and tied.

42. Crawling Boards.

Crawling board shall not be less than 250 millimeters wide and 25 millimeters thick and shall have cleats at least 38 millimeters wide, spaced at equal intervals not more than 310 millimeters apart across the full width of the board and firmly nailed. Such boards shall extend from the ridge pole to the eaves when used in connection with roof construction, repair or maintenance.

PART VI CATCH PLATFORMS

43. Catch Platforms.

(1) During the demolition of the exterior walls of a structure originally more than 12.2 metres high, catch platforms shall be erected along the exterior faces of such wall, where necessary to prevent injury to the public and man working below.

(2) Such platform shall be designed by a Professional Engineer and certified for safety prior to erection.

(3) Such catch platform shall be construed and maintained not more than 6 metres below the storey from which the exterior walls are being removed.

(4) Catch platforms shall not be used for storage of material or be used as working platforms or walkways.

44. Construction of Catch Platform.

- (1) Catch platforms shall be at least 1.5 metres wide and shall be inclined so that the outer edge is 152 millimetres higher than the inner edge. Planks shall be laid close together and shall be nailed down. The open ends of a catch platform shall be properly fenced up to a height of not less than 0.9 metres.
- (2) Catch platforms may be constructed of material other than wood provided such material is of equal strength and does not otherwise lessen the security against falling material.
- (3) Catch platforms shall be capable of sustaining a live load of not less than 735 kgf per square metre

45. Details of Catch Platforms, etc.

Details of construction of catch platforms and sidewalk sheds shall conform to the requirements of the Code of Practice for Building Operation Code.

PART VII CHUTES, SAFETY BELTS AND NETS

46. Chutes.

- (1) Wooden or metal chutes provided for the removal of materials and which are at an angle of more than 45 degrees with the horizontal shall be entirely enclosed on all sides, except at openings used for the receiving or discharging of materials.
- (2) All openings of chutes except the top openings shall be closed when not in use.
- (3) Chutes at an angle of 45 degrees or less with the horizontal may be opened on the upper side

47. Construction.

- (1) Every chute shall be constructed of planking or sheet metal of sufficient thickness.
- (2) Every chute shall have a strong bottom where the material strikes the chute and shall be rigidly supported throughout its length.
- (3) A strong gate shall be constructed at the lower end of every loading chute to control the loading of material into trucks and to close the chute at all other times.
- (4) Splashboards shall be erected to prevent materials from rebounding into public thoroughfare.
- (5) Chutes exceeding 12 metres in height shall be constructed in accordance with the design and drawings of a Professional Engineer.
- (6) Where construction of a chute is in accordance with sub-regulation (5), certified copies of the design and drawings of the chute shall be made available at the site for inspection by an Inspector.

48. Danger Sign.

A simple but effective warning notice in the national language shall be placed in a conspicuous position at the discharge end of every chute to warn the employees and public.

49. Chute Maintenance.

Every chute shall be cleared when debris has accumulated to a height as specified by the design engineer, where applicable, in any case at least once a day.

50. Safety Belts.

Safety belts, life lines and all devices for the attachment of life lines shall be adequate strength and of a type approved by the Chief Inspector.

51. Attachment Required.

(1) Every safety belt made available or supplied to an employee for his personal protection shall be used by the employee in the performance of his work.

(2) At all times during use, the safety belt shall be attached to a life line which is securely attached to a sufficient anchorage and shall not be longer than is necessary to permit the employee to perform his work.

(3) The point of anchorage of the life line shall not be lower than the level of the working position of the employee.

(4) There shall be provided adequate and suitable means of anchorage when the use of safety belt or life line is necessary.

52. Instruction in Using Safety Belt.

Every employee who is provided with a safety belt shall be instructed in the proper method of wearing and using it, as well as attaching it to the life line.

53. Protection of Life Lines.

Padding, wrapping or similar means shall be provided to protect every life line from contact with edges or objects which may cut out or severely abrade it.

54. Inspection of Safety Belt.

(1) Every safety belt and every life line shall be inspected by a designated persons before use by an employee.

(2) No employer shall suffer or permit an employee to use a safety belt or life line which shows any indication of wear, damage or deterioration likely to affect its strength and no such belt or life line shall be kept on the worksite

55. Safety Nets.

(1) Every safety net shall be of a type tested and approved by a testing body approved by the Chief Inspector.

(2) Every safety net or combination of safety nets shall be of sufficient size and strength to catch any person for whose protection it is used and so located as to cover the area of possible fall.

(3) Every safety net shall be attached to sufficient anchorages or supports outside and beyond the area possible fall and supported at the height sufficient to prevent sagging to any surface or object beneath when cushioning the fall of a person.

56. Storage.

Every safety net shall be thoroughly dried before storage in a dry location. It shall be protected against mechanical damage and damage from acid or other corrosive substances.

57. Inspection Of Safety Nets.

(1) Each safety net shall be inspected by a designated person before each installation.

(2) No safety net which shows signs of wear, damage or deterioration that will materially affect the strength of any portion thereof shall be installed.

(3) After installation, a designated person shall inspect the safety net and its supports daily.

(4) The result of inspection as required under sub-regulations (1) and (3) shall be entered into a register which shall be kept at the worksite for inspection by an Inspector.

PART VII RUNWAYS AND RAMPS

58. Use by Vehicles.

All runways and ramps shall be substantially constructed and securely braced and supported. Runways and ramps for the use of motor trucks or heavier vehicles shall have a width of not less than 3.7 metres and shall be provided with timber curbs not less than 200 millimetres by 200 millimetres placed parallel to, and secured to, the sides of the runway or ramp and shall be designed by a Professional Engineer.

59. Use by Employees.

Runways and ramps for the use of employees shall not less than 430 millimetres in width and shall be constructed of not less than 25 millimetres thick planking, supported substantially in relation to the span and braced. Planking shall be laid close, butt-jointed and securely nailed without cantilevered ends. Runways and ramps for the use of employees and located or rising more than 3 metres above the floor or ground shall be provided on the open sides with a guard rail. Ramps or runways, when used as passages for workmen, shall be provided with standard railings

60. Use by Wheel-Barrows, Etc.

Runways and ramps used for wheel-barrows, handcarts or hand trucks shall be not less than one metre in width and shall be constructed of not less than 50 millimetres thick planking, supported substantially in relation to the span and braced. Planking shall be laid close, butt-jointed and securely nailed without cantilevered ends. Runways and ramps for the use of wheel-barrow, hand-carts or hand trucks and located or rising more than 3 metres above the floor or ground shall be provided on the open sides with a suitable guard-rail of adequate strength.

61. Slope.

Ramps shall have a slope not exceeding one in four and the total rise of a continuous ramp used by men carrying material or using wheel-barrows shall not exceed 3.7 metres, unless broken by horizontal landings at least 1.2 metres in length. If the slopes is steeper than one in eight, the ramp shall be provided with cleats spaced not more than 350 millimetres apart, and securely fastened in the planking to afford a foothold. Spaces in the cleats may be provided for the passage of the wheel of vehicle.

PART IX LADDERS AND STEP-LADDERS

62. Construction.

Every ladder and step-ladder shall be of good construction, sound material and adequate strength for the purpose for which it is used.

63. Handhold to be provided.

Where ladder is used as means of communication or as a working place, the ladder shall rise, or adequate handhold shall be provided, to a height of at least one metre above the place of landing or the highest rung to be reached by the feet of any person working on the ladder, as the case may be or, if that is impracticable to the greatest practicable height unless other convenient and secure handholds are provided at such places. The rungs shall be omitted from this extension

64. Exception.

Nothing in regulation 63 shall apply to a crawling ladder.

65. Loose Footing.

Ladders and step-ladders shall not stand on loose bricks or other loose packing, but shall have a level and firm footing

66. Prevention against Slipping.

Every ladder, shall so far as practicable, be securely fixed so that it can move neither from its top nor from its bottom points of rest. If it cannot be so securely fixed, it shall, where practicable, be securely fixed at the base or if such fixing at the base is impracticable, a person shall be stationed at the base of the ladder to prevent slipping:

Provided that this regulation shall not apply to a ladder not more than 3 metres in length and not used as a means of communication if it is securely placed so as to prevent it from slipping or falling.

67. Swaying and Sagging.

Every ladder shall be-

- (a) secured so as to prevent undue swaying;
- (b) equally and properly supported on each upright; and
- (c) so used as not to cause undue sagging

68. Landing Place.

Every ladder or run of ladders rising a vertical distance of over 9 metres shall if practicable be provided with a landing place or places so that the vertical distance between any two successive landing places shall not exceed 9 metres. Every landing place shall be of adequate dimensions and, if a person is liable to fall therefrom for a distance of more than 3 metres, shall, except in so far as that is not reasonably practicable, be provided with sufficient and suitable guard rails to a height or at least 0.9 metre above the landing place. Where a ladder passes through an opening in the floor of a landing place, the opening shall be as small as it is reasonably practicable.

69. Prohibition against Use Of Defective Ladder.

No ladder-

- (a) with missing, broken or defective rung;
- (b) with broken or split side rails;
- (d) of faulty or defective construction; or

(d) with any of the rungs depending for its support solely on nails, spikes, or other similar fixing, shall be used

70. Wooden Ladder Construction.

No wooden ladder shall be used unless it is constructed with-

(a) uprights of adequate strength made of straight-grained wood free from defects and having the grain of the wood running lengthwise;

(b) rungs made of straight-grained wood free from defects and mortised or securely notched into the uprights; and

(c) reinforcing metal ties if the tenons are not secured by wedges

71. General.

(1) Except where either permanent or temporary stairways or suitable ramps or runways are provided, ladders shall be provided to give access to all floors or to scaffolds or platforms where work is being performed more than 1.5 metres above ground or to a permanent or temporary floor.

(2) Ladders which are to remain as a part of the permanent structure after completion of building operations shall conform to these Regulations.

PART X SCAFFOLDS

72. Construction.

(1) Every scaffold and every part thereof shall be of good construction, of suitable and sound material and of adequate strength for the purpose for which it is used.

(2) Sufficient material shall be provided for and shall be used in the construction of scaffolds.

(3) Timber used in the construction of scaffolds shall be of *keruing* wood or wood of equal or higher strength.

(4) Timber used in the construction of scaffolds shall be rough sawn and shall be sound, straight-grained, free from dry-rot, or other defects impairing its strength or durability.

(5) Timber used in the construction of scaffolds must have the bark completely stripped off, and not be painted or treated in any way so that defects cannot be easily seen.

(6) Metal parts used for scaffolds shall be of suitable quality and be in good condition and free from corrosion or other patent defect likely to affect their strength materially.

(7) All scaffolds and their supports shall be capable of supporting the load they are designed to carry with a safety factor of at least four.

73. Maintenance.

(1) Every scaffold shall be properly maintained and every part thereof shall be kept so fixed, secured or placed in position as to prevent, as far as is practicable, accidental displacement.

(2) No scaffold or part thereof shall be partly dismantled and allowed to remain in such a condition that it is capable of being used unless either-

(a) the scaffold continues to comply with these Regulations; or

(b) a prominent warning notice in the national language indicating that the scaffold or part thereof is not to be used, is affixed near any point at which the scaffold or part, as the case may be, is liable to be approached for the purpose of use

74. Supervision of Work and Inspection of Material.

(1) No scaffold shall be erected or be substantially altered or be dismantled except under the direct supervision of a designated person.

(2) All materials to be used for the construction of scaffolds shall be inspected by a designated person on each occasion before being used.

75. Design and Drawings of Scaffolds to be approved.

(1) Every metal tube scaffold exceeding 40 metres in height and every other scaffold exceeding 15 metres in height shall be constructed in accordance with the design and drawings of a Professional Engineer. All other metal tube scaffolds shall have their designs and drawings approved by the Chief Inspector.

(2) A copy of the design and drawings of the structure shall be submitted to the Chief Inspector for his record prior to the erection of the structure.

(3) A copy of the design drawings certified by the Professional Engineer shall be made available at the worksite for inspection by an Inspector.

76. Standards, Uprights, Ledgers and Putlogs.

(1) Standards or uprights of scaffolds shall be-

(a) where practicable vertical or slightly inclined towards the building; and

(b) fixed sufficiently close together to secure the stability of the scaffold having regard to all the circumstances.

(2) The displacement of the foot of any standard or upright shall, unless prevented in some other sufficient way, be prevented either-

(a) by sinking the standard or upright to a sufficient depth into the ground; or

(b) by placing the standard or upright on an adequate base plate in a manner to prevent slipping.

(3) Ledgers shall be as nearly as possible horizontal and shall be securely fastened to the uprights or other means of support or suspension by bolts, dogs, ropes or other efficient means.

(4) Where two ledgers are connected together the connection shall be secure and in the case of timber ledgers not connected together at an upright or point of suspension, both ledgers shall be connected to a separate splicing ledger of adequate strength spanning between and properly secured to the uprights or points or suspension on opposite sides of the connection of the ledgers.

(5) Putlogs shall be straight or approximately straight and shall be securely fastened to the ledgers or uprights, except in the case of a timber putlogs so shaped and placed that fastening is not necessary to prevent its displacement. Putlogs which have one end supported by a wall shall have at that end a flat supporting surface of sufficient area. Nails shall not be used for fastening putlogs.

(6) The distance between two consecutive putlogs or other supports on which a platform rests shall be fixed with due regard being given to the anticipated load and the nature of the platform flooring. As a general rule the distance with single planks shall not exceed one metre with planks 32 millimetres in thickness, 1.5 metres with planks 38 millimetres in thickness, or 2.6 metres with planks 50 millimetres in thickness.

77. Support and Stability of Scaffolds.

(1) Every scaffold shall be securely supported or suspended and where necessary sufficiently and properly strutted or braced to ensure stability.

Provided that if the scaffold is not properly designed and constructed as an independent scaffold, it shall be rigidly connected with the building.

(2) All structures and appliances used as supports for scaffolds, working platforms, gangways or runs shall be of sound construction, have a firm footing or be firmly supported, and shall, where necessary, be sufficiently and properly strutted or braced to ensure stability.

(3) Any mobile scaffold or scaffold which can be moved on wheels or skids shall, unless it is a suspended or slung scaffold, be-

(a) constructed with due regard to stability, and if necessary for stability, adequately weighed at the base.

(b) used only on a firm and even surface, not so sloping as to involve risk of instability of the scaffold or any load thereon;

(c) adequately secured to prevent movement when any person is working upon it; and

(d) moved only by the application of force at or near the base

78. Gears for Suspension of Scaffolds.

(1) Chains, ropes and lifting gear used for the suspension of scaffolds shall be of sound material, adequate strength and suitable quality, and in good condition.

(2) No rope other than a wire rope shall be used for the suspension of a scaffold, but this requirement shall not apply in the case of a suspended scaffold which is raised or lowered otherwise than by means of winches or in the case of those equipment being used for the purposes of a suspended scaffold in accordance with regulation 83.

(3) Chains, ropes and metal tubes used for the suspension of a scaffold other than a suspended scaffold shall be properly and securely fastened to safe anchorage points and to the scaffold ledgers or other main supporting members. They shall be so positioned as to ensure stability of the scaffold, be approximately vertical and be kept taut.

(4) Every scaffold suspended by means of ropes or chains shall be secured to prevent undue horizontal movement while it is used as a working platform.

79. Cantilever, Jib, Figure and Bracket Scaffolds, Etc.

(1) No cantilever or jib scaffold shall be used unless it is adequately supported, fixed and anchored on the opposite side of the support, has outriggers of adequate length and cross-section and is, where necessary, sufficiently and properly strutted or braced to ensure rigidity and stability.

(2) No working platform resting on bearers let into a wall at one end and without other support shall be used unless the bearers are of adequate strength, pass through the wall and are securely fastened on the other side.

(3) No figure or bracket scaffold supported or held by dogs, spikes, or similar fixings which are liable to pull out of the stonework or brickwork in which they are fixed shall be used.

80. Scaffolds Supported By Buildings.

No part of a building shall be used as support for part of a scaffold unless it is sound material and sufficiently stable and of sufficient strength to afford safe support. Over-hanging eaves gutters shall not be used as such support unless they have been specially designed as walkways and are of adequate strength.

81. Suspended Scaffolds Raised or Lowered By Means Of Winches.

Suspended scaffolds raised or lowered by means of winches shall not be used unless-

(a) outriggers are-

- (i) of adequate length and strength and properly installed and supported;
- (ii) installed horizontally;
- (iii) properly spaced in relation to the putlogs or deck irons;

(iv) securely fixed to the building by anchor bolts or other equivalent means, or where such fixing is not reasonably practicable, adequately and securely anchored at the inner ends; and

(v) provided with adequate stops at their outer ends;

(b) the points of suspension are at adequate horizontal distances from the building face;

(c) the suspension ropes are-

(i) of good construction, and sound material, adequate strength and free from patent defect.

(ii) securely attached to the outriggers or other supports and to the winch drum, and

(iii) of such length that at the lowest position of the platform there are at least two turns of rope on each winch drum; and

(d) the platform is-

(i) not less than 635 millimetres wide, and

(ii) so arranged or secured that, at each working position, the edge of the platform (whether of the normal platform or of an extension thereof towards the building face as the case may be) is as close as practicable to the building face, but so that where employees sit at the edge of the platform to work the edge may be not more than 460 millimetres from such face.

82. Other Suspended Scaffolds.

Suspended scaffolds other than scaffolds raised or lowered by means of winches shall not be used unless-

(a) outriggers are-

(i) of adequate length and strength and properly installed and supported.

(ii) firmly anchored at the inner ends, and

(iii) securely fastened to any ballast or counterweight;

(b) the points of suspension are at adequate horizontal distances from the building face;

(c) the platform is-

(i) not less than 430 millimetres wide;

(ii) suspended by ropes or chains which are spaced not more than 3.2 metres apart, are maintained in tension and are properly and securely fastened; and

(iii) suspended so as to prevent tipping or tilting of the platform;

(d) the suspension ropes or chains are of good construction, sound material, adequate strength and free from patent defect; and

(e) there are devices provided and used where necessary to keep the platform at a sufficient distance from the wall when persons have to work in a sitting position :

Provided that sub-paragraph (ii) of paragraph (c) of this regulation shall not apply in the case of a scaffold which is securely suspended from fixed anchorages and has a platform more than 635 millimetres wide supported on metal bearers properly and securely connected to raising and lowering tackle (being wire rope or chain tackle which is capable to sustain the load).

83. Skip, Bucket, Basket, Boatswain's Chair, etc. Shall not be used As Suspended Scaffold.

(1) A skip, bucket, basket, boatswain's chair or similar equipment shall not be used for the purposes of a suspended scaffold except in special circumstances where the work is of such short duration as to make the use of a suspended scaffold unreasonable or where the use of a suspended scaffold is not reasonably practicable and shall only be so used under the supervision of a designated person.

(2) Such equipment shall not be used for the purpose of a suspended scaffold unless-

(a) the equipment including the suspension ropes or chains and their means of support are of good construction, sound material, adequate strength and free from patent defect and the ropes or chains are securely attached; and

(b) suitable measures are taken to prevent spinning or tipping and to prevent any occupant from falling therefrom.

(3) No skip, bucket or basket shall be used for the purposes of a suspended scaffold unless it is-

(a) at least 760 millimetres deep; and

(b) either constructed wholly of suitable metal or carried by two strong bands of suitable metal which are properly fastened and continued round the sides and bottom.

84. Trestle Scaffold.

(1) No trestle scaffold shall be used-

(a) if constructed with more than three tiers; or

(b) if it has working platform more than 4.5 metres above the ground or floor or other surfaces upon which the scaffold erected.

(2) The provisions of sub-regulation (1) shall not apply to trestle scaffolds constructed in accordance with the design and drawings of a Professional Engineer.

(3) No trestle scaffold shall be erected on a scaffold platform unless-

(a) the width of the platform is such as to leave sufficient clear space for the transport of materials; and

(b) the trestle or uprights are firmly attached to the platform and adequately braced to prevent displacement.

(4) No trestle scaffold shall be erected on a suspended scaffold.

85. Inspection of Scaffolds.

(1) Subject to the provision of these Regulations, no scaffold shall be used unless-

- (a) it has been inspected by a designated person within the preceding seven days; and
- (b) it has been inspected by a designated person since its exposure to weather conditions is likely to have affected its strength or stability or to have displaced any part; and
- (c) the results of such inspection are entered by the designated person into a register which is to be kept at the worksite for inspection by an Inspector.

(2) The provisions of paragraph (a) of sub-regulation (1) of this regulation shall not apply to a scaffold where no part of which has been erected of more than seven days, and a trestle scaffold or a scaffold from no part of which a person is liable to fall more than 3 metres.

86. Working Platforms.

Every working platform from which a person is liable to fall more than 3 metres shall be -

- (a) either closely boarded, planked and plated, or a platform consisting of open metal work having interstices none of which exceeds 3,870 square millimetres in area;
- (b) at least 635 millimetres wide if the platform is used as a footing only and not for the deposit of any materials;
- (c) at least 860 millimetres wide if the platform is used for the deposit of material; and
- (d) at least 1.1 metres wide if the platform is used for the support of any higher platform.

87. Boards and Planks in Working Platforms.

(1) Every board or plank forming part of a working platform or used as a toe-board shall be-

- (a) of a thickness capable of affording adequate security having regard to the distance between the putlogs or standards; and
- (b) not less than 200 millimetres wide or in the case of boards or planks exceeding 50 millimetres in thickness, not less than 150 millimetres wide.

(2) No board or plank which forms part of a working platform shall project beyond its end support to a distance exceeding four times the thickness of the board or plank unless it is effectively secured to prevent tipping, or to a distance which, having regard to the thickness and strength of the plank, renders the projecting part of the plank and unsafe support for any weight liable to be upon it.

(3) Suitable measures such as the provision of adequate bevelled pieces shall be taken to reduce to a minimum the risk of tipping and to facilitate the movement of barrows where boards or planks which

form part of a working platform overlap each other or are not of reasonably uniform thickness where they meet each other or owing to warping or for some other reason do not provide an even surface.

(4) Every board or plank which forms part of a working platform shall-

(a) rest securely and evenly on its supports; and

(b) rest on at least three supports, unless, taking into account the distance between the supports and the thickness of the board or plank, the conditions are such as to prevent undue sagging more supports are required.

(5) Where work has to be done at the end of a wall, the working platform at such wall shall, wherever practicable, extend at least 610 millimetres beyond the end of the wall.

88. Guard-Rails and Toe-Boards at Working Place.

(1) Subject to sub-regulations (3), (4) and (5) every side of a working platform or working place, being a side thereof from which a person is liable to fall a distance of more than 3 metres, shall be provided with a suitable guard-rail or guard-rails of adequate strength to a height of at least one metre above the platform or place and above any raised standing place on the platform, and with toe-boards up to a sufficient height being in no case less than 200 millimetres and so placed as to prevent so far as possible the fall of persons, materials and tools from such platform or place.

(2) The guard-rails and toe-boards used on a working platform or working place shall be placed on the inside of the uprights, and the space between any toe-board and the lowest guard-rail above it shall not exceed 690 millimetres.

(3) Guard-rails and toe-boards required by sub-regulation (1) and (2) may be removed or remain unerected for the time and to extent necessary for the access of persons or the movement of materials.

(4) On the side of suspended scaffold facing the wall-

(a) guard-rails where required by this regulation need not extend to a height of more than 690 millimetres above the platform if the work is impracticable with a guard-rail at a greater height;

(b) guard-rails and toe-boards shall not be required if the workers sit at the end of the platform to work and ropes or chains affording all the employees a safe and secure handhold are provided.

(5) The requirements of sub-regulations (1) and (2) regarding toe-boards shall not apply to the platform of a trestle scaffold or where the provisions of a toe-board is impracticable on account of the nature or special circumstances at the work

89. Working Platforms at Building Face.

Where work at the face of a building is done from a working platform, the space between the face of the building and the working platform shall be as small as practicable and where employees sit at the edge of the platform to work, the space shall not exceed 460 millimetres

90. Platforms to be Unobstructed And To Afford Safe Foothold.

(1) Every platform shall be kept free from any unnecessary obstruction, material or rubbish and from any projecting nails.

(2) If a platform becomes slippery, appropriate steps shall as soon as reasonably practicable be taken to remedy the defect.

91. Tube Scaffolds.

The scaffold members shall be of steel tubing complying with BS 1139 "Metal Scaffolding".

92. Scaffold Locking Device.

All vertical and horizontal members of a tube scaffold shall be fastened together with a coupler or approved locking device, forming a positive connection. The locking device shall be of a type having no loose parts.

93. Locking Device Material.

The locking device or coupler shall be of drop-forged steel

94. Construction of Tubular Scaffold.

In the construction of tubular scaffolds, members of the following dimensions shall be used-

(a) in a light type tubular scaffold all posts, runners, and bearers shall be of 50 millimetres outside diameter tubing with the posts spaced not more than 1.5 metres apart by 3 metre along the length of the scaffold and all bracing shall be of 50 millimetres outside diameter tubing;

(b) in a medium type tubular scaffold, all posts and runners shall be of 50 millimetres outside diameter tubing and the bearers of 60 millimetres outside diameter tubing with the posts spaced 1.8 metres apart by 2.4 metres along the length of the scaffold and all bracing shall be of 50 millimetres outside diameter tubing; and

(c) in a heavy tubular pole scaffold, all posts and runners to be of 50 millimetres outside diameter tubing, and the bearers of 60 millimeters outside diameter tubing with the posts spaced 1.8 metres by 2.4 metres along the length of the scaffold and all bracing to be of 50 millimetres outside diameter tubing.

95. Size of Tube Scaffold.

For tubular steel scaffolds up to 22 metres in height, posts of 50 millimetres outside diameter tubing shall be used and for heights 22 metres to 61 metres, 60 millimetres outside diameter tubing shall be used.

96. Factor of Safety.

All tubular scaffolds shall be designed to have a factor of safety of not less than four

97. Bracing.

Posts shall be kept plumb during erection and the scaffold shall be subsequently kept plumb and rigid by means of adequate bracing.

98. Power to Prohibit the Use of Unsafe Scaffolds.

The Inspector may prohibit the use of any scaffold or part thereof which does not comply with the requirements of these Regulations or the design of construction of which appears to be unsafe to the Inspector, by any means he deems fit.

**PART XI
DEMOLITION**

99. Warning Sign.

On every demolition job, danger signs shall be conspicuously posted around the property, and all doorways or thoroughfares giving access to the property shall be kept barricaded except when being used as a passage for men or equipment and during darkness, and lights at flares shall be placed on or about all barricades

100. Preparation.

Before commencing any demolition work all glass in exterior operating shall be removed. All gas, electric, water, steam and other supply lines shall be shut off and capped. In each case, the relevant authorities involved shall be notified in advance. Where it is necessary to maintain any power, water, gas or electric lines during demolition such lines shall be so re-located or protected with substantial covering so as to protect them from damage and to afford safety to the employees.

101. Projection of Adjacent Structures.

During the demolition of any structure the employer performing such demolition shall examine the walls of all structures adjacent to the structure which is to be demolished. Such examination shall include a determination of the thickness and method of support of the walls of all such adjacent structure. Where there is reason to believe that an adjacent structure is unsafe or will become unsafe because of demolition operations, no demolition shall be performed at this point until there has been provided sheet piling, shoring, bracing or other such means as may be necessary to ensure the stability of the adjacent structure and to prevent such structure or other property from collapsing.

102. Demolition Of Walls, Partitions, etc.

(1) Demolition of walls and partitions shall proceed in a systematic manner and all work above each tier of floor beams shall be completed before the safety of its supports is impaired.

(2) Masonry shall neither be loosened nor permitted to fall in such masses as to endanger the structural stability of any floor or structural support.

(3) No wall, chimney or other structure or part of a structure shall be left unguarded in such a condition that it may fall, collapse or weaken due to wind pressure or vibration.

(4) In the demolition by hand of exterior walls, safe footing for the employees shall be provided in the form of sound flooring or scaffolds.

(5) Walls or partitions which are to be demolished by hand shall not be left standing more than one storey high above the uppermost floor on which men are working

103. Inspection.

During demolition, continuing inspections shall be made by a designated person as the work progresses to detect any hazard to employees resulting from weakened or deteriorated floors or walls, or loosened material. No employee shall be suffered or permitted to work where such hazards exist unless they are corrected by shoring, bracing or other effective means.

104. Method of Operation.

Debris, bricks and other materials shall be removed-

(a) by means of chutes, buckets or hoists; or

(b) through openings in the floors.

105. Access to Floor.

There shall be provided at all times safe access to and egress from every building in the course of demolition by means of entrances, hallways, stairways or ladder runs which shall be so protected as to safeguard the persons using them from falling materials.

106. Opening in Floors.

Every opening used for the removal of debris on every floor which is not closed to access, except the top or working floor, shall be provided with an enclosure from the floor to ceiling. Alternatively, the opening shall be so barricaded that no person shall have access to within a horizontal distance of 6 metres from any opening above through which debris is being dropped. The aggregate area of openings in the floor immediately beneath the floor being demolished shall not exceed 25 per cent of the total area of such floor.

107. Demolition of Structural Steel.

All steel structures shall be demolished column length by column length and tier by tier. Every structural member which is being dismembered shall not be under any stress other than its own weight and such member shall be chained or lashed in place to prevent any uncontrolled swinging or dropping. Large structural members shall not be thrown or dropped from the building, but shall be carefully lowered. where a derrick is used in the demolition of buildings of skeleton steel construction, the floor on which the derrick rests shall be completely planked over and the floor shall be of adequate strength for such operation.

108. Storage of Materials.

Materials shall not be stored on catch and scaffold platforms, floor or stairways of the building being demolished, except that the floor of a building may be used for the temporary storage of materials when such floor is of such strength as to support safely the load of such material. Storage spaces shall not interfere with access to any stairway or passageway, and suitable barricades shall not be provided so as to prevent materials from sliding or rebounding into any space used by the employees or by the public.

109. Barricades, Catch Platforms and Warning Signs.

- (1) Along every sidewalk or thoroughfare bordering demolition operations there shall be erected a substantial barricade to prevent unauthorised persons from entering the site of such operations.
- (2) During the demolition of an exterior masonry wall or a roof from a point more than 12 metres above the adjoining ground level, if persons below are exposed to falling objects, catch platforms which meet the requirements of regulation 43 shall be provided and maintained at a level not more than 6 metres below the working level except where an exterior built-up scaffold provides equivalent protection.
- (3) Suitable warning signs shall be put up at conspicuous positions.

110. Mechanical Method of Demolition.

- (1) The use of a swinging weight, clamshell bucket, power shovel, bulldozer or other contrivance for the purpose of demolition shall be in accordance with the following requirements-
 - (a) the building or structure or remaining portion thereof shall not be more than 24 metres in height;
 - (b) where a swinging weight is used, a zone of 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;
 - (c) where a clamshell bucket is being used, a zone of demolition shall be maintained within 8 metres of the line of travel of the bucket;

(d) where other contrivances are being used to effect total or partial collapse, there shall be maintained in the area into which the affected portion may fall a zone of demolition at least one and half times the height of the structures or remaining portion thereof; and

(e) no person other than employees essential to the operation of the equipment shall be permitted to enter a zone of demolition which shall be provided with substantial barricades

PART XII EXCAVATION WORK

111. Protection of The Public.

(1) All public walkways, sidewalks, and the thoroughfares bordering on or running through any excavation site shall be provided with substantial guard-rails or board fences. In addition, temporary footwalks beyond the kerb shall be substantially constructed and provided with protection on both sides.

(2) A flagman or watchman shall be designated to warn the public of the approach of trucks and to direct the trucks in and out the property. Danger or warning signs shall be posted at all truck entrances and exits.

(3) During darkness, all public sidewalks shall be adequately illuminated and warning lights or flares shall be placed about the property to ensure safety for pedestrian and vehicular traffic

112. Stability of Structures.

Where there is any question of stability of structures adjoining or over areas to be excavated, such structures shall be supported where necessary by underpinning, sheet piling, shoring, bracing or other means made or erected according to the design of a Professional Engineer to prevent injury to any person.

113. General Requirements.

(1) No employee shall be permitted to enter any excavated area unless sheet piling, shoring or other safeguards that may be necessary for his protection are provided.

(2) The excavation site and its vicinity shall be checked by a designated person after every rainstorm or other hazard-increasing occurrence and the protection against slides and cave-ins shall be increased, if necessary.

(3) Temporary sheet piling installed to permit the construction of a retaining wall shall not be removed until the wall has developed its full strength.

(4) Where banks are undercut adequate shoring shall be provided to support the overhanging materials.

(5) Excavated materials and other superimposed load shall be placed at least 610 millimetres from the edge of open excavation and trenches, and shall be so piled or retained that no part thereof can fall into the excavation, or cause the banks to slip or cause the upheaval of the excavation bed.

(6) Banks shall be stripped of loose rocks or other materials which may slide, roll or fall upon persons below.

(7) Open sides of excavations where a person may fall more than 3 metres shall be guarded by adequate barricades and suitable warning signs shall be put up at conspicuous positions.

(8) No employee shall be permitted to work where he may be struck or endangered by an excavating machine or by material dislodged by it or falling from it.

114. Piling, Shoring and Bracing.

(1) Planks used as sheet piling shall be at least 50 millimetres thick. The maximum spacing between wales shall be such as to keep the planks within their safe bending stress. Shores and braces shall be of adequate dimensions for stiffness and shall be so placed as to be effective for their intended purposes. Each end of each wales piece shall be separately braced.

(2) Earth-supported shores or braces shall bear against a footing of sufficient area and stability to prevent their shifting.

115. Access.

In every excavation of more than 1.2 metres deep there shall be provided ladders, stairways or ramps to furnish safe access to and egress from such excavation. Such ladders, stairways or ramps shall comply with the provisions of these Regulations and shall be installed in sufficient numbers and in such locations as to be readily accessible

116. Trench Excavation.

(1) Pilings, shoring and bracing used in a trench excavation to protect employees against falling or sliding materials shall be of adequate strength. Where the trench to be excavated exceeds 4 metres in depth, such protection shall be constructed in accordance with the design and drawings of a Professional Engineer.

(2) Where trenching of more than 1.5 metres in depth is done by a mechanical digger the protection required by sub-regulation (1) shall follow the jib as closely as possible

117. Deep Trench.

Where the trench requires two lengths of sheet piling, one above the other, the lower piling shall be set inside the bottom wales of the upper piling and shall be driven down and braced as the excavation continues

118. Positioning Of Machinery.

No person shall be permitted to position or operate machinery in a manner likely to endanger himself or others in the vicinity of the excavation site.

PART XIII
MATERIAL HANDLING AND STORAGE, USE AND DISPOSAL

119. General Requirements.

(1) All materials in bags, containers, or bundles, and other material stored in tiers shall be stacked, blocked, interlocked, and limited in height so that it will be stable and otherwise safe against sliding or collapse.

(2) When any material is stored in public thoroughfares, it shall be located so as to prevent the least possible hazard to, and interference with the traffic and the public. Unauthorised persons shall not be allowed on or around the material

120. Falling Of Timber.

(1) Timber shall be so stacked so as to be safe against falling or topping over and when unstacked all tiers shall be unstacked simultaneously.

(2) Unused timber shall have nails withdrawn before it is stacked unless it is to be burned without further handling.

121. Aisles and Passageways To Be Kept Clear.

(1) Aisles and passageways shall be kept clear to provide for the free and safe movement of material handling equipment or workers. Such areas shall be kept in good repair.

122. Material Storage.

(1) Material stored inside buildings under construction shall not be placed within 1.8 metres of any hoistway or inside floor openings, nor within 3 metres of an exterior wall which does not extend above the top of the material stored.

(2) Employees required to work on stored material in silos, hoppers, tanks and similar storage areas shall be equipped with life lines and safety belts.

(3) Unused materials shall be segregated in storage.

(4) Bagged materials shall be stacked by stepping back the layers and cross-keying the bags at least every 10 bags high.

(5) Materials shall not be stored on scaffolds or runways in excess of supplies needed for immediate operations.

(6) Brick stacks shall not be more than 2.1 metres in height. When a loose brick stack reaches a height 1.2 metres, it shall be tapered back 50 millimetres in every 0.3 metres.

(7) When masonry blocks are stacked it shall be tapered back one-half block per tier above the 1.8 metres level

(8) Timber shall be stacked on level and solidly supported sills and shall be so stacked as to be stable and self-supporting.

(9) Structural steel poles, pipes, bar stock, and other cylindrical materials shall be attached and blocked so as to prevent spreading or tilting.

123. Disposal of Waste Material.

(1) Whenever materials are dropped more than 6 metres to any point lying outside the exterior walls of the building, an enclosed chute of wood, or equivalent material, shall be used. For the purpose of this sub-regulation, an enclosed chute is a slide, closed in on all sides, through which material is moved from a high place to a lower one.

(2) When debris is dropped through holes in the floor without the use of chute, the area on to which the material is dropped shall be completely enclosed with barricades not less than 1.2 metres high and not less than 1.8 metres back from the projected edge of the opening above. Signs warning of the hazard of falling materials shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.

(3) All scrape lumber, waste material and rubber shall be removed from the immediate work area as the work progresses.

(4) Disposal of waste material or debris by burning shall comply with local fire regulations.

(5) All solvent waste, oily rags and flammable liquids shall be kept in fire-resistant covered containers until removed from worksite.

PART XIV PILING

124. Stability of Adjacent Structures.

Where there is any question of stability of structures adjoining areas to be piled, such structures shall be supported where necessary by underpinning, sheet piling, shoring, bracing or other means in accordance with the design of a Professional Engineer to prevent injury to any person

125. Inspection.

All pile-driving equipment shall be inspected daily by a designated person before the start of work and every defect shall be immediately corrected before pile-driving commences. Every piling frame and its attachments shall be thoroughly examined by an approved person at least once in every twelve months.

126. Protection of Operator.

The operator of every pile driver shall be protected from falling objects, steam, cinders and water by a substantial covering

127. Qualifications of Operator.

Each member of the pile-driving crew shall be properly instructed in the work he is to do and the operation shall be in the charged of a designated person who shall personally direct the work and give the operating signals.

128. Handling of Piles.

The preparation of the piles shall be done at a safe distance from the driving operation. During the hoisting of piles, all persons not actually engaged in operating the equipment and handling the piles shall be kept out of the area.

129. Pile Driver Not In Use.

When the pile driver is not in use, the hammer shall be choked or blocked in the leads or lowered to the ground

130. Ladders.

A ladder extending from the bottom of the leads to the overhead sheaves shall be permanently attached to the structure supporting the leads.

131. Working Platforms.

Where a structural tower supports the leads, suitable working platforms of adequate strength shall be provided on levels of the leads at which it is necessary for men to work. Such platforms shall be provided with a safety railing and toe-board on all sides, except on the hammer or lead side of the platform. Where such platform cannot be provided, a safety belt shall be provided

132. Piles.

All concrete piles shall have attained the required strength before being hoisted or being subject to piling stresses

133. Pile Testing.

(1) The testing of piles shall be conducted under the direct supervision of a designated person.

(2) Reasonably practicable measures shall be taken to warn persons not to approach within 50 metres of a pile under test.

(3) Under no circumstances shall anyone be permitted to approach a test pile while the process of increasing or decreasing test loading is being carried out.

(4) While the process of increasing or decreasing test loading is not in progress, anyone approaching a test pile for any purpose shall only be permitted to do so under the specific instruction of the designated person who shall take reasonably practicable measures to ascertain that the kentledge is in a stable condition and is safe for approach

134. Footing.

Before placing or advancing a pile driver, the ground shall be inspected by a designated person and, where necessary for firm and level footing, timber shall be placed. After placing or advancing a pile driver, inspection and correction of the footing shall be made, when necessary, to maintain stability.

PART XV BLASTING AND USE OF EXPLOSIVES

135. Handling of Explosives.

Explosives shall not be handled or used except in accordance with the manufacturer's instructions, if any, and under the immediate control of a designated person who has the training, knowledge or experience in the field of transporting, storing, handling, and use of explosives. Such person shall be required to furnish satisfactory evidence of competency in handling explosives and performing in a safe manner the type of blasting to be carried out and he shall have adequate knowledge of the dangers connected with their use; and steps shall be taken to see that, when a charge is fired, all persons are in positions in which, so far as can reasonably be anticipated, they are not exposed to risk of injury from the explosion or from flying mater

136. Smoking and Open Lights.

Smoking, open lights and flame or spark-producing devices are prohibited in or around any explosive magazine or storage enclosures and there shall be posted and maintained proper warning signs to that effect in the national language

137. Opening Packages.

Packages of explosives shall not be opened at any point less than 15.3 metres distance from any magazine, and metallic instruments shall not be used for opening packages of explosives

138. Drilling Holes.

(1) Drilling in any hole that has at any time contained explosives is prohibited.

(2) All holes for inserting cartridges of explosive shall be of sufficient size for such cartridges to be inserted to the bottom of the holes without forcing or ramming.

139. Removing Cartridge Wrappers.

(1) Dynamite shall not be removed from its original wrapper before being loaded into holes.

(2) All explosives shall be accounted for at all times

140. Loading near Other Operations.

The loading of holes shall be under the direct supervision of the blaster. Holes shall not be loaded in dangerous proximity to drilling or any other operations.

141. Loading and Tamping.

In loading and tamping explosives only a hardwood rod free from any metal part shall be used.

142. Warning before Blasting.

Before firing the blaster shall sound a warning distinctly audible to all persons within the danger zone and all such persons shall retreat to a safe distance or to a safe shelter. No blast shall be fired while any person is in the danger zone as determined by the blaster.

143. Return To The Blast Area.

No person shall return from such safe distance or safe shelter until permitted to do so by the blaster as announced by audible or visible signal.

144. Misfires.

Immediately following the blast, the area shall be examined by the blaster for evidence of misfired charges. Immediately on learning of misfire, every person in the danger zone shall retreat to a safe distance or a safe shelter. The misfire shall be reported at once by the blaster to the person in charge and control of the dispose of the misfire and shall determine the safe and proper method of its disposal. No person except those designated to effect such disposal shall enter the danger zone until the misfire has been disposed of.

145. Precaution before Blasting.

Before blasting, the owner should take every precaution for the protection of life and property and warning notices shall be given to all residence and others in the immediate vicinity of the blasting operation

146. Operations during Thunderstorms.

All use of explosives and any handling of explosives shall be stopped immediately upon the approach of a thunderstorm and all personnel in the area shall immediately seek a safe place for shelter as directed by the person in charge of the blasting.

PART XVI HAND AND POWER TOOLS

147. General Requirements.

(1) All hand and power tools and similar equipment, whether furnished by the employer or the employee, shall be maintained in a safe condition.

(2) When power-operated tools are designed to accommodate guards, they shall be equipped with such guards when in use.

(3) Belts, gears, shafts, pulleys, sprockets, spindles, drum, fly wheels, chains, or other reciprocating rotating or moving parts of the equipment shall be guarded if such parts are exposed to contact by employees or otherwise create a hazard in accordance with the requirements of the Factories and Machinery (Fencing of Machinery and Safety) Regulations 1970.

(4) Employees using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapours or gases shall be provided with the necessary personal protective equipment to protect them from hazards.

(5) (a) All hand-held powered platen sanders, grinders with wheels 51 millimetres in diameter or less, routers, planers, laminate trimers, nibblers, shears, scroll saws, and jigsaws with blade shanks 6 millimetres wide or less may be equipped with only a positive "on-off" control.

(b) All hand-held powered drills, tappers, fastener, drivers, horizontal, vertical, and angle grinder with wheels greater than 51

millimetres in diameter, disc sanders, belt sanders, reciprocating saws and other similar operating powered tools, shall be equipped with a momentary contact "on-off" control and may have a "lock-on" control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.

(c) All other hand-held powered tools, such as circular saws, chain saws, and percussion tools without positive accessory holding means, shall be equipped with a content pressure switch that will shut off the power when the pressure is released.

148. Hand Tools.

- (1) Employers shall not issue, suffer or permit the use of unsafe hand tools.
- (2) Wrenches, including adjustable pipe ends and socket wrenches shall not be used when jaws are sprung to the point that slippage occurs.
- (3) Impact tools, such as drift pins, wedges, and chisels, shall be kept free of mushroomed head.
- (4) The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the cool.

149. Electric Power-Operated Tools.

- (1) Electric power-operated tools shall be insulated in accordance with the requirement of Electrical Inspectorate Regulations 1984[P.U.(A) 313 / 1984].
- (2) The use of electric cords for hoisting or lowering tools shall not be permitted.

150. Pneumatic Power Tools.

- (1) Pneumatic-power tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected.
- (2) Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.
- (3) All pneumatically-driven nailers, staplers, and other similar equipment provided with automatic fastener feed, which operate at more than 7 bars pressure at the tool shall have a safety device on the muzzle to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface.
- (4) Compressed air shall not be used for cleaning clothing or parts of the body.
- (5) The manufacturer's safe operating pressure specification for hoses, pipes, valves, filters and other fittings shall not be exceeded.
- (6) The use of hoses for hoisting or lowering tools shall not be permitted.
- (7) All hoses whose inside diameter exceed 13 millimetres shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure.
- (8) Airless spray guns of the type which atomize paints and fluids at a pressure greater than 70 bars shall be equipped with automatic or visible manual safety devices which will prevent pulling of the trigger to prevent release of the paint or fluid until the safety device is manually released or alternatively, a diffuser which will prevent high pressure or high velocity release, while the nozzle tip is removed, plus a nozzle tip guard which will prevent the tip from coming into contact with the operator, or their equivalent protection, shall be provided.

151. Fuel-Powered Tools.

- (1) All fuel-powered tools shall be stopped while being refueled, serviced, or maintained, and fuel shall be transported, handled, and stored safely.
- (2) When fuel-powered tools are used in enclosed spaces, the applicable provisions in respect of concentrations of toxic gases and the use of personal protective equipment, must be followed.

152. Hydraulic-Powered Tools.

- (1) The fluid used in hydraulic-powered tools shall be fire-resistant fluids, and shall retain its operating characteristics at the most extreme temperatures to which it may be exposed.
- (2) The manufacturer's safe operating pressure specifications for hoses, pipes, valves, filters and other fittings shall not be exceeded.

153. Power-Actuated Tools.

- (1) Only employees who have been trained in the operation of the particular tool in use shall be allowed to operate a power-actuated tool.
- (2) The tool shall be tested each day before loading to see that safety devices are in proper working condition. The method of testing shall be in accordance with the manufacturer's recommended procedure.
- (3) Any tool found not in proper working order, or that develops a defect during use, shall be immediately removed from use and shall not be used until it is properly repaired.
- (4) Tools shall only be loaded within a reasonable period prior to the intended firing time. Neither loaded nor empty tools shall be pointed at any employees. Hands shall be kept clear of the open barrel end.
- (5) Loaded tools shall not be left unattended.
- (6) Fasteners shall not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tile, surface-hardened steel, glass block, live rock, face brick, or hollow tile.
- (7) Driving into materials easily penetrated shall be avoided unless such materials are backed by a substance that will prevent the pins or fastener from passing completely through to the other side.
- (8) No fastener shall be driven into a spalled area caused by an unsatisfactory fastening.
- (9) Tools shall not be used in an explosive or flammable atmosphere.

**PART XVII
MISCELLANEOUS**

154. Penalty.

Any person who contravenes any provisions of these Regulations shall be guilty of an offence and shall, on conviction, be liable to a fine not exceeding two thousand ringgit.

Made th 16th September 1986.

[KB. Sulit 32 / 1 / 2 / 5 / 1 / 1 SJ. (3); PN. (PU²)235.]

DATO' LEE KIM SAI,
Minister of Labour