

Unvalidated References:

Industrial Safety, Health and Welfare Act 1961

This reprint of this Statutory Instrument incorporates all amendments, if any, made before 25 November 2006 and in force at 1 July 2001.

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Legislative Counsel
Dated 25 November 2006

INDEPENDENT STATE OF PAPUA NEW GUINEA.

Chapter 175C.

Industrial Safety (Excavation Works, Shafts and Tunnels) Order 1968

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MADE under the *Industrial Safety, Health and Welfare Act 1961*.

Dated 200 .

PART I. – PRELIMINARY.

1. INTERPRETATION.

In this Order, unless the contrary intention appears “excavation work” includes any quarry, clay pit, gravel pit, sand pit, trench or any similar type or excavation made for the purpose of obtaining construction materials or for constructional purposes.

2. LIABILITY OF OPERATOR, ETC.

(1) A person who, directly or by his servants or agents, carries out any work in an excavation, tunnel or shaft shall ensure that the provisions of this Order are complied with.

(2) Subsection (1) does not relieve a person from liability under any other provision of this Order.

(3) It is a defence to a charge of a contravention of this Order if the defendant proves that—

(a) he was not aware, and could not, with the exercise of reasonable diligence, have become aware, of the relevant non-compliance with this Order; and

(b) he took all reasonable steps to ensure that no such non-compliance took place.

PART II. – VENTILATION.

3. DETERMINATION OF ADEQUATE VENTILATION.

(1) The air in a shaft, tunnel or other underground working place is not adequate if–

- (a) it contains less than 20% by volume of oxygen; or
- (b) it contains by volume more than–
 - (i) 0.25% of carbon dioxide (CO₂); or
 - (ii) 0.007% of carbon monoxide (CO); or
 - (iii) 0.001% of nitrous fumes; or
 - (iv) 0.002% of hydrogen cyanide (HCN); or
 - (v) 0.002% of hydrogen sulphide (H₂S); or
 - (vi) 0.0001% of arsine (AsH₃); or
- (c) it shows a count per cc in excess of 300 particles of dust of 5 microns or less in diameter; or
- (d) the temperature of the air exceeds 28.3°C by the wet bulb thermometer.

(2) Where the free silica content of an airborne sample exceeds 35%, the maximum allowable number of dust particles per cc is as prescribed in writing by a medical officer.

4. MAINTENANCE OF ADEQUATE VENTILATION.

(1) Subject to Subsection (2), in each shaft or tunnel or other underground working place, ventilation shall–

- (a) be constantly produced at not less than 2.832 m³ per minute for each person underground; and
- (b) be maintained so that the air is adequate for all persons in it.

(2) Notwithstanding Subsection (1), where an Industrial Safety Officer certifies that the ventilation or the distribution of the ventilation current is inadequate in any particular shaft, tunnel or other underground working place, auxiliary ventilating appliances shall be provided and kept constantly working.

5. RECIRCULATION OF AIR.

The air currents passing through a tunnel, shaft or other underground working place shall be regulated, as far as practicable, in such a manner that–

- (a) the air passes through the workings from inlet to outlet without local circulation; and
- (b) the same air is not allowed to return continuously through the same place.

6. SUPPLY OF AIR THROUGH AIR COMPRESSOR, ETC.

(1) The supply of air for a ventilating machine or air compressor that forces air into the workings of a tunnel, shaft or other underground working place shall be drawn from the purest source available.

(2) Where an Industrial Safety Officer certifies that the supply of air to a tunnel, shaft or other underground working place, does not comply with Section 3, air compressors shall be fitted with suitable inter-coolers and after-coolers.

7. CLEARANCE OF AIR RECEIVER MAINS, ETC.

Subject to Section 6—

- (a) air receivers, and pipes connecting air receivers with the compressors, shall be blown out each day on which they are in operation; and
- (b) air mains from the compressors and branch lines shall be furnished with sufficient traps of an approved type to remove accumulations of water, and water shall not be allowed to blow through to the working face; and
- (c) pumps shall be blown off at least once in each shift.

8. DUST FUMES, ETC.

(1) Where dust, fumes or toxic gases are produced in the course of any excavation, operation, crushing operation, or any other process, to such an extent that the health of workmen is in any way endangered, a person shall not be allowed to work in the area until provision is made for preventing or allaying the dust, fumes or toxic gases so produced.

(2) Water used for the purpose of laying dust, fumes or toxic gases shall be free from pollution with noxious matter.

9. MAINTENANCE OF ROCK-DRILLING MACHINES, ETC.

(1) Rock-drilling machines employed in a tunnel, shaft or other underground place shall be overhauled regularly at least once each fortnight, and maintained in a proper state of repair.

(2) In the event of fogging occurring as a result of any defect or misuse of a rock-drilling machine—

- (a) the person in charge shall not permit the machine to be further used; and
 - (b) a person shall not use the machine,
- until the cause of the fogging has been removed.

10. TIMING OF BLASTING OPERATIONS.

(1) Times of blasting operations in a tunnel, shaft or other underground place shall be so arranged that workmen are not exposed to dust, fumes or toxic gases from them.

(2) A person shall not be allowed to enter a working place after blasting has taken place until the fumes, dust or toxic gases arising from the explosion have been effectively dispersed.

11. SMOKE HELMETS.

Where foul air accumulates, or is likely to accumulate, in a tunnel, shaft or other underground place to such an extent that it is dangerous to the safety of persons employed in the tunnel, shaft or place, approved smoke helmets or other like appliances shall be kept ready for use in the tunnel, shaft or place.

PART III. – WINDING AND SIGNALS IN SHAFT EXCAVATION OPERATIONS.

12. READINESS OF WINDING ENGINES.

(1) Winding engines in a vertical shaft shall–

- (a) be kept ready for use; and
- (b) be in charge of a competent engine driver,

when any person is in the shaft, tunnel or underground place.

(2) A winding engine driver shall not, under any pretext, absent himself or cease to have continual supervision of the machinery under his control during the time that he is required to be on duty in a tunnel, shaft or other underground place, unless he is relieved by a person qualified for the purpose.

13. PROVISION OF CAGES IN SHAFTS.

(1) Except as provided in Subsection (3), a cage properly constructed for the purpose and driven by engine-power shall be provided for raising and lowering men in any shaft exceeding 60.96 m in depth.

(2) Buckets or skips may be used for raising or lowering materials or debris in a shaft.

(3) During the sinking of a shaft, one or two men may be raised or lowered in a bucket or skip properly constructed for the purpose if–

- (a) a person capable of directing the winch driver in the signal code used for that occupation; and
- (b) a person capable of directing the winch driver in the signal code used for lowering,

are stationed at each staging, in constant communication with the winch operator by means of a knocker-signal line or other means of communication that is, to the satisfaction of an Industrial Safety Officer, functional.

(4) A cage, bucket or skip shall be deemed to be properly constructed for the purposes specified in Subsection (1) or (2), as the case may be, if it is approved by the Departmental Head for the work for which it is being used.

14. DROP BARS ON CAGES.

A drop bar shall–

- (a) be fitted to each cage at any entrance, gate or door; and
- (b) be securely fixed while the cage is being raised or lowered.

15. RAISING AND LOWERING OF TOOLS, ETC.

(1) When men are in the cage, tools, machines or materials shall not be taken up or down a shaft unless the men are authorized by the Departmental Head to travel in the cage at a time when tools, machines or materials are being taken up or down the shaft.

(2) When men are working in a shaft, tools, machines or materials shall not be raised or lowered in the shaft, except—

- (a) in a bucket or other receptacle properly constructed for the purpose; and
- (b) in such a way that they are properly secured and cannot fall out of the bucket or receptacle.

16. OVERHEAD PROTECTION.

(1) Men working in a shaft, or being raised or lowered in a shaft, shall be protected overhead from falling material by means of an approved roof or other suitable appliance, to the satisfaction of an Industrial Safety Officer.

(2) It is a defence to a charge of a failure to comply with Subsection (1) if it is proved that—

- (a) the contravention occurred during repairs to, or an inspection of, the shaft; and
- (b) it was not possible to provide overhead protection.

17. SAFETY APPLIANCES ON CAGES.

A cage, skip or other similar receptacle used in a shaft shall be fitted with a suitable and properly constructed safety appliance approved by the Departmental Head, to prevent it—

- (a) falling down the shaft; or
- (b) coming into contact with the poppet head.

18. SAFETY MEASURES FOR CAGES, ETC.

(1) The following safety measures shall be carried out on each cage, skip or other similar receptacle used in a shaft:—

- (a) all detaching and suspending hooks and safety catches shall, at least once in every month, be taken to pieces, examined and cleaned by a competent person and a record kept of the inspection;
- (b) an inspection hole 9.525 mm in diameter shall be drilled through the plates of each safety hook and kept clear;
- (c) each safety hook shall be cleaned at least once in every six months, or at such lesser periods as an Industrial Safety Officer orders;

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- (d) all detaching plates and bells in use shall be tested at least each six months by means of calipers and gauges;
- (e) subject to Subsection (2), at least once in every six months all cage or skip chains and hooks in general use shall—
 - (i) be annealed or given other proper heat treatment; and
 - (ii) be thoroughly examined by a properly qualified and competent person;
- (f) a safety hook that will not suspend a cage at the poppet head or landing stage when the cage is detached from the winding ropes shall not be used;
- (g) each baling tank shall be fitted with a safety device approved by the Departmental Head.

(2) The Departmental Head may, in writing, exempt from the requirements of Subsection (1)(e) chains or hooks made from materials that do not require heat treatment.

19. CLEARANCE BETWEEN LANDING AND POINT OF DETACHMENT.

When a cage, skip or other similar receptacle is at the landing of any shaft, there shall be not less than 3.048 m of clearance between the detaching hooks and the point of detachment.

20. TESTING OF CAGE, ETC.

(1) Before a cage, skip or other similar receptacle is first used in a shaft, it shall be tested in the presence of an Industrial Safety Officer to show that it complies with this Order.

(2) Cages, skips or other receptacles—

- (a) shall be tested with maximum load to the satisfaction of the Industrial Safety Officer; and
- (b) shall not be used unless approved.

(3) The Industrial Safety Officer may require a cage, skip or other receptacle used in a shaft to be tested by a “free fall” test.

(4) At least once in every month, each cage, skip or other receptacle used in a shaft shall be tested from the drum.

21. RECORD OF TESTS.

A record shall be kept of all tests made in accordance with this Order, and the record shall be made available to an Industrial Safety Officer at all times.

22. TRAVELLING ON OUTSIDE OF CAGE.

A person shall not ascend or descend a shaft on the outside of a cage unless the ascent or descent has been authorized by the Departmental Head for a special duty.

23. MAXIMUM NUMBER OF PASSENGERS IN CAGE.

(1) The Departmental Head shall determine the maximum number of persons who may ride in a cage at any time, and the number so determined shall be posted up and kept posted up at all landing stages in the shaft.

(2) A number of persons greater than the number authorized in accordance with Subsection (1) shall not ride in the cage at any one time.

24. OVERWIND CATCHES.

(1) Automatic or self-acting catches of a suitable kind shall be fixed below the winding sheaves of each shaft in which a cage is used, so as to prevent the fall of the cage down the shaft when detached from the rope by overwinding.

(2) Catches referred to in Subsection (1) shall be kept in proper working order at all times.

25. BRAKES ON WINDING DRUMS.

(1) Machinery used for raising or lowering persons or for the haulage of material in a shaft shall be fitted with an adequate brake.

(2) A brake referred to in Subsection (1) shall—

- (a) be fitted in such a manner to each winding drum that it can be applied by the engine driver without leaving his operating position; and
- (b) be kept in efficient working order.

26. DEPTH INDICATORS.

A dial or indicator approved by an Industrial Safety Officer shall be provided in machinery used for raising and lowering persons in order to enable the engine driver to accurately determine the position in the shaft of each cage, skip or bucket.

27. AUTOMATIC OVERWINDING DEVICES IN DEEP SHAFTS.

(1) Where—

- (a) a shaft is more than 91.44m in depth; and
- (b) mechanical power is used for raising or lowering persons to or from the surface,

an automatic device, effectual to prevent overwinding, shall be installed, to the satisfaction of the Departmental Head—

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- (c) to prevent the descending cage from being landed at the shaft bottom at a speed exceeding 1.524 m per second; and
- (d) to control the movement of the ascending cage so as to prevent danger to any person riding in or using the cage.

(2) Unless it is in full and fixed engagement with the winding engine, an automatic device installed in accordance with Subsection (1) shall be fully engaged, either automatically or by the winding engine driver, whenever persons are to be raised or lowered.

(3) An automatic indicator shall be installed, in such a position that it can be seen by the braceman, to show whether the device is engaged or not engaged.

(4) A person shall not be allowed to enter a cage until the indicator shows that the device is fully engaged.

28. APPLIANCES ON DRUMS.

On the drum of each machine used for lowering or raising persons, there shall be—

- (a) such flanges or horns and if the drum is conical, such other appliances as are necessary to prevent the rope from slipping on the drum; and
- (b) appliances to prevent the drum from revolving when out of gear.

29. WINDING ENGINES WITH DEFECTIVE DRUMS, ETC.

(1) Where winding engines are provided with two drums, a persons shall not, except in cases of emergency, be raised or lowered in the cage while one of the drums is out of gear and loose on the shaft that supports it.

(2) A person shall not be raised or lowered by means of a winding engine with an ungeared or single drum with brake or friction gear only.

30. SUPPORTING, ETC., OF CAGES DURING REPAIRS.

When repairs are being effected to the clutch or brakes of a winding engine and ropes are attached to the drums, the skip, cage or other receptacle shall be disconnected, or firmly supported by some means other than the rope, while the work is in progress.

31. SPEED OF WINDING.

(1) When a cage, skip or other receptacle is raising or lowering men, it shall not exceed a speed of 152.4 m per minute within 60.96 m of the surface or bottom stopping place.

(2) The maximum rate of speed in any other portion of the shaft shall be determined by the Departmental Head for each particular shaft.

32. WINDING ROPES, GENERAL.

(1) Ropes used for hoisting materials or men in a shaft shall be approved by the Departmental Head before installation.

(2) A written record shall be kept of the service of each rope used for hoisting materials and men, and the record shall be available for inspection at all times by an Industrial Safety Officer.

(3) Ropes used for winding shall be reshod or reclamped at least once in each six months.

(4) The Departmental Head may require that any rope used for winding be replaced, reshod or reclamped at any time when he thinks it unsatisfactory.

33. CERTIFICATE AS TO STRENGTH OF WINDING ROPE.

(1) When a winding rope is to be placed in service in a shaft, there shall be deposited with the Departmental Head a true copy of the maker's certificate, giving full details of—

- (a) the construction of the rope; and
- (b) the class of steel used; and
- (c) the breaking strain of the rope; and
- (d) the condition of the rope at the time of installation.

(2) The Departmental Head may require further tests to be carried out on the rope before it is installed.

34. EXAMINATION OF WINDING ROPES, ETC.

(1) A competent person shall carefully examine—

- (a) at least once in every day—
 - (i) the winding ropes and their attachments to the cages, skips or other receptacles in a shaft; and
 - (ii) the brakes; and
 - (iii) the depth indicators; and
 - (iv) the cages and their safety catches; and
 - (v) the head sheaves; and
 - (vi) all external parts of the winding arrangements on the proper working of which safety to life depends; and
- (b) at least once in every week—
 - (i) the guides and the winding compartments generally; and
 - (ii) the signalling arrangements; and

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- (c) at least once in every month—the structure of the rope, for the purpose of discovering the amount of deterioration; and
 - (d) at least once in every year—the winding engine, as to the condition of its working parts.
- (2) Tests shall be made—
- (a) before the installation of any new, remodelled, or repaired skip, cage or other receptacle in a shaft; and
 - (b) after any alteration to free travel in any part of a shaft in use up to the detaching thimble.

35. MAINTENANCE OF ROPES.

Winding or hoisting ropes shall be treated with a suitable rope compound at least once every month.

36. DEFECTS IN ROPES.

- (1) If any weakness or defect in the rope or winding appliances is discovered—
- (a) it shall be immediately reported to the person in charge; and
 - (b) a person shall not be raised or lowered by the rope or appliance until the defect is properly and adequately remedied.

(2) Immediately any defect is discovered in a rope, it shall no longer be used for the transport of persons, unless—

- (a) the damaged part is at the end and is cut off; and
- (b) the rope is otherwise safe for use.

37. USE OF CHAINS FOR LOWERING PERSONS.

(1) Subject to Subsection (2), a chain shall not be used for raising or lowering persons in a shaft.

(2) Short coupling chains of two single-link chains of uniform size, each having a breaking strain of not less than eight times the weight of the load on them, may be attached to the cage, skip or other receptacle used for lowering men or materials in a shaft.

38. WINDING AFTER STOPPING.

After any stoppage of winding exceeding four hours in duration (whether for repairs or for other reasons), and after any stoppage in the operation of changing levels, each cage or other receptacle used for lowering men in a shaft shall be run a complete trip up and down the working portion of the shaft to ensure that the shaft is clear and the machinery in working order, before any person is allowed to travel in the cage or other receptacle.

39. GUIDES IN SHAFTS.

In vertical shafts in which men are raised or lowered by machinery, other than machinery operated by hand labour—

- (a) guides shall be provided to within not less than 18.288 m from the bottom of the shaft; and
- (b) efficient means and appliances for steadying the load shall be provided, to the satisfaction of the Departmental Head.

40. SIGNALLING.

(1) A shaft in which a cage is used, and every division of such a shaft in which a person is raised or lowered, shall be provided with a signal line for communicating distinct and definite signals from the bottom of the shaft to the engine room.

(2) A signal line shall be so balanced as to be easily worked by hand without the aid of a lever.

(3) An underground travelling way in which materials are transported shall be provided with proper means of communicating distinct and definite signals between the regular stopping places.

(4) Signals shall be distinctly given.

(5) Only a standard code of signals, approved by the Departmental Head, may be used.

(6) The code of signals used in a shaft shall be clearly printed or painted on a metal plate and posted in a conspicuous place in full view of the engine driver.

(7) If directed by the Departmental Head, the code of signals shall be displayed at such other places as he directs.

(8) A person shall not—

- (a) give a wrong signal; or
- (b) ride on a cage, skip or other receptacle used in a shaft at a time when signals have informed the driver that no person is so to ride.

41. KNOWLEDGE OF SIGNALS.

(1) A person employed as a platman, skipman, braceman or lander in a tunnel or shaft shall have sufficient knowledge of the code and system of signals used as to enable him to use and understand them and to perform efficiently his duties and obligations.

(2) A person shall not be employed as a platman, skipman, braceman or lander in a tunnel or shaft unless he has the knowledge referred to in Subsection (1).

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42. SPEAKING TO DRIVERS.

A person shall not speak to the driver of a hoist or winding engine while his machine is in motion, except for the purpose of stopping the hoist or engine in an emergency.

43. POWER-INDICATING GAUGES.

(1) Each winch shall be provided with an indicating gauge or other suitable device in proper working order to indicate to the person in charge that power is available.

(2) The motive power shall not be cut off until it is safe to do so.

PART IV. – LADDERS AND TRAVELLING WAYS.

44. TRAVELLING WAY CLEARANCE.

On each underground travelling way in which materials are transported, there shall be—

- (a) a clearance of at least 457.2 mm maintained between the sides and the conveyance; or
- (b) a clearance of 609.6 mm on one side; or
- (c) clearly marked manholes each 30.48 m, kept clear.

45. LINING OF SHAFTS.

Ladders and working shafts shall be securely timbered, lined or otherwise made secure, to the satisfaction of the Departmental Head.

46. LADDERS, ETC., IN SHAFTS.

(1) A proper ladder or footway shall be provided in each shaft or tunnel for men ascending or descending, whether or not machinery is used.

(2) A ladder used for the ascent or descent of persons in a shaft shall—

- (a) be securely fixed; and
- (b) be inclined at the most convenient angle that the space in which the ladder is fixed allows,

but shall not be fixed in an overhanging position.

(3) The ladder shall have substantial platforms at intervals of not more than 9.144 m.

(4) Unless the ladder extends above the top of the opening or platform, as the case may be, suitable fixtures for the hand grip shall be placed above the ladder for the use of the persons ascending or descending the ladder.

(5) Ladders shall be so placed that there is not less than 127 mm of foothold between the rungs and the wall against which they are placed.

(6) Construction of the ladders shall conform with the requirements of the Standards Association of Australia Code for the construction of ladders.

(7) A person shall not ascend or descend any portion of a shaft by ladder when the haulage portion is in use, unless the haulage portion is securely fenced off from the ladder compartment.

47. DOORS ON SHAFTS.

(1) Doors of a type approved by the Departmental Head shall be installed where a shaft is sunk from the surface.

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(2) Doors shall be—

- (a) hinged to the frame set off the shaft; and
- (b) so balanced that they close automatically when the lever operating them is released.

(3) The doors shall be kept closed at all times when men are working in the shaft except when opened for—

- (a) the passage of the bucket or other receptacle used in the shaft; or
- (b) the passage of men or materials.

(4) The doors shall be kept locked when no work is being carried out in the shaft.

PART V. – SPECIAL SAFETY AND PROTECTION.

48. WITHDRAWAL OF WORKMEN IN CASE OF DAMAGE.

(1) If it is found by the person for the time being in charge of a shaft or tunnel, or of any part of the shaft or tunnel, that for any reason the shaft or tunnel, or part of the shaft or tunnel, is dangerous—

- (a) every workman shall be withdrawn from the shaft or tunnel, or the part of the shaft or tunnel, found to be dangerous; and
- (b) a competent person appointed for the purpose by the person in charge shall—
 - (i) inspect the shaft, tunnel or part found to be dangerous; and
 - (ii) make a true report of the condition of the shaft, tunnel or part.

(2) A workman shall not, except so far as is necessary for—

- (a) inquiring into the cause of danger; or
- (b) the removal of the danger; or
- (c) exploration,

be re-admitted into the shaft or tunnel, or the part of the shaft or tunnel, found to be dangerous until the person appointed in accordance with Subsection (1) reports that the shaft or the tunnel is not dangerous.

(3) Every report and action taken in accordance with this section shall be notified to the Departmental Head.

49. WORKMEN APPROACHING DANGEROUS PLACES.

(1) In the case of a working in a tunnel or shaft near a place that is likely to be dangerous, the person in charge shall notify the Departmental Head.

(2) When notification is received under Subsection (1), the Departmental Head may issue any directions that he thinks suitable for the safe working of the place concerned.

50. MEN WORKING ALONE.

(1) In any shaft, tunnel, quarry or deep excavation works where men are required to work alone, whether above or below ground, it is the responsibility of the person in charge to make arrangements to ensure that they are visited at intervals of not more than two hours during each working shift.

(2) A workman shall not be employed alone in dangerous ground.

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51. SAFETY HELMETS.

A person shall not work or pass in or about any tunnel, shaft, quarry or deep excavation unless he is wearing a hard hat, of the type approved by the Departmental Head.

52. FENCING OF SHAFTS AND PROTECTION OF EXCAVATIONS.

(1) All entrances to shafts shall be securely fenced off to the satisfaction of an Industrial Safety Officer.

(2) An excavation of any kind shall be securely protected and made safe for persons employed in or about it.

53. SAFETY OF MACHINERY.

Machinery shall be maintained in good working order, and shall be suitable and safe for the work for which it is to be used.

54. SAFETY INSPECTION.

(1) The person in charge, or a competent person appointed by the person in charge, shall—

(a) once in every week carefully examine—

(i) the buildings, machinery, tunnels, shafts and excavations; and

(ii) all other places used in the working of the tunnels, shafts and excavations,

as to their safety; and

(b) report on any alterations or repairs necessary to ensure the safety of persons employed in places referred to in Paragraph (a).

(2) Alterations or repairs necessary to ensure safety to persons shall be carried out without delay.

55. GUARDING OF MACHINES.

All exposed or dangerous parts of machinery shall be kept securely and safely fenced.

56. LIGHTS.

Lights approved by the Departmental Head shall be provided for the use of the workmen in any underground working.

57. SAFETY BELTS AND ROPES.

Where the Departmental Head so directs—

(a) safety belts and safety ropes shall be provided; and

- (b) workmen shall wear safety belts and safety ropes where necessary to ensure safety.

58. WORKING ON POWER LINES.

Where men are engaged on electric power lines, suitable danger notices shall be attached to the switchboard.

59. FIRE-FIGHTING EQUIPMENT.

Fire-fighting equipment, to the satisfaction of the Departmental Head, shall be provided and maintained in or about a tunnel, shaft or excavation.

60. INFLAMMABLE REFUSE.

(1) Inflammable refuse—

- (a) shall be removed from the workings at least once each week; and
- (b) shall not be allowed to accumulate below ground level.

(2) Refuse removed under Subsection (1) shall be disposed of in a suitable manner away from the workings.

(3) Oil and grease kept underground shall be stored in suitable metal containers.

61. OPEN CUTS.

Where any excavation work is in operation—

- (a) if the face of the cut is more than 19.812 m in height it shall be worked in benches, unless otherwise approved by the Departmental Head; and
- (b) all unconsolidated matter (such as clay, earth, sand, gravel and loose rock) lying within 1.829 m from the rim of the cut shall be removed; and
- (c) beyond 1.829 m from the rim of the cut, all overburden shall be sloped at an angle of repose; and
- (d) a person shall not be permitted to work near the wall of the cut until the person in charge, or a competent person appointed by him, has examined the wall and pronounced it safe; and
- (e) where the wall of the cut is found to be unsafe, a person shall not be permitted to do other work on the cut until all dangers have been removed; and
- (f) each person engaged in work on the wall shall wear a substantial and adequate lifeline that is securely fastened above the working place; and
- (g) a person shall not be lifted or lowered, or allow himself to be lifted or lowered, by means of a crane or derrick; and

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(h) a person shall not ride on a conveyor or belt.

62. REPORT OF DANGEROUS CONDITIONS.

(1) A person in or about a shaft, tunnel or excavation work who witnesses any circumstance, manner or thing that may be likely to cause danger of any kind shall immediately notify it to the person under whose immediate direction or control he is.

(2) A person on duty as a shift boss or leading hand in any shaft, tunnel or excavation workings shall, on changing his shift, inform the person appointed to relieve him of the state of the workings in the part of the shaft, tunnel or excavation workings in which he is employed.

63. INTOXICATING LIQUOR.

A person who is under the influence of, or carrying, intoxicating liquor shall not—

- (a) enter any shaft, tunnel or excavation workings; or
- (b) be in the proximity of any working place on the surface or near machinery that is in motion.

PART VI. – INTERNAL COMBUSTION ENGINES UNDERGROUND.

64. USE OF INTERNAL COMBUSTION ENGINES UNDERGROUND.

(1) An internal combustion engine other than an internal combustion engine driven by diesel fuel shall not be installed underground.

(2) An internal combustion engine shall not be installed underground without the approval of the Departmental Head.

65. INSPECTION OF ENGINES.

(1) All internal combustion engines used underground–

(a) shall be inspected daily and examined by–

(i) the person in charge; or

(ii) a competent person, other than the driver, appointed for the purpose; and

(b) shall be inspected at least once in every week by a competent diesel engineer or mechanic,

as to the safe operation of the engine.

(2) An engine shall not be used underground if it has any defect that may affect its safe operation.

66. FUEL FOR DIESEL ENGINES.

Fuel for diesel-engined machines used underground shall–

(a) have a flash point of not less than 65.6° C; and

(b) be conveyed into underground workings in approved strong receptacles that–

(i) do not leak; and

(ii) are regularly tested and examined for leakage by the person in charge or a competent person appointed for the purpose by the person in charge; and

(c) be conveyed underground only in quantities approved by an Industrial Safety Officer; and

(d) be stored underground only as approved by an Industrial Safety Officer; and

(e) be placed in the engine of the vehicle at a place and in a manner approved by an Industrial Safety Officer.

67. FIRE EXTINGUISHERS, ETC.

Fire extinguishers of a type and capacity approved by the Departmental Head shall be installed on all diesel-engined machines and at all fuel rooms and service points, and buckets of dry sand shall be provided at all fuel rooms and service points.

68. EXHAUST SCRUBBERS, ETC.

(1) If approved by the Departmental Head, exhaust gas scrubbers or other apparatus, suitable for—

- (a) making toxic exhaust gases harmless; or
- (b) reducing the toxic content of such gases so as to comply with this Order,

shall be fitted to all diesel-engined machines used underground.

(2) The tanks of the exhaust gas scrubbers shall be cleaned and filled daily with fresh water.

(3) Any other apparatus for making toxic exhaust gases harmless shall be examined daily and cleaned as frequently as is necessary.

69. RUNNING OF ENGINES WHEN STATIONARY.

Diesel-engined machines used under ground shall not be left running while the machine is not being operated, except for short periods when necessary.

70. ENGINE EXHAUSTS.

Engine exhaust gases shall be discharged at a point remote from the engine operator.

71. VENTILATION.

(1) Diesel-engined machines may be used underground only in places where the following standards of ventilation are maintained:—

- (a) air for the ventilation shall be drawn from the purest possible source and contain—
 - (i) not less than 20% by volume of oxygen; and
 - (ii) not more by volume than—
 - (A) 0.025% of carbon dioxide (CO₂); or
 - (B) 0.01% of carbon monoxide (CO); or
 - (C) 0.0025% of nitrous oxide or sulphuretted hydrogen; and
- (b) the exhaust gases of diesel-engined vehicles do not contain more than 0.15% of carbon monoxide; and
- (c) the quantity of air passing through is not less than 1.415 m³ per minute per brake horsepower or 141.58 m³ per minute whichever is the greater.

(2) For the purposes of Subsection (1)(c), the total power of the maximum number of vehicles working in any place at any one time shall be used as the power for computing the quantity of air in accordance with that paragraph.

(3) The quantity of air for the vehicles referred to in Subsection (1)(c) is in addition to any quantity of air required for any other purpose.

72. ANALYSES OF AIR.

(1) Analyses, by methods approved by the Departmental Head, of—

(a) the air in places where diesel-engined vehicles are used underground;
and

(b) the exhaust gases of such vehicles,

shall be made at four-weekly intervals or more frequently as directed by an Industrial Safety Officer.

(2) The results of analyses under Subsection (1) shall be recorded, and the records shall be made available to an Industrial Safety Officer.

73. DEVICES TO INDICATE AIR CIRCULATION.

Where required by an Industrial Safety Officer, suitable devices to show that a sufficient quantity of air is circulating shall be installed in all places where diesel-engined machines are used underground.

PART VII. – TRENCHES.

74. TRENCHES IN HARD COMPACT GROUND.

(1) This section applies in respect of trenches over 2.438 m in length or 1.524 m in depth in hard compact ground.

(2) The trenches shall be braced at intervals not exceeding 1.829 m with runners of 31.75 mm hardwood or heavier material, placed vertically in the trench opposite each other against the trench wall.

(3) The runners shall, if possible, extend to the bottom of the trench, and otherwise as low as possible to clear the top of the pipe, sewer, conduit or other material to be placed in the bottom of the trench.

(4) The runners shall be supported by walings placed horizontally and held in position by screw jacks or struts, and side and end walings abutting at the corners of excavations shall be joined by halving one to the other so that each waling sustains its correct proportion of any external load imposed on them.

(5) The cross sectional dimensions of hardwood walings shall not be less than 152.4 mm x 76.2 mm, and walings of other materials or timbers shall be at least of strength equivalent to that of hardwood walings.

(6) Walings shall be spaced not more than 0.914 m apart measured vertically from centre to centre of walings.

(7) Struts or screw jacks shall be spaced not more than 1.829 m apart, except at the joints of walings where they shall be closer.

(8) The cross-sectional dimensions of struts relative to the width of the trench shall not be less than the dimensions shown in the following table:—

Width of trench.	Dimensions of strut.
0.304 m but less than 0.914 m	101.6 mm x 76.2 mm
0.914 m but less than 1.524 m	152.4 mm x 76.2 mm
1.524 m but less than 2.133 m	152.4 mm x 101.6 mm
2.133 m or more	152.4 mm x 152.4 mm

(9) All struts, braces and walings in any excavation works shall be properly and adequately secured so as to prevent their accidental displacement or fall.

75. TRENCHES IN SATURATED, ETC., GROUND.

(1) This section applies in respect of trenches in saturated, filled or otherwise unstable ground.

(2) The trenches shall be close timbered.

(3) The cross-sectional dimensions of the runner shall not be less than 152.4 mm x 38.1 mm for hardwood timber runners.

(4) The cross-sectional dimensions for hardwood timber walings shall not be less than 152.4 mm x 177.8 mm.

(5) The walings shall be spaced as required by Section 74(6).

(6) Struts shall be of the cross-sectional dimension specified in Section 74(8).

76. USE OF HEAVIER TIMBERS.

In exceptional circumstances, if the Departmental Head thinks that heavier timber is necessary he may order heavier timbering than prescribed in Section 74 or 75.

77. DISPOSAL OF EXCAVATED MATERIAL.

(1) Excavated material shall not be placed nearer than 0.609 m to the edge of the trench.

(2) Where the excavated material is unstable or of running consistency, no material shall be placed nearer than 0.914 m to the edge of the trench except with the approval of an Industrial Safety Officer.

78. EGRESS FROM TRENCHES.

Trenches 1.524 m or more in depth shall be supplied with one ladder for each 60.96 m or fraction of 60.96 m of trench, and each ladder shall extend from the bottom of the trench to at least 1.067 m above the top of the trench.

79. SAFETY HATS.

A person working in a trench over 1.524 m in depth or where there is any danger of material falling from the top of the trench shall wear a hard safety hat of approved design.

80. BARRIERS ABOUT TRENCHES.

Trenches into which a person is liable to fall shall be provided with a suitable barrier to a height of at least 0.914 m and as close as is reasonably practicable to the edge of the trench.

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