OCCUPATIONAL SAFETY AND HEALTH STANDARDS

Premises of establishments

1062: Space Requirements

- Workrooms shall be at least **2.7 meters (8 ft. 10 in.)** in height from the floor to the ceiling. Existing heights of not less than **2.4 meters (7 ft. I 0 in.)** may be allowed.
- The maximum number of persons employed in a workroom area shall not exceed one person per **11.5 cubic meters (400 cu. ft.)**. In calculating the area, no deductions shall be made for benches or other furniture, machinery, or materials but heights exceeding **3 meters (9 ft.-10 in.)** shall not be included.
- Passageways between machinery or equipment shall not be less than **60 cm. (24 in.)**

1064: Floor and Wall Opening

1064.03: Manholes and Other Openings:

- Floor openings into which persons cannot accidentally walk on account of fixed machinery, equipment or wall, shall be guarded by covers having no openings more than **2.5 cm. (1in.)** in width securely held in place.
- All wall openings less than **1 m. (3.3 ft.)** from the floor, having a height of at least **75-cm (30 in.)** and a width of at least **45 cm. (18 in.)** from which there is a drop of more than **2 m. (6.6 ft.)** shall be solidly enclosed or guarded by barriers capable of with-standing a load of at least **100 kgs. (220 lbs.)** applied in any direction at any point of the top rail or corresponding members except vertically upward.
- All other wall openings, irrespective of width shall, if their lower edge is either **8 cm. (3.2 in.)** or less above floor level on the rear side and **2 m (6.6 ft.)** or more above ground or floor level on the far side, be guarded by:
    a. An enclosing screen either solid or of grills or slat work with openings not more than **2.5 cm. (1 in.)** in width capable of withstanding a load of at least **50 kgs. (100 lbs.)** applied horizontally at any point.

1064.04: Construction of Railings:

- Standard railings shall be at least **1 meter (3.3 ft.)** from the floor level to the upper surface of the top rail.
- Standard railings shall have posts not more than **2 meters (6.6 ft.)** apart and an intermediate rail halfway between the top rail and the floor.
- The dimensions of railings and posts anchorage and framing of members shall be such that the completed structure shall be capable of withstanding a load of at least **100 kgs. (220 lbs.)** applied from any direction to any point of the top rail.
- *For wood railings*, top rails and posts of at least **5 cm. x I 0 cm. (2 in. x 4 in.)** stock and intermediate rails of at least **5 cm. x 5 cm. (2 in. x 2 in.) or by 2 cm. x 10 cm. (1 in. x 4 in.)** stock, all such railings shall be smooth and free from large or loose knots, protruding nails or bolts, splinters, fins, slivers, or cracks.
- *For pipe railings*, top rails and posts of metal pipes of at least **30 mm. (1 in.) diameter.**
- *For structural metal railings*, top rails and posts of angle iron of at least **38 mm. x 38 mm. x 5 mm. (1.5 in. x 1.5 in. x 0.2 in.)** and intermediate rails of angle iron of at least **32 mm. x 32 mm. x 3 mm. (13 in. x 1.3 in. x 0.1 2 in.).**

1064.05: Construction of Toeboards

- Toeboards shall be at least **15 cm. (6 in.) in height**
- Toeboards shall be securely fastened in place, with not more than **6 mm. (0.3 in.)** clearance above the floor level.

1065: Stairs

1065.01: Strength

- All stairs, platform, and landings shall be of sufficient strength to sustain safely a liveload of not less than **490 kg/m2 (100 lbs/ft2)** with a factor of **safety of four (4).**

1065.02: Width

- Stairs, except service stairs, i.e., stairs giving access to oiling platforms, shall not be less than **1.10 meters (3 ft. 7 in.)** in width, clear of all obstructions, except handrails, and shall in no case be less than **90 cm. (35 in.)** without the handrails.

1065.03: Pitch

- Except for service stairs, the pitch of stairways be between 30° to 38° from the horizontal but shall not be less than **20° or more than 45°.**
- If pitch is **less than 20°**, a ramp shall be installed. If **more than 45°,** fixed ladder shall be provided.

1065.04: Height

- No stairway shall have a height of more than **3.6 meters (12 ft)** between landings.

1065.05: Headroom

- The vertical clearance shall not be less than **2.0 meters (6 ft. 7 in.)** from the top of the tread in line with the face of the riser.

1065.06: Treads and Risers

- Except for the service stairs, treads shall not be less than **25cm. (9in.)** in width exclusive of nosing and projections, and the riser shall not be more than **20 cm. (8 in.)** and not less than that provided in 1065.03 (1) *[pitch of stairways between 30° to 38°]*

1065.07: Railings

- All stairs having **four or more risers** shall be equipped with stair railings on any open side.
- Stairways **1.12 meters (3 ft. - 8 in.)** more in width shall be equipped with one stair railing on each open side and one handrail on each enclosed side.
- The height of the stair railings from the upper surface of the top rail to the surface of the tread in line with the face of the riser at the forward edge of the tread shall not be more than **90 cm. (35 in.)** or less than **80 cm (31 in.).**
- Wooden handrails shall be at least **5 cm. x 5 cm. (2 in. x 2 in.) in cross section**. If made of metal pipe, at least **2.54 cm. (1 in.)** and not more than **6.75 cm. (2 1/2 in.) in diameter.**
- Brackets shall be spaced not more than **2 meters (6 ft. - 6 in.)** apart and shall be of sufficient length to provide a clearance of at least **4 cm. (1.5 in.)** between the rails and the wall or any obstruction on the wall.
- The completed structure shall be capable of withstanding a load of at least **100 kgs. (220 lbs.)** applied in any direction at any point of the trail.
- The pitch of service stairs shall not be more than **60°** and the width of treads shall not be less than **15 cm. (6 in.).**
- Ramps used by persons for ascent or descent shall be limited to a rise of not more than **I in 10**
- Ramps subjected to heavy stresses from trucking or handling materials shall be provided with additional strength by the use of heavier stock, closer spacing of posts bracing or otherwise designed with a factor of **safety of four (4).**

1066: Window Openings

- Window openings at stair landings, where the opening is more than **30 cm. (1 2 in.)** in width and the sill is less than **1 m. 90 cm. (6 ft.)** above the landing, shall be guarded securely by bars, slats, or grills to prevent persons from falling through.

1067: Fixed Ladders

- Fixed ladders shall be installed in the following manner:
    a. Perpendicular distance from the center line of the rungs to the nearest fixed object on the climbing side of the ladder is at least **90 cm. (35 in.)** for a pitch of **75°** and **75 cm. (30 in.)** for a pitch of **90°.**
    b. The distance from the back of the rungs to the nearest fixed object is at least **15 cm. (6 in.)**
    c. Except in the case of ladders equipped with cages, baskets, or equivalent guards, a clearance of **20 cm. (8 in.)** from either side of the ladder to a fixed object shall be provided.
    d. No fixed ladders be installed with a pitch over **90°**.
- Fixed ladders used to ascend heights exceeding **9 meters (30 ft.)**.
    a. Shall be provided with landing platform for each **6 meters (20 ft.)** or fraction thereof;

1068: Overhead Walks, Runways and Platforms

- Walks, runways, working platforms or open sided floors **2 m. (6.6 ft.)** or more above the floor or ground level, except when used for

motor or similar equipment, which do not afford standing space for persons, shall be guarded on all open sides by standard railings and toeboards.

- Runways used for filling tank cars or for oiling purposes may have the railing on one side omitted if necessary but the hazards of falling shall be reduced by the use of runways not less than **56 cm. (22 in.)** in width.

1069: Yards

1069.03: Roadways

- Roadways shall be of adequate width, and where used by, two-way traffic shall be at least twice the width of the widest vehicle normally used plus **1.25 m. (4 ft.)**

Occupational Health and Environmental Control

1074: Physical Agents

1074.03:

- If the variation in noise level involves maximum intervals of **one (1) second or less**, it shall be considered as continuous. If the interval is **over one (1) second**, it becomes impulse or impact noise.

1075: Illumination

1075.04: Intensity

- A minimum of **20 lux (2 foot candles**) shall be provided for yards, roadways and outside thoroughfares.
- A minimum of **50 lux (5-foot candles)** shall be provided:
  a. where discrimination of detail is not essential
  (handling coarse materials, coal or ashes, rough sorting or grinding of clay products)
  b. for passageways, corridors, stairways, warehouses, storerooms for rough and bulky materials.
- A minimum of **100 lux (1 0 foot candles)** shall be provided:
  a. where slight discrimination of detail is essential
  (production of semi-finished iron/steel products, milling of grains, or other primary operation in most of the industrial processes)
  b. for engine and boiler rooms, passenger and freight elevators, receiving and shipping rooms, storerooms, locker rooms, toilets, and washrooms.
- A minimum of **200 lux (20 foot candles)** shall be provided where moderate discrimination of details is essential
  (for medium assembling, rough inspection of testing of products, planning of lumber and veneering.)
- A minimum of **300 lux (30 foot candles)** shall be provided where close discrimination of details is essential
  (for medium bench and machine work, medium inspection, goods or for office desk work with intermittent reading and writing for filing and mail sorting)
- A minimum of **500 to 1,000 lux (50 to 100 foot candles)** shall be provided where discrimination of fine details is involved under conditions of a fair degree of contrasts
  (assembling, fine machine work, fine inspection, or for accounting, bookkeeping, drafting, or other prolonged close office desk work)
- A minimum of **I 000 lux (1 00 foot candles)** shall be provided where discrimination of extremely fine detail is involved under conditions of poor contrast for long periods of time
  (such as for extra fine assembling instrument, jewellery, and watch manufacturing, proof-reading in printing plants, etc.)
- Where conditions allow, it may be necessary to provide initially an illumination of at least **25%** more. In locations where dirt will collect rapidly, the initial level should be at least **50%** above the recommended standards.

1075.06: Emergency Lighting

- Emergency systems shall be capable of producing and maintaining for at least one **(1) hour**, a minimum intensity of **5 lux (0.5 ft. candle)** and shall have an energy source independent of the general lighting system installation.

1076: General Ventilation

1076.02: Air Supply

- Clean fresh air shall be supplied to enclosed workplaces at an average rate of not less than **20 to 40 cubic meters (700 to 1400 cu. ft.)** an hour per worker, or at such a rate as to effect a complete change of air a number of times per hour varying from 4 sedentary workers to 8 active workers.

1076.05: Air Movement

- The air velocity shall not exceed **15 meters (50 ft.) per minute** during the rainy season and **45 meters (150 ft.) per minute** during the summer season.

Personal Protective Equipment and Devices

1084: Head Protection

1084.01: Head Protection

- The total weight of complete hard hat should not be more than **0.45 kgs. (16 ounces).**

1086: Safety Belts, Life Lines and Safety Nets

1086.01: General Provisions

- Workmen working in unguarded surface above open pits or tanks, or working from unguarded surfaces **six (6) meters (20 ft.)** or more above water or ground, temporary or permanent floor platform, or is exposed to the possibility of falls hazardous to life or limb, shall be secured by safety belts and life lines.
- Window washers or cleaners working outside buildings **six (6) meters (20 ft.)** or more above the ground or other surfaces unless protected from falling by other means, shall use safety belts attached to suitable anchors.
- Workers who are required to climb and work on top of poles **six (6) meters or more** shall use safety belts.

1086.02: Requirements

- Safety belts shall be made of chromed tanned leather, linen or cotton webbing, or other suitable materials at least **11.5 cm. (4 1/2 in.) wide, 0.65 cm. (1/4 in.) thick** and can support a weight of **114 kgs. (250 lbs.)** without breaking.
- Belt anchors shall be made of metal machined from bar stock, forged or heat treated, can support a pull of **2730 kgs. (6,000 lbs.)** without fracture applied in the direction which the anchor must withstand should a man fall.
- Life lines shall be made of good quality manila rope of at least **1.9 cm. (3/4 in.) diameter** or equivalent material such as nylon rope of at least **1.27 cm. (1/2 in.)** diameter and shall be of sufficient strength to support a weight of **1140 kgs. (2,500 lbs.)** without breaking.
- Safety nets shall
  a. not be less than **0.94 cm. (3/8 in.) diameter** mesh ropes
  b. not less than **1.90 cm. (3/4 in.) diameter** border ropes (perimeter) made of materials that can absorb the impact of a falling body equally
  c. The mesh shall be arranged not to exceed **15.25 cm. (6 in.)** on canters positively and securely attached to avoid wear at each crossing point and at points of contact with the border.

Hazardous Materials

1093: General Rules

1093.04: Marking Containers

- Receptacles of over **18.92 liters (5 gallons)** capacity may be marked with letters stenciled, stamped, or uniformly printed not less than **2.54 cm. (1 in.)** in height. Marking shall not be defaced or obliterated by rain or other weather elements.

1095: Storage

1095.01: Vats and Tanks

- Vats, pans, and open tanks containing hot corrosive or toxic liquids shall, when the opening or top is less than 1 m (3.3 ft) above the floor or working level, be either:
  a. raised so the top will not be less than **1 m (3.3 ft.)** from the floor or working level, or
  b. guarded on all sides by enclosures or by standard railings and when the top is less than **15 cm. (6 in.)** above the floor shall be provided with standard toe- boards.
- Walkways shall not cross over open vats, pans or tanks containing hot, corrosive or toxic liquids. Where it is necessary to install service walkways for access to agitator drives or valves or for taking

samples, such walkways shall not be less than **50 cm (20 in.)** in width
- Tanks used for storing non-flammable hazardous liquids stored in pits below ground levels shall be mounted **38 to 45 cm. (15 to 18 in.)** above the bottom of the pit.
- Tanks used for storing corrosive or caustic liquids shall be provided with a permanent open wet pipe not less than **5cm (2 in).** in diameter at the highest point in the tank
- Tanks used for storing corrosive or caustic liquids shall have the filling connections at the top and the discharge pipes **15cm. (6 in.)** above the bottom

1096: Use of Lead and Its Compounds

1096.08:Physical Examination

- Workers exposed to lead shall be subjected to periodic physical examination and laboratory examination at intervals of not more than **6 months** and where the degree of contamination rises above the threshold limit value.
- Physical examination shall be conducted at least once every **3 months** and a record of such examinations shall be open to authorized agents and to the exposed workers.

Gas and Electric Welding and Cutting Operations

1100.01: General Provisions

- Welding and cutting operations carried out or done in places where persons other than the welders work or pass shall be enclosed by means of suitable stationary or portable screens. Screens shall be opaque, of sturdy construction to withstand rough usage of a material which will not readily be set on fire by sparks or hot metal, at least **2 m. (6.5 ft.)** high, and preferably painted with light flat paint.

Hazardous Work Processes

1121: Underground Tank and Similar Confined Space Work

112101: General Provisions

- the area shall be checked visually to ensure that the water level is below **15 cm. (6 in.)** and if water is present, a dry wooden platform shall be available for use;

Explosives

1142: Definitions

- "Barricaded" means that the building containing explosives is effectually screened from a magazine, building, railway or highway either by a natural barricade or by an artificial barricade of such height that a straight line from the eave line of any magazine or building containing explosives to a point **3.70 m. (12 ft.)** above the center of a railway or highway will pass through such intervening natural or artificial barricade.
- "Artificial Barricade" means an artificial mound or revetted wall of earth of a minimum thickness of **1 meter (3.3 ft.)**

1144: Limitation

1144.01: Requirements

- Explosives materials used in loading detonators or other similar manufacturing processes shall not be stored in workrooms wherein people are employed except under the following conditions:
  a. Where the quantity used for an eight-hour work does not exceed **45 kgs. (100 lbs.).** Only this quantity shall be stored in the workroom at any one time and at a place where it shall be suitably protected from uncontrolled or irresponsible handling.

1144.04:

- "Magazine" shall mean a building or structure, other than factory building, used exclusively for the storage of explosives. Only a maximum of **136,360 kgs. (300,000 lbs.)** or **twenty million (20,000,000)** blasting caps shall be stored in any one magazine.

1146: Storage of Explosives

1146.01: Class I Explosives

- Magazines shall contain over **22.5kgs (50lbs)** of explosives. It shall be masonry of metal construction or a combination of both constructed and maintained as follows:

a. Signs such as "EXPLOSIVE KEEP OFF:", legibly printed thereon in not less than **15cm. (16in)** high.

b. Outside walls shall be of **5 cm. x 10 cm. (2 in. x 4 in.)** studding with a **5 cm. (2 in.)** plank or tongued and grooved lumber having a nominal size of **2.5 cm. (1 in.)** covered with not less than **No. 26 gauge** galvanized iron or steel on the outside.

c. Brick walls shall be **20cm (8in)** in thickness of medium soft variety laid in cement mortar containing not over **25%** lime

d. *Concrete* - Concrete walls shall be **15 cm. (6 in.)** in thickness constructed of nine (9) parts sand to one (1) part cement with a **1.25 cm (½ in.)** face surface of three (3) parts sand to one (1) part cement.

e. *Cement Block* - Cement block walls shall be **20 cm. (8 in.)** thick hollow cement block, a mixture of seven (7) parts sand and one (1) part cement. The spaces in the block shall be filled with dry coarse sand (not crushed stone or gravel) or a weak mixture of cement mortar.

f. *Fabricated Metal* - Walls and roof shall consist of approximately **No. 14 gauge metal** securely fastened together. Walls shall be lined with **10 cm. (4 in.)** of brick of at least a **15 cm. (6 in)** sand fill between the interior and exterior walls.

g. *Lining of Magazines* - Lining of magazines may not be required for the storage of black powder or for the storage of not more than **100,000** pieces of blasting caps.

h. *Foundation* - shall be of stone laid in concrete, wood posts or brick piers. Magazines of less than **13,600 kgs. (30,000 lbs.)** capacity shall have flooring of lumber having a nominal size of **2.5 cm. (1 in.)** tongued and grooved.

i. *Ventilation* - The floor and ceiling shall be constructed to within **5 cm. (2 in.)** of the walls to provide a **3 cm.** ventilation space. This shall be provided by constructing a **2.5 cm. x 15 cm. (1 in. x 6 in.)** lattice wood lining on **5 cm. x 5 cm. (2 in. x 2 in.)** wood stud **60 cm. (2 ft.)** on centers. Foundation ventilators shall be spaced not more than **150 cm. (5 ft.)** on center in all sides and properly screened to prevent the entrance of sparks of fire.

j. *Doors* - The doors shall be 1 m. (3.28 ft.) wide and **1.8 m. (6 ft.)** high constructed of at least three (3) layers of hard wood, having a nominal size of **2.5 cm. (1 in.)** and covered on the outside with a steel sheet of at least **No. 20 gauge**. Where there is a need for bullet proofing the thickness of the steel sheet shall be a minimum of **1 cm. (3/8 in.).**

k. Form a box by laying a floor of a good grade of tongue and groove boards on ceiling joists and build a **2.5 cm. x 10 cm. (1 x 4 in.)** rim lined with one (1) layer of building paper and filled with **10 cm. (4 in.)** of dry coarse sand. Except for fabricated metal magazines, the outer roof shall be covered with not less than **No. 26 gauge** galvanized iron ridge roll fastened to **2.2 cm (7/8 in.)** sheating.

1146.02: Class II Magazines

- Magazines shall be used for storing not more than **22.5 kgs (50lbs)** of explosives. It shall be of wood or metal construction or a combination of both
  a. Principle of construction is simply that of placing one box inside of another with a **12.5 cm. (5 in.)** space in between filled with dry coarse sand, not gravel or crushed rock

  b. Outer Box shall be constructed of tongued and grooved lumber with a nominal size of **2.5 cm. (1 in.)** plain lumber. The outside of the box shall be covered with no less than **No. 24 gauge** iron sheet. The outer box shall be **0.33 m. (1 foot)** longer, **0.33 m. (1 foot)** wider, and **15 cm (6 in.)** deeper than the inner box allowing a **12.5 cm. (5 in.)** space on all sides for sand filling.

c. Ventilation at the top of each box, on the sides and ends, cut **0.625cm cm. (1/4 in.) by 5 cm. (2 in.)** notches, spaced about **0.33 m (1 ft)** apart, and not directly opposite

d. The box (magazine) shall be set in a level position and supported by either wooden sills, bricks or piers and the bottom of the magazine kept at about **15 cm. (6 in.)** off the ground

e. Sand Fill - Fill the space between boxes with dry coarse sand (not gravel or crushed rock) to within **0.625 cm (1/4 in.)** of the top.

1146.03: Temporary Storage at Job Sites

- When used for temporary storage at a job site for blasting operations, Class II magazines shall be located away from neighboring buildings, railways, highways and other magazines. A distance of at least **45 m. (150 ft.)** shall be maintained between Class II Magazines and the work site when the quantity of explosives kept therein is in excess of **11.4 kgs. (25 lbs.)** and at least **15 m. (50 ft.)** when the quantity of explosives is **11.4 kgs (25 lbs.)** or less.
- Class II portable magazines for transporting small amounts of explosives from the permanent magazine to the work site and for temporary storage in the work site shall be constructed or built of **5 cm. (2 in.)** hardwood or **7.5 cm. (3 in.)** soft wood, well braced at corners, with sheet metal exterior sheating.

1146.07: Approval of Plans

- These plans shall be drawn to a scale of **1:2000 meters (100 or 200 feet to an inch)** submitted in triplicate in white or blue print.
- Plans and specifications of proposed magazines and other factory buildings drawn scale of at least **1.50 meters (1/4 in. to a foot)**

1146.09: General Precautions

- For handling and housekeeping, packages of explosives shall not be opened within **15m (50ft)** of any magazine.
- All premises surrounding magazines must be kept free from bush, dry grass, and similar growth for at least **7.5m (25 ft.)** around
- When explosives are carried from one building to another or from magazines to workrooms, employees carrying explosives must allow an interval of a least one **(1) minute** in time or **30m. (110 ft)** in distance.

1146.10: Protection Against Lightning

- Protection against lightning
  a. Magazine for **2270 kgs. (5000 lbs)** or less
     - Vertical conductor of **2cm x 0.3cm (3/4 in. x 1/8 in.)** copper tape attached to a vertical pole which shall be installed so that the horizontal distance between the conductor and the nearest part of the magazine shall not be less than **1.2m (4 ft).**
     - Joints in the conductor shall be tinned and riveted with **0.47 cm. (3/16 in.)** copper rivet.
     - The conductor shall terminate at least **3 m. (10 ft.)** higher than the highest point of the magazine. The lower end of the conductor shall be attached to a point of at least **7.5 cm. (3 in.)** above ground level by **0.47 cm. (3/16 in.)** copper rivets to one or more copper rods **2 cm. (3/4 in.)** in diameter which have been driven vertically into the ground to a depth of at least **3 m. (10 ft.)**.
     - The resistance to earth shall be less than **10 ohms**.
     - Outside walls shall be of **5 cm. x 10 cm. (2 in. x 4 in.)** studding with a **5 cm. (2 in.)** plank or tongued and grooved lumber having a nominal size of **2.5 cm. (1 in.)** covered with not less than **No. 26 gauge** galvanized iron or steel on the outside.

  b. Magazine for **2770 kgs (5000 lbs)** explosive or more
     - Masts shall be erected at each end of the longer axis of the magazine and at least **0.33 m. (1 foot)** from any part of the magazine. Copper tape **2 cm. x 0.3 cm. (3/4 in. x 1/8 in.)** shall be attached to the mast. The conductor shall terminate at least **0.33 m. (1 foot)** above the top of the mast and at a point of at least **7.5 cm. (3 in.)** above ground level attached by **2 cm. (3/4 in.)** in diameter copper rods which have been driven at least **3 m. (10 ft.)** vertically into the ground. An aerial of **2 cm. x 0.3 cm. (3/4 in. x 1/8 in.)** copper tape shall be suspended between the masts so that it is either horizontal or curved upwards in the middle and is at least **3 m. (10 ft.)** higher than the highest part of the magazines. The aerial shall be attached to the copper tape conductors by **2 cm. (3/4 in.)** copper rivets and binds of at least **0.6 m. (2 ft.)** radius. Joints in the aerial and vertical conductors shall be tinned and riveted with **2 cm. (3/4 in.)** copper rivets. The resistance to earth shall be less than **10 ohms**.

Boiler

1161: Definitions

- Power Boiler is a steam boiler with a working pressure exceeding **1.055-kg/cm^2 gauge (15 psig)**
- Miniature Boiler is a power boiler which does not exceed the following limits:
  a. **40.5 cm (16 in.)** inside diameter of shell;
  b. **106.5 cm (42 in.)** overall length of the shell;
  c. **1.85 m.2 (20 ft2)** water heating surface, or;
  d. **7.03 kg/cm2 (100 psig)** max allowable working pressure.
- Low Pressure Heating Boiler is a steam boiler used exclusively for operation at a pressure not exceeding **1.055 kg/cm^2 (15 psig)** or a temperature not exceeding **121°C (250°C)**
- Boiler Horsepower is the equivalent of **0.95 sq.m. (10 sq.ft.)** of heating surface for vertical tube boilers and the equivalent of **0.46 sq.m. (5sq.ft.)** of heating surface for other types

1162: General Provisions

1162.02: Inspection of Boilers

- Boiler subjected to hydrostatic test shall be:
  a. With a test pressure equal to **1.2 times** the max working or operating pressure. Minimum temperature of water used shall not be less than **21°C (70°F)** and a max temperature not to exceed **71°C (160°F)**
  b. Under proper control, to reach the required test pressure gradually and in no case shall this test pressure be exceeded by more than **6%**

1162.05: Boiler Records

- All second hand/ rehabilitated boilers shall be accompanied by detailed working drawings and certificates executed by a Professional Mechanical Engineer calculating the ultimate tensile stress which shall not exceed **3,873 kg./cm.2 and (55,000 psi),** the joint efficiency of not more than 90% for radio graphed and heat-treated butt fusion weld, and a factor of safety of not less than **5.**

1163: Power Boilers

1163.01: Boiler Rooms

- Clearance around the boiler to the boiler room wall or any equipment shall be at least **100 cm. (3.28 ft.).** Boiler room shall have two independent doors for easy access.
  a. in separate buildings of fire-resistant materials used for no other purpose and situated not less than **3 m. (10 ft.)** away from buildings not forming part of the factory.
- Power boiler rooms, blow-offs, ash pits and other places where there is danger or workers being trapped in the event of explosion or rupture of steam lines, shall be provided with not less than (**2**) adequate exits which shall be kept clear of any obstructions.
- Runways located on top or alongside a battery of power boilers shall be provided with not less than two (**2**) means of descent.
- Power boiler rooms shall be of sufficient height to permit installation and operation of all valves and safety devices with a minimum clearance of **90 cm. (3 ft.)** above the highest valve fitting or levers.
- Wet-bottom stationary boiler shall have a space of not less than **30 cm. (12 in.)** between the bottom of the boiler and the floor line to provide access for maintenance or inspection.
- Clearance around the boiler to the boiler room wall or any equipment shall be at least **90cm. (3 ft.).** Boiler room shall have two independent doors for easy access.

1163.02: Factors of Safety

- The working pressure shall be reduced to maintain a factor of safety of not less than (**5**) of such other factor as may have been specified/fixed in the specification, to which the boiler was made

by increasing the factor of safety by **10%** or more as determined by the enforcing authority under the following conditions:

a. the inspection shows signs of deterioration affecting the integrity of the boiler/s unless repair is/are undertaken
b. after **25** years of service

1163.03: Access and Inspection

- Hand-hole openings in heads or shells of power boilers shall not be less than **70mm. x 90 mm. (2 ¾ in x 3 ½ in).**
- Each power boiler shall be equipped with at least **1** safety valve if the heating surface is **46.5 sq.m. (500 sq.ft.)** or less and **2** or more if the heating surface is over.
- The safety valve on power boilers shall be of sufficient capacity to discharge all the steam generated by the boiler without allowing the pressure to rise to more than:
  a. **6%** above the maximum allowable working pressure;
  b. **6%** above the highest pressure to which any valve is set.
- Safety valves discharge outlets for power boiler shall be located or piped out away from running boards and platforms, preferably not less than **3 meters. (10 ft.)** above the platforms.
- Economizers used on power boilers shall be equipped with at least **1** safety valve provided with seats and discs of corrosion resistant materials, if there is an isolating valve between the drum and economizer.

1163.05: Water Column Pipes

- Pipes connecting water columns to power boilers shall not be less than **25 mm. (1 in.)** pipe size, and as short and direct as possible.
- Horizontal return to water columns shall be taken from the top of the shell in the upper part of the head and the water connections from a point not less than **15 cm. (6 in.)** below the lowest center line of the shell.
- On the fire box type of power boilers, the water connections shall be taken from a point not less than **25 cm. (10 in.)** below the lowest water line or as near thereto as possible, and in no case less than **45 cm. (18 in.)** above the mud ring.
- Steam gauges shall be connected to the steam space or to the water column on its steam connection by siphons or equivalent devices, which shall be arranged that the gauge cannot be shut-off from the boiler, except:
  a. by a cock or shut-off valve of **35 kg/cm²g (500 psig.)** rating or over.
- Dials of steam gauges for power boilers shall:
  a. be of a size and marked that the graduations of the pointer can be clearly determined by a person with normal vision from a distance equal to **1 ½** times the width of the boiler front;
  b. be graduated to not less than **1 ½** times the pressure at which the safety valve is set, preferably to about double such pressure.

1163.07: Water Gauge Glasses

- Each power boiler, except once-through boilers with no fixed steam and water-lines, shall be equipped with at least **1** water gauge glass which shall be:
  a. Connected to the water column or directly to the boiler by piping of not less than **12 mm. (15/32 in.)** diameter
- Water gauge glasses on power boilers shall be located in a way that when the visible water level is at its lowest reading in the glass, the reading should not be less than:
  a. **75 mm (3 in.)** of water over the highest point of the tubes, flues or crown sheets in horizontal fire tube power boilers; or
  b. **50 mm. (2 in.)** of water above the lowest permissible level in water tube power boilers.

1163.08: Gauge Cocks

- When the boiler is equipped with water gauge independently connected to the boiler and located not less than **70 cm. (28 in.)** apart on the same horizontal line may not be provided with gauge cocks
- Gauge cocks shall be equipped with at least **1** try-cock each
- For boilers of the locomotive type not over **90 cm. (35 in.)** diameter, and for boilers of the fire box and watering types with a heating surface not exceeding **5 sq. m. (53 sq. ft.)** only **2** gauge cocks shall be required.

1163.09: Fusible Plugs

- Fusible plugs, when used on power boilers, as additional low water alarms, shall be renewed at intervals not exceeding **12** months. Casings which have been used shall not be refilled.
- Fusible plugs shall not be used on power boilers operating at pressures exceeding **17.5 kg/cm2g (250 psig).**

1163.10: Blow-Off Requirements

- Each power boiler, except once-through boilers with no fixed steam and water line, shall be equipped with at least **1** blow-off pipe fitted with valve cock directly connected to the lowest water space
- Each bottom blow-off pipe on a power boiler forming a part of a range of boilers having a common blow-off pipe, drain or pump, shall be fitted with:
  a. **2** slow opening valves, or
  b. **1** slow opening valve, and **1** quick opening valve or cock

1164: Heating Boilers

1164.01: Working Pressure and Temperature

- The maximum allowable pressure of boilers used exclusively for low pressure steam heating shall not exceed **1.055 kg./cm²g (15 psig).**
- The maximum allowable working temperature at or near the outlets of hot water boilers shall not exceed **121°C (250°F).**

1164.02: Access and Openings

- Access doors in steel-plate low pressure steam boiler settings shall not be less than **30 cm. x 40 cm. (12 in. x 16 in.).**

1164.03: Safety Valves

- Each low-pressure steam boiler shall be equipped with at least **1** safety valve which shall be sealed and adjusted to discharge at a pressure not exceeding **1.055 kg/cm2g (15 psig)** with the seal attached so that the valve cannot be taken apart without breaking the seal.

1164.04: Water Relief Valves

- Each hot water boiler shall be equipped with at least **1** water relief valve placed on a vertical dead-end pipe attached to the cold-water supply pipe close to the boiler or directly to the boiler and the discharge point free from any intervening valve or obstruction.

1164.07: Steam Gauges

- scales on dials of steam gauges for low pressure steam boiler shall be graduated to not less than **2kg./cm²g (28.5 psig)** and the face of the pressure gauge not less than **75 mm. (3 in.).**

1164.08: Pressure or Altitude Gauge

- Scales on dials of pressure and altitude gauges on hot water boiler shall be graduated to not less than **1 ½** times the maximum allowance pressure of the boiler

1164.09: Pressure Combusiton Regulators

- When pressure combustion regulators are used on low pressure steam boilers, they shall operate to prevent the steam pressure from rising above **1kg./cm²g (14.25 psig.).**

1165: Cleaning and Repairs

1165.13:

- **One** worker shall be detailed to examine the interior to see that no tools or other equipment are left inside the boilers

1165.14:

- The amount of bulging on the boiler or fire box shall not exceed **2%** of the area of the bulge. If it exceeds 2%, the use of boiler shall be discontinued or patch work shall be done according to the provisions of Rule 1162

1168: Requirements in the Preparation of Boiler and Pressure Vessel Plans

- For the Installation and Foundation plans, clearance of the lowest portion of the boiler shell to the floor line shall not be less than **45 cm (17.80 in.)** in case of horizontal fire tube boiler
- For the size of Plans, all sheets to be submitted shall be:
  a. **375 mm x 530 mm** - minimum
  b. **530 mm x 750 mm**
  c. **750 mm x 1065 mm** – maximum
- Title Block shall be **7.62 cm.** in width

Unfired Pressure Vessels

1172: General Provisions

1172.05: Access and Inspection Openings

- Handhole openings in pressure vessels shall be not less than **70 mm. (2 ¾ in.)** in size.

1172.07: Safety Valves

- When two or more safety valves are fitted on a pressure vessel, all except one of the valves shall be set to blow at a pressure slightly above but not more than **10%** of the maximum permissible working pressure.

1173: Liquefied Petroleum Gas (LPG) Vessels and other Cylinders

- Vessels containing or are used as containers for LPG, chemicals, catalyst and other corrosive gases shall be subjected to internal and/or external inspection, including hydrostatic tests equal to **1.2 times** the maximum working pressure at intervals not exceeding **2** years in the case of cylinders for corrosive gases **5** years for other gas cylinders.

1173.03: Markings and Identifications

- Metal stampings shall have a minimum height of **0.31 cm (⅛ in.).**
- The height of lettering by printing, stenciling, labeling and paint or ink stamping shall not be less than **1/25** of the diameter of the cylinder with a minimum height of **0.62 cm. (¼ in.).**

1174: Steam Heated Pressure Vessels

1174.02:

- Steam supply pipes for steam heated pressure vessels shall be placed in floor trenches, where practicable, or covered with insulating materials within **2 m.** from the floor or working level to prevent excessive increase of temperature in the atmosphere of the workroom.

1175: Closed Steam Heated Pressure Vessels

1175.05: Digesters

- Openings of blow-pits shall be so constructed as small as possible with raised sides or guarded by standard railings of not less than **1.25 m. (48 in.)** in height.
- Each floor of digester buildings shall be provided with not less than **2** unobstructed means of egress.

1175.08: Vulcanizers and Devulcanizers

- Periodic and through internal and external inspections shall be made of vulcanizers including all attachments and connecting equipment, at intervals not exceeding **3** months.
- Horizontal vulcanizers and open type devulcanizers shall be equipped with an additional drain valve near the center, when the vessel is more than **0.75 m. (2. 5 ft.)** in length.

1176: Open Steam Heated Pressure Vessels

1176.01: General Provisions

- Where the top edges of large open steam pressure vessels are less than **1.20 m. (4 ft.)** above the floor or working level, the vessels shall be surrounded by standard railings to the floor, so that workers can watch the operations, without the possibility of falling into the vessels or being burned by splashing materials.
- Batteries of open kiers or similar open steam heated pressure vessels shall be arranged that:
    a. the distance between the edges of the vessels is at least **45 cm. (18 in.);** and
    b. there is unobstructed space for passage around each vessel of at least 45 cm. (18 in.).

1177: Water and Air Pressure Tanks

1177.04: Air Receivers

- Where **two or more** receivers are served by **one** compressor, the air supply piping for each tank shall be equipped with a stop valve and with a safety valve between the stop valve and the compressor.

1178: Refrigeration Tanks

1178.02:

- Not more than **2** refrigeration tanks shall be located one above the other within the same area between floor and ceiling.

1178.07: Pressure Relief Device

- Refrigeration tanks shut off by valves from other parts of the refrigerating system, shall be equipped with:
    a. at least **2** pressure relief valves or one pressure relief valve in parallel with a rupture member when the capacity of the tank exceeds **140 liters (5 cu. ft.)** and its diameter exceeds **15 cm. (6 in.)** and
    b. a pressure relief device or a fusible plug, when the capacity of the tank is **140 liters (5 cu. ft.)** or less.

Internal Combustion Engine

1181: Definitions

- "Internal Combustion Engine" can be a **two or four** stroke cycle piston engine wherein heat energy is developed by burning then fuel mixture (gas, diesel, oil, etc.) inside the combustion chamber which in turn produces mechanical energy in the form of reciprocating and rotating forces of expanding gases during combustion to drive a piston, shaft or propeller.
- "Horsepower" (hp) is the amount of energy or work required to raise, create or force a weight of **33,000 pounds** to a height or distance of one-foot in one-minute time; a standard unit of power equivalent to 746 watts or 746 joules/second.

1183: Internal Combustion Engine Room/ Building

- Engine room shall be at a minimum of **3.0 meters** in height or as specified by the manufacturers.
- Clearance around the engine to the engine room wall or any equipment shall be at a minimum of **1.0** meter. Engine room shall have **two** independent doors for easy access.
- Engines with "weatherproof" housings which are installed outdoors or on roofs of structures shall be located at a minimum of **1.5 m** from openings in walls and at least **1.0 m** from structures having combustible adjacent walls.
- Engines rated at more than **50 hp** shall be located in accordance with the previously mentioned condition or shall be installed in detached structures reserved exclusively for the purpose with equipment and processes having similar hazard, or in rooms within or attached to other structures.

1183.01: Internal Combustion Engine Foundation Requirements

- Floor slabs or building footings shall be isolated from foundation base by at least **25 mm** around its perimeter to eliminate transmission of vibration. Opening shall be filled with watertight insulation.
- Foundation shall be concrete, at least class A mixture of **1** part cement, **2** parts sand and 4 parts broken stone or gravel **(50 mm. max.**) or at least **211.36 kg/cm2 (3000 psi).**
- Engine should be placed on the foundation only after seven days have elapsed from pouring of base and should be operated only after **20** days have elapsed from placement or as per specifications of the manufacturer/installer.
- Minimum foundation bolts shall be at least **12 mm.** in diameter.
- The weight of the engine plus the weight of concrete foundation shall be distributed over a sufficient soil base area large enough to cause a bearing stress within the safe bearing capacity of the soil with a minimum factor of safety of **5**.

1184: Requirements in the Preparation of Internal Combustion Engine Installation Plan

- For the Installation and Foundation Plans, the piping installation should be incorporated especially those within a height of **2.13 meters** from the floor line
- All sheets of plans to be submitted should be of the following sizes:
    a. **375 cm. x 530 cm**. ----------Minimum
    b. 530 cm. x 750 cm.
    c. **750 cm. x 1065 cm**. ----------Maximum
- For the title Block, the size shall be **7.62 cm**. in width

Machine Guarding

1203: Standard Machinery Guards

1203.02: Framework

- For small guards, minimum dimensions of materials of the framework of metal guards **75 cm (30 in.)** or less in height and width, a surface area not exceeding **1 sq. meter (11 sq. ft.)** shall be **1 cm. (⅜ in.)** for solid rod, **20 mm x 10 mm x 3 mm (¾" by ⅜" by ⅛")** for angle iron.
- For Braced Guards:
    a. minimum dimensions of materials of the framework of guards more than **75 cm. (30 in.)** in height and with a surface area exceeding **1 sq. meter (11 sq. ft.)** shall be **25 mm. x 25 mm. x 3 mm. (1 " x 1" x ⅛")** for angle iron or **20 mm. (¾ in.)** diameter for metal pipe.

b. such guards should be rigidly braced every **90 cm. (3 ft.)** or fractional part of their height to some fixed part of machinery or other structure.

- For Unbraced Guards, when a machinery guard is fastened to the floor or working platform without any other support or bracing, the framework shall be
  a. Wood Railings: The top rail and post shall be **50 mm x 100 mm** and the intermediate rail shall be **50 mm x 50 mm or 20 mm x 100 mm**
  b. Pipe Railings: The top rail and post shall be **30 mm**. in diameters and intermediate rail shall be **25 mm**. in diameter.
  c. Structural Metal Railings: Top rails and posts of angle iron shall be **38 mm x 38mm x 5 mm** and the intermediate rails of angle iron shall be **32 mm x 32 mm x 3 mm**.
- For Horizontal Overhead Belt Guards, ropes, or chains, more than 2.6 m. (8 1/2 ft.) above the floor or platform of angle iron, shall be at least:
  a. **25 x 25 x 5 mm. (1 by 1 by 3/16 in.)** for belts up to **25 cm. (10 in.)** in width;
  b. **38 x 38 x 6 mm. (1 1/2 by 1 1/2 by 1/4 in)** for belts over **25 up to 35 cm (10 to 14 in.)** in width;
  c. **50 x 50 x 8 mm. (2 by 2 by 5 /16 in.)** for belts over **35 up to 60 cm. (14 to 24 in.)** in width; and
  d. **80 x 80 x 10 mm. (3 by 3 by 3/8 in.)** for belts over **60 cm. (24 in.)** in width;
- Guards support, if of flat iron, should be of the following dimensions:
  a. **38 x 6 mm. (1 1/2 by 1/4 in.)** for belts up to **25 cm. (10 in.)** in width;
  b. **50 x 8 mm. (2 by 5/16 in.)** for belts over **25 to 35 cm. (10 to 14 in.)** in width;
  c. **50 x 10 mm. (2 by 3/8 in.)** for belts over **35 to 60 cm. (14 to 24 in.)** in width., and
  d. **65 x 10 mm. (2 1/2 by 3/8 in.)** for belts over **60 cm. (24 in.)** in width.

1203.03: Fillers

- Minimum dimensions of materials:
  a. Fillers should be made of solid sheet metal not less than **0.8 mm**. in thickness, perforated sheet metal not less than **1.00 mm**. in thickness or woven wire not less than **1.6 mm.** in diameter.
- Woven wire shall be of the type in which the wires are securely fastened at every crosspoint by welding or galvanizing or soldering except in the case of diamond or square wire mesh made of wire **2 mm. (0.08 in.)** in diameter, **20 mm. (3/4 in)** mesh or heavier.
- Fastenings:
  a. Wire mesh made of wire **2 mm. (0.08 in.)** in diameter, **20 mm. (3/4 in.)** mesh or heavier, may be bent entirely around rod frames.
- Filler Openings:
  a. Where guards or enclosures is within 100 mm. from moving parts, opening on the guard shall be of such size as will prevent passage of any object greater than **12 mm.** in diameter.
  b. Where guards are located more than **100 mm**. and less than **380 mm**. from moving parts, the maximum opening shall not be more than **50 mm**. and where slotted guards are used, the width of the opening shall be not greater than **25 mm**. and its area shall be not more than **13 sq. cm.**

1203.04: Height of Guards

- Except as provided for specific installation, the minimum height of guards shall be **1.00 meter** from the upper surface of the top rail to the floor or platform level.

1203.05: Floor Clearances

- Standards railing guards shall be placed not less than **380 mm.** nor more than **500 mm.** from any moving parts, provided however that where clearance from other moving parts are less than **380 mm.** such parts shall be guarded as required elsewhere in this Standards.

1203.08: Wood Guards

- Wood guards shall be made of planed lumbed not less than **25 mm. (1 in.),** or of wood or fabricated lumber of equal strength.

1205: Transmission Machinery Guarding

1205.01: Prime Movers

- Any exposed part of flywheel **2,100 mm** or less above the floor or platform shall be guarded.
- In areas where standard railings are used, the railings shall not be less than **380 mm**. nor more than **500 mm** from the rim of the wheel.

1205.02: Governors

- Fly ball governors located **2,135 mm or less** above the floor, platform or other working level having rotating, projecting or sectional parts shall be enclosed or covered with guard secured to rigid supports and accessible to oiling and inspection.

1205.05: Tail Rods

- If guardrails are used, the range shall be **50.8 cm. (20 in.)** when the tail is fully extended.

1205.06: Shafting

- Shafts shall be completely enclosed **2.13 m. (7 ft.)** from the floor.

1205.07: Belt and Pulley Drive

- Any part of a horizontal belt and pulley drive, involving the use of flat crowned or flanged pulleys, which is **2,100 mm or less** above the floor or working level shall be guarded.
- Overhead belts **over 2,100 mm** from the floor shall be guarded in its entire length if:
  a. Located over passageways or workplaces and running at speed of **20 km/hr.** or over.
  b. Center to center distance between pulleys is **3.05 m** or more.
  c. Belt is **200 mm** or more in width.
- When both runs of belts are 2,100 mm or less from the floor, the belts shall be completely enclosed
- Where a group of flat belt drive is guarded by standard railing guard, such drives shall be considered guarded where the distance from the vertical plane of the rail to the nearest point of any belt or pulley is not less than 380 mm nor more than 500 mm and where the distance between any two adjacent belts or pulleys does not exceed **900 mm.**
- Belt-type variable speed drives located **2,100 mm** or less from the floor or working level shall have all moving parts guarded.
- Pulleys with a speed of **400 rpm** shall be periodically inspected for defects.

1205.08: Conveyors

- Screw conveyors **2,100 mm**. or less above floor or other working level shall be completely covered with substantial lids except that screw conveyors the top of which is **600 mm** or less above the floor or other working level, or below the floor level may be guarded by standard railing guards having toeboards of midrail height or shall be guarded by substantial covers or gratings.

1205.09: Gears and Sprockets

- The chains, sprockets and chain drives located within **2,100 mm** of the floor or other working level shall be guarded in the same manner as the belts are.

1205.10: Starting and Stopping Devices

- Clutches, cut-off couplings or clutch pulleys and other mechanical power control devices having projecting parts where any parts of such devices is located **2,100 mm** or less above the floor or working level shall be completely enclosed and shall not interfere with the operation of the mechanical control.

1206: Woodworking Machinery

1206.01: Table Saws

- where the saw moves forward horizontally the hood or guard shall extend at least **50 mm** in front of the saw teeth when the saw is in back position. The width of the hood shall be limited, providing not more than **12.70 mm** clearance on each side of saw blade. A fixed or manually adjusted hood or guard may be allowed, provided the space between the bottom of the guard and the material being cut does not exceed **12.70 mm.**
- Except when grooving and when a roller wheel is provided at its back, the saw shall be provided with a spreader mounted directly at the back of the saw at a distance of not more than **0.95 cm**. and

shall be supported so that all times it will be in alignment with the saw when the table is lifted or tilted.

1206.05: Sanders

- Disc sanders shall have the periphery and back of revolving disc guarded, and the space between revolving disc and edge of table shall not be greater than **6.35 mm.**

1206.06: Band Saws

- The guard shall be constructed of heavy material, preferably metal and the edge of the guard shall come to within **12.70 mm**. of the plane formed by the inside face of the feed roll in contact with the stock being cut.

Electrical Safety

1212: Electrical Safety Inspection

1212.03: Application and Plans

- Application for the electrical installation for household lighting utilizing energy involving installation of **20** outlets or less, or for the power or heat utilizing electrical energy not exceeding **4** kilowatts need not be accompanied by plans.

- Duration of Temporary Certificate:
    a. Temporary installation for construction work and installation pending permanent installation shall be for a period of **120 days** from the date of issuance subject to renewal until the work is completed.
    b. Installations for amusements shall be for 60 days renewable for a maximum of 60 days

Elevators and Related Equipment

1223: General Requirements

- Hoistways for elevators outside the buildings shall be substantially enclosed to a height of at least **3 m (10 ft.)** provided that the enclosure shall be continuous to the top of any side where there is access to the cage.
- In general enclosures shall be fire resistant.
    a. Fire-resistant hoistway or machinery spaced enclosures shall be carried to the underside of the roof, if the roof is of fire-resistive construction, and at least **90 cm (3 ft.)** above the surface of the roof, if the roof is of non-fire-resistive construction;
    b. Hoistway pits shall be of such depth that when the car rests on the fully compressed buffers, there shall be a vertical clearance of not less than **610 mm.** between the pit floor and the lowest structural or mechanical part, equipment or device installed beneath the car platform except guide shoes or rollers, safety jaw assemblies, and platform aprons, guards, or other equipment located within **305 mm.** horizontally from the sides of the car platform.

- Safe and convenient access shall be provided to all pits and shall conform to the following:
    a. There shall be installed in the pit of each elevator where the pit extends more than **914 mm** below the sill of the pit access door, a fixed vertical ladder or non-combustible material located within reach of the access door.
    b. Ladder shall extend not less than **1067 mm** above the sill of the access door, or handgrips shall be provided to the same height
- A permanent lighting fixture shall be provided in all pits, which shall provide and illumination of not less than **54 lux** at the pit floor
- There shall be installed in the pit of each elevator an enclosed stop switch or switches and shall be located as to be accessible from the pit access door. When the pit exceeds **2010 mm.** in depth, an additional stop switch is required adjacent to the pit ladder and approximately **1220 mm.** above the pit floor
- Hoistways of elevators serving more than **3** floors shall be provided a means of venting smoke and hot gases to the outer air in case of fire. The area of the vents shall not be less than **3 ½%** of the area of the hoistway or less than **0.28 sq. m. (3 sq.ft.)** for each elevator car, which ever is greater. Of the total required vent area, not less than **1/3** shall be permanently opened by a damper.
- Closed portions of the required vent area shall consist of windows, skylights openings glazed with glass not more than **0.32 cm (1/8 in.)** thick.
- Windows on the hoistway wall enclosures are prohibited. Frames and sashes of windows in machine rooms and skylights shall be of metal. A metal or concrete floor shall be provided at the top of the hoistway:
    a. Metal floors shall conform to the following:
        i. If of bar-type grating, the openings between bars shall reject a ball **20 m.m.** in diameter.
        ii. If of perforated sheet metal or of fabricated openwork construction, the openings shall reject a ball **25 mm.** in diameter.
- The floor shall be capable of sustaining a concentrated load of **136 kg.** on any **2,580 mm²** area in addition where it constitutes the floor of the main or secondary level machinery space, it shall be designed for a live load of not less than **611 kg/m²** in all open areas.
- A sign stating the maximum allowable load for which the floor is designed shall be prominently displayed at eye level in a main and secondary machine room spaces and shall be of metal with block letters with at least **10 cm. (4 in.)** high on a white background.
- The floor shall extend over the entire area of the hoistway where the cross-sectional area is **10 sq.m.** or less. Where the cross-sectional area is greater, the floor shall extend not less than **2 cm.** beyond the contour of the machine or sheaves or other equipment, and to the entrance to the machinery space at or above the level of the platform.
- Differences in levels of machine room and machinery space floors shall be avoided, where practicable. Where the difference in level in such floors exceed **30 cm.**, a railing shall be provided at the edge of the higher level. Where such change in level occurs, ladders or stairs shall be provided for access between levels.
- Landing doors of power-driven elevators shall be provided with interlocks to hold the elevator car immovable while any landing is open, and to make it impossible to open any landing door when the car is more than **7.5 cm. (3 in.)** away from the landing except with a special emergency key.
- On passenger elevators, vertically sliding or counter-balanced landing doors shall only be permitted if interlocked with elevator car doors or gates so the landing door cannot:
    a. open more than **60 cm. (24 in.)** until the hoistway door is locked in its fully opened positions, and
    b. start to close until the car door or gates is closed to **60 cm. (24 in.)** of full closure.
- Clearance between the sides of elevators cars and hoistway enclosure shall not be less than **1.9 mm.** except on the sides used for loading and unloading. Clearance between the cars and their counterweight shall not be less than **25 mm.** The clearance between counter weight and the counterweight screen and between the counterweight and the hoistway enclosure shall be not less than **19 mm.**
- Clearance between the car-platform sill and the hoistway edge of any landing sill, or the hoistway side of any vertically sliding counterweighted or counterbalanced hoistway door or of any vertically sliding counterbalanced biparting hoistway door, shall be not less than **13 mm.** where side guides are used, and not less than **19 mm**. where corner guides are used. In no case shall such clearances exceed **38 mm.**
- The clearance between the landing edge of car platform sill the hoistway enclosure of fascia plate for the full width of the clear hoistway-door opening shall be not more than **127 mm.** Except where vertically sliding hoistway doors are installed, the clearance specified may be increased **190 mm.** For heavy duty elevators on extra wide door openings, the clearance may be increased where necessary, subject to the approval of the enforcing authority.
- Counterweight runways shall be located in the hoistways with the exposed sides covered from a height of at least **2.15 m. (7 ft.)** above the floor of the pit.
- The operation of freight elevators having only one hoisting cable shall be prohibited, unless the diameter and material of the cable is adequate to carry safely the maximum load with a factor of safety of not less than **12.**
- The rated speed of power driven elevators carrying an operator shall not exceed **3.66 km/hr. (200 ft/min)**, except in the case of automatic operation and continuous pressure operation elevators or those controlled by a regular operator.
- The rated speed of electric freight elevators with continuous pressure operation shall not exceed **2.76 km/hr. (151 ft/min)**.
- The rated speed of belt or chain-driven freight elevator shall not exceed **1.1 km/hr. (60 ft./min)**, and the rated speed of elevators operating through hatchway covers shall not exceed **0. 91 km/hr. (50 ft./min)**

Identification of Piping System

1230.07: Type and Size of Letters for Stencils

- The standard sizes for letters in the use of stencils shall be from **13 to 89 mm** in height. Tags shall be used for identifying pipes with less than **(3/4") 19 mm** in diameter.

Power Piping Lines

1206: Woodworking Machinery

- After installation, all piping line connection shall be hydrostatically tested and shall observe the following:
    a. Applied hydrostatic test is equal to **1.5** times the service operating pressure for a minimum of **24 hours** for new installation and **4 hours** for existing repaired/installation.

Construction Safety

1412: General Provisions

1412.05: Fire Protection

- Permanent stand pipe installed in a construction site shall:
    a. Have a hose outlet to which is connected to a hose that is
        i. at least 4 cm. **(1 ½ in.)** in diameter,
        ii. installed in all storeys in locations where every part of the budding shall be protected by a hose having a length of not more than **25 m. (75 ft.)**
    b. Have a connection of the size used by the local fire department
        i. located on the street side not more than **1 m. (3 ft.)** and not less than **0.33 m (1 ft.)** above the ground level.

1412.07: Lifting of Weights

- For continued lifting, a male worker shall not be made to lift, carry or move any load over **50 kgs**. and female workers over **25 kgs**. Weights over these shall either be handled by more than one worker or by mechanical means.

1412.09: Protection of the Public

- A safe covered walkway shall be constructed over the sidewalk for pedestrians in a building construction work less than **2.3 m. (7 ft.)** from a sidewalk or public road.

1412.10: Storage of Materials

- Lumber, structural steel, and similar building materials shall be properly stored and secured against collapsing or tipping. Cross pieces shall be used in a pile of lumber more than **1 m. (3 ft.)** high.

1413: Excavation

1413.01: Shoring and Timbering

- The walls of every excavation over **1 m. (3 ft.)** deep shall be supported by adequate shoring and timbering to prevent collapse, provided that this shall not apply to an excavation:
    a. the walls are sloped to **45°** angle from the vertical or cut to the angle of repose.
- Shoring or timbering in excavation over **6.6 m. (29 ft.)** deep and those installed to prevent the movement, collapse of an adjacent structure shall be designed by a structural engineer and approved by the proper authority.
- Every excavation over **1 m. (3 ft.)** shall be kept free of water at all times.

1413.02: Minimum Berm

- Where the disposal area is limited, a berm of reduced width of not less than **1 m. (3 ft.)** may be allowed, provided the materials being excavated are stable, the shoring is designed to carry the additional load, and barriers are provided to prevent roll back of the excavated materials.

1413.03: Tools Materials and Machinery

- Tools or materials shall be kept a minimum of **1 m. (3 ft.)** away from the edge of the excavation to prevent their being knocked down into the excavation.
- No vehicle or other machinery shall be driven, operated or located near the edge of an excavation at least a distance 1/3 of its depth.

1413.04: Provision for Barricades

- The top of the walls of an excavation more than **2.0 m. (6 ft.)** deep shall be barricaded to a height of at least **1 m. (3 ft.)** to prevent the fall of workers.

1413.05: Means of Access and Escape

- Every excavation over **1 m. (3 ft.)** deep shall be provided with means of access and escape in case of flooding or collapse of the excavation work.
- Every excavation shall have at least **1** ladder in every **16.6 m. (50 ft.)** of length or fraction thereof, of a length, which shall extend at least **0.83 m. (2'6")** above the top of the excavation to provide a firm handhold when stepping on or off the ladder.

1413.06: Inspection and Examination of Excavation

- Every part of an excavation over **2 m. (6 ft.)** deep where workers work shall be inspected by the person in charge at least once everyday.

1413.08: Sizes and Spacing of Members

- Sheating shall not be less than **5 cm. x 15 cm. (2" x 6")** in section, wales not less than **10 cm. x 15 cm. (4"x 6")** in section and struts not less than **10 cm. x 15 cm. (4" x 6")** in section; the length, section and spacing of timbering members shall be designed considering the nature of soil, depth and the surroundings.

1414: Scaffoldings

- Timber/bamboo scaffoldings shall be limited to a height of **20 meters** from the ground or base provided that, over a height of **10 meters**, the scaffolding and all other installations constructed over the scaffolding shall be designed by a structural engineer and duly approved by the appropriate authority.
- At heights over **20 meters**, structural metals should be used designed by a structural engineer and duly approved by the appropriate authority.

1414.01: Maintenance of Scaffolds

- Scaffoldings left standing for **4** months shall not be used until damaged members are replaced and the whole structure returned to its original strength.

1414.02: Supervision and inspection of Scaffolds

- Lumber with **2** nail holes aligned crosswise or **4** nail holes along its length shall not be used as horizontal load bearing member of scaffolds.

1414.03: Construction of Timber Scaffolds

- In single scaffold, the standard shall be placed at **1.18 - 2.43 m. (4 - 8 ft.)** apart at a distance of **1 m. (3 ft.)** from the wall, connected horizontally by ledgers spaced vertically at **1.51 m. (5 ft.) - 1.81 m. (6 ft.)** on centers.
- The size of the standard shall not be less than **8.9 cm. (3 in.)** in diameter or its equivalent and when it is necessary to extend a standard, the overlaps shall not be less than **60 cm. (23 in.),**
- In double scaffold, the outer row shall be at a distance of **1.22 to 1.32 m.** from the wall.
- The size of the standards for double scaffold shall not be less than **10 cm**. in diameter or its equivalent and when it is necessary to extend a standard the overlap shall not be less than **15 cm**.
- The distance between two consecutive putlogs shall be designed with due regard to anticipated load and the nature of the platform flooring. As a minimum rule, the spacing shall be as follows: for **3.2 cm.** thick planks, spacing shall not exceed **1 m.** for **3.8 cm.** thick planks spacing shall not exceed **1.5 m.**

1414.05: Types of Scaffolds

- Suspended scaffolds shall not be used unless:
    a. the fixed support or outriggers to which it is attached are capable of supporting at least **4** times the maximum load to which they may be subjected without exceeding the allowable unit stresses of the material used;
    b. the platform is at least **25 cm**. wide, suspension points shall not be more than **3 m**, apart, and provided with devices to keep the platform at a distance from the wall to allow working in sitting position.
- Skips, brackets, boatswain chair:
    a. No skip, bracket, or basket shall be used as a suspended scaffold unless it is at least **76 cm.** deep and either constructed of metal or carried by two strong bands of metal fastened around the sides and bottom
- Ladder scaffolds or ladder jack scaffolds
    a. Ladder scaffolds shall be used only when

i. the work is of such light nature and the material required for the work is light and can be hung on the ladder.
ii. the distance between the ladders of the scaffold is less than **3 m.**

- Trestle scaffolds shall not be used if the working platform is more than **5m** from the ground or other surface upon which the scaffold is erected
- A trestle scaffold shall not be erected on a scaffold platform unless designed by structural engineer and approved by the proper authority if erected on a scaffold **10 m** over in height
- Bamboo scaffold may be used for painting or light construction work constructed and maintained
    a. The material and construction shall be sufficient to carry at least **4** times the imposed load
    b. only one worker shall be allowed in any one span
    c. the maximum span between posts shall be **266 cm. (8 ft.)**
    d. when the height or fall is over **6.6 in. (20 ft.),** the use of safety belt shall be required
    e. when erected over a height of **10 m (30 ft.),** the design shall be by a structural engineer approved by the proper authority and construction shall be under expert supervision
    f. the maximum height allowed is **20 m (60 ft.)**

1414.06: Platforms, Runways, Ramps, and Stairs

- All working platforms, runways and ramps from which workers are liable to fall a distance of more than **2 m. (6 ft.)** shall be:
    a. for platform with minimum width of **70 cm. (28 in.)** the runways and ramp shall be **45 cm. (18 in.)** and if runways are used for the passage of materials, the width shall not be less than **70 cm. (28 in.).**
    b. provided with strong guard rails up to a height of **91 cm. (35 in.)** above the working surface and toeboards of at least **20 cm. (8 in.)** in height.
- The following shall be the minimum width of platform for various types of scaffolds:
    a. When the platform is not more than **2 m. (6 ft.)** above the ground floor:
        i. for painters, decorators and similar types of workers, **30 cm. (12 in.)**
        ii. for all other types of workers and tools, **50 cm. (20 in.)**
    b. When the platform is more than **2 m. (6 ft.)** above the ground or floor:
        i. for men, tools and materials, **1 m. (3 ft.)**
        ii. for men, tools, materials and vehicles, **1.5 m. (5 ft.)**
- The uniformly distributed minimum design load of platform, runway, ramp or stair shall be **650 kg./sq.m. (133 lbs./sq. ft.).**
- Planking used shall not be less than **3 cm. (2 in.)** thick.
- A scaffold platform shall not project beyond its end support to a distance exceeding **4** times the thickness of the plank, unless secured to prevent tipping.
- Slope of runway or ramp shall not exceed **2 in** 3.
- When the slope of runway or ramp requires additional foothold using stepping laths, they shall:
    a. have a minimum section **5 x 8 cm. (2 in. x 3 in.)** placed at maximum intervals of **46 cm. (18 in.)** on centers
    b. extend to the full width of the runway or ramp except that they may be interrupted over a width of not more than **10 cm. (4 in.)** to facilitate the passage of barrows.

1415: Construction Equipment

1414.01: Protection of Crane Driver

- Every side of a platform more than 2.16 meters (6.5 ft.) high shall be provided with guard rails and toeboards.

1415.04: Anchorage and Load Test of Cranes

- Every crane after erection altered or any kind of change shall be tested by the contractor/ supervisor with the imposition either:
    a. of a load of twenty-five per cent (25%) above the maximum load to be lifted by the crane as erected at the position when the maximum pull is applied on each anchorage

1415.05: Drums and Pulleys

- Every chain or rope that terminates at the winding drum of a lifting appliance shall be properly secured thereto and at least **2** turns or such chain or rope shall remain on the drum in every operating maximum end position of the appliance.

1415.14: Carriage of Persons by Means of Lifting Appliances

- when the use of hoist or suspended scaffold is not reasonable, provided that no person is carried except in a safe skip or other receptacle at least **1 m. (3 ft)** deep
- No wire rope shall be used for lifting and lowering of any load if in any **10 meters** length the total number of visible broken wires exceed five percent of the total number of wires in the rope.
- No chain, rope or lifting gear shall be used unless it is thoroughly examined by a competent person at intervals of **6** months and the result of examination recorded in a log book maintained for the purpose open for inspection by the enforcing authority.

1416: Plant and Equipment

- When a worker is endangered by the rotation or uncontrolled motion of a load being hoisted by a crane or similar hoisting machine, **one or more** guide ropes or tag lines shall be used to prevent rotation on uncontrolled motion.

1417: Demolition

1417.01:

- All demolition operations of building or other structure over **6 m.** high shall be under supervision of a competent person. No person except the workers who are directly engaged in the demolition shall enter a demolition area to within a distance equal to **1 ½** times the height of the structure being demolished, where this distance is not possible the structure shall be fenced around and no unauthorized person shall be allowed within the fenced area.

1417.02: Demolition Work

- No workers shall stand on top of wall, pier or chimney more than **6 m. (18 ft.)** high unless safe flooring or adequate scaffolding or staging is provided on all sides of the wall, three **3 m. (9 ft.)** away from where he is working.

1418: Mechanical Demolition

- The demolition area where work is done by mechanical devices such as weight balls or power shovels shall be barricaded for a minimum distance of **1 ½** times the height of the structure.

1419: Explosives

1419.01: Blasting

- No holes shall be drilled:
    a. within **3.3 m. (10 ft.)** of a hole containing explosives or blasting agents;
    b. within **6.6 m. (20 ft.)** of a hole being loaded with explosives or blasting agents.

Logging

1422: Handtools

- Impact tools which have mushroomed more than **0.6 cm**. from the body of the tool shall be repaired or replaced.

1423: General Logging Operations

- Servicing of fuel tanks of gasoline fed equipment shall be done in an approved manner and no gasoline shall be handled in open containers. There shall be no open light or fire within **30 m (100 ft.)** from the equipment during refueling or loading of gasoline or other flammable substances.
- Logging cars or trains carrying passengers shall not carry gasoline over **19 liters (5 gal.)** outside of the regular fuel supply tank
- Logging trains carrying passengers shall not be coupled immediately behind or in front of logging trains carrying gasoline over **19 liters (5 gal.).**
- Undercuts shall be about **113** of the diameter of the tree. **Two** horizontal undercuts shall not be allowed unless the tree is sniped.

1425: Logging Engine

- Ends of lines attached to drums shall be securely fastened. Ends of line aver **2.5 cm. (1 in.)** shall be babbitted.
- Head blocks and fair-leads shall be fastened with maximum number of **4** bolts designed with a factor of safety of **6**.

1426: Logging Engine Operation

- Spar trees shall be provided with pass lines of from **1 to 1.5 cm.** in diameter, in good condition without short or eye-to-eye splices or knots, and long enough for the purpose.
- The bearing pin shall be of the type which will positively secure the nuts and pins. The chains shall be of at least **0.6 cm. (114 in.)** of the best material without cold shuts or wire strands and attached to the end of the pass line with a clevis or ring.
- Spar trees used for loading or yarding shall be short enough to be rigid and the top guy wires shall not be more than **30 cm (12 in.)** or less than **15 cm. (6 in.)** from the top of the spar trees.
- Guy wires shall not be less than **2.5 cm. (1 in.)** in diameter of plow steel or better material in good condition, and shall develop a factor of safety of **3** under a load that will stall the engine.

OPERATION	TOP GUY	BUCKLE GUY
Logging and Yarding	6	4
Logging and Swinging	6	4
Loading only (head tree)	5	-
Loading only (tail tree)	5	-
Yarding only	5	3
Yarding with sky line		
Head tree	6	4
Tail tree	3	-

- Extensions to the guy lines or sky lines shall only be by regular long splices equal in strength to the lines to which they are spliced or by shackles connecting two spliced eyes tucked at least **3** times. The shackles used for connections shall have a strength of at least **1 ½** times the strength of the lines which they connect. Shackles shall not be placed where the lines pass through blocks or travelers.
- The anchor ends of guy or sky lines shall be firmly secured by passing the end lines at least **2 ½** turns around the stumps adequately notched to contain the end lines. Where wire rope clips are used, they shall be at least **3** "U" bolts secured on the dead end of the rope and spaced at approximately **6** times the diameter of the rope.
- The strength of shackles used to hang blocks and tree jacks shall be not less than **2** times that of the pulling lines.
- Safety straps of at least **2.5 cm. (1 in.)** material shall be used on all blocks rigged below the guy lines. The end of the strap shall be securely fastened to the block and the other end to a shackle arranged to slide down on a guy line which will carry the blocks in the direction of least hazard to the workers. Where this arrangement is not possible, safety strap shall be **1.25 cm. (112 in.)** larger than the pulling lines.
- Blocks used for yarding or swining shall be hung in at least two (**2**) straps, and each strap shall be of a line equal in strength to the running line.
- Yarding with more than **1** logging engine at one time in one spar tree is prohibited.
- The angle between the logging engine, the high line block and the yarding or swing line shall not be less than **90°.**
- Hand signals for yarding and swinging shall only be used in temporary emergencies and only when the worker giving the signal is in plain sight of the logging engine operator but shall never be used for distances more than **9 m. (30 ft.)**

1427: Tractor Yarding

- Logs shall not be suspended in arches when tractor yarding is done on slopes of **60°** or over.

1428: Line, Blocks, Rigging

- Cables with **12 ½%** of the wires broken within a distance of one wrap shall not be used.
- The following shall be used in permanently splicing running lines:

ROPE DIAMETER	UNRAVELED
0.638 cm (1/4 in.)	1.52 m.
1027 cm. (1/2 in.)	2.14 m.
1.905 cm. (3/4 in.)	2.74 m.
2.54 cm. (1 in.)	3.65 m.
3.175 cm. (1 - 3/4 in.)	4.57 m.
3.81 (1 - 1/2 in.)	6.10 m.
4.445 cm (1 - 3/4 in.)	7.65 m.
5.02 cm. (2 in.)	9.15 m.

- Eye splices in all lines shall be tucked **3** times, and **4** times if subjected to heavy strains.
- The strength of shackles used for joining line shall not be less than **1 ½** times that of the lines they join.

Fire Protection and Control

1943: Building Construction and Facilities

1943.03: Exits

- At least **2** exits shall be provided in every floor and basement of every workplace capable of clearing the work area in **5 minutes**.
- Additional exits shall be provided if the travel distance from any occupied space in a high hazard occupancy exceeds **23 m.**
- In moderate or low-hazard occupancy, the travel distance shall not be more than **31 m.** for industrial establishments, **61 m.** for business establishments and **30.5 m.** for mercantile and commercial establishments.
- If approved automatic-sprinkler protection is installed, the travel distance in high hazard occupancy may be increased to **25 m.** and for moderate or low-hazard occupancy may be increased to **46 m.**
- The width of the exits shall be computed by dividing the total occupants of a floor or a storey (maximum allowable) by **60** in industrial and commercial establishments by **45** in service establishments, and by **75** in places of assembly and the quotient multiplied by **55** to get the width of the exit in centimeters.
- Slide escapes may be considered as exits in buildings housing high hazard occupancies but these shall not constitute more than **25%** of the total number of the required means of egress.
- No steps or stairs shall be used in horizontal exits. When there is a difference in level between cemented floor areas, ramps or inclines of not more than **1 to 10** slopes shall be installed.

1943.04: Stairways

- Stairs, platforms, stairways and landings in buildings of any type of construction over **3** stories in height used as fire exits shall be constructed of incombustible materials.
- Building over **3** stories in height of non-fire resistant construction and with roofs having a slope of less than **1 in 4**, at least one stairway shall extend through the roof.

1944: Fire Fighting Facilities

1944.01: Water Supply

- Where connection from a public water supply system is not available, an adequate private water supply reservoir capable of supplying all fire-fighting systems for **8 hours** shall be provided.

1944.04: Hose

- Hose shall be thoroughly drained and dried after each use, and tested at frequent intervals or at least once every 4 months.

1944.05: Portable Extinguisher

- extinguishers having group weight not exceeding **18 kg** shall be installed so that the top is not more than **1.5 m.** above the floor. Those exceeding **18 kgs**., except wheeled types, shall be installed not more than **1 m**. above the floor.
- Distribution of fire extinguishers:
  a. Extinguishers for light hazards Class "A" fires, where the amount of combustible or flammable materials present are of such quantity that fires of small size may be expected in offices, schoolrooms, churches, assembly halls and other similar places shall be located that a person will not travel more than **30 m.** from any point to reach the nearest extinguisher. One (**1**) unit of **5 to 6 quarts (1 114 to 1 1/2 gal.)** foam extinguisher for every **250 sq. m. (2,500 sq. ft.)** of floor area or a greater fraction thereof shall be provided;
  b. Extinguishers for ordinary hazards Class "A" fires, where the amount of combustible of flammable material present are such that fires of moderate size may be expected in mercantile storage, school shops, and other similar places shall be provided and located that a person will not travel for more than **15 m.** from any point to reach the nearest extinguishing capacity for every **125 sq. m.** of floor area or a greater fraction thereof;
  c. Extinguishers for extra hazard Class "B" fires, where the amount of combustible or flammable materials present is such that fires of severe magnitude may be expected in woodworking auto repair, air craft servicing, warehouses with high piled (**5 meters** or over) combustible processes, such as flammable liquid handling, painting and other similar areas shall be provided with a **2.7 kgs.** dry chemical for every **60 sq. m.** of floor area or a greater fraction thereof;
  d. For deep-layer flammable liquid Class "B" fires in deep or quench tanks, at least one numerical unit of extinguishing

potential shall be provided for every **60 sq. m.** of floor area or a greater fraction thereof. The travel distance to reach the nearest extinguisher shall not be more than **15 m.**

e. Extinguishers shall be hydrostatically tested before use and periodically tested at least once in every **5 years** or as may be required by the enforcing authority when inspection indicate the need for such examination.

1945: Flammable and Combustible Liquids

- This requirement shall apply to liquids with a flash point of not more than **93.3°C**.
- Liquids of flash points above **93.3°C** which may assume the characteristic of lower flash points liquids when heated shall be covered by this provision.

1945.06: Installation of Underground Tanks

- The distance from any part of tanks storing liquids having flash points below **37.77°C (100°F)** to the nearest wall of a building, basement or pit shall not be less than **30.50 cm. (1 ft.);** and the property line, not less than **91.50 cm. (3 ft.).**
- The distance from any part of a tank storing liquids having flash points at or above **37.77°C (100°F.)** to the nearest wall of a building basement pit or property line shall not be less than **30.50 cm. (1 ft.)**
- Underground tanks shall be set on firm foundations and surrounded with at least **6 in.** of noncorrosive inert material well tamped in place.
- Vent pipes shall terminate outside of buildings and higher than the fill opening. The size of the vent shall depend on the filling or withdrawal rate to prevent the pressure in tank to exceed, **2.5 psig.**

1945.07: Service Stations

- Tank used in automotive service stations shall be buried as provided in Rule 1945.06 but with at least **6 in.** thick reinforced concrete slab over one foot of earth.
- There shall be only a maximum of **3** tanks in one service station containing **6,000 gal.** per tank and a total aggregate of **18,000 gal.**

1946: Combustible Solids

1946.01: Nitrate Motion Picture Film

- Rooms in which nitrate motion picture films are handle through which workers pass, shall be provided with a minimum aisle of **80 cm. (31.24)** width.
- There shall be at least **3.25 sq. m**. of floor area allotted to each worker in every room and not more than **15** persons shall work at any one time in a room where nitrate film is handled.
- Tables and racks used in connection with the handling of film (joining inspection and assembling tables) shall be non-combustible, or shall be of wood construction with no member less than **3.75 cm**. and kept at least **10 cm.** away from any radiator or heating apparatus.

1946.02: Nitrate Motion Picture Film

- Buildings used in the fabrication of pyroxylin plastics shall be of fire-resistant materials. However, building for factory use may be of non-fire-resistant construction but shall not exceed four stories or **17 m.** in height.
- No pyroxylin plastic shall be stored within **1 meter** from steam pipes, chimneys and other heating apparatus nor within **6 meters** from any manufacturing operations.
- In machining magnesium, when holes with depths greater than five times the drill diameter are being drilled in magnesium, a high helix drill **45°** shall be used to prevent the packing of chips causing resultant frictional heating and possible flash fire in the fine chips.

1948: Alarm Systems and Fire Drills

1948.01: Sounding Devices

- All buildings having **two or more** stories in height shall be equipped with fire alarm system and signals of distinctive quality and pitch clearly audible to all persons inside the building.
- Hand-operated sending stations of fire alarm boxes shall be provided on every floor and located that the travel to reach a station is not more than **30 m.** for industrial and commercial establishments with moderate or low hazard occupancy.
- Hand operated sending stations of fire alarm boxes shall be provided on every floor and located such that the travel to reach a station is not more than **61 m.** for business establishments with moderate or low hazard occupancy.

1948.03: Fire Exit Drills

- Fire-exit drills shall be conducted at least **twice** a year year to maintain an orderly evacuation of buildings, unless the local fire department requires a higher frequency of fire drills.
- When **two or more** establishments occupy a building, fire exit drills shall be planned as if there is only **1** establishment.

Pesticides and Fertilizers

1955: Fertilizers

1955.02: Storage

- Aqua ammonia shall be stored in a cast iron or mild steel tank designed with a working pressure of **7 kg./cm²**
- Anhydrous ammonia shall be transported and stored in pressure containers designed with a working pressure of **18.65 kg,/cm² g (265 psig).** Storage tanks shall have no brass and copper fittings.
- Tanks for anhydrous ammonia shall not be more than **4/5 full**

Occupation Health Services

1961: General Provisions

1961.04: Organization and Preventive Services

- Occupational health services organized as a service for a single small-scale establishment shall have an occupational health practitioner as one of its personnel, who shall conduct an inspection of the workplace:
  a. at least once every 2 months for hazardous small-scale establishments employing **1 to 50 workers**;
  b. at least once every month for hazardous small-scale establishments employing **51 to 99 workers**;
  c. at least once every 6 months for non-hazardous establishments employing **1 to 99 workers**.

- Occupational health services organized as a service for a single, non-hazardous medium- scale establishment employing **100 to 199** workers, shall have an occupational health practitioner as one of its personnel who shall conduct an inspection of the workplace at least once every **3 months**

- Occupational health services organized as a service for a single, hazardous medium-scale establishment employing **100 to 199** workers shall have a part-time occupational health physician as one of its personnel

- For hazardous and non-hazardous large-scale establishments employing **200** workers and more occupational health services shall be organized as a service solely for a single establishment/undertaking, and shall have a part-time or full-time occupational health physician.

- When an occupational health service is organized as a service common to a number of establishments/ undertakings, the following regulations shall be followed:
  a. for small-scale industries, the total number of establishments shall not exceed **10**.
  b. for medium-scale industries, the total number of establishments shall not exceed four (**4**).

1963.02: Emergency Medical and Dental Services

- For Hazardous Workplaces:
  a. In small-scale industries
     i. ***1 – 50 workers***: employer shall provide the services of a full-time first aider who maybe one of the workers in the workplace and who has immediate access to the first-aid medicines.
     ii. ***51 – 99 workers***: employer shall provide the services of a part-time occupation health nurse who shall stay in the premises of the workplace at least **4 hrs/day, 6** times a week. For more than one work shift in a day, the nurse shall stay during the shift with the biggest number of workers.

  b. In medium-scale industries
     i. ***100 – 199 workers***: employer shall provide the services of a part-time occupational health physician and a part-time dentist each of whom shall stay in the premises of the workplace at least **4 hrs/day, 3** times a week, and each one working on the alternate days with the other. For more than one work shift in a day, the physician and the dentist shall stay during the shift with the biggest number of workers.

  c. In large-scale industries

i. ***200 – 600 workers***: employer shall provide the services of a part-time occupational health physician and a part-time dentist each of whom shall stay in the premises of the workplace at least **4 hrs/day, 6** times a week, and each working in alternate periods with the other, where there are more than one work shift in a day, the physician and the dentist shall stay during the shift with the biggest number of workers.
ii. ***601 – 2000 workers:*** employer shall provide the services of a full-time occupational health physician who shall stay in the premises of the workplace **8 hrs/day, 6** times a week, or **2** part-time occupational health physician each working **4 hrs/day**, **6** times a week in alternate periods with the other. The services of a full-time dentist shall also be provided.
iii. ***More than 2000 workers:*** employer shall provide the services of a full-time occupational health physician and a full-time dentist, each of whom shall stay in the premises of the workplace **8 hrs/day**, **6** times a week during the work shift which has the biggest number of workers. In addition, the employer shall provide the services of one 1 part-time occupational health physician for each of the other work shifts who shall stay in the premises of the workplace at least **4 hrs/day, 6** times a week. The employer shall maintain in his place of employment an emergency hospital having a bed capacity of **1** bed for every **100** workers and a dental clinic

- every employer of industries/establishments having factories/plants using or producing pesticides under toxicity categories I and HI of the World Health Organization (WHO) toxicity classification standards shall provide for his workers the following:
  a. a medical clinic within **100 m** of working area in the formulation/manufacturing plant
  b. services of a competent full-time occupational health physician who shall stay in the medical clinic provided for above, at least **8 hrs/day** during the work shift which has the biggest number of workers

- For non-hazardous workplaces:
  a. In small-scale industries
     i. ***1 – 99 workers***: employer shall provide the services of a full-time first aider who maybe one of the workers in the workplace and who has immediate access to the first-aid medicines.
     ii. ***51 – 99 workers***: an emergency treatment room shall be provided

  b. In medium-scale industries: immediate access to the first-aid medicines.
     i. ***100 – 199 workers:*** employer shall provide the services of a part-time occupational health nurse who shall stay in the premises of the workplace at least **4 hrs/day**, **6** times a week. For more than one shift a day, the nurse shall stay during the shift with the biggest number of workers.

  c. In large-scale industries
     i. ***200 – 600 workers:*** employer shall provide the services of a part-time occupational health physician and a part-time dentist each of whom shall stay in the premises of the workplace at least **4 hrs/day**, **3** times a week, on alternate days with the other.
     ii. ***601 – 2000 workers***: employer shall provide the services of a part-time occupational health physician and a part-time dentist each of whom shall stay in the premises of the workplace at least **4 hrs/day**, **6** times a week working in alternate periods with the other.
     iii. ***More than 2000 workers***: employer shall provide the services of a full-time occupational health physician and a full-time dentist, each of whom shall stay in the premises of the workplace **8 hrs/day**, **6** times a week during the shift with the biggest number of workers. In addition, the employer shall provide the services of one part-time occupational health physician for each of the other workshift who shall stay in the premises of the workplace at least **4 hrs/day, 6** times a week.

- For both hazardous and non-hazardous workplaces:
  a. Where only a treatment room is provided under this rule, he shall in addition provide for his workers in case of emergency, access to the nearest medical/dental clinic or to a medical/dental clinic located not more than **5 km** away from the workplace.

1963.03: Emergency Hospital

- An employer may not establish an emergency hospital or dental clinic in his workplace as required in these regulations where there is a hospital or dental clinic which is located not more than **5 km** away from the workplace, if situated in any urban area, or which can be reached in **25 minutes** of travel, if situated in a rural area, and the employer has facilities readily available for transporting workers to the hospital or clinic in case of emergency.

1963.04: Contracts for Occupational Health Services

- No occupational health practitioner, whether acting singly or as a part of a group/ association, shall enter into a contract for occupational health practitioner services with more than **10** establishments.
- No part-time occupational health physician/nurse shall enter into contract for occupational health services with more than **4** establishments.
- When a full-time occupational health physician/nurse who is also a qualified occupational health practitioner, has entered into a contract for occupational health services with **1** establishment, he/she shall not engage himself/herself, with or without a written contract, for the same services with any other establishment.

1964: Training and Qualification

1964.01: Qualifications

- A nurse must have passed the examination given by the Board of Examiners for nurses and duly licensed to practice nursing in the Philippines with at least **50 hours** of Basic training in occupational nursing conducted by the Bureau/Region office concerned, the College of Public Health of the University of the Philippines, or by any institution/organization accredited by the former.
- An occupational health practitioner must have all for the following qualifications:
  a. At least **5 years** experience in the field of, or practice of occupation health and safety

1964.03: Refresher Training

- Occupational health personnel and the first-aiders of every establishment shall undergo a minimum **8 hrs** refresher training course in their respective fields at least once a year

Guidelines Governing Occupational Safety and Health in the Construction Industry *(Dept. Order No. 13 Series 1998)*

Section 1: Definition of Terms

- "Heavy equipment" refers to any machine with engine or electric motor as prime mover used for lifting, excavating, leveling, drilling, compacting, transporting and breaking works in the construction site, such as but not limited to crane, bulldozer, backhoe, grader, road compactor, prime mover and trailer, with minimum operating weight and horsepower rating of **1,000 KG and 10 HP**, respectively.

Section 7: Safety Personnel

- General Constructor must provide for **1** construction Safety and Health Officer for every **10** units of heavy equipment assigned to the project site.

Section 8: Emergency Occupational Health Personnel and Facilities

- The construction project owner or his duly authorized representative shall provide competent emergency health personnel within the worksite duly complemented by adequate medical supplies, equipment and facilities, based on the total number of workers in the site as indicated below:
  a. ***Less than 50 workers:*** services of a certified firs-aider
  b. ***More than 50, less than 200 workers:*** services of a full-time registered nurse
  c. ***More than 200, less than 300 workers:*** services of a full-time nurse, part-time physician and dentist, and an emergency clinic
  d. ***More 300 workers:*** services of a full-time registered nurse, physician, dentist, and an infirmary or emergency

hospital with one bed capacity. There should be one bed capacity for every **100** employees

- When an employer provides only a treatment room, he shall provide for his workers in case of emergency, access to the nearest medical/dental clinic located **5 km** radius from the workplace and can be reached in **25 mins** of travel.

Section 11: Construction Safety and Health Committee

- To ensure that the rules and Construction Safety and Health Program are observed and enforced at the project site, each site shall, at the start of the construction have a construction safety and health committee composed of the following personnel as prescribed under Section 7 above:
  a. Worker's representatives (minimum of **3**, union members if organized, not necessarily from one employer)

Section 16: Worker's Welfare Facilities

16.1: Adequate supply of safe drinking water

- If the water used in common drinking areas, it should be stored in closed containers from which the water is dispensed through the taps or cocks. So such containers should be cleaned and disinfected at regular intervals not exceeding **15 days.**

Memorandum Circular No. 02 Series of 1998

(Technical Guidelines for Classifying Hazardous and Non-Hazardous Establishments, Workplaces and Work Processes)

Section 5: Criteria for Classifying Exposure to Environmental Elements as Hazardous

- Exposure or risk of exposure to ionizing radiation in doses exceeding **1 millisievert per year (mSv/yr.)** or **100 milliRem per year** (mRem/yr.) of ionizing radiation shall be classified as hazardous (e.g., processes involving x-ray equipment and other similar radiation sources)
- Exposure to fields of radio-frequency (RF) and microwave (MW) radiation with power densities equal to or greater than **5 milliwart** per square centimeter (mW/cm^2) or an average specific absorption rate equal to **4 W/kg**. or greater (e.g., immediate vicinity of radio and television transmission towers and antennas)
- Exposure to infra-red radiation in doses of at least **10 mW/cm^2** for more than **5 mins**., such workplace is considered hazardous (e.g., operations that uses of infra-red-light sources for the protection of photosensitive materials and processes)
- Exposure to ultraviolet (UV) radiation at an energy level of at least **6.0 mJ/cm^2** (millijoule per square centimeter) and wavelength above **300 nm**. (nanometers), or where the workers' eyes are exposed to UV radiation at an energy level of **4.0 mJ/cm^2** (e.g., processes which involve the use of UV light in order to enhance contrast as in fine embroidery work)
- Exposure to visible light radiation with a dose of **10 mJ/cm^2** (e.g., high intensity lasers; activities such as filming or shooting which employ the use of high-capacity lamps or light sources).

Section 6: Criteria for Classifying the Use of or Exposure to Power-Driven and Similar Tools

- An establishment or workplace using a power tool as part of regular processes or operations may be considered hazardous:
  i. Where there is a strong possibility of contact with any energized part with a potential difference of at least **50 volts** AC or DC during the normal operations of the tool

Department Order No. 16-01 Series of 2001

1033: Training and Personnel Complement

- For Hazardous Workplaces:

Number of Workers	Minimum Number of Safety Officers	
	Hazardous	Highly Hazardous
1-50	One (1) part-time	One (1) full-time
51-200	One (1) full-time	One full-time & one part-time
201-250	One full-time & One part-time	Two (2) full-time
251-500	Two (2) full-time	Two full-time & One part-time
Every additional 500 or fraction thereof	One (1) additional full-time	
Every additional 250 or fraction thereof		One (1) additional full-time

- For Non-Hazardous Workplaces

Number of Workers	Minimum Number of Safety Officers
1-250	One (1) part-time
251-500	Two (2) part-time
501-750	One (1) full-time
751-1000	Two (2) full-time
Every additional 500 or fraction thereof	One (1) additional full-time

- A part-time safety officer shall be required to perform the duties of safety officer at least **6 hours per week**

1034: Accreditation

1034.01: Requirements for Accreditation for A practitioner in Occupational Safety and Health

- A practitioner in Occupational Safety and Health must have:
  a. **40-hour** Basic Occupational Safety and Health Training Course
  b. At least **3 years** of relevant experience in occupational safety and Health
  c. If applicant is a graduate of any 4 or 5-year college course without a license, they must have at least **4 years** of relevant experience in any sub-components in a field of specialization
  d. If applicant is a college undergraduate, they must have at least **10 years** relevant experience in occupational safety and health

- Consultant in Occupation Safety and Health
  a. Applicant must be an accredited practitioner for at least **5 years** with experience in at least **2** field of specialization
  b. Must have completed the **80-hour** Advanced Occupation Safety and Training Course

- Occupational Safety and Health Training Organization
  a. Trainers must have completed **40-hour** BOSH training course, at least **24 hours** of Training of Trainers course, and at least **3 years** of experience in the design, conduct, and evaluation of any OSH Training Program

Department Order No. 57-04 Series of 2004

(Guidelines on the Effective Implementation of Labor Standards Enforcement)

Section 1:

- Labor Standards Enforcement Framework shall ensure compliance with labor standards through the following:
  a. Self-Assessment: this voluntary mode shall be encouraged in establishments with at least **200 workers**
  b. Inspection: this shall be undertaken in workplaces with **10 to 199 workers**
  c. Advisory services: this shall be undertaken in workplaces with less than **10 workers** and those registered as Barangay Micro-Business Enterprises (BMBEs)

Department Order No. 74-05 Series of 2005

(Rule 1162.5 of 1160 on Boiler of the OSH)

- Power Utility Boiler
  a. During construction or fabrication, it shall be hydrostatically tested at **1.5** times the design pressure after completion
  b. Before placed into service after installation, it shall be hydrostatically tested at **1.5** times the design pressure
  c. Before placed into service after reconstruction or repair, it shall be hydrostatically tested at **1.2** times the max allowable working pressure
  d. Test shall be conducted at a minimum water temperature of **21°C (70°F)** and a max temperature of **71°C (160°F)**

e. Inspection shall be conducted at an interval not exceeding **18 months**. It shall be the duty of the power plant owner to inform the Regional Office **30 days** prior to the scheduled shutdown. The Regional Office shall serve Notice of Inspection **5 days** prior to scheduled shutdown

- Industrial Boiler
  a. During construction and fabrication, it shall be hydrostatically tested at **1.5** times the design pressure
  b. Before being placed into serves after installation, it shall be hydrostatically testing **1.5** times the design pressure
  c. Before placed into service after reconstruction or repair, it shall be hydrostatically tested at **1.5** times the max allowable working pressure
  d. Test shall be conducted at a minimum water temperature of **21°C (70°F)** and max temperature of **71°C (160°F)**
  e. Under proper control and to reach required test pressure gradually, in no case shall this test be exceeded by more than **6%**
  f. Regional Office shall serve Noticed of Inspection for the annual inspection of boiler to the owner **30 days** before the expiration of the permit to operate the boiler and exact date of scheduled inspection, the owner shall have the boiler drained, cooled, opened-up and thoroughly cleaned for the conduct of internal and external inspection on all boiler parts and appliances

- For Power Utility Boiler, hydrostatic test shall be done every **5 years** unless the existence of the following conditions are noticed during the inspection:
  a. Deposit and scaled on drums, tubes, and other parts
  b. Cracks, broken stays, pitting, corrosion
  c. Wastage of tube ends

- For Industrial Boiler, hydrostatic test shall be done at an interval of not more than **12 months**

- Unsafe boilers shall not be allowed to operate and no permit shall be issued until the defects are corrected. The validity of permit to operate for Power Utility Boiler shall be **18 months** and **12 months** for Industrial Boiler

Department Circular No. 1 Series of 2009
(Guidelines on OSH in the Shipbuilding, Ship Repair, AND Shipbreaking Industry)

Section 9: Emergency Occupational Health Personnel and Facilities

- The following emergency health personnel shall be present at individual workplace, supported by adequate medical supplies, equipment and facilities;
  a. A certified first-aider for **50** workers or less
  b. A full-time registered nurse for **51 - 200** workers
  c. A full-time registered nurse, a part-time physician, a dentist, and an emergency clinic for **201 – 300** workers
  d. A full-time registered nurse, a full-time physician, a dentist, and an infirmary or emergency hospital with **1** bed capacity for more than **300** workers. There should be **1** bed capacity for every **100** workers in excess of 300 workers

- Where only a treatment room is available, in case of emergency, workers shall have access to the nearest medical/dental clinic or a medical/dental clinic located within **5 km**-radius from the workplace

Department Advisory No. 128-13 Series of 2013
(Amending 1414 on Scaffoldings of the 1989 OSH Standards, as Amended)

1414:

1414.02: General Provisions

- Timber/bamboo scaffolds shall be limited to **6 m.** height from the ground or base. For **over 6 m.** height, steel scaffolds shall be used
- All site fabricated/conventional supported scaffolds exceeding **6 m**. in height or working load of **150 kg/m²** shall be designed and inspected by the structural engineer and approved by the appropriate authority.
- A fall protection equipment shall be used when working in a height of **2 m.** and above. For 10 m. height, workers are required to use fall arrest equipment
- Each platform unit (e.g. scaffold plank, fabricated plank, etc.) shall be installed so that the space between adjacent units and space between the platform and the uprights is no more than **1 in. (2.5 cm)** wide.
- Each scaffold platform and walkway shall be at least **18 in. (46cm)** wide.
- Each platform end, unless cleated or restrained by hooks, shall extend over the centerline of its support at least **6 in. (15cm)**
- Each end of a platform that is **10 ft.** or less in length shall not extend over its support more than **12 in. (30 cm)** unless the platform is designed and installed so that the cantilevered portion of the platform is able to support employees and/or materials without tipping.
- Each platform greater than **10 ft.** in length shall not extend over its support more than **18 in. (46 cm),** unless designed and installed so that the cantilevered portion of the platform is able to support employees without tipping.
- On scaffolds where platforms are overlapped to create a long platform, the overlap shall occur only over supports, and shall not be less than **12 in. (30 cm)** unless platforms are nailed together or restrained.

1414.03: Design and Stability

- Supported scaffolds and their components shall be capable of supporting without failure at least **4** times the maximum intended load, while scaffolds shall have **6** times factor of safety

1414.04: Inspection of Scaffold Components Before Erection

- Lumber with **2** nail holes aligned crosswise or 4 nail holes along its length shall not be used as horizontal load bearing member of scaffolds

1414.06: Scaffolds Erection

- Diagonal brace shall extend from one connection to another. It shall be connected to the post within **150 mm** from the point of connection.
- Diagonal braces shall not exceed **60°** from horizontal
- Always maintain the based width to height ratio of **1:4** during erection for stability
- No scaffold activity shall be undertaken if the wind velocity exceeds **48 kph.**
- Material and Personnel Access
  a. When hooked-on ladder is used, a rest platform with a minimum width of **60 cm (2 ft)** shall be provided every **4 m**. in height

- Mobile Scaffold
  a. When manual force is used to move the scaffold, it must be applied as close to the base as practicable, but not more than **1.2 m (4 ft)** above the supporting surface
  b. When free standing, the height of the mobile scaffold should not exceed **4** times the base width dimension
  c. Weight of tower should not exceed the capacity of casters and should be design to support **4** times the maximum intended load

- Ladder Scaffold or Ladder Jack Scaffolds:
  a. Distance between ladders of scaffold is less than **3 m (10 ft)**

- Tube and Coupler
  a. On straight run scaffolds, longitudinal bracing across the inner and outer rows of posts must be installed diagonally in both directions, and extend upward from the base of the end posts to the top of the scaffold at approximately a **45°** to **60°**.
  b. Scaffolds whose length is greater than their height, longitudinal bracing must be repeated at least every **5th** post
  c. Runners must be installed along the length of the scaffold, located at level heights on both the inside and outside posts. Runners shall be spaced vertically at **1.8m (6 ft.)** to **2m (7 ft.)** on centers.

- Timber scaffolds
  a. In single scaffold, the post shall be placed at **1.2 to 2.4 m (4 to 8 ft.)** apart at a distance of **1 m. (3 ft.)** from the wall, connected horizontally by runners shall be spaced vertically at **1.8m. (6 ft.)** to **2 m. (7 ft.)** on centers. Putlogs shall be placed in the holes left in walls

b. The size of the post shall not be less than **50 x 100 mm (2 x 4in)** and when it is necessary to extend a post, the overlaps shall not be less than **60 cm. (24 in.)**
c. The size of the posts for double scaffold shall not be less than **50 x 100 mm (2 x 4in)** and when it is necessary to extend a post the overlap shall not be less than **60cm (24 in).**
d. The distance between two consecutive bearers shall be designed with due regard to anticipated load and the nature of the platform flooring. As a minimum rule, the spacing shall be as follows:
   i. For 3.2 cm (1 ¼ in) thick planks, spacing shall not exceed **I m (3ft).**
   ii. For 3.8 cm (1 ½ in) thick planks spacing shall not exceed **1.5 m (5ft).**

- Bamboo Scaffold
  a. The material and construction shall be sufficient to carry at least **4** times the imposed load
  b. Only **one worker** allowed in any **one span;**
  c. The maximum span between poles shall be **2.4m. (8 ft.)**
  d. When the height or fall is over **2m (6 ft.),** the use of fall protection shall be required
  e. The maximum height allowed is **6 m (20 ft.).**

- Trestle Scaffolds
  a. Trestle scaffolds shall not be used if the working platform is more than **5 m**. from the ground or floor or other surface upon which the scaffold is erected.
  b. A trestle scaffold shall not be erected on a scaffold platform unless designed by a structural engineer and approved by the proper authority if erected on a scaffold **10 m**. or over in height

- Form Scaffolds and Carpenters' Bracket Scaffolds
  a. Each bracket, except for wooden bracket-form scaffolds, must be attached to the supporting framework or structure by **one** or more nails
  b. Brackets are triangular-shaped frames made of either wood with a cross-section not less the **2 x 3 in**., or structural angle iron measuring **1-¼ in x 1-¼ in x ⅛ in.**
  c. Bolts used to attach brackets to structures must not be less than **5/8 inch** in diameter.
  d. Maximum bracket spacing is **8 ft** on centers.
  e. No more than **two** employees may occupy any given **8 feet** of a bracket or form scaffold at any one time.

- Roof Bracket Scaffolds
  a. When nails are not used, brackets must be secured with first-grade manila rope of at least **3/4-inch** diameter, or equivalent.
  b. The inboard end of outrigger beams must be not less than **1½** times the length of the outboard end, measured from the fulcrum point to the extreme anchorage point, and securely anchored either by braced struts bearing against sills in contact with the overhead beams or ceiling, or tension members secured to the floor joists underfoot, or both.
  c. The fulcrum point of outrigger beams must rest on secure bearings at least **15cm (6 inches)** in each horizontal dimension.

- Window Jack Scaffolds
  a. Not more than **one** worker at a time may occupy a window jack scaffold.

- Crawling Boards (Chicken Ladders)
  a. Crawling boards must be not less than **25cm (10 inches)** wide and **2.54cm (1 inch)** thick
  b. Cleats on crawling boards must be equal in length to the width of the board be spaced at equal intervals not to exceed **60cm(24 in),** and have a minimum cross-sectional area of **2.54 x 3.8 cm (1 x 1-1/2 in).**

- Suspended Scaffold
  a. All suspended scaffold support devices, such as outrigger beams, cornice hooks, parapet clamps, and similar devices, shall rest on surfaces capable of supporting at least **4** times the load imposed on them by the scaffold operating at the rated load of the hoist (or at least **1.5** times the load imposed on them by the scaffold at the stall capacity of the hoist, whichever is greater).

- Ropes shall be inspected for defects by a competent person prior to each work shift and after every occurrence which could affect a rope's integrity. Ropes shall be replaced if any of the following conditions exist:
  a. Any physical damage such as **6** randomly distributed broken wires in one rope lay or three broken wires in one stand in one rope lay

- When wire rope clips are used on suspended scaffolds, There shall be a minimum of **3** wire rope clips installed, with a minimum distance of **6** rope diameters apart

1414.07: Scaffolds Inspection & Tagging

- All site fabricated/ conventional supported scaffolds exceeding 6 m. in height or a working load of **150 kg/m²** shall be evaluated, tested, and approved by a qualified person.

1414.08: Maintenance During Use

- Scaffoldings left standing for **4** months shall not be used until damaged members are replaced and the whole structure returned to its original strength

1414.12: Fall Protection

- For Supported Scaffolds
  a. Fall protection equipment shall be provided of any scaffold **2 m (6 ft)** or more above ground
  b. Open sides and ends shall be allowed when scaffold distance is **25 cm (10 in)** or less from the structure being worked on
  c. Fall Arrest Sytem
     i. When vertical lifelines are used the shall be fastened to a fixed safe point of anchorage. **Two or more** vertical lifelines shall not be attached to each other or to same point of anchorage
     ii. When horizontal lifelines are used, they shall be secured to **two or more** structural members. Life lines shall be made of good quality manila rope of at least **1.9 cm (¾ in.)** diameter or equivalent material such as nylon rope of at least **1.27 cm (½ in)** diameter and shall be of sufficient strength to support a weight of **1140 kgs (2500 lbs)** without breaking.
  d. Guardrail System
     i. Walkways within a scaffold shall have guardrail systems installed within 24 cm (9 ½ in.) of and along at least **1** side of the walkway
     ii. Each toprail or equivalent member of a guardrail system shall be able to withstand a force of at least **100 kg (220 lbs**) applied in any downward or horizontal direction. Height of top rails shall be **91 cm (36 in.)**
     iii. Midrails, screens, mesh, etc., shall be able to withstand at least **68 kg (150 pounds)** of force applied in any downward or horizontal direction, at any point along the midrail or other member. When intermediate members are used, they shall be no more than **48 cm (19 in.)** apart
     iv. Crossbracing may serve as a midrail when its crossing point is between **50 and 75 cm (20 and 30 in)** above the work platform and install toprail.
     v. Crossbracing may serve as a toprail when its crossing point is between 96 and **122 cm (38 and 48 in.)** above the work platform and install midrail

- For Suspended Scaffold
  a. Fall protection equipment shall be provided on any suspended scaffold **2m (6 feet)** or more above ground.
  b. Fall Arrest System
     i. Vertical lifelines may not be used on **two-point** adjustable suspended scaffolds that have overhead components such as overhead protection or additional platform levels.
     ii. **Two or more** vertical lifelines shall not be attached to each other, or to the same point of anchorage.

Department Order No. 132 Series of 2013
(Guidelines on Maritime Occupational Safety and Health)

RULE II: OSH POLICY AND PROGRAM

Section 2: Occupational Safety and Health Policy and Program
2.4: Fall Protection System

- Shipowner must provide a fall-protection system to every seafarer who is granted access to an unguarded work area that is more than **2 m** above the nearest permanent safe level

Section 4: Work Environment Conditions

4.2: Lighting

- Minimum of **100 lux** where slight discrimination of details is essential (storage area, sanitary facilities, etc.)
- Minimum of **200 lux** where moderate discrimination of details is essential (crew accommodation, boiler & engine rooms, etc.)
- Minimum of **300 lux** where close discrimination of details is essential (galleys, workshops, etc.)

4.3: Prevention of Noise and Vibration

- Level of sound in the workplace must be less than **85 dB.** If it is not practicable for shipowner to maintain it below 85 dB, engineering or administrative controls shall be utilized.
- For more than **85 dB**, employer must put signage and warnings to persons entering the workplace
- A seafarer must not be exposed to a continuous level of sound **more than 75 dB** in crew

RULE III: CREW ACCOMODATION

Section 2: Sleeping Quarters

- In ships of less than **3,000 gross** tonnage other than passenger ships and special purpose ships, sleeping rooms may be occupied by a maximum of two seafarers; the floor area of such sleeping rooms shall not be less than **7 sq.m**.
- On passenger ships and special purpose ships, floor area of sleeping rooms shall not be less than:
  a. **7.5 sq.m**. in rooms for **2** persons
  b. **11.5 sq.m**. in rooms for **3** persons
  c. **14.5 sq.m.** in rooms for **4** persons
- For each occupant, the furniture shall include a clothes locker of ample space (minimum of **475 Liters**)
- In sleeping quarters and galleys, the temperature measured one meter above the deck in the center of the room or galley, must be maintained at a level of not less than **18°C** and, if practicable, not more than **29°C**.