RULE IX - SANITATION

SECTION 901. General Requirements

Subject to the provisions of Book II of the **Civil Code** of the Philippines on Property, Ownership, and its Modification, **all buildings** hereafter erected, altered, remodeled, relocated or repaired for human habitation shall be provided with **adequate and potable water supply**, plumbing installation, and suitable wastewater treatment or disposal system, storm water drainage, pest and vermin control, noise abatement device, and such other measures required for the protection and promotion of health of persons occupying the premises and others living nearby.

SECTION 902. Water Supply System

1. Whenever available, the potable water requirements for a building used for human habitation shall be supplied from existing municipal or city waterworks system.

2. The quality of drinking water from meteoric, surface or underground sources shall conform to the criteria set in the latest approved **National Standards for Drinking Water Standards**.

3. The design, construction and operation of deepwells for the abstraction of groundwater shall be subject to the provisions of the Water Code of the Philippines (**PD 1067**).

4. The design, construction and operation of independent waterwork systems of private housing subdivisions or industrial estates shall be governed by existing laws relating to local waterworks system.

5. The water piping installation for water supply and distribution to each fixture including the wastewater drainage with proper venting inside building and premises, shall conform to the provision of the Revised National Plumbing Code of the Philippines.

SECTION 903. Wastewater Disposal System

1. Sanitary sewage from buildings and neutralized or pre-treated industrial wastewater shall be discharged directly into the nearest street sanitary sewer main of existing municipal or city sanitary sewerage system in accordance with the criteria set by the Code on Sanitation of the Philippines and the Department of Environment and Natural Resources (**DENR**).

2. All buildings located in areas where there are no available sanitary sewerage system shall dispose their sewage to “Imhoff” or septic tank and subsurface absorption field or to a suitable waste water treatment plant or disposal system in accordance with the Code on Sanitation of the Philippines and the Revised National Plumbing Code of the Philippines.

3. Sanitary and industrial plumbing installations inside buildings and premises shall conform to the provisions of the Revised National Plumbing Code of the Philippines.

SECTION 904. Storm Drainage System

1. Rainwater drainage shall not discharge to the sanitary sewer system.

2. Adequate provisions shall be made to drain rainwater from low areas in buildings and their premises.

3. The drainage pipe installation and sewerage system of any premises and/or connection with any public disposal or any acceptable terminal shall conform to the Revised National Plumbing Code of the Philippines.

SECTION 905. Pest and Vermin Control

1. All buildings with hollow and/or wood construction shall be provided with rat-proofing.

2. Garbage bins and receptacles shall be provided with ready means for cleaning and with positive protection against entry of pests and vermins.

3. Dining rooms for public use without artificial ventilation shall be properly screened.

SECTION 906. Noise Pollution Control

1. Industrial establishments shall be provided with positive noise abatement devices to tone down the noise level of equipment and machineries to acceptable limits set down by the Department of Labor and Employment and the Department of Environment and Natural Resources.

2. Noise as an unwanted sound both in quality and intensity and excessive vibration whose sources in building/structure construction shall conform to acceptable limits the required **emission standards** of **DENR**.

SECTION 907. Pipes Materials

All pipe materials to be used in buildings/structures shall conform to the standard specifications of the Bureau of Product Standards (**BPS**) of the Department of Trade and Industry (**DTI**).

(emphases supplied)

Rule X follows

RULE X - BUILDING PROJECTION OVER PUBLIC STREETS

SECTION 1001. General Requirements

1. No part of **any building** or structure or any of its appendages, shall project beyond the building line except as provided herein.

2. The projection of any structure or appendage over a public property shall be the distance measured horizontally from the property line to the outermost point of the projection.

SECTION 1002. Projection into Alleys or Streets

1. No part of any structure or its appendage shall project into any alley or street, national road or public highway except as provided in the **Code**.

2. Footings located at least 2.40 meters below grade along national roads or public highway may project not more than 300 millimeters beyond the property line provided that said projection shall not obstruct any existing utilities/services such as power, water, sewer, gas, communication, and drainage lines, etc, unless the owner concerned shall pay the corresponding entities for the rerouting of the parts of the affected utilities.

3. Foundations may be permitted to encroach into public sidewalk areas to a width not exceeding 500 millimeters; provided that the top of the said foundation is not less than 600 millimeters below the established grade; and provided further, that said projection shall not obstruct any existing utilities/services such as power, water, sewer, gas, communication and drainage lines, etc., unless the owner concerned shall pay the corresponding entities for the rerouting of the parts of the affected utilities.

SECTION 1003. Projection of Balconies and Appendages Over Streets

1. The extent of any projection over an alley or street shall be uniform within a block and shall conform to the limitations set forth in Table X.1. as shown below:

TABLE X.1. Projection of Balconies and Appendages

Width of Streets	Total Projections
Over 3.00 meters but less than 6.00 meters	.60 meter
6.00 meters to less than 10.00 meters	.90 meter
10.00 meters to less than 11.00 meters	1.00 meter
11.00 meters to less than 12.00 meters	1.10 meters
12.00 meters to less than 13.00 meters	1.30 meters
13.00 meters to less than 14.00 meters	1.40 meters
14.00 meters or over	1.50 meters

2. The clearance between the established grade of the street and/ or sidewalk and the lowest under surface of any part of the balcony shall not be less than 3.00 meters.

3. In case the projection is a neon sign and the like, the same shall be in accordance with Rule XX - Signs.

SECTION 1004. Arcades

1. **Whenever required by <u>existing</u> building and zoning regulations, arcades shall be constructed on sidewalks of streets**. The width of the arcade and its height shall be uniform throughout the street provided that in **no** case, shall an arcade be **less** than 3.00 meters above the established sidewalk grade. (***Fig. X.1.***)

2. Arcaded pedestrian walkways shall have a clear height of 3.00 meters. (***Fig. X.1.***)

3. Driveways crossing arcaded pedestrian walkways shall be at the same level with that of the arcades for the safety of the pedestrians. (***Fig. X.2.***)

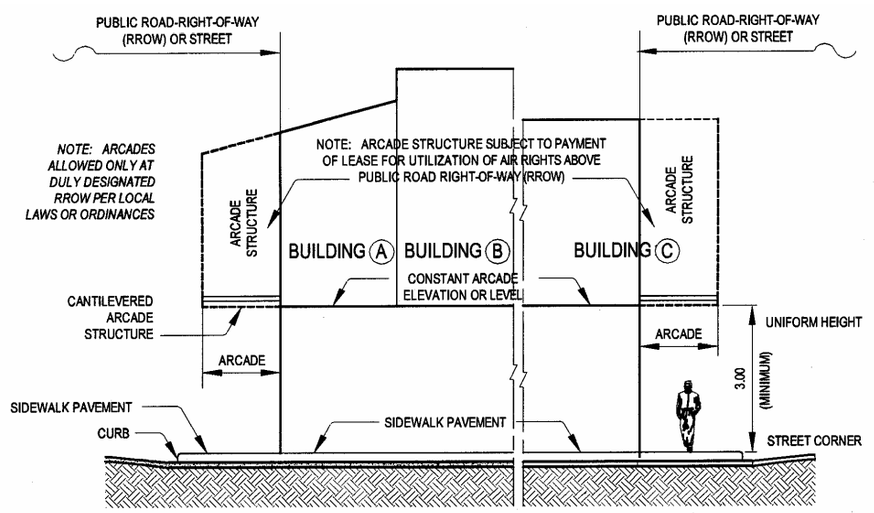


Figure X.1.

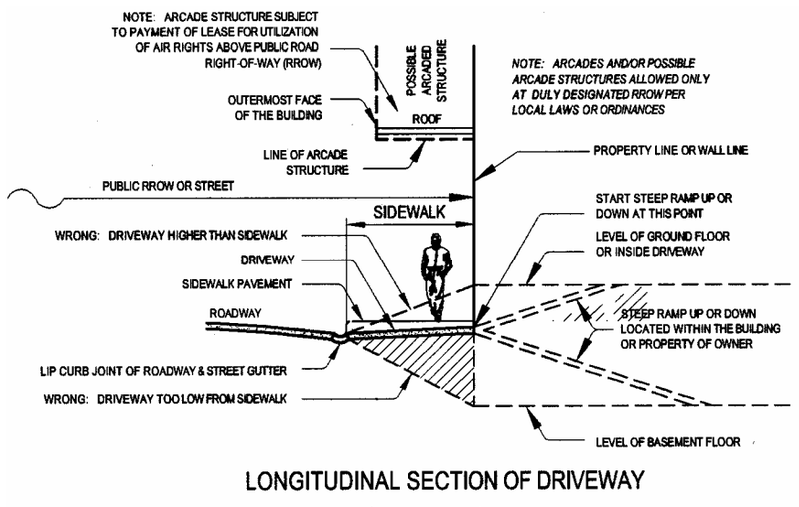


Figure X.2.

ARCADES

Annotation. There should be no hanging signs, projecting signs nor ground signs within the entire length of the arcade area. Signs should be above, part of or above the storefront windows. All doors must swing inward to prevent accidents.

SECTION 1005. Canopies (Marquees)

1. *Canopy or Marquee* is a **permanent** roofed structure above a door attached to and supported by the building and projecting over a wall or sidewalk. This includes any object or decoration attached thereto.

2. *Projection and Clearances.* The horizontal clearance between the outermost edge of the marquee and the curb line shall be not less than 300 millimeters. The vertical clearance between the pavement or ground line and the undersurface of any part the marquee shall not be less than 3.00 meters.

3. *Construction*. A marquee shall be constructed of incombustible material or materials of not less than two- hours fire- resistive construction. It shall be provided with necessary drainage facility.

4. *Location.* Every marquee shall be so located as not to interfere with the operation of any exterior standpipe connection or to obstruct the clear passage from stairway exits from the building or the installation or maintenance of electroliers.

SECTION 1006. Movable Awnings or Hoods

1. *Awning* is a movable shelter supported entirely from an exterior wall of a building and of a type which can be retracted, folded, or collapsed against the face of a supporting building.

2. *Clearance.* The horizontal clearance between the awning and the curb line shall not be less than 300 millimeters. The vertical clearance between the undermost surface of the awning and the pavement or ground line shall be not less than 2.40 meters. Collapsible awnings shall be so designated that they shall not block a required exit when collapsed or folded.

SECTION 1007. Doors, Windows, and the Like

Doors, windows, and the like less than 2.40 meters above the pavement or groundline shall not, when fully opened or upon opening, project beyond the property line except fire exit doors.

SECTION 1008. Corner Buildings with Chaflans

1. **Every corner building** or solid fence on a public street or alley less than 3.60 meters in width shall be **truncated** at the corner. The face of the triangle so formed shall be at right angle to the bisector of the angle of the intersection of the street lines, provided, that in **no** case shall the length of the chaflan be less than 4.00 meters. (***Fig. X.3.***)

2. Corner buildings or solid wall fences to be built abutting property lines on corners of public alley or street intersections shall be provided with chaflans to afford a clear view.

3. If the building is arcaded, **no** chaflan is required notwithstanding that the width of the public street or alley is less than 3.60 meters. (***Fig. X.4.***)

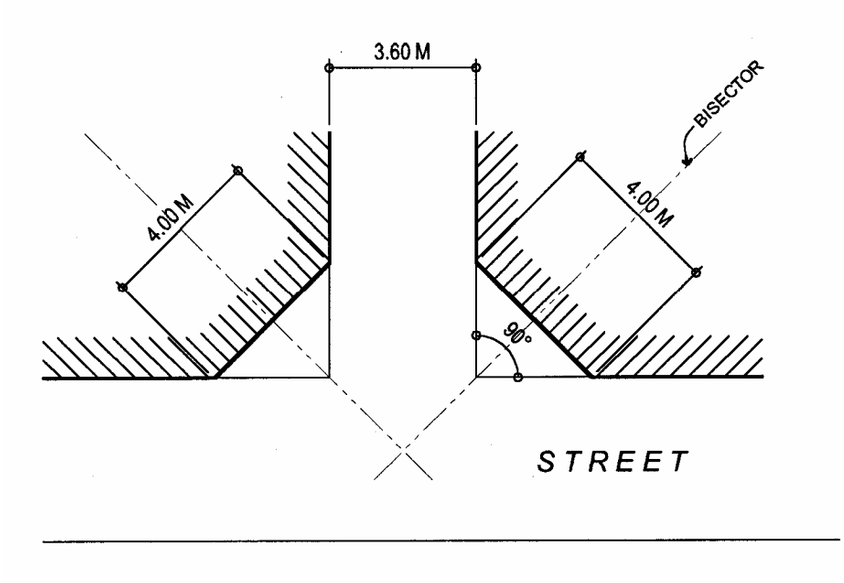


Figure X.3.

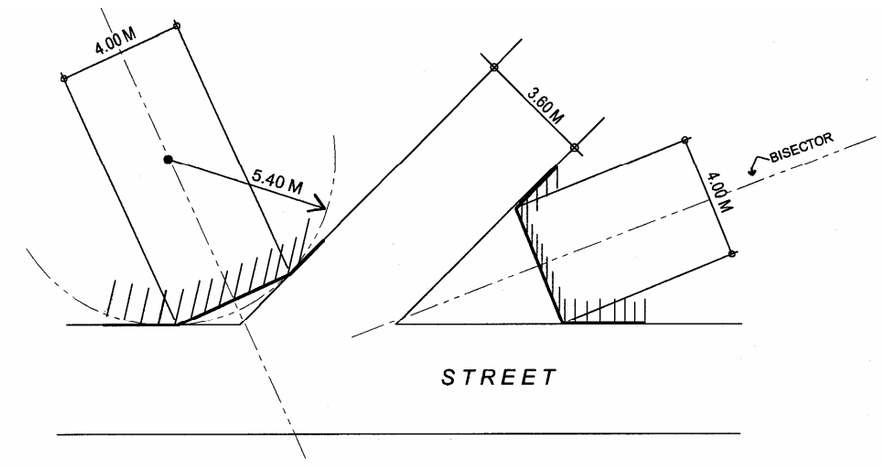


Figure X.4.

CHAFLANS

Anotation. The foregoing examples assume that the building faces are flush with the property lines i.e. no setbacks provided. These examples are thus only possible if the arcades to be introduced are either within the property line or are within the RROW i.e. leases of the air rights for the arcade structure (or the spaces directly above the arcade) shall be absolutely necessary.

(emphases, underscoring and annotations supplied)

Rule XI follows

RULE XI - PROTECTION OF PEDESTRIANS DURING CONSTRUCTION OR DEMOLITION

SECTION 1101. General Requirements

1. **No person** shall use or occupy a street, alley or public sidewalk for the performance or work covered by a building permit except in accordance with the provisions of this Rule.

2. **No person** shall perform any work or any building/structure adjacent to a public way in general use for pedestrian travel, unless the pedestrians are protected as specified in this Rule.

3. Any material, building/structure temporarily occupying public property, including fence, canopies and walkways, shall be adequately lighted between sunset and sunrise.

SECTION 1102. Storage in Public Property

1. Materials and equipment necessary for work to be done under a permit when placed or stored on public property shall not obstruct free and convenient approach to and use of any fire hydrant, fire or police alarm box, utility box, catch basin, or manhole and shall not interfere with any drainage of any street or alley, gutter, and with the safe and smooth flow of vehicular and pedestrian traffic.

2. Materials to be stored at or near construction sites shall be piled or stacked in an orderly manner to avoid toppling over or being otherwise displaced. No materials shall be piled or stacked higher than 1.80 meters, except in yards or sheds intended especially for storage. When piles exceed 1.20 meters in height, the material shall be so arranged that the sides and ends of the piles taper back.

SECTION 1103. Mixing Mortar on Public Property

The mixing of mortar, concrete, or similar materials on public streets shall not be allowed.

SECTION 1104. Protection of Utilities

1. All public or private utilities and services above or below the ground shall be protected from any damage by any work being done under the permit.

2. The protection shall be maintained while such work is being done and shall not obstruct the normal functioning of any such utility.

3. Temporary Light and Power

   a. Temporary wiring for light, heat and/or power shall be adequately protected against mechanical or over-current failures. All conductive materials enclosing fixed or portable electric equipment, or forming a part of such equipment, shall be properly grounded.

   b. Temporary electric service poles shall be self-supporting or adequately braced or guyed at all times.

SECTION 1105. Walkway

1. When the **Building Official** authorizes a sidewalk to be fenced or closed, or in case there is no sidewalk in front of the building/structure site during construction or demolition, a temporary walkway of not less than 1.20 meters shall be provided.

2. Such walkway shall be capable of supporting a uniform live load of 650.00 kilogram per sq. meters.

3. Durable wearing surface shall be provided and must remain safe throughout the construction period.

4. Where the sidewalk is permitted by the **Building Official** to be fully occupied and fenced-off or enclosed, a temporary walkway adjacent to the curb line shall be required. Where the street has no sidewalk, a temporary walkway adjacent to the street line not less than 600 millimeters wide shall be provided. Where the RROW is 5.00 meters or less, no temporary walkway shall be allowed.

5. Where only partial occupancy and fencing-off of the sidewalk is necessary, a temporary walkway will not be required provided that a width of at least 600 millimeters of the sidewalk with protective railing on road side shall be left open for the use of pedestrians.

SECTION 1106. Pedestrian Protection

1. Where the walkway occupies part of the roadway or is adjacent to an excavation, protective railings on the street side or on the side of the excavation shall be required.

2. Railings where required, shall be built substantially strong and sturdy and shall not be less than 1.00 meters in height.

3. Fences

   Fences shall entirely enclose the construction/demolition site and shall be erected on the building side of sidewalks or walkways and shall be made of approved materials (e.g. G.I. sheet, wooden boards and/or planks, plywood or *Lawanit, sawali*), **not** less than 2.40 meters in height above the curb line. Fences shall be built solid for its full length except for such openings as may be necessary for proper execution of the work. Such openings shall be provided with doors, which shall be kept closed at all times except when in actual use.

   a. When the horizontal distance between the outermost face of the **building**/structure area and the inner edge of the sidewalk is more than one-half (1/2) the height of the building, a 2.40 meters fence is required. (***Figure XI.1.***)

   b. When the horizontal distance between the outermost face of the building and the inner edge of the sidewalk is equal to or less than one-half (1/2) the height of the building, a canopy shall be required in addition to a fence. (***Fig. XI.2.***)

4. Canopies

   a. The protective canopy shall have a clear unobstructed height of 2.40 meters above the walkway and shall be made of sufficient strength and stability to sustain safely the weight of materials that may be placed thereon, and to withstand shocks incident to the handling of such materials or their preparation for use, and accidental jars from trucks passing or delivering materials.

   b. When the canopy is used for the storage of materials or for the performance of work of any kind, substantial railings not less than 1.00 meters high and solid toe boards **not** less than 300 millimeters high shall be placed along the street side and ends of the canopy. The canopy shall be capable of safely sustaining a load of 4800 Pascal or the intended load to be placed thereon, whichever is bigger.

c. The deck flooring of a canopy shall consist of planking not less than 50 millimeters in thickness, closely laid. All members of the canopy shall be adequately braced and connected to resist displacement of members or distortion of the framework.

d. Canopies shall be constructed solid for its entire length except for such openings as may be necessary for loading purposes. Such openings shall be kept closed at all times except during actual loading operation.

e. Unless the top deck of the canopy is built solidly against the face of the building/structure to be constructed/demolished, the vertical face of the canopy supports next to the building shall be solidly fenced throughout, except for such openings as may be necessary for the execution of work. Such openings shall be provided with sliding or swinging gates which shall be kept closed at all times except when in actual use. (***Figs. XI.3., XI.4., XI.5., XI.6.***).

f. The street side of the canopy shall be kept open for a height of not less than 2.40 meters above the curb. The underside of the canopy shall be properly lighted at night with not less than 100-Watts bulb every 6.00 meters of its length and at each change of grade or elevation of the sidewalk surface.

g. When a wall of the building abuts or fronts a street, fans or catch platforms shall be erected along that wall at the level of the first floor of the building above the street level. Fans or catch platforms shall be erected at the level of other floors of the building as may be necessary to prevent nuisance from dust or danger from falling debris or materials.

h. When the horizontal distance between the outermost face of the building and the outer edge of the sidewalk is less than one-half (1/2) the height of the building, a protective device such as a net or screen extending from the uppermost part of the construction/demolition to ground level shall be required in addition to a fence and canopy. (***Fig. XI.7.***)

i. Wherever required, protective netting/covering shall be of approved and substantially strong material such as 2 millimeters diameter G.I. wire, 38 millimeters mesh nylon net, or canvas.

j. Where a wall of the building abuts or fronts a street, dust screens shall be erected to cover the entire wall so as to prevent nuisance from dust.

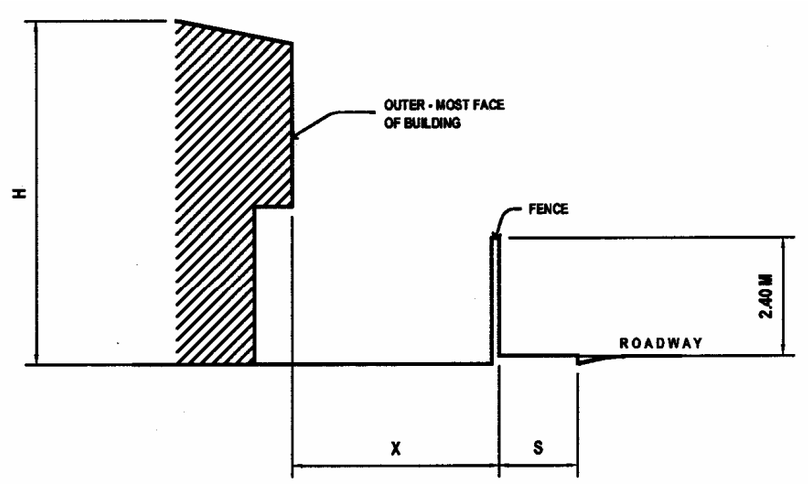
k. For medium and high-rise buildings six (6) storeys and higher, all protective and safety devices/facilities shall be completely installed including safety belts, safety nets and canopies for the safety of workers, pedestrians, nearby residents and motorists.

5. Warning Signs and Lights

a. At every construction/demolition site, warning signs shall be conspicuously posted around the property. Warning signs shall be adequately illuminated at night for the protection of unwary pedestrians.

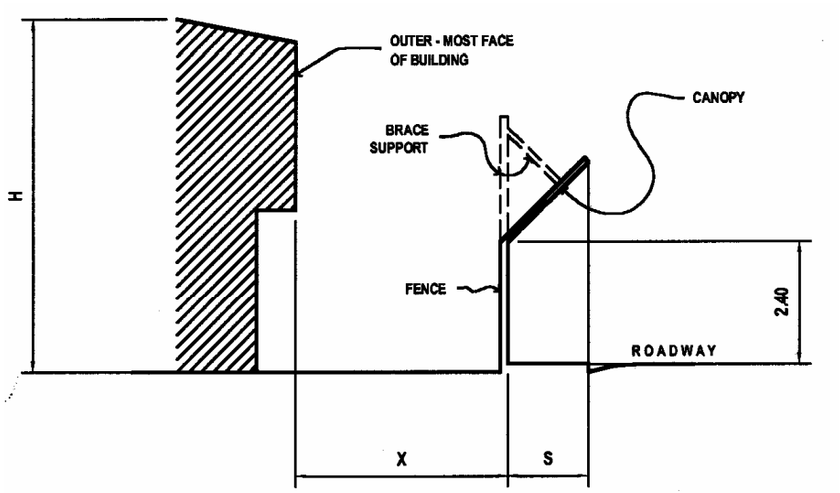
b. All entrances/exits to and from the construction/demolition site shall be kept closed at all times except during actual passage of men, materials or equipment.

c. All warning signs and lights shall be properly maintained even when operations are not in progress.



WHEN: X > H/2 ONLY A FENCE IS REQUIRED

Figure XI.1.



WHEN: X ≤ H/2 FENCE AND CANOPY IS REQUIRED

Figure XI.2.

PROTECTION OF PEDESTRIANS, NEARBY RESIDENTS AND THE PUBLIC DURING CONSTRUCTION AND DEMOLITION

Annotation. The necessary lights, warning devices and safety barriers should be properly installed, operated and maintained in the areas to be used by the general public during construction.

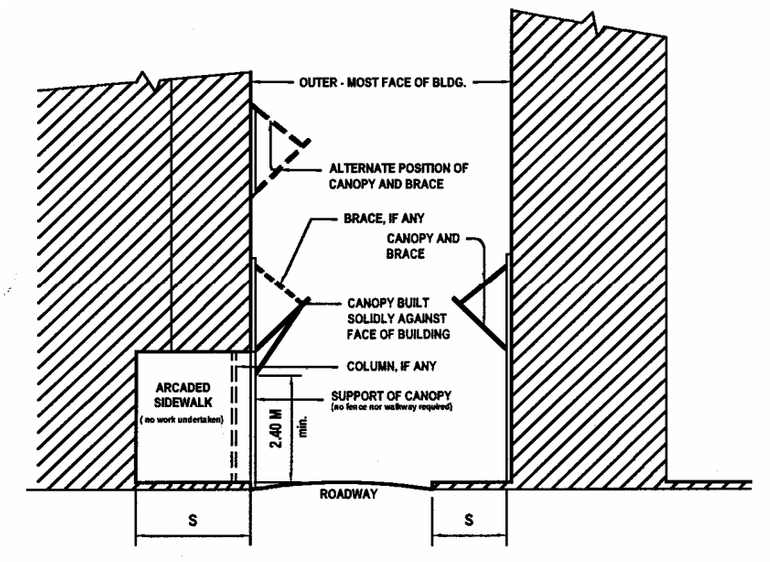
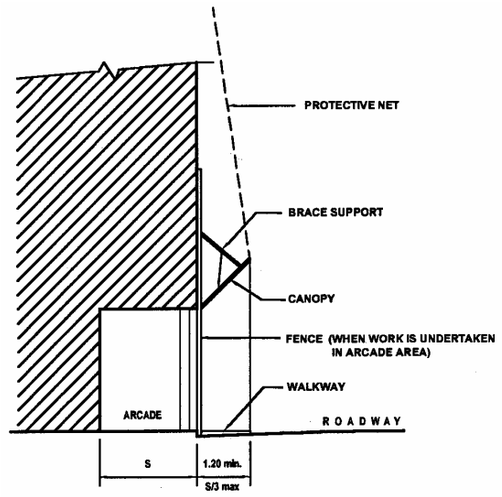
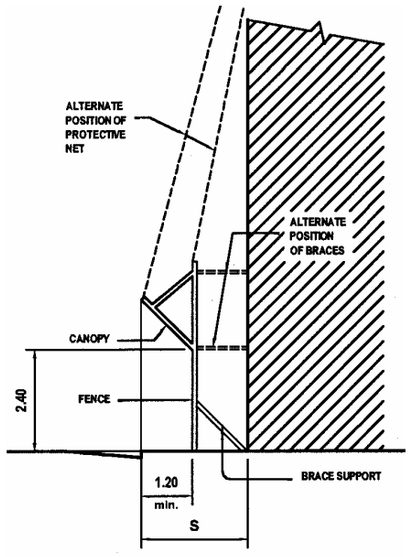


Figure XI.3.



FULL OCCUPANCY OF SIDEWALK

Figure XI.4.



PARTIAL OCCUPANCY OF SIDEWALK

Figure XI.5.

PROTECTION OF PEDESTRIANS, NEARBY RESIDENTS AND THE PUBLIC DURING CONSTRUCTION AND DEMOLITION

Annotation. For narrow roadways (along which tall buildings shall be constructed), it may be best to provide a steel mesh (with protective net) to catch falling debris. Also, the necessary lights, warning devices and safety barriers should be properly installed, operated and maintained in the areas to be used by the general public during construction.

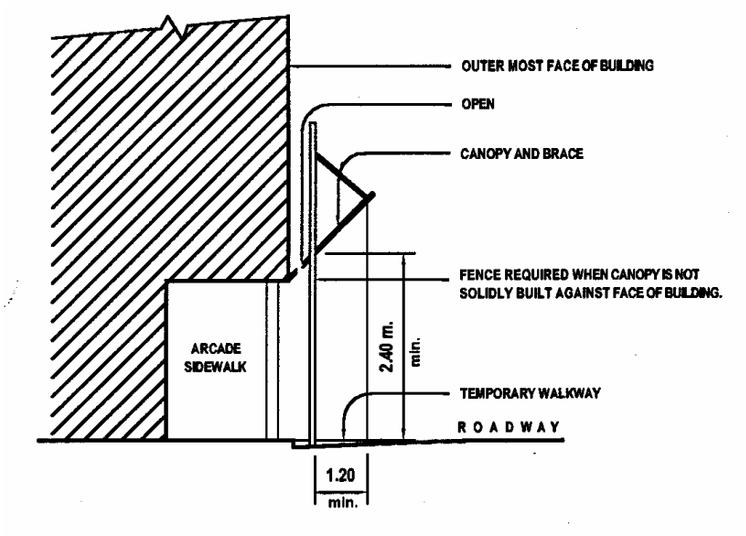


Figure XI.6.

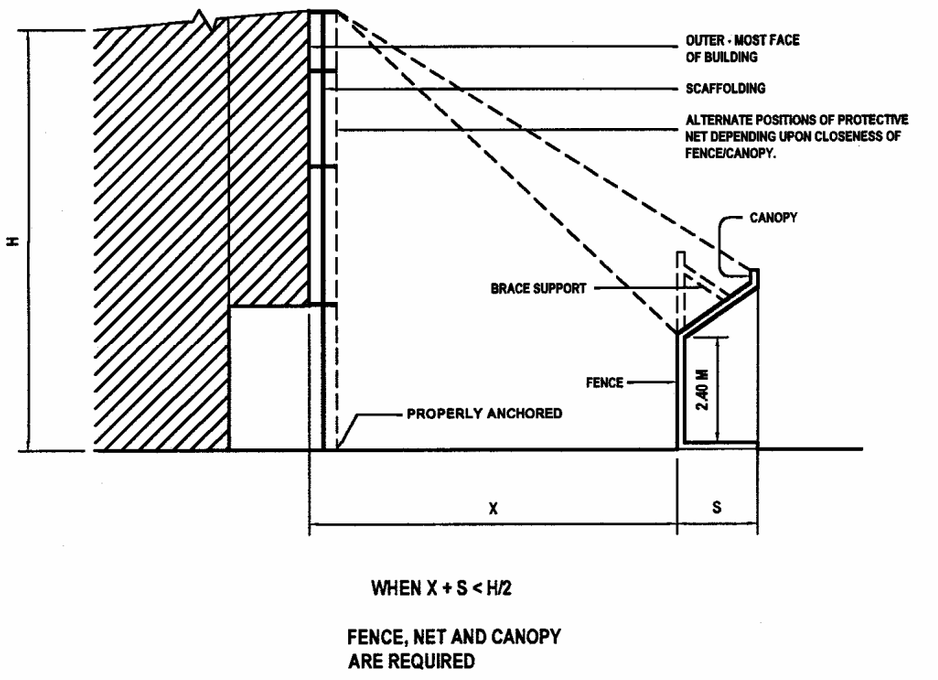


Figure XI.7.

PROTECTION OF PEDESTRIANS, NEARBY RESIDENTS AND THE PUBLIC DURING CONSTRUCTION AND DEMOLITION

Annotation. The necessary lights, warning devices and safety barriers should be properly installed, operated and maintained in the areas to be used by the general public during construction.

d. All areas of danger in demolition operations shall be properly enclosed and danger signs posted. Watchmen shall be provided to warn workers of impending dangers and all unauthorized persons shall be excluded from places where demolition is in progress.

SECTION 1107. Maintenance and Removal of Protective Devices

1. Maintenance. All protective devices shall be properly maintained in place kept in good order for the entire length of time pedestrians may be endangered.

   a. Average Light Intensity and Illumination

      i. All parts of buildings/structures under construction/demolition, and all sheds, scaffolds, canopied walkways, work or storage areas, and equipment used in connection with such operations shall have sufficient light to insure safety and protection of life and property. In passageways, stairways and corridors, the average light intensity measured at floor level shall be not less than 200 LUX.

      ii. At locations where tools and/or machinery are used, the average light intensity measured at floor level shall be not less than 500 LUX. Natural or artificial illumination shall be provided in such a manner that glare and shadows will not adversely affect the safety and protection of the public, workers and property.

   b. Welding and Cutting

      i. Gas welding and cutting and arc welding in construction/ demolition operations shall be restricted to experienced workers accredited by the Technical Education Skills Development Authority (**TESDA**). Suitable goggles, helmets and gloves shall be provided for and worn by workers engaged in gas welding or cutting or arc welding. Incombustible shields shall be provided to protect the workers when exposed to falling hot metal oxide.

      ii. Gas welding or cutting or arc welding shall not be done above pedestrians and workers. When unavoidable, an incombustible shield shall be provided between the work and workers below. A watchman shall be stationed to give warning at places where pedestrians and workers, in the course of their activity, are likely to pass under a gas welding or cutting or an arc welding operation.

      iii. Gas welding or cutting shall not be carried out in any place where ample ventilation is not provided or from which quick escape is difficult. When unavoidable, workers engaged in such work in confined spaces shall be allowed frequent access to fresh air. A relief worker shall be stationed close at hand to assist the worker in case of accident and to shut off the gases.

      iv. Tanks of fuel gas shall not be moved or allowed to stand for any extended period when not in use unless the caps of such tanks are in place.

      v. Suitable cradles shall be used for lifting or lowering oxygen or fuel tanks, to reduce to a minimum the possibility of dropping tanks. Ordinary rope slings shall not be used.

      vi. Tanks supplying gases for welding or cutting shall be located at no greater distance from the work than is necessary for safety.

      vii. Such tanks shall be securely fastened in place and in upright position. They shall be stored or set in place for use so that they are not exposed to the direct rays of the sun or to high temperature.

      viii. Before steel beams or other structural shapes or elements of construction are cut by means of a gas flame, they shall be secured by cables or chains to prevent them from dropping or swinging.

      ix. Where, in the course of demolition work, steel work or ironwork is being cut, released or dismantled, all necessary precautions shall be taken to prevent danger from sudden twist, spring or collapse.

   c. Special Typhoon Precautions

i. Whenever a typhoon is expected to pass at or near the construction site, all construction materials and equipment shall be secured against displacement by wind forces.

ii. Construction sheds, construction materials and equipment shall be secured by guying, shoring, or by tying down.

iii. Where a full complement of personnel is employed or engaged for such protection purposes, normal construction activity or uses of materials or equipment may continue, allowing such reasonable time as may be necessary to secure such materials and equipment before winds of gale force are anticipated, in accordance with warnings or advisories issued by the Philippine Atmospherical Geophysical Astronomical Services Administration (**PAGASA**).

d. Hoisting Machinery

i. Every hoisting engine shall be provided with adequate brakes capable of holding the maximum load at any point of travel.

ii. Hoisting machinery shall be enclosed to exclude unauthorized persons. If placed outside the building, further protection against falling objects shall be provided.

iv. Guards shall be provided with exposed gears and other moving parts and around hoisting cables at all points to prevent workers from tripping or getting their clothing caught.

v. Ample room shall be provided around hoisting engines, motors or machineries or apparatus to allow the free and safe movement of the operators.

vi. When hoisting machinery is set on an elevated platform, such platform shall be of substantial and sturdy construction. Guardrails and toe boards shall be provided along all open sides of such platform.

vii. Electrical machinery and equipment to be used for construction work shall be installed and operated in accordance with the Philippine Electrical Code.

viii. Steam boilers used in construction work shall be installed, equipped and maintained in accordance with the Philippine Mechanical Code.

ix. A tag line or guide rope shall be used on all loads being hoisted or lowered.

e. Platform Hoists

i. Platform hoists for the handling of materials in buildings under construction shall have the car substantially constructed and provided with covers, either solid or wire mesh.

ii. If suitable overhead protection is provided, the covers may be omitted.

iii. Hoists shall be equipped with a broken-rope safety device.

iv. Where wheelbarrows or buggies are used for handling material on platform hoists, cleats shall be nailed to the platform to fix the proper position so that handles shall not project beyond platform edges.

v. Supports for the overhead sheave of the hoist shall be designed to carry two (2) times the weight of the hoist and its maximum load.

f. Hoist Towers

i. Hoist towers erected in connection with construction work shall be substantially constructed. All members shall be so proportioned that the stresses shall not exceed those specified for the material when carrying the dead load of the tower plus two times the weight of the platform or bucket or its maximum load.

ii. Every hoist tower shall rest on a sufficiently solid foundation to prevent injurious settlement or distortion of its framework.

iii. The base of every hoist tower shall be screened or otherwise protected on all sides to a height of not less than 1.80 meters.

iv. Every hoist tower shall be secured in not less than four (4) directions against swaying or tipping at intervals of not more than 10.00 meters in its height, by steel cable guys adequately anchored or by other satisfactory means.

v. Such towers which are constructed adjacent to buildings shall be secured to the building frame at each floor as the construction progresses.

vi. Hoist towers erected within the building, but not occupying the entire opening through which they pass, shall be completely enclosed on all sides and shall be provided with doors at the unloading points unless the platform hoist is solidly enclosed on all sides to the height to which material is to be loaded or unloaded.

vii. Landing platforms in hoist towers or platforms connecting a hoist tower to a building or other structure shall be provided with guardrails and toe boards.

g. Derricks and Cranes

i. Derricks shall be so designed and assembled that no part shall be stressed beyond the safe working stress for the material under its maximum rated load in any possible position. Such maximum load shall be conspicuously posted on each derrick.

ii. The foot-block of every derrick shall be firmly secured against motion in any direction.

iii. Guy derricks shall have the top of the mast held by not less than six (6) steel guy cables secured by firm anchorages and so placed that the angle of the guy with the mast shall be as large as possible.

iv. The moving parts of derricks and cranes shall be kept well lubricated. All parts shall be inspected at least every other day.

v. Use and operation of cranes shall be in accordance with Rule XIII.

vi. In the operation of cranes and similar devices, a standard signal system shall be used and all men assigned to the operation of such equipment shall be fully instructed on the signals.

h. Cables, Ropes, Chains and Blocks

i. All ropes and cables used in connection with scaffolds, derricks and hoisting apparatus shall be tested before being put to use and at least once every thirty (30) days while in use, to insure their safety and suitability for the purpose.

ii. Cables, ropes, chains and blocks shall be of such size that the maximum load supported by them will not exceed one-sixth (1/6) of their breaking strength.

iii. Blocks designed for use with abaca ropes shall not be used for steel cables.

iv. Blocks used at or near floors or in other exposed places to change the direction of cables shall be enclosed or otherwise effectively guarded.

v. Chains shall not be used for slings, bridles or other similar purposes, but shall be restricted to only a straight pull.

vi. Hooks shall not be used for hoisting buckets, cages or skips.

i. Ladders and Temporary Stairways

i. Except where either permanent or temporary stairways or runways are required, ladders shall be provided to give access to all floors, stagings or platforms where work is being done more than five (5) storeys above ground or above a permanent or temporary floor.

ii. Ladders shall not be extended by joining two (2) or more together. No single ladder shall exceed 6.00 meters in length. When greater heights are to be reached, intermediate platforms shall be erected.

iii. Ladder landings shall be at least 1.20 meters square and equipped with handrails and toe boards.

iv. Ladder rungs shall be spaced uniformly and as near to 300 millimeters as practicable.

v. Ladders leading to floors, stagings or platforms shall extend at least 900 millimeters above the level of such floors, stagings or platforms.

vi. When used temporarily in place of stairways or runways, ladders serving traffic in both directions simultaneously shall be at least 1.00 meters wide. If separate ladders are provided for going up and coming down, they shall be marked "UP" and "DOWN" respectively at each floor and platform level.

vii. All ladders, when in use, shall be set up in a manner to be secured and to prevent slipping. Ladders, except stepladders or other self-supporting ladders, shall be securely fastened to a permanent support at the top, and if necessary, at the bottom, and braced to prevent swaying, bending or shaking.

viii. Ladders shall not be placed or used in shafts of operative elevators or hoists except by workers engaged in the erection, construction, alteration or repair of any such shafts, hoistways or equipment.

ix. Ladders shall not be painted, but may be oiled or treated with preservatives so as to permit the detection of faults.

x. Every ladder shall be inspected by the superintendent or foreman in charge before being put to use on a construction operation and thereafter at least once every thirty (30) days while in continued use.

xi. Permanent stairways shall be installed in all buildings under construction as soon as conditions will permit.

xii. When the work on a building has progressed to a height in excess of 18.00 meters and it has not been practicable to install the permanent stairways, at least one temporary stairway shall be provided for the full height and continued upward as rapidly as the work progresses.

xiii. Stairs and stairways shall be of sufficient strength to support a load of at least 4800 Pascal. All stairways shall be guarded on all open sides with handrails and toe boards.

xiv. Temporary stairs shall be constructed so that treads and risers are uniform in width and height in any one (1) flight.

xv. The sum of the height of the two (2) risers and the width of one (1) tread shall be not less than 460 millimeters nor more than 700 millimeters.

xvi. Temporary stairways shall be not less than 900.00 millimeters wide.

xvii. Landings shall be not less than 750 millimeters long. No flight of stairs of temporary stairways shall have a vertical rise in excess of 3.60 meters. Whenever necessary, intermediate landings shall be provided.

xviii. Temporary and permanent stairways shall be adequately lighted.

xix. Permanent stairs that are to be used during construction and on which treads are to be filled in later shall have wooden treads firmly fitted in place for the full area of the tread.

xx. The top surfaces of the temporary treads shall be maintained above the tops of the risers or nosings.

xxi. No door shall open directly onto a flight of stairs, but a landing equal at least the width of the door shall be provided between the door and the stairs.

j. Runways and Ramps

i. Runways and ramps used in connection with scaffolds or extending from storey to storey or otherwise located and maintained for an extended period of time or for the transfer of bulky material shall be constructed of at least three (3) 25 x 250 millimeters planks laid closely side by side and substantially supported and braced to prevent unequal deflection and springing action.

ii. Runways and ramps shall have a slope not greater than one is to three (1:3). The total rise of a runway or ramp between landings shall not exceed 1.80 meters.

iii. When the rise is steeper than 1:3, runways or ramps shall be provided with cleats spaced not more than 20 millimeters apart.

iv. Runways and ramps having a total rise of more than 1.80 meters, or passing over or near floor openings, high tension wires or other dangerous places, shall be provided with guardrails and toe boards.

h. Scaffolds

i. Properly constructed scaffolds shall be provided for all works which cannot be done safely by workmen standing on permanent or solid construction, except when such work can be done safely from ladders. All such scaffolds shall be substantially constructed to support at least four (4) times the maximum load, and shall be secured to prevent swaying.

ii. Planks used in the construction of stationary scaffolds shall be not less than 50 millimeters nominal thickness. Where such planks overlap at the ends, the overlap shall be not less than 150 millimeters. Planks shall be so placed that they cannot tip under the weight of the worker at any point. All nails shall be driven full strength. No nails shall be subject to direct pull.

iii. Ropes, cables and blocks shall sustain at least six (6) times the maximum loads to which they will be subjected. Where acids are likely to come in contact with them, ropes shall not be used but steel cables properly protected by grease or oil or other effective methods shall be used instead.

iv. Every scaffold, the platform level of which is more than 1.80 meters above the ground, or above a permanent or temporary floor, other than iron workers' scaffolds and carpenters' bracket scaffolds, shall be provided with guard rails and toe boards extending the full length of the scaffold and along the ends except where ramps or runways connect with them, unless otherwise enclosed or guarded. On suspended, swinging and pole scaffolds, the space between guardrails and toe boards shall be fitted with wire mesh screens securely attached.

v. Where objects are likely to fall on a scaffold from above, a substantial overhead protection shall be provided not more than 3.00 meters above the scaffold platform, and at doorways, passageways or other points. Where workers must pass under scaffolds, a substantial overhead protection shall be provided.

vi. No materials or equipment other than required by the workers shall be placed on scaffold platforms.

vii. Roof brackets, roof scantling, crawling boards and similar forms of supports shall be substantial in construction and securely fastened in place when in use.

viii. Barrels, boxes or other similar unstable objects shall not be used as supports.

ix. When used over public sidewalks or other places of public use, scaffolds used for minor building repairs, alterations, or painting, shall be equipped with drop cloths to effectively prevent the falling of paint or debris.

x. Scaffolds used for sandblasting and guniting operations shall be entirely and effectively enclosed, and the determination of effective enclosure shall be the completed absence of particles of materials of operation in the air at a horizontal distance of 15.0 meters from the point of operation.

k. Temporary Flooring

i. In buildings of skeleton construction, the permanent floor, except for necessary hoistway openings, shall, when possible, be constructed as the building progresses. There shall be not more than three (3) unfilled floors below the highest permanent floor.

ii. In buildings of skeleton construction, the entire working floor shall be planked over, except spaces required for raising or lowering materials, and for stairways or ladders. Planks shall not tip under the weight of a worker at any point and secured, so that they cannot slip out of place.

iii. In buildings of wood joist construction, the immediate underfloor shall be laid for each floor as the building progresses.

l. Floor Openings

i. All floor openings used as hoistways or elevator shaftways shall be protected on all sides, except the side being used for loading or unloading. Protection shall be in the form of barricades or guardrails not less than 900 millimeters high placed not less than 600 millimeters distant at all points from the edges of such openings. If guardrails are used, toe boards shall be provided along the edges of the openings. Sides left open for loading or unloading shall be guarded by similar solid doors or gates.

ii. All floor openings used as stairways or for the accommodation of ladders or runways shall be guarded by railings and toe boards.

iii. All floor openings shall be protected on all sides by solid barriers or railings with toe boards not less than 900 millimeters high or shall be planked over by temporary construction capable of sustaining safely such loads as are likely to come thereon.

iv. Barriers for the protection of openings used as hoistways or for elevators shall be constructed so that workers cannot thrust head, arms or legs through them, and loose materials cannot fall or be pushed into the shaftway.

v. Barriers and guardrails around floor openings shall remain in place until permanent enclosures or protection are otherwise provided.

m. Guardrails and Toe Boards

i. Guardrails, when required under this Rule, shall have the top rail not less than 900 millimeters with an intermediate rail provided between the top rail and the platform.

ii. All guardrails shall have supports not more than 2.40 meters apart, constructed to withstand a horizontal force of 30 kilograms per sq. meters.

iii. Toe boards, whenever required under this Rule, shall extend not less than 150 millimeters above the platform level and shall be placed to fit close to the edges of the platform. They shall be adequately secured along the entire length to resist the impact of workers' feet and the shifting of materials.

iv. Toe boards of metal shall be not less than 25 millimeters nominal thickness, with supports not more than 1.20 meters apart.

v. Toe boards of metal shall be not less than 30 millimeters thick, with supports not more than 1.20 meters apart.

2. Removal. Every protective fence or canopy shall be removed within 30 days after such protection is no longer required as determined by the Building Official.

SECTION 1108. Demolition

1. If the work is of a difficult or dangerous nature, it should be done by a contractor experienced in such work.

2. Before demolition is commenced, notice of intention to proceed should be given to the adjoining owners of the buildings.

3. Before commencing to demolish a building or repair a badly damaged building, shoring, tying, and strutting are necessary to prevent movement.

4. For the purposes of arranging shores, ties, and other security measures, a survey of the existing building and the adjoining owner's building should be made prior to demolition and, where possible, particulars of existing wall foundations and of the subsoil should be obtained.

5. Demolition should be done as much as possible, floor-by-floor.

6. Care should be taken to dispose of debris as it arises. If this is not done, there is a great risk of overloading the floors, which may result in a collapse. All debris arising from demolition should be kept damp by means of spraying water from a hose with a fine spray to prevent dust arising and causing inconvenience to adjoining owners and pedestrians.

7. Fans or catch platforms should be provided over public footways, etc., to protect workmen and occupants of adjoining building and the general public from falling debris during demolition. One fan at the first (1st) floor level should be sufficient for buildings of three (3) storeys. Building of more than three (3) storeys should have additional fans at higher levels, generally at alternate floor levels.

8. Precautions Before Demolition

   a. Before commencing the work of demolition of a building/structure, all gas, electric, water and other utility meters shall be removed and the supply and service lines disconnected by the corresponding utility/service companies, who should be notified in advance.

   b. **All** fittings attached to the building/structure and connected to any street lighting system, electrical supply or other utilities shall be removed.

   c. **All** electric power shall be shut off and all electric service lines shall be cut and disconnected by the power company at or outside the property line.

d. No electric cable or other apparatus, other than those especially required for use in connection with the demolition work, shall remain electrically charged during demolition operations. When it is necessary to maintain any power, water, gas, or other utility/service lines during the process of demolition, such lines shall be temporarily relocated and protected with substantial covering to the satisfaction of the utility/service company concerned.

e. All necessary steps shall be taken to prevent danger to persons arising from fire or explosion from leakage or accumulation of gas or vapor, and from flooding from uncapped water mains, sewers and/or culverts.

f. All entrances/exits to and from the building shall be properly protected so as to prevent any danger to persons engaged in the demolition work using such entrances/exits in the performance of their works.

g. Glazed sashes and glazed doors shall be removed before the start of demolition operations.

9. Chutes

a. Chutes for the removal of materials and debris shall be provided in all parts of demolition operations, which are more than 6.00 meters above the point from which material is to be removed. Chutes shall be so situated and constructed so as not to pose any danger to the public or to workmen.

b. Chutes shall be completely enclosed and shall be equipped, at intervals of 6.00 meters or less, with substantial stops to prevent descending materials from attaining dangerous speeds. Proper tools shall be provided and kept available to loosen materials or debris jammed in the chute. No materials or debris shall be dropped from any part of a building under demolition to any point outside the walls of the building except through properly enclosed wooden or metal chutes.

c. Chutes which are at an angle of more than 45^{o} from the horizontal shall be completely enclosed on all four (4) sides, except for openings at or about floor level at each floor, for the receiving of materials or debris.

d. Chutes at an angle of less than 45^{o} with the horizontal may be left open on the upper side. However, where such a chute discharges into another chute steeper than 45^{o} with the horizontal, the top of the steeper chute shall be covered at the junction point of the two (2) chutes to prevent the spillage of materials or debris.

e. Openings into which materials or debris are dumped at the top of a chute shall be protected by a substantial guardrail extending at least 1.80 meters above the level of the floor.

f. At chute openings where materials or debris are dumped from wheelbarrows, a toe board or bumper not less than 150 millimeters high and 50 millimeters nominal thickness shall be provided.

g. Any space between the chute and edges of floor openings through which the chute passes shall be solidly planked over.

h. Chutes, as well as floors, stairways and other places, shall be effectively wet down at frequent intervals, whenever the dust from demolition operations would cause a menace or hardship to residents of adjoining buildings or premises.

i. The bottom of each chute shall be equipped with an adjustable gate or stop for regulating the flow of materials.

j. Except when in actual use in the discharge of materials, the gate or stop shall be kept closed. A reliable person shall be designated to control the gate and the backing up and loading of trucks. He shall see to it that no person is allowed to stand or pass under the discharge end of the chute at any time.

k. The area at the discharge end of each chute shall be completely enclosed with a substantial fence at all times or otherwise made inaccessible. A danger sign shall be placed at the discharge end of every chute.

10. Demolition of Walls and Chimneys

a. No wall, chimney or other construction shall be allowed to fall in mass, except under competent supervision.

b. Scaffolds or stagings shall be erected for workers if walls or other elements of the structure are too thin or too weak to work on. Heavy structural members, such as beams or columns, shall be carefully lowered and not allowed to fall freely.

c. Masonry walls or sections of masonry walls shall not be permitted to fall upon the floors of the building in such masses as to exceed the safe carrying capacity of the floors.

d. No walls or section of walls whose height is more than twenty-two (22) times its thickness shall be permitted to stand without lateral bracing unless such wall is in good condition and was originally designed to stand to a greater height without such lateral support.

e. Workmen shall not **be permitted to work on top of a wall when weather conditions constitute a hazard.**

f. Before demolishing any interior or exterior wall which is within 3.00 meters of any opening in the floor immediately below, such opening shall be substantially planked over unless all workmen are removed from all floors below and access to such floors is positively prevented.

g. At the completion of each day's work, all walls undemolished shall be left stable and in no danger of overturning or falling.

h. Foundation walls which serve as retaining walls to support earth and adjoining structures shall not be demolished until such adjoining structures have been underpinned or braced, and earth either removed or supported by sheet piling or other suitable materials.

i. In the demolition of brick and/or masonry chimneys which cannot safely be toppled or dropped, all materials shall be dropped down through the inside of such chimneys.

j. The loading point at the discharge end chute, at or near the bottom of a chimney, shall be completely protected by means of any overhead timber canopy.

k. To enable workmen to reach or leave their work on any wall or scaffold, walkways shall be provided. Such walkways shall not be less than three (3) planks, properly tied or nailed to bearers of not less than 560 millimeters in width, such that the planks do not deflect more than 50 millimeters under normal loading.

l. In buildings of skeleton construction, the steel framing may be left in place during the demolition of masonry work. When this is done, all steel beams, girders and the like shall be cleared of all loose materials as the demolition progresses.

11. Demolition of Floors

a. Before the demolition of floors and floor beams, the floors and beams shall be completely supported by temporary planking and supports.

b. When the load is transferred to lower floors, these floors shall be carefully propped.

c. Demolition of floors shall not be started until the surrounding floor area to a distance of 6.00 meters have been entirely cleared of debris and other unnecessary materials.

d. No floor, roof or other part of a building that is being demolished shall be so overloaded with debris or materials as to render it unsafe.

e. Where workmen are engaged in the removal of floors, planks of ample strength which are supported independently of the flooring shall be provided for the workmen to step on. The planks shall be so placed as to give the workmen a firm support in case the floor gives way or collapses unexpectedly. Where it is necessary for a workman to straddle a space between two planks, such space shall not exceed 400 millimeters. To enable workmen to reach any workplace without the necessity of walking on exposed beams, planks shall be provided to serve as catwalks.

f. Planks used for temporary protection shall be sound, and at least 25 millimeters thick. They shall be laid close together, with the ends overlapping by at least 100 millimeters over solid bearings to prevent tipping under a load.

g. Where floors are being removed, no workmen shall be allowed to work in the area directly underneath. Such areas shall be barricaded to prevent access to it.

h. Structural or load-supporting members at any floors shall not be cut or removed until all stories above that floor have been demolished and removed.

i. Where any floor has been removed, the entire tier of beams on which any device is supported shall be completely planked over, except for such openings as are required for the handling of materials or equipment.

j. Stairs and stair railings shall be kept in place and in usable condition as long as it is practicable.

k. Steps and landings shall be kept free from debris and obstructions.

12. Other Safeguards

a. Where applicable, the **Building Official** shall require strict compliance with the minimum safety standards as prescribed under Administrative Order of **DOLE**. The construction, alteration and removal of scaffolds and the application, installation and setting up of safeguard devices shall be done by skilled workmen under the supervision of a person, qualified by experience or training for such work.

b. A device or piece of equipment, which is unsafe, shall be reported to the superintendent or foreman, who shall take immediate steps to remedy such condition or remove such device or equipment.

c. Scaffolds, ladders, stairs, fuel gas tanks and other devices or equipment falling within the scope of this Rule shall be maintained in a good, safe and usable conditions as long as in use.

d. Scaffolds, temporary floors, ramps, stairway landings, stair treads, and all other walkway surfaces shall be kept free from protruding nails/splinters.

e. Protruding nails and tie wire ends shall be removed, hammered in or bent in a safe condition.

f. Electric lines, moving ropes and cable gears, or similar hazards with which a person might come in contact with shall be encased or protected.

g. No person, firm or corporation, either personally or through an employee or agent of another, shall operate or move any machinery, equipment, materials, scaffolds, closer than 5.00 meters to any energized high voltage overhead electrical facilities unless authorized by the Electrical Inspector.

h. All workmen on any demolition job shall be required to wear industrial safety helmets and body protective gears.

i. Construction sheds and toolboxes shall be so located as to protect persons from dangerous falling walls and objects.

j. The **Building Official** may permit the use of alternative methods and/or devices depending on local conditions provided that the minimum standard of safety sought to be achieved under this Rule is not jeopardized.

k. In Fire Zones of **Types I, II and III** Construction, only heaters with enclosed flames shall be used for the heating of any roofing or other similar materials.

l. Wherever any enclosed flame heaters or open fires are used, there shall be a workman in constant attendance, whose duty shall be to have such heater or fire under proper control at all times.

m. In all buildings in which standpipes are required, such standpipes shall be installed as the construction progresses in such a manner that they are always ready for Fire Department use, to the topmost constructed floor. Such standpipes shall be provided with a Siamese twin dry standpipe outside the building and with one (1) outlet at each floor connected to a fire hose cabinet.

n. In every construction operation, wherever a tool house, storeroom or other shanty is built or a room or space is used for storage, dressing room or workshop, at least one (1) approved hand pump, tank or portable chemical or dry powder fire extinguisher shall be provided and maintained in an accessible location.

o. During construction operations, free access from the street to fire hydrants and to outside connections for standpipes, sprinklers or other fire extinguishing equipment, whether permanent or temporary shall be provided and maintained at all times. No material or construction equipment shall be placed within 3.00 meters of such hydrant or connection, nor between it and the centerline of the street.

p. Toilet facilities at the construction/demolition site, as an ancillary to the bunkhouse and operation, shall be maintained in a clean/sanitary condition for the use of the workers.

q. Supply of potable water and sanitary washing facilities shall be provided for workers' and other uses during workdays.

r. At every construction/demolition operation, arrangements shall be made for prompt medical attention in case of an accident. An ample supply of first aid medicine shall be provided and maintained in a clean/sanitary cabinet, which shall be available at all times under the direction of the superintendent or a person designated by him.

s. Unless competent medical attention is quickly available, where more than two hundred (200) workers are employed, a properly equipped first-aid room shall be provided, and a physician or competent nurse shall be in constant attendance.

(emphases, underscoring and annotations supplied)

Rule XII follows

RULE XII - GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS

SECTION 1201. General Requirements

1. Buildings proposed for construction shall comply with all the regulations and specifications including safety standards embodied in the Administrative Order of **DOLE** herein set forth governing quality, characteristics and properties of materials, methods of design and construction, type of occupancy and classification.

2. The various applicable referral codes shall supplementally guide the planning, design, layout, content, construction, location/siting, installation and maintenance of all buildings/structures.

3. For the guidance of the general public, the Secretary shall periodically issue generic lists of approved, strictly regulated or banned items, procedures, usages and the like relative to the design, construction and use/occupancy of buildings/structures:

   a. Materials for construction;

   b. Processes for the production of materials, their installation or construction;

   c. Procedures/methodologies/systems for both design and construction;

   d. Organizational structures/hierarchies for construction;

   e. Types of occupancy; and

   f. Classifications relative to design, construction and occupancy.

4. All buildings/structures shall be placed in or upon private property or duly designated public land and shall be securely constructed in conformance with the requirements of the **Code**.

SECTION 1202. Excavation, Foundation, and Retaining Walls

1. **Subject to the provisions of** Articles 684 to 686 **of the** Civil Code **of the Philippines on lateral and subjacent support, the design and quality of materials used structurally in excavation, footings, and in foundations shall conform to accepted engineering practice.**

2. **Excavation and Fills**

   a. **Excavation and fills for buildings or structures shall be so constructed or protected that they do not endanger life or property.**

   b. **Whenever the depth of excavation for any construction is such that the lateral and subjacent support of the adjoining property or existing structure thereon would be affected in a manner that the stability or safety of the same is endangered, the person undertaking or causing the excavation to be undertaken shall be responsible for the expense of underpinning or extending the foundation or footings of the aforementioned property or structure.**

   c. **Excavation and other similar disturbances made on public property shall, unless otherwise excluded by the** Building Official**, be restored immediately to its former condition within 48 hours from the start of such excavation and disturbances by whosoever caused such excavation or disturbance.**

d. Before undertaking excavation works, drilling or otherwise disturbing the ground, the persons doing the work, or causing such work to be done, shall contact all public utilities/services to determine the possible location of underground facilities, to avoid hazard to public safety, health and welfare caused by the inadvertent disruption of such facilities.

e. Protection of Adjoining Property. Any person making or causing an excavation to be made below existing grade shall protect the excavation so that the soil of adjoining property will not cave-in or settle and shall defray the cost of underpinning or extending the foundation of buildings on adjoining properties. Before commencing the excavation, the person making or causing the excavation to be made shall notify in writing the owners of adjoining buildings not less than ten **(10) days before such excavation is to be made and that the adjoining buildings will be protected by him. The owners of the adjoining properties shall be given access to the excavation for the purpose of verifying if their properties are sufficiently protected by the person making the excavation. Likewise, the person causing such excavation shall be given access to enter the adjoining property for the purpose of physical examination of such property, prior to the commencement and at reasonable periods during the progress of excavation. If the necessary consent is** not **accorded to the person making the excavation, then it shall be the duty of the person refusing such permission to protect his buildings or structure. The person causing the excavation shall** not **be responsible for damages on account of such refusal by the adjoining property owner to permit access for inspection. In case there is a party wall along a lot line of the premises where an excavation is being made, the person causing the excavation to be made shall at his own expense, preserve such party wall in as safe a condition as it was before the excavation was commenced and shall, when necessary, underpin and support the same by adequate methods.**

f. At an early stage, and before work is commenced, a careful and accurate survey of any cracks in the existing adjoining owner's premises should be made, and, where possible, photographs should be taken, recorded, and agreed between the parties concerned. Where necessary, tell-tales should be fixed to cracks with the object of showing any further movements during demolition and excavation. Tell-tales should preferably be in the form of fixed points built in on each side of the crack and should be capable of being measured by a micrometer or vernier caliper. They should be of such a nature that both horizontal and vertical movements could be recorded.

g. Cut slopes for permanent excavations shall not be steeper than two (2) horizontal to one (1) vertical and slopes for permanent fills shall not be steeper than two (2) horizontal to one (1) vertical. Deviation from the foregoing limitations for slopes shall be permitted only upon the presentation of a geotechnical/geological investigation report acceptable to the Building Official.

h. On a large site that is at a considerable distance from the surrounding properties and public highways, deep excavation may be carried out in the open in bulk, leaving slopes around the perimeter. It is important to ensure that no serious failures of the banks will occur to endanger those working on the site or the public. The safe angle of the cut slope shall be determined by an appropriate geotechnical/geological site investigation acceptable to the Building Official.

i. In cases where the excavation passes through a permeable water-bearing stratum overlying an impervious bed, a bench should be formed at the junction of the strata to carry an intermediate intercepting drain.

j. If groundwater is standing at a considerable head around the excavation, measures shall be undertaken to reduce this head by a system of weepholes at the lowest 1/3 section of the excavation wall or by enclosing the site with suitable sheet piling or if a water-sealing stratum can be reached within a reasonable distance at the bottom of the excavation.

k. In fine sands or silts where sheet piling alone is relied upon, it will be necessary to watch the pumping very carefully because, in fine-grained materials, the removal of even a small volume of water may cause "blows" in the bottom of the excavation or may result in disturbance to adjoining structures.

l. Except in excavation inside sloping banks, rock, or within caissons, all excavations should be lined with shotcrete, boards, runners or sheet piles supported laterally, if necessary, by framings of wallings and struts, which may be of timber, steel, or reinforced concrete, to a sufficient extent to prevent the excavation from becoming dangerous to life or limb by movement or caving in of the adjoining soil.

m. All linings and framings should be inserted as the excavation proceeds, and should be tightened up against the adjoining soil by wedging or jacking and secured by cleats or other suitable means.

n. Every trench, 1.50 meters or deeper, shall be provided with suitable means of exit or escape at least every 7.50 meters of its length.

o. Where workers are employed adjacent to an excavation on work other than that directly connected with the excavation, sufficient railings or fences shall be provided to prevent such workers from falling into the excavation.

p. Excavations that may be left open for any length of time, periodic inspections of timbering or strutting should be made and wedges tightened as found necessary.

q. In long excavation for walls, it may be found expedient and safe to arrange the excavation in a series of alternate sections in order to avoid a long, continuous excavation supported only on temporary strutting. Such sections should be arranged in convenient lengths (depending on the total length to be done) and of a width sufficient to construct a unit of the retaining wall that will be adequate to afford permanent support to that portion of the ground; the wall unit should be completed before proceeding with the adjacent section of the excavation.

r. Where water is encountered in excavation, a sump should be maintained below the level of the excavation in order that surface and groundwater can be led into it and pumped out; provided that the inflow of water does not carry much soil in suspension and does not require continuous pumping to keep the risk of settlement of the surrounding ground.

s. No fill **or other surcharge loads shall be placed adjacent to** any building**/structure unless such** building**/structure is capable of withstanding the additional loads caused by the fill or surcharge.**

t. Existing footings or foundations which may be affected by any excavation shall be underpinned adequately, or otherwise protected against settlement, and shall be protected against lateral movement.

u. **Fills to be used to support the foundations of** any building**/structure shall be placed in accordance with accepted engineering practice. A soil investigation report and a report of satisfactory placement of fill, shall be both acceptable to the** Building Official**.**

3. **Footings, Foundations, and Retaining Walls**

   a. **Footings and foundations shall be of the appropriate type, of adequate size, and capacity in order to safely sustain the superimposed loads under seismic or any condition of external forces that may affect the safety or stability of the structure. It shall be the responsibility of the architect and/or engineer to adopt the type and design of the same in accordance with the standards set forth by the Secretary.**

   b. **Whenever or wherever there exist in the site of the construction an abrupt change in the ground levels or level of the foundation such that instability of the soil could result, retaining walls shall be provided and such shall be of adequate design and type of construction as prescribed by the Secretary.**

SECTION 1203. Veneer

1. **Veneer is a nonstructural facing of brick, concrete, tile, metal, plastic, glass, or other similar approved materials attached to a backing or structural components of the building for the purpose of ornamentation, protection, or enclosure that may be adhered, integrated, or anchored either on the interior or exterior of the building or structure.**

2. ***Design Requirements.*** **The design of all veneer shall comply with the following:**

   a. **Veneer shall support no load other than its own weight and the vertical dead load of veneer immediately above.**

   b. **Surfaces to which veneer is attached shall be designed to support the additional vertical and lateral loads imposed by the veneer.**

   c. **Consideration shall be given to differential movements of the supports including those caused by temperature changes, shrinkage, creep, and deflection.**

   d. **Adhered veneer and its backing shall be designed to have a bond to the supporting elements sufficient to withstand shearing stresses due to their weights including seismic effects on the total assemblage.**

   e. **Anchored veneer and its attachment shall be designed to resist horizontal forces equal to twice the weight of the veneer.**

   f. **Anchors supports and ties shall be non-combustible and corrosion-resistant.**

SECTION 1204. Enclosure of Vertical Openings

1. ***General.*** **Vertical openings shall be enclosed depending upon the fire resistive requirements of a particular type of construction as set forth in the Code.**

2. ***Elevator Enclosures.*** **Walls and partitions enclosing elevators and escalators shall be of not less than the fire-resistive construction required under the Types of Construction. Enclosing walls of elevator shafts may consist of wire glass set in metal frames on the entrance side only. Elevator shafts extending through more than two storeys shall be equipped with an approved means of adequate ventilation to and through the main roof of**

the building; *Provided,* that in those buildings housing Groups F and G Occupancies equipped with automatic fire-extinguishing systems throughout, enclosures shall not be required for escalators; *Provided,* further that the top of the escalator opening at each storey shall be provided with a draft curtain. Such draft curtain shall enclose the perimeter of the unenclosed opening and shall extend from the ceiling downward at least 300 millimeters on all sides. Automatic sprinklers shall be provided around the perimeter of the opening and within a 600 millimeters of the draft curtain. The distance between the sprinkles shall not exceed 1.80 meters center-to-center.

3. ***Other Vertical Openings.*** **All shafts, ducts, chutes, and other vertical openings not covered in paragraph above shall have enclosing walls conforming to the requirements specified under the type of construction of the building in which they are located. In other than Group A Occupancies, rubbish and linen chutes shall terminate in rooms separated from the remainder of the building by a One-Hour Fire-Resistive Occupancy Separation. Openings into the chutes shall not be located in required exit corridors or stairways.**

4. ***Air Ducts.*** **Air ducts passing through a floor shall be enclosed in a shaft. The shaft shall be as required in this Code for vertical openings. Dampers shall be installed where ducts pierce the shaft enclosure walls. Air ducts in Group A Occupancies need not be enclosed in a shaft if conforming to the mechanical provisions of the Code.**

SECTION 1205. Floor Construction

1. **Floors shall be of such materials and construction as specified under Rule V - Fire Zones and Fire-Resistive Standards and under Rule IV - Types of Construction.**

2. **All floors shall be so framed and secured into the framework and supporting walls as to form an integral part of the whole building.**

3. **The types of floor construction used shall provide means to keep the beam and girders from lateral buckling.**

SECTION 1206. Roof Construction and Covering

1. ***Roof Covering.*** **Roof covering for all buildings shall be either fire-retardant or ordinary depending upon the fire-resistive requirements of the particular type of construction. The use of combustible roof insulation shall be permitted in all types of construction provided it is covered with approved roof covering applied directly thereto.**

2. ***Roof Trusses.*** **All roofs shall be so framed and tied into the framework and supporting walls so as to form an integral part of the whole building. Roof trusses shall have all joints well fitted and shall have all tension members well tightened before any load is placed in the truss. Diagonal and sway bracing shall be used to brace all roof trusses. The allowable working stresses of materials in trusses shall conform to the Code. Camber shall be provided to prevent sagging.**

3. ***Attics.***

    a. ***Access.*** **An attic access opening shall be provided in the ceiling of the top floor of buildings with a combustible ceiling or roof construction. The opening shall be located in a corridor or hallway of buildings of three (3) or more storeys in height and readily accessible in buildings of any height. An opening shall not be less than 600 millimeters square or 600 millimeters in diameter. The minimum clear headroom of 800 millimeters shall be provided above the access opening. For ladder requirements, refer to the Philippine Mechanical Engineering Code.**

b. *Area Separation.* Enclosed attic spaces of combustible construction shall be divided into horizontal areas not exceeding 250 sq. meters by fire-resistive partitions extending from the ceiling to the roof. *Except,* that where the entire attic is equipped with approved automatic fire-extinguishing system, the attic space may be divided into areas not to exceed 750 sq. meters. Openings in the partitions shall be protected by self-closing doors.

c. *Draft Stops.* Regardless of the type of construction, draft stops shall be installed in trusses roofs, between roof and bottom chords or trusses, in all buildings exceeding 2000 sq. meters. Draft stops shall be constructed as for attic area separations.

d. *Ventilation.* Enclosed attics including rafter spaces formed where ceilings are applied direct to the underside or roof rafters shall be provided with adequate ventilation protected against the entrance of rain.

4. *Roof Drainage System*

a. *Roof Drains.* Roof drains shall be installed at low points of the roof and shall be adequate in size to discharge all tributary waters.

b. *Overflow Drains and Scuppers.* Where roof drains are required, adequate overflow drains shall be provided.

c. *Concealed Piping.* Roof drains and overflows drains, when concealed within the construction of the building, shall be installed in accordance with the provisions of the National Plumbing Code.

d. *Over Public Property.* Roof drainage water from a building shall not be permitted to flow over public property, except for Group A and J Occupancies.

5. *Flashing.* Flashing and counterflashing shall be provided at the juncture of the roof and vertical surfaces.

SECTION 1207. Stairs, Exits, and Occupant Loads

1. *General.* The construction of stairs and exits shall conform to the occupant load requirements of buildings, reviewing stands, bleachers, and grandstands.

a. *Determination of Occupant Loads.* The occupant load permitted in any building or portion thereof shall be determined by dividing the floor area assigned to that use by the unit area allowed per occupant as shown on ***Table XII.1.*** and as determined by the Secretary.

i. When the unit area per occupant for any particular occupancy is not provided for in ***Table XII.1.***, the **Building Official** shall determine the same based on the unit area for occupancy, which it most nearly resembles.

ii. The occupant load of any area having fixed seats shall be determined by the number of fixed seats installed. Aisles serving the fixed seats in said area shall be included in determining the occupant load.

iii. The occupant load permitted in a building or portion thereof may be increased above that specified in ***Table XIII.1.*** if the necessary exits are provided.

iv. In determining the occupant load, all portions of a building shall be presumed to be occupied at the same time.

EXCEPTION: Accessory areas, which ordinarily are only used by persons who occupy the main areas of occupancy, shall be provided with exits as though they were completely occupied. However, in computing the maximum allowable occupant load for the floor/building, the occupant load of the accessory area/s shall be disregarded.

b. *Exit Requirements.* Exist requirements of a building or portion thereof used for different purposes shall be determined by the occupant load which gives the largest number of persons. No obstruction shall be placed in the required width of an exit except projections permitted by the Code.

c. *Posting of Room Capacity.* Any room having an occupant load of more than fifty (50) where fixed seats are not installed, and which is used for classroom, assembly, or similar purpose shall have the capacity of the room posted in a conspicuous place near the main exit from the room.

d. *Changes in Elevation.* Except in Group A Occupancies, changes in floor elevations of less than 300 millimeters along any exit serving a tributary occupant load of ten (10) or more shall be by means of ramp.

Table XII.1. **General Requirements for Occupant Loads and Exits***
(*In all occupancies, floors above the first (1st) storey having an occupant load of more than ten (10) shall have at least two (2) exits)

Use or Occupancy	Unit Area per Occupant (sq. meters)	**Minimum of Two (2) Exits** Other than Elevators are Required Where Number of Occupants is Over
Dwellings	28.00	10
Hotels	18.60	10
Apartments	18.60	10
Dormitories	18.60	10
Classrooms	1.80	50
Conference Rooms	1.40	50
Exhibit Rooms	1.40	50
Gymnasia	1.40	50
School Shops	4.60	50
Vocational Institutions	4.60	50
Laboratories	4.60	50
Hospitals**, Sanitaria**	8.40	5
Nursing Homes**	7.40	5
Children's Homes**	7.40	5
Homes for the Aged**	7.40	5
(**Institutional Sleeping Departments shall be based on one (1) occupant per 11.00 sq. meters of the gross floor area; In-patient Institutional Treatment Departments shall be based on one (1) occupant per 22.00 sq. meters of gross floor area)	3.25	6
Nurseries for Children		
Dwellings	28.00	10
Stores-Retail Sales Rooms		
Basement	2.80	50
Ground Floor	2.80	50
Upper Floors	5.60-	10

Offices	9.30	30
Aircraft Hangars (no repair)	46.50	10
Parking Garages	18.60	30
Drinking Establishments	1.40	30
Kitchens (commercial)	18.60	50
Warehouses	28.00	30
Mechanical Equipment Rooms	28.00	30
Garages	9.30	10
Auditoriums	0.65	50
Theaters	0.65	50
Churches and chapels	0.65	50
Dance Floors	0.65	50
Reviewing Stands	0.65	50
Stadia	0.65	50

2. Exits

   a. *Number of Exits*. Every building or usable portion thereof shall have **at least one (1) exit**. In **all** occupancies, floors above the first storey having an occupant load of more than **ten** (10) shall not have less than **two** (2) exits. Each mezzanine floor used for other than storage purposes, if greater in area than 185 sq. meters or more than 18.00 meters in any dimension, shall have at least two (2) stairways to an adjacent floor. Every storey or portion thereof, having an occupant load of 500 to 999 shall have at least **three** (3) exits. Every storey or portion thereof having an occupant load of **one thousand** (1000) or more shall have at least **four** (4) exits. The number of exits required from any storey of a building shall be determined by using the occupant loads of floors which exit through the level under consideration as follows: 50% of the occupant load in the first adjacent storey above (and the first adjacent storey below, when a storey below exits through the level under consideration) and 25% of the occupant load in the storey immediately beyond the first adjacent storey. The **maximum** number of exits required for any storey shall be maintained until egress is provided from the structures. For purposes of this Section basement or cellars and occupied roofs shall be provided with exits as required for storeys. Floors above the second storey, basements and cellars used for other than service of the building shall have not less than **two** (2) exits.

   b. *Width.* The total width of exits in meters shall **not** be less than the total occupant load served divided by **one hundred sixty five** (165). Such width of exits shall be divided approximately equally among the **separate** exits. The total exit width required from any storey of a building shall be determined by using the occupant load of that storey plus the percentage of the occupant loads of floors which exits through the level under consideration as follows: 50% of the occupant load in the first adjacent storey above (and the first adjacent storey below when a storey below exits through the level under consideration) and 25% of the occupant load in the storey immediately beyond the first adjacent storey. The **maximum** exit width from any storey of a building shall be maintained.

   c. *Arrangement of Exits.* If only **two** (2) exits are required, they shall be placed a distance apart to not less than one-fifth (1/5) of the perimeter of the area served measured in a straight line between exits. Where **three** (3) or more exits are required, they shall be arranged a reasonable distance apart so that if one becomes blocked, the others will be available.

   d. *Distance to Exits.* **No** point in a building **without** a sprinkler system shall be more than 45.00 meters from an exterior exit door, a horizontal exit, exit passageway, or an enclosed stairway, measured along the line of travel. In a building equipped with a complete automatic fire extinguishing system, the distance from exits may be increased to 60.00 meters.

3. *Doors.* The provisions herein shall apply to every exit door serving an area having an occupant load of more than **ten** (10), or serving hazardous rooms or areas.

a. *Swing.* Exit door shall swing in the direction of exit travel when serving any hazardous areas or when serving an occupant load of fifty (50) or more. Double acting doors shall **not** be used as exits serving a tributary occupant load of more than one hundred (100); nor shall they be used as a part of fire assembly, nor equipped with panic hardware. A double acting door shall be provided with a view panel of **not** less than 1,300 sq. centimeters.

b. *Type of Lock or Latch.* Exit door shall be openable from the inside without the use of a key or any special knowledge or effort: *Except*, that this requirement shall **not** apply to exterior exit doors in a Group E or F Occupancy if there is a conspicuous, readily visible and durable sign on or adjacent to the door, stating that the door is to remain unlocked during business hours. The locking device must be of a type that will readily be distinguishable as locked. **Flush bolts or surface bolts are prohibited**.

c. *Width and Height.* Every required exit doorway shall be of a size as to permit the installation of a door not less than 900 millimeters in width and not less than 2.00 meters in height. When installed in exit doorways, exit doors shall be capable of opening at least 90 degrees and shall be so mounted that the clear width of the exitway is not less than 700 millimeters. In computing the required exit width the net dimension of the exitway shall be used.

d. *Door Leaf Width.* **No** leaf of an exit door shall exceed 1.20 meters in width.

e. *Special Doors.* Revolving, sliding, and overhead doors shall not be used as required exits.

f. *Egress from Door.* Every required exit door shall give immediate access to an approved means of egress from the building.

g. *Change in Floor Level at Doors.* Regardless of the occupant load, there shall be a floor or landing on each side of an exit door. The floor or landing shall be leveled with, or not more than 50 millimeters lower than the threshold of the doorway: *Except*, that in Group A and B Occupancies, a door may open on the top step of a flight of stairs or an exterior landing provided the door does not swing over the top step or exterior landing and the landing is not more than 200 millimeters below the floor level.

h. *Door Identification.* Glass doors shall conform to the requirements in **Section 1802**. Other exit doors shall be so marked that they are readily distinguishable from the adjacent construction.

i. *Additional Doors.* When additional doors are provided for egress purposes, they shall conform to all provisions in the following cases: Approved revolving doors having leaves which will collapse under opposing pressures may be used in exit situations; *provided*; that such doors have a minimum width of 2.00 meters or they are not used in occupancies where exits are required to be equipped with panic hardware or at least **one** conforming exit door is located adjacent to each revolving doors installed in a building and the revolving door shall **not** be considered to provide any exit width.

4. *Corridors and Exterior Exit Balconies.* The provisions herein shall apply to every corridor and exterior exit balcony serving as a required exit for an occupant load of more than **ten** (10).

a. *Width.* Every corridor or exit balcony shall not be less than 1.10 meters in width.

b. *Projections.* The required width of corridors and exterior exit balconies shall be unobstructed. *Except*, that trim handrails, and doors when fully opened shall not reduce the required width by more than 200 millimeters. Doors in any position shall not reduce the required width of the corridor by more than one-half (1/2).

c. *Access to Exits.* When more than **one** (1) exit is required, they shall be so arranged to allow going to either direction from any point in the corridor or exterior exit balcony to a separate exit, except for dead ends permitted by the Code.

d. *Dead Ends.* Corridors and exterior exit balconies with dead ends are permitted when the dead end does not exceed 6.00 meters in length.

e. *Construction.* Walls and ceilings of corridors shall **not** be less than one-hour fire-resistive construction. Provided, that this requirement shall not apply to exterior exit balconies, railings, and corridors of one-storey building housing a Group E and F Occupancy occupied by **one** (1) tenant only and which serves an occupant load of thirty (30) or less, nor to corridors, formed by temporary partitions. Exterior exit balconies shall not project into an area where protected openings are required.

f. *Openings.* Where corridor wall are required to be **one-hour fire-resistive** construction, every interior door opening shall be protected as set forth in generally recognized and accepted requirements for dual-purpose fire exit doors. Other interior openings except ventilation louvers equipped with approved automatic fire shutters shall be 7 millimeters thick fixed wire glass set in steel frames. The total area of **all** openings other than doors, in any portion of an interior corridor wall shall not exceed 25% of the area of the corridor wall of the room being separated from the corridor.

5. *Stairways.* Except stairs or ladders used only to access equipment, every stairway serving any building or portion thereof shall conform to the following requirements:

a. *Width.* Stairways serving an occupant load of more than fifty (50) shall **not** be less than 1.10 meters. Stairways serving an occupant load of fifty (50) or less may be 900 millimeters wide. Private stairways serving an occupant load of less than ten (10) may be 750 millimeters. Trim and handrails shall not reduce the required width by more than 100 millimeters.

b. *Rise and Run.* The rise of every step in a stairway shall not exceed 200 millimeters and the run shall not be less than 250 millimeters. The maximum variations in the height of risers and the width of treads in any one flight shall be 5 millimeters: *Except,* in case of private stairways serving an occupant load of less than ten (10), the rise may be 200 millimeters and the run may be 250 millimeters, except as provided in sub-paragraph (c) below.

c. *Winding Stairways.* In Group A Occupancy and in private stairways in Group B Occupancies, winders may be used if the required width of run is provided at a point not more than 300 millimeters from the side of the stairway where the treads are narrower but in no case shall any width of run be less than 150 millimeters at any point.

d. *Circular Stairways.* Circular stairs may be used as an exit provided the minimum width of run is not less than 250 millimeters. All treads in any one flight between landings shall have identical dimensions within a 5 millimeters tolerance.

e. *Landings.* Every landing shall have a dimension measured in the direction of travel equal to the width of the stairway. Such dimension need not exceed 1.20 meters when the stairs has a straight run. Landings when provided shall not be reduced in width by more than 100 millimeters by a door when fully open.

f. *Basement Stairways.* Where a basement stairway and a stairway to an upper storey terminate in the same exit enclosure, an approved barrier shall be provided to prevent persons from continuing on to the basements. Directional exit signs shall be provided as specified in the **Code**.

g. *Distance Between Landings.* There shall be not more than 3.60 meters vertical distance between landings.

h. *Handrails.* Stairways shall have handrails on each side and every stairway required to be more than 3.00 meters in width shall be provided with not less than one intermediate handrail for each 3.00 meters of required width. Intermediate handrails shall be spaced approximately equal within the entire width of the stairway. Handrails shall be placed not less than 800 millimeters nor more than 900 millimeters above the nosing of treads, and ends of handrails shall be returned or shall terminate in newel posts or safety terminals: *Except,* in the following cases: Stairways 1.10 meters or less in width and stairways serving one (1) individual dwelling unit in Group A or B Occupancies may have one handrail, except that such stairway, open on one or both, sides shall have handrails provided on the open side or sides: or stairways having less than four (4) risers need not have handrails.

i. *Exterior Stairway Protection.* All openings in the exterior wall below or within 3.00 meters, measured horizontally, of an exterior exit stairway serving a building over two storeys in height shall be protected by a self-closing fire assembly having a **three-fourth - hour fire-resistive rating**; *Except,* that openings may be unprotected when two separated exterior stairways serve an exterior exit balcony.

j. *Stairway Construction*

i. *Stairway Construction - Interior.* Interior stairways shall be constructed as specified in this Code. Where there is enclosed usable space under the stairs the walls and soffits of the enclosed space shall be protected on the enclosed side as required for one-hour fire resistive construction.

ii. *Stairway Construction - Exterior.* Exterior stairways shall be of incombustible material: *Except,* that on Type III buildings which do **not** exceed two storeys in height, which are located in **less fire-restrictive** Fire Zones, as well as on **Type I** buildings which may be of wood not less than 50 millimeters in nominal thickness. Exterior stairs shall be protected as required for exterior walls due to location on property as specified in the **Code**. Exterior stairways shall **not** project into an area where openings are required to be protected. Where there is enclosed usable space under stairs, the walls and soffits of the enclosed space shall be protected on the enclosed side as required for **one-hour fire-resistive** construction.

k. *Stairway to Roof.* In every building four (4) or more storeys in height, one (1) stairway shall extend to the roof unless the roof has a slope greater than 1 in 3.

l. *Headroom.* Every required stairway shall have a headroom clearance of **not** less than 2.00 meters. Such clearance shall be established by measuring vertically from a plane parallel and tangent to the stairway tread nosing to the soffit above all points.

6. *Ramps.* A ramp conforming to the provisions of the **Code** may be used as an exit. The width of ramps shall be as required for corridors.

7. *Horizontal Exit.* If conforming to the provisions of the **Code**, a horizontal exit may be considered as the required exit. **All** openings in a separation wall shall be protected by a fire assembly having a fire-resistive rating of **not** less than one hour. A horizontal exit shall not lead into a floor area having a capacity for an occupant load **not** less than the occupant load served by such exit. The capacity shall be determined by allowing 0.30 sq. meter of net floor area per ambulatory occupant and 1.90 sq. meters per non-ambulatory occupant. The dispersal area into which the horizontal exit leads shall be provided with exits as required by the **Code**.

8. *Exit Enclosure.* Every interior stairway, ramp, or escalator shall be enclosed as specified in the Code; *Except*, that in other than Group D Occupancies, an enclosure will **not** be required for stairway, ramp, or escalator serving only one adjacent floor and not connected with corridors or stairways serving other floors. Stairs in Group A Occupancies need **not** be enclosed.

   a. Enclosure walls shall not **be less than** two-hour fire-resistive **construction. There shall be** no **openings into exit enclosures except exit doorways and openings in exterior walls.** All **exit doors in an exit enclosure shall be appropriately protected.**

   b. Stairway and ramp enclosures shall include landings and parts of floors connecting stairway flights and shall include a corridor on the ground floor leading from the stairway to the exterior of the building. Enclosed corridors or passageways are **not** required for unenclosed stairways.

   c. A stairway in an exit enclosure shall **not** continue below the grade level exit unless an approved barrier is provided at the ground floor level to prevent persons from accidentally continuing into the basement.

   d. There shall be **no** enclosed usable space under stairways in an exit enclosure, nor shall the open space under such stairways be used for any purpose.

9. *Smokeproof Enclosures*

   A smokeproof enclosure shall consist of a vestibule and a continuous stairway enclosed from the highest point to the lowest point by walls of **two-hour fire-resistive** construction. In buildings five (5) storeys or more in height, one of the required exits shall be a smokeproof enclosure.

   a. Stairs in smokeproof enclosures shall be of incombustible construction.

   b. There shall be **no** openings in smokeproof enclosures, except exit doorways and openings in exterior walls. There shall be **no** openings directly into the interior of the building. Access shall be through a vestibule with one (1) wall at least 50% open to the exterior and having an exit door from the interior of the building and an exit door leading to the smokeproof enclosure. In lieu of a vestibule, access may be by way of an open exterior balcony of incombustible materials.

   c. The opening from the building to the vestibule or balcony shall be protected with a self-closing fire assembly having one-hour fire-resistive rating. The opening from the vestibule or balcony to the stair tower shall be protected by a self-closing fire assembly having a **one-hour fire-resistive** rating.

   d. A smokeproof enclosure shall exit into a public way or into an exit passageway leading to a public way. The exit passageway shall be without other openings and shall have walls, floors, and ceilings of **two-hour fire-resistance**.

   e. A stairway in a smokeproof enclosure shall **not** continue below the grade level exit unless an approved barrier is provided at a ground floor level to prevent persons from accidentally walking into the basement.

10. *Exit Outlets, Courts, and Passageways*

   Every exit shall discharge into a public way, exit court, or exit passageway. Every exit court shall discharge into a public way or an exit passageway. Passageways shall be without openings other than required exits and shall have walls, floors, and ceilings of the same period of fire-resistance as the walls, floors and ceilings of the building but shall not **be less than one-hour fire-resistive construction.**

a. *Width*

Every exit court and exit passageways shall be at least as wide as the required total width of the tributary exits, such required width being based on the occupant load served. The required width of exit courts or exit passageways shall be unobstructed except as permitted in corridors. At any point where the width of an exit court is reduced from any cause, the reduction in width shall be affected gradually by a guardrail at least 900 millimeters in height. The guardrail shall make an angle of not more than 30º with the axis of the exit court.

b. *Slope*

The slope of exit courts shall not exceed 1 in 10. The slope of exit passageway shall **not** exceed 1 in 8.

c. *Number of Exits*

Every exit court shall be provided with exits as required in the **Code**.

d. *Openings*

All openings into an exit court less than 3.00 meters wide shall be protected by fire assemblies having **not** less than three-fourth - hour fire-resistive rating. *Except,* that openings more than 3.00 meters above the floor of the exit court may be unprotected.

11. *Exit Signs and Illuminations*

Exits shall be illuminated at any time the building is occupied with lights having an intensity of not less than 10.7 LUX at floor level; *Except,* that for Group A Occupancies, the exit illumination shall be provided with separate circuits or separated sources of power (but **not** necessarily separate from exit signs when these are required for exit sign illumination).

12. *Aisles*

Every portion of every building in which are installed seats, tables, merchandise, equipment, or similar materials shall be provided with aisles leading to an exit.

a. *Width*

Every aisle shall be not less than 800 millimeters wide if serving only one side, and not less than 1.00 meter wide if serving both sides. Such minimum width shall be measured at the point farthest from an exit, cross aisle, or foyer and shall be increased by 30 millimeters for every meter in length towards the exit, cross aisle or foyer.

Side aisles shall not be less than 1.10 meters in width.

b. *Exit Distance*

In areas occupied by seats and in Groups H and I Occupancies without seats, the line of travel to an exit door by an aisle shall be not more than 45.00 meters. With standard spacing, as specified in the **Code**, aisles shall be so located that there will be **not** more than seven (7) seats between the wall and an aisle and **not** more than fourteen (14) seats between aisles. The number of seats between aisles may be increased to thirty (30) where exits doors are provided along each side aisle of the row of seats at the rate of one (1) pair of exit doors for every five (5) rows of seats, provided further that the distance between seats back to back is at least 1.00 meter. Such exit doors shall provide a minimum clear width of 1.70 meters.

c. *Cross Aisles*

Aisles shall terminate in a cross aisle, foyer, or exit. The width of the cross aisle shall be **not** less than the sum of the required width of the widest aisle plus 50% of the total required width of the remaining aisle leading thereto. In Groups C, H and E Occupancies, aisles shall **not** be provided a dead end greater than 6.00 meters in length.

d. *Vomitories*

Vomitories connecting the foyer or main exit with the cross aisles shall have a total width not less than the sum of the required width of the widest aisles leading thereto plus 50% of the total required width of the remaining aisles leading thereto.

e. *Slope*

The slope portion of aisles shall not exceed a fall of 1 in 8.

13. *Seats*

a. *Seat Spacing*

With standard seating, the spacing of rows of seats from back-to-back shall be not **less than 840 millimeters. With continental seating, the spacing of rows of unoccupied seats shall provide a clear width measured horizontally, as follows: 450 millimeters clear for rows of eighteen (18) seats or less; 500 millimeters clear for rows of thirty five (35) seats or less; 525 millimeters clear for rows of forty five (45) seats or less; and 550 millimeters clear for rows of forty six (46) seats or more.**

b. *Width*

The width of any seat shall be **not** less than 450 millimeters.

14. *Reviewing Stands, Grandstands, and Bleachers*

a. *Height of Stands*

Stands made of combustible framing shall be limited to eleven (11) rows or 2.70 meters in height.

b. *Design Requirements*

The minimum unit live load for reviewing stands, grandstands, and bleachers shall be 500 kilograms per square meter of horizontal projection for the structure as a whole. Seat and footboards shall be 180 kilograms per linear meter. The sway force, applied to seats, shall be 35 kilograms per linear meter parallel to the seats and 15 kilograms per linear meter perpendicular to the seats. Sway forces need not be applied simultaneously with other lateral forces.

c. *Spacing of Seats*

i. *Row Spacing*

The minimum spacing of rows of seats measured from back-to-back shall be: 600 millimeters for seats without backrests in open air stands; 750 millimeters for seats with backrests; and 850 millimeters for chair seating. There shall be a space of **not** less than 300 millimeters between the back of each seat and the front of the seat immediately behind it.

ii. *Rise Between Rows*

The maximum rise from one row of seats to the next shall not exceed 400 millimeters.

iii. *Seating Capacity*

For determining the seating capacity of a stand, the width of any seat shall **not** be less than 450 millimeters nor more than 480 millimeters.

iv. *Number of Seats Between Aisles*

The number of seats between any seat and an aisle shall **not** be greater than fifteen (15) for open air stands with seats without backrests, a far open air stands with seats having backrests and seats without backrests within buildings and **six** (6) for seats with backrests in buildings.

d. *Aisles*

i. *Aisles Required*

Aisles shall be provided in **all** stands; *Except*, that aisles may be omitted when all the following conditions exist: Seats are without backrests; the rise from row to row does not exceed 300 millimeters per row; the number of rows does not exceed **eleven** (11) in height; the top seating board is **not** over 3.00 meters above grade; and the first seating board is not more than 500 millimeters above grade.

ii. *Obstructions*

No obstruction shall be placed in the required width of any aisle or exitway.

iii. *Stairs Required*

When an aisle is elevated more than 200 millimeters above grade, the aisle shall be provided with a stairway or ramp whose width is not less than the width of the aisle.

iv. *Dead End*

No vertical aisle shall have a dead end more than sixteen (16) rows in depth regardless of the number of exits required.

v. *Width*
Aisles shall have a minimum width of 1.10 meters.

e. *Stairs and Ramps*

The requirements in the **Code** shall apply to all stairs and ramps except for portions that pass through the seating area.

i. *Stair Rise and Run*

The maximum rise of treads shall **not** exceed 200 millimeters and the minimum width of the run shall be 280 millimeters. The maximum variation in the width of treads in any one (1) flight shall **not** be more than 5 millimeters and the maximum variation in one (1) height of two (2) adjacent rises shall not exceed 5 millimeters.

ii. *Ramp Slope*

The slope of a ramp shall **not** exceed 1 in 8. Ramps shall be roughened or shall be of approved non-slip material.

iii. *Handrails*

A ramp with a slope exceeding 1 in 10 shall have handrails. Stairs for stands shall have handrails. Handrails shall conform to the requirements of the **Code**.

f. *Guardrails*

i. Guardrails shall be required in all locations where the top of a seat plank is more than 1.20 meters above the grade and at the front of stands elevated more than 600 millimeters above grade. Where only sections of stands are used, guardrails shall be provided as required in the **Code**.

ii. Railings shall be 1.10 meters above the rear of a seat plank or 1.10 meters above the rear of the steps in an aisle when the guardrail is parallel and adjacent to the aisle; *Except,* that the height may be reduced to 900 millimeters for guardrails located in front of the grandstand.

iii. A midrail shall be placed adjacent to any seat to limit the open distance above the top of any part of a seat to 250 millimeters where the seat is at the extreme end or at the extreme rear of the bleachers or grandstand. The intervening space shall have one additional rail midway in the opening; *Except,* that railings may be omitted when stands are placed directly against a wall or fence giving equivalent protection; stairs and ramps shall be provided with guardrails. Handrails at the front of stands and adjacent to an aisle shall be designed to resist a load of 75 kilograms per linear meter applied at the top rail. Other handrails shall be designed to resist a load of 40 kilograms per linear meter.

g. *Foot Boards*

Footboards shall be provided for all rows of seats above the third (3rd) row or beginning at such point where the seating plank is more than 600 millimeters above grade.

h. *Exits*

i. *Distance to Exit*

The line of travel to an exit shall **not** be more than 45.00 meters. For stands with seats without backseats, this distance may be measured by direct line from a seat to the exit from the stand.

ii. *Aisle Used as Exit*

An aisle may be considered as only one (1) exit unless it is continuous at both ends to a legal building exit or to a safe dispersal area.

iii. *Two (2) Exits Required*

A stand with the first (1st) seating board **not** more than 500 millimeters above grade of floor may be considered to have two (2) exits when the bottom of the stand is open at both ends. Every stand or section of a stand within a building shall have at least two means of egress when the stand accommodates more than fifty (50) persons. Every open air stand having seats without backrests shall have at least two (2) means of egress when the stand accommodates more than three hundred (300) persons.

iv. *Three (3) Exits Required*

Three (3) exits shall be required for stands within a building when there are more than 300 occupants within a stand and for open air stands with seats without backrests where a stand or section of a stand accommodates more than one thousand (1000) occupants.

v. *Four (4) Exits Required*

Four (4) exits shall be required when a stand or section of a stand accommodates more than 1000 occupants; *Except,* that for an open air stand with seats without backrest four (4) exits need **not** be provided unless there are accommodations for more than three thousand (3000) occupants.

vi. *Width*

The total width of exits in meters shall not be less than the total occupant load served divided by one hundred sixty five (165); *Except,* that for open air stands with seats without backrest the total width of exits in meters shall be not less than the total occupant load served divided by five hundred (500) when exiting by stairs, and divided by six hundred fifty (650) when exiting by ramps or horizontally. When both horizontal and stair exits are used, the total width of exits shall be determined by using both figures as applicable. No exit shall be less than 1.10 meters in width. Exits shall be located at a reasonable distance apart. When only two (2) exits are provided, they shall be spaced not less than one-fifth (1/5) of the perimeter apart.

i. *Securing of Chairs*

Chairs and benches used on raised stands shall be secured to the platforms upon which they are placed; *Except,* that when less than twenty five (25) chairs are used upon a single raised platform the fastening of seats to the platform may be omitted. When more than five hundred (500) loose chairs are used in connection with athletic events, chairs shall be fastened together in groups of **not** less than three (3), and shall be tied or staked to the ground.

j. *Safe Dispersal Area*

Each safe dispersal area shall have at least two (2) exits. If more than six thousand (6000) persons are to be accommodated within such an area, there shall be a minimum of three (3) exits, and for more than nine thousand (9000) persons there shall be a minimum of four (4) exits. The aggregate clear width of exits from a safe dispersal area shall be determined on the basis of not less than one (1) exit unit of 600 millimeters for each five hundred (500) persons to be accommodated and no exit shall be less than 1.10 meters in width, a reasonable distance apart that shall be spaced not less than one-fifth (1/5) of the perimeter of the area apart from each other.

15. *Special Hazards*

a. *Boiler Rooms*

Except in Group A Occupancies, every boiler room and every room containing an incinerator or liquefied petroleum gas or liquid fuel-fired equipment shall be provided with at least two (2) means of egress, one of which may be a ladder. All interior openings shall be protected as provided for in the **Code**.

b. *Cellulose Nitrate Handling*

Film laboratories, projection rooms, and nitro-cellulose processing rooms shall have not less than two exits.

SECTION 1208. Skylights

1. All skylights shall be constructed with metal frames except those for Groups A and J Occupancies. Frames of skylights shall be designed to carry loads required for roofs. All skylights, the glass of which is set at an angle of less than 45º from the horizontal, if located above the first storey, shall be set at least 100 millimeters above the roof. Curbs on which the skylights rest shall be constructed of incombustible materials except for Types I or II Construction.

2. Spacing between supports in one direction for flat wired glass in skylights shall not exceed 625 millimeters. Corrugated wired glass may have supports 1.50 meters apart in the direction of the corrugation. All glass in skylights shall be wired glass; *Except,* that skylights over vertical shafts extending through two (2) or more storeys shall be glazed with plain glass as specified in the Code; *Provided,* that wired glass may be used in ventilation equal to not less than one-eight (1/8) the cross-sectional area of the shaft but never less than 1.20 meters provided at the top of such shaft. Any glass not wired glass shall be protected above and below with a screen constructed of wire not smaller than 2.5 millimeters in diameter with a mesh not larger than 25 millimeters. The screen shall be substantially supported below the glass.

3. Skylights installed for the use of photographers may be constructed of metal frames and plate glass without wire netting.

4. Ordinary glass may be used in the roof and skylights for greenhouses, *Provided,* that height of the greenhouses at the ridge does not exceed 6.00 meters above the grade. The use of wood in the frames of skylights will be permitted in greenhouses outside of highly restrictive Fire Zones if the height of the skylight does not exceed 6.00 meters above the grade, but in other cases metal frames and metal sash bars shall be used.

5. Glass used for the transmission of light, if placed in floors or sidewalks, shall be supported by metal or reinforced concrete frames, and such glass shall not be less than 12.5 millimeters in thickness. Any such glass over 100 sq. centimeters in area shall have wire mesh embedded in the same or shall be provided with a wire screen underneath as specified for skylights in the Code. All portions of the floor lights or sidewalk lights shall be of the same strength as required for floor or sidewalk construction, except in cases where the floor is surrounded by a railing not less 1.10 meters in height, in which case the construction shall be calculated for not less than roof loads.

SECTION 1209. Bays, Porches, and Balconies

Walls and floors in bay and oriel windows shall conform to the construction allowed for exterior walls and floors of the type of construction of the building to which they are attached. The roof covering of a bay or oriel window shall conform to the requirements of the roofing of the main roof. Exterior balconies attached to or supported by wall required to be of masonry, shall have brackets or beams constructed of incombustible materials. Railings shall be provided for balconies, landings, or porches which are more than 750 millimeters above grade.

SECTION 1210. Penthouses and Roof Structures

1. *Height*
   No penthouse or other projection above the roof in structures of other than Type V construction shall exceed 8.40 meters above the roof when used as an enclosure for tanks or for elevators which run to the roof and in all other cases shall not extend more than 3.60 meters in height with the roof.

2. *Area*
   The aggregate area of all penthouses and other roof structures shall **not** exceed one third (1/3) of the area of the supporting roof.
3. *Prohibited Uses*
   No penthouse, bulkhead, or any other similar projection above the roof shall be used for purposes other than shelter of mechanical equipment or shelter of vertical shaft openings in the roof. A penthouse or bulkhead used for purposes other than that allowed by this Section shall conform to the requirements of the **Code** for an additional storey.

4. *Construction*
   Roof structures shall be constructed with walls, floors, and roof as required for the main portion of the building except in the following cases:

   a. On Types III and IV constructions, the exterior walls and roofs of penthouses which are 1.50 meters or more from an adjacent property line may be of one-hour fire-resistive incombustible construction.

   b. Walls not less than 1.50 meters from an exterior wall of a Type IV construction may be of one-hour fire-resistive incombustible construction.

      The above restrictions shall not prohibit the placing of wood flagpoles or similar structures on the roof of any building.

5. *Towers and Spires*
   Towers and spires when enclosed shall have exterior walls as required for the building to which they are attached. Towers **not** enclosed and which extend more than 20.00 meters above the grade shall have their framework constructed of iron, steel, or reinforced concrete. No tower or spire shall occupy more than one-fourth (1/4) of the street frontage of any building to which it is attached and in no case shall the base area exceed 150.00 sq. meters unless it conforms entirely to the type of construction requirements of the building to which it is attached and is limited in height as a main part of the building. If the area of the tower and spire exceeds 10.00 sq. meters on any horizontal cross section, its supporting frames shall extend directly to the ground. The roof covering of the spires shall be as required for the main room of the rest of the structure. Skeleton towers used as radio masts, neon signs, or advertisement frames and placed on the roof of any building shall be constructed entirely of incombustible materials when more than 7.50 meters in height, and shall be directly supported on an incombustible framework to the ground. No such skeleton towers shall be supported on roofs of combustible framings. They shall be designed to withstand a wind load from any direction in addition to any other loads.

SECTION 1211. Chimneys, Fireplaces, and Barbecues

1. *Chimneys*

   a. *Structural Design*
      Chimneys shall be designed, anchored, supported, reinforced, constructed, and installed in accordance with generally accepted principles of engineering. Every chimney shall be capable of producing a draft at the appliance not less than that required for the safe operation of the appliance connected thereto. No chimney shall support any structural load other than its own weight unless it is designed to act as a supporting member. Chimneys in a wood-framed building shall be anchored laterally at the ceiling line and at each floor line which is more than 1.80 meters above grade, except when entirely within the framework or when designed to be free standing.

   b. *Walls*

Every masonry chimney shall have walls of masonry units, bricks, stones, listed masonry chimney units, reinforced concrete or equivalent solid thickness of hollow masonry and lined with suitable liners in accordance with the following requirements:

i. *Masonry Chimneys for Residential Type Appliances*

Masonry chimneys shall be constructed of masonry units or reinforced concrete with walls not less than 100 millimeters thick; or of rubble stone masonry not less than 300 millimeters thick. The chimney liner shall be in accordance with the Code.

ii. *Masonry Chimneys for Low Heat Appliances*

Masonry chimneys shall be constructed of masonry units or reinforced concrete with walls not less than 200 millimeters thick; *Except,* that rubble stone masonry shall be not less than 300 millimeters thick. The chimney liner shall be in accordance with the Code.

iii. *Masonry Chimneys for Medium-Heat Appliances*

Masonry chimneys for medium-heat appliances shall be constructed of solid masonry units of reinforced concrete not less than 200 millimeters thick, *Except,* that stone masonry shall be not less than 300 millimeters thick and, in addition shall be lined with not less than 100 millimeters of firebrick laid in a solid bed of fire clay mortar with solidly filled head, bed, and wall joints, starting not less than 600 millimeters below the chimney connector entrance. Chimneys extending 7.50 meters or less above the chimney connector shall be lined to the top.

iv. *Masonry Chimneys for High-Heat Appliances*

Masonry chimneys for high-heat appliances shall be constructed with double walls of solid masonry units or reinforced concrete not less than 200 millimeters in thickness, with an air space of not less than 50 millimeters between walls. The inside of the interior walls shall be of firebrick not less than 100 millimeters in thickness laid in a solid bed of fire clay mortar with solidly filled head, bed, and wall joints.

v. *Masonry Chimneys for incinerators installed in Multi-Storey Buildings (Apartment-Type Incinerators)*

Chimneys for incinerators installed in multi-storey buildings using the chimney passageway as a refuse chute where the horizontal grate area of combustion chamber does not exceed 0.80 sq. meter shall have walls of solid masonry or reinforced concrete, not less than 100 millimeters thick with a chimney lining as specified in the Code. If the grate area of such an incinerator exceeds 0.80 sq. meter, the walls shall not be less than 100 millimeters of firebrick except that higher than 9.00 meters above the roof of the combustion chamber, common brick alone 200 millimeters in thickness may be used.

vi. *Masonry Chimneys for Commercial and Industrial Type Incinerators*

Masonry chimneys for commercial and industrial type incinerators of a size designed for not more than 110 kilograms of refuse per hour and having a horizontal grate area not exceeding 0.50 sq. meter shall have walls of solid masonry or reinforced concrete not less than 100 millimeters thick with lining of not less than 100 millimeters of firebrick, which lining shall extend for **not** less than 12.00 meters above the roof of the combustion chamber. If the design capacity of grate area of such an incinerator exceeds 110 kilograms per hour and 0.80 sq. meter respectively, walls shall not be less than 200

millimeters thick, lined with not les than 100 millimeters of firebrick extending the full height of the chimney.

c. *Linings*
Fire clay chimney lining shall **not** be less than 15 millimeters thick. The lining shall extend from 200 millimeters below the lowest inlet or, in the case of fireplace, from the throat of the fireplace to a point above enclosing masonry walls. Fire clay chimney linings shall be installed ahead of the construction of the chimney as it is carried up, carefully bedded one on the other in fire clay mortar, with close-fitting joints left smooth on the inside. Firebrick not less than 500 millimeters thick may be used in place of fire clay chimney.

d. *Area*
No chimney passageway shall be smaller in area than the vent connection of the appliance attached thereto.

e. *Height*
Every masonry chimney shall extend at least 600 millimeters above the part of the roof through which it passes and at least 600 millimeters above the highest elevation of any part of a building within 3.00 meters to the chimney.

f. *Corbeling*
No masonry chimney shall be corbeled from a wall more than 150 millimeters nor shall a masonry chimney be corbeled from a wall which is less than 300 millimeters in thickness unless it projects equally on each side of the wall. In the second (2^{nd}) storey of a two-storey building of Group A Occupancy, corbeling of masonry chimneys on the exterior of the enclosing walls may equal the wall thickness. In every case the corbeling shall **not** exceed 25 millimeters projection for each course of brick.

g. *Change in Size or Shape*
No change in the size or shape of a masonry chimney shall be made within a distance of 150 millimeters above or below the roof joints or rafters where the chimney passes through the roof.

h. *Separation*
When more than one passageway is contained in the same chimney, masonry separation at least 100 millimeters thick bonded into the masonry wall of the chimney shall be provided to separate passageways.

i. *Inlets*
Every inlet to any masonry chimney shall enter the side thereof and shall be of not less than 3 millimeters thick metal or 16 millimeters refractory material.

j. *Clearance*
Combustible materials shall not be placed within 50 millimeters of smoke chamber or masonry chimney walls when built within a structure, or within 25 millimeters when the chimney is built entirely outside the structure.

k. *Termination*
All incinerator chimneys shall terminate in a substantially constructed spark arrester having a mesh **not** exceeding 20 millimeters.

l. *Cleanouts*
Cleanout openings shall be provided at the base of every masonry chimney.

2. *Fireplaces and Barbecues*

Fireplaces, barbecues, smoke chambers, and fireplace chimneys shall be of solid masonry or reinforced concrete and shall conform to the minimum requirements specified in the **Code**.

a. Fireplace Walls
Walls of fireplaces shall **not** be less than 200 millimeters in thickness. Walls of fireboxes shall not be less than 250 millimeters in thickness; *Except,* that where a lining of firebrick is used, such walls shall not be less than 200 millimeters in thickness. The firebox shall **not** be less than 500 millimeters in depth. The maximum thickness of joints in firebrick shall be 10 millimeters.

b. *Hoods*
Metal hoods used as part of a fireplace or barbecue shall be not less than No. 18 gauge copper, galvanized iron, or other equivalent corrosion-resistant ferrous metal with all seams and connections of smokeproof unsoldered construction. The hoods shall be sloped at an angle of 45° or less from the vertical and shall extend horizontally at least 150 millimeters beyond the limits of the firebox. Metal hoods shall be kept a minimum of 400 millimeters from combustible materials.

c. *Circulators*
Approved metal heat circulators may be installed in fireplaces.

d. *Smoke Chamber*
Front and side walls shall not be less than 200 millimeters in thickness. Smoke chamber back walls shall **not** be less than 150 millimeters in thickness.

e. *Fireplace Chimneys*
Walls of chimneys without flue lining shall **not** be less than 200 millimeters in thickness. Walls of chimneys with flue lining shall **not** be less than 100 millimeters in thickness and shall be constructed in accordance with the requirements of the **Code**.

f. *Clearance to Combustible Materials*
Combustible materials shall **not** be placed within 50 millimeters of fireplace, smoke chamber, or chimney walls when built entirely within a structure, or within 25 millimeters when the chimney is built entirely outside the structure. Combustible materials shall not be placed within 150 millimeters of the fireplace opening. No such combustible material within 300 millimeters of the fireplace opening shall project more than 3 millimeters for each 25 millimeters clearance from such opening. No part of metal hoods used as part of a fireplace, barbecue or heating stoves shall be less than 400 millimeters from combustible material. This clearance may be reduced to the minimum requirements set forth in the **Code**.

g. *Area of Flues, Throats, and Dampers*
The net cross-sectional area of the flue and of the throat between the firebox and the smoke chamber of a fireplace shall **not** be less than the requirements to be set forth by the Secretary. Where dampers are used, they shall be of not less than No. 12 gauge metal. When fully opened, damper opening shall be **not** less than 90% of the required flue area. When fully open, damper blades shall not extend beyond the line of the inner face of the flue.

h. *Lintel*
Masonry over the fireplace opening shall be supported by a non-combustible lintel.

i. *Hearth*
Every fireplace shall be provided with a brick, concrete, stone, or other approved non-combustible hearth slab at least 300 millimeters wider on each side than the fireplace opening

and projecting at least 450 millimeters therefrom. This slab shall **not** be less than 100 millimeters thick and shall be supported by a noncombustible material or reinforced to carry its own weight and all imposed loads.

SECTION 1212. Fire-Extinguishing Systems

1. *Fire-Extinguishing Systems* - Where required, standard automatic fire-extinguishing systems shall be installed in the following places, and in the manner provided in the Code.

    a. In every storey, basement or cellar with an area of 200.00 sq. meters or more which is used for habitation, recreation, dining, study, or work, and which has an occupant load of more than twenty (20).

    b. In all dressing rooms, rehearsal rooms, workshops or factories, and other rooms with an occupant load of more than ten (10) or assembly halls under Group H and I Occupancies with occupant load of more than five hundred (500), and if the next doors of said rooms are more than 30.00 meters from the nearest safe fire dispersal area of the building or opening to an exit court or street.

    c. In **all** rooms used for storage or handling of photographic x-ray nitrocellulose films and other inflammable articles.

2. *Dry Standpipes* - Every building **four** (4) or more storeys in height shall be equipped with one or more dry standpipes.

        a. *Construction and Tests* - Dry standpipes shall be of wrought iron or galvanized steel and together with fittings and connections shall be of sufficient strength to withstand 20 kilograms per square centimeter of water pressure when ready for service, without leaking at the joints, valves, or fittings. Tests shall be conducted by the owner or the building contractor in the presence of a representative of the **Building Official** whenever deemed necessary for the purpose of certification of its proper function.

        b. *Size* - Dry standpipes shall be of such size as to be capable of delivering 900 liters of water per minute from each of any three (3) outlets simultaneously under the pressure created by one (1) fire engine or pumper based on the standard equipment available.

        c. *Number Required* - Every building four (4) or more storeys in height where the area of any floor above the third (3rd) floor is 950 sq. meters or less, shall be equipped with at least one (1) dry standpipe and an additional standpipe shall be installed for each additional 950 sq. meters or fraction thereof.

        d. *Location* - Standpipes shall be located within enclosed stairway landings or near such stairways as possible or immediately inside of an exterior wall and within 300 millimeters of an opening in a stairway enclosure of the balcony or vestibule of a smokeproof tower or an outside exit stairway.

        e. *Siamese Connections* - Subject to the provisions of subparagraph (b) all 100 millimeters dry standpipes shall be equipped with a two-way Siamese fire department connection. All 125 millimeters dry standpipes shall be equipped with a three-way Siamese fire department connection, and 150 millimeters dry standpipes shall be equipped with four-way Siamese fire department connections. All Siamese inlet connections shall be located on a street-front of the building and not less than 300 millimeters nor more than 1.20 meters above the grade and shall be equipped with a clapper-checks and substantial plugs. All Siamese inlet connections shall be recessed in the wall or otherwise substantially protected.

f. *Outlets* - All dry standpipes shall extend from the ground floor to and over the roof and shall be equipped with a 63 millimeters outlet nor more than 1.20 meters above the floor level at each storey. All dry standpipes shall be equipped with a two-way 63 millimeters outlet above the roof. All outlets shall be equipped with gate valves.

g. *Signs* - An iron or bronze sign with raised letters at least 25 millimeters high shall be rigidly attached to the building adjacent to all Siamese connections and such signs shall read: "CONNECTION TO DRY STANDPIPE".

3. *Wet Standpipes* - Every Group H and I Occupancy of any height, and every Group C Occupancy of two (2) more storeys in height, and every Group B, D, E, F and G Occupancy of three (3) or more storeys in height and every Group G and E Occupancy over 1800 sq. meters in area shall be equipped with one or more interior wet standpipes extending from the cellar or basement into the topmost storey; *Provided,* that Group H buildings having no stage and having a seating capacity of less than five hundred (500) need **not** be equipped with interior wet standpipes.

   a. *Construction* - Interior wet standpipes shall be constructed of the same materials as those required for dry standpipes.

   b. *Size*

      i. Interior wet standpipes shall have an internal diameter sufficient to deliver 190 liters of water per minute under 2.00 kilograms per square centimeter pressure at the hose connections. Buildings of Group H and I Occupancy shall have wet standpipes systems capable of delivering the required quantity and pressure from any two (2) outlets simultaneously; for all other Occupancies only one (1) outlet need be figured to be opened at one time. In no case shall the internal diameter of a wet standpipe be less than 50 millimeters, except when the standpipe is attached to an automatic fire-extinguishing system.

      ii. Any approved formula which determines pipe sizes on a pressure drop basis may be used to determine pipe size for wet standpipe systems. The **Building Official** may require discharge capacity and pressure tests on completed wet standpipe systems.

   c. *Number required* - The number of wet standpipes when required in the Code shall be so determined that all portions of the building are within 6.00 meters of a nozzle attached to a hose 23.00 meters in length.

   d. *Location* - In Group H and I Occupancies, outlets shall be located as follows: one (1) on each side of the stage, one (1) at the rear of the auditorium, and one (1) at the rear of the balcony. Where occupant loads are less than five hundred (500) the above requirements may be waived; *Provided,* that portable fire extinguishers of appropriate capacity and type are installed within easy access from the said locations. In Group B, C, D, E, F and G Occupancies, the location of all interior wet standpipes shall be in accordance with the requirement for dry standpipes; *Provided,* that at least one (1) standpipe is installed to cover not more than 650 sq. meters.

   e. *Outlets.* **All** interior wet standpipes shall be equipped with a 38 millimeter valve in each storey, including the basement or cellar of the building, and located not less than 300 millimeters nor more than 1.20 meters above the floor.

   f. *Threads.* All those threads used in connection with the installation of such standpipes, including valves and reducing fittings shall be uniform with that prescribed by the Secretary.

g. *Water Supply*. All interior wet standpipes shall be connected to a street main not less than 100 millimeters in diameter, or when the water pressure is insufficient, to a water tank of sufficient size as provided in subparagraph (h). When more than one (1) interior wet standpipe is required in the building, such standpipe shall be connected at their bases or at their tops by pipes of equal size.

h. *Pressure and Gravity Tanks* – Tanks shall have a capacity sufficient to furnish at least 1,500 liters per minute for a period of not less than 10 minutes. Such tanks shall be located so as to provide not less than 2 kilograms per square centimeter pressure at the topmost base outlet for its entire supply. Discharge pipes from pressure tanks shall extend 50 millimeters into and above the bottom of such tanks. All tanks shall be tested in place after installation and proved tight at a hydrostatic pressure 50% in excess of the working pressure required. Where such tanks are used for domestic purposes the supply pipe for such purposes shall be located at or above the center line of such tanks. Incombustible supports shall be provided for all such supply tanks and not less than a 900 millimeters clearance shall be maintained over the top and under the bottom of all pressure tanks.

i. *Fire pumps*. Fire pumps shall have a capacity of not less than 1,000 liters per minute with a pressure not less than 2 kilograms per square centimeter at the topmost hose outlet. The source of supply for such pump shall be a street water main of not less than 100 millimeters diameter or a well or cistern containing a one-hour supply. Such pumps shall be supplied with an adequate source of power and shall be automatic in operation.

j. *Hose and Hose Reels* - Each hose outlet of all interior wet standpipes shall be supplied with a hose not less than 38 millimeters in diameter. Such hose shall be equipped with a suitable brass or bronze nozzle and shall be not over 23.00 meters in length. An approved standard form of wall hose reel or rack shall be provided for the hose and shall be located so as to make the hose readily accessible at all times and shall be recessed in the walls or protected by suitable cabinets.

4. *Basement Pipe Inlets* - Basement pipe inlets shall be installed in the first (1st) floor of every store, warehouse, or factory where there are cellars or basements under same; *Except,* where in such cellars or basements there is installed a fire-extinguishing system as specified in the **Code** or where such cellars or basements are used for banking purposes, safe deposit vaults, or similar uses.

   a. *Material* - **All** basement pipe inlets shall be of cast iron, steel, brass, or bronze with lids of cast brass or bronze and shall consist of a sleeve not less than 200 millimeters in diameter through the floor extending to and flush with the ceiling below and with a top flange, recessed with an inside shoulder, to receive the lid and flush with the finished floor surface. The lid shall be a solid casting and shall have a ring lift recessed on the top thereof, so as to be flushed. The lid shall have the words “FOR FIRE DEPARTMENT ONLY, DO NOT COVER UP” cast on the top thereof. The lid shall be installed in such a manner as to permit its removal readily from the inlet.

   b. *Location*. Basement pipe inlets shall be strategically located and kept readily accessible at all times to the Fire Department.

5. *Approval* - All fire-extinguishing systems, including automatic sprinklers, wet and dry standpipes, automatic chemical extinguishers, basement pipe inlets, and the appurtenances thereto shall meet the approval of the Fire Department as to installation and location and shall be subject to such periodic test as it may require.

SECTION 1213. Stages and Platform

1. *Stage Ventilators* - There shall be one (1) or more ventilators constructed of metal or other incombustible material near the center and above the highest part of any working stage raised above the stage roof and having a total ventilation area equal to at least 5% of the floor area within the stage walls. The entire equipment shall conform to the following requirements:

    a. *Opening Action* - Ventilators shall open by spring action or force of gravity sufficient to overcome the effects of neglect, rust, dirt, or expansion by heat or warping of the framework.

    b. *Glass* - Glass, if used in ventilators, must be protected against falling on the stage. A wire screen, if used under the glass, must be so placed that if clogged it cannot reduce the required ventilating area or interfere with the operating mechanism or obstruct the distribution of water from the automatic fire extinguishing systems.

    c. *Design* - Ventilators, penthouses, and supporting framework shall be designed in accordance with the Code.

    d. *Spring Actuation* - Springs, when employed to actuate ventilator doors, shall be capable of maintaining full required tension indefinitely. Springs shall not be stressed more than 50% of their rated capacity and shall not be located directly in the air stream, nor exposed to elements.

    e. *Location of Fusible Links* - A fusible link shall be placed in the cable control system on the underside of the ventilator at or above the roof line or as approved by the Building Official, and shall be so located as not to be affected by the operation of fire-extinguishing systems.

    f. *Control* - Remote, manual or electrical control shall provide for both opening and closing of the ventilator doors for periodic testing and shall be located at a point on the stage designated by the Building Official. When remote control of ventilator is electrical, power failure shall not affect its instant operation in the event of fire. Hand winches may be employed to facilitate operation of manually controlled ventilators.

2. *Gridirons* -

    a. Gridirons, fly galleries, and pin-rails shall be constructed of incombustible materials and fire protection of steel and iron may be omitted. Gridirons and fly galleries shall be designed to support a live load of not less than 367 kilograms per sq. meter. Each loft block well shall be designed to support 373 kilograms per linear meter and the head block well shall be designed to support the aggregate weight of all the loft block wells served. The head block well must be provided with an adequate strongback or lateral brace to offset torque.

    b. The main counterweight sheave beam shall be designed to support a horizontal and vertical uniformly distributed live load sufficient to accommodate the weight imposed by the total number of loft blocks in the gridiron. The sheave blocks shall be designed to accommodate the maximum load for the loft or head blocks served with a safety factor of five (5).

3. *Rooms Accessory to Stage* - In a building having a stage, the dressing room sections, workshops, and storerooms shall be located on the stage side of the proscenium wall and shall be separated from each other and from the stage by not less than a One-Hour Fire-Resistive Occupancy Separation.

4. *Proscenium Walls* - A stage shall be completely separated from the auditorium by a proscenium wall of not less than two-hour incombustible construction. The proscenium wall shall extend not less than 1.20 meters above the roof over the auditorium. Proscenium walls may have, in addition to the main proscenium openings, one (1) opening at the orchestra pit level and not more than two (2) openings at the stage floor level, each of which shall be not more than 2.00 sq. meters in area. All openings in the proscenium wall of stage shall be protected by a fire assembly having a one

and one-half - hour fire-resistive rating. The proscenium opening, which shall be the main opening for viewing performances, shall be provided with a self-closing fire-resistive curtain as specified in the **Code**.

5. *Stage Floor* - The type of construction for stage floors shall depend upon the requirements based on the Type of Occupancy and the corresponding fire-resistive requirements. All parts of the stage floor shall be designed to support not less than 620 kilograms per square meters. Openings through stage floors shall be equipped with tight-fitting trap doors of wood of not less than 50 millimeters nominal thickness.

6. *Platforms* - The type of construction for platforms shall depend upon the requirements based on the Type of Occupancy and corresponding fire-resistive requirements. Enclosed platforms shall be provided with one (1) or more ventilators conforming to the requirements of stage ventilators; *Except,* that the total area shall be equal to 5% of the area of the platform. When more than one (1) ventilator is provided, they shall be so spaced as to provide proper exhaust ventilation. Ventilators shall not be required for enclosed platforms having a floor area of 45.00 sq. meters or less.

7. *Stage Exits* - At least one (1) exit not less than 900 millimeters wide shall be provided from each side of the stage opening directly or by means of a passageway not less than 900 millimeters in width to a street or exit court. An exit stair not less than 750 millimeters wide shall be provided for egress from each fly gallery. Each tier of dressing rooms shall be provided with at least two (2) means of egress each not less than 750 millimeters wide and all such stairs shall be constructed in accordance with the requirement specified in the Code. The stairs required in this Sub-section need not be enclosed.

SECTION 1214. Motion Picture Projection Rooms

1. *General Requirements* - The provisions of this Section shall apply only where ribbon type motion picture films in excess of 22-millimeter width and electric projection equipment are used. Every motion picture machine using ribbon type film in excess of 22 millimeter width and electric arc projections equipment, together with all electrical devices, rheostats, machines, and all such films present in any Group C, I, or H Occupancy, shall be enclosed in a projection room large enough to permit the operator to walk freely on either side and back of the machine.

2. *Construction* - Every projection room shall be of not les than one-hour fire-resistive construction throughout and the walls and ceiling shall be finished with incombustible materials. The ceiling shall be not less than 2.40 meters from the finished floor. The room shall have a floor area of not less than 7.00 sq. meters and 3.50 sq. meters for each additional machine.

3. *Exit* - Every projection room shall have at least two doorways separated by not less than one-third the perimeter of the room, each at least 750 millimeters wide and 2.00 meters high. All entrances to a projection room shall be protected by a self-closing fire assembly having a three-fourth - hour fire-resistive rating. Such doors shall open outward and lead to proper exits as required in the Code and shall not be equipped with any latch. The maximum width of such door shall be 750 millimeters.

4. *Ports and Openings* - Ports in projection room walls shall be of three (3) kinds: projection ports; observation ports; and combination ports used for both observation and for stereopticon, spot or floodlight machines.

    a. *Ports Required* - There shall be provided for each motion picture projector not more than one (1) projection port, which shall be limited in area to 750 sq. centimeters, and not more than one (1) observation port, which shall be limited in area to 1,300 sq. centimeters. There shall be not more than three (3) combination ports, each of which shall not exceed 750 millimeters by 600

millimeters. Each port opening shall be completely covered with a pane of glass; *Except,* that when acetate safety film is used, projection ports may be increased in size to an area not to exceed 4,500 sq. centimeters.

b. *Shutters* - Each port and every other opening in projection room walls, including, any fresh-air inlets but excluding exit doors and exhaust ducts, shall be provided with a shutter of not less than 2.4 millimeters thick sheet metal or its equivalent large enough to overlap at least 25 millimeters on all sides of such openings. Shutters shall be arranged to slide without binding in guides constructed of material equal to the shutters in strength and fire-resistance. Each shutter shall be equipped with a 74° fusible link, which when fused by heat will cause closure of the shutter by gravity. Shutters of a size greater than 1,300 sq. centimeters shall be equipped with a counter-balance. There shall also be a fusible link located over the upper magazine of each projector, which upon operating, will close all the shutters. In addition, there shall be provided suitable means for manually closing all shutters simultaneously from any projector head and from a point within the projection room near each exit door. Shutters on openings not in use shall be kept closed; *Except*, that shutters may be omitted when only acetate safety film is used.

5. *Ventilation*
   a. *Inlet* - A fresh-air inlet from the exterior of the building not less than 900 sq. centimeters and protected with wire netting, shall be installed within 50 millimeters of the floor in every projection room, the source of which shall be remote from other outside vents or flues.
   b. *Outlets* - Ventilation shall be provided by one (1) or more mechanical exhaust systems which shall draw air from each arc lamp housing to out-doors either directly or through an incombustible flue used for no other purpose. Exhaust capacity shall not be less than 0.50 cu. meter nor more than 1.40 cu. meter per minute for each arc lamp plus 5.60 cu. meters for the room itself. Systems shall be controlled from within the enclosure and shall have pilot lights to indicate operation. The exhaust systems serving the projection room may be extended to cover rooms associated therewith such as rewind rooms. No dampers shall be installed in such exhaust systems. Ventilation of these rooms shall not be connected in any way with ventilating or air-conditioning systems serving other portions of the building. Exhaust ducts shall be of incombustible material and shall either be kept 25 millimeters from combustible material or covered with 10 millimeters of incombustible heat-insulating material.

6. *Regulation of Equipment* - All shelves, fixtures, and fixed equipment in a projection room shall be constructed of incombustible materials. All films not in actual use shall be stored in metal cabinets having individual compartments for reels or shall be in generally accepted shipping containers. No solder shall be used in the construction of such cabinets.

SECTION 1215. Lathing, Plastering, and Installation of Wall Boards

The installation of lath, plaster and gypsum wall board shall conform to the fire-resistive rating requirements and the type of construction of building.

(emphases and underscoring supplied)

Rule XIII follows

RULE XIII - ELECTRICAL AND MECHANICAL REGULATIONS

SECTION 1301. Electrical Regulations

All electrical systems, equipment and installations mentioned in the Code shall conform to the provisions of the Philippine Electrical Code Part 1 (PEC-1) and Part 2 (PEC-2), as adopted by the Board of Electrical Engineering pursuant to Republic Act 7920, otherwise known as the Philippine Electrical Engineering Law.

1. Overhead Service Entrance

   In **Subdivisions, Housing Projects**, Commercial and Industrial Buildings, overhead transmission and distribution voltages are required to supply power source including transformers, poles and supporting structures.

2. Attachments on and Clearances from Buildings

   a. An Attachment Plan approved by professional electrical engineer shall cover power lines and cables, transformers and other electrical equipment installed on or in buildings and shall be submitted to the local Building Official.

   b. Where building/s exceed 15.00 meters in height, overhead lines shall be arranged where practicable so that clear space or zone at least 1.80 meters (horizontal) will be left adjacent to the building or beginning not over 2.45 meters (horizontal) from the building, to facilitate the raising of ladders where necessary for fire fighting.

      EXCEPTION: This requirement does not apply where it is the rule of the local fire department to exclude the use of ladders in alleys or other restricted places, which are generally occupied by supply lines.

3. Open Supply Conductors Attached to Buildings

   Where the permanent attachment of open supply conductors to any class of buildings is necessary for service entrance, such conductors shall meet the following requirements:

   a. Conductors of more than 300 volts to ground shall not be carried along or near the surface of the building unless they are guarded or made inaccessible.

   b. To promote safety to the general public and to employees not authorized to approach conductors and other current-carrying parts of electric supply lines, such parts shall be arranged so as to provide adequate clearance from the ground or other space generally accessible, or shall be provided with guards so as to isolate persons effectively from accidental contact.

   c. Ungrounded service conduits, metal fixtures and similar noncurrent-carrying parts, if located in urban districts and where liable to become charged to more than 300 volts to ground, shall be isolated or guarded so as not to be exposed to accidental contact by unauthorized persons. As an alternative to isolation or guarding noncurrent-carrying parts shall be solidly or effectively grounded.

   d. Service drops passing over a roof shall be securely supported by substantial structures. Where practicable, such supports shall be independent of the building.

4. Conductors Passing By or Over Buildings

   a. Unguarded or accessible supply conductors carrying voltages in excess of 300 volts may be either beside or over buildings. The vertical or horizontal clearance to any buildings or its attachments (balconies, platforms, etc.) shall be as listed in Table XIII.1. The horizontal clearance governs above the roof level to the point where the diagonal equals the vertical clearance requirements. This Rule should not be interpreted as restricting the installation of a trolley contact conductor over the approximate centerline of the track it serves. (Figure XIII.1.)

   b. Supply conductors of 300 volts or more, when placed near enough to windows, verandas, fire escapes, or other ordinarily accessible places, shall be properly guarded by grounded conduit and barriers.

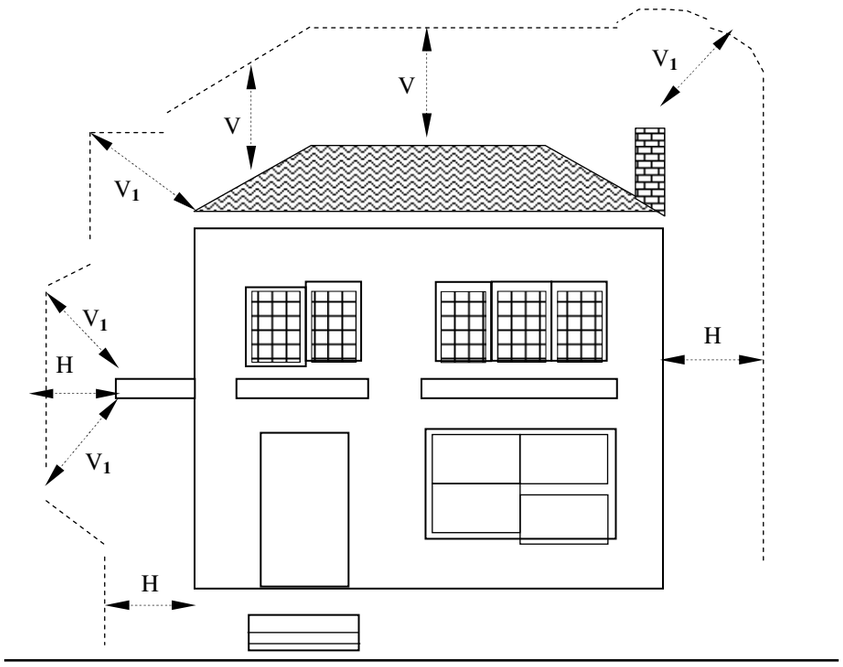
   c. Where the required clearances cannot be obtained, supply conductors shall be grouped or bundled and supported by grounded messenger wires.

5. Clearance of Service Drops

   a. Service drop conductors shall not be readily accessible and when not in excess of 600 volts, shall conform to the following:
      i. Conductors shall have a clearance of not less than 2.50 meters from the highest point of roofs over which they pass with the following exceptions:
         (a) Where the voltage between conductors does not exceed 300 volts and the roof has a slope of **not** less than 100 millimeters in 300 millimeters, the clearance may not be less than 1.00 meter.
         (b) Service drop conductors of 300 volts or less which do **not** pass over other than a maximum of 1.20 meters of the overhang portion of the roof for the purpose of terminating at a through-the-roof service raceway or approved support may be maintained at a minimum of 500 millimeters from any portion of the roof over which they pass.
   b. Conductors shall have a clearance of **not** less than 3.00 meters from the ground or from any platform or projection from which they might be reached.
   c. Conductors shall have a horizontal clearance of not less than 1.00 meter from windows, doors, porches, fire escapes, or similar locations and shall be run less than 1.00 meter above the top level of a window or opening.
   d. Service drop of conductors, when crossing a street, shall have a clearance of not less than 5.50 meters from the crown of the street or sidewalk over which it passes; and shall have a minimum clearance of 3.00 meters above ground at its point of attachment to the building or pedestal.
   e. No parts of swimming and wading pools shall be placed under existing service drop conductors or any other overhead wiring; nor shall such wiring be installed above the following:
      i. Swimming and wading pools and the area extending 3.00 meters outward horizontally from the inside of the walls of the pool;
      ii. Diving structures;
      iii. Observation stands, towers or platforms.

TABLE XIII.1. **Clearance of Wires, Conductors, Cables and Unguarded Rigid Energized Parts Adjacent but not Attached to Buildings and Other Installations Except Bridges**

Clearance of	Insulated Communication conductors and cables; messengers; surge protection wires; grounded guys; neutral conductors (mm)	Supply cables of 0 to 750 V (mm)	Unguarded rigid energized parts, 0 to 750 V; non-insulated communication conductors (mm)	Supply cables over 750 V; open supply conductors, 0 to 750 V (mm)	Open supply conductors, over 750 V to 22 kV (mm)	Unguarded rigid energized parts, over 750 V to 22 kV (mm)
1. Buildings						
a. *Horizontal*						
(1) To walls, projection and guarded windows	1400	1500	1500	1700	2300	2000
(2) To unguarded windows	1400	1500	1500	1700	2300	2000
(3) To balconies and areas readily accessible	1400	1500	1500	1700	2300	2000
b. *Vertical*						
(1) Over or under roofs or projections not readily accessible to pedestrians	900	1070	3000	3200	3800	3600
(2) Over or under balconies and roofs readily accessible to pedestrians	3200	3400	3400	3500	4100	4000
(3) Over roofs accessible to vehicles but not subject to truck traffic	3200	3400	3400	3500	4100	4000
(4) Over roofs accessible to truck traffic	4700	4900	4900	5000	5600	5500
2. Signs, chimneys, billboards, radio and television antennas, and other installations not classified as buildings or bridges						
a. Horizontal	900	1070	1500	1700	2300	2000
b. Vertical over or under	900	1070	1700	1800	2450	2300



V - Minimum vertical clearance, measured either diagonally or vertically

V_1 - Transition

Where:

$V_1 = V$

Figure XIII.1.

CLEARANCE DIAGRAM FOR BUILDING

Anotation. The appropriate protective devices for high tension wires shall be provided.

6. Wiring Methods

Service entrance conductors extending along the exterior or entering buildings or other structures shall be installed in rigid steel conduit or concrete encased plastic conduit from point of service drop to meter base and from meter base to the disconnecting equipment. However, where the service entrance conductors are protected by approved fuses or breakers at their terminals (immediately after the service drop or lateral) they may be installed in any of the recognized wiring methods as provided by PEC-1.

a. Abandoned lines and/or portions of lines no longer required to provide service shall be removed.

b. Power pole, lines, service drop and other line equipment shall be free from any attachment for antennas, signs, streamers and the like.

7. Transformers

a. Oil-insulated transformers rated more than 15 kV between conductors shall be installed inside a transformer vault.

b. Dry-type and other transformers with non-flammable insulation shall be installed in a transformer room.

c. **Transformers shall be guarded as follows:**

i. **Appropriate provisions shall be made to minimize the possibility of damage to transformers from external causes where the transformers are located exposed to physical damage.**

ii. **Dry-type transformers shall be provided with a non-combustible moisture resistant case or enclosure which will provide reasonable protection against accidental insertion of foreign objects.**

iii. **The transformer installation shall conform to the provisions for guarding of live parts in PEC-1.**

iv. **The operating voltage of exposed live parts of transformer installations shall be indicated by signs or visible markings on the equipment or structures.**

8. **Provisions for Transformer Vault**

a. **A transformer vault when required, shall be constructed in accordance with PEC-1 latest edition.**

b. **Transformers and transformer vaults shall be accessible only to qualified personnel for inspection and maintenance.**

c. **Adequate ventilation shall be provided for the transformer vault.**

9. **Capacitor**

a. **This applies to installation of capacitors on electric circuits in buildings.**

EXCEPTION:

1. **Capacitors that are component of other apparatus shall conform to the requirements for such apparatus.**

2. **Capacitors in hazardous locations shall comply with additional requirements as prescribed in PEC-1.**

b. **Installation of capacitors in which any single unit contains more than 11 liters of flammable liquid shall be in a vault or outdoor fence enclosures complying with PEC-1.**

c. **Capacitors shall be protected from physical damage by location or by suitable fences, barriers or other enclosures.**

d. **Capacitors shall be provided with non-combustible cases and supports.**

10. **Emergency Power Systems**

a. **Shall provide electric power for the safety to life and property when normal electric power supply is interrupted.**

b. **Shall have adequate capacity for the operation of the emergency load.**

c. **For hospitals, the transition time to transfer power supply from the instant of interruption of normal power supply to the emergency supply shall not exceed 10 seconds.**

11. **Electrical Room**

a. **An adequate space or area shall be provided at load centers where panel boards, breakers, switchgears and other electrical equipment are installed.**

12. **Service Equipment**

a. **An adequate space or area shall be provided for the service equipment that shall be located in a readily accessible area, either inside or the outside walls of the building.**

13. **Metering Facilities**

a. **Metering Vault, when required for primary service, shall be provided with natural or artificial ventilation.**

b. **Metering space shall be provided for single metering or multi-metering centers for secondary service.**

SECTION 1302. Mechanical Regulations

1. All mechanical systems, equipment and installations mentioned in the Code shall conform to the provisions of the Philippine Mechanical Code, as adopted by the Board of Mechanical Engineering pursuant to **RA 8495** as amended, otherwise known as the Philippine Mechanical Engineering Law.

2. Guarding of Moving and Dangerous Parts

   All prime movers, machines and machine parts, power transmission equipment shall be so guarded, shielded, fenced or enclosed to protect any person against exposure to or accidental contact with dangerous moving parts.

3. Cranes

   a. Adequate means like ladders, stairs or platforms shall be provided for cranes having revolving cabs or machine houses, to permit the operator to enter or leave the crane cab and reach the ground safely, irrespective of its position. If a step-over is provided, the gap must not exceed 300 millimeters.

   b. A gong or other effective warning device shall be mounted on each cage or cab.

   c. Temporary crane operation without warning device may be allowed provided there is a flagman whose sole duty is to warn those in the path of the crane or its load.

   d. The maximum rated load of all cranes shall be plainly marked on each side of the crane. If the crane has more than one hoisting unit, each hoist shall have marked on it or its load block, its rated capacity clearly legible from the ground or floor.

4. Hoists

   a. Operating control shall be plainly marked to indicate the direction of travel and provided with an effective warning device.

   b. Each hoist designed to lift its load vertically shall have its rated load legibly marked on the hoist or load block or at some easily visible space.

   c. A stop, which shall operate automatically, shall be provided at each switch, dead end rail or turntable to prevent the trolley running off when the switch is open.

   d. Each electric hoist motor shall be provided with electrically or mechanically operated brake so arranged that the brake will be applied automatically when the power is cut off from the hoist.

5. Elevators

   Elevators shall be installed in all private and public buildings for public use accessible to disabled persons, pursuant to the objectives of *Batas Pambansa Bilang* 344 (Accessibility Law).

   a. Hoistway for elevators shall be substantially enclosed throughout their height, with no openings allowed except for necessary doors, windows or skylights.

   b. Ropes, wires or pipes shall not be installed in hoistways, except when necessary for the operation of the elevators.

c. Hoistway pits shall be of such depth that when the car rests on the fully compressed buffers, a clearance of not less than 600 millimeters remains between the underside of the car and the bottom of the pit.

d. When four (4) or more elevators serve all or the same portion of a building, they shall be located in not less than two (2) hoistways and in no case shall more than four (4) elevators be located in any one hoistway.

e. Where a machine room or penthouse is provided at the top of a hoistway, it shall be constructed with sufficient room for repair and inspection. Access shall be by means of an iron ladder or stairs when the room is more than 600 millimeters above the adjacent floor or roof surface. The angle of inclination of such ladder or stairs shall not exceed 60° from the horizontal. This room shall not be used as living quarters or depository of other materials and shall be provided with adequate ventilation.

f. Minimum number of hoisting ropes shall be three (3) for traction elevators and two (2) for drum type elevators.

g. The minimum diameter of hoisting and counterweight ropes shall be 30 millimeters.

h. Elevators shall be provided with Fall-Free Safety Device, over-load switch and reverse polarity relay.

i. In apartments or residential condominiums of five (5) storeys or more, at least one (1) passenger elevator shall be kept on twenty-four (24) hour constant service.

6. Escalators

a. The angle of inclination of an escalator shall not exceed 30° from the horizontal.

b. The width between balustrades shall not be less than 560 millimeters nor more than 1.20 meters. This width shall not exceed the width of the steps by more than 330 millimeters.

c. Solid balustrades of incombustible material shall be provided on each side of the moving steps. If made of glass, it shall be of tempered type glass.

d. The rated speed, measured along the angle of inclination, shall be not more than 38 meters per minute.

7. Boilers and Pressure Vessels

a. Location of Boilers

i. Boilers may be located inside buildings provided that the boiler room is of reinforced concrete or masonry and that the boiler room shall not be used for any other purpose. No part of the boiler shall be closer than 1.00 meter from any wall and shall have at least two (2) separate exits.

ii. In case the main building is not made up of fire resistive materials, boilers shall be located outside the building at a distance of not less than 3.00 meters from the outside wall of the main building and the building housing the boiler shall be made up of fire-resistive materials.

b. Smokestacks, whether self-supporting or guyed, shall be of sufficient capacity to handle fuel gases, shall be able to withstand a wind load of 175 kilometers per hour and shall rise at least 5.00 meters above the eaves of any building within a radius of 50.00 meters.

c. Manufacturers/assemblers of boilers/pressure vessels/pressurized water heaters shall stamp each vessel on the front head or on any other suitable location with the name of the manufacturer, serial number, year of manufacture maximum allowable working pressure, heating surface in sq. meters, and thickness of shell.

d. Boilers of more than 46.00 sq. meters heating surface shall each be provided with two (2) means of feeding water, one (1) steam driven and one (1) electrically driven, or one (1) pump and one (1) injector.

e. Two (2) check valves shall be provided between any feed pump and the boiler in addition to the regular shut-off valve.

f. Where two (2) or more boilers are connected in parallel, each steam outlet shall be provided with a non-return valve and a shut-off valve.

g. In no case shall the maximum pressure of an existing boiler be increased to a greater pressure than would be allowed for a new boiler of same construction.

h. Each boiler shall have at least one (1) safety valve. For boilers having more than 46.00 sq. meters of water heating surface or a generating capacity exceeding 910 kilograms per hour, two (2) or more safety valves shall be required.

i. Each boiler shall have a steam gauge, with a dial range of not less than one and one-half times and not more than twice the maximum allowable working pressure. It may be connected to the steam space or to the steam connection to the water column.

j. Repairs/replacements on any parts shall comply with the applicable section on New Installation of Boilers/Pressure Vessels of the Philippine Mechanical Code.

k. Upon the completion of the installation, the Building Official shall conduct an inspection and test, and if found complying with requirements, a certificate of operation for a period not exceeding one (1) year shall be issued after payment of the required inspection fees.

l. After a permit has been granted to install a boiler/pressure vessel/pressurized water heater upon payment of the installation fees therefore, it shall be the duty of the Building Official to make periodic inspection of the installation to determine compliance with the approved plans and specifications.

m. The **Building Official** shall notify the owner in writing of the intended date of the annual inspection at least fifteen (15) days in advance but not to exceed thirty (30) days from the intended date of inspection.

n. The owner/user shall prepare the boiler(s) for inspection and provide all labor and equipment required during said inspection.

8. Refrigeration and Air Conditioning

a. The effective temperature and relative humidity of the air to be used for comfortable cooling shall be maintained at 20°Celsius to 24°Celsius and 50% to 60%, respectively, with 4.60 to 7.60 meters per minute air movement within the living zone.

b. Water from evaporators, condensers and other machinery shall be properly collected into a suitable water or drainage system.

c. Ducts shall be constructed entirely of non-combustible materials such as steel, iron, aluminum or other approved materials. Only fire retardant lining shall be used on the inside of ducts.

d. Access doors shall be provided at all automatic dampers, fire dampers, thermostats and other apparatus requiring service and inspection in the duct system.

e. Where ducts pass thru walls, floors or partitions, the space around the duct shall be sealed with fire resistant material equivalent to that of the wall, floor or partition, to prevent the passage of flame or smoke.

f. When ducts or their outlets or inlets pass through firewalls, they shall be provided with automatic fire dampers that automatically close on both sides of the firewall through which they pass.

g. Fire doors and fire dampers shall be arranged to close automatically and remain tightly closed, upon the operation of a fusible link or other approved heat actuated device, located where readily affected by an abnormal rise of temperature in the duct.

h. Each refrigerating system shall be provided with a legible metal sign permanently attached and easily noticeable, indicating thereon the name of manufacturer or installer, kind and total number of kilograms of refrigerant contained in the system and applied field test pressure applied.

i. In refrigerating plants of more than 45 kilograms, refrigerant, masks and helmets shall be used. These shall be kept in a suitable cabinet outside the machine room when not in use.

j. Not more than 140 kilograms of refrigerant in approved containers shall be stored in a machine room at any given time.

k. Where ammonia is used, the discharge may be into tank of water, which shall be used for no other purpose except ammonia absorption. At least 1 liter of water shall be provided for every 120 gallons of ammonia in the system.

l. In a refrigerating system containing more than 9 kilograms, stop valves shall be installed in inlets and outlets of compressors, outlets of liquid receivers, and in liquid and suction branch headers.

m. Window type air conditioners shall be provided with drainpipe or plastic tubing for discharging condensate water into a suitable container or discharge line.

n. Window type air conditioners shall be provided with exhaust ducts if the exhaust is discharged into corridors/hallways/arcades/sidewalks, etc., and shall be installed at not less than 2.10 meters above the floor level.

9. Water Pumping for Buildings/Structures

a. Installation of pumping equipment to supply buildings/structures directly from existing water supply system shall not be allowed. An underground water tank or cistern must be filled by gravity flow from the water supply system, from where pumps can be installed.

b. To maintain water pressure in all floors of a building/structure, the following systems may be used:

i. Overhead tank supply - may be installed above the roof supported by the building/structure or on a separate tower.

(a) Water tanks shall be provided with a vent and an overflow pipe leading to a storm drain and shall be fully covered.

ii. Pneumatic tank - an unfired pressure vessel, initially full of air, into which water from mains is pumped.

(a) A suitable pressure switch shall stop the pump when pressure required is attained.

(b) Tanks shall be designed for twice the maximum total dynamic pressure required.

(c) An air volume control device shall be installed to maintain correct air volume inside the tank.

10. Pipings for Fuel, Gas and Steam

a. Piping shall, as much as possible, run parallel to building walls.

b. Grouped piping shall be supported on racks, on either horizontal or vertical planes.

c. Piping on racks shall have sufficient space for pipe or chain wrenches so that any single line can be altered/repaired/replaced without disturbing the rest.

d. Piping 100 millimeters in diameter and above shall be flanged. Smaller sized pipes may be screwed.

e. Piping subjected to varying temperatures shall be provided with expansion joints.

f. Galvanized piping shall not be used for steam.

g. Piping carrying steam, hot water or hot liquids shall not be embedded in concrete walls or floors and shall be properly insulated.

h. Piping carrying propane, butane and other gas which are heavier than air, shall be provided with automatic shut-off devices. The automatic shut-off device is most effective if provided to each burner before the flexible connection.

11. Identification of piping by color and tag shall be as follows:

Material Piped	Pipe Color	Pipe Identification
Acetylene	Orange	Acetylene
Acid	Yellow	Acid
Air-High pressure	Yellow	H.P. Air
Air-Low Pressure	Green	L.P. Air
Ammonia	Yellow	Ammonia
Argon-Low Pressure	Green	L.P. Argon
Blast Furnace Glass	Orange	B.F.Gas
Carbon Dioxide	Red	Carbon Dioxide
Gasoline	Orange	Gasoline

Grease	Orange	Grease
Helium-Low Pressure	Green	L.P. Helium
Hydrogen	Orange	Hydrogen
Nitrogen-Low Pressure	Green	L.P.-Nitrogen
Oxygen	Orange	Oxygen
Oil	Orange	Oil
Steam-High Pressure	Yellow	H.P.Steam
Steam-Low Pressure	Yellow	L.P. Steam
Tar	Orange	Tar
Producer Gas	Orange	Producer Gas
Liquid Petroleum Gas	Orange	L. P. Gas
Vacuum-High	Orange	High Vacuum
Water-Boiler Feed	Yellow	Boiler Feed Water
Water-Cold	Green	Cold Water

Water-Distilled	Green	Distilled Water
Water (Fire Service)	Red	Fire Service Water
Water-Hot	Yellow	Hot Water
Water-Low-Pressure (Excl. Of fire Service)	Green	L.P. Water
Water-High Pressure (Excl. of Fire service)	Yellow	H.P. Water
Water-Treated	Green	Treated Water
Oil and Water (For hydraulic system)	Green	Oil and Water
Oil and Water (For hydraulic system)	Orange	Oil and Water

(emphases and underscoring supplied)

Rule XIV follows

RULE XIV - PHOTOGRAPHIC AND X-RAY FILMS

SECTION 1401. Storage and Handling

1. Storage rooms of unexposed photographic and x-ray films shall be provided with automatic fire extinguishing systems in the following cases:

    a. When unexposed films in generally accepted safety shipping containers exceed the aggregate of 14.00 cu. meters;

    b. Where shelving used for storage of individual packages not in said shipping containers exceeds 1.40 cu. meters in capacity; and

    c. Storage is **not** in generally accepted safety shipping containers in any section **not** exceeding 14.00 cu. meters.

2. Film negatives in storage or in process of handling shall be kept in heavy Manila envelopes, not exceeding twelve (12) films to an envelope. Expanding envelopes shall not be used.

3. Film negatives shall be kept in properly insulated vented cabinets, vented storage vaults or outside storage houses. **Not** more than 110 kilograms shall be stored in any single cabinet. Where the film stored exceeds 450 kilograms, it shall be in vented storage vaults or in a detached structure or roof vault. Door openings in vaults shall be of **four-hour fire-resistive** construction and shall be kept closed except when in use.

4. Only incandescent electric light shall be permitted; protected with substantial wire guards or vapor proof globes or both. Portable lights on extension cords are prohibited. Conspicuous "NO SMOKING" signs shall be posted.

5. **No** films shall be stored within 600 millimeters of steam pipes, chimneys, or other sources of heat.

6. There shall be first aid provisions of types using water or water solutions. Discarded films shall be stored and handled in the same manner as other films until removed from the premises.

SECTION 1402. Classes of Film Exempted

1. The provisions of this Section do **not** apply to the following: film for amateur photographic use in original packages of "roll" and "film pack" films in quantities of less than 1.40 cu. meters; safety film; dental X-ray film; establishments manufacturing photographic films and their storage incidental thereto; and films stored or being used in standard motion picture booths.

2. Safety photographic X-ray film may be identified by the marking on the edge of the film.

SECTION 1403. Fire Extinguishing System

Unless otherwise provided in the **Code**, all fire extinguishing systems when so required shall be of a type, specifications, and methods of installation as prescribed in accordance with the requirements of the Secretary.

(emphases supplied)

Rule XV follows

RULE XV - PREFABRICATED CONSTRUCTION

SECTION 1501. Prefabricated Assembly

1. Prefabricated assembly is a structural unit, the integral parts of which have been built-up or assembled prior to incorporation in the building. It shall be made of pre-cast concrete, various metal components, unplasticized polyvinyl chloride (**uPVC**) or other construction materials acceptable to the architect/engineer.

2. To determine the structural adequacy, durability, soundness, weather and fire resistance of pre-fabricated assemblies, they shall pass the special tests conducted by any accredited material testing laboratories.

3. Every device or system to connect prefabricated assemblies shall be capable of developing the strength of the different members as an integral structure. Except, in the case of members forming part of a structural frame as specified in the **Code and this IRR**.

4. Anchorages and connections between members and the supporting elements of the structure or walls shall be capable of withstanding all probable external and internal forces or other conditions for a structurally adequate construction.

5. In structural design, proper allowances shall be made for any material to be displayed or removed for the installation of pipes, conduits, or other equipment.

6. Metal and uPVC prefabricated assembly shall be adequately provided with anchorage and connectors.

7. Placement of prefabricated assemblies shall be inspected to determine compliance with the Code.

8. During the placement of the prefabricated assembly, a safety engineer shall be required at the site.

(emphases supplied)

Rule XVI follows

RULE XVI - PLASTICS

SECTION 1601. Approved Plastics

Approved plastic materials shall be those which have a **flame-spread rating** of **two hundred twenty five** (225) **or less** and a **smoke density not greater than that obtained from the burning of untreated wood under similar conditions** when tested in accordance with generally accepted engineering practices. The products of combustion shall be **no** more toxic than the burning of untreated wood under similar conditions.

SECTION 1602. Installation

1. *Structural Requirements* - All plastic materials shall be of adequate strength and durability to withstand the prescribed design loads. Sufficient and substantial technical data shall be submitted to establish stresses, maximum unsupported spans, and such other information as may be deemed necessary for the various thicknesses and forms used.

2. *Fastenings* - Fastenings shall be adequate to withstand design loads and internal and external stresses required of the assembly. Proper allowances of plastic materials in conjunction with other materials with which it is assembled or integrated shall be provided.

SECTION 1603. Glazing of Openings

1. The location of doors, sashes and framed openings glazed or equipped with approved plastics at the exterior walls of a building shall be so arranged that in case of fire, the occupants may use such openings to escape from the building to a place of safety. The travel distance from any point of the building towards the location of such openings should not be over 45.00 meters in any place of assembly for spaces **not** protected by automatic fire suppression and 60.00 meters in areas so protected.

2. Openings glazed with approved plastics at the ground floor shall be so located such that it shall open directly to a street or into an exit court. Such openings at the upper floor shall be so located at a horizontal distance not less than 3.00 meters from the enclosed stairway, outside stairway or exit passageway leading to a street or into an exit court.

3. The use of plastic doors, sashes and framings of openings for Group A to I Occupancies may be allowed except for entrance doors and exit doors which should be of materials other than plastics permitted by the Code.

4. The size of openings glazed with approved plastics shall have a minimum dimension where one person could pass through or 600 millimeters square.

5. The maximum size of such openings depends upon the structural strength and the fastening adequacy requirements of approved plastics being used.

6. The spacing between openings glazed with approved plastics shall have a minimum distance such that the materials used in between can withstand the vertical and lateral forces within the influence of such openings. The minimum distance shall be 2.00 meters for all spans.

SECTION 1604. Skylights

1. *General* - Approved plastics may be used in skylights installed on roofs of Types I, II or III Constructions and all buildings in these categories shall be equipped with an approved automatic fire-extinguishing system in Groups A, B, C, E, F, J, H-3 and H-4 Occupancies; *Except,* that:

a. Approved plastics may be used in any type of construction or occupancy as a fire venting system when approved by the **Building Official**.

b. Plastics may be used in approved skylights in **Type II one-hour fire-resistive** construction which are located 300 millimeters or more above the lower flange of the ceiling. The walls of the skylight well shall be no less fire-resistive than the adjacent ceiling.

c. Where a fire-resistive ceiling is **not** required in one-storey buildings, approved plastics may be used in skylights.

2. *Installation Requirements*

a. Except in Group A Occupancies, no skylight shall be installed within 3.00 meters of a property line.

b. The edges of dome-type skylights shall be properly flashed.

c. Plastic skylights shall be separated from each other by at least 2.50 meters laterally and 3.00 meters along the slope of the roof.

3. *Allowable areas* - The area of individual plastic skylights shall not exceed 10.00 square meters. The total aggregate area of plastics used in skylights, monitors, and sawtooth glazing shall not exceed 20% of the floor area of the room or occupancy sheltered.

4. *Curb Requirements* - Plastic skylights in roofs having a slope of less than 1 in 3 shall have a 100 millimeters high curb. The curb may be omitted where a wire screen not smaller than No. 12 U.S. gauge with a mesh not larger than 25 millimeters is provided immediately below the skylight. The screen shall be substantially mounted below the skylight.

SECTION 1605. Light-Transmitting Panels in Monitors and Sawtooth Roofs

1. *General* - Where a fire-resistive rating is **not** required for the roof structure, and in all buildings provided with an approved automatic fire-extinguishing system, approved plastics may be used with or without sash as the light-transmitting medium in monitors and sawtooth; *Except*, that plastics used in monitors or sawtooth roofs of **Type II** Construction shall be of materials appropriate to be used according to flame-spread characteristics.

2. *Allowable Areas* - The area of individual plastic glazing used in monitors and sawtooth glazing shall not exceed 15.00 square meters. The total aggregate area of plastics used in skylights, monitors, and sawtooth glazing shall not exceed 20% of the floor area of the room or occupancy sheltered.

3. *Area Separation* - The area of such plastic panels shall be separated from each other by a section of incombustible material or by a section of the roofing material of the structure not less than 1.50 meters in length. The lower edge of the plastic material shall be at least 150 millimeters above the surface of the adjoining roof surface.

SECTION 1606. Plastic Light Diffusers in Ceilings

1. *General* - Ceiling light diffusers having an area greater than 10% of any 10.00 sq. meters of room area shall be of approved plastics conforming to the requirements specified in the Code.

2. *Installation* - Plastic light diffusers shall be installed in such a manner that they will not readily become detached when subjected to room temperature of 80°C for 15 minutes, *Except,* for plastic light diffusers which are installed in the first floor area of Group C Occupancies having egress

directly to the exterior of the building; and plastic light diffusers which are located between an approved automatic Fire-extinguishing system and the area to be protected other than public corridors for Group A, B, C, D, E, G, H, and I Occupancies if tests required by the Secretary have established that such installation will not interfere with the efficient operation of such automatic fire-extinguishing systems.

SECTION 1607. Partitions

Where partitions are not required to be of fire-resistive or incombustible construction, approved plastics conforming to the requirements specified in the Code may be used.

SECTION 1608. Exterior Veneer

1. *General* - Exterior veneer may be of approved plastic materials, and shall conform to the provisions of this Section.

2. *Height* - Plastic veneer shall not be attached to any exterior wall above the first storey; *Provided,* that plastic veneer may be attached to exterior walls above the first storey of buildings located outside of highly restrictive Fire Zones; *Provided,* further that the height of veneer is **not** in excess of 10.00 meters above the adjacent grade of elevation.

3. *Area* - Sections of plastic veneer shall not exceed 15.00 sq. meters in area, *Except,* that in less restrictive Fire Zones, the area may be increased by 50%.

4. *Separation* - Sections of plastic veneer shall be separated by a minimum of 1.20 meters vertically and 600 millimeters horizontally.

SECTION 1609. Awnings and Canopies

1. Plastic materials appropriate for use according to Flame Spread characteristics may be utilized in awnings and canopies, provided such awnings and canopies are constructed in accordance with provisions governing projections and appendages as specified in the **Code**.

2. Approved plastics may be used in awnings where untreated canvass is permitted.

3. Approved plastics may be used in lieu of plain glass in greenhouses in less restrictive Fire Zones.

(emphases supplied)

Rule XVII follows

RULE XVII - SHEET METAL PAINT SPRAY BOOTHS

SECTION 1701. Sheet Metal Paint Spray Booth

1. Paint spray booths shall be constructed of steel of **not** less than No. 18 U.S. gauge in thickness and shall be designed in accordance with the Code.

2. The area of a paint spray booth shall **not** exceed 150 sq. meters nor 10% of the basic area permitted for the major use of the building according to its Occupancy Group.

3. The floor of the spray booth and operator's working area, if combustible, shall be covered with non-combustible, non sparkling material of such character as to facilitate the safe cleaning and removal of residue.

4. Paint spray booths shall be designed to permit the free passage of exhaust air from all parts of the interior and all interior surfaces shall be smooth and continuous without outstanding edges.

SECTION 1702. Fire Protection

1. Every spray booth having an open front elevation larger than 1.00 sq. meters and which is not equipped with doors, shall have a fire curtain or metal deflector not less than 100 millimeters deep installed at the upper outer edge of the booth opening.

2. Each paint spray booth shall be separated from other operations by not less than 91 centimeters, or by a greater distance, or by such partition or wall as the Local Fire Service Marshall may require.

SECTION 1703. Light

1. Paint spray booths shall be illuminated through hammered wire or heat-treated glass panels. The glass panels shall be located in such a manner as to reduce the hazard of ignition caused by paint spray deposit.
2. When spraying areas are illuminated through glass panels or other transparent materials, only light units shall be used as source of illumination.
3. Panels shall effectively isolate the spraying area from the area in which the lighting unit is located and shall be of **non-combustible** material or such a nature or so protected that breakage will be unlikely.
4. Panels shall be arranged so that normal accumulations of residue on the exposed surface of the panel will not be raised to a dangerous temperature by radiation or conduction from the source of illumination.

SECTION 1704. Ventilation

1. Mechanical ventilation shall be provided direct to the exterior of the building. The mechanical exhaust system shall be designed to move the air through any portion of the paint spray area at the rate of not less than 30.00 lineal meters per minute.

2. The blades of exhaust fans shall be constructed of non-ferrous material and shall be mounted in such a manner as to prevent contact with the exhaust duct.

3. The motor shall not be mounted in the spray booth or the duct system and belts shall be enclosed where they enter the booth or duct system.

4. The discharge point for ducts in a paint spray booth shall be not less than 2.00 meters from the adjoining combustible construction nor less than 8.00 meters from adjoining exterior wall openings; except, that the discharge point for exhaust ducts is not regulated in a waterwash spray booth.

(emphases supplied)

Rule XVIII follows

RULE XVIII - GLASS AND GLAZING

SECTION 1801. General Requirements

1. This Rule shall apply to exterior glass and glazing in all Uses/Occupancies except Groups A, B and J Occupancies **not** over three (3) storeys in height, and to interior and exterior glass and glazing in all occupancies subject to human impact.
2. Standards for glass and glazing materials shall conform to the provision on glass dimensional tolerance, breaking stress level, and design safety factors.
3. Each light (glass panel) shall bear the manufacturer's label designating the type and thickness of glass.
4. Each light with special performance characteristics such as laminated, heat strengthened, fully tempered or insulated, shall bear the manufacturer's identification showing the special characteristics and thickness by etching or other permanent identification that shall be visible after the glass is glazed.
5. Appropriate measures shall be provided to deter persons walking into fixed glass panels where the floor contiguous thereto on to both sides is approximately the same level.
6. Glass panels **not** adjacent to wall openings may be made obvious by horizontal bars at guardrail height, a 450 millimeters opaque bulkhead, distinctive glass such as etched or translucent for guardrail height, fixed flower bins or other appropriate construction arrangement.

SECTION 1802. Area Limitation

1. Exterior glass and glazing shall be capable of safely withstanding the load due to wind pressure for various height zones above ground acting inward or outward. The area of individual light shall **not** be more than the maximum allowable area of glass according to the wind load multiplied by the appropriate adjustment factor.
2. Glass panels which are more than 600 millimeters in width and 180 millimeters or more in height adjacent to wall opening shall be safety glass unless a bulkhead of opaque materials not less than 450 millimeters high is provided.
3. The table provided below shall govern the glass area limitation for use in large area along shopping malls, commercial buildings, theaters, offices, institutional public buildings and factories other than Group A, B and J Occupancies.

THICKNESS (millimeter)	WIDTH (meter)	LENGTH (meter)
8	1.10 and below	1.10 and below
10	2.25 and below	2.25 and below
12	3.00 and below	3.00 and below
15	Over 3.00	Over 3.00

SECTION 1803. Glazing

Glass firmly supported on all **four** (4) edges shall be glazed with minimum laps and edge clearances in accordance with Section 1801 paragraph (2), *Provided,* that glass edge clearance in fixed openings shall be **not** less than what is required for wind and earthquake drift. For glass **not** firmly supported on all four (4) edges and design shall be submitted for approval of the **Building Official**. Glass supports shall be considered firm when deflection of the support at design load does not exceed 1/175 of the span.

SECTION 1804. Louvered Windows

Regular plate, sheet, or patterned glass in jalousies and louvered windows shall not be thinner than 5.6 millimeters minimal and shall not be longer than 1.20 meters. Exposed glass edges shall be smooth.

SECTION 1805. Impact

Frameless glass doors, glass in doors, fixed glass panels, and similar glazed openings which may be subject to accidental human impact shall conform with the requirements provided under Section 1802 on impact loads of glass; *Except* in the following cases:

1. Bathtub and shower enclosures shall be constructed from approved shatter-resistant materials, such as: wire-reinforced glass **not** less than 5.6 millimeters thick; fully tempered glass not less than 4.8 millimeters thick; or laminated safety glass not less than 6.4 millimeters thick.
2. Glass lights located **not** less than 450 millimeters above the adjacent finished floor or walking surface.
3. Glass lights when the least dimension is **not** greater than 450 millimeters.
4. Glass lights 1.50 sq. meters or less in area.

(emphases supplied)

Rule XIX follows

RULE XIX - THE USE OF COMPUTERS

SECTION 1901. General Rule

The use of computer for all or any part of the design of buildings under the **Code** is permitted provided that **all programs** to be used are documented.

SECTION 1902. Program Documentation

1. Documenting a program under the **Code** consists of filing with the **OBO** a reference to a publication or publications accessible to him where the detailed description of the program or a brief statement of the theoretical background of the program including a description of the algorithms used are found.

2. The software name, version number and the company that developed the program and its address shall be provided as part of the program documentation.

SECTION 1903. Submission of Computer-Generated Computations

a. A copy of the output sheets for computer-generated computations shall be submitted as part of the design computations.

i. The first sheet of the output sheets shall be signed and sealed by the designer.

b. The output sheets shall be accompanied by a certification of a designer and/or consultant that the output sheets are the results obtained through the use of documented programs. The certification should include the identification of the specific program used for each portion of the computer-generated computations being submitted.

i. The data provided, as computer input shall be clearly distinguished from those computed in the program.

ii. The information required in the output shall include date of processing, program identification, all output data, units and final results.

(emphases supplied)

Rule XX follows

RULE XX - SIGNS

SECTION 2001. General Requirements

1. **No** sign or signboard shall be erected in such a manner as to confuse or obstruct the view or interpretation of any official traffic sign, signal, or device.

2. Signs which are written in any foreign language shall have a corresponding **translation in English** or in the local dialect.

3. The bottom line of all signboards adjacent to each other shall follow a common base line as determined by the **Building Official**.

4. The installation of all kinds of signs shall be such that a harmonious and aesthetic relationship of all units therein is presented.

SECTION 2002. Maintenance

All signs, together with all of their supports, braces, guys, and anchors, shall be kept in repair and in proper state of preservation. The display of all signs shall be kept neatly painted and secured at all times.

SECTION 2003. Design and Construction

Sign structures shall be designed and constructed to resist all forces in accordance with the National Structural Code for Buildings. For signs on buildings, the dead lateral loads shall be transmitted through the structural frame of the building to the ground in such a manner as not to overstress any of the elements of the building. The weight of earth superimposed over footings may be used in determining the dead load resisting moment. Such earth shall be carefully placed and thoroughly compacted.

SECTION 2004. Supports and Anchorages

1. *General.* The supports and anchorages of all signs or sign structures shall be placed in or upon private property and shall be constructed in conformity with the requirements of the **Code**.

   a. Sign structures may be constructed only in areas where zoning regulations permit them and in accordance with the accepted standards of design, construction and maintenance.

   b. Roof Signs

      i. The design and construction of roof signs shall conform to the provisions of Sec. 1210 of the **Code**.

      ii. No signs shall be erected, attached to, installed or fastened on rooftops of buildings of wooden structures or of buildings/structures with wooden roof framing.

      iii. Adequate provisions for grounding metallic parts of roof signs exposed to lightning shall be provided.

      iv. Installation of warning lights/obstruction lights for air traffic shall be installed where applicable.

   c. Ground Signs

i. Ground signs and advertising ground signs which shall be constructed in conformity with accepted engineering standards, of which height control shall be in conformity with the Local Zoning Regulation (**LZR**). (***Figure XX.1.***)

ii. Ground sign structures shall be located **within the property line** and under **no** circumstances shall they occupy the RROW/street or sidewalk/arcade or similar access-ways.

iii. Public or government signs erected or installed within the area of the sidewalk shall be so designed and located that they do **not** obstruct the easy passage of pedestrians nor distract the attention of motorists.

d. Projecting Signs

i. On **non-arcaded** RROW/streets, signs shall **not** extend more than 1.20 meters over the sidewalk and measured horizontally from the wall line or building line. **On arcaded RROW/streets, the signs shall not project more than 0.60 meter from the outermost portion of the wall line of the allowed structure over the arcade**. For buildings abutting on RROW/streets or alleys without sidewalks or provisions therefor, the signs shall **not** project more than 0.30 meter from the outermost portion of the building/structure. (***Figures XX.2., XX.3., and XX.4.***)

ii. A height clearance of not less than 3.00 meters measured from the finished road surface shall be provided below the lowest part of such signs projecting over sidewalks on buildings without arcades and a clearance of **not** less than 5.00 meters shall be provided below the lowest part of such signs projecting over arcaded RROW/streets.

iii. The erection of electric neon signboards or other advertisements of similar nature projecting over roadways or public streets shall be allowed, provided that:

(1) Clear distance between the signboards erected on one building is **not** less than 4.00 meters.

(2) Signboards on multi-storey buildings shall be erected on the same vertical line and shall not overlap each other.

(3) Tops of signboards shall **not** extend over the topmost part of the parapet or the bottom line of the eave of the building.

(4) Horizontal projections of signboards shall follow subsections (i) and (ii) of this Rule.

(5) In case of two (2) adjacent buildings, adjacent signboards shall be placed at a distance of not less than 2.00 meters from the common boundary line.

(6) Signboards shall **not** obstruct any window or emergency exit and shall **not** be closer than 1.00 meter from electric and telephone posts and wires.

e. Wall Signs

i. Outdoor display signs placed against the front exterior surface of buildings shall **not** extend more than 300 millimeters from the wall with its lowest portion **not** less than 3.00 meters above the sidewalk.

ii. Commercial signs shall **not** be attached to, painted on, installed or displayed on posts/columns, beams/girders or any other exterior portion of arcades and structures for public utilities/services, e.g. mass transit and the like.

iii. Display windows or wall signs within 3.00 meters above the sidewalk shall be flushed or recessed.

2. *Materials.* Materials for construction of signs or sign structures shall be of the quality and grade as specified in the Code. In all signs and sign structures, the materials and details of construction shall, in the absence of specified requirements, conform to the following:

   a. Structural steel shall be of such quality as to conform to ASTM A 36. Secondary members in contact with or directly supporting the display surface may be formed of light gauge steel, provided such members are designed in accordance with the specifications of the design of light gauge steel as specified in ASTM A 242 and, in addition, shall be galvanized. Secondary members, when formed integrally with the display surface, shall be not less than No. 24 gauge in thickness. When **not** formed integrally with the display surface, the minimum thickness of the secondary members shall be No. 12 gauge. The minimum thickness of hot-rolled steel members furnishing structural support for signs shall be 6.35 millimeters, except that if galvanized, such members shall be not less than 3.18 millimeters thick. Steel pipes shall be of such quality as to conform to ASTM A 36. Steel members may be connected with one galvanized bolt provided that connection is adequate to transfer the stresses in the members.

   b. Anchors and supports, when of wood and embedded in the soil, or within 150 millimeters of the soil, shall all be of heartwood of a durable species or shall be pressure-treated with an approved preservative.

3. *Restrictions on Combustible Materials* - All signs or sign structures erected in highly restrictive Fire Zones shall have structural members of incombustible materials. Ground signs may be constructed of any material meeting the requirements of the Code. Combination signs, roof signs, wall signs, projecting signs, and signs on marquees shall be constructed of incombustible materials. No combustible material other than approved plastics shall be used in the construction of electric signs.

4. *Non-structural Trim* - Non-structural trim and portable display surfaces may be of wood, metal, approved plastics, or any combination thereof.

5. *Display Surfaces* - Display surfaces in all types of signs may be made of metal, glass, or approved plastics.

SECTION 2005. Projections and Clearances

1. *Clearances from High Voltage Power Lines* - Clearances of signs from high voltage power lines shall be in accordance with the Philippine Electrical Code.

2. *Clearances from Fire Escapes, Exits, or Standpipes* - **No** signs or sign structures shall be erected in such a manner than any portion of its surface or supports will interfere in any way with the free use of any fire escape, exit, or standpipe.

3. *Obstruction of Openings.* **No** sign shall obstruct any opening to such an extent that light or ventilation is reduced to a point below that required by the Code. Signs erected within 1.50 meters of an exterior wall in which there are openings within the area of the sign shall be constructed of incombustible material or approved plastics.

4. *Projection over Alleys.* **No** sign or sign structure shall project into any public alley below a height of 3.00 meters above established sidewalk grade, nor project more than 300 millimeters where the sign structure is located 3.00 meters to 4.50 meters above established sidewalk grade. The sign or sign structure must not project more than 1.00 meter into the public alley where the sign or sign structure is located more than 4.50 meters above established sidewalk grade.

SECTION 2006. Lighting

Signs shall be illuminated only by electrical means in accordance with the Philippine Electrical Code.

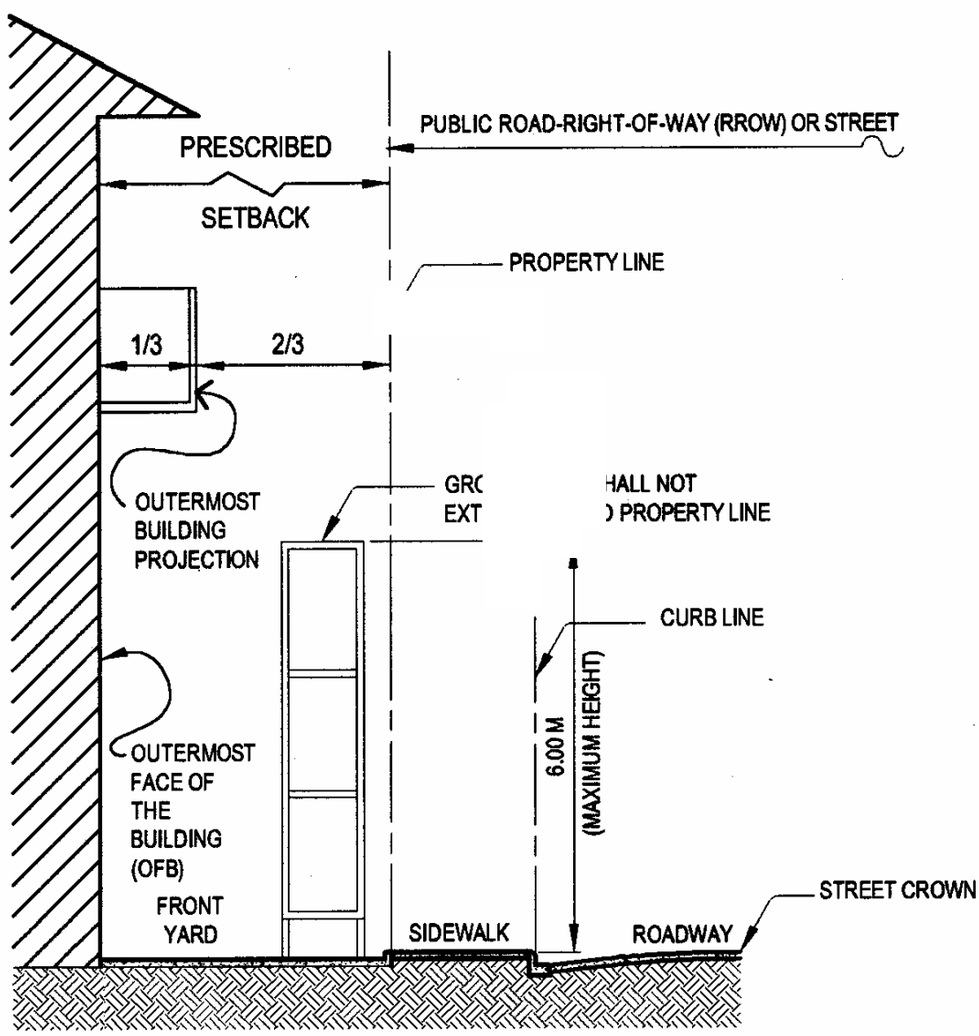


Figure XX.1.

GROUND SIGN

*Annotation. The ground-mounted sign must have its foundation/supports firmly planted within the property limits and **not** on any part of the RROW.*

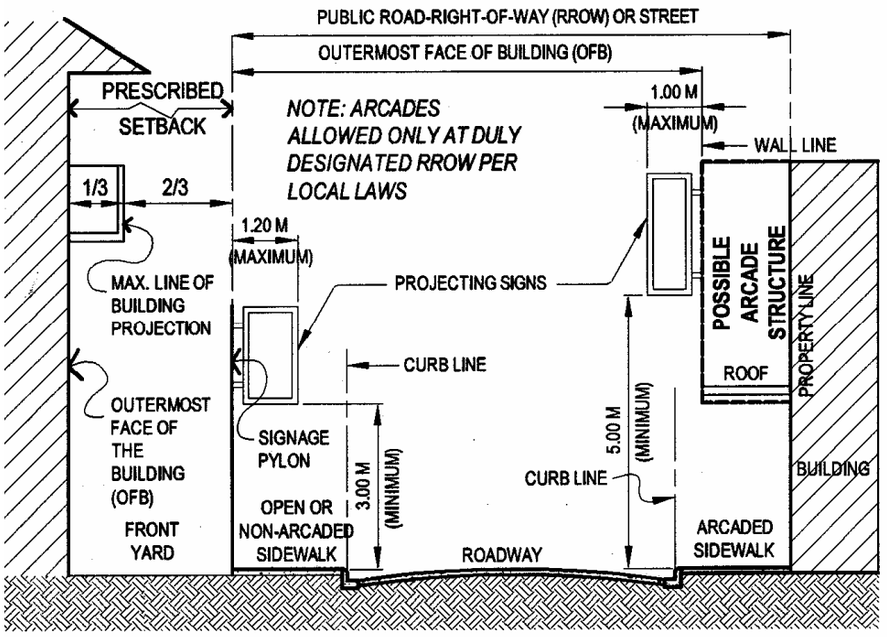
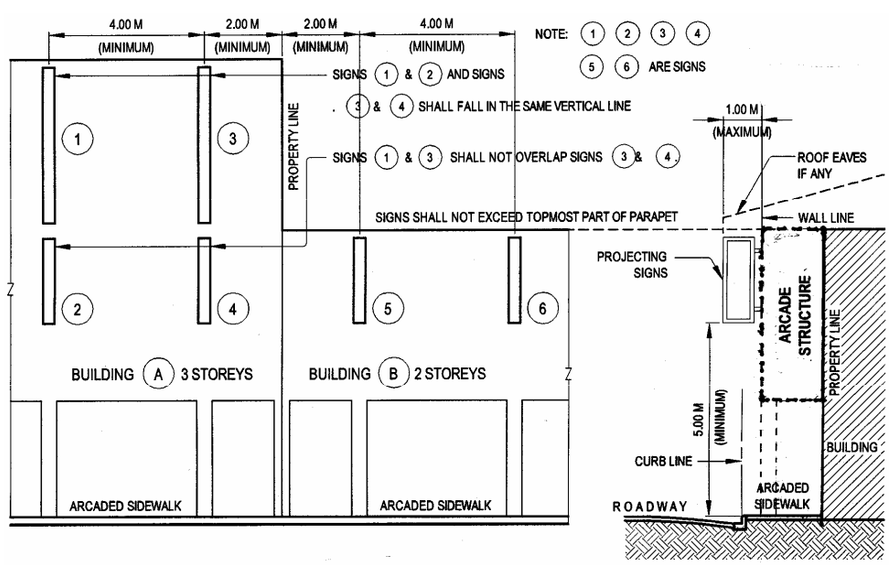


Figure XX.2.

PROJECTING SIGNS



FRONT ELEVATION *SECTION*

Figure XX.3.

PROJECTING SIGNS

*Annotation. There shall be **no** ground-mounted, hanging nor projecting signboard within the arcade/ arcaded sidewalk itself. The permitted signs for arcaded structures are to be located **above** portions of the RROW (**not** below the arcade structure).*

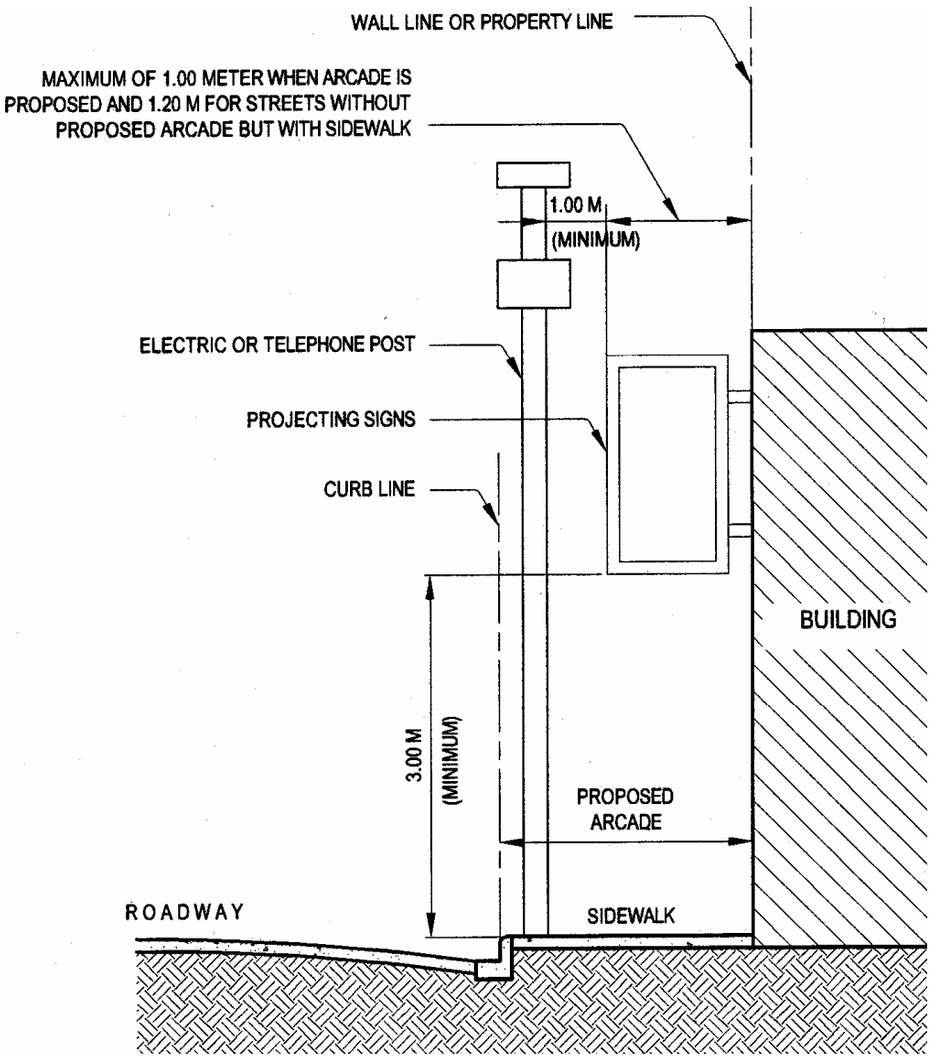


Figure XX.4.

PROJECTING SIGNS

Annotation. The example above assumes that there shall be no arcade structure (only a covered sidewalk i.e. which still qualifies as an arcade).

(emphases, underscoring and annotations supplied)

Rule XXI follows

RULE XXI - FINAL PROVISIONS

SECTION 2101. Separability Clause

If any provision of this **IRR** or the application thereof to any person or circumstance is declared unconstitutional or invalid by a competent court, the other sections and provisions hereof which are not affected thereby shall continue to be in full force and effect.

SECTION 2102. Repealing and Amending Clause

All Administrative Orders, rules and regulations, memoranda circulars and other issuances inconsistent herewith or contrary to the provisions of these rules and regulations are hereby repealed or modified accordingly.

SECTION 2103. Effectivity

This **IRR** shall take effect fifteen (15) days after its publication once a week for three (3) consecutive weeks in a newspaper of general circulation.

Annotation: The DPWH published these 2004 Revised Implementing Rules and Regulations (IRR) of P.D. No. 1096 (the 1977 NBCP) on 01, 08 and 15 April 2005 in the Manila Standard Today. These IRR took effect 01 May 2005.

While a preliminary injunction against its sections 302.4 & 4 (limiting the signing and sealing of architectural documents only to registered and licensed architects (RLAs) was issued in May 2005, the said injunction was lifted (by the same court that issued the injunction) by vitue of a Court Order cum Decision dated 29 January 2008.

To date, only RLAs can prepare, sign and seal architectural documents, in full accordance with R.A. No. 9266 (The Architecture Act of 2004), its IRR and derivative regulations and in accordance with these Revised IRR.

APPROVED this **29th of October 2004**.

Original Signed
FLORANTE SORIQUEZ
Acting Secretary

(emphases, underscoring and annotation supplied)

Building Permit Form follows.

NBC FORM NO. B - 01

Republic of the Philippines
City/Municipality of _____
Province of _____

OFFICE OF THE BUILDING OFFICIAL

APPLICATION FOR BUILDING PERMIT

☐ NEW ☐ RENEWAL ☐ AMENDATORY

APPLICATION NO. | | | | | | | | | |

AREA NO | | | | | | | | | |

BOX 1 (TO BE ACCOMPLISHED IN PRINT BY THE APPLICANT)

DO NOT FILL-UP (NSO USE ONLY)

OWNER/APPLICANT LAST NAME	FIRST NAME	M.I.	TIN

FOR CONSTRUCTION OWNED BY AN ENTERPRISE	FORM OF OWNERSHIP

ADDRESS: NO., STREET,	BARANGAY,	CITY/MUNICIPALITY	ZIP CODE	TELEPHONE NO.

LOCATION OF CONSTRUCTION: LOT NO. _____ BLK NO. _____ TCT NO. _____ TAX DEC. NO. _____

STREET_____ BARANGAY _____ CITY/ MUNICIPALITY OF_____

SCOPE OF WORK

☐ NEW CONSTRUCTION ☐ RENOVATION _____ ☐ RAISING _____
☐ ERECTION_____ ☐ CONVERSION _____ ☐ ACCESSORY BUILDING/STRUCTURE _____
☐ ADDITION _____ ☐ REPAIR _____ ☐ OTHERS (Specify) _____
☐ ALTERATION _____ ☐ MOVING _____ _____

USE OR CHARACTER OF OCCUPANCY

☐ GROUP A : RESIDENTIAL, DWELLINGS
☐ GROUP B : RESIDENTIAL HOTEL, APARTMENT
☐ GROUP C : EDUCATIONAL, RECREATIONAL
☐ GROUP D : INSTITUTIONAL
☐ GROUP E : BUSINESS AND MERCANTILE
☐ GROUP F : INDUSTRIAL
☐ GROUP G : INDUSTRIAL STORAGE AND HAZARDOUS
☐ GROUP H : RECREATIONAL, ASSEMBLY OCCUPANT LOAD LESS THAN 1000
☐ GROUP I : RECREATIONAL, ASSEMBLY OCCUPANT LOAD 1000 OR MORE
☐ GROUP J : AGRICULTURAL, ACCESSORY
☐ OTHERS (Specify) _____

OCCUPANCY CLASSIFIED _____
NUMBER OF UNITS_____
TOTAL FLOOR AREA _____ SQUARE METERS

TOTAL ESTIMATED COST P _____
PROPOSED DATE OF CONSTRUCTION _____
EXPECTED DATE OF COMPLETION_____

BOX 2

FULL-TIME INSPECTOR AND SUPERVISOR OF CONSTRUCTION WORKS (REPRESENTING THE OWNER)

	Address	
_____		
ARCHITECT OR CIVIL ENGINEER (Signed and Sealed Over Printed Name) Date_____	PRC No.	Validity
	PTR No.	Date Issued
	Issued at	TIN

BOX 3

APPLICANT:

_____ Date_____
(Signature Over Printed Name)

Address		
CTC No	Date Issued	Place Issued

BOX 4

WITH MY CONSENT: **LOT OWNER**

_____ Date_____
(Signature Over Printed Name)

Address		
CTC No	Date Issued	Place Issued

BOX 5

REPUBLIC OF THE PHILIPPINES)
CITY/MUNICIPALITY OF _____) S.S

BEFORE ME, at the City/Municipality of _____, on _____ personally appeared the following:

_____ APPLICANT	_____ C.T.C. No.	_____ Date Issued	_____ Place Issued
_____ LICENSED ARCHITECT OR CIVIL ENGINEER (Full-Time Inspector and Supervisor of Construction Works)	_____ C.T.C. No.	_____ Date Issued	_____ Place Issued

whose signatures appear hereinabove, known to me to be the same persons who executed this standard prescribed form and acknowledged to me that the same is their free and voluntary act and deed.

WITNESS MY HAND AND SEAL on the date and place above written.

Doc. No. _____
Page No. _____
Book No. _____
Series of _____

_____
NOTARY PUBLIC (Until December _____)

BOX 6 (TO BE ACCOMPLISHED BY THE PROCESSING AND EVALUATION DIVISION)

ASSESSED FEES	ASSESSED BY	AMOUNT DUE	DATE PAID	O.R. NUMBER	NSO
☐ FILING FEE					
☐ PROCESSING FEE					
☐ LOCATIONAL/ZONING OF LAND USE					
☐ LINE AND GRADE (Geodetic)					
☐ FENCING					
☐ ARCHITECTURAL					
☐ CIVIL/STRUCTURAL					
☐ ELECTRICAL					
☐ MECHANICAL					
☐ SANITARY					
☐ PLUMBING					
☐ ELECTRONICS					
☐ INTERIOR					
☐ ONE HALF (½) OF FIRE SERVICE FUND (FSF)					
	TOTAL				

BOX 7 (TO BE ACCOMPLISHED BY THE BUILDING OFFICIAL)

BUILDING PERMIT

BUILDING PERMIT NO. ☐☐☐☐☐☐☐☐

OFFICIAL RECEIPT NO. ☐☐☐☐☐☐☐☐

DATE ISSUED ☐☐☐☐☐☐ (M M D D Y Y)

DATE PAID ☐☐☐☐☐☐ (M M D D Y Y)

Permit is issued to_____ (Owner/Applicant) for the proposed _____ (Type of Project)
under_____ (Use or Character of Occupancy), of Group_____, located at Lot No._____Block No._____OCT/TCT No. _____,
_____Street, Barangay_____, City/Municipality of_____ subject to the following:

1. That under Article 1723 of the Civil Code of the Philippines, the engineer or architect who drew up the plans and specifications for a building/structure is liable for damages if within fifteen (15) years from the completion of the building/structure, the same should collapse due to defect in the plans or specifications or defects in the ground. The engineer or architect who supervises the construction shall be solidarily liable with the contractor should the edifice collapse due to defect in the construction or the use of inferior materials.
2. This permit shall be accompanied by the various applicable ancillary and accessory permits, plans and specifications signed and sealed by the corresponding design professionals who shall be responsible for the comprehensive and correctness of the plans in compliance to the Code and its IRR and to all applicable referral codes and professional regulatory laws.
3. That the proposed construction/erection/addition/alteration/renovation/conversion/repair/moving/demolition, etc. shall be in conformity with the provisions of the National Building Code, and its IRR.
   a. That prior to commencement of the proposed projects and construction an actual relocation survey shall be conducted by a duly licensed Geodetic Engineer.
   b. That before commencing the excavation the person making or causing the excavation to be made shall notify in writing the owner of adjoining property not less than ten (10) days before such excavation is to be made and show how the adjoining property should be protected.
   c. That no person shall use or occupy a street, alley or public sidewalk for the performance of work covered by a building permit.
   d. That no person shall perform any work on any building or structure adjacent to a public way in general use for pedestrian travel, unless the pedestrians are protected.
   e. That the supervising Architect/Civil Engineer shall keep at the jobsite at all times a logbook of daily construction activities wherein the actual daily progress of construction including tests conducted, weather condition and other pertinent data are to be recorded, same shall be made available for scrutiny and comments by the OBO representative during the conduct of his/her inspection pursuant to Section 207 of the National Building Code.
   f. That upon completion of the construction, the said licensed supervising Architect/Civil Engineer shall submit to the Building Official duly signed and sealed logbook, as-built plans and other documents and shall also prepare and submit a Certificate of Completion of the project stating that the construction of the building/structure conform to the provision of the Code, its IRR as well as the plans and specifications.
   g. All such changes, modifications and alterations shall likewise be submitted to the Building Official and the subsequent amendatory permit therefor issued before any work on said changes, modifications and alterations shall be started. The as-built plans and specifications maybe just an orderly and comprehensive compilation of all documents which include the originally submitted plans and specifications of all amendments thereto as actually built or they may be an entirely new set of plans and specifications accurately describing and/or reflecting therein the building as actually built.
4. That no building/structure shall be used until the Building Official has issued a Certificate of Occupancy therefor as provided in the Code. However, a partial Certificate of Occupancy may be issued for the Use/Occupancy of a portion or portions of a building/structure prior to the completion of the entire building/structure.
5. That this permit shall not serve as an exemption from securing written clearances from various government authorities exercising regulatory function affecting buildings/structures.
6. When the construction is undertaken by contract, the work shall be done by a duly licensed and registered contractor pursuant to the provisions of the Contractor's License Law (RA 4566).
7. The Owner/Permittee shall submit a duly accomplished prescribed "**Notice of Construction**" to the Office of the Building Official prior to any construction activity.
8. The Owner/Permittee shall put a Building Permit sign which complies with the prescribed dimensions and information, which shall remain posted on the construction site for the duration of the construction.

PERMIT ISSUED BY:

_____

BUILDING OFFICIAL
(Signature Over Printed Name)
Date _____

NOTE : THIS PERMIT MAY BE CANCELLED OR REVOKED PURSUANT TO SECTIONS 305 AND 306 OF THE "NATIONAL BUILDING CODE"

Nothing follows.