Section 1.

1. These regulations may be cited as the General Safety Regulations.

Section 2.

2. In these regulations, where a unit of measurement is given in metric (System International d'Unites - SI) the metric unit is binding and if an Imperial unit appears in parenthesis after it the Imperial Unit is given only as an approximate equivalent.

Section 3. GENERAL

3. (1) Workers with physical or mental impairment shall not be assigned to work where such impairment endangers themselves or others.
(2) No employee shall enter or remain or be permitted to remain on the premises of any place of employment while his or her ability to work is so affected by alcohol, drug or other substance as to endanger his or her health or safety or the health or safety of any other person.

Section 4.

4. (1) Machinery and equipment shall be operated only by people who are authorized to do so; those who are authorized shall be adequately instructed and trained, and able to demonstrate an ability to operate the machinery or equipment safely.
(2) Before any equipment or machinery is put into operation the person responsible for doing so shall take care that:
    (a) all affected areas are inspected;
    (b) all safeguards and controls required by these regulations are in place and functioning and;
    (c) the operation of the equipment or machinery will not cause undue risk of injury to workers in the area.

Section 5. PERSONAL PROTECTIVE EQUIPMENT

5. (1) All workers shall equip themselves with suitable clothing to protect themselves from the natural elements to which they may be exposed and shall furnish themselves with footwear as required by these regulations.
(2) Every employer shall equip each worker with safety headgear, eye and ear protection, respiratory protection, personal flotation devices, foot guards, leggings, fall arresting devices, and other specialized protection where the use is required by these regulations.

(3) Where the clothing of a worker is likely to become contaminated, during the work process, with a substance which is health hazard, facilities shall be provided at the place of employment for laundering the clothing and keeping work clothes separate from street clothes.

Section 6.

6. (1) Where there is a danger of contact with moving parts of machinery or with electrically energized equipment, or where the work process is such that a similar hazard exists:
(a) the clothing of workers shall fit closely about the body;
(b) dangling neckwear, bracelets, wrist watches, rings or similar articles shall not be worn; and
(c) cranial and facial hair shall be confined, or worn at a length which will prevent it being snagged or caught.
(2) Leg protective devices shall be worn by workers regularly operating chain saws.
(3) Workers regularly exposed to the hazard of moving vehicles shall wear distinguishing apparel conforming to the applicable requirements of section 21,3.
(4) Parts of a machine, transmission machinery, device or thing shall be cleaned, oiled, adjusted, repaired, or have maintenance work performed on them only when
(a) motion that may endanger a worker has stopped, and
(b) any part that has been stopped and that may subsequently move and endanger a worker has been blocked to prevent its movement.

Section 7.

7. (1) Substantial footwear, made of leather or other material appropriate to the protection required, shall be worn by workers in all industrial occupations.
(2) Safety footwear shall be worn by workers in all work areas where there is a hazard of injury to the toes, metatarsal area, or soles of the feet; such footwear shall conform with CSA Standard Z195 entitled "Safety Footwear".
(3) The soles and heels of such footwear shall be of a material that will not create a danger of slipping.
(4) Footwear that has deteriorated to a point where it does not provide the required protection shall not be used.
(5) Subsection (2) does not apply when foot guards or other devices affording equivalent protection are worn.

Section 8.

8. (1) Safety headgear shall be worn by workers in all work areas where there is a hazard from falling, flying, or thrown objects; such headgear shall conform with CSA Standard Z94.1 entitled "Industrial Protective Headgear".
(2) Chin straps or other effective means of keeping safety headgear on the wearer's

head, shall be properly fitted and worn when workers are exposed to high winds or other conditions which might cause the loss of headgear.
(3) Operators and passengers of over snow machines and motor cycles used in employment shall wear approved safety helmets, winter helmet liners, cold weather face guards, and suitable eye protection while operating or riding in or on those machines or motor cycles; such headgear shall conform with CSA Standard D230.

Section 9.

9. (1) All persons handling or using acids, caustics, steam, abrasives, hot fluid jets, or similar harmful substances, shall use suitable personal protective equipment, or other protective methods that will provide protection against these hazards.
(2) Appropriate facilities for flushing the eyes or the entire body shall be available where workers are or may be exposed to harmful and corrosive substances.

Section 10.

10. (1) Properly fitting goggles, face shields, or other eye protective equipment, appropriate to the work being done, shall be worn by a worker who
(a) is handling or is exposed to any material which is likely to injure or irritate the eyes, or
(b) is engaged in any work in which there is a hazard of eye injury, or
(c) has no better than 20/200 vision in either eye or is blind in either eye.
(2) Industrial eye protectors shall meet the requirements of CSA Standard Z94.3 entitled "Eye Protectors".
(3) A worker employed in an industrial occupation who intends to wear contact lenses at his or her place of employment, shall tell his or her employer about that intention.
(4) No worker shall wear contact lenses where
(a) gases, vapours, or other materials are present which when absorbed by contact lenses, may harm the eyes, or
(b) there are present dusts or other materials which may harm the eyes or cause distraction that may expose the worker to other injury.

Section 11.

11. (1) Every worker employed under conditions that involve a risk of drowning shall wear a personal flotation device having a buoyant effect sufficient to keep the worker's head above the water; the device shall be one that does not require manual manipulation to produce the buoyant effect.
(2) Any personal flotation device purchased after April 1, 1981, shall be in conformity with one of the following standards and shall be so labelled in accordance with those standards:
(a) Canadian Government Specifications Board 65-GP-11 for Personal flotation

Devices, Type 1 (Inherently Buoyant);

(b) Canadian Government Specifications Board Standard 65-GP-7 for Life Jackets (Inherently Buoyant).

(3) Lifesaving appliances, including life-boats, life-rafts, life- buoys, buoyant apparatus and life-jackets shall be fitted with retro-reflective tapes; installations of tapes shall be made in accordance with the current requirements of the Department of Transport (Canada).

(4) Existing personal flotation devices which conform to subsection (1) may remain in use if in serviceable condition.

Section 12.

12. (1) When workers are or may be exposed to an oxygen deficient atmosphere or to harmful concentrations of air contaminants, mechanical means or engineering design shall be utilized to prevent or to eliminate those hazardous conditions of exposure.

(2) Where the prevention or elimination of the hazardous conditions referred to in subsection (1) is not reasonably practicable, or where the exposure results from temporary or emergency conditions only, every worker exposed to the hazard shall wear protective respiratory equipment.

(3) Protective respiratory equipment shall be of a design and quality that provides adequate protection against contaminants in the work place and shall be maintained in good working order in accordance with the manufacturer's instructions.

(4) Every worker who is required to use respiratory protective equipment shall be given instruction by the employer to understand its use, its limitations, and its maintenance requirements, as far as these relate to its correct use by the worker.

(5) Workers required to use respiratory protective equipment shall be clean shaven where the face-piece seals the face.

(6) Access routes to work areas where workers may be exposed to oxygen deficient atmospheres or harmful concentrations of air contaminants shall be posted with signs specifying:

(a) the areas and hazards involved;

(b) the required personal protective equipment.

(7) The employer shall ensure that sufficient workers, who are trained in rescue procedures are immediately available whenever workers are working in areas where an oxygen deficient atmosphere exists or harmful concentrations of air contaminants exist or those hazards are likely to develop. The rescue workers shall have immediate access to appropriate breathing apparatus or other aids necessary to effect a rescue.

(8) Where a worker is wearing air-line or air-hose type respirators in an atmosphere immediately harmful to the worker,

(a) the air supply source shall be attended by another worker who shall be equipped to effect rescue or render assistance if the worker is rendered unconscious or otherwise incapacitated, and

(b) the worker shall be provided with and carry an auxiliary supply of compressed respirable air of sufficient capacity to enable the worker to escape from the area in an emergency or until rescue is effected.

Section 13.

13. The employer shall ensure that respirable air supplied by mechanical ventilation devices is free of dust, oil vapours, and toxic or noxious fumes or gases.

Section 14.

14. When workers are required to work in areas in which the noise levels exceed the permissible noise exposure levels established by the Occupational Health Regulations, the employer shall take appropriate measures to suppress the noise to approved levels and, if it is not reasonably practicable to decrease the noise or isolate the worker from the noise, the workers shall be provided with and wear personal protective equipment that will effectively protect them from the harmful effects of the noise.

Section 15.

15. (1) Where it is not practicable to provide adequate work platforms, scaffolds or staging, safety belts, life-lines or safety straps conforming with CSA Standard Z259.1-1981 shall be worn by all persons working at elevations 3 m (10 ft.) or more above grade or floor level.
(2) These regulations do not apply to structural steel erectors or similar tradesmen experienced in working at heights in circumstances where
    (a) the use of belts, life-lines, or safety-straps would produce an additional hazard or is clearly impracticable, or
    (b) safety nets or equivalent protection against falling are in use.

Section 16.

16. (1) When workers are employed under circumstances where they might become entrapped by material they shall wear a safety-belt or safety-harness attached to a life-line or other device, attended by another person who shall be stationed, equipped and capable of immediately effecting a rescue.
(2) Where the workers must be lifted through a man-hole or other opening of such size as to necessitate lifting them in a vertical attitude, those workers shall each wear a harness that will enable them to be lifted in such a manner; a wrist-harness alone is not acceptable for this purpose.
(3) Life-lines and safety-straps shall be independently secured to firm structures having adequate strength to bear them; and the life- lines shall be suitably padded at points of attachment and elsewhere, as necessary, to protect against chafing or abrasion caused by contact with sharp edges.
(4) Except as allowed by subsection (5), life-lines, lanyards, and safety-straps shall be
    (a) first-grade, three-strand, hawser-laid manilla rope of not less than 19 mm (3/4 in), having a breaking strength of not less than 24 kN (5400 lbs), or

(b) synthetic fibre rope or webbing, or wire rope having a breaking strength not less than that specified in paragraph (a).

(5) When the axes or other tools that are used are likely to sever, abrade, or burn the life-line, lanyard or safety-strap, a wire rope of equivalent strength, or four strand wire-cored manilla rope of not less than 16 mm (5/8 in) diameter and having a breaking point of not less than 23.4 kN (5,250 lbs) shall be used.

(6) Where workers are engaged in work in proximity to energized electrical circuits or in other work where conductive safety-straps cannot be used, two non-conductive safety-straps shall be worn to provide the additional protection required, in lieu of the wire or wire-cored rope specified by subsection (5).

(7) Life-lines exceeding 91 m (300 ft) in length shall not be used.

(8) Terminal eye-splices in hawser-laid manila ropes shall have a minimum of 4 tucks; such eye-splices in synthetic fibre ropes shall have a minimum of 6 tucks; all splices in braided ropes shall conform with the manufacturer's instructions.

(9) Life-lines, lanyards, and safety-straps shall be free of knots or splices except at their terminals.

(10) Life-lines shall extend to within 3 m (10 ft) of ground level or a safe landing.

(11) Safety-belts, safety-straps, and life-lines shall be arranged to limit the free-fall of a worker to 1.22 m (4 ft).

(12) Thimbles shall be installed to protect ropes from chafing at points of connection to eyes, rings, and snaps.

(13) Not more than one worker shall be attached to any one life- line.

Section 17. PERSONAL HAZARDS

17. No worker shall be permitted to work where vision within a work area is restricted by the presence of dust, smoke, steam, or other substances in the atmosphere, which might result in workers being exposed to hazards, unless effective means of communication are provided.

Section 18.

18. (1) Open flames, steam pipes, steam or hot water jets and other high temperature sources shall, wherever reasonably practicable, be positioned or shielded to prevent accidental contact by a worker with the hazard.

(2) Where such a source is necessarily unshielded, or exposed, workers shall wear suitable personal protection equipment in accordance to the requirements of section 5.

Section 19. TRANSPORTATION OF WORKERS

19. (1) When workers are being transported in the body of a vehicle isolated from the cab
(a) some form of ventilation shall be used to remove any possibility of the air becoming contaminated,

(b) an interior light shall be provided, and

(c) some signal device or other method of communication shall be provided between the driver and the passengers.

(2) No worker shall be required or permitted to

(a) ride in or on any vehicle in a standing position unless protection is provided against being thrown off balance, or

(b) sit with any part of his or her body protruding outside any part of the vehicle while riding in or on the vehicle.

(3) Where a vehicle is used primarily to transport workers, firmly secured seats and safe means of access and egress shall be provided.

(4) When the body of the vehicle is enclosed, the exhaust outlets shall be so located so that exhaust gases cannot enter the enclosed body of the vehicle.

(5) When workers are being transported by vehicle, loose equipment shall not be carried in the passenger compartment.

(6) No explosives or flammable material, other than normal fuel supply for the vehicle or boat shall be transported in a vehicle or boat transporting workers within the body of the vehicle or boat.

(7) Workers shall not board or leave any moving vehicle.

(8) While being transported in a boat or water craft workers shall wear personal flotation devices in accordance with section 11.

Section 20. PUBLIC WAY

20. (1) Where a building or other structure that is being constructed, altered, repaired, dismantled or demolished is within 2 m (6.5 ft) of a public way, a covered way shall be constructed over that part of the public way immediately adjacent to the building before the construction, alteration, repair, dismantling, or demolition of the adjacent part of the building is begun.

(2) Where a covered way is required under subsection (1) it shall

(a) have a clear height of not less than 2.5 m (8 ft.),

(b) have a clear width of not less than 1.5 m (5 ft.) or, where it is over a sidewalk that is less than 1.5 m (5 ft.) wide, have a width equal to the width of the sidewalk,

(c) be capable of supporting any load likely to be applied to it, but in no case less than 2.4 kN per square meter (55 lbs. per sq. ft.) on the roof,

(d) have a weather-tight roof sloped toward the project,

(e) be totally enclosed on the project side with a structure having a reasonably smooth surface facing the public way,

(f) have a railing 107 cm (42 in.) in height on the street side where the covered way is supported by posts on the street side, and

(g) be adequately lighted when the public way is lighted.

(3) When a project of the kind described in subsection (1) may constitute a hazard to the public and is located 2 m (6.5 ft.) or more from a public way, a strongly constructed fence, boarding, or barricade not less than 1.8 m (6 ft.) in height shall be erected between the project and the public way.

(4) Barricades shall have a reasonably smooth surface facing the public way and shall be without openings, except those required for access.

(5) Access openings through barricades shall be equipped with gates which shall be

kept closed and locked when the project is unattended and shall be maintained in place until completion of the project.
(6) Where any special hazard exists from which it is not possible to protect the public by other means, workers shall be employed to prevent the public from entering the danger zone at any time of the day or night.
(7) When work on a construction site is suspended or ceases so that it will not be occupied, the hazardous part of the construction site shall be protected by
(a) covering with a securely fastened barricade all windows, doors, and other openings located within 3 m (10 ft.) of the ground which may give access to the building, or
(b) constructing a fence or barricade constructed according to the requirements of subsections (3), (4) and (5).
(8) Where a project is on or adjacent to a public way, all machinery, equipment, and material that might be a hazard to vehicular or pedestrian traffic shall be marked by flashing devices.
(9) If a street or public property must be used to carry out works of short duration, public access shall be restricted or controlled by barriers or people to direct traffic.
(10) Warning lights shall be installed on all barriers during darkness or when visibility is poor.

Section 21.

21. (1) Where a worker may be endangered by vehicular traffic on a project on a public way or on a public way on a project, the worker shall be protected by such of the following measures as are necessary for his or her protection:
(a) workers directing traffic by signs;
(b) warning signs;
(c) barriers;
(d) lane control devices;
(e) flashing lights or flares.
(2) Workers who are required to direct traffic shall be given written instructions in a language they can read and understand setting out the signals they are to use and the instructions shall be explained to them verbally.
(3) Workers who are directing traffic or who may be endangered by vehicular traffic while they are working on a public way shall wear high visibility safety headgear and vests that shall be reflective fluorescent and colored blaze orange or red.

Section 22. WORKPLACE

22. (1) Floors, platforms, stairs, and walkways used by a worker shall be maintained in a state of good repair and kept free of tripping and slipping hazards.
(2) Where the work process results in the spillage of a substance on the floor of a work area and where this spillage could create a slipping or other hazard, suitable means shall be adopted to control this hazard.
(3) Disposal methods must be used that do not create hazards to other persons,

equipment, or structures.
(4) Salvaged lumber shall have protruding nails removed promptly and shall be piled safely; scrap lumber shall not be allowed to accumulate in the working area.
(5) Rags that have been used for cleaning or wiping flammable or harmful materials from any surface shall be stored in covered metal containers and the containers shall be clearly labelled.
(6) Flammable liquids or harmful substances shall be stored in approved containers and the contents shall be clearly identified on the outside of the containers.
(7) Flammable liquids shall be stored in accordance with local by- laws and The Fire Prevention Act and regulations made thereunder.
(8) Racks for the storage of materials or equipment shall be adequately designed and constructed and shall be placed on level and solid foundations.
(9) Stacked material or containers shall be interlocked to provide stability and when this is impractical stacked materials or containers shall be effectively secured or restrained from dislodgment to prevent injury to workers.

Section 23.

23. (1) If compressed air or steam is used for blowing dust, chips, or other substances, from equipment, materials, and structures, no person shall be exposed to the jet of air or steam or to the material expelled or propelled by the jet; nor shall such a jet be used if a fire, explosion, or other hazard is likely to result.
(2) Compressed air or steam shall not be used for blowing dusts, chips, or other substances from clothing being worn by workers.
(3) Notwithstanding subsection (2) compressed air may be used in specially designated areas for blowing dusts or other substances from clothing being worn by workers if appropriate eye protection is worn and the compressed air supply is limited to 69 kPa (10 psi), or safety nozzles that have the same pressure limiting effect are used.

Section 24.

24. Every employer shall ensure that
(a) linoleum and other polished floor surfaces are treated with a non-slip preparation,
(b) rugs are maintained in good order and that torn or damaged floor coverings are removed or repaired immediately,
(c) entrance steps and stairs to buildings are free from ice and snow at all times,
(d) all stairways are equipped with anti-slip treads and suitable handrails and are kept clean and dry,
(e) differences of floor elevation in aisles and corridors are clearly marked,
(f) power and telephone outlets, wires, and extension cords are not located where they will cause a tripping hazard,
(g) step ladders or stands provided with non-slip feet or treads are available to workers when high files or high equipment is being used, and
(h) materials are not placed on the floor where tripping may result.

Section 25.

25. (1) Working space and office equipment shall be so arranged that fire codes are not violated and there is easy access to all exits.
(2) Floors shall be adequate to carry the load.
(3) File cabinets shall be placed so as to distribute the weight properly.
(4) Flammable liquids and similar materials shall be stored in a safe place and only minimum quantities shall be kept in the office for immediate use.

Section 26.

26. (1) Every working area shall be provided with the appropriate level of illumination recommended by the current edition of the CSA publication C92.1.
(2) Emergency lighting shall be provided in places of employment that are normally used during periods of darkness or that do not have an available source of natural light.
(3) Emergency lighting shall provide a minimum level of 10.8 lx (1 foot candle) at all means of egress from the place of employment.
(4) Where emergency lighting is required it shall be from a power source independent of that for the general lighting or shall be controlled by an automatic device that will reliably operated the secondary power source in the event of failure of primary power source.

Section 27.

27. (1) Work places shall be adequately ventilated either by natural or mechanical means and excessive air draughts shall be avoided.
(2) An employer whose operations produce or disseminate gases, vapours, smokes, fumes, mists, or dusts that can or may accumulate in hazardous concentrations in work areas shall install a ventilation system of a capacity sufficient under normal operating conditions to maintain the concentration of the contaminants in the atmosphere of work areas below the threshold limit values established by the Occupational Health Regulations.
(3) Whenever reasonably practical, contamination shall be controlled at its source.
(4) When contamination arises from a variety of sources not all of which can be controlled by local ventilation at each source, the employer shall install a general ventilation system, calculated on a standard height basis, in addition to any local ventilation system.
(5) All ventilation systems shall be designed to provide an amount of fresh air at least equal to the designed exhaust capacity of the system.
(6) A general ventilation system, shall be so designed that under normal operations a worker is not located between the source of contamination and the exhaust pickup.
(7) Ventilation systems shall be so designed that exhausted air does not re-enter the working area or contaminate any other working area.
(8) Ventilation openings shall be kept clear of all obstruction.
(9) All ventilation systems shall be maintained in good working order.
(10) Whenever an operation produces or creates flammable dust, vapours, smoke,

fumes, or gases that may exceed the lower explosive limit of the dust, vapour, smoke, fume or gas, such operation shall be provided with its own separate approved exhaust system.
(11) When a change in a process or operation increases the harmful contaminants in the work environment, the ventilation system shall be modified to handle the increase of contaminants.
(12) A permanent inlet shall be provided for replacement air.
(13) Opening of doors or windows shall not be considered adequate ventilation for replacement air purposes.

Section 28.

28. Walkways shall
    (a) be clearly marked out,
    (b) be 1 m (3.3 ft.) in width if considered as direct access to exits,
    (c) be provided with guardrails where there is a falling hazard, and
    (d) have safe access by means of fixed ladders or stairways.

Section 29.

29. (1) All permanent walkways and platforms 3m (10 ft.) or more above grade and all floor openings shall be equipped with toe- boards.
(2) Walkways and platforms at any height, when installed over machinery and work areas, shall be equipped with toe-boards.
(3) The top of the toe-board shall be approximately 10 cm (4 in.) above the floor or platform and the clearance between the bottom of the toe-board and the floor or platform shall not exceed 13 mm (_ in.).
(4) Where materials are stored nearby, toe-boards shall be increased in height or mesh panels of appropriate height shall be installed to prevent such material from falling.

Section 30.

30. (1) Curbs shall be installed wherever there is danger of vehicles or equipment running off the edge of an elevated area.

Section 31.

31. (1) Every flight of stairs having more than 4 risers shall be equipped with handrails
    (a) on all open sides of stairways,
    (b) on one side of enclosed stairways 1 m (3.3 ft.) or less in width, and
    (c) on both sides of enclosed stairways over 1 m (3.3 ft.) in width.

(2) The top of a handrail shall be at a height between 80 cm and 90 cm (32 and 35 in.) above the stair tread, measured vertically from the nose of the tread and the height shall not vary on any flight or succession of flights of stairs.
(3) Handrails on open sided stairways should be fitted with midrails located approximately equi-distant from the top of the handrail and the nose of the stair tread.

Section 32.

32. (1) Guardrails shall be provided around any uncovered opening in a floor, roof, or other surface to which a worker has access.
(2) Guardrails shall be provided at the perimeter of the open sides and ends of a floor, including a mezzanine and a balcony, of the surface of a bridge, of a concrete roof while the form work remains in place, and of a scaffold platform, working platform, runway, or ramp to which a worker has access and from which the worker may fall into water or from which the worker may fall a vertical distance of 2.4 m (8 ft.) or more.
(3) A guardrail constructed in accordance with section 33 shall be provided at the open sides and ends of a scaffold platform, working platform, runway or ramp that is used as a path by wheelbarrow or other similar equipment and from which a worker may fall a distance of 1.2 m (4 ft.) or more.
(4) Where an opening in any floor or other surface to which a worker has access is not protected by a guardrail, the opening shall be covered with securely fastened planks capable of supporting or braced either permanently or temporarily to support all loads to which they may be subjected and capable of supporting at least a live load of 2.4 kN per square meter (55 lbs. per sq. ft.) without exceeding the allowable unit stress for each material used.

Section 33.

33. (1) A guardrail shall consist of a top rail, intermediate rail and toe-board, and be capable of resisting any load likely to be applied to it.
(2) The top of a guardrail shall have a height of not less than 91 cm (3 ft.) and not more than 1.07 m (3 ft. 6 in.) above the surface, floors, scaffold or roof on which it is installed.
(3) A wooden guardrail shall be free of splinters and protruding nails and shall consist of
(a) a top rail not less than 38 mm (1 _ in) by 89 mm (3 _ in.) securely supported on posts which are not less than 38 mm (1 _ in.) by 89 mm (3 _ in.) and spaced at intervals of not more than 2.4 m (8 ft.),
(b) an intermediate rail not less than 19 mm (3/4 in.) by 89 mm (3 _ in.) in size and securely fastened to the inner side of the posts midway between the top rail and the toe-board, and
(c) a toe-board securely fastened to the posts or other vertical supports and extending from the surface, floor, scaffold, or roof to a height of not less than 10 cm (4 in.).
(4) A wire cable guardrail shall be maintained taut by means of a turn-buckle and shall consist of
(a) a top rail and an intermediate rail made of wire cable not less than 10 mm (2/5

in.) in diameter,
(b) vertical separators not less than 5 cm (2 in.) wide spaced at intervals not exceeding 2.4 m (8 ft.), and
(c) a toe-board securely fastened to the inner side of the vertical separators and extending from the surface, floor, scaffold or roof to a height of not less than 10 cm (4 in.).

Section 34.

34. All workplaces where workers are required to be shall have safe means of access and egress appropriate to the conditions of the work area.

Section 35.

35. (1) Doors shall not open directly onto stairways but shall open onto floors or landings having a width in excess of the swing of the doors.
(2) Double-acting swing doors shall be designed and installed to permit adequate view through the doors.
(3) Transparent glass doors and transparent glass panels, that extend less than 30.5 cm (12 in) from the floor, and that could be mistaken for doorways, shall be constructed of laminated, tempered or wired safety glass.
(4) Subsection (3) does not apply where the glass is fitted with bars, or other devices or marking, which clearly indicate the presence and position of such doors and panels.

Section 36.

36. (1) An emergency plan including firefighting shall be developed for each workplace.
(2) Emergency means of escape shall be provided from any work area in which the malfunctioning of a work process could create an immediate danger to a worker and where regular means of exit could be rendered dangerous or unusable.
(3) Emergency exits shall be designed, marked and maintained to provide quick and unimpeded exit.

Section 37.

37. (1) Fire hoses equipped with nozzles, portable extinguishers, automatic sprinkler valves, hydrants and all other fire fighting equipment shall be provided and maintained in accordance with the Fire Protection Act.
(2) Portable extinguishers approved under the Fire Protection Act shall be placed
(a) in any workshop,
(b) in any building used for storage or handling of combustible materials or

flammable liquids,
(c) in places where welding or cutting operations with a torch are being carried on and for a reasonable time thereafter,
(d) where temporary oil or gas-fired heat generators are used,
(e) where there is use of a tar or asphalt kettle,
(f) near the exits on each storey having a floor area of 500 square meters (5382 sq. ft.) or less in a building where construction is in progress, and an additional portable fire extinguisher for each additional 500 square meters (5382 sq. ft.) of floor area or any fraction thereof.

(3) Portable fire extinguishers approved under the Fire Protection Act shall
(a) offer protection in keeping with the nature of the hazard,
(b) be filled after each use,
(c) bear the name of the person in charge of its maintenance and the date of its annual inspection, and
(d) contain an appropriate fire-fighting substance, but shall not contain carbon tetrachloride or methyl bromide.

Section 38. CONFINED SPACES

38. (1) In this section, "confined space" means a place
(a) to which or from which the means of access or egress are restricted because of location, design, construction, or contents, and
(b) in which a hazardous accumulation of gas, vapour, dust, mist or smoke may be present, or there may be an oxygen content in the atmosphere of less than 18% or more than 23%, and includes an open or closed tank, vat, sewer, pipe, duct, flue, reactor, chamber, and other such spaces, and bilges, tanks, compartments, or cargo spaces of marine equipment.

(2) A worker shall not enter or be required to enter a confined space unless
(a) there is a means of egress from all accessible parts of the confined space by a manhole or other clear opening,
(b) mechanical equipment installed in the confined space is disconnected from its power source and locked out,
(c) all pipes and other supply lines are blanked off or where it is impractical to blank or blind piping containing hazardous substances, written work procedures are implemented to ensure at least equal protection to all workers exposed to the hazard, and
(d) sufficient tests are made for oxygen deficiency, flammability, explosive conditions and toxic vapours, in appropriate locations by a competent person who shall record the results of each test in a permanent record, evaluate the tests, certify in writing in the permanent record that a hazard does not exist in the confined space and that there is not a likelihood of a hazard developing while any person is in the confined space having regard to the nature and duration of the work to be performed.

(3) Where a confined space contains or is likely to contain a gas, vapour, dust, mist or smoke that is toxic or hazardous or has or is likely to have an oxygen content in the atmosphere of less than 18% or more than 23%, the space shall be purged and ventilated to provide and maintain a safe atmosphere, and in addition to the measures and procedures prescribed by subsection (2), a competent person shall be in

attendance, stationed outside the confined space, and rescue procedures shall be established and equipment readily available to remove a worker if necessary.
(4) Where a space to which subsection (3) applies cannot be purged and ventilated to provide and maintain a safe atmosphere, in addition to the measures and procedures prescribed by subsections (2) and (3), a worker entering or required to enter the space shall use
(a) a self-contained breathing apparatus and a safety harness or other similar equipment to which is securely attached a rope the free end of which is fastened to a solid support and which is held by a person who is equipped with an alarm and is keeping watch outside the confined space, and
(b) such other equipment as is necessary to ensure the worker's safety.
(5) The safety harness, rope, and other equipment mentioned in subsection (4) shall be inspected to ensure that it is in good working order at all times.
(6) In addition to the requirements of subsections (2), (3), (4) and (5), where the gas or vapour in a confined space is or is likely to be, explosive or flammable, the confined space shall not be entered unless
(a) the concentration of the gas or vapour does not, or is not likely to, exceed 50% of the lower explosive limit of the gas or vapour,
(b) only cleaning or inspection is to be performed,
(c) explosion-proof equipment is used.
(7) Cold work may be performed in a confined space which contains, or is likely to contain, an explosive or flammable gas or vapour where the concentration does not, and is not likely to, exceed 10% of the lower explosive limit of the gas or vapour.
(8) Where the confined space is a manhole or vault containing electrical equipment, the work shall be
(a) performed by an electrical utility or an employer specializing in such work,
(b) carried out by at least two competent persons,
(c) supervised by a competent person,
(d) performed in accordance with the code of rules, techniques and procedures approved for work in manholes and vaults containing electrical equipment, and
(e) carried out using tools, clothing, and equipment that is adequate and specifically designed for the work being performed.

Section 39. HAND TOOLS AND POWER DRIVEN PORTABLE TOOLS

39. (1) Every employer shall ensure to the extent that is reasonably practicable that every hand tool or portable power tool used by employees is so designed and constructed as to be safe under all conditions of its intended use.
(2) Hand tools shall be
(a) suitable for the work for which they are intended,
(b) used only for the purposes for which they were designed, and
(c) inspected and replaced or repaired if they are found defective.
(3) Hand tools shall not be left in elevated locations from where they could fall on people.
(4) Handles for tools such as axes, hammers, sledge-hammers, shall be carefully adjusted to the heads, firmly fixed, and replaced if found defective.
(5) Files shall have metal ferruled handles or other suitable handles and shall not be

used without them.
(6) Where screw-jacks and jacks are used to lift loads, they shall
(a) rest on solid bases, and
(b) be lined up with the load to lift.
(7) Pipes or other extension pieces shall not be adapted to wrenches unless they are designed to be used under such conditions.

Section 40.

40. (1) Every employer shall ensure that every electric portable power tool used by any employee is
(a) of a type intended for commercial or industrial use, and
(b) certified as safe for its intended purpose by the Canadian Standards Association or some other testing agency acceptable to the Chief Industrial Safety Officer or the Chief Mines Safety Officer.
(2) Every employer shall, where there is a risk that an explosive or flammable atmosphere in any place is likely to be ignited by sparks, ensure that the exterior surface of any tool used by any of the employees in that place is made of non-sparking material.
(3) Portable electrical tools shall be
(a) effectively grounded by using three-wire cords and three- prong polarized plugs inserted in grounded polarized receptacles, and
(b) provided with double insulation.

Section 41.

41. (1) Operating triggers of portable pneumatic tools shall be
(a) so located as to reduce any risk of accidental starting, and
(b) so designed as to close automatically the compressed air supply valve when the operator releases them.
(2) Electrical wires and the hoses supplying compressed air to portable power driven tools shall be
(a) suspended
(b) protected on the floor in order to avoid any damage to these wires or hoses, and to reduce risks of tripping, and
(c) provided with a third conductor for grounding in the case of electrical wires.
(3) Portable power driven tools shall be regularly examined and, if found defective, shall be replaced or repaired.
(4) Guards or safety devices on portable power driven tools shall be left in place while using these tools.

Section 42.

42. (1) No worker shall remove or change an attachment, or make any adjustment or repair

to a portable power tool unless the tool is disconnected from its power source in a manner that ensures that it cannot be inadvertently reconnected.
(2) Every worker who uses a pneumatic portable power tool shall shut off the air supply to that tool and bleed the air line before disconnecting it from the tool unless the air line is equipped with a quick disconnect coupling that makes such precautions unnecessary.
(3) No worker shall use a pneumatic portable power tool or air hose in such a manner that an air stream might be directed forcibly against his body or the body of any other person.

Section 43.

43. (1) A chain saw with a bar of less than 66 cm (26 in.) shall be equipped with a chain brake and an activating device.
(2) A chain saw shall be equipped with a handle vibration isolation system that prevents vibration in the front and rear handles; this system shall be designed and constructed so that failure of one of the isolators does not result in the loss of ability of the operator to stop the chain saw under full control.
(3) A chain saw shall
(a) have a chain that minimizes the possibility of a kickback,
(b) be in safe operating condition,
(c) when being started, be held firmly,
(d) when being used, be held firmly by both hands,
(e) have the chain stopped when not actually cutting, and
(f) not be refueled when, because of the heat of the motor or of some other reason, there is danger of fire or explosion.

Section 44. POWDER ACTUATED TOOLS

44. (1) No powder actuated fastening tool shall be used unless it is of a type which has been approved by the Canadian Standards Association and meets C.S.A. Standards Z166-1975.
(2) No worker shall operate a powder actuated tool until they
(a) have been trained in the use of the specific make and model of that tool,
(b) are in possession of a valid Operator's Certificate,
(c) have been authorized by their supervisor to use the tool, and
(d) are wearing the personal protective equipment as specified in Sections 5-16.
(3) Tools shall be operated in accordance with the manufacturer's instructions.
(4) A powder actuated tool shall not be used in an explosive or flammable atmosphere.
(5) When powder actuated tools are used in confined spaces ventilation shall be supplied as specified in Section 38.
(6) When not in use, unloaded tools and their explosive charges shall be kept in a place of storage, accessible only to persons authorized to handle them.
(7) Power loads of different power levels and types shall be kept in separate compartments or containers.

Section 45.

45. (1) Only persons authorized by the Director shall instruct and qualify operators of powder actuated tools.
(2) All authorized instructors shall have in their possession a valid Authorized Instructor's Certificate issued and signed by a safety officer.
(3) After training, the operator shall satisfactorily complete a written examination.
(4) The written examination shall assess the operator's competence with respect to
(a) proper use and applications of the tool according to manufacturer's specifications,
(b) the powder actuated fastening system, and
(c) the specific details of operation and maintenance of the tool(s) involved.
(5) Each qualified operator shall have a valid Operator's Certificate in their possession at all times while using the tool; this certificate shall be displayed upon request.
(6) An Operator's Certificate is valid only when issued for the makes and models to tools being used.
(7) An Operator's Certificate shall be valid for a period not exceeding five years; issuance of a new certificate is contingent upon the satisfactory completion of a written examination.

Section 46. LIFTING, HOISTING AND CRANES

46. (1) While working in a boatswain chair a worker shall wear a safety belt which shall be attached to a life-line.
(2) The life-line and the support for the boatswain chair shall be secured to separate anchor points.
(3) The boatswain chair shall be supported by a 19 mm (3/4 in.) manila rope rigged at least three to one.
(4) A boatswain chair shall be constructed of 25 mm (1 in.) thick select No. 1 hardwood suspended from its four corners with not less than 19 mm (3/4 in.) manila rope crossed diagonally under the seat; or a metal boatswain chair of equivalent strength may be used.
(5) The boatswain chair shall be equipped with
(a) retaining cables preventing any swaying,
(b) stirrups so as to avoid numbness of the legs, and
(c) a back.

Section 47.

47. (1) Pilots of helicopters used for aerial construction, demolition, erection, dismantling and the associated transport of workers or materials, shall have
(a) a commercial, senior commercial, or airline transport helicopter pilot's license endorsed for the type of aircraft being used, and
(b) a minimum of 500 hours flying time as pilot-in-command of helicopters.
(2) Whenever approaching or leaving a helicopter with blades rotating, all workers shall remain in full view of the pilot and shall avoid the area from the cockpit or cabin

rearward, unless authorized by the pilot, and should not approach the helicopter from uphill nor depart in an uphill direction.
(3) No airlift operation shall be initiated without effective clear channel radio communication between pilots and supervisors of all workers involved in the operation; hand signals shall be rehearsed in advance, but shall be used only to complete an operation in the event of radio failure when the aircraft has been committed to a point which precludes termination of the operation.
(4) Workers who are in two-way radio contact with pilots, shall be identified by wearing fluorescent red vests or jackets.
(5) In structural erection or dismantling, where existing conditions adversely affect communications between the supervisor and the crew handling the airlift load, designated crew members shall wear receivers on which they can hear radio communication to and from the pilot.
(6) Workers shall not touch an airlift load or any part of its rigging until accumulated static electricity has first been discharged to ground.

Section 48.

48. (1) Material assembly yards, landing areas, and work sites shall be located at a safe distance from trees, poles, power lines, and other obstructions, and shall be kept clear of slipping and tripping hazards and excavated materials or other obstructions, that could endanger workers during placement of loads airlifted by helicopter.
(2) In all work areas exposed to helicopter rotor downdrafts,
(a) equipment and materials shall be secured against dislodgment, and
(b) effective measures shall be taken to control dust and prevent loose materials from becoming airborne.
(3) Helicopters shall be equipped with both electrically and mechanically operated load release mechanisms, to permit instant release of the load in an emergency; automatic load release mechanisms shall not be armed while handling loads over workers.

Section 49.

49. (1) All rigging used in helicopter airlifting operations shall be in conformity with the requirements of sections 50, 51, 52, 53, and 54.
(2) Tag lines shall be of a length that will not permit their being drawn up into rotors.
(3) The working load on ropes, chains, slings, hooks, and fittings shall not exceed the safe working load recommended by the manufacturer.
(4) Except as otherwise specified by these or other regulations made under the Occupational Health and Safety Act, the safe working load of ropes, chains, slings, hooks, attachments, and other rigging equipment shall be warranted by the manufacturer of the equipment, or be certified by a professional engineer or by any other person whose qualifications are acceptable to the Chief Industrial Safety Officer or the Chief Mines Safety Officer.
(5) When a warranty or certification described in subsection (4) is not obtainable the

maximum rated loads shall not be more than

(a) one-fifth of the ultimate breaking strength of the weakest component of the rigging, or

(b) one-tenth of the ultimate breaking strength of the weakest component of the rigging, when the rigging is used as a means of supporting workers.

(6) Ropes, chains, slings, and fittings shall be inspected thoroughly at regular intervals, and when found to have deteriorated to such an extent as to make them unsafe for use, they shall be discarded.

(7) Hooks that have opened more than 15% of the normal throat opening measured at the narrowest point, or that have twisted more than 10° from the original plane of the hook, or that are cracked or otherwise defective shall be permanently removed from service.

(8) Knotted slings shall not be used.

(9) When slings are applied to sharp-edged loads, the sharp edges shall be guarded wherever possible to prevent damage to the slings.

(10) Chain slings bearing hazardous defects, such as stretch or deformation, cracks, nicks or gouges, corrosion pits or burned links, shall be permanently removed from service or returned to a chain sling manufacturer for repair, reconditioning, and proof-testing.

(11) Chain slings shall not be exposed to temperatures above 260°C (500°F) without written instructions from the manufacturer.

(12) Chain slings shall be designed in such a manner and manufactured from such material which will stretch at least 15% before breaking.

Section 50.

50. (1) Synthetic fibre-web slings, shall be constructed, tested, certified, and identified by the manufacturer in accordance with the "Recommended Standard Specification for Synthetic Web Slings" of the Web Sling Association Inc.

(2) Slings constructed from nonmetallic fibres shall not be subject to a temperature above 82°C (180°F).

(3) Nonmetallic fibre slings bearing nicks, cuts, burns, or any other damage or defect shall be removed from service until repaired and recertified by an agency acceptable to the Chief Industrial Safety Officer or the Chief Mines Safety Officer.

Section 51.

51. (1) Wire core rope slings shall not be exposed to or used at temperatures above 205°C (400°F) and fibre core wire rope slings shall not be exposed to or used at temperatures above 100°C (212°F) without written instructions from the manufacturer.

(2) Wire rope utilizing the Lang's Lay type of construction shall not be used for slings.

(3) Wire ropes shall be considered unserviceable and shall be permanently removed from service if

(a) in running ropes, 6 randomly distributed wires are broken in one rope lay, or 3 wires are broken in one strand in any one lay,

(b) in standing ropes, there are more than 2 broken wires in one lay in sections between end connections, or more than one broken wire at an end connection,
(c) wear, or the effects of corrosion, exceeds 1/3 of the original diameter of outside individual wires,
(d) there is evidence of kinking, birdcaging, or any other damage resulting in distortion of the rope structure,
(e) there is evidence of any heat damage, or
(f) there are reductions of normal rope diameter, from any cause, in excess of
(i) 1mm (3/64 in.), for diameters up to and including 19 mm (3/4 in.),
(ii) 2 mm (1/16 in.), for diameters 22 to 29 mm (7/8 in. to 1 1/8 in.) inclusive, or
(iii) 3 mm (3/32 in.), for diameters 32 to 38 mm (1 1/4 in. to 1 1/2 in.) inclusive.

TABLE 1

Diameter of Rope in inches		Number of Clips	Spacing Between Clips Centre to Centre		Torque	
mm	(in)		mm	(in)	Pounds' Foot	Newton Meters
6	(1/4)	2	38	(1 1/2)	15	20.34
8	(5/16)	2	51	(2)	30	40.67
10	(3/8)	2	57	(2 1/4)	45	61.01
11	(7/16)	2	63	(2 1/2)	65	88.13
13	(1/2)	3	76	(3)	65	88.13
16	(5/8)	3	10.2cm	(4)	95	128.80
19	(3/4)	4	11.4cm	(4 1/2)	130	176.26
22	(7/8)	4	13.3cm	(5 1/4)	225	305.06
25	(1)	4	15.2cm	(6)	225	305.06
28	(1 1/8)	5	17.8cm	(7)	225	305.06
32	(1 1/4)	5	20.3cm	(8)	360	488.09
38	(1 1/2)	6	22.9cm	(9)	360	488.09
44	(1 3/4)	7	26.7cm	(10 1/2)	465	630.46
51	(2)	8	30.5cm	(12)	650	881.28

Section 52.

52. (1) Whenever practicable cable clips shall be torqued to the manufacturer's specifications or, in the absence of specifications, to the values shown in Table 1 below.

(2) Cable clips shall be installed with u-bolts on the dead end of the line.
(3) Double-saddle type clips shall be used in similar numbers and spacing.
(4) Where a wedge socket connector is used as a wire rope terminal, the dead end of the rope shall be looped back on itself and secured with a single cable clip.
(5) Hands or feet shall not be used for the purpose of spooling lines; spooling devices shall be used to ensure proper spooling.
(6) Ropes shall be securely fastened to winding drums.

(7) At least five full wraps of rope shall remain on the drums at all times.
(8) Knots or cable clips shall not be used as stoppers on rope ends which pass through an opening in the drum.
(9) Hooks, shackles, eyes, and other rigging fittings shall be designed, manufactured, and assembled in accordance with their intended use; makeshift fittings, including those constructed from reinforcing steel rod, shall not be used.
(10) Spreader bars and similar specialized lifting devices shall be designed by qualified persons and shall be clearly marked to indicate their safe working loads.
(11) A safety hook, shackle, or mousing shall be used when
(a) hoisting concrete buckets,
(b) hoisting cages or skips,
(c) suspending any type of working platform, or
(d) in any other operation where dislodgment of the hook may create a hazard to workers.
(12) When shackles are being used, shackle pins shall be secured to prevent accidental withdrawal.
(13) Manufactured pressed steel ferrules shall only be used with the "Flemish eye" splice to form any eye loop in a wire rope when the ends of the splice are visible beneath the ferrule or the ferrule is identified as covering a "Flemish eye" splice.
(14) Manufactured aluminum alloy ferrules, which have been pressed to form a cold flowed mass around the strands of the wire rope, may be used to form an eye loop on a wire rope where such ferrules are so identified.
(15) Rigging blocks of cranes, derricks, and hoists shall be constructed and installed so that the cable cannot jump off the sheaves.

Section 53.

53. (1) Hoisting equipment shall be operated only by qualified persons.
(2) Operators shall inspect the hoisting equipment at the beginning of each shift and shall test limit-switches, brakes, circuit- breakers and other control and safety devices; any defects found shall be reported immediately to the supervisor, who shall then be responsible for determining the action to be taken; when the defects affect the safe operation of the equipment, it shall not be used until the defects have been remedied.
(3) When the operator has any doubt as to whether a load can be safely hoisted, he or she shall not hoist the load; instead, he or she shall report the circumstances to the immediate supervisor who shall then be responsible for determining the action to be taken.
(4) Loads shall not be permitted to contact crane booms and booms shall not be permitted to contact structures.
(5) When a hazard is created by the swinging movement of the load, cab, counterweight or any other part of the lifting equipment, no worker shall remain within range of the swinging load or equipment, and the operator shall not move the equipment when any worker is so exposed.
(6) Equipment shall be so positioned that no swinging portion of the equipment can come within 61 cm (2 ft.) of any obstruction in any area accessible to workers; where this cannot be done, entry to such areas shall be prevented by barriers or other effective means.

(7) The use of 2 cranes for any one load shall be under the direction of a qualified supervisor who shall be responsible for the safe conduct of the total operation.
(8) The operator shall ensure that loads are carried as close to the grade as possible, tag lines shall be rigged as necessary to control swinging of the load.
(9) Operators of hoisting equipment shall not pass loads over workers, unless no practicable alternative exist and then only when the workers have been warned of the danger by the sounding of an audible alarm.
(10) No suspended load shall be left unattended by an operator, nor shall any worker stand or pass beneath a suspended load.
(11) All loads shall be hooked or slung under the direction of designated competent workers.
(12) Double choker slings shall be used on all horizontal loads, comprising two or more pieces of material, over 3 m (10 ft.) in length.

Section 54.

54. (1) A signaller shall be employed whenever the hoisting equipment operator does not have a clear and unobstructed view of the load hook throughout its complete range of operation.
(2) Where hoisting operations are required to be controlled by signals, hoisting equipment operators shall act only on signals from designated signallers.
(3) Two-way radio or other audio or video systems acceptable to the Chief Industrial Safety Officer or the Chief Mines Safety Officer shall be used when distance, atmospheric conditions, or other circumstances render the use of hand signals hazardous or impracticable.
(4) Two-way radio system shall operate on ultra-high frequencies and shall have selective calling capability.

Section 55.

55. No worker shall ride on loads, slings, hooks, or similar equipment.

Section 56.

56. (1) Mobile cranes shall be designed, constructed, maintained, and operated in accordance with the Canadian Standards Association Safety Code, Z150 entitled "Safety Code for Mobile Cranes".
(2) Mobile cranes shall be operated with their turntables level, except as permitted by the manufacturer; level indicating devices shall be provided and used for this purpose.
(3) Truck and wheel-mounted cranes shall be adequately and securely blocked on firm ground before hoisting commences; outriggers, when deployed to meet load capacity requirements, shall be fully extended and secured against retraction; outrigger beams shall be marked to indicate the fully extended position and jacks shall be extended

sufficiently to bear the full weight of the crane with running gear clear of the ground.
(4) The owner or lessee of any piece of machinery used to lift loads and capable of vertical, lateral, or rotational motion, shall post on the piece of machinery a sign reading: "Danger do not approach electric power lines"; such sign shall be posted in a conspicuous place so as to be seen by the operator and shall be in 15 mm (9/16 in.) lettering, at least.
(5) The safe working load shall not be exceeded and shall be determined by
(a) the original manufacturer of the equipment, or
(b) a registered professional engineer.
(6) Modification or re-manufacture of equipment shall be supported by a certificate of adequacy, signed by a registered professional engineer.
(7) All cranes, derricks, hoists, and similar equipment shall be permanently identified by the legible display of the manufacturer's name, model, and serial number on the structure and, where applicable, on major components.
(8) Where the origin or safe working load of a crane or hoist cannot be ascertained, or its continued safe use cannot be assured because of its age or history, the crane or hoist shall not be used until examined and certified by a registered professional engineer.
(9) A permanent notation shall be affixed to each crane, derrick, hoist and similar hoisting equipment, showing its safe working load expressed in Imperial and metric (SI) units; such notation shall be kept legible and clearly visible to the operator and all persons directly involved with the safe operation of the equipment.
(10) The safe working load expressed in Imperial and metric (SI) units shall be plainly marked on the load block and superstructure of hoisting equipment and shall be kept legible; the capacity of the hoisting equipment shall not exceed that of its superstructure.
(11) Subsection (10) does not apply to hoisting equipment when the safe working load is affected by
(a) the vertical or horizontal angle of a boom or jib,
(b) the length of a boom or jib,
(c) the position of a load-supporting trolley, or
(d) the use or position of outriggers to increase the stability of the structure.
(12) Where the safe working load is affected as outlined in subsection (11), a separate load chart showing the safe working loads in Imperial and metric (SI) units in all possible working positions and configurations of use shall be:
(a) permanently posted on the equipment; or
(b) issued to the operator of the equipment, who shall keep it available and legible at all times when operating the equipment.
(13) Every crane having a boom movable in the vertical plane, shall be equipped with means or devices to indicate the safe working load at various boom angles, and boom extensions or radii of lift; the devices may indicate the safe working load directly, or indirectly by showing the information required to determine the safe working load by reference to the load chart.
(14) All cranes, derricks, and hoists shall be inspected frequently and shall be maintained so that every component is capable of carrying out its original design function with adequate margins of safety; if examination reveals any condition that might endanger workers, the equipment shall not be used until the dangerous condition is remedied.
(15) On any project where any crane, derrick, or similar hoisting equipment is being used, a manufacturer's manual shall be supplied or available to all persons concerned

with the safe operation of each unit of equipment, and that manufacturer's manual shall show the approved methods of erection, dismantling operation, adjustment and maintenance of the component parts and of the assembled unit; the unit shall not be erected, dismantled, operated, adjusted, or maintained in any other manner, unless approved by the original manufacturer, or by a registered professional engineer and such modifications and deviations shall be recorded in the manual.

(16) A log book or other recording medium, acceptable to the Chief Industrial Safety Officer or chief Mines Safety Officer, shall be provided and maintained for each powered crane, derrick and hoist, of the following types:

(a) overhead travelling, bridge, and gantry cranes;

(b) tower cranes;

(c) stiff-leg, guy, A-frame and gin-pole derricks;

(d) jib, wall and pillar cranes, exceeding 2032 kg. (2 tons) capacity;

(e) mobile cranes, drag lines, aerial ladders and baskets, but excluding cranes of less than 1016 kg. (one ton) capacity;

(f) hoisting units of greater than 1016 kg. (one ton) capacity;

(g) such other types of hoisting equipment as the Chief Industrial Safety Officer or Chief Mines Safety Officer may specify.

(17) Such log books, or other recording media, shall show the main maintenance history and any structural modification of the equipment; this data shall be immediately available to the operator and to any person concerned with the maintenance and safe operation of the equipment; such persons shall be responsible for recording any defects, operating difficulties, the need for maintenance and all inspection, maintenance, modification, and repair work performed; all entries shall be made legibly and shall be dated and signed.

Section 57.

57. (1) Cranes shall be set up, assembled, extended and dismantled only

(a) by competent persons,

(b) in accordance with the written instructions of the manufacturer, and

(c) in such a manner as to eliminate hazards to any person and property.

(2) Only the correct sections for the particular crane shall be used and they shall be in an undamaged condition without either broken welds or bent bracings and main chords.

(3) Only the correct size and quality of nuts, bolts, pins and fastenings shall be used and they shall be assembled in the correct manner and sequence in accordance with the written instructions of the manufacturer.

(4) Outriggers and stabilizing devices, when deployed to meet load capacity requirements, shall be fully extended to bear the whole weight of the crane and shall rest on firm ground or blocking adequate to support the maximum loads without failure, unreasonable settlement or deformation.

Section 58.

58. (1) All undercarriages of rail-mounted tower cranes shall be fitted with rail clamps which

can be firmly attached to the rails to lock the crane in position.
(2) A rail-mounted tower crane shall be securely locked to the rails when not in use.
(3) A rail-mounted tower crane shall have adequate rail stops or bumpers that are securely attached at both ends of the rails and extend at least as high as the centre of the wheels.
(4) The track bed of a rail-mounted tower crane shall have a sound and rigid base capable of carrying the maximum load to which it is likely to be subjected without unreasonable settlement or deformation.
(5) Automatic means shall be provided for the protection of tower cranes from overload at relative radii; and where the load hoisting capacity changes with the distance of the hook from the tower, the overload protection shall be capable of protecting the crane from overload at the different radii.
(6) Tower cranes shall have a device that automatically applies the brakes when a load reaches its highest permissible position or the trolley reaches its travel limits.
(7) Every twelve months the structural elements and components of a tower crane shall be inspected for soundness by competent persons using approved methods of non-destructive testing.
(8) Where a tower crane jib is permitted to swing freely in the wind and the crane is unattended, the empty load block shall be raised near its top position and located at minimum radius.

Section 59.

59. (1) A mechanical hoist, rigid beam, or swing beam hoist, or other similar roofer's hoist used in roofing shall be operated only by a competent person.
(2) The counterweights on a roofer's hoist shall
(a) be suitable for the purpose,
(b) not consist of roofing or other construction material,
(c) be securely attached to the hoist, and
(d) be of such weight that their total weight will provide a factor of safety against overturning of not less than three.

Section 60.

60. (1) Powered hoists and winches shall be designed, constructed, and maintained in accordance with the American National Standards Institute, Safety Codes B30.7 entitled "Base Mounted Drum Hoists' and B30.16 entitled "Overhead Hoists" as applicable.
(2) The supporting structure to which a hoist is attached shall have a safe working load equal to, or greater than that of the hoist; the safe working load shall be clearly marked upon the structure.
(3) The supporting structure shall not prevent the hoist from aligning itself with the load and shall be located to permit the operator to stand clear of the load.
(4) Every trolley from which a hoist is suspended shall be fitted with a means to prevent the trolley from falling in the event of wheel or axle failure.
(5) Air operated hoists and winches shall be provided with an air supply of sufficient

pressure and capacity to safely operate the hoists; means shall be provided to prevent inadvertent disconnection of air supply hoses.
(6) Electrically operated hoists and winches shall be properly grounded and connected to their power supply.

Section 61.

61. (1) Manually operated hoists and winches shall be designed and constructed in accordance with the requirements of the American National Standards Institute B30.16 entitled "Overhead Hoists", or other standards acceptable to the Chief Industrial Safety Officer or the Chief Mines Safety Officer.
(2) A hand operated hoist shall be provided with a ratchet and pawl, load brake, or other mechanism which will hold the load at any desired height.
(3) Crank operated winches, not fitted with automatic load brakes, shall be provided with a means of preventing the crank-handle from slipping.
(4) Subsection (3) does not apply where crank-handles have been replaced by permanently secured, smooth rimmed hand wheels.

Section 62.

62. (1) Gin poles or A-frames shall not be inclined more than 45 degrees from the vertical and shall be equipped with boom stops.
(2) The sheave and cap shall be attached to the gin pole securely enough to withstand any imposed load.

Section 63. PILE DRIVING AND DREDGING

63. (1) Restraining devices shall be used
(a) on connections of hoses under pressure, when inadvertent disconnection could cause a reaction dangerous to workers,
(b) on equipment under stress, where the failure, fall or collapse of the equipment may injure workers, and
(c) to secure objects from falling and endangering workers.
(2) Floors, decks, platforms, stairs, and walkways used by workers, shall be maintained in a state of good repair and shall be kept free of tripping and slipping hazards.
(3) Safe means of access and egress shall be provided to and from all work areas.
(4) Engine exhaust gases and steam shall be discharged only where such discharge will not harm workers, nor interfere with the view of the operator or other workers.

Section 64.

64. (1) All fixed work platforms 3 m (10 ft.) or more above grade or deck level, shall be fitted with standard guardrails, in conformity with the requirements of sections 32 and 33.
(2) Suspended work platforms such as Gilley boards, small boats and buckets shall:
(a) be equipped with adequate hoisting slings, secured by safety-wired shackles or safety hooks, but open hooks shall not be used;
(b) have the total weight of the platform, occupants and rigging accurately determined, and a safety factor of 10 shall be applied to all suspension cables, slings and attachments;
(c) be suspended from hoisting units equipped with a brake capable of controlling the speed during lowering, and of sustaining at rest a load of 1 1/2 times the rated load of the hoisting unit; and
(d) be completely enclosed to a height of 1 m (40 in.), or shall be fitted with substantial guardrails and toe-boards, extending completely about the perimeter, in accordance with the requirements of sections 29 and 32.
(3) When guardrails would interfere with the work process, workers shall wear safety-belts, tied off securely to the structure or, when suspended from a crane or hoist, to a substantial anchorage above the load hook.

Section 65.

65. (1) When workers are employed on floating equipment, a suitable powered boat, ready for use, shall be available for rescue or escape.
(2) Workers exposed to a risk of drowning shall wear personal flotation devices as required by section 11.
(3) Lifebuoys and life-lines shall be provided on all floating equipment, in accordance with the requirements of section 11.
(4) Pile drivers, dredges, and associated equipment operating in navigable waters shall be lighted and shall meet all the requirements of the Department of Transport (Canada).

Section 66.

66. (1) When piling is being hoisted in the leads, only workers engaged in that operation shall remain on the superstructure or within range of a falling pile.
(2) Pile driver operators are responsible for ensuring that suspended hammers are securely chocked when not in use; on pile drivers with swinging or suspended leads, the hammer shall not be raised until necessary.
(3) Pile heads shall be cut square and shall be cleaned of debris, bark and slivers before being driven.
(4) Pile heads shall be trimmed to fit the follower or pile driving cap.
(5) Followers or pile driving caps shall be of a size and type suitable for the type of piling being driven.
(6) Hoisting winches shall be provided with suitable roofs or shelters to protect the operators from falling objects, rigging failures and from the weather.

(7) Crane booms used with vibratory hammers or vibratory pile extractors shall be inspected for structural defects, at least monthly, by a registered professional engineer.

Section 67.

67. (1) Workers shall not walk on floating discharge lines; walkways shall be provided and shall be not less than 50 cm (20 in.) in width and shall be fitted with guardrails as required by sections 32 and 33.
(2) Walkways on floating discharge lines shall be adequately illuminated in conformity with the requirements of subsection 26(1).

Section 68. PLATFORMS, RUNWAYS AND RAMPS

68. (1) A runway, ramp, or platform other than scaffold platform shall:
(a) be designed, constructed and maintained to support, without exceeding the allowable unit stresses for the materials used, all loads that may be expected to be applied to it, but not less than 2.4 kilonewtons per square meter (55 lbs. per sq. ft.);
(b) be 45 cm (18 in.) or more in width; and
(c) be securely fastened in place.
(2) A ramp shall have a slope not exceeding a gradient of one in three, and cross cleats where the slope exceeds a gradient of one in eight; and the cleats shall be spaced at regular intervals not exceeding 50 cm (20 in.) and made from 20 mm (3/4 in.) by 40 mm (1 1/2 in.) size boards securely nailed to the ramp.
(3) Subsection (2) does not apply to a ramp installed in the stairwell of a building not exceeding two storeys in height where the ramp has a slope not exceeding a gradient of one in one and cross cleats that are
(a) spaced at regular intervals not exceeding 30 cm (12 in.), and
(b) made from 38 mm (1 1/2 in.) by 38 mm (1 1/2 in.) size boards securely nailed to the ramp.
(4) Platforms and other similar structures hooked to concrete forms shall be designed, constructed and installed with respect to the work to be performed and the hazards involved; these structures shall be supported on solid foundations, be securely anchored at the rest point, and never be overloaded.

Section 69. MOBILE EQUIPMENT

69. (1) The following types of powered mobile equipment manufactured on or after January 1, 1973 shall, when put into service, be provided with roll-over protective structures (R.O.P.S.) that meet the criteria of the specified Recommended Practice of the Society of Automotive Engineers (S.A.E.) as shown in Table 2 below:

TABLE 2

Equipment	S.A.E. Recommended Practice
(a) Crawlers Tractors, loaders and skidders	J 395
(b) Wheel dozers, loaders and skidders	J 394
(c) Motor Graders	J 396
(d) Self-propelled wheel scrapers	J 320a
(e) Agriculture and industrial tractors	J 334a

(2) The following types of mobile equipment manufactured after January 1, 1979 shall be equipped with roll-over protective structures when put into service
(a) self propelled rock drills,
(b) compactors and rollers.
(3) The following information shall be permanently and legibly marked upon a roll-over protective structure
(a) manufacturer's name and address,
(b) model and serial number, and
(c) make, model, or series number of the machine which the R.O.P.S. is designed to fit.
(4) Crawler tractors operating with side booms are exempt from the requirements of roll-over protective structures.
(5) Replacements, modifications, additions, repairs, weldings, and cuts to a R.O.P.S. shall only be effected in accordance with the manufacturer's instructions or under direction of a professional engineer.
(6) Mobile equipment referred to in Table 2, which was manufactured on or before December 31, 1972, must be equipped with R.O.P.S. which conforms to the following requirements:
(a) the structure and supporting attachments shall be designed, fabricated and attached to support at least twice the weight of the prime mover;
(b) there shall be a vertical clearance of at least 1.3 m (4.3 ft.) between the deck and the R.O.P.S. at the point of operator access and egress;
(c) the equipment must be certified as meeting the above requirements by a professional engineer;
(d) the equipment must be marked in accordance with subsection 3;
(e) any mobile equipment which is already equipped with an overhead canopy or cab shall have the canopy or cab strengthened by the addition of proper gussetting and by substantially attaching the structure to the frame of the machine.
(7) Where glass is used as part of the enclosures for cabs, canopies or tops, it shall be safety glass or an equivalent material.
(8) Broken or cracked glass shall be replaced immediately.
(9) A safety officer may order the installation of a R.O.P.S. on exempted equipment where it is warranted by the nature of the work.

Section 70.

70. (1) Except as otherwise stipulated in these regulations, seat belts meeting the requirements for S.A.E. Recommended Practices J386 and J4c, or other standards acceptable to the Chief Industrial Safety Officer or the Chief Mines Safety Officer and having a minimum webbing width of 76 mm (3 in.), shall be provided and used by the operator and passengers on mobile equipment that has been fitted with a R.O.P.S.
(2) When a motor grader is operated with the cab door open and the operator standing, additional restraints such as door bars, chairs or harnesses shall be installed and used.

Section 71.

71. (1) All mobile equipment shall be maintained in a safe operating condition.
(2) The inspection, repair, maintenance and modification of mobile equipment shall be carried out in accordance with the manufacturer's instructions or, in the absence of such instructions, in accordance to good engineering practice.
(3) The servicing, maintenance and repair of mobile equipment shall, where possible, be done when the equipment is not in operation, but equipment in operation may be serviced if it can be done safely and if the continued operation of the mobile equipment is essential.
(4) When a worker is required to clean, oil or adjust powered mobile equipment or any part thereof that is in motion, and the controls are inaccessible to the worker, another worker shall be stationed at the controls of the equipment and
(a) an adequate means of communication shall exist between the two workers, or
(b) other effective precautions shall be taken to prevent injury to the worker.
(5) The tanks of powered mobile equipment shall not be refuelled
(a) while the engine is running,
(b) while anyone is smoking on or near the vehicle, or
(c) while there is any other source of ignition in the immediate vicinity.
(6) When the operator of powered mobile equipment has any doubt as to the safety of workers, he or she shall not move the equipment of loads until
(a) safe conditions have been assured, or
(b) orders to proceed have been issued by his or her supervisor, who shall ensure that safe conditions exist, and assume responsibility for the safe movement of the equipment or loads.
(7) The operator of powered mobile equipment must have a clear view of the path to be travelled or the movement to be performed; where the operator does not have a clear view he or she shall not proceed until receiving a signal from a designated signaller who does have a clear view of the path to be travelled or the movement to be performed.
(8) No worker shall remain in the cab of any powered mobile equipment while loads are elevated above the cab unless the worker is protected against moving or falling material.
(9) Only the operator, a trainee, a supervisor or necessary maintenance personnel shall be permitted on any part of powered mobile equipment while the equipment is in operation.
(10) Powered mobile equipment shall be so positioned that no swinging portion of it shall come within 60 cm (2 ft.) of any obstruction in any area accessible to workers, unless entry to such area has been prevented by barriers or other effective means.

(11) Where there is a hazard of the operator being struck by flying or falling objects or materials, operators of powered mobile equipment shall be protected by means of adequate cabs, screens, or guards.
(12) Starting devices shall be so arranged as to prevent accidental starting due to unintentional contact.
(13) No belt shall be shifted by hand while the belt is in motion.
(14) All mobile equipment shall be equipped with
(a) an audible warning signal for forward motion and, where the motion is in a reverse direction, a repeated sounding of a warning device, and
(b) a means of illuminating the path of travel at any time when, because of insufficient light or unfavourable atmospheric conditions, persons or vehicles are not clearly discriminable at a distance of 150 m (500 ft.).
(15) Windshields, side and rear windows, and rear-vision mirrors shall be maintained in a condition that provides clear vision for the operator.

Section 72.

72. (1) Except as hereafter specified, powered mobile equipment shall be equipped with service brakes capable of stopping and holding it, within the limits of traction of the braked wheels, on any grade on which it is designed to operate, and when loaded to the manufacturer's gross vehicle weight.
(2) Every motor vehicle shall be equipped with an effective mechanical parking brake.
(3) Where a mechanical parking brake provides the only means of emergency stopping in the event of service brake failure, it shall be capable of stopping and holding the vehicle under any operating condition.

Section 73.

73. (1) Air brakes shall be installed and maintained in accordance with the requirements of the Motor Vehicles Act and the regulations thereunder.
(2) The following types of mobile equipment manufactured on or after July 1st, 1978, shall be equipped with service brake systems, emergency stopping systems, and parking brake systems meeting the performance criteria of either the Society of Automotive Engineers (SAE) recommended practices shown in Table 3 below, or such other standards as are acceptable to the Chief Industrial Safety Officer or the Chief Mines Safety Officer.

TABLE 3

Equipment	S.A.E. Recommended Practice
Off-highway rubber-tires front-end loaders, dozers and skidders	J 237
Off-highway trucks and wagons	J 166
Rubber-tired self-propelled graders	J 236
Rubber-tired self-propelled scrapers	J 319b.

Section 74.

74. (1) All powered mobile equipment fitted with torque-converter or similar fluid drive transmissions shall be provided with services that will permit starting the engine only when the transmission is in the neutral position.
(2) A comfortable, well designed and constructed, safely located, and securely mounted seat shall be provided for the operator of mobile equipment.
(3) A safe means of access shall be provided to the operating platforms, cabs, and bodies of mobile equipment.
(4) The operator shall maintain the floor or deck of mobile equipment free of material, tools or other objects that could create a tripping hazard or that could interfere with the operation of controls.
(5) No person shall board or leave any vehicle while it is in motion, except in an emergency situation.
(6) A cab or other form of enclosure on powered mobile equipment shall have adequate means of ventilation.
(7) Any powered mobile equipment having moving parts on one or more sides of an operator's compartment shall have such moving parts effectively guarded so that no part of any person in the compartment can project into the hazardous area created by the moving parts.
(8) The controls of any powered mobile equipment having moving parts on one or more sides of the operator's compartment shall be located so that they cannot be operated from outside the operator's compartment.
(9) No person shall work beneath an elevated dump truck box or cab until the box or cab has been securely blocked in the elevated position.
(10) Power units on powered mobile equipment shall be kept clean to ensure that excess oil and grease will not contact the clutch or brake bands or drum, and the equipment does not become a potential fire hazard.

Section 75. LOCK-OUT

75. (1) Adjustments or repairs to machinery or equipment shall be done promptly whenever the failure to do so could create a hazard to workers.

(2) No person shall oil or adjust any moving machinery if he or she could come in contact with moving parts.
(3) When machinery or equipment is shut down for maintenance or repairs, no work shall be carried out
(a) until all parts, extensions and attachments have been secured against inadvertent movement,
(b) when the nature of the work exposes workers to mechanical hazards or harmful substances, until the hazardous conditions have been removed, and
(c) until lock-out procedures have been applied.
(4) Machinery, equipment or material that is temporarily elevated and under which a worker may pass or work shall be securely and solidly blocked to prevent the machinery, equipment or material from falling or moving.

Section 76.

76. (1) For the purpose of these regulations "control device" means, in the case of electrical controls, the switch or circuit- breaker controlling the flow of current to the branch circuit which supplies power to the machinery or equipment.
(2) The locking out of individual control buttons or switches on a console does not constitute compliance with these regulations.
(3) When circumstances require the application of lock-out procedures the control devices shall be secured in the inoperative position by the use of locks; such locks shall be marked or tagged to identify the person applying them; written lock-out procedures shall be made available to all workers who are required to work on the machinery or equipment.
(4) Locks issued to an individual worker shall be operable only by that worker's key and by a master key for emergency use, which shall be securely kept under a senior supervisor's control; combination locks shall not be used.
(5) Where a number of locks are issued to a worker for his or her sole use they may be mastered to a single key.
(6) Where circumstances render the application of lock out procedures impracticable, alternative proposals designed to provide equivalent protection to workers shall be submitted to a Chief Industrial Safety Officer or the Chief Mines Safety Officer for consideration and approval.
(7) Where a person is required to work in any vessel or area that is connected to a system of material conveyance, the control devices shall be locked in the inoperative position or other effective means shall be adopted to prevent any substance from flowing into the vessel or area in which the person is working.
(8) Before commencing maintenance or repair work on any power driven machinery or equipment, the control devices shall be secured marked or tagged to identify the person applying them.
(9) Each worker who works on the machinery or equipment requiring lock-out procedures shall be responsible for locking the control devices and removal of his or her own locks on the completion of the work.
(10) The person applying the first lock in a lock-out procedure shall forthwith ensure that the locked-out machinery or equipment cannot be operated.
(11) Locks shall only be removed by the person or persons who installed them, or, in emergency, by the senior supervisor on duty who shall first make a reasonable effort to

contact the individual who put the lock on and who shall then ensure that the machinery or equipment can be operated safely.

(12) Workers coming on shift shall place their own locks on all control devices before the individuals going off shift remove their locks, or the senior supervisor may lock-out the control devices during shift changes to allow workers going off shift to remove their locks.

(13) The use of a key box system as outlined below is acceptable when multiple lock-out points are involved:

(a) two qualified workers, one of whom may be a supervisor, shall be responsible for

(i) locking out the multiple control devices, each using a set of locks, keyed alike, but not keyed to the other set,

(ii) completing, signing and posting the check list adjacent to the key box,

(iii) placing in the box the keys for the locks which are affixed to the multiple control points, and

(iv) locking out the key box using personal locks or other positive sealing devices acceptable to the Chief Industrial Safety Officer or the Chief Mines Safety Officer;

(b) all other workers who are required to work on the machinery or equipment shall also lock-out the key box using personal locks before commencing maintenance or repair work;

(c) on the completion of the work all workers shall remove their locks from the key box;

(d) the two qualified workers who locked out the equipment shall then remove their locks from the key box and from the multiple lock-out points;

(e) a written key box lock-out procedure shall be kept posted at the key box location.

(14) Subsection (2) does not apply where systems are controlled by a central control operator; the operator shall lock-out the central control and record the portion locked-out and the time; the operator shall re-energize the system on the instructions of the person who requested the de-energization, who has first determined that it is safe to do so.

Section 77.

77. (1) Piping which contains hazardous substances under pressure shall, prior to any repair, modification or replacement, be

(a) disconnected,

(b) blanked or blinded, or

(c) double valved, by having 2 valves in the flow lines locked closed, and a bleed off valve between them, locked open.

(2) Piping which has been blanked, blinded, or valved shall be clearly marked to indicate such.

Section 78. MOVING EQUIPMENT AND BUILDINGS

78. (1) Before moving any buildings, loads, or equipment under and adjacent to any power line, the mover shall obtain the permits necessary for such a move.

(2) If the power lines interfere with the proposed move, the mover shall notify the owners of power lines involved before the commencement of any move and request any changes or assistance required.
(3) Power lines shall be moved or handled only when directly supervised by a qualified power company employee.
(4) When a worker is on the top of any building, load, or equipment, the vehicle shall move only upon the direction from the worker who is on the top of the load; a signaller shall transmit such directions to the driver and shall remain in a position where he or she can be clearly seen by the driver and the worker.
(5) Safe means of access to and egress from the top of the building, load, or equipment shall be supplied and maintained by the mover.
(6) Adequate safeguards, to prevent slipping or falling from the top of the building, load or equipment, shall be provided and maintained by the mover.

Section 79. MACHINERY AND MACHINERY GUARDING

79. (1) Where a machine or prime mover or transmission equipment has an exposed moving part that may endanger the safety of any worker, the machine or prime mover or transmission equipment shall be equipped with a guard or other device which prevents access to the moving part.
(2) An in-running nip hazard or any part of a machine, device, or thing that may endanger the safety of any worker shall be equipped with a guard or other device which prevents access to the pinch point.
(3) A machine shall be shielded or guarded so that the product, material being processed or waste stock will not endanger the safety of any worker.
(4) No person shall remove or make ineffective any handrail, guardrail, safeguard, safety appliance or device except for the purpose of immediately making repairs or adjustments or as otherwise provided for in these regulations.
(5) Any person who removes or makes ineffective any such handrail, guardrail, safety appliance or device, for the purpose of making repairs or adjustments, shall replace the same immediately upon the completion of the repairs or adjustments.
(6) When the handrail, guardrail, safeguard, safety appliance or device has been removed and a delay occurs in the completion of the repair or adjustment which makes it impractical to replace the handrail, guardrail, safeguard, safety appliance or device, the worker responsible for its removal shall tag-out, lock-out or otherwise ensure that no worker can come in contact with any exposed moving part of the equipment.

Section 80.

80. (1) Starting devices shall be so arranged as to prevent accidental starting due to unintentional contact.
(2) Before starting any machinery or equipment, the operator shall ensure that he or she or any other worker will not be endangered by the starting of the machinery or equipment.
(3) Every power-driven machine shall have a stopping device located within easy reach

of its operator.
(4) Where the automatic restarting of machinery that has been stopped through power failure would create a hazard to any person, the motor control device shall be designed to prevent restarting after restoration of power.
(5) No conveyor shall be restarted after an emergency stop until it has been inspected to determine that it can be operated safely.

Section 81.

81. (1) Any mechanically driven machine that is not coupled directly to an individual motor shall be provided with a clutch, loose pulley, or other adequate means
(a) that allows starting or sudden stopping of the machine,
(b) whose control is immediately accessible to the operator,
(c) that is protected against any accidental jar capable of starting the machine, and
(d) that is provided with a mechanism preventing the belt from creeping from the loose to the fast pulley.
(2) Unless all machines are clearly visible to the operator, efficient warning devices shall be installed and used to signal starting operations.

Section 82.

82. (1) All belts, gears, shafts, key ways, pulleys, sprockets, spindles, drums, flywheels, couplings, reciprocating, rotating and moving parts or machinery, 2.2 m (7 ft.) or less from the floor, work platform or work area, shall be fenced or guarded, unless they are equipped with a safety device which automatically prevents a worker from coming in contact with them.
(2) Except for those operated from a cat head or capstan, every belt, rope, or chain used for the transmission of power to gears, sprockets, clutches, cranks, and connecting rods shall be enclosed, screened, or railed off to prevent any worker from coming in contact therewith.
(3) All pinch points of all types of machines and the cutting edge of all power-driven tools and production equipment shall be guarded or provided with a device which will be used to prevent accidental contact by worker.
(4) All drive belts, ropes or chains used for power transmission when located over any area used by workers shall have a guard which will effectively protect workers from injury as a result of failure of the belt, rope or chain.
(5) Driven pulleys on line-shafts or counter-shafting, where there is no bearing between the pulley and the outer end of the shaft, shall be equipped with approved safe-guards to prevent the belt from running off the driven pulley.
(6) The manual engagement of belts or cables shall not be done while the pulleys are in motion.

Section 83.

83. (1) All manually controlled loose pulleys shall be furnished with permanent belt-shifters located within easy reach of the operator; the belt-shifter shall be equipped with a device to make it impossible for the belt to creep from the loose pulley onto the tight pulley.
(2) All belts over 10 cm (4 in.) in width, running on cone pulleys, shall be equipped with belt-shifters.
(3) When a belt is not in use it shall be hung clear of shafting and pulleys.
(4) Where it is necessary to apply belt dressing to a moving belt, the dressing shall be applied only where the belt leaves a pulley.
(5) When the pulleys are 20 cm (8 in.) or less in diameter the dressing shall be applied midway between the pulleys but not within 60 cm (2 ft.) of an in-running nip-point.
(6) No cast iron fly-wheel or pulley shall be operated at a rim velocity in excess of the manufacturer's specifications or, in the absence of such specifications, in excess of 1800 meters per minute (6000 ft. per minute).
(7) A pulley or fly-wheel that is defective or that has been exposed to excessive heat shall be removed from service.
(8) No worker shall repair a cast iron fly-wheel by welding, brazing, or bolting.
(9) The nip-point of belt conveyors shall be guarded against contact by any person.
(10) Every projecting shaft end shall be guarded to prevent contact by any person.
(11) Every pit for flywheels or pulleys shall be fitted with curbs or toe-boards.
(12) Every friction-clutch coupling shall have the exposed operating mechanisms guarded, and the operating handles shall be placed at a safe distance from the coupling.
(13) Every gear and chain-drive sprocket shall be completely enclosed or, where complete enclosure is impracticable, shall have band-type guards with flanges extending inward beyond the root of the teeth, and where there is a hazard from exposed spokes, the gear or sprocket shall be enclosed on exposed sides.

Section 84.

84. (1) A grinding wheel shall be
(a) marked with the maximum speed at which it may be used,
(b) checked for defects before mounting,
(c) mounted in accordance with the manufacturer's specifications,
(d) operated at a speed which does not exceed the manufacturer's recommendations,
(e) provided with protective hoods that enclose the wheel as closely as the work will permit,
(f) operated only by workers protected by eye protection, and
(g) stored where it will not be subjected to
(i) extreme heat or cold, or
(ii) damage from impact.
(2) A work rest for a grinding wheel shall
(a) have a maximum clearance of 3 mm (1/8 in.) from the grinding wheel,
(b) be in a position not below the centre line of the wheel, and
(c) not be adjusted while the grinding wheel is in motion.

Section 85.

85. (1) Guards shall be installed at the point of operation on every power press, shear or cutter, or special devices shall be provided and used to prevent injury to the hands of the operator.
(2) After a die-setter has set the dies, and before the machine is placed into operation, the guards and feeding arrangements shall be arranged so as to effectively protect the operator from injury.
(3) Where a ram-enclosure type of guard is used
(a) the opening between the bottom of the enclosure and the work or working surface shall not exceed 10 mm (3/8 in.),
(b) the top of the enclosure shall extend at least as high as the upper limit of the ram,
(c) there shall be no dangerous shear-points between the guard and any moving part,
(d) openings in the guard, if within 10 cm (4 in.) of any moving part, shall not exceed 13 mm (_ in.) in minor dimension, and
(e) openings in the guard, if over 10 cm (4 in.) from a moving part, shall not exceed 5 cm (2 sq. in.).
(4) Where a press is equipped with a gate-guard, two-handed tripping device, or sweep-guard, the guards or devices shall be simple and reliable in construction, application, adjustment, and permanently attached to the press-frame.
(5) Except on large presses that cannot be turned by hand, the source of power shall be disconnected when setting dies.
(6) Every power press that is operated by more than one person shall be equipped with devices to prevent operation of the press until both operator's controls have been activated.
(7) Where a power press that is equipped with more than one control station is operated by only one person, the unused controls shall be locked out.
(8) Where a press is guarded by limiting the ram stroke, the stroke of the ram shall be such that the clearance between the ram and the die or stripper does not exceed 10 mm (3/8 in.).

Section 86.

86. Guillotine and alligator shears and cutters shall be fitted with guards or other devices which will
(a) prevent the hands of the operator from entering the point of operation while the shears are closing, and
(b) protect the operator from flying particles emanating from the shears.

Section 87.

87. (1) All rotating rolls offering a contact hazard for workers shall be so placed that the material to be processed can be fed to the rolls without having the operator's fingers jammed between the rolls or between the guard and the rolls and be equipped with

(a) a quick power-disconnecting or reversing device within easy reach of either hand or foot of the operator, and
(b) a fixed or self adjusting barrier on the in-running angle of the rolls.

(2) Workers shall not manually clean the rolls without having previously stopped the machine and cut the power supply, except for large machines which cannot be turned manually or which are equipped with a slow motion power control.

(3) The clearance between the guard and the material passing through the feed-rolls shall not exceed 9.5 mm (2/5 in.).

(4) Where work processes on metal-forming rolls preclude the use of guards, emergency stopping devices operable by contact with the legs or body shall be installed on the exposed sides of the rolls.

(5) Splash guards shall be provided to contain cutting or cooling fluids thrown from the work.

Section 88.

88. (1) Agitators or mixers shall be equipped with guards or enclosed with guardrails on all exposed sides and be fitted with individual stopping devices or provided with circuit breakers preventing any accidental starting.

(2) Mobile parts or crushers, grinding mills, and pulverizers shall be covered with standard machine guards, and if possible, be enclosed with guardrails.

(3) Crushers shall be enclosed with strong guards or placed in an enclosure for protecting workers from hazards created by flying material.

Section 89.

89. (1) All openings in shaper and planer beds shall be covered or guarded to eliminate shearing hazards.

(2) Guards shall be installed at the farthest points of travel of the carriages or tables of sharpers, planers, surface grinders and like equipment, to protect workers against contact with moving parts.

(3) The rims of the revolving tables of vertical boring mills shall be guarded to prevent contact by workers.

Section 90. MATERIALS

90. (1) All material and equipment shall be placed, stacked, or stored in a manner that will prevent inadvertent movement of the material or equipment that might injure workers regardless of the duration of the placement or storage.

(2) No workers shall enter any place where there is a danger of entrapment in loose material which is stored or exists in bulk form unless safe access thereto has been provided by catwalks, walkways, or other means or unless the worker is equipped with a safety-belt and life-line and is attended by another worker who is prepared to readily

effect the rescue of the worker exposed to the hazard.
(3) When workers might be injured by materials being dropped, dumped, or spilled, the area in which the material may fall shall be barricaded to prevent the inadvertent entry of workers and signs shall be installed to indicate the danger area.
(4) Construction material shall not be stored, stacked, or piled within 1.8 meters (6 ft.) of
(a) a floor or roof opening,
(b) the open edge of a floor, roof or balcony, or
(c) an excavation.
(5) Subsection (4) does not apply to a building, or a completely enclosed part of a building, used solely for the purpose of storing and distributing materials.
(6) A safety can for flammable, corrosive or toxic substances shall
(a) be appropriate to the substance contained,
(b) be labelled to identify
(i) the substance contained,
(ii) the dangers resulting from its use,
(iii) the uses for which it shall not be utilized, and
(iv) the safety measures to be taken before, during, and after use.
(7) No quantity of flammable liquid contained in safety cans in excess of the required daily quantity shall be stored in a building under construction, unless it is stored in a ventilated room that has a fire resistance of a least 2 hours.
(8) When transferring flammable or explosive materials from one container to another, the containers shall be in contact with each other or electrically bonded to prevent the accumulation of static charges.
(9) When tanks, mixers, vessels or other containers are used for storage of flammable or explosive materials, they shall be electrically bonded and grounded while being filled or emptied.
(10) Cylindrical objects stored on their side shall be piled symmetrically with each unit in the bottom row chocked or wedged to prevent motion.

Section 91.

91. (1) The storage and handling of hazardous chemical substances shall be so controlled as to prevent spillage or accidental ignition of these substances and the following measures shall be taken:
(a) separate or isolate any chemical substance which when mixed with other substances, may cause a fire or an explosion, or may liberate flammable or poisonous gases;
(b) keep containers, piping and apparatus in good working order; and
(c) do not leave any spilled substance on the floors or shelves.
(2) Corrosive and poisonous substances shall be handled with care and stored
(a) away from high fire-hazard areas,
(b) away from oxidizing substances,
(c) protected against direct solar rays,
(d) in cool and well ventilated areas, and
(e) in clearly identified containers.

Section 92.

92. (1) Reserves of building lumber shall be neatly piled and the piles shall be
(a) supported off the ground,
(b) disposed in horizontal layers, crisscrossed, and slightly inclined, and
(c) stabilized by means of transversal supports or wedges, if the piles are more than 1.2 m (4 ft.) high.
(2) Masonry units shall be stacked
(a) on planks, a platform, or other level base,
(b) in layers covering the entire area of the stacks,
(c) in such a way that the height of the vertical face of the stacks does not exceed 1.8 m (6 ft.),
(d) in tiers, when the height of the stockpiling exceeds 1.8 m (6 ft.),
(e) with wooden transversal supports between the layers to prevent the pile from crumbling, if the height of the pile exceed 1.8 m (6 ft.), and
(f) bound together, if necessary, so as to ensure the stability thereof.
(3) Pipes shall be stacked
(a) on racks or solid shelves,
(b) on wooden blocks provided with tappets at both ends, or
(c) on metal bars of which both ends are bent upwards.
(4) Bagged materials shall
(a) be stacked by cross-piling the bags to form layers piled no higher than 10 bags unless
(i) the bags are stored in reservoirs or enclosures, and
(ii) the sides of the piles are supported by the walls of the reservoirs or enclosures, and
(b) be removed from the piles in such a way that the top of the pile remains horizontal.
(5) When drums, casks, or barrels are stacked full and standing upright, the height of the piles shall be limited and 2 planks shall be laid side by side on each row before proceeding on to the next row.
(6) When drums, casks, or barrels are stacked empty, and lying on their sides, the piles shall be symmetrical and stable, and all units in the bottom row shall be carefully wedged.

Section 93.

93. A storage cylinder for compressed gas shall
(a) have a valve connection that prevents an inadvertent connection that would result in a hazardous mixture of gases,
(b) be secured in position during transportation, storage, or use,
(c) have the valve protection cap in position when the cylinder is not in use,
(d) when containing acetylene, be in an upright position,
(e) be protected from physical damage, and
(f) not be lifted with slings or magnets.

Section 94. TRANSPORTING AND HANDLING MATERIAL

94. (1) Mechanical apparatus shall be provided and used for carrying material when the safety of the worker is jeopardized.
(2) Workers assigned to the handling of material shall be instructed as to the manner of lifting and carrying loads.
(3) Where an inclined plane is used to raise or lower heavy objects, the following guidelines shall be followed:
(a) avoid standing on the lower end of the plane; and
(b) control the displacement of such object by means of cables, blocks, wedges or other apparatus.
(4) Where rollers are utilized for moving objects, tools designed for this type of work shall be used, such as bars or sledge-hammers instead of hands or feet to change to position of the moving rollers.
(5) Suitable protective equipment in accordance with the hazard shall be used for the manual transport of objects having sharp and dangerous edges and for the handling of burning caustic or corrosive substances.
(6) An oil drum, grease pail, or similar container shall not be used for hoisting purposes unless it is placed in a cage designed for that purpose.

Section 95.

95. (1) A lifting device shall:
(a) be so constructed, of such strength, and be equipped with suitable ropes, chains, slings and other fittings so as to adequately ensure the safety of all workers;
(b) be thoroughly examined by a competent person to determine its capability of handling the maximum load as rated
(i) prior to being used for the first time, and
(ii) thereafter as often as necessary but not less frequently than recommended by the manufacturer and in any case at least once a year and a permanent record shall be kept and signed by the competent person doing the examination;
(c) be plainly marked with sufficient information so as to enable the operator of the device to determine the maximum rated load that the device is capable of lifting under any operating condition;
(d) have a cab, screen, canopy guard, or other adequate protection for the operator where he or she may be exposed to the hazard of falling material; and
(e) when it is a pneumatic or hydraulic hoist, have controls that automatically return to their neutral position when released.
(2) A lifting device shall be operated only by a competent person or a worker who is being instructed and is accompanied by a competent person.
(3) A lifting device shall be operated in such a way that
(a) no part of the load passes over any worker,
(b) where a worker may be endangered by the rotation or uncontrolled motion of a load, one or more guide ropes are used to prevent rotation or other uncontrolled motion, and
(c) when its load is in a raised position the controls are attended by an operator.

Section 96.

96. (1) The carrying elements of conveyors shall be so designed as to support safely the loads for which they are intended.
(2) If belts, chains, gears, driving-shafts, drums, sheaves, or chain pinions of conveyor installations are located at 2.1 m (7 ft.) or less above the floor or the working platform, then they shall be guarded.
(3) The installation of conveyors above walkways and working zones shall be avoided.
(4) Conveyors passing above areas where employees are working or moving shall be provided with guards to prevent any fall of objects.
(5) Elevated conveyors where access is necessary shall be provided with gangways having guardrails extending on their full length.
(6) Workers are prohibited from climbing on conveyors or standing on their frames for loading or unloading.
(7) Floor openings for vertical or inclined conveyors not completely covered shall be encircled with guardrails.
(8) Conveyors to which workers have access and which present a hazard for the workers of being dragged or injured shall be provided with emergency stop devices located at the loading and unloading stations, and at various points on the conveyor path.
(9) A conveyor which may be started automatically or by remote control, or where a portion of the conveyor is not visible from the operator's position, shall be equipped with a start up warning device.
(10) Bucket-conveyors shall be encircled with solid guards that shall
    (a) extend on the full height,
    (b) be provided with doors or removable sections to facilitate inspection, cleaning and repairs, and
    (c) be provided with an automatic switch stopping the conveyor when opening the door mentioned in subsection (b).

Section 97. DEMOLITION

97. (1) The demolition, dismantling, or moving of a building or structure, shall be commenced or continued only when
    (a) all steps necessary to prevent injury to a person on or near the project or the adjoining property have been taken, and
    (b) all existing gas, electrical, and other services, that are likely to endanger a worker having access to the building or structure have been shut off and disconnected.
(2) The exterior walls of a building shall be demolished only when all glass has been
    (a) removed from windows and other locations, or
    (b) protected so that there is no reasonable possibility of breakage of the glass at any stage of the demolition.
(3) Except where a worker may be endangered, demolition and dismantling shall proceed systematically and continuously from the highest to the lowest point of a project.
(4) In a skeleton structural frame building, the skeleton structural frame may be left in place during the demolition or dismantling of the masonry if the masonry and any loose

material are removed from the skeleton structural frame as prescribed in this section.
(5) The work above each tier of floor shall be completed before the support of the tier or floor is affected by the demolition or dismantling operation.
(6) Masonry walls shall be removed in reasonably level courses.
(7) Materials shall not be loosened or permitted to fall in masses that are likely to endanger the structural stability of a floor or other support of the project or of a scaffold or a worker.
(8) A truss, girder, or other structural member shall not be disconnected until it has been relieved of all loads other than its own weight and, where necessary, has been given temporary support.
(9) A worker shall not stand on top of a wall, pier, or chimney to remove material from the wall, pier, or chimney, unless adequate flooring, scaffolding, or staging not more than 2.4 m (8 ft.) below the place where he or she is working is provided on all sides of the wall, pier, or chimney.

Section 98.

98. (1) A worker shall not enter any part of a project being demolished that will not safely support him or her.
(2) Only a worker directly engaged in the demolition, dismantling, or moving of a building or structure shall be in, on, or near the building or structure.
(3) Where work on a building or structure being demolished or dismantled is suspended or discontinued prior to completion, access by persons to the part of the building or other structure that remains to be demolished or dismantled shall be prevented by the installation of fencing or barriers.
(4) Where adequate precautions are taken to ensure that no person is in such a position that he or she may be endangered by the demolition operations, section 97 does not apply to a building or structure that is being demolished by
(a) a heavy weight suspended by cable from a crane or other hoisting machine,
(b) a power shovel, bulldozer, or other vehicle,
(c) any other powered mechanical device,
(d) explosives, or
(e) any combination of one or more of the methods mentioned in clauses (a), (b), (c) and (d).
(5) The controls of a mechanical device for demolishing a building or structure shall be operated from a location that is as remote as is practicable from the operation.
(6) Where a swinging weight is used for demolition, the supporting cable shall be of such length, or be so restrained, that the weight will not swing against any building or structure other than the building or structure being demolished.

Section 99.

99. (1) Any worker on a demolition site shall wear the necessary personal protective equipment.
(2) The public shall be prevented from entering a building which is marked for

demolition.
(3) Construction signs and warning lights shall be installed wherever the public may be exposed to any danger.
(4) All demolition work shall be done under the continuous supervision of a competent person.

Section 100.

100. During demolition the following precautions shall be taken:
(a) materials with protruding nails shall be stacked or removed or nails shall be removed or hammered in;
(b) entrances and exits which are protected against hazards shall be provided;
(c) floor openings below the demolition level which are not being used for the removal of debris shall be boarded up; and
(d) stairways and ramps shall be maintained as long as possible.

Section 101. WELDING AND CUTTING

101. (1) Welding and cutting operations shall not be conducted close to combustible materials or in places containing flammable or explosive dusts, gases, or vapours, unless precautions are taken to prevent fire or explosions.
(2) In areas where welding and cutting operations are normally performed and where persons other than welders work or circulate, protective screens shall be provided.
(3) No cutting, welding, or other work requiring an open flame shall be performed on a vessel, reservoir, pipe, or other container where a flammable or explosive substance may be present, unless air samples have been taken to indicate that the work may be done without danger or procedures have been taken to ensure the safety of workers.
(4) Where necessary, steam or an inert gas such as nitrogen shall be used to purge explosive or flammable substances from tanks, tankers, vessels, reservoirs or other containers prior to welding or cutting taking place.
(5) Where purging has been carried out and tests indicate that the tank, tanker, vessel, reservoir, pipe or other container is free of explosive or flammable substances, work shall be started without delay.
(6) Where the work shall be continued for an extended period of time, testing shall be conducted at pre-determined intervals, in keeping with the nature of the work.

Section 102.

102. (1) Any compressed gas cylinder used with oxygen for welding or cutting shall be equipped with a check-valve to prevent the oxygen from flowing into the gas cylinder.
(2) Cylinders, piping, and fittings, including regulators and valves, used in welding and

cutting shall be protected against damage.
(3) The valve of a cylinder shall be closed when the cylinder is not being used or when the cylinder is empty.
(4) are welding electrodes or ground leads shall not be hung over any compressed gas cylinder.
(5) An area where electric welding is carried on shall be kept free of electrode stubs and metal scrap.
(6) Receptacles for electrode stubs shall be provided and used.
(7) Suitable close fitting goggles or helmets shall be worn by workers when cutting, welding, quenching, chipping or grinding.
(8) Gloves shall be worn by workers when welding.
(9) Ragged or oil soaked clothes shall not be worn by workers engaged in or near welding operations.

Section 103. ELECTRICAL WORK AND HAZARDS

103. (1) No material shall be piled, stored or otherwise handled, no scaffolding erected or dismantled, nor any tools, machinery or equipment operated within the minimum distances specified in subsection (2) from any energized high voltage electrical conductor capable of energizing the material or equipment, unless workers are protected in accordance with this section.
(2) The following minimum distances shall be maintained:

Voltage (Phase to Phase)	**Minimum Distance (Meters)**	**(Feet)**
751 V to 75KV	3	10
Over 75KV to 250KV	4.5	15
Over 250KV to 550KV	6	20

(3) Where overhead electric conductors are encountered in proximity to a work area, the employer shall be responsible for
(a) ascertaining the voltage and minimum clearance distance required,
(b) maintaining the minimum clearance distance, and
(c) ensuring that the requirements of subsection (1) are complied with.
(4) When work is being carried out in proximity to energized electrical conductors such work shall be performed in a manner to prevent contact by any worker with the energized conductors.
(5) This regulation shall not apply to qualified electrical workers using standard construction or maintenance procedures.

Section 104.

104. (1) On all electrical system jobs a sufficient number of workers shall be present to do the

job safely; the supervisor shall determine when additional workers are needed to protect workers against accidents or to render assistance in case of unforeseen circumstances.
(2) Only experienced and qualified persons shall be authorized to do any work without direct supervision on any energized electrical line or equipment.
(3) No person shall do work on or in the near vicinity of electrical lines or equipment for which they are not qualified, unless they are under direct supervision of a competent person.
(4) Rubber protective equipment such as gloves, sleeves, blankets, hoses, and hoods, or other necessary safety equipment, shall be used as required within their safe limits specified by an authority acceptable to the Chief Industrial Safety Officer or Chief Mines Safety Officer; this equipment shall be tested according to the manufacturer's specification to ensure the level of protection to the worker is maintained.
(5) No workers shall work or be permitted to work on any energized line or equipment having voltages in excess of the specified safe voltage limits of rubber protective equipment; workers shall be trained in the use of approved line tools and utilize procedures approved by an authority acceptable to the Chief Industrial Safety Officer or Chief Mines Safety Officer.
(6) Weather resistant and clearly legible signs reading "Danger-High Voltage" shall be placed in prominent positions in proximity to electrical apparatus operating at over 300 volts which may be accessible to workers.
(7) Electrical apparatus and lines and mechanical apparatus must always be considered alive or in service until clearances are received by the workers concerned, ensuring that such apparatus has been cleared and isolated and will be kept dead or out of service until work is ready for test or completed and all workers are clear of the job.
(8) When de-energized lines and equipment rated at 300 volts or over are to be worked on, they shall be tested for voltage, short circuited, and grounded, or the work done as though the equipment were energized at normal voltage.
(9) Before doing any work on de-energized lines or equipment where there is a possibility of their becoming energized from any source, such lines or equipment shall be short circuited and grounded within sight of the workers and between all possible sources of energy and the work location.
(10) All tunnels and manholes where work is being performed and which contain electrical cables, equipment and apparatus shall be kept free of debris, unused tools, materials and seepage or stagnant water.
(11) Where there is any doubt as to soundness of a pole or structure or where it is intended that the direction of strain is to be altered, the pole or structure must be effectively guyed or supported prior to and during the actual work being performed; pike poles will not be permitted for support while workers are working on poles.
(12) Mailboxes, signs, clotheslines, or other obstructions which are not part of the installation shall not be allowed on poles or structures upon which workers are required to work; where these are found, they shall be removed prior to work being done.
(13) Means of access to main switches, sectionalizing switches, main disconnecting devices and meters shall be clear of obstructions at all times.
(14) Metal ladders, or wire reinforced wooden ladders, shall not be used in proximity to energized electrical equipment.

Section 105. ABRASIVE BLASTING

105. (1) Abrasive blasting and similar operations within a building shall be conducted in a separate enclosure or cabinet.
(2) Enclosures and cabinets for abrasive blasting and similar operations shall be provided with an exhaust system of sufficient capacity for the effective removal of the dust.
(3) Operating controls on equipment used for abrasive blasting or similar operations shall be immediately accessible to the operator.
(4) Other workers in the vicinity of an abrasive blasting operation where the atmosphere is contaminated by that operation shall be provided with and shall wear respiratory protective equipment, or such workers shall be removed from the hazardous area.
(5) When a worker is carrying out abrasive blasting operations outdoors or within a separate enclosure or cabinet, the worker shall be provided with and shall wear an air supplied hood.
(6) Air supplied to the hood shall
(a) be respirable air,
(b) be supplied at a suitable temperature,
(c) be of a volume sufficient to prevent the entry of contaminants into the hood, and
(d) be supplied at a pressure not to exceed 1 kPa (.15 pounds per square inch).
(7) No one shall re-use any abrasive blasting materials that contain
(a) dusts or respirable size containing 1% of more free silica, or
(b) paint pigments containing harmful metal impurities such as lead, cadmium, chromium, nickel, mercury or zinc, or
(c) other harmful substances.

Section 106. CONTROL OF ROCK DUST

106. (1) Workers employed in gravel crushing or sand pit operations shall be protected from dust by
(a) an operator's booth supplied with filtered fresh air, or
(b) a ventilation system designed and installed to locally capture the dust at jaw, cone or roll crushers, elevating wheels or transfer points of conveyors and shakers, and to exhaust to a collector system or to a remote area where it cannot return and contaminate the work area.
(2) Other workers employed around a gravel crusher and not protected by a filtered air booth or a ventilation system shall be provided with and shall wear respiratory protective equipment.
(3) Every rock drill shall be equipped with a water jet, spray, or other device, of a type acceptable to the Chief Industrial Safety Officer or the Chief Mines Safety Officer to suppress drilling dust effectively; this regulation does not apply to handheld and hand-powered rock drills.

Section 107.

107. (1) Dust generated in the operation of asphalt plants shall be controlled by means of a collector system.
(2) Workers exposed to harmful dust concentrations during maintenance or repairs shall be provided with and shall wear appropriate respiratory protective equipment.

Section 108. WINDOW CLEANING

108. (1) In buildings having windows with sills 3 m (10 ft.) or more above the grade and constructed so that it is necessary for a worker to clean the windows from the outside, approved safety devices shall be provided and maintained in good condition for the protection of the window cleaner.
(2) Approved safety devices for window-cleaners shall include swing stages, monorail systems, boatswain chairs or harness, extended window-platforms, ladders and safety-belts.
(3) In buildings where the window sill extends less than 10 cm (4 in.) out from the window-frame, workers shall not stand on such sills unless an approved auxiliary sill or other approved device is provided; the width of an auxiliary and the permanent sill combined shall not be less than 25 cm (10 in.) or exceed 35 cm (14 in.); auxiliary sills, or other devices, shall be so designed and made that they are safely held in place and can be readily put in position and removed.
(4) Window-cleaners shall not pass from window to window on the outside except where adequate protection is provided.

Section 109. LAUNDRIES AND DRY CLEANING PLANTS

109. For the purpose of this section, "dry cleaning" means the process of removing dirt, grease, paints or other stains from wearing apparel, textiles fabrics, rugs, or other materials by the use of organic solvents.

Section 110.

110. (1) Dry cleaning by immersion, by agitation, or by spraying, in open vessels, is prohibited except as may be required for spotting.
(2) Dry cleaning by immersion and agitation in closed machines shall be carried out only with machinery and equipment designed and installed for that purpose.
(3) The employer shall assure that each dry cleaning machine bears a label specifying the chemical name of the solvent for which it is designed; solvents other than that for which the machine was designed shall not be used.

Section 111.

111. (1) Fully-closed and semi-closed dry cleaning systems shall
(a) be provided with effective exhaust ventilation during loading and unloading, or
(b) have the exhaust ventilation system in operation when the loading door is open.
(2) All hand controls shall be well recessed, or effectively shrouded to prevent inadvertent activation.

Section 112.

112. (1) Drum-type washing machines and driers shall be provided with devices which will prevent the inner drums from rotating while the outer drum doors are open.
(2) Every centrifugal extractor shall be provided with devices to prevent power being applied before the cover is closed and to prevent the cover being opened while the basket is in motion.
(3) All pipes and fittings at temperatures capable of inflicting burns shall be insulated to a height of 2.1 m (7 ft.) above the floor so as to prevent contacts injurious to workers.
(4) Laundry chutes shall discharge into enclosed areas, or shall be fitted with baffles or other equally effective means, to prevent laundry from striking workers.
(5) Laundry carts shall be maintained in good mechanical condition, free of sharp corners or edges and splintered wood.
(6) Workers who are servicing dry cleaning fluid filters shall wear appropriate respiratory protection; the used filters and filter material shall be placed in metal containers with tight fitting lids; these containers shall be stored, prior to disposal, outside the building or in a suitable, well ventilated area.

Section 113.

113. (1) All flatwork ironer feed-rolls shall be equipped with a front mounted bar, designed to stop the machine on contact; otherwise the machine shall be fitted with a fixed guard to prevent the operator's hands from entering the rolls.
(2) Every roller-type body ironer shall be equipped with a front mounted fixed bar, designed to prevent the operator's hands from entering the rolls; the hot roll shall be guarded against contact by workers.
(3) Every press-type ironer shall be equipped with an automatic device to prevent the application of injurious pressure when the operator's fingers are between the bed and the pressure-head; if such an automatic device is not used, then a device shall be fitted which requires the removal of both the operator's hands from the danger zone when the machine is tripped.

Section 114.

114. (1) Open flame heating apparatus shall
(a) not be located in the same work area as a dry cleaning machine,
(b) be fitted with corrosion-resistant flue and draft hoods to conduct products of combustion out-of-doors, and
(c) obtain the air used for combustion other than from the dry cleaning area.

Section 115. GARAGE AND VEHICLE REPAIRS

115. (1) Air-borne contaminants in vehicular storage, parking and repair facilities shall be maintained in accordance with the Occupational Health Regulations, by means of an effective air exhaust and supply ventilation system.
(2) When engine exhaust gases inside garages or repair shops exceed allowable concentration a local exhaust ventilation system attached to the vehicle tailpipe or exhaust stack shall be employed.
(3) Safety chains, cages or other protection against blown-off side or lock rings shall be used when inflating a tire mounted on a rim.
(4) A service pit in which a worker is required to work shall be ventilated to reduce air contaminants to or below the allowable concentrations.
(5) Clip-on air chucks shall be equipped with an in-line "dead man" control which will stop the flow of air when released.
(6) Vehicles shall be adequately and securely blocked before workers are permitted to work under them. Jacks are not considered as adequate blocking.

Section 116. FORESTRY AND LOGGING

116. When weather conditions create hazards to workers such additional precautions shall be taken as are necessary for the safe conduct of the work.

Section 117.

117. All hand tools shall be maintained and used in accordance with section 39.

Section 118.

118. (1) A sufficient distance for eliminating accident risks shall be maintained between each forestry worker while felling; this distance shall not be less than 2 tree lengths.
(2) When within range of a travelled road, no trees shall be felled unless effective means are used to stop all traffic until the tree is felled and any ensuing hazards corrected.
(3) A route of withdrawal and a space around the tree shall be cleaned before felling.

(4) A sufficient undercut shall be made in each tree being felled; fallers shall ensure that the undercut is complete and cleaned out.
(5) Fallers shall not push one tree with another unless this procedure is required to overcome an unavoidable falling difficulty.
(6) No partially cut trees shall be left standing.

Section 119.

119. (1) For the purpose of these regulations "tractor logging" means the use of any wheeled or tracked vehicle employed in the skidding, yarding, or swinging of logs.
(2) All mobile equipment utilized for skidding, loading and unloading must meet the requirements of section 69 for ROPS protection.
(3) Operators shall operate and control their machines in a safe manner and shall avoid operations in areas where machine stability may not be maintained.
(4) Winches shall be fitted with quick-release systems to permit main lines to run out freely and automatically disengage from their drums.
(5) When tractors are used in the vicinity of workers, tractor movements shall be regulated by a code of hand signals.
(6) Cutting torches, impact or hydraulic cable cutters, abrasive discs or soft hammers and wire axes shall be provided and used for cutting cables.
(7) Hard hammers or axes shall not be used for cutting cable.
(8) The following safe work procedures shall be adhered to:
(a) no mainline shall be allowed to trail behind the tractor where it may hang up and snap forward;
(b) winching at a severe angle, which could cause a hang-up to upset the machine, shall be avoided;
(c) the log turn shall be winched up tight to the fairlead before travelling;
(d) before climbing or descending grades, the proper gear shall be selected to allow the engine to govern the tractor speed;
(e) on side hills, an abrupt turn uphill shall be avoided; the tractor shall be backed downhill first then turned uphill, the log turn may be slacked off as necessary to permit this maneuver; and
(f) the operator shall, before leaving a tractor, lower the dozer blade to the ground and apply the parking brake.
(9) When operating on steep terrain, a tractor shall not be driven off the skid road or trail to reach a log turn; instead the mainline shall be taken out and the choker extensions used, if necessary, to reach otherwise inaccessible log turns.

Section 120.

120. (1) For the protection of the driver, each logging truck shall be equipped with a substantial bulkhead, at least 15 cm (6 in.) higher and 15 cm (6 in.) wider than the cab of the logging truck.
(2) Each logging truck shall be equipped with a horn or whistle which shall have a tone distinct from that of whistles with which other equipment in the vicinity are equipped.

(3) Steps giving access to logging trucks shall be equipped with non-slip surfaces.
(4) Operators of logging trucks on private roads
(a) shall not overtake and pass another moving vehicle, except on signal from the other operator,
(b) shall not follow crew cars, except at a safe distance commensurate with road, grade, and visibility conditions, and
(c) shall use extreme caution when approaching vehicles coming from the opposite direction.
(5) Operators of vehicles in which workers are being transported shall not pass a moving loaded logging truck, except under suitable road conditions and then only upon signal from the driver of the logging truck.
(6) Only the operator and one other authorized person, shall be allowed to ride in the driver's compartment of a loaded logging truck, except in case of emergency.
(7) Motor trucks, trailers and semi-trailers used for transporting logs shall be equipped with bunks and stakes of adequate design and construction to perform their intended function without hazard.
(8) Bunks shall rotate freely upon their pivots.
(9) Each stake shall be so constructed that it can be released only from the opposite end of the bunk; all keeper pins shall be secured against unintended release.
(10) When stakes are over 1.2 m (4 ft.) in height, springs or other mechanical means shall be fitted to facilitate returning the stakes to a vertical position.
(11) Stake extensions shall be secured against inadvertent detachment from the stakes.
(12) Stakes, extensions, and stake lines shall be so installed and maintained that the angle between bunks and stakes does not exceed 90 degrees when loaded.
(13) Stakes, extensions, and stake lines shall be of adequate strength to withstand the load imposed upon them. Stake lines shall be in conformity with the following table:

TABLE 4

Bunk Width		Stake Line Minimum diameter	
(m)	(ft)	(mm)	(in)
up to 2.6	(8 1/2)	22	7/8
2.6 - 3.7	(8 1/2 - 12)	29	1 1/8
over 3.7	(12)	32	1 1/4

(14) Stake and bunk assemblies shall be inspected before each trip and shall not be used if they show signs of excessive wear.

Section 121.

121. (1) Logs shall be loaded in a manner that will ensure the stability of the vehicle and its load while in transit.
(2) No logs shall be loaded wholly above the level of the top of the stakes, unless the

centres of such logs are within the limits of perpendicular lines drawn through the centres of the outer logs in the next lower tier, and such logs shall be entirely within perpendicular lines drawn from the inner sides of the tops of the stakes.
(3) The bottom tier and the side rows of logs (bunk and stake logs) shall extend at least 15 cm (6 in.) beyond the front and rear bunks and stakes, or a positive means shall be used to securely restrain and contain the log load.
(4) Bunk and stake logs on logging trucks with compensating reach type trailers shall extend not less than 30 cm (12 in.) beyond the bunks and stakes or a positive means shall be used to securely restrain the lost load, and to prevent any logs from slipping off the load.
(5) Logs on trucks shall be loaded so that not more than 1/3 of the weight of the logs extends beyond the trailer bunks or beyond the ends of the logs supporting them.

Section 122.

122. Workers shall not stand on the cab platform of logging trucks when such trucks are being loaded.

Section 123.

123. (1) Unless the centres of all logs lie below the level of the top of the stakes, loads shall be restrained by at least 2 binders and cinches. Such binders shall be installed before the truck is moved, and shall be checked in transit to ensure their effectiveness.
(2) A loaded logging truck, required by subsection (1) to have binders, may be moved within the loading area without binders only if such movement does not present a hazard to any workers.
(3) For the purpose of these regulations, applied bundle straps or banding are not acceptable as binders.
(4) When logs or log chunks could roll or slide off the truck due to ice conditions or the logs or log chunks are not contained within the stakes, at least 2 binders with cinches shall be used regardless of the height of the load.
(5) Binders shall be positioned on the load in such a manner that they can be safely removed from the load while the load restraining equipment is in position.
(6) Each binder, cinch and attachment, shall have a breaking strength of not less than 53.4 kN (12,000 lbs) and shall be so rigged that it can be safely released.

Section 124.

124. (1) Log storage and sorting on land areas shall be constructed, arranged, maintained, and operated so that workers may work in the clear of moving logs, machines and equipment.
(2) Such areas shall be located on stable and relatively level ground and shall be adequately illuminated in areas where workers are required to work during hours of

darkness or other conditions of inadequate illumination.
(3) Jackets or vests of fluorescent red or other high visibility colour shall be worn by all workers who are exposed to the danger of moving vehicles while working on or travelling through log dumps or dry land dumps, sorting, or storage grounds.
(4) Unauthorized vehicular or foot traffic shall not be permitted in dry land sorting or storage areas.
(5) Lift forks, grapples and arms of mobile log loading machines shall be lowered to their lowest position and all equipment brakes set, prior to the operator leaving the machine unattended.
(6) Log unloader machines shall not be moved with loads lifted higher than necessary in order to provide unobstructed vision for the operators.
(7) All deck structures, plankways and road or other surfaces of log dumps shall be kept in good repair and free from bark and other debris.
(8) Roads at log dumps shall be sufficiently wide, level and firm, to ensure safe operation of equipment.

Section 125. SAWMILLS

125. (1) Unless clearly impracticable, every log-haul shall have at least one walkway with cleats and handrails; the walk-ways shall be of sufficient width to enable workers to stand clear of logs in the slip.
(2) All log-hauling or hoisting equipment shall be equipped with devices to prevent logs running back as a result of power failure, or other causes.
(3) Provision shall be made at the mill end of the log-deck to protect workers from rolling logs.
(4) Head blocks shall be cleared with a stick, wire brush, or other effective means; the use of hands or feet for this purpose is prohibited.
(5) Means shall be provided for securely locking the sawyer's log- turning and carriage-control levers, to prevent inadvertent operation.
(6) On a double-cut bandsaw the top of the barrier shall be not less than 60 cm (24 in.) above the rollcase.
(7) On a single-cut bandsaw the top of the barrier shall be not less than 60 cm (24 in.) above the husk roll.
(8) The barrier shall extend not less than 1.2 m (4 ft.) back from the husk.
(9) Where necessary, a substantial sheering device shall be installed between the sawyer and the saw, to prevent saw material going back into the sawyer's box.
(10) Where workers may be exposed to the hazard of kickbacks from circular saws and re-saws, such saws shall be equipped with knife or fin-type splitters, which shall be of a minimum height of _ the distance from the collar to the top of the saw.

Section 126.

126. (1) The up-travel of a band saw shall be completely guarded and the down-travel shall be guarded with a shield extending down to the guide.
(2) A screen shall be placed between a head saw and the sawyer, to protect the sawyer

from flying particles.
(3) Circular-saw mills shall be equipped with safety guides; the use of a wrench or other handtool for adjusting guides is prohibited.
(4) The upper half of a top saw shall be covered, to prevent chips and sawdust flying and to prevent contact by workers.
(5) Barriers shall be installed in front of and behind all slasher and multiple trimmer saws.
(6) Where a worker may be exposed to the hazard of being pulled into the saw by the lug chains of a moving trim table, an emergency stopping device which will effectively stop the chains shall be installed at each operator's position.
(7) Each single and double-end trim saw shall have those portions of the saw not in the cutting area fully guarded; the portion of the saw in the cutting area shall be guarded so as to allow the passage of material being cut and expose a minimum amount of the saw.
(8) Portions of band resaws, other than in the cutting area, shall have a guard to prevent contact by workers and to restrain the saw in case of breakage.
(9) Circular resaws shall be guarded against contact, by position or by a housing, and they shall be equipped with splitters.
(10) Each circular trim saw shall have those portions of the saw not in the cutting area fully guarded; the portion of the saw in the cutting area shall be guarded so as to allow the passage of material being cut and to expose a minimum amount of the saw.

Section 127.

127. (1) Means shall be provided to contain ejected knots, chips and debris, from adjustable or fixed saw edgers.
(2) Kickback fingers shall be installed on all fixed or adjustable saw edgers when any worker could be exposed to material thrown back by the saws.
(3) Overhead, or double arbor saw edgers, shall be provided with means of protecting workers from materials thrown from either the infeed or outfeed rolls.
(4) When any worker could be exposed to material thrown back by edger saws, a substantial barrier shall be provided to protect workers.
(5) Edger pressure rolls shall have a solid continuous-rim surface and shall not be built with gaps or spaces.
(6) Pressure rolls shall be kept in contact with the material being cut and no more than one piece at a time shall be fed into any single set of feed rolls of edgers, surfacers, or planers.
(7) Whenever pressure rolls are elevated for service, they shall be blocked or otherwise positively supported.

Section 128.

128. (1) Loads or packages of lumber built up for storage or transportation shall be stabilized as follows:
(a) lumber under 10 cm (4 in.) in width shall have one set of sticks for each 20 cm (8 in.) of load in height;

(b) lumber 10 to 15 cm (4 to 6 in.) in width shall have one set of sticks for each 30 cm (12 in.) of load height; and

(c) lumber over 15 cm (6 in.) in width shall have one set of sticks for each 46 cm (18 in.) of load height.

(2) In all cases there shall not be more than 15 cm (6 in.) of boards, or small-dimension lumber on the top of the upper set of sticks.

(3) Sticks shall be made of rigid material not less than 3 mm x 38 mm (1/10" x 1 1/2") in size.

(4) Sticks shall not protrude beyond the sides of the load and shall be uniformly spaced in loads that are to be stacked.

(5) Spacing blocks of not less than 10 cm (4 in.) by 10 cm (4 in.) nominal dimensions shall be placed beneath each pile and between loads of lumber.

(6) Lumber piles shall be erected plumb and level and shall be maintained in a stable condition.

(7) Provided the foundation is firm and level, loads of lumber may be stacked 3 loads high.

(8) If 3 or more loads of any size lumber are cross-tied at each successive level, the stacks may be 7 loads high.

Section 129. WOODWORKING

129. (1) Machine construction shall be in accordance with the following:

(a) the height of the table or working surface of each machine shall be designed to provide the best efficiency and least amount of fatigue for the operator;

(b) each machine shall be so constructed as to be free from needless vibration when the largest size tool is mounted and run idle at full speed;

(c) arbors and mandrels shall be constructed so as to have firm and secure bearing and be free from play;

(d) saw frames or tables shall be constructed with lugs cast on the front of the frame or with an equivalent means to limit the size of saw that can be mounted so as to avoid overspeed due to mounting a saw larger than intended;

(e) rip saw gauges or fences shall be constructed so that they can be positively secured to the table without changing their alignment with the saw; for saws with tilting tables or tilting arbors the gauge or fence shall be constructed so that it will remain in a parallel with the saw regardless of the angle of the saw with the table;

(f) crosscut saw gauges or fences shall be constructed so as to slide in grooves or tracks that are accurately machined to insure exact alignment with the saw for all positions of the guide;

(g) hinged saw tables shall be constructed so that the table can be positively secured in any position and in true alignment with the saw; and

(h) all belts, pulleys, gears, shafts, cutting heads, saw blades and moving parts shall be guarded in a manner which will protect anyone from injury.

(2) Driving power for wood-working machinery shall be by individual motors.

(3) Requirements for machine control shall be as follows:

(a) a mechanical or electrical power control shall be provided on each machine so as to make it possible for the operator to cut off the power without leaving his position at the point of operation;

(b) on each machine operated by electric motors, positive means shall be provided for rendering such controls or devices inoperative while repairs or adjustments are being made to the machines they control;
(c) on machines driven by belts and shafting a locking-type belt shifter or an equivalent positive device shall be used;
(d) each operating treadle shall be covered by an inverted U- shape metal guard, fastened to the floor, of adequate size to prevent accidental tripping.

(4) Automatic feeding devices on machines shall be installed wherever the nature of the work will permit.

Section 130.

130. (1) A circular saw blade that has developed a crack whose length is more than 1/20 the diameter of the saw blade shall be discarded.
(2) A circular saw blade that has developed a crack from the eye or the collar, unless the circular saw is used for bucking and the blade is repaired, shall be discarded.
(3) A bandsaw blade that has developed a crack whose length is greater than 1/10 the width of the saw blade shall be discarded unless the width is reduced so as to eliminate the crack, or the cracked section is replaced or welded.
(4) A bandsaw machine, other than a small hand fed woodwork shop bandsaw, shall have an automatic tension control device.
(5) Power fed circular rip saws with horizontal power-drive in-feed rolls shall be equipped with a sectional non kick-back device located in front of the saw blade across the full width of the feed rolls.
(6) Power fed circular rip saws shall be equipped with a splitter which extends to the height of the top of the saw and the saw shall be equipped with a cover.
(7) A hand operated swing cut-off saw other than a radial arm saw, shall be equipped with a device which will return the saw automatically to the back of the table when the saw is released at any point in its travel.
(8) A limit device or an extended table shall be used to prevent a swing saw, sliding cut-off saw, or radial arm saw from travelling beyond the outside edge of the cutting table.

Section 131.

131. Drives on planers shall be constructed so that the rolls may be stopped independently of the cutting heads.

Section 132.

132. (1) Portable hand-operated circular power saws shall be equipped with a guard designed so as to cover the portion of the saw blade not in use.
(2) Depth gauges and guides on portable hand-operated circular power saws shall be properly adjusted before starting the motor.

Section 133.

133. (1) Each hand-fed planer and joiner with a horizontal head shall be equipped with a cylindrical cutting head, the throat of which shall not exceed 11 mm (7/16 in.) in depth nor 16 mm (5/8 in.) in width.
(2) The clearance between the edge of the rear table and the cutter head shall be not more than 3 mm (1/8 in.).
(3) The table throat opening shall be not more than 60 mm (2 _ in.).

Section 134.

134. (1) The feed rolls on grooving and tenoning machines shall be guarded by metal strips or bars fastened to the frames carrying the rolls and they shall be designed to remain in adjustment for any thickness of stock.
(2) Hand-fed tenoning machines shall be equipped with a clamping or "hold-down" device to assist the operator in holding the material being cut.

Section 135.

135. (1) Safety-bit chucks with no projecting set screws shall be used.
(2) Universal joints on spindles of boring machines shall be completely enclosed.

Section 136.

136. (1) Cylindrical shaper heads shall be used.
(2) The diameter of circular shaper guards shall be not less than the greatest diameter of the cutter.
(3) Templates, jigs, and fixtures which will keep the operator's hands from the point of operation shall be used wherever the nature of the work permits.
(4) All double-spindle shapers shall be equipped with a spindle starting and stopping device for each spindle.

Section 137.

137. (1) Turn plates, jigs, and fixtures which will keep the operator's hands from coming in contact with the moving parts at the point of operation shall be used wherever the nature of the work will permit.

Section 138. FIRE FIGHTING

138. Sections 139 to 148 apply to workers who are employed as fire- fighters on a full or part-time basis, including volunteer fire- fighters, in fire departments organized for the protection of the general public, and to the equipment and operational procedures involved.

Section 139.

139. (1) Except as provided by subsection (2), workers shall not engage in fire-fighting operations unless they are wearing personal protective clothing and equipment appropriate to the hazards to which they will be exposed.
(2) In a serious emergency the requirements of subsection (1) may be modified but only to the extent necessitated by the prevailing circumstances and under the direction of the superior officer present.
(3) Workers shall ensure that the personal protective clothing and equipment used by them is maintained in safe condition; the fire chief shall arrange to have the equipment inspected at regular intervals and any defective equipment shall be repaired or replaced.
(4) Protective headgear of a type designed for use by fire-fighters and meeting the Class D requirements of the Canadian Standards Association Z94.1 entitled "Industrial Protective Headwear", or other standard acceptable to the Director, shall be worn by each worker in attendance at a fire, or in attendance at a practice or drill, where a hazard of head injury exists; protective headgear meeting the requirements of the Canadian Standards Association Z94.1 (Classes A or B), may be worn where workers are exposed to hazard of head injury while carrying out other duties associated with the cause and prevention of fires.
(5) Class D headgear shall be brightly coloured and shall have bands or patches of reflective tape applied to the exterior.
(6) Headgear that does not conform to the Canadian Standards Association Z94.1 and which was purchased before July 1, 1984, may remain in use until July 1, 1989, if it is in satisfactory condition; all such headgear shall have bands or patches of reflective tape applied to the exterior.
(7) Effective eye protection as required by section 10 shall be worn whenever fire-fighters are exposed to the hazard of eye injury.
(8) Where visors are attached to the headgear they shall not be riveted to the head shell.

Section 140.

140. (1) Protective coats and pants shall be in conformity with N.F.P.A. #1971 entitled "Protective Clothing for Structural Fire Fighting" or other standards acceptable to the Director.
(2) Non-conforming coats and pants purchased prior to July 1, 1984 shall be replaced by July 1, 1989.
(3) Working gloves shall be of a type and quality to provide protection against heat, cold

and abrasion.
(4) At least 2 pairs of gloves of a type and quality to provide protection against hot or burning material shall be available on each firefighting vehicle and shall be worn when necessary.
(5) Where firefighters are required to handle electrical emergencies two pairs of Class I Linemen's rubber gloves conforming to Canadian Standards Association Z259.4-1979 entitled "Rubber Insulating Gloves and Mitts", with line worker's leather gauntlets shall be made available; these are intended for use only for saving of life in exposures not exceeding 300 volts phase to ground; they are only to be used upon instruction of a qualified supervisor; these gloves shall be tested every 6 months and after each use to ensure effectiveness and a record of tests shall be kept.

Section 141.

141. When it is necessary for workers to be secured against falling, safety-belts shall be worn; such belts shall be in conformity with the requirements of section 15.

Section 142.

142. (1) Each fire-fighting company present at a fire shall be equipped with at least two units of self-contained breathing apparatus, each having minimum duration of effective protection of at least 30 minutes; where such a duration is insufficient, units having adequate duration for the circumstances shall be used.
(2) All respiratory equipment shall be in conformity with the applicable requirements of section 12.
(3) Firefighters who use or are likely to use a self-contained breathing apparatus shall be shaved where it seals against the face.
(4) At least one spare compressed air or oxygen cylinder, as applicable, shall be available for each breathing apparatus on site; spare cylinders shall be maintained at full capacity.

Section 143.

143. (1) Workers being transported by fire-fighting vehicle shall ride only in secure positions.
(2) The fire chief shall determine the capacity of the tailboard of each vehicle in service upon which workers may be required to ride and the capacity shall not be exceeded.
(3) When workers are required to ride on the tailboard, adequate handholds shall be provided and workers shall be secured by safety- belts, or by other equally effective means; the means of restraint provided shall conform to standards acceptable to the Chief Industrial Safety Officer.
(4) Fire-fighting vehicle tailboards shall not project outboard of the vehicle sides and shall be designed to provide safe footing.

Section 144.

144. Hearing protection devices shall be provided to and worn by firefighters for protection against excessive noise in accordance with section 14.

Section 145.

145. Personal flotation devices conforming to section 11 shall be worn by firefighters where they may be exposed to risk of drowning.

Section 146.

146. (1) Except as otherwise stipulated in these regulations, ladders and aerial devices used for fire-fighting shall be designed, constructed, maintained, and tested in accordance with the requirements of the National Fire Protection Association Standard 1931 and Recommended Practice 1904.
(2) Truck mounted aerial devices shall be subject to annual non- destructive testing of critical components conducted by an agency or person acceptable to the Chief Industrial Safety Officer; where defects are found in critical components, the aerial device shall be repaired and certified by a registered professional engineer; a permanent record of such tests and repairs shall be maintained for each unit.
(3) Notwithstanding subsection (2), an alternative preventive maintenance program to ensure the structural integrity of such equipment may be submitted to the Chief Industrial Safety Officer for consideration.

Section 147.

147. (1) Plaster hooks and pike poles shall be fitted with electrically non-conductive shafts.
(2) Each vehicle used for fire-fighting shall be equipped with at least two battery-operated hand lanterns; the lanterns shall not be used in an explosive atmosphere unless approved for such use by the Canadian Standards Association or other standards or testing organization acceptable to the Chief Industrial Safety Officer.

Section 148.

148. (1) Firefighting vehicles shall be brought to a full stop when workers are required to connect hoses; before moving the vehicle, the driver shall ensure that the hydrant attendant has taken a turn of hose about the hydrant, or has otherwise secured the hose line to the hydrant.
(2) Workers shall not be in the bed of the vehicle when the hose is being run out from the bed.

(3) Workers shall not tie themselves to a hose-line by any means other than with a hose-strap which can be quickly disconnected from their belts.
(4) A nozzle-equipped hose-line shall not be left unattended, unless it is shut off, or effectively secured.
(5) Hoses, having nozzle reaction in excess of 667 N (150 lbs.), but shall not be used as mobile hand-lines, but shall be fixed or secured before being placed in operation.

Section 149. LADDERS AND SCAFFOLDS - METAL, WOODEN

149. (1) Ladders shall
(a) be designed, constructed, maintained, and used so as not to endanger a worker,
(b) be used only in such a way that the loads applied to them will not cause the materials used in any part of them to be stressed beyond their allowable unit stresses, and
(c) if they are constructed of metal, or if they are metal- reinforced, not be used in close proximity to uninsulated, energized electrical equipment or conductors.
(2) A ladder shall
(a) have rungs evenly spaced at 30 cm (12 in.) on centres;
(b) have side rails not less than 30 cm (12 in.) apart;
(c) if it exceeds 9 m (30 ft.) in length and is not securely fastened, be held in place by one or more persons while being used,
(d) when not securely fastened, be placed so that the base of the ladder is not less than one-quarter and not more than one- third of the length of the ladder from a point directly below the top of the ladder and at the same level as the base of the ladder,
(e) where it is used as a regular means of access between levels
(i) be securely fastened in place,
(ii) extend at the upper level at least 90 cm (35 in.) above the landing or floor,
(iii) have a clear space of at least 15 cm (6 in.) behind any rung, and
(iv) be so located that an adequate landing surface, clear of obstructions, is available at the top and bottom of the ladder,
(f) not be in an elevator shaft when such space is being used for hoisting, and
(g) not be lashed to another ladder to increase its length.
(3) A wooden ladder shall
(a) consist of wood that is straight-grained and free from loose knots, sharp edges, splinters and shakes, and
(b) not be painted or coated with an opaque material.
(4) The maximum length of a ladder measured along the side rail shall not be more than
(a) 5 m (16 ft.) for a trestle ladder or for each of the base or extension sections of an extension trestle ladder,
(b) 6 m (20 ft.) for a step-ladder,
(c) 9 m (30 ft.) for a single ladder or individual section of a ladder,
(d) 15 m (49 ft.) for an extension ladder having two sections, and
(e) 20 m (66 ft.) for an extension ladder having more than two sections.
(5) Subject to subsection (2), a vertical access ladder fixed in position shall
(a) have rest platforms at not more than 9 m (30 ft.) intervals,
(b) be offset at each rest platform,
(c) where the ladder extends over 5 m (16 ft.) above grade or a floor or landing, have

a safety cage commencing not more than 2.2 m (7.2 ft.) above grade or the floor or landing and continuing at least 90 cm (35 in.) above the top landing with openings to permit access by a person to rest platforms on the top landing,
(d) have side rails that extend 90 cm (35 in.) above the landing, and
(e) have rungs that are at least 15 cm (6 in.) from the wall.

Section 150.

150. (1) Where a step ladder is being used by a worker at a height of more than 3 m (10 ft.), the ladder shall be secured or held by another worker; no worker shall stand or work on the top two rungs of a step ladder, except in cases where the step ladder is equipped with a railed platform.
(2) Step ladders shall be used so that when in the open position the front section shall have a minimum pitch of six to one.
(3) Step ladders shall be equipped with metal braces or substantial cords.
(4) Where a step-ladder is being used as a self-supporting unit the legs shall be fully spread and the spreader shall be locked.

Section 151.

151. (1) Scaffolds shall be erected, maintained and dismantled under the personal and direct supervision of a competent person.
(2) Unpainted construction grade dressed lumber or better shall be used in the construction of wooden scaffolds.
(3) All scaffolds shall be designed and constructed to support at least four times the weight of workers and material to be carried on them.
(4) A light duty scaffold means a scaffold designed to carry an evenly distributed load of not more than 1200 Pa (25 lbs per square foot); a light duty scaffold is designed to carry workers only.
(5) A heavy duty scaffold means a scaffold designed to carry an evenly distributed load of not more than 3590 Pa (75 lbs per square foot); a heavy duty scaffold may be used for both workers and materials.
(6) Scaffolds shall be supported against lateral movement by diagonal bracing.

Section 152.

152. (1) Approved metal scaffolding may be used in place of any other type of scaffolding referred to in these regulations, if such metal scaffolds are erected, used, and maintained in accordance with the manufacturer's specifications and instructions.
(2) All parts of metal scaffolding shall be securely fastened together.

Section 153.

153. (1) Guardrails shall be installed in accordance with sections 32 and 33.
(2) Scaffolds shall be anchored vertically at 4.5 m (15 ft.) intervals and horizontally at 6 m (20 ft.) intervals.
(3) Scaffold planks shall be at least nominal size construction grade 2' x 10" fir or 2" x 12" spruce, or material of equivalent strength, and shall not span more than 3 m (10 ft.).
(4) Except where otherwise permitted or required by these regulations, all scaffold platforms shall be at least two planks in width for light duty scaffolds and at least four planks in width for heavy duty scaffolds.
(5) Planks shall extend not less than 15 cm (6 in.) nor more than 30 cm (12 in.) beyond all ledgers.
(6) All planks on working platforms shall be secured to supporting members.
(7) A worker working beneath another worker shall be provided with overhead protection consisting of planking heavy enough to provide protection from falling objects.

Section 154.

154. (1) Scaffolds that vary from the requirements of these regulations may be used if the scaffold and any part of it that may require alteration or modification is constructed, maintained, and used in accordance with the specifications of a professional engineer.
(2) A scaffold of a type not otherwise referred to in these regulations shall be designed by a professional engineer and, before being used, the employer shall submit drawings and specifications of it to the Chief Industrial Safety Officer for approval and the scaffold shall be used in accordance with the drawings and specifications and any other conditions that the Chief Industrial Safety Officer may attach.

Section 155.

155. (1) Half-horse scaffolds shall be used only as light duty scaffolds.
(2) Half-horse scaffold ledgers shall not be more than 3 m (10 ft.) apart.
(3) Half-horse scaffold legs shall not be spliced.
(4) A ladder shall be used to provide access to and egress from a half-horse scaffold.
(5) Half-horse scaffolds shall be no more than 5 m (16 ft.) in height.
(6) The dimensions of members of half-horse scaffolds shall be not less than the nominal sizes specified in Table 5:

TABLE 5

Height	Up to 3 m (10')	More than 5 m (16')
Ledger	(2" x 6")	(2" x 6")
Legs	(2' x 4")	(2" x 6")
Braces	(1" x 8")	(1" x 8")
Ribbons	(1' x 6")	(1' x 6")
Spread of legs at bottom	90 cm (3')	1.5 m (5')

Section 156.

156. (1) Wooden brackets shall be triangular in design and shall be at least 2" x 4" nominal lumber of construction grade or better.
(2) Wooden brackets shall be attached to the wall by
(a) bolting through the wall and through a 2" x 4" nominal cleat that must span at least two studs, or
(b) hooking over a well-secured supporting member of adequate strength.
(3) No other means of fastening a wooden bracket scaffold to a wall shall be used without the approval of the Chief Industrial Safety Officer.
(4) Wooden bracket scaffolds shall be used only as light duty scaffolds.
(5) Wooden bracket scaffolds shall not be used at a height of more than 5 m (16 ft.) above ground level or other working surface unless specific approval has been received from the Chief Industrial Safety Officer.
(6) Brackets shall not be more than 3 m (10 ft.) apart.
(7) Metal brackets at least equivalent in strength to wooden brackets may be used.
(8) When metal brackets are used they shall be attached to the structure by means of bolting, welding or hooking over a well secured supporting member of adequate strength.

Section 157.

157. (1) Ladderjack scaffolds shall not be more than 5 m (16 ft.) in height and shall have approved metal brackets.
(2) A single extending painter's plank may be used on ladderjack scaffolds.
(3) Ladders shall not be more than 3 m (10 ft.) apart.
(4) There shall not be more than two workers at one time on a ladderjack scaffold.

Section 158.

158. (1) Roofing brackets shall be substantially constructed and shall be maintained in good condition.
(2) Roofing brackets shall be installed by securely nailing them to the roof and shall be provided with effective non-slip devices.
(3) Roofing brackets shall not be used on a roof steeper than one- third pitch, a slope ratio of 20 cm (8 in.) vertical to 30 cm (12 in.) horizontal.

Section 159.

159. (1) Wooden single-pole scaffolds shall be used only as light duty scaffolds and shall not be more than 9 m (30 ft.) in height.
(2) The nominal dimensions of members of wooden single-pole scaffolds shall not be less than those specified in Table 6:

TABLE 6

	Up to 6 m (20 ft.)	6 m - 9 m (20-30 ft.)
Uprights	2" x 4"	4" x 4"
Ledgers	2-1" x 6" S	2-1" x 6" S
	or	or
Ribbons	1 - 1" x 8"	1 - 1" x 8"
Bracing	1" x 6"	1" x 6"
Wall Scabs	2" x 6"	2" x 6"

(3) Uprights shall be spaced not more than 3 m (10 ft.) apart.
(4) The dimensions of members of wooden double-pole scaffolds shall not be less than those specified in Table 7:

TABLE 7

	------- Light Duty -------		------- Heavy Duty -------	
	Up to 6m (20ft.)	Over 6m (20ft.)	Up to 6m (20ft.)	Over 6m (20ft.)
Uprights	2" x 4"	4" x 4"	2" x 6"	4" x 6"
Ledgers	2-1" x 6"	2-1" x 6"	2-1" x 6"	2-1" x 6"
	or	or	or	or
Ribbons	1 - 1" x 8"	1 - 1" x 8"	1 - 2" x 8"	1 - 2" x 8"
Bracing	1" x 6"	1" x 6"	1" x 6"	1" x 6"
Wall Scabs	1" x 6"	1" x 6"	1" x 6"	1" x 6"

(5) Uprights and ledgers in light duty scaffolds shall be spaced not more than 3 m (10 ft.), and in heavy duty scaffolds shall be spaced not more than 2.3 m (7 ft. 6 in.) apart.

Section 160.

160. (1) The height of a rolling scaffold shall not be more than three times the smallest base dimension and when outriggers are used to maintain the 3:1 ratio, they shall be firmly attached to ensure stability of the scaffold.
(2) Workers may remain on a rolling scaffold while it is being moved provided that the height of its work platform does not exceed two times the smallest base dimension.
(3) Wheels on rolling scaffolds shall be equipped with locking devices or adequate blocking shall be provided and these shall be engaged or used at all times when workers are on the scaffold.
(4) All components of a rolling scaffold shall be securely fastened together.

(5) Rolling scaffolds shall only be used on surfaces which are firm, level and free of materials or debris.

Section 161.

161. (1) Beams shall be at least 4" x 6" nominal lumber, or equivalent, placed on edge.
(2) Beams shall not be laminated.
(3) Planks shall be pinned to prevent slipping.
(4) Ropes shall be at least 2.5 cm (1 in.) manila or other material of equivalent strength, but in no case shall such other material be less than five-eighths inch in diameter.
(5) Ropes shall be padded to prevent chafing or cutting.
(6) Beam ends shall be provided with stops to prevent the ropes from slipping off the beam.

Section 162.

162. (1) Lumber thrust-outs shall be construction grade dressed lumber at least 4" x 6" nominal, or equivalent, placed on edge.
(2) Thrustouts shall not extend more than 1.2 m (4 ft.) beyond the edge of the bearing surface and the inboard portion from the fulcrum point to the point of anchorage shall be not less than one and one- half times the length of the outboard portion.
(3) The thrustouts shall be securely braced at the fulcrum point against upsetting and the inboard ends shall be securely anchored against horizontal or vertical movement or upsetting.
(4) Counterweights shall not be used on outrigger and suspended outrigger scaffolds.
(5) The maximum distance between thrustouts shall be 2.3 m (7 ft. 6 in.).
(6) When working platforms are suspended from thrustouts they shall be supported by 2" x 6" nominal or larger vertical lumber hangers not more than ten feet long, secured to the side of the thrustout and extending at least 30 cm (12 in.) above the top of the thrustout and also secured to a block which shall rest on the top edge of the thrustout as an additional support.
(7) The suspended platform shall be supported on 10 cm x 15 cm (4 in. x 6 in.) nominal beams, secured to the vertical hangers at least 30 cm (12 in.) above the bottom of the hanger and resting on a block which shall also be secured to the side of the hanger below the beam as an additional support.
(8) Adequate stops shall be affixed to the thrustout and to the platform ledgers.
(9) Outrigger scaffolds shall not be used for the storage of materials.
(10) Working platforms shall be planked completely between the hangers and the suspended platform shall be braced to prevent swaying.
(11) A worker going out on a thrustout shall wear a safety belt attached to a life-line tied to a part of the structure which is independent of any member of the scaffold.

Section 163.

163. (1) Manufactured suspended scaffolds shall be erected, used, operated, and maintained in accordance with the manufacturer's specifications and instructions.
(2) Suspended scaffolds shall be supported by steel wire ropes suspended from overhead thrustouts.
(3) Suspension ropes shall be at least 12 mm (_ in.) wire rope.
(4) The suspension rope shall be attached to a thrustout by fittings designed to secure a load equivalent to the ultimate strength of the rope.
(5) The upper end of the suspension rope shall terminate in a spliced loop in which a steel thimble or eye is securely inserted.
(6) The suspension rope shall be secured to the shackle by a bolt passing through the shackle, the steel thimble or the eye, and drawn up tightly by a securing nut.
(7) The lower end of the suspension rope shall be firmly secured to the hoisting machine.
(8) Thrustouts shall be securely anchored to the building by U- bolts, with anchor plates tightened and made secure by washers and nuts or other approved means.
(9) Thrustouts shall not be less than a standard 18 cm (7 in.) I- beam, weighing not less than 6.8 kg (15 lbs), or a beam of equivalent strength and they shall be spaced not more than 2.3 m (7 ft. 6 in.) apart.
(10) I-beams shall be set with their webs vertical.
(11) A stop bolt shall be placed at the outer end of each thrustout.

Section 164.

164. (1) A worker going out on a thrustout shall wear a safety belt attached to a life-line tied to a part of the structure which is independent of any member of the scaffold.
(2) Only workers specifically authorized by their employer shall be permitted to operate a scaffold hoisting machine.
(3) The ledgers of a suspended scaffold shall consist of two steel standard angles bolted together and shall be of a size and strength capable of supporting four times the imposed load of scaffold planks, workers, and materials.
(4) Working platforms shall be not less than four planks in width.
(5) On a suspended scaffold, the ends and the side of the scaffold away from the structure shall be securely enclosed with #16 gauge wire mesh or equivalent extending from the toe board to the top rail.
(6) The wire mesh required by subsection (5) shall be capable of rejecting a 38 mm (1 1/2 in.) ball and in no case shall the cross wires of the mesh be more than 76 mm (3 in.) apart.

Section 165.

165. (1) A powered swing-stage shall be equipped with an independent secondary mechanism or an approved individual escape device for use in the event of a mechanical or power failure to enable the swing- stage to be moved by a worker

positioned on the stage to a point of safe egress, or to permit the worker to reach a point of safe egress.
(2) A powered swing-stage not equipped in accordance with subsection (1) may only be used on structures where safe egress is accessible in the event of mechanical power failure.

Section 166.

166. (1) Suspension ropes shall be:
(a) improved plow steel wire rope not less than 8 mm (5/16 in.) in diameter; or
(b) manila rope not less than 19 mm (3/4 in.) in diameter; or
(c) synthetic rope at least 16 mm (5/8 in.) in diameter and equivalent in strength to three-quarter inch manila.
(2) When welding, burning or similar work is being performed on a swing-stage, wire suspension ropes shall be used.
(3) Ropes or cables shall be padded to prevent chafing or cutting on sharp objects.
(4) When the vertical distance between blocks exceeds 30 m (100 ft.), improved plow steel wire rope not less than 8 mm (5/16 in.) in diameter shall be used for swing-stage suspension ropes.

Section 167.

167. (1) Swing-stage scaffolds shall be used only as light duty scaffolds.
(2) No more than two workers shall be on a swing-stage scaffold at any time.
(3) Thrustouts shall be at least 4" x 6" nominal timber set on edge, or metal beams of equivalent strength, and shall be at least 4.9 m (16 ft.) long.
(4) Bagged or loose materials shall not be used as counterweights.
(5) Counterweights shall be firmly attached to the thrustout.
(6) The counterweights shall be heavy enough to counterbalance four times the weight of any imposed load.
(7) Thrustouts shall be tied back to a solid part of the structure and secured against movement or dislodgment.
(8) Supports other than thrustouts may be used to support a swing- stage, provided that all components can adequately carry a load of at least four times the maximum working load and the supports are tied back to the structure.

Section 168.

168. (1) Platforms shall be at least 50 cm (20 in.) in width.
(2) Platforms shall be fastened to the stirrups.
(3) Swing-stage platforms shall be equipped with rollers or fenders which will bear against the side of the building to hold the platform at a proper distance from the wall.
(4) When necessary the platform of swing-stage scaffolds shall be secured to prevent

them from swinging or swaying away from the building or structure.

Section 169.

169. (1) When workers are required to be on a manually operated swing-stage scaffold, the hoisting mechanism shall be locked in a positive drive position and the keys shall be kept in the possession of the supervisor.
(2) Each worker on a swing-stage shall wear a safety belt and his or her lanyard shall be attached to a separate lifeline.
(3) Life-lines shall be tied to a part of the structure capable of supporting a load at least equal to that which the life-line will support and shall be independent of the scaffold support structure.

Section 170.

170. (1) When the block and tackle method is used to raise or lower a swing-stage scaffold the distance between stirrups shall be not more than 4.9 m (16 ft.) and fall lines shall be long enough to reach the ground or a safe landing level at all times.
(2) Two or more swing-stage scaffolds shall not be combined into one by bridging the distance between them with planks or any other form of connection.
(3) No swing-stage scaffold shall be permitted above or below another swing-stage scaffold except with the approval of the Chief Industrial Safety Officer.
(4) There shall be no covering or hoarding around or over a swing- stage scaffold except with the approval of the Chief Industrial Safety Officer.
(5) On a swing-stage scaffold where loose material or equipment is being carried, the ends and the side of the swing- stage away from the structure shall be securely enclosed with #16 gauge wire mesh or equivalent extending from the toe board to the top rail; the wire mesh shall be capable of rejecting a 38 mm (1 1/2 in.) ball and in no case shall the cross wires of the mesh be more than 76 mm (3 in.) apart.

Section 171.

171. (1) Suspended cages may be used only where the work to be performed cannot be carried out by the use of conventional scaffolding, aerial devices, ladders, or other elevating devices.
(2) The use of suspended cages is subject to the following requirements:
(a) a suspended cage that has not been commercially manufactured must be designed and certified by a professional engineer;
(b) a suspended cage shall be equipped with guardrails, intermediate rails and toe boards on all open sides, or shall be enclosed to a height of 110 cm (42 in.);
(c) a copy of the drawings and specifications shall be forwarded to the Chief Industrial Safety Officer prior to the cage being put into service;
(d) the loaded weight of the cage shall be accurately calculated; the suspension

slings, attachments, and hoisting mechanisms shall be rigged to a safety factor of 10;
(e) the operator of the crane and all concerned workers shall be aware of the weight and any limiting factors such as radius of lift;
(f) all supporting hooks or shackles shall be safety wired to prevent dislodging;
(g) cages shall be suspended only from cranes having hoisting gear capable of raising and lowering under power; those controlled only by brakes shall not be used;
(h) cranes, power hoists and winches, or other elevating devices shall be of a type approved by the manufacturer for this purpose;
(i) hoisting and lowering speeds shall be kept as low as practicable;
(j) any dog-clutches in the hoisting winch drives shall be secured against accidental disengagement;
(k) the crane or hoist shall be operated by a qualified operator, who shall remain at the controls while the cage is suspended;
(l) standard hand signals or radio communication shall be used to control movement of the cage;
(m) workers in a suspended cage shall wear safety belts that are attached to a substantial anchor point above the hook assembly or attached to the cage if a secondary safety line for the cage is attached to a substantial anchor point above the hook assembly; and
(n) the number of workers in a suspended cage shall be limited to 2.

Section 172.

172. (1) A work platform to be mounted on a forklift shall be designed and constructed to a safety factor of 4, based on the heaviest anticipated loading.
(2) The platform shall be attached to the forks of the lift truck to prevent lateral or vertical movement of platform.
(3) Guardrails and toe boards shall be installed on all open sides of the platform in accordance with sections 29, 32 and 33.
(4) A screen, mesh or similar barrier shall be provided on the mast side of the platform to prevent workers from contacting the mast hoisting apparatus.

Section 173. EXCAVATING, TRENCHING, SHORING

173. (1) All underground cables, conduits and pipelines shall be located and marked before the commencement of any excavation, trench, tunnel, or shaft.
(2) The walls of any excavation shall be shored and braced or cut back where a worker is required to work closer to the walls than the height of the walls.
(3) Wherever an adjacent foundation may be undermined by an excavation, the foundation shall be adequately supported before proceeding with the work.
(4) Guardrails or barricades shall be installed when workers are required to be in the immediate vicinity of the walls of an excavation.
(5) Loose material shall be scaled and trimmed from the sides of an excavation.
(6) All over-hangs shall be removed or supported.
(7) Excavated material shall be kept back at least 60 cm (2 ft.) from the edge of the

excavation and piled so that material cannot roll, slide, or fall into the excavation.
(8) In pits, quarries and similar excavations the height of faces shall not exceed the maximum safe reach of the equipment being used.

Section 174.

174. (1) Workers required to enter any trench 1.2 m (4 ft.) or more in depth shall be provided with protection from cave-ins and slides by the installation of shoring and bracing or by cutting back the walls of the trench.
(2) Minimum requirements for shoring and bracing, where used in trenches 6 m (20 ft.) or less in depth, shall comply with the minimum lumber sizes and maximum spacing requirements contained in Tables 8 and 9 below which are based on the use of No. 1 Douglas Fir:

TABLE 8
Minimum Recommendations for Trench Timbering

SIZE AND SPACING OF MEMBERS [1] (IMPERIAL FIGURES)

	UPRIGHTS		STRINGERS		CROSS-BRACES			
Trench Depth (ft.)	Minimum Dimensions (in.)	Maximum Spacing (ft.)	Minimum Dimensions (in.)	Maximum Vertical (ft.)	Width of Trench Up to 6 (ft.)	Width of Trench 6 - 12 (ft.)	Maximum Spacing ft.	
Hard and Solid Soils					Min. Dim. (in.)		Vertical	Horizontal
4-10[2]	2x10	6	4x6[3]	4	4x4	6x6	4	6
10-15	2x10	4	6x6	4	4x6	6x8	4	6
15-20	2x10	Close tight	6x6	4	6x8	8x8	4	6
Soils Likely to Crack or Crumble								
4-10[2]	2x10	4	4x6	4	4x6	6x6	4	6
10-15	2x10	3	6x8	4	6x6	6x8	4	6
15-20	2x10	Close tight	6x8	4	6x8	8x8	4	6
Soft, Sandy, Filled or Loose Soils								
4-10[2]	2x10	4	4x6	4	4x6	6x6	4	6
10-15	2x10	3	6x8	4	6x6	6x8	4	6
15-20	2x10	Close tight	6x8	4	6x8	8x8	4	6

Note (1) The dimensions shown are minimum and shall be increased to meet job conditions.
Note (2) Trenches less than 1.2 m (4 ft.) deep shall be shored when hazardous ground movement may be expected, as in ground subject to hydrostatic pressure or vibration.
Note (3) Stringer may be omitted in trenches not exceeding 2.4 m (8 ft.) in depth provided that it has been confirmed that the soil is sufficiently hard and solid as to safely permit stringer deletion, and provided that the trench is not in proximity to previously excavated ground.

TABLE 9

SIZE AND SPACING OF MEMBERS (METRIC FIGURES)

	UPRIGHTS		STRINGERS		CROSS-BRACES			
Trench Depth (m)	Minimum Dimensions (in.)	Maximum Spacing (m)	Minimum Dimensions (in.)	Maximum Vertical (m)	Width of Trench (m) Up to 1.8	1.8-3.7	Maximum Spacing (m)	
Hard and Solid Soils					Min. Dim.	(in.)	Vertical	Horizontal
1.2-3	2x10	1.8	4x6	1.2	4x4	6x6	1.2	1.8
3.-4.6	2x10	1.2	6x6	1.2	4x6	6x8	1.2	1.8
4.6-6	2x10	Close tight	6x6	1.2	6x8	6x8	1.2	1.8
Soils Likely to Crack or Crumble								
1.2-3	2x10	1.2	4x6	1.2	4x4	6x6	1.2	1.8
3-4.6	2x10	0.9	6x8	1.2	4x6	6x8	1.2	1.8
4.6-6	2x10	Close tight	6x8	1.2	6x8	6x8	1.2	1.8
Soft, Sandy, Filled or Loose Soils								
1.2-3	2x10	Close tight	6x8	1.2	6x6	6x8	1.2	1.8
3.-4.6	2x10	Close tight	8x8	1.2	6x6	8x8	1.2	1.8
4.6-6	3x10	Close tight	8x10	1.2	6x8	8x10	1.2	1.8

(3) When installing shoring and bracing, a worker shall use a ladder and work downward from the top of the trench, installing each brace consecutively.

(4) When removing shoring and bracing, a worker shall use a ladder and work upward from the bottom of the trench, removing each brace consecutively.

(5) If the quality of the ground in which a trench or ditch has been dug has deteriorated during operations to the extent that it would be unsafe to use the method of removal outlined in subsections (3) and (4), shoring and bracing shall be removed by a method which does not require a worker to enter into or to be in any unshored portion of the trench.

(6) Shoring and bracing shall not be removed from a trench or portion thereof until there is no further occasion or need for a worker to be in that portion of the trench.

(7) All trenches 1.2 m (4 ft.) or more in depth shall at all times be supplied with at least one ladder for each 15 m (50 ft.) in length or fraction thereof; the ladder shall extend from the bottom of the trench to at least 90 cm (3 ft.) above the surface of the ground.

(8) No worker shall be in any unprotected portion of a trench.

Section 175.

175. (1) When walls of trenches are cut back, the slope of the cut- back shall not be steeper than 3/4 horizontal to 1 vertical.

(2) Where the vertical walls of the square-cut portion of a trench are 1.2 m (4 ft.) or greater in height, the walls shall be shored and braced in compliance with requirements of these regulations.

(3) Excavated material shall be kept back at least 60 cm (2 ft.) from the edge of the trench.

(4) Trees, boulders, or other surface encumbrances located so as to create a hazard at any time during operations shall be removed before excavation is started.

Section 176.

176. (1) When equipment operation or traffic on thoroughfares causes vibrations, shock, and extra pressure from increased load, additional shoring shall be installed.
(2) Screw jacks, hydraulic equipment, or other apparatus of equivalent strength and reliability may be used in lieu of wooden shoring and bracing.
(3) Trench cages shall be designed, manufactured, and used to meet the requirements established by a professional engineer and shall be inspected by the Chief Industrial Safety Officer or the Chief Mines Safety Officer before use.
(4) The walls of the cage shall extend a minimum of 30 cm (12 in.) above the top of the vertical cut of the trench wall.

Section 177.

177. (1) Trenches and excavations 6 m (20 ft.) or more in depth shall not be commenced without prior notification to the Chief Industrial Safety Officer or the Chief Mines Safety Officer of a shoring system intended to be used.
(2) Specifications shall be determined by a registered professional engineer verifying the adequacy of the shoring system.

Section 178.

178. Workers who are required to enter any trench or excavation in seasonally frozen soil, whether in the frozen or thawed state, shall be afforded protection in accordance with sections 175, 176, 177, and 178.

Section 179. TUNNELS AND SHAFTS

179. Excavations and trenches in true, stable permafrost, as certified by a professional engineer, do not have to be shored or cut back when the excavation or trench is open only for a short duration, or weather conditions ensure that damage will not occur to the permafrost.

Section 180.

180. Trenches and excavations in permafrost shall not be commenced without prior notification to the Chief Industrial Safety Officer.

Section 181.

181. (1) Hoists used to raise or lower workers in any shaft, drilled, or bored pile hole or caisson shall be approved by the Chief Industrial Safety Officer or Chief Mines Safety Officer before being put into service.
(2) The capacity plate stating the maximum number of workers for which the cage is designed shall be fixed to the cage and be clearly visible.
(3) During the excavation of a shaft more than 1.2 m (4 ft.) in depth, the walls of the shaft from the top downward shall be retained by protective structures or devices strong enough to prevent collapse or cave-in.
(4) Protective structures or devices used in shafts more than 6 m (20 ft.) in depth or in any tunnel shall be designed by a professional engineer and shall be constructed and used in accordance with the engineer's specifications.
(5) The drawings for the protective structures or devices designed in accordance with subsections (3) and (4) shall be kept at the project at all times while the protective structures or devices are being installed or used.
(6) Protective structures or devices shall remain in place and be properly maintained as long as workers are required to enter or be in the shaft or tunnel.

Section 182.

182. (1) A level plank floor shall extend outward at least 2.4 m (8 ft.) from the shaft opening in any area used for access or egress or as a working area.
(2) A guardrail and toe board shall be installed around a shaft opening with #16 gauge wire mesh or its equivalent securely attached to and extending between the toe board and the top rail.
(3) The wire mesh required by subsection (2) shall be capable of rejecting a 38 mm (1 1/2 in.) ball and in no case shall the cross wires of the mesh be more than 76 mm (3 in.) apart.
(4) A solid fence providing at least equivalent protection may be used as an alternative to the requirements of subsection (2).
(5) Gates not less than 90 cm (3 ft.) in height shall be installed at each shaft entrance to provide at least equivalent protection to that required by subsection (2).

Section 183.

183. (1) A ladder shall be installed in every shaft in a compartment separate from the hoistway.
(2) Where the ladder is in excess of 6 m (20 ft.) a landing or rest platform shall be installed at not more than 6 m (20 ft.) intervals.

Section 184.

184. All pipes, fittings and wires extending down shafts shall be securely fastened to substantial supports in a compartment which is separate from the hoistway and from the compartment in which the ladder is installed.

Section 185.

185. Adequate illumination shall be provided in all shafts and tunnels as specified in section 26.

Section 186.

186. (1) Immediately prior to commencement of any shift and following the use of any explosives, the supervisor shall inspect the shaft and all underground areas and no other worker shall enter therein until the foreman states that it is safe to do so.
(2) No internal combustion engine using gasoline, naphtha or liquefied petroleum gas for fuel shall be operated near the entrance to or in any underground project.
(3) When a deficiency of respirable air exists or may exist in any shaft or tunnel, a ventilation system shall be installed which will provide at least 30.5 cubic meters (1080 cu. ft.) of respirable air per minute per worker to the furthest extremity of the workings in addition to any ventilation that may be required for any other purpose.

Section 187.

187. Diesel engines may be used in an underground project if
(a) ventilation is provided in the amount of at least 30.5 cubic meters (1080 cu. ft.) of air per minute per brake horsepower of the aggregate diesel equipment in use in the underground workings,
(b) each diesel is equipped with an adequate exhaust gas conditioner that is properly maintained and regularly serviced,
(c) when the ventilation system ceases to function, all diesel engines are shut down immediately and are not started or run, except for emergency evacuation of workers, and until the ventilation is again functioning effectively, and
(d) tests in all underground work areas are conducted at least once during each shift to determine if toxic or harmful gases are present

Section 188.

188. (1) An approved fire extinguisher of adequate size and suitable for oil and electrical fires shall be provided at the working face in each tunnel or shaft.

(2) No worker shall remain or be in any shaft or tunnel when explosives are detonated.
(3) Explosives and flammable substances shall not be stored within 30 m (100 ft.) of any shaft or any structure attached to the shaft entrance.

Section 189.

189. Every tunnel and shaft shall be provided with suitable and efficient machinery or devices for keeping the tunnel or shaft free of accumulations of water.

Section 190.

190. An approved method of dust suppression shall be used in any tunnel or shaft where dust creates a hazard to workers.

Section 191.

191. (1) An adequate visual or audible signal or communication system shall be maintained at all times between the hoist operator and workers at any landing in the shaft.
(2) When an audible signal system is operated by buttons or switches, the buttons or switches shall be installed and be available for use at every landing in the shaft and at the operator's controls.
(3) When an audible signal system is used, the audible signal system code shall be prominently posted at all landings and at the hoist operator's controls.

Section 192. ROOFING

192. (1) Crawl boards or ladders, used for roof work, shall be securely fastened over the ridge of the roof, or shall be otherwise effectively anchored. The use of eavestroughs for support is prohibited.
(2) When a worker is employed on a roof having a pitch of 1/3 (slope ratio 20 cm (8 in.) vertical to 30 cm (12 in.) horizontal) or greater, 5 cm (2 in.) by 15 cm (6 in.) toeholds shall be employed, and the worker shall wear a safety-belt, secured to a firmly anchored life-line.
(3) When it is necessary to work on roofing of fragile material incapable of supporting workers, safe access and safe-working platforms shall be provided by means of suitable catwalks and decking spanning the roof framing. A permanent notice stating: "Fragile roof: no access without proper equipment" shall be displayed at all points where access to such a roof can be gained.

Section 193. WALKING STILTS

193. (1) Workers shall use only approved metal walking stilts not more than 76.2 cm (30 in.) in height.
(2) Workers shall use walking stilts only on floor areas that are clean, level, and free from tripping or slipping hazard.
(3) Workers wearing walking stilts shall not climb stairs, work on any scaffolds, or work beyond the confines of any building.

Section 194. TEMPORARY STRUCTURES AND DEVICES

194. (1) Falsework includes
(a) tubular metal frames,
(b) columns where the effective length is dependent upon the provision of lateral restraints between the ends of the column,
(c) shores placed one upon another to form a supporting system that is more than one tier in height,
(d) trusses, and
(e) members so connected to one another that a load applied to one member of it may alter or induce stresses in the other members.
(2) Without limiting the generality of subsection (1), falsework shall, when more than 3 m (10 ft.) in height:
(a) be designed by a professional engineer in accordance with good engineering practice to withstand all loads likely to be applied to the falsework before, during and after the placing of concrete, and
(b) be constructed in accordance with the design of the professional engineer referred to in clause (a).
(3) Drawings of the falsework designed under subsection (1) shall
(a) show the size and specifications of the falsework including the types and grade of all materials to be used in the construction of the falsework,
(b) be certified by the professional engineer referred to in subsection (2), and
(c) be kept at the project at all times.
(4) A shore shall
(a) be braced, with sufficient bracing in the vertical and horizontal planes, to prevent lateral movement of the forms and buckling of the shores, and
(b) have sound and rigid footings capable of carrying the maximum load to which it is likely to be subjected without unreasonable settlement or deformation.
(5) Where shoring is more than one tier in height, the junction of each tier shall be braced against a fixed support in at least two directions to prevent any lateral movement.

Section 195.

195. (1) All formwork and shoring parts shall be designed to support
(a) the dead load of the formwork,

(b) the dead load of the concrete and the embedded materials,
(c) a minimum vertical live load evenly distributed of 2633 Pa (55 lb. per sq. ft.) or more to the satisfaction of the engineer, and
(d) a minimum horizontal live load evenly distributed of 1676 Pa (35 lb. per sq. ft.) of vertical surface or more, to the satisfaction of the engineer.

(2) For the design of wooden parts, the requirements shall be those of the standard Code for the Engineering Design of Wood CSA O86- 1976, and for the design of structural steel parts the requirements shall be those of the standard Steel Structures for Buildings CSA S16-1969 and its supplement No. 1-1975 or of the standard Steel Structures for Building Limit States Design CAN3-S16.1-M78.

Section 196.

196. (1) Every part of a project, including any temporary structure shall be capable of supporting or be braced, either permanently or temporarily, to support all loads to which it may be subjected without exceeding the allowable unit stress for each material used.
(2) Ramps, platforms, runways, scaffolding, and other temporary structures shall be designed and constructed according to recognized methods so as to avoid any risk of collapse or any other danger of accident.
(3) Any temporary structure shall be sufficiently braced in order to withstand all loads that might be applied during construction, restoration, or demolition.
(4) Any temporary structure constructed to support part of a permanent structure until this structure is self-supporting, shall be designed, constructed, supported, and braced to withstand all loads which might be applied.
(5) No change which might affect the structure of a building shall be undertaken before ensuring that the constituent elements will not be submitted to stresses higher than those prescribed.

Section 197.

197. (1) During the construction of a building, temporary or permanent flooring shall be installed progressively as the building is erected.
(2) Subject to subsection (3), all work shall be carried out not higher than two storeys above the temporary or permanent flooring installed as prescribed by subsection (1).
(3) Temporary flooring shall
(a) consist of material,
(i) capable of supporting any load to which it may be subjected, and
(ii) at least capable of supporting a load of 747 Pa (15.6 lb. per sq. ft.), without exceeding the allowable unit stress for the material used,
(b) be securely fastened to and supported on girders, beams or other structural members capable of supporting any load likely to be applied to the flooring without exceeding the allowable units stress for the material used, and
(c) extend over the whole area of the surface on, or above, the work being carried out.
(4) Subsections (2) and (3) do not apply to work carried out

(a) from a scaffold,
(b) above an area where the worker has the protection of a safety net, or
(c) where the workers are protected from falling by means of parachute-type harnesses or safety belts attached to the project.

(5) Where it is impractical to install temporary floors, rope safety-nets shall be substituted therefor.

Section 198.

198. (1) Any equipment providing temporary heating shall be safely installed and operated.
(2) It is prohibited to use a heating system which burns gasoline or naphtha.
(3) Any oil or fuel or gas heating system with the exception of those where the flame is in direct contact with the air, shall have a vent pipe.
(4) Hot air and air retake ducts shall be constructed with non- flammable material and be sufficiently supported.
(5) Electric heaters shall be approved by the CSA.

Section 199.

199. (1) Oil heating equipment shall be installed in accordance with the Canadian Standards Association Standard, Installation Code for Oil Burning Equipment, CSA B139-1971, with the exception, however, of clause 12.3 of the same code.
(2) Any fuel fired heating system shall be
(a) so located, protected and used that there is no risk of igniting
(i) tarpaulins or any other similar temporary shelter, or
(ii) wood or any other combustible material adjacent thereto,
(b) used in an enclosed area only if there is
(i) sufficient air supply for normal combustion, and
(ii) sufficient ventilation,
(c) protected from any damage or overturning,
(d) located so as not to block the means of egress,
(e) connected to a metal chimney, if used to burn a solid fuel, in order to discharge the products of combustion outside the building, and
(f) connected to the liquid fuel tank by means of piping well- protected against any damage.
(3) All fuel supply lines shall be so constructed, guarded or placed as to be protected from damage.

Section 200. WORK ON OR OVER WATER

200. (1) When work is being performed over or on water, the following equipment and services shall be provided
(a) a rescue boat of sufficient size with the capability of being operated in all

prevailing conditions,

(b) a trained operator to be in charge of the boat and another worker who is capable of assisting the operator,

(c) a life jacket for each person anticipated to be in the boat, and

(d) a life buoy, equipped with a least 15 m (50 ft.) of rope, equivalent in strength to 10 mm (3/8 inch) manila rope.

(2) When work is being performed over a river or stream, the boat shall be stationed downstream from the work.

(3) When work is being performed on ice, the employer shall ensure that daily tests are conducted to ensure that the ice will support any load which may be placed on it.

(4) When working on or over water, workers shall be provided with and shall wear personal flotation devices as outlined in section 11.

Section 201. SPRAY PAINTING

201. (1) Airborne contaminants resulting from painting and coating operations shall be maintained at or below the concentrations listed in Table 8 of the Occupational Health Regulations by means of an effective ventilation system.

(2) Workers shall wear eye, skin and respiratory protective equipment as required by regulations 5, 8, 10 and 12.

(3) No open source of ignition shall be permitted in or near any area where flammable materials are being sprayed.

(4) Workers who have been exposed to harmful substances shall not consume or handle food until the affected body areas have been cleansed.

(5) During the application of paint or other materials inside any enclosed or confined space, effective ventilation shall be provided to ensure that airborne contaminants are maintained at or below concentrations listed in Table 8 of the Occupational Health Regulations.

(6) Where paints or coatings or insulations containing isocyanate compounds or similar toxic compounds are applied, the following requirements shall be met

(a) in outdoor application an air flow of 0.25 meters per second (50 ft. per min.) shall be assured, by mechanical means if necessary, to carry vapours away from the breathing zone of the workers, or