



STATE OF SELANGOR

SUBSIDIARY LEGISLATION

STREET, DRAINAGE AND BUILDING ACT 1974

Sel. P.U. 26/1985

SELANGOR UNIFORM BUILDING BY-LAWS 1986

[Incorporating latest amendments Sel. P.U. 142/2012]

Date of publication:

19 December 1985

Date of coming into operation:

1 January 1986

ARRANGEMENT OF BY-LAWS

Preamble

PART I - PRELIMINARY

By-Law 1. Citation, application and commencement.

By-Law 2. Interpretation.

PART 1A - DEMOLITION OF BUILDING

By-Law 2A. Application of this Part.

By-law 2B. Preparation and submission of demolition plan, etc.

By-Law 2C. Power of local authority to reject demolition plan and stability report.

By-Law 2D. Notice of commencement or resumption of building operations.

By-Law 2E. Methods of demolition.

By-Law 2F. Duties of submitting person.

By-Law 2G. Exemption from this Part.

PART II - SUBMISSION OF PLANS FOR APPROVAL

By-Law 3. Submission of plans for approval.

By-Law 4. Return of plan.

By-Law 5. Supervision of work.

By-Law 6. Plans to be signed.

By-Law 7. Withdrawal or change of principal submitting person or submitting person.
By-Law 8. Plans to be deposited in triplicate.
By-Law 9. Scale of plans.
By-Law 10. Plans required.
By-Law 11. Exemption from by-law 10.
By-Law 12. Sketch plans for approval in principle.
By-Law 13. Special permission to commence building operations.
By-Law 14. Plans of alterations.
By-Law 14A. Prohibition against altering facade.
By-Law 15. Specification.
By-Law 15A. Power of the Perbadanan to determine colour code of exterior of proposed building.
By-Law 16. Details and calculations of structural plans.
By-Law 17. Power of local authority to reject structural plans and calculations.
By-Law 18. Permits.
By-Law 19. Temporary permits.
By-Law 20. Advertisement hoardings
By-Law 21. Materials not to be deposited in a street without permission.
By-Law 22. Notice of commencement or resumption of building operations.
By-Law 23. [Deleted].
By-Law 24. [Deleted].
By-Law 25. Certificate of completion and compliance.
By-Law 25A. [Deleted].
By-Law 26. [Deleted].
By-Law 27. Partial certificate of completion and compliance.
By-Law 28. Offences.
By-Law 29. Fees for consideration of plans and for permits.

PART III - SPACE, LIGHT AND VENTILATION

By-Law 30. Open spaces to be provided.
By-Law 31. Open spaces not to be altered or roofed.
By-Law 32. Space about buildings abutting a street and a backlane.
By-Law 33. Space about buildings on lots abutting a street and having no backlane.
By-Law 34. Space about detached buildings.
By-Law 34A. Buildings requirements for disabled persons.
By-Law 35. Access from a street.
By-Law 36. Splayed corners.
By-Law 37. Projections over the street and over the building line.
By-Law 38. Width of footway.
By-law 38A. Energy efficiency in buildings.
By-law 38B. Protection of building structures against lightning strikes.
By-Law 39. Natural lighting and ventilation.
By-Law 40. Air-wells.
By-Law 41. Mechanical ventilation and air-conditioning.
By-Law 42. Minimum area of rooms in residential buildings.
By-Law 43. Minimum dimensions of latrines, water-closets and bathrooms.
By-Law 44. Height of rooms in residential buildings, shophouses, school, etc.
By-Law 45. Height of rooms in places of public resorts.
By-Law 46. Heights of rooms in other buildings.
By-Law 47. Projections over a verandah-way.

PART IV - TEMPORARY WORKS IN CONNECTION WITH BUILDING OPERATIONS

By-Law 48. Commencement of building operation.
By-Law 49. Responsibility of persons granted temporary permits.
By-Law 50. Cancellation of temporary permit

- By-Law 51. Vehicular access to site.
- By-Law 52. Rising mains to be installed progressively.

PART V - STRUCTURAL REQUIREMENTS

- By-Law 53. Building materials.
- By-Law 54. General requirements of loading.
- By-Law 55. Dead and imposed loads.
- By-Law 56. Dead loads calculated from weights of materials used.
- By-Law 57. Weight of partitions.
- By-Law 58. Contents of tanks and other receptacles.
- By-Law 59. Imposed floor loads.
- By-Law 60. Mechanical stacking.
- By-Law 61. Imposed loads on ceilings, skylights and similar structures.
- By-Law 62. Reduction in total imposed floor loads.
- By-Law 63. Imposed roof loads.
- By-Law 64. Curved roofs.
- By-Law 65. Roof coverings.
- By-Law 66. Internal suspended loads on primary structural members.
- By-Law 67. Amount of suspended load.
- By-Law 68. Dynamic loading.
- By-Law 69. Crane gantry girders.
- By-Law 70. Parapets and balustrades.
- By-Law 71. Vehicle barriers for car parks.
- By-Law 72. Basement walls and floors.
- By-Law 73. Foundations.
- By-Law 74. [Deleted].
- By-Law 75. Reinforced concrete foundations.
- By-Law 76. [Deleted].
- By-Law 76A. Buildings on hill slopes.
- By-Law 77. [Deleted].
- By-Law 78. Foundations below invert of drains.
- By-Law 79. Foundations under external and party walls.
- By-Law 80. Structure above foundations.

PART VI - CONSTRUCTIONAL REQUIREMENTS.

- By-Law 81. Building site.
- By-Law 82. Drainage of subsoil.
- By-Law 83. Protection against soil erosion, etc.
- By-Law 84. Prevention of dampness.
- By-Law 85. Nominal thickness of walls.
- By-Law 86. [Deleted].
- By-Law 87. [Deleted].
- By-Law 88. Recess.
- By-Law 89. [Deleted].
- By-Law 90. Underpinning.
- By-Law 91. Coping, etc., to be impervious.
- By-Law 92. [Deleted].
- By-Law 93. Measurement of the length of a wall.
- By-Law 94. [Deleted].
- By-Law 95. External panel walls.
- By-Law 96. Non load-bearing partition.
- By-Law 97. [Deleted].
- By-Law 98. Fences and boundary walls.
- By-Law 99. Cooking facilities in residential buildings.

By-Law 100. [Deleted].
By-Law 101. Boilers, fireplaces, forges and incinerators in factories.
By-Law 102. Combustible materials adjoining smoke flues.
By-Law 103. [Deleted].
By-Law 104. [Deleted].
By-Law 105. Space below floors to be ventilated.
By-Law 106. Dimensions of staircases.
By-Law 107. Handrails.
By-Law 108. Maximum flights.
By-Law 109. Winders.
By-Law 110. No obstructions in staircases.
By-Law 111. Lighting and ventilation of staircases.
By-Law 112. Enclosure of staircases in a shop.
By-Law 113. Use of timber staircases.
By-Law 114. [Deleted].
By-Law 115. Roof coverings and drainage with a rainwater harvesting and utilisation system (SPAH).
By-Law 116. Accessible flat roofs, balconies, etc.
By-Law 117. Access to roof space.
By-Law 118. [Deleted]
By-Law 119. Change of use of building.
By-Law 120. [Deleted].
By-Law 121. [Deleted].
By-Law 122. [Deleted].
By-Law 123. [Deleted].
By-Law 124. Lifts.
By-Law 125. Swimming pools.
By-Law 126. Steps and footway.
By-Law 127. Opening into swimming pool.
By-Law 128. Depth of water.
By-Law 129. Location of diving boards.
By-Law 130. Changing rooms.
By-Law 131. Foot-baths and shower.
By-Law 132. Private, residential swimming pools.

PART VII - FIRE REQUIREMENTS

By-Law 133. Interpretations.
By-Law 134. Designation of purpose groups.
By-Law 135. Rules of measurement.
By-Law 136. Provision of compartment walls and compartment floors.
By-Law 137. Compartmentation by height.
By-Law 138. Other walls and floors to be constructed as compartment walls or compartment floor.
By-Law 139. Separation of fire risk areas.
By-Law 140. Fire appliance access.
By-Law 141. Separating walls.
By-Law 142. External walls.
By-Law 143. Beam or column.
By-Law 144. Cladding on external wall.
By-Law 145. Reference to Sixth Schedule.
By-Law 146. Relevant boundary.
By-Law 147. Construction of separating walls.
By-Law 148. Special requirements as to compartment walls and compartment floors.
By-Law 149. Horizontal and vertical barriers at the external walls.
By-Law 150. Protected shafts.
By-Law 151. Ventilation to lift shafts.
By-Law 152. Openings in lift shafts.

By-Law 153. Smoke detectors for lift lobbies.
By-Law 154. [Deleted].
By-Law 155. Fire mode of operation.
By-Law 156. Protected shafts as ventilating duct.
By-Law 157. Protected shafts consisting of staircase.
By-Law 158. Stages in places of assembly.
By-Law 159. Open stages.
By-Law 160. Fire precaution in air-conditioning systems.
By-Law 161. Fire-stopping.
By-Law 162. Fire doors in compartment walls and separating walls.
By-Law 163. Fire doors.
By-Law 164. Door closers for fire doors.
By-Law 165. Measurement of travel distance to exits.
By-Law 166. Exits to be accessible at all times.
By-Law 167. Storey exits.
By-Law 168. Staircases.
By-Law 169. Exit route.
By-Law 170. Egress through unenclosed openings.
By-Law 171. Horizontal exits.
By-Law 172. Emergency exit signs.
By-Law 173. Exit doors.
By-Law 174. Arrangement of storey exits.
By-Law 175. Calculation of occupancy loads.
By-Law 176. Computing storey exit width.
By-Law 177. Computing number of staircases and staircase width.
By-Law 178. Exits for institutional and other places of assembly.
By-Law 179. Classification of places of assembly.
By-Law 180. Spaced standards for calculating occupancy loads.
By-Law 181. Width of means of egress.
By-Law 182. Rate of discharge.
By-Law 183. Exit details for places of assembly.
By-Law 184. Seating.
By-Law 185. Gangways in places of ass
By-Law 186. Exit doors in places of assembly.
By-Law 187. Notice affixed to door of gate.
By-Law 188. Travel distance in places of assembly.
By-Law 189. Enclosing means of escape in certain buildings.
By-Law 190. External staircase.
By-Law 191. Openings in adjacent walls not permitted.
By-Law 192. Moving walks.
By-Law 193. Power operated doors as means of egress.
By-Law 194. Building with single staircase.
By-Law 195. Staircases to reach roof level.
By-Law 196. Smoke lobbies.
By-Law 197. Protected lobbies.
By-Law 197A. Means of access and fire fighting in building over 18.0 metres high.
By-Law 197B. Fire fighting access lobbies.
By-Law 198. Ventilation of staircase enclosures.
By-Law 199. Ventilation of staircase enclosures in buildings not exceeding three storeys or 18 metres.
By-Law 200. Ventilation of staircase enclosures in buildings exceeding 18 metres.
By-Law 201. Staircase enclosures below ground level.
By-Law 202. Pressurized system for staircases.
By-Law 203. Restriction of spread of flame.
By-Law 204. Classification of restriction of flame over surfaces of wall and ceiling.
By-Law 205. Classification of interior finish materials.
By-Law 206. Classification of surface of wall or ceiling.

By-Law 207. Exception relating to ceilings.
By-Law 208. Reference to roofs.
By-Law 209. Reference to buildings.
By-Law 210. Construction of roofs.
By-Law 211. Roofing materials.
By-law 211A. Materials for construction.
By-Law 212. Category designation for fire penetration and spread of flame on roof surface.
By-Law 213. Fire resistance.
By-Law 214. Additional requirements.
By-Law 215. Height of buildings.
By-Law 216. Single storey buildings.
By-Law 217. Fire resistance of structural member.
By-Law 218. Compartment wall separating flats and maisonnette.
By-Law 219. Application of these By-laws to floors.
By-Law 220. Floor area and capacity of buildings and compartments.
By-Law 221. Test of fire resistance.
By-Law 222. Fire resistance for walls.
By-Law 223. Fire resistance for floors above ground floor.
By-Law 224. Fire resistance for any element of structure.

PART VIII - FIRE DETECTION, FIRE ALARM AND FIRE EXTINGUISHMENT

By-Law 225. Detecting, warning and extinguishing fire.
By-Law 226. Automatic system for hazardous occupancy.
By-law 226A. Hose reel systems.
By-Law 227. Portable extinguishers.
By-Law 228. Sprinkles systems.
By-Law 229. Means of access and fire fighting in building over 18 metres high.
By-Law 230. Dry riser systems.
By-Law 231. Wet riser systems.
By-Law 232. Wet or dry rising system for buildings under construction.
By-Law 233. [Deleted].
By-Law 234. [Deleted].
By-Law 235. Fixed extinguishing systems.
By-Law 236. Special hazards.
By-Law 237. Fire detection and fire alarms systems.
By-Law 238. Fire Command Centre.
By-Law 239. Voice communication system.
By-Law 240. Electrical isolation switch.
By-Law 241. Special requirements for fire alarm systems.
By-Law 242. [Deleted].
By-Law 243. [Deleted].
By-law 243A. Emergency mode of operation in the event mains power failure.
By-Law 244. [Deleted].
By-Law 245. Approval of D.G.F.R.
By-Law 246. [Deleted].
By-Law 247. [Deleted].
By-Law 248. Marking on wet riser, etc.
By-Law 249. Smoke and heat venting.
By-Law 250. Natural draught smoke vent.
By-Law 251. Smoke vents to prevent dangerous accumulation of smoke.
By-Law 252. [Deleted].
By-law 252A. Atriums in buildings.
By-Law 253. Emergency power system.
By-law 253A. Emergency lights.

PART IX – MISCELLANEOUS

By-Law 254. Buildings to which Parts VII and VIII apply.
By-Law 255. Power of local authority to extend period, etc.
By-Law 256. Buildings exempted.
By-Law 257. Application of standard or code of practice.
By-Law 258. Failure to Buildings.
By-Law 259. Repeal.

SCHEDULES

FIRST SCHEDULE: Fees for consideration of plans, permits, etc.

SECOND SCHEDULE: Form A - Form G 21

THIRD SCHEDULE: Interpretation

FOURTH SCHEDULE - [Deleted -Sel. P.U.142/2012]
FOURTH SCHEDULE - [Deleted -Sel..P.U.142/2012]
FOURTH SCHEDULE - [Deleted -Sel..P.U.142/2012]
FOURTH SCHEDULE - [Deleted -Sel..P.U.142/2012]

FIFTH SCHEDULE: Designation of purpose groups

SIXTH SCHEDULE: Calculation of permitted limits of unprotected areas.

SEVENTH SCHEDULE: Maximum travel distance and Calculation of occupant load and capacity of exits.

EIGHT SCHEDULE: Classification of restriction of spread of flame over surfaces of walls and ceilings.

NINTH SCHEDULE: Limits of compartments and minimum periods of fire resistance for elements of structure.

TENTH SCHEDULE: Table of requirements for fire detection, fire alarm and fire extinguishment systems.

LIST OF AMENDMENTS

Preamble

IN exercise of the powers conferred by section 133 of the Street, Drainage and Building Act 1974 [Act 133], the State Authority makes the following by-laws:

PART I PRELIMINARY

1. Citation, application and commencement

(1) These by-laws may be cited as the **Selangor Uniform Building By-Laws 1986** and shall apply to all the City, Municipal and District Council in the State of Selangor.

[Am. Sel. P.U. 9/2007]

(2) These By-laws shall come into force on the 1st of January, 1986.

2. Interpretation.

In these By-laws, unless the context otherwise requires-

"Act" means the Street, Drainage and Building Act 1974;

"advertisement hoarding" means any frame, hoarding, board, wall, bar, pillar, post, wire, or any combination of these, or any erection of any kind, or any surface or space used for the display of trade, business or professional advertisements;

"aggregate" means any material other than cement and water used in the making of concrete which does not contain additions or admixtures;

"alterations" includes additions and extensions;

"approved" means approved by the local authority;

"approved plan" means a plan for a building approved by the local authority in accordance with these By-laws;

"architect" means any person who is registered as a Professional Architect under any law relating to the registration of architects and who under that law is allowed to practise or carry on business as an architect;

["architect" Am. Sel. P.U. 9/2007]

"ASHARE" means the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.;

"balcony" means any stage, platform, oriel window or other similar structure projecting outwards from the wall of a building and supported by brackets and cantilevered;

"base" in relation to a wall or pier means-

(a) the underside of the course immediately above the footings, if any, or in the case of wall carried by a beam, above the beam; and

(b) in any other case the bottom of such wall or pier;

"basement" means any storey or storeys of a building which is or are at a level lower than the ground storey;

"building draughtsman" means any building draughtsman who is registered under the relevant Act;

["building draughtsman" Subs. Sel. P.U. 9/2007]

"building line" means the line prescribed by either the competent planning authority or the local authority beyond which no part of a building may project, except as otherwise permitted by these By-laws;

"building plans" means plans that include site plans, key plans, floor plans, sections and elevations of buildings, and are as stipulated in by-laws 8, 9 and 10;

"BS" means the latest published edition of the British Standard Specification;

"BSCP" means the latest published edition of the British Standard Code of Practice;

"ceiling" means the covering to the underside of floor joists or ceiling joist or floor slabs excluding in all cases any supporting beams, and where no such covering exists means the underside of floor joists or root cellars or ties excluding any supporting beams;

"certificate of completion and compliance" means a certificate issued under by-law 25;

["certificate of completion and compliance" Ins. Sel. P.U. 40/1999; Am Sel. P.U. 9/2007]

"column" , in relation to structural steel, timber or reinforced concrete, means any part of construction which will by its resistance to compression in the direction of its length and to the bending actions induced by such compression, support and transmit loading;

"dead load" means that static weight of all walls, partitions, floors, roofs and finishes, including all other permanent construction.

"depth", in respect of a building, means the measured distance between the front line of the building and the back line of the rear main wall which separates the main building from the open space;

"detached building" means any building not attached to any other buildings;

"disabled persons" means people with a physical, hearing or sight impairment which affects their mobility of their use of buildings as referred to under by-laws 34A.

["disabled persons" Ins. Sel. P.U. 95/1993]

"engineer" means a person who is registered as a Professional Engineer under any law relating to the registration of engineers and who under the law is allowed to practice or carry on the business of an engineer;

["engineer" Am. Sel. P.U. 9/2007]

"external wall" means an outer wall of a building not being a party wall notwithstanding that it may immediately adjoin a wall of another building;

"factory" means any building or part thereof designed, adapted or used for-

(a) the making of any article or part of any article, commodity or product; or

(b) the altering, repairing, ornamenting, finishing, cleaning, washing or the breaking up or demolition of any article, commodity or product; or

(c) the adapting for sale or assembly of any article, commodity or products; and

(d) any other building as defined in the Factories and Machinery Act 1967 [Act 139];

"fire wall" means any wall, not being a party wall or external wall, of materials having the fire resistance as required under Part VII of these By-laws and either used or constructed to be used for the separation adjoining buildings or the separation of parts of a building in such manner as to prevent or reduce the spreading of fire from one building to another or from one part of a building to another part of that building and includes a proscenium wall, compartment wall, separating wall and a protecting structure;

"flat" means any separate dwelling used or constructed or adapted to be used wholly or principally for human habitation for a single family, where the kitchen, lavatory and bathroom or water-closet are contained within the separate dwelling and that dwelling is contained in a building comprising two or more such dwellings joined vertically;

"flat roof" means any roof having no inclinations or having an inclination of not more than seven and one-half degrees with the horizontal;

"flood level" means such flood level as may be prescribed for any area by the local authority;

"floor" includes any horizontal platform forming the surface of any storey and any joist, board, timber, stone, concrete, steel or other substance connected with or forming part of such platform;

"footing" means the construction whereby the weight of the structure of building is transferred from the base structure to the foundations;

"foundation" means a system or arrangement of foundation units such as footing, raft or pile through which the loads from a building or structure are transferred to the supporting soil or rock;

"garage" for purposes of these By-laws, means a building or part thereof designed, adapted or used for the housing of motor vehicles";

"godown" means any building or part thereof designed, adapted or used for storage purposes but does not include any garage ancillary to a residential building;

"ground storey" means the lowest storey of a building to which there is an entrance from the outside on or above the level of the ground at the front of the building;

"habitable rooms" means any room not less 6.5 square metres in area but does not include any bathroom, water-closet, open verandah, terrace or garage;

"hardwood timber" for the purpose of these By-laws includes Cengal Batu, Balau, Resak, Tempenis, Jati, Cengal, Merbau, Kapur, Belian, Tembusu, Damar Laut Merah, Keruing, Teak or any similar natural durable heavy timber classified as such by the Forestry Department;

"headroom" means the clear vertical distance between the finished floor level and the soffit of the lowest projecting member or surface above that point;

"height" in relation to –

(a) a room means the vertical distance measured between the finished floor level and the underside of the ceiling excluding the thickness of the plaster;

(b) any storey means the vertical distance measured between the upper surfaces of its floor to the upper surface of the floor immediately above it;

(c) a wall means the vertical distance measured from the base of the wall to its highest part or, in the case of a gable, to half the height of the gable;

"hospital" means any building or part thereof designed, adapted or used for the care, accommodation or treatment of the sick, infirm, aged, convalescent or pregnant;

"hotel" means any building specifically designed and constructed or substantially adapted to be used to accommodate persons for the purpose of gain or profit, with or without arrangements for communal feeding, and includes a boarding house, lodging house or guest house;

"imposed load" means the load assumed to be produced by the intended occupancy or use including distributed, concentrated impact and inertia loads but excluding wind loads;

"lateral support", in relation to a wall or pier, means such support in the direction of the thickness, length or breadth of the wall or pier which prevents movement thereof at the level and in line of direction of such support;

"layout plan" means a plan approved by the competent planning authority;

"lintel" means a beam supporting walling over an opening or recess;

"load bearing", in relation to any part of a building its foundations, means that part of the building which bears a load other than that due to its own weight and to wind pressure on its own surface;

"low lying land" means any land of which the surface is below flood level or which is so situated that it cannot at all times be efficiently drained by gravitation into an existing public surface water drain or water course;

"mesh" in the relation to the measurement of materials, means the mesh of a sieve complying with BS 410- Test Sieves;

"mezzanine floor" means any floor interposed between the main floors of a building and includes any platform or landing of greater than 2.5 metres width;

"MS" means the latest published edition of the Malaysian Standard;

"MS EN" means the latest published edition of the Malaysian Standard which is identical to the European Standard;

["MS EN" Ins. Sel.P.U.142/2012]

"MSCP" means the latest published edition of the Malaysian Standard Code of Practice;

"panel wall" means a non-load bearing wall set within a structural frame;

"partition" means any internal wall not being a party or an external wall;

"party wall" means a wall forming part of a building and used or constructed to be used for separation of adjoining buildings belonging to different owners or occupied or constructed or adapted to be occupied by different persons either constructed over or abutting a common boundary;

"pitched roof" means a roof having an inclination of more than seven and a-half degrees with the horizontal;

"prestressed concrete" means concrete in which predetermined stresses are induced to counteract the stresses due to dead and superimposed loading for the purpose of eliminating or decreasing the tensile stresses due to bending and shear;

"principal submitting person" means a qualified person who submits building plans to the local authority for approval in accordance with these By-Laws and includes any other qualified person who takes over the duties and responsibilities of or acts for the first-mentioned qualified person in accordance with by-law 7;

["principal submitting person" Ins. Sel. P.U. 9/2007]

"qualified person" means a Professional Architect, Professional Engineer or building draughtsman registered under any written law relating to the registration thereof;

["qualified person Subs. Sel. P.U. 9/2007]

"residential building" means a building of part thereof designed, adapted or used for human habitation;

"room" means any portion of a building enclosed by walls or partitions;

"school" means any building or part thereof design, adapted or used for the dissemination of knowledge and includes a *creche*.

"SPAH" means "A Rainwater Harvesting and Utilisation System" where rainwater is collected from a roof conveyed to a rainwater tank stored for use.

["SPAH" Ins. Sel. P.U. 40/2012]

"self-closing door" means a door fitted with a device which is free from any means of holding it in an open position and which will close automatically unless held open by other approved means;

"semi-detached building" means any building designed to be built as one pair having a party wall as one of its walls;

"shophouse" means any building, part of which is designed, adapted or used for business purposes;

"singly built detached house" [Ins. Sel. P.U. 40/1999; Deleted by Sel. P.U. 9/2007]

"smoke stop door" means a door or pair of doors which when fitted in a frame satisfies the requirements of section 7 of BS 476: Part 8: 1972 as to freedom from collapse for not less than thirty minutes and is resistant to the passage of flame and hot gases for not less than twenty minutes and which is fitted with minimum practicable clearances between the leaf and frame;

"storey" means the space between the upper surface of every floor and the surface of the floor next to above it, or if there be no such floor then the underside of the tie or collar beam of the roof or other covering or if there be neither tie nor collar beam then the level of half the vertical height of the underside of the rafters or other support of the roof;

"submitting person" means a qualified person who submits plans, other than building plans, to the local authority or relevant statutory authority in accordance with these By-Laws and includes any other qualified person who takes over the duties and responsibilities of or acts for the first mentioned qualified person in accordance with by-law 7;

["submitting person" Subs. Sel. P.U. 9/2007]

"swimming pool" means any pool or bath for the purpose of swimming;

"technical conditions" means conditions pertaining to health and safety issues relating to buildings and essential services serving the buildings;

["technical conditions" Ins. Sel. P.U. 9/2007]

"temporary building" means includes any building constructed wholly or in part of materials which are, in the absence of special care, liable to rapid deterioration, or are otherwise unsuitable for use in the construction of permanent buildings, and may include any house or building the erection of which is permitted under licence issued by the local authority for a limited period to be specified upon the expiration of which the building shall be demolished;

"terrace house" means any residential building designed as a single dwelling unit and forming part of a row or terrace of not less than three such residential buildings;

"verandah-way" means a covered footway fronting a street;

"wind load" means all loads due to the effect of wind pressure or suction.

PART 1A DEMOLITION OF BUILDING

2A. Application of this Part

This Part shall apply to the demolition of a building before reconstruction thereof.

[Ins.Sel.P.U.142/2012]

2B. Preparation and submission of demolition plan, etc

(1) Before the demolition is commenced, one copy of the detailed demolition plan together with a copy of the stability report prepared in accordance with MS 2318:2010 (P) shall be submitted to the local authority.

(2) The detailed demolition plan shall bear a certificate by the submitting person as in Form A of the Second Schedule to the effect that the details are in accordance with MS 2318:2010 (P) and that the submitting person accepts full responsibility.

[Ins. Sel.P.U.142/2012]

2C. Power of local authority to reject demolition plan and stability report.

Notwithstanding paragraph (2) of by-law 2B, the local authority may examine and in so doing may reject any demolition plan or stability report which is not in accordance with MS 2318:2010 (P) and if it rejects such plan or report it may require such submitting person to resubmit a new demolition plan or stability report in respect of the rejected portion.

[Ins. Sel.P.U.142/2012]

2D. Notice of commencement or resumption of building operations

(1) Notice of the intention to commence or resume the demolition of a building required under subsection 70(9) of the Act shall be made in Form B of the Second Schedule and shall include particulars of the intended work.

(2) If the work is not commenced or resumed on the date given in such notice, a further notice in Form B of the Second Schedule shall be given before the work may be commenced or resumed.

[Ins. Sel.P.U.142/2012]

2E. Methods of demolition.

The demolition works shall conform to MS 2318:2010 (P).

[Ins. Sel.P.U.142/2012]

2F. Duties of submitting person.

(1) The submitting person certifying the plan under paragraph (2) of by-law 2B shall be responsible for the proper execution of the demolition works and shall continue to be so responsible until the completion of the demolition works unless—

(a) with the agreement of the local authority, another submitting person is appointed to take over;
or

(b) the local authority agrees to accept his withdrawal or replacement at the request of the owner provided that the demolition works has not commenced.

(2) Where the local authority agrees to accept the submitting person's withdrawal or replacement under subparagraph (1)(b), the demolition works shall not commence until another submitting person is appointed to take over.

(3) Where any submitting person who has submitted the demolition plan has died or become bankrupt or cannot be found or has been deregistered from the register or for any other reason ceased to practice, the owner or occupier shall as soon as practicable appoint another submitting person to act for him and to submit adequate evidence to the local authority of the circumstances.

[Ins. Sel.P.U.142/2012]

2G. Exemption from this Part

The local authority may if it deems fit exempt any minor demolition work from the requirements of this Part.

[*Ins. Sel.P.U.142/2012*]

PART II SUBMISSION OF PLANS FOR APPROVAL

3. Submission of plans for approval.

(1) All plans for buildings submitted to the local authority for approval in addition to the requirements of section 70 of the Act shall-

(a) be deposited at the office of the local authority together with the fees prescribed for the submission of such plans in accordance with the First Schedule to these By-laws;

(b) bear upon them a statement showing for what purpose the building for which the plans are submitted is to be erected and used;

(c) bear the certification of the principal submitting persons or submitting persons on these plans together with Form A as set out in the Second Schedule to these By-laws for which they are respectively responsible; and

[*(1)(c) (Am. Sel. P.U. 9/2007)*]

(d) [*Deleted - Sel.P.U.142/2012*].

(2) Every plan, drawing or calculation in respect of any building shall be submitted by a principal submitting person or submitting person.

[*(2) Am. Sel. P.U. 9/2007*]

4. Return of plan

(1) A local authority may if it is of the view that any plan, drawing or calculation is beyond the competence of such principal submitting person or submitting person submitting the same, return such plan, drawing or calculation.

(2) A local authority shall accept any returned plan, drawing or calculation if the same were re-submitted together with a certificate from the relevant competent authority responsible for registering such principal submitting person or submitting person, certifying that such plan, drawing or calculation is within the competence of such principal submitting person or submitting person submitting the same.

[*Am. Sel. P.U. 9/2007*]

5. Supervision of work

(1) Where under these By-laws any plan, drawing or calculation in relation to any building is required to be submitted by a principal submitting person or submitting person, no erection or continued erection of that building shall take place unless that principal submitting person or submitting person or any person duly authorised by him undertakes the supervision of the erection and the setting out, where applicable, of that building.

[(1) Am.Sel.P.U. 142/2012; Am. Sel. P.U 9/2007]

(2) The erection of a building shall be carried out under the fulltime supervision of a construction site supervisor who is accredited and certified by the Lembaga Pembangunan Industri Pembinaan Malaysia under the Lembaga Pembangunan Industri Pembinaan Malaysia Act 1994 [Act 520].

[(2) Ins.Sel.P.U. 142/2012]

6. Plans to be signed

(1) All plans submitted shall be signed by the principal submitting person or submitting person and by the owner or his agent and shall bear the full address of the owner.

(2) The local authority may, if satisfied that the owner of the premises has refused to or has failed to execute any work which is required under the Act to be executed by him, direct the owner of the premises in writing to execute such work.

[Am. Sel. P.U. 9/2007]

7. Withdrawal or change of principal submitting person or submitting person.

(1) The principal submitting person or submitting person submitting the plans shall be responsible for the proper execution of the works and shall continue to be so responsible until the completion of the works unless-

(a) with the agreement of the local authority another principal submitting person or submitting person is appointed to take over ; or

(b) the local authority agrees to accept his withdrawal or replacement at the request of the owner provided that the erection of a building has not commenced.

(2) Where the local authority agrees to accept a principal submitting person's or submitting person's withdrawal or replacement under paragraph (1) (b) of by-law 7 the works shall not commence until another principal submitting person or submitting person is appointed to take over.

(3) Where any principal submitting person or submitting person who has submitted any plan, drawing or calculation in respect of any building has died or become bankrupt or cannot be found or has been deregistered from the register or for any other reason ceased to practise, the owner or occupier shall as soon as practicable appoint another principal submitting person or submitting person to act for him and to submit adequate evidence to the local authority of the circumstances.

[Am. Sel. P.U. 9/2007]

8. Plans to be deposited in triplicate.

(1) All building plans shall be deposited in triplicate or in as many copies as may be required by the local authority.

(2) One set of the plans shall be returned after approval.

[(2) Am. Sel.P.U.142/2012]

(3) If the plans are disapproved, one set of such plans shall be returned with a statement explaining the reasons for disapproval.

(4) Nothing in this by-law shall prohibit the depositing of additional sets of plans if it is considered that by so doing the work of the local authority may be expedited.

9. Scale of plans.

(1) All plans shall be drawn to the following scales:

- | | |
|--|---|
| (a) site plans .. | not less than 1=1000 |
| (b) key or location plans | any convenient scale. |
| (c) all other general building plans | not less than 1=100 except in special cases where the size of the building renders drawings to this scale to be impracticable to accommodate within the limitations of paper sizes or when the drawings are of unwieldy dimensions, the local authority may use its discretion to permit plans to be submitted to a smaller scale but in no case shall the scale be less than 1=200 |
| (d) sketch plans for approval in principle | not less than 1=200 |

(2) Notwithstanding paragraph (1), all plans may be drawn in International System of Units.

10. Plans required.

(1) All building plans in respect of any building shall, unless inapplicable, contain the following:

[(1) Am. Sel. P.U. 9/52007]

(a) A site plan showing-

(i) the site of the proposed building lot together with the number of the lot and the section number;

(ii) the means of access to the site from the street and the name of the street;

(iii) the distance from the centre and side of roadway distinctly figured on one of such plans;

(iv) where required by the local authority the dimensions and area of the lot;

[(1) (a)(iv) Am. Sel.P.U.142/2012]

(v) the complete lines of surface water and foul water drainage and the point of discharge of the proposed drains;

(vi) the scale, North point and the numbers of adjoining lots or buildings;

(vii) the dimensions of clearances between the proposed building and the boundaries;

(viii) all lines of proposed adjustments of land or buildings for street, river or drainage improvements and such like where applicable showing the width of such new street or proposed new street and its connection with the nearest public street;

(ix) existing and proposed ground level of the site.

(x) the location of the rainwater tank;

(xi) SPAH elements such as piping system, rainwater tank, water pump and other related equipments (as required to install SPAH) must be clearly shown on the plan for the following category of buildings:

(aa) in respect of residential buildings, SPAH is required to be installed only for bungalows and semi detached houses with a roof area equivalent to or more than 100 m²; and

(bb) all detached buildings with roof area equivalent to or more than 100 m².

[(x) and (xi) Ins. Sel. P.U. 40/2012]

(b) A floor plan of each floor except when other floors are repetitive or are identical floors, containing the following information:

(i) figured dimensions of the lengths and breadths of the building and rooms and thickness of walls thereof;

(ii) figured dimensions of all door and window openings, the clear day-light area of air-wells, back areas and open spaces of the building;

(iii) figured dimensions between walls, piers and stanchions on the foundation plan of the building;

(iv) lines of permanent drainage of the site with arrows indicating the direction of flow, the drains into which they will discharge and their sizes;

(v) the names and uses of rooms.

(c) Cross, longitudinal and other sections to clearly delineate the construction of the building and showing-

(i) the existing ground level and proposed new ground level if the level of the site is to raised or lowered;

(ii) the level of street, roadside drain and verandah-way (if the building , abuts a street);

(iii) the width and depth of foundations and thickness of walls, partitions and floors thereof;

(iv) the height of storeys, staircases, doors, windows and ventilating openings thereof;

(v) the sizes, position and direction of floor joists and beams and the construction of the roof thereof; and

(vi) the materials to be used in the construction of the structure.

(d) Front, rear and side elevations showing-

(i) the levels of adjoining footways, verandah-ways, roads and the levels of the proposed counterparts;

(ii) part elevations of existing adjoining buildings showing their floor levels, main coping, parapets and verandah heights;

(iii) the materials proposed for the walls, windows and roof, if applicable and visible.

(2) The principal submitting person or owner or occupier as the case may be shall provide the local authority with such further information as the local authority may require.

[(2) Am. Sel. P.U. 9/52007]

(3) All plans shall either be in clear indelible prints or drawn in the black with differences of material shown in distinct colours and all existing structures in neutral tints.

11. Exemption from by-law 10.

The local authority may if it deems fit exempt any person from any or all of the requirements of paragraph (1) of by-law 10.

12. Sketch plans for approval in principle.

(1) Notwithstanding the provisions of by-laws 8 and 10 when the consideration of the local authority is desired for approval in principle of a building, tentative sketch plans in duplicate on paper accompanied by a brief report sufficient to show the character and standard of the building may be submitted subject to the payment of the fees as prescribed in the First schedule to these By-laws.

(2) When a building has been approved in principle, plans in accordance with by-laws 3 to 10 and 14 to 16 shall be submitted and approved before erection of the building approved in principle may be commenced.

13. Special permission to commence building operations.

(1) The local authority may, in writing grant special permission to commence building operations provided that such commencement will not infringe the provisions of the act or these By-laws.

(2) The granting of any permission under paragraph (1) of by-law 13 shall not deprive the local authority of its power to give written directions in respect of such building.

14. Plans of alterations.

(1) In plans submitted for additions or alterations, including a subdivision of rooms, to a building, the parts, if any, of the building to be removed shall be shown in dotted lines and new work shall be either in red or in black fully coloured.

(2) All existing surface water and foul water drains, stairs, windows, and doors and all openings for light and ventilation of the building shall be shown on such plans.

14A. Prohibition against altering facade.

Notwithstanding the prohibitions of by-law 14, no person shall alter the facade of any building without the prior written permission of the local authority.

[Ins. Sel. P.U. 15/2000]

Notes:-

This By-law shall be applicable only to the Kawasan Perbadanan Putrajaya.

15. Specification.

If so required by the local authority plans submitted for approval shall be accompanied by a specification of all materials proposed to be used.

15A. Power of the Perbadanan to determine colour code of exterior of proposed building.

(1) The local authority may determine the colour code of the exterior of any proposed building submitted for approval.

(2) Where the colour is determined under paragraph (1), the submitting person shall be notified by the local authority at the time of approval.

[Ins. Sel. P.U. 15/2000]

Notes:-

This By-law shall be applicable only to the Kawasan Perbadanan Putrajaya.

16. Details and calculations of structural plans.

(1) One copy of the detailed structural plans of the proposed building together with a legible copy of the structural calculations for the same shall be submitted before the commencement of construction.

(2) The detailed structural plans shall bear a certificate by the submitting person as in Form A as set out in the Second Schedule to these By-laws to the effect that the details are in accordance with these By-laws and that the submitting person accepts full responsibility.

[Am. Sel. P.U. 9/2007;(2) Am. Sel.P.U.142 of the year 2012]

(3) All structural plans shall be clearly marked to indicate the imposed loads for which each floor system or each part has been designed.

17. Power of local authority to reject structural plans and calculations.

Notwithstanding paragraph (2) by-law 16 the local authority may examine and in so doing may reject any structural plans or calculations which are not in accordance with these By-laws and if it rejects such plans or calculations it may require such submitting person to resubmit new structural plans or calculations in respect of the rejected portion.

[Am. Sel. P.U. 9/2007]

18. Permits.

(1) Sketch plans may be submitted for minor erections, minor alterations and additions in lieu of approved plans and permits may be issued as authority to carry out such work if they comply with the requirements of these By-laws, provided that if in the opinion of the local authority the works involved require the submission of normal building plans, such plans shall be submitted in accordance with these By-laws.

(2) Permits may be issued on such terms and conditions as the local authority thinks fit for the erection of any fence which encroaches on a footway.

19. Temporary permits.

(1) A temporary permit for a limited period may be issued by the local authority for the following purpose:

(a) the erection of a shed for shows or place of worship;

(b) the erection of a builders' working shed or a store or other shed to be used in connection with building works;

(c) the depositing of building materials on streets;

(d) the erection of scaffolding on a street;

(e) the erection of staging, framework, platform or superstructure of any kind on a roof abutting a street; and

(f) the erection of hoarding on streets in accordance with by-law 20.

(2) A temporary permit may be issued at the discretion of the local authority for the erection of a temporary building and shall be subject to all or some of the conditions as set out in the First Schedule to these by-laws.

(3) Plans or sketch plans in accordance with the requirements of the local authority shall be submitted for temporary permits under this by-law.

20. Advertisement hoardings

(1) First erection of hoardings or any framing for the display of advertisements or sign-boards shall be subject to an annual temporary permit issued at discretion of and subject to any conditions that may be imposed by the local authority.

(2) Plans or sketch plans of such hoardings or framings shall be submitted in accordance with the requirements of the local authority.

(3) The plans must be certified by the submitting person to the effect that the proposed hoarding can be safely supported by the structure onto which it is to be constructed and that he accepts full responsibility.

[Am. Sel. P.U. 9/2007]

21. Materials not to be deposited in a street without permission.

(1) No person shall deposit any building materials in any street without a temporary permit issued under by-law 19.

(2) The fee for such permit shall be that prescribed in the First Schedule to the By-laws.

(3) The person to whom such permit is issued shall at his own expense cause such materials to be sufficiently fenced and enclosed until the materials are removed or otherwise made secure to the satisfaction of the local authority.

(4) Such materials shall be suitably lighted during the hours of darkness and watchman shall be employed to ensure that this is done.

22. Notice of commencement or resumption of building operations.

(1) Notice of the intention to commence or resume the erection of a building required under subsection (9) of section 70 of the Act shall be made in Form B as set out in the Second Schedule to these By-laws and shall include particulars of the intended work.

(2) If the work is not commenced or resumed on the date given in such notice, a further notice in Form B as set out in the Second Schedule to these By-laws shall be given before the work may be commenced or resumed.

23. [Deleted].

[Deleted by Sel. P.U. 9/2007]

24. [Deleted].

[Deleted by Sel. P.U. 9/2007]

25. Certificate of completion and compliance.

(1) A certificate of completion and compliance in Form F as set out in the Second Schedule shall be issued by the principal submitting person—

(a) when all the technical conditions as imposed by the local authority have been duly complied with;

(b) when Forms G1 to G21 in respect of stage certifications as set out in the Second Schedule have been duly certified and received by him;

(c) when all the essential services, including access roads, landscape, car parks, drains, sanitary, water, electricity installations and communication, fire hydrants, sewerage and refuse disposal requirements and, fire lifts where required, have been provided; and

[(1)(c) Am. Sel. P.U. 40/2012]

(d) when he certifies in Form F that he has supervised the erection and completion of the building and that to the best of his knowledge and belief the building has been constructed and completed in accordance with the Act, these By-Laws and the approved plans.

(2) Upon the issuance of the certificate of completion and compliance, the principal submitting person accepts full responsibility for the issuance of the certificate of completion and compliance and he certifies that the building is safe and fit for occupation.

(3) The principal submitting person shall within fourteen days from the issuance of the certificate of completion and compliance or partial certificate of completion and compliance, as the case may be, deposit a copy of the said certificate and the Forms G1 to G21 with the local authority and the Board of Architects Malaysia or Board of Engineers Malaysia, as the case may be.

(4) Nothing contained in this by-law shall prevent the local authority or any officer authorized by it in writing for the purpose, from inspecting any building works at any stage thereof and calling attention to any failure to the building or non-compliance with these By-Laws which he may observe and, giving notice in writing to the principal submitting person ordering such failure or non-compliance to be rectified.

(5) Subject to paragraph (4), the local authority may issue a directive in writing to the principal submitting person to withhold the issuance of the certificate of completion and compliance or partial certificate of completion and compliance, as the case may be.

(6) The principal submitting person shall within twenty-one days after the receipt of the notice issued in pursuance of paragraph (4) or such further period as may be approved by the local authority, rectify the failure or non-compliance.

(7) Where the principal submitting person has rectified the failure or non-compliance, he shall issue a notice to the local authority confirming that such rectification works have been satisfactorily completed.

(8) Upon receipt of the notice as mentioned in paragraph (7), the local authority shall within fourteen days from the receipt of such notice inspect the building to confirm that the failure or noncompliance has been satisfactorily rectified.

(9) Where the local authority is satisfied that the failure or noncompliance as stipulated in paragraph (4) has been satisfactorily rectified, the local authority shall issue a directive in writing to the principal submitting person to issue the certificate of completion and compliance or partial certificate of completion and compliance, as the case may be.

(10) Where the local authority does not carry out the inspection of rectification works in pursuance of paragraph (8) within the period as stipulated in that paragraph, it shall be deemed that the local authority is satisfied that the rectification works have been satisfactorily completed.

(11) Where the failure or non-compliance is not rectified by the principal submitting person within the period stipulated in paragraph (6), the local authority may itself cause any work to be executed or any measure to be taken if it considers such work or measure is necessary to rectify the non-compliance.

(12) The cost of executing such work or taking such measure as referred to in paragraph (11) shall be borne by the owner of the building.

(13) The certificate of completion and compliance or partial certificate of completion and compliance, as the case may be, shall not be issued by the principal submitting person until all the failures or non-compliances in respect of the building has been satisfactorily rectified.

[Am.Sel. P.U. 40/2000; Subs. Sel. P.U. 9/2007]

25A. [Deleted].

[Deleted by Sel. P.U. 9/2007]

26. [Deleted].

[Deleted by Sel. P.U. 9/2007]

27. Partial certificate of completion and compliance.

(1) The principal submitting person may issue a partial certificate of completion and compliance in Form FI as set out in the Second Schedule in respect of any part of a building partially completed subject to any condition imposed by the local authority which it deems necessary for reasons of public health and safety:

Provided that no such certificate shall be issued unless all the essential services including access roads, landscape, car parks, drains, sanitary, water, electricity installation and communication, fire hydrant, sewerage and refuse disposal requirements and, fire lifts where required, serving the partially completed portion of the building have been provided.

[(Proviso. Am. Sel..P .U. 40/2012)]

(2) A partial certificate of completion and compliance once issued shall remain effective until the whole of the building is completed and a certificate of completion and compliance is issued in pursuance of by-law 25.

[(2) Subs. Sel. P.U. 9/2007]

28. Offences.

(1) Where the principal submitting person fails to deposit a copy of the certificate of completion and compliance or partial certificate of completion and compliance, as the case may be, and the Forms G1 to G21 within the period as stipulated in paragraph 25(3) with the local authority and the Board of Architects Malaysia or Board of Engineers Malaysia, as the case may be, he commits an offence.

(2) Where the principal submitting person or submitting person fails to comply with the notice issued by the local authority in respect of the rectification of any failure to the building or noncompliance with these By-Laws in accordance with paragraph 25(4), he commits an offence.

[Subs. Sel. P.U. 9/2007]

29. Fees for consideration of plans and for permits.

Fees in accordance with the First Schedule to these By-laws shall be paid by the principal submitting persons or submitting persons who submit plans and specifications for approval in respect of buildings to be constructed or altered or for the issue of permits or temporary permits in accordance with these By-laws.

[Am. Sel. P.U. 9/2007]

PART III
SPACE, LIGHT AND VENTILATION

30. Open spaces to be provided.

Every building which is erected shall, unless the local authority is of the opinion that in any particular case air space is otherwise sufficiently and permanently provided for, have directly attached thereto an open space exclusively belonging thereto of such dimensions as may be prescribed hereafter.

31. Open spaces not to be altered or roofed.

(1) Whenever any open space has been provided in connection with any building in pursuance of these By-laws, no person shall, without the approval in writing of the local authority-

(a) make or maintain or permit to be made or maintained any alteration in such open space; or

(b) construct or maintain or permit to be constructed or maintained a roof over any portion thereof so as to diminish the area of such open space:

Provided that the local authority in its discretion may issue such a permit if it is satisfied that the free movement of air is not impeded or hindered.

(2) The local authority may by notice in writing require the owner or any person acting in contravention of this Part to remove any such alterations or roof or otherwise to do such works as will restore such open space.

32. Space about buildings abutting a street and a backlane.

(1) The open space for buildings abutting a street and backlane shall be-

(a) in respect of residential buildings, not less than one-third of the built-on area of the building lot; and

(b) in respect of other buildings used for non-residential purposes, not less than one-tenth of the built-on area of the building lot.

(2) For the purpose of calculating the open space required by paragraph (1) of by-law 32-

(a) in a two-storeyed shophouse the space occupied by any single-storeyed annexe not being a habitable room which does not exceed the height of the ceiling of the ground floor shall be considered as neutral and shall not be counted as built-on area or as open space;

(b) half the width of the backlane abutting a building shall be counted as open space;

(c) balconies, passage-ways and sun-shades may project over any open space provided they do not project more than 1 metre and such projection shall be counted as open space and not as built up area;

(d) the open space provided between the street and the set back for a building line of a terrace house shall not be counted as open space.

(3) Where open space not abutting a backlane is provided for, such open space shall have a minimum clear dimension of not less than 2.5 metres and such open space shall exclude projections of hoods, sunshades or balconies.

33. Space about buildings on lots abutting a street and having no backlane.

For a building on a lot abutting a street and having no backlane, the open space shall be situated at the rear of the building and shall extend across the full width of the lot.

34. Space about detached buildings.

Every building to be erected on a site which does not front a street shall have access from a street and the means, nature and extent of the access shall be in accordance with a layout plan approved by the competent planning authority or the local authority.

34A. Buildings requirements for disabled persons.

(1) Any building or part thereof to which this law applies shall-

(a) be provided with access to enable disabled persons to get into, out of and within the building except for any part of the building for which access is provided wholly or mainly for the inspection, maintenance or repair of the building, its services or fixed plant or machinery; and

(b) be designed with facilities for used by disabled persons.

(2) The requirements of this by-law shall be deemed to be satisfied by compliance with Malaysia Standard MS 1184 and MS 1183.

(3) Building to which this by-law applies and which on the date of commencement of this by-law has been erected, are being erected or have not been erected but plans have been submitted and approved shall be modified or altered to comply with this by-law within three years from the date of commencement of this by-law.

(4) Notwithstanding paragraph (3) the local authority may where it is satisfied that it is justifiable to do so-

(a) allow an extension or further extensions of the period within which the requirements of this by-law are to be complied with; or

(b) allow variations, deviations or exemptions as it may specify from any provisions of this by-law.

(5) Any person aggrieved by the decision of the local authority under paragraph (4) may within 30 days of the receipt of the decision appeal in writing to the State Authority, whose decisions shall be final.

(6) [Deleted - Sel.P.U.142 of the year 2012]

[Ins. Sel. P.U. 95/1993]

35. Access from a street.

Every building to be erected on a site which does not front a street shall have access from a street and the means, nature and extent of the access shall be in accordance with a layout plan approved by the competent planning authority or the local authority.

36. Splayed corners.

Where a building is erected at the junction of two streets and in cases where the degree of splay or rounding off is not shown on the layout plan or any statutory amendment, modification or replacement thereof maintained by the competent planning authority, the corner of such building shall be splayed or rounded off to the height of not less than 5 metres above the street level at the point of intersection of the street lines so that no part of the building below this height shall project beyond the straight line drawn across the corner of the building plot joining each street line at a point 3 metres from the point of intersection of the street lines.

37. Projections over the street and over the building line.

(1) Where buildings abut on a street, projection over the street for open, verandahs, balconies, sunshades or similar projections may be permitted on the following basis:

$$\text{Projection} = \frac{\text{Width of street in metres minus 10 metres}}{2}$$

Provided that the maximum projection which may be permitted under this formula is 1.25 metres clear of the approval line of street.

(2) Projections in the nature of canopies over entrances in excess of 1.25 metres may be permitted at the discretion of the local authority.

(3) All such projections shall be at least 5 metres above the level of the road. Between the levels of 2.5 metres and 5 metres, projections not exceeding 500 millimetres may be permitted.

(4) Where a building line is prescribed for a street set back from the regular line of street, projections above the ground floor over such building line may be permitted provided that such projection shall not exceed 1.83 metres and shall not exceed one half of the building frontage to the building line.

38. Width of footway.

(1) The width of any verandah-way or uncovered footway shall not be less than 2.10 metres but piers or columns to a maximum depth of 600 millimetres from the boundary of the street may be permitted on such verandah-way or footway.

[(1) Am. Sel.P.U.142/2012]

(2) The width of the verandah-way or uncovered footway shall be measured from the boundary of the street to the wall or other part (not being an outside verandah pier) of the building nearest the street, and all dimensions referred to in this by-law shall be measured at the pavement level of the verandah or uncovered footway.

(3) For the purpose of this by-law any step, threshold or other structure appurtenant to a building shall be deemed to be a part of the building though not directly connected therewith.

(4) Where there is a change in levels along the footways between adjoining lots there shall be provided steps with risers not exceeding 150 millimetres and treads not less than 275 millimetres or a pedestrian ramp of gradient not exceeding one in ten.

(5) Where a service road is provided the footway required to be provided and constructed shall follow the line of the street.

38A. Energy efficiency in buildings.

(1) New or renovated non-residential buildings with air-conditioned space exceeding 4,000 square meters shall be-

(a) designed to meet the requirements of MS 1525 with regards to the Overall Thermal Transfer

Value (OTTV) and the Roof Thermal Transfer Value (RTTV); and

(b) provided with an Energy Management System.

(2) The roof for all buildings (residential and non residential) shall not have a thermal transmittance (U-value) greater than—

(a) 0.4 W/m²K for Light (under 50 kg/m²) weight roof; and

(b) 0.6 W/m²K for Heavy (above 50 kg/m²) weight roof,

unless provided with other shading or cooling means.

[Ins.Sel.P.U.142 of the year 2012]

38B. Protection of building structures against lightning strikes.

(1) The assessment of risks and provision of measures to protect building structures against lightning strikes shall comply with the requirements set out in MS IEC 62305.

(2) For the purpose of paragraph (1), "MS IEC" means the latest published edition of the Malaysian Standard which is identical to the International Electrotechnical Commission Standard.

[Ins.Sel.P.U.142 of the year 2012]

39. Natural lighting and ventilation.

(1) Every room designed, adapted or used for residential, business or other purposes except hospitals and schools shall be provided natural lighting and natural ventilation by means of one or more windows having a total area of not less than 10% of the clear floor area of such room and not less than half out of this 10% floor area shall have openings capable of allowing a free uninterrupted passage.

[(1) Am.Sel.P.U.142 of the year 2012]

(2) Every room used for the accommodation of patients in a hospital shall be provided with natural lighting and natural ventilation by means of one or more windows having a total area of not less than 15% of clear floor area of such room and not less than two third out of this 15% floor area shall have openings capable of allowing a free uninterrupted passage.

[(2) Am.Sel.P.U.142 of the year 2012]

(3) Every room used for the purpose of conducting classes in a school shall be provided with natural lighting and natural ventilation by means of one or more windows having a total area of not less than 20% of clear floor area of such rooms and not less than half out of this 20% floor area shall have openings capable of allowing a free uninterrupted passage.

[(3) Am.Sel.P.U.142 of the year 2012]

(4) Every water-closet, latrine, urinal or bathroom shall be provided with natural lighting and natural ventilation by means of one or more openings having a total area of not less than 0.2 square metre per water-closet, urinal latrine or bathroom and such openings shall be capable of allowing a free uninterrupted passage of air.

40. Air-wells.

(1) (a) The minimum size of each air-well where provided in all buildings shall be as follows:

- (i) for buildings up to 2 storeys in height, 7 square metres;
- (ii) for buildings up to 4 storeys in height, 9 square metres;
- (iii) for buildings up to 6 storeys in height, 11 square metres;
- (iv) for buildings up to 8 storeys in height, 13 square metres;
- (v) for buildings more than 8 storeys in height, 15 square metres;

(b) The minimum width of such air-wells in any direction shall be 2.5 metres.

(2) (a) The minimum size of each air-well for lavatories, water-closets and bathrooms shall be as follows:

- (i) for buildings up to 2 storeys in height, 3.5 square metres;
- (ii) for buildings up to 4 storeys in height, 4 square metres;
- (iii) for buildings up to 6 storeys in height, 4.5 square metres;

- (iv) for buildings up to 8 storeys in height, 5 square metres;
- (v) for buildings more than 8 storeys in height, 5.5 square metres;
- (b) The minimum width of such air-wells in any direction shall be 2 metres.

41. Mechanical ventilation and air-conditioning.

(1) Where permanent mechanical ventilation or air-conditioning is intended, the relevant building by-laws relating to natural ventilation, natural lighting and heights of rooms shall not apply.

[(1) Am.Sel.P.U.142 of the year 2012]

(2) Permanent air-conditioning system shall be provided with alternate means of ventilating the air-conditioned enclosure, such that within half an hour of the air-conditioning system failing, not less than the stipulated volume of fresh air specified hereinafter shall be introduced into the enclosure during the period when the air-conditioning system is not functioning.

[(2) Subs.Sel.P.U.142 of the year 2012]

(3) The provisions of the Third Schedule to these By-laws shall apply to buildings which are mechanically ventilated or air-conditioned.

(4) Where permanent mechanical ventilation in respect of lavatories, water-closets, bathrooms or corridors is provided for and maintained in accordance with the requirements of the Third Schedule to these By-laws, the provisions of these By-laws relating to natural ventilation and natural lighting shall not apply to such lavatories, water-closets, bathrooms or corridors.

42. Minimum area of rooms in residential buildings.

(1) The area of the first habitable room in a residential building shall be not less than 11 square metres, the second habitable room be not less than 9.3 square metres and all other rooms be not less than 6.5 square metres in area.

(2) The width of every habitable room in a residential building shall be not less than 2 metres.

(3) The area and width of a kitchen in a residential building shall be not less than 4.5 square metres and 1.5 metres respectively.

43. Minimum dimensions of latrines, water-closets and bathrooms.

In all buildings, the sizes of latrines, water-closets and bathrooms shall be-

- (a) in the case of latrines or water-closet with the pedestal-type closet fittings, not less than 1.5 metres by 0.75 metre;

(b) in the case of the water-closets with fittings other than pedestal-type closet fittings, not less than 1.25 metres by 0.75 metre;

(c) in the case of bathrooms, not less than 1.5 square metres with a width of not less than 0.75 metre; and

(d) in the case of bathrooms with closet fittings, not less than 2 square metres with a width of not less than 0.75 metre.

44. Height of rooms in residential buildings, shophouses, school,etc.

(1) The height of rooms in residential buildings other than shophouses shall be-

(a) for living rooms and bedrooms, not less than 2.5 metres;

(b) for kitchens, not less than 2.25 metres;

(c) for bathrooms, water-closets, latrines, porches, balconies, verandahs, garages and like, not less than 2 metres.

(2) The average height of rooms with sloping ceilings in residential buildings other than shophouses shall be-

(a) for living rooms and bedrooms, not less than 2.5 metres;

(b) for kitchens, not less than 2.25 metres;

(c) for bathrooms, water-closets, latrines, porches, balconies, verandahs, garages and the like, not less than 2 metres.

Provided that not part of any room shall be less than 2 metres in height.

(3) In shophouses the height of ground floor rooms shall be not less than 3 metres and the height of upper floor rooms shall be not less than 2.5 metres. Where the depth of such shophouse at any upper floor level is greater than 10.5 metres the height of rooms on every such upper floor shall be not less than 2.55 metres.

(4) In schools, the height of rooms used for the dissemination of knowledge shall be not less than 3 metres headroom.

(5) In hospitals the height of rooms used for the accommodation of patients shall be not less than 3 metres.

(6) The height of any room in a factory in which any person works shall be not less than 3 metres headroom.

45. Height of rooms in places of public resorts.

(1) The height of rooms, other than water-closets, lavatories, cloakrooms, corridors and rooms to which the public do not have access in places of public resort shall be not less than 3.5 metres. Where a

balcony is provided for in places of public resort, the heights between the level of the topmost tier of the balcony and the ceiling over such topmost tier, and between the floor immediately under the balcony and the underside of the balcony, shall be not less than 3 metres in each case.

(2) In places of public resort the provisions of the paragraph (1) of by-law 46 shall apply to water-closets, lavatories, cloakrooms, corridors and rooms to which the public do not have access.

46. Heights of rooms in other buildings.

(1) In buildings other than those specified in the preceding provisions of by-laws 44 and 45 the height of rooms on the ground floor shall not be less than 3 metres and on any floor above the ground floor shall not be less than 2.75 metres.

(2) The height of any basement shall be not less than 2.5 metres.

(3) Where the greater part of the ground floors is left open for use as car-park or covered garden or similar purposes, the height of such ground floor shall be not less than 2.5 metres.

(4) The minimum headroom of any habitable room or space inside any building shall be 2 metres.

(5) The height of any verandah-way shall be not less than 3 metres.

47. Projections over a verandah-way.

Projections in the nature of-

- (a) beams;
- (b) stairways and landings;
- (c) screens;
- (d) blinds; and
- (e) signboards or advertisements,

which are not less than 2.5 metres above the verandah-way paving may be permitted.

PART IV TEMPORARY WORKS IN CONNECTION WITH BUILDING OPERATIONS

48. Commencement of building operation.

(1) When any building operation is commenced, the person responsible for the erection shall display a board giving the names, addresses and telephone numbers of the principal submitting person, submitting person and building contractor.

(2) Construction of any building shall not commence unless a protective hoarding to the requirements of the local authority is erected to separate the building from the public street or footway.

(3) Where a protective hoarding is required, a temporary permit shall be obtained in accordance with by-law 19 and the protective hoarding shall be constructed according to the approved protective hoarding plan and shall during the demolition or erection of any building be maintained in good condition to the satisfaction of the local authority.

[Am. Sel. P.U. 9/2007]

49. Responsibility of persons granted temporary permits.

The person to whom the temporary permit is granted shall be responsible for-

(a) taking such measures as are necessary to keep the roadside drain clear of obstruction and to the satisfaction of the local authority;

(b) adjustments to existing cables, pipes and other service or utility or equipment and for their reinstatement on completion of the works in accordance with the requirements of the relevant authorities;

(c) painting the ends of the hoardings white and for having the ends of hoardings and railings suitably marked by red warning lights throughout the night;

(d) any accident and damage to property or persons, directly attributable to the hoardings or railings;

(e) ensuring that hydrant points and any other existing utility service installations are not obstructed by such hoardings or materials;

(f) providing suitable openings with hand-rails at the end of the hoarding to permit easy means of access and egress over the roadside drain, to and from the adjoining verandah-ways;

(g) the maintenance of the hoarding to the satisfaction of the local authority;

(h) exercising due care not to damage any existing service mains by overloading the ground or by any temporary construction;

(i) removing the hoarding together with all materials and debris on completion of the works; and

(j) to reinstate any damage to roads, drains, footways and verandah-ways and leaving the site and drains in a clean and tidy condition.

50. Cancellation of temporary permit

The local authority shall have the right to cancel the temporary permit for breach of any the foregoing conditions or for any reason it thinks fit and the applicant shall within one week of receipt of such notice have the hoardings, railings and all other materials connected therewith removed from the public road.

51. Vehicular access to site.

Vehicular access to the site may be restricted to specified hours to avoid obstructing the flow of traffic if found to be necessary.

52. Rising mains to be installed progressively

In buildings which are designed to exceed 18.3 metres in height to the top most full floor, rising mains in accordance with by-law 232 shall be installed as soon as the building exceeds that height to provide fire fighting facilities during the various stages of construction.

**PART V
STRUCTURAL REQUIREMENTS**

53. Building materials.

(1) Any materials used-

(a) in the erection of a building;

(b) in the structural alteration or extension of a building;

(c) in the execution of works or the installation of fittings, being works or fittings to which any provision of these By-laws applies; or

(d) for the backfilling of any excavations on a site in connection with any building or works or fittings to which any provision of these By-laws applies, shall be-

(aa) of a suitable nature and quality in relation to the purposes for and conditions in which they are used;

(bb) adequately mixed or prepared; and

(cc) applied, used or fixed so as to adequately perform the functions for which they are designed.

(2) The use of any material or any method of mixing or preparing materials or of applying, using or fixing materials, which conforms with a Standard Specification or Code of Practice prescribing the quality of material or standards of workmanship shall be deemed to be sufficient compliance with the requirements of paragraph (1) of by-law 53 if the use of the material or method is appropriate for the purpose and conditions in which it used.

54. General requirements of loading.

(1) In determining, for the purposes of these By-laws, the loads to which any building will be subjected, the dead and imposed loads and wind loads shall be calculated in accordance with this Part:

Provided that in the case where-

(a) an actual imposed load to which a building will be subjected will exceed the imposed load calculated in accordance with this Part, such actual load shall be substituted for the load so calculated; and

(b) plant, machinery or equipment will produce exceptional dynamic effects, there shall be substituted for the imposed load calculated in accordance with this Part such greater amount which would, as a static load, produce stresses of a magnitude and kind approximating to that induced dynamically.

(2) In determining, for the purposes of this Part, the loads to which a building will be subjected-

(a) permanent loads shall be calculated in accordance with MS EN 1991-1-1 or as provided hereinafter;

(b) imposed loads shall be calculated in accordance with MS EN 1991-1-1 or as provided hereinafter

[(2) (a) & (b) Subs.Sel.P.U.142/2012]

Provided that, if any actual imposed load will exceed or is likely to exceed the load so calculated, that actual load shall be substituted for the load so calculated; and

(c) wind loads shall be calculated in accordance with MS 1553.

[(2) (c) Subs.Sel.P.U.142/2012]

Provided that-

(aa) in no case shall the factor S 3 be taken as less than 1; and

(bb) if a building falls outside the range of those for which that code gives forces and pressure coefficients, values shall be used which are appropriate in relation to that building, having regard to its construction, size, proportions, shape, profile and surface characteristics.

(3) [Deleted - Sel.P.U.142/2012]

55. Dead and imposed loads.

(1) The provisions of this Part relating to dead and imposed loads shall apply to-

(a) new buildings and new structures;

(b) structural alterations and additions to existing buildings and existing structures; and

(c) existing construction on change of use,

but shall not apply to the maintenance of, or the replacement of parts of, existing buildings and structures where there is no change of use.

(2) The dead and imposed loads provided hereinafter shall be in addition to and not in substitution of provision relating to-

(a) loads on road bridges;

(b) loads on rail bridges;

(c) loads due to wind;

(d) loads due to seismic forces;

(e) loads due to explosions;

(f) loads on structures subject to internal pressure from their contents such as bunkers, silos and water tanks;

(g) loads incidental to construction;

(h) loads due to lifts and escalators;

(i) loads due to machinery vibration (except those due to some gantry cranes);

(j) loads due to thermal effects; and

(k) test loads.

56. Dead loads calculated from weights of materials used.

(1) Dead loads shall be calculated from unit weight given in accordance with MS EN 1991-1-1 or from the actual known weights of the materials used.

(2) Typical values for commonly used materials are laid out in the MS EN 1991-1-1

[Am.Sel.P.U.142/2012]

57. Weight of partitions.

Where partitions are shown in the plans, their actual weights shall be included in the dead load. To provide for partitions where their positions are not shown on the plans, the beams and the floor slabs where these are capable of effective lateral distribution of the load, shall be designed to carry, in addition to other loads, a uniformly distributed load per square metre of not less than one third of the weight per metre run of the finished partitions, but not less than 1 kN/m^2 if the floor is used for office purposes.

[Am.Sel.P.U.142/2012]

58. Contents of tanks and other receptacles.

The weight of tanks and other receptacles, and of their contents shall be treated as dead loads; account shall be taken of the load conditions when the tank or receptacle is full and when it is empty.

59. Imposed floor loads.

All Imposed floor loads shall be calculated in accordance with MS EN 1991-1-1.

[Subs.Sel.P.U.142/2012]

60. Mechanical stacking.

Where there is the possibility of the use of mechanical stacking machines, such as fork lift trucks, special provision shall be made in the design of the floors in accordance with MS EN 1991-1-1.

[Am.Sel.P.U.142/2012]

61. Imposed loads on ceilings, skylights and similar structures.

(1) The support of ceilings (other than false ceiling), ribs of skylights, frames and covering (other than glazing) of access hatches and similar structures shall be designed in accordance with MS EN 1991-1-1.

[(1) Am.Sel.P.U.142/2012]

(a) [Deleted Sel.P.U.142 of the year 2012].

(b) [Deleted Sel.P.U.142 of the year 2012].

(2) For the purposes of this by-law false ceiling means a ceiling which is built with a space between it and the structure above and which satisfies at least one of the following conditions relating to access to that space-

(a) the space is inaccessible; or

(b) the ceiling is demountable for access; or

(c) the space is provided with catwalks supported independently.

[Am.Sel.P.U.142/2012]

62. Reduction in total imposed floor loads.

The reduction in assumed total imposed floor loads given in MS EN 1991-1-1 may be taken in designing columns, piers, walls, their supports and foundations.

[Subs.Sel.P.U.142/2012]

63. Imposed roof loads.

For the purpose of this by-law, imposed roof load shall be designed in accordance with MS EN 1991-1-1.

[Subs.Sel.P.U.142/2012]

64. Curved roofs.

The imposed load on a curved roof shall be calculated in accordance with MS EN 1991-1-1.

[Subs.Sel.P.U.142/2012]

65. Roof coverings.

To provide for loads incidental to maintenance, all roof coverings, other than glazing, shall be in accordance with MS EN 1991-1-1.

[Subs.Sel.P.U.142/2012]

66. Internal suspended loads on primary structural members.

Due allowance shall be made in the design of roof trusses or other primary structural members supporting roofs, for the weight of heating, lighting and ventilating equipment, service trunking, piping for liquids or gases, mechanical handling or production equipment and overhead walkways for inspection and maintenance, as applicable.

67. Amount of suspended load.

Any panel point of the lower chord of such roof trusses or any point of such other primary structural members supporting roofs over garages, manufacturing or storage floors shall be designed in accordance with MS EN 1991-1-1.

[Subs.Sel.P.U.142/2012]

68. Dynamic loading.

(1) Where loads arising from machinery, runways, cranes and other plant producing dynamic effects are supported by or communicated to the framework, allowance shall be made for these dynamic effects, including impact, by increasing the dead weight values by an adequate amount.

(2) In order to ensure due economy in design, the appropriate dynamic increase for all members affected shall be ascertained as accurately as possible.

(3) In the absence of sufficient data for such calculation, the increase in the imposed loads shall be in accordance with MS EN 1991-1-1;

[(3) Subs.Sel.P.U.142/2012]

(4) Concentrated imposed loads including impact and vibrating effects which may arise due installed machinery shall be considered and provided for in the design. In any event the increase in imposed loads shall not be less than 20% or the minimum standard specified in the MS EN 1991-1-1, whichever is the higher;

[(4) Subs.Sel.P.U.142/2012]

(5) Provisions shall also be made for carrying any concentrated equipment loads while the equipment is being installed or moved for servicing and repairing.

69. Crane gantry girders.

In respect of crane gantry girders, all forces set up by vibration, shock from slipping of slings, kinetic action of acceleration and retardation and impact of wheel loads shall be designed in accordance with MS EN 1991-1-1.

[Subs.Sel.P.U.142/2012]

70. Parapets and balustrades.

Parapets, balustrades and lower panel of cladding or curtain walls shall be designed for the minimum loads in accordance with MS EN 1991-1-1.

[Subs.Sel.P.U.142/2012]

71. Vehicle barriers for car parks.

All vehicle barriers including enclosing parapets and balustrades shall be designed to withstand the impact force of vehicle in accordance with MS EN 1991-1-1.

[Subs.Sel.P.U.142/2012]

72. Basement walls and floors.

(1) In the design of basement walls and similar underground structures, provision shall be made for the lateral pressure of adjacent soil, due allowance being made for possible surcharge from fixed or moving loads.

(2) When a portion, or the whole, of the adjacent soil is below a free water surface, computations shall be based on the weight of the soil diminished by buoyancy plus full hydrostatic pressure.

(3) In the design of basement floors and similar structures underground, the upward pressure of water, if any, shall be taken as the full hydrostatic pressure applied including any artesian pressure over the entire area.

[(3) Am.Sel.P.U.142/2012]

(4) The hydrostatic head shall be measured from the underside of the construction.

73. Foundations.

(1) The earthworks, the underground building works and the foundations for the building shall be designed based on the field and laboratory tests of a proper site investigation. The tests are

to be initiated and supervised by a Professional Engineer with the relevant geotechnical experience.

[Ins. Sel. P.U.142/2012]

(2) The foundations of a building shall-

(a) safely sustain and transmit to the ground the combined dead load, imposed load and wind load in such a manner as not to cause any settlement beyond the limits designed for or other movement which would impair the stability of, or cause damage to, the whole or any part of the building or of any adjoining building or works;

(b) be taken down to such a depth, or be so constructed, as to safeguard the building against damage by soil settlement and movement; and

[(b) Am. Sel. P.U.142/2012]

(c) be capable of adequately resisting any attack by sulphates or any other deleterious matter present in the subsoil.

[From No.(1) to (2) Am. Sel. P.U.142/2012]

(3) The requirements of paragraph (2) shall be deemed to be satisfied if the foundations of a building are designed and constructed in accordance with MS EN 1997.

[Subs. Sel. P.U.142/2012]

74. [Deleted].

[Deleted - Sel. P.U.142/2012]

75. Reinforced concrete foundations.

Reinforced concrete foundation shall be designed and constructed in accordance with MS EN 1990, MS EN 1991 and MS EN 1992.

[Subs. Sel. P.U.142/2012]

76. [Deleted].

[Deleted - Sel. P.U.142/2012]

76A. Buildings on hill slopes.

Every building to be constructed on hill slopes shall comply with any planning requirement as the local authority may determine.

[Ins. Sel. P.U.142/2012]

77. [Deleted].

[Deleted - Sel. P.U.142/2012]

78. Foundations below invert of drains.

Within a distance not less than the depth of a drain measured from the closer edge of the drain, no part of a building shall be erected with its substructure foundation level higher than 450 millimeters below the drain invert level, unless the whole of such building is carried on piles other than timber piles.

[Subs.Sel. P.U.142/2012]

79. Foundations under external and party walls.

Where an external wall is built against another external wall or against a party wall of an adjacent building lot, the extent of concrete foundations shall not extend beyond its own lot boundary.

[Subs. Sel. P.U.142/2012]

80. Structure above foundations.

(1) The structure of a building above the foundations shall be designed and constructed to safely sustain and transmit to the foundations the combined dead and imposed loads and wind loads without such deflection or deformation as will impair the stability of, or cause damage to, the whole or any part of the building.

(2) The requirements of paragraph (1) shall be deemed to be satisfied if the design and construction of the structure or part of the structure complies with the following Standards:

MS EN 1990 – Basis of Structural Design;

MS EN 1991 – Actions on structures;

MS EN 1992 – Design of concrete structures;

MS EN 1993 – Design of steel structures;

MS EN 1994 – Design of composite steel and concrete structures;

MS EN 1995 – Design of timber structures;

MS EN 1996 – Design of masonry structures;

MS EN 1998 – Design of structures for earthquake resistance; and

MS EN 1999 – Design of aluminum structures.

[(2) Subs. Sel. P.U.142/2012]

PART VI CONSTRUCTIONAL REQUIREMENTS

81. Building site.

(1) No building shall be erected on any site which has been filled up with any matter impregnated with faecal, animal or vegetable matter, until the whole ground surface or site of such building has been properly treated based on geotechnical techniques conforming to MS 1754 and MS 1756.

[(1) Am. Sel. P.U.142/2012]

(2) The ground to be built upon by any building shall be effectively cleared of turf and other vegetable matter.

82. Drainage of subsoil.

(1) Wherever the dampness or position of the site of a building renders it necessary, the subsoil of the site shall be effectively drained or such other steps shall be taken as will effectively protect the building against damage from moisture.

(2) Where, during the making of an excavation for a building, existing subsoil drains are discovered, such drains shall either be diverted or replaced by pipes of approved materials to ensure the continual passage of subsoil water through such drains in such a manner as to ensure that no subsoil water entering such drains causes dampness to the site of the building.

83. Protection against soil erosion, etc.

(1) All slopes in and around buildings shall be suitably protected against soil erosion and slope failures and shall be monitored and maintained regularly.

[(1) Subs. Sel. P.U.142/2012]

(2) All ground under raised buildings shall be suitably finished and graded to prevent the accumulation of water or the growth of unwanted vegetation or for the breeding of vermin.

84. Prevention of dampness.

(1) Suitable measures shall be taken to prevent the penetration of dampness and moisture into a building.

(2) Damp proof courses where provided shall comply with BS 743 (materials for Horizontal D.P.C).

(3) Every wall of a building founded on foundation shall be provided with a damp proof course which shall be-

[(3) Am. Sel. P.U.142/2012]

(a) at a height of not less than 150 millimetres above the surface of the ground adjoining the wall; and

(b) beneath the level of the underside of the lowest portion of the ground floor resting on the wall, or where the ground floor is a solid floor, not higher than the level of the upper surface of the concrete or other similar solid material forming the structure of the floor.

[(3)(b) Am. Sel. P.U.142/2012]

(4) Where any part of a floor of the lowest or only storey of a building is below the surface of the adjoining ground and a wall or part of a wall of the storey is in contact with the ground-

(a) the wall or part of the wall shall be constructed or provided with a vertical damp proof course so as to be impervious to moisture from its base to a height of not less than 150 millimetres above the surface of the ground; and

(b) an additional damp proof course shall be inserted in the wall or part of the wall at its base.

(5) Where the floor or any part of the walls of a building is subject to water pressure, that portion of the floor or wall below ground level shall be waterproof.

85. Nominal thickness of walls.

For the purposes of this Part wherever references are made to the thickness of any brick wall, the maximum or minimum thickness of such wall shall not exceed the nominal thickness plus or minus the maximum tolerance permissible under any standard specification.

86. [Deleted].

[Deleted - Sel. P.U.142/2012]

87. [Deleted].

[Deleted - Sel. P.U.142/2012]

88. Recess.

Where the recess is made in an external wall-

[Am. Sel. P.U.142/2012]

(a) the wall at the back of the recess shall be not less than 100 millimetres thick in an external wall;

[(a) Am. Sel. P.U.142/2012]

(b) a sufficient arch or lintel of incombustible material shall be built in every storey over the recess;

(c) in each storey the total area of recesses causing the wall at the back of the recesses to be of less thickness than that prescribed by these By-laws shall not exceed one-half of the superficial area of the wall; and

(d) the side of the recess nearest to the inner face of a return external wall, shall be not less than 300 millimetres therefrom.

89. [Deleted].

[Deleted - Sel. P.U.142/2012]

90. Underpinning.

If underpinning is required the owner or his agent shall-

(a) give written notice to the local authority informing of the fact and stating the method of underpinning proposed to be used;

(b) obtain the written sanction of the local authority thereof before proceeding with the work; and

(c) comply with the requirements as set out in these By-laws.

91. Coping, etc., to be impervious.

(1) Every coping, cornice or other like projection shall be of brick, tile, stone concrete, cement render or other impervious material.

(2) Every parapet wall, free-standing wall or boundary wall shall be finished on top with an impervious material.

92. [Deleted].

[Deleted - Sel. P.U.142/2012]

93. Measurement of the length of a wall.

For the purpose of these By-laws-

(a) walls shall be deemed to be divided into distinct lengths by return walls when bonded to each other;

(b) the length of a wall shall be measured from centre to centre of-

(i) cross walls bonded to it; or

(ii) column therein having a dimension measured parallel to the length of the wall of not less than twice the thickness of the wall and a dimension measured at right angles to the wall of not less than three times the thickness of the wall.

[(b) (ii) Am.Sel. P.U.142/2012]

94. [Deleted].

[Deleted - Sel. P.U.142/2012]

95. External panel walls.

In all cases where 100 millimetres brickwork or 100 millimetres precast concrete blocks are used for external panel walls, such walls shall be properly secured to the reinforced concrete framework.

For the purpose of this by-law the expression "properly secured to the reinforced concrete framework " means bonding the wall panel to the reinforced concrete column with a metal tie of at least 14 gauge and 40 millimetres width, built at least 230 millimetres into the brickwork with vertical spacings of not more than 400 millimetres. All metal ties shall be securely fixed to the column.

96. Non load-bearing partition.

Every non load-bearing partition shall be adequately restrained or buttressed.

97. [Deleted].

[Deleted - Sel. P.U.142/2012]

98. Fences and boundary walls.

Fences or walls to the boundaries of detached properties other than the boundary which abuts the street or backlane shall be constructed to a maximum height of 1.8 metres in the case of solid fences or walls and to a maximum height of 2.75 metres in the case of fences which are so constructed as to permit the passage of light and air.

99. Cooking facilities in residential buildings.

(1) Every residential building and every floor of a residential building which is or may be separately let for dwelling purposes shall be provided with a kitchen.

(2) Where a common vertical kitchen exhaust riser is provided, the riser shall be continued up to a mechanical floor or roof for discharge to the open, and shall be constructed with fire resisting material of at least 2 hours rating in accordance with BS 476: Part 3.

[Subs. Sel. P.U.142/2012]

100. [Deleted].

[Deleted - Sel. P.U.142/2012]

101. Boilers, fireplaces, forges and incinerators in factories.

Boilers , fireplaces, furnaces, forges, incinerators and other similar heat generating appliances used in buildings other than residential buildings shall be provided with the adequate means for conveying the heat and fumes generated by such appliances so as to discharge into the open by means of properly constructed flues or ducts of fire resisting material of at least two hours rating in accordance with BS 476 Part 3.

102. Combustible materials adjoining smoke flues.

Combustible materials used in the construction of the building shall be at least 80 millimetres clear of any casing to any flue required for the conveyance of smoke or other products of combustion.

103. [Deleted].

[Deleted - Sel. P.U.142/2012]

104. [Deleted].

[Deleted - Sel. P.U.142/2012]

105. Space below floors to be ventilated.

Where the ground of any building is constructed with timber joists and flooring boards, the space below the floor shall be adequately ventilated.

106. Dimensions of staircases.

(1) In any staircase, the rise of any staircase shall be not more than 180 millimetres and the tread shall not less than 255 millimetres and the dimensions of the rise and the tread of the staircase so chosen shall be uniform and consistent throughout.

(2) The widths of staircases shall be in accordance with by-law 168.

(3) The depths of landings shall be not less than the width of the staircases.

107. Handrails.

(1) Except for staircases of less than 4 risers, all staircases shall be provided with at least one handrail.

(2) Staircase exceeding 2200 millimetres in width shall be provided with intermediate handrail for each 2200 millimetres of required width spaced approximately equally.

[(2) Am. Sel. P.U.142/2012]

(3) In building other than residential buildings, a handrail shall be provided on each side of the staircase when the width of the staircase is 1100 millimetres or more.

(4) All handrails shall project not more than 100 millimetres from the face of the finished wall surface and shall be located not less than 825 millimetres and not more than 900 millimetres measured from the nosing of the treads provided that handrails to landings shall not less than 900 millimetres from the level of the landing.

108. Maximum flights.

(1) In a residential buildings, a landing of not less than 1.80 metres in depth shall be provided in staircases at vertical intervals of not more than 4.25 metres and in staircases in all other buildings there shall be not more than sixteen risers between each such landing.

(2) No part in any flight of any staircase shall have less than two risers.

109. Winders.

Winding and spiral staircase shall not form part of the exit route.

[Subs. Sel. P.U.142/2012]

110. No obstructions in staircases.

(1) There shall be no obstruction in any staircase between the topmost landing thereof and the exit discharge on the ground floor.

(2) There shall be no projection, other than handrails in staircases, in any corridor, passage or staircase at a level lower than 2 metres above the floor or above any stair.

111. Lighting and ventilation of staircases.

All staircases shall be properly lighted at an average illuminance level of not less than 100 lux and ventilated according to the requirements as stipulated under by-laws 198 to 200 of Part VII.

[Subs. Sel. P.U.142/2012]

112. Enclosure of staircases in a shop.

In a shop, the flight of stairs which has access direct from the street shall be enclosed with walls in incombustible material.

113. Use of timber staircases.

(1) Timber staircases may be permitted for the following types of buildings which are not more than three storeys in height:

(a) detached residential buildings;

(b) semi-detached residential buildings;

(c) terrace houses;

(d) in the upper floors of shophouses other than from the ground floor to the first floor provided that it is located within the protected area for its full height; and

(e) other similar types of buildings of limited fire risk at the discretion of the local authority.

(2) All other staircases shall have a fire-resistance rating of not less than two hours.

114. [Deleted].

[Deleted - Sel. P.U. 142/2012]

115. Roof coverings and drainage with a rainwater harvesting and utilisation system (SPAH).

(1) All roofs of buildings shall be so constructed as to drain effectually to suitable and sufficient channels, gutters, chutes or troughs which shall be provided in accordance with the requirement of these by-laws for receiving and conveying all water which may fall on and from the roof.

(2) For buildings required to install SPAH, the design and construction of SPAH shall conform to the following requirement:

(a) rainwater must not flow into the public water tank. Water from the public water tank can flow into the rainwater tank subjected to it being equipped with a one way non return valve or the over flow pipe in the rainwater tank is located at least 225 mm lower from the inlet pipe to the rainwater tank;

(b) SPAH outlet/rainwater tank shall be clearly marked with "Not For Drinking or Bathing";

(c) gutters used shall have sufficient slope to prevent stagnant water; and

(d) rainwater pipes shall be green in colour.

[(1)(c) Am. Sel.P.U. 40/2012]

116. Accessible flat roofs, balconies, etc.

Every flat roof, balcony or other elevated areas 1.8 metres or more above the adjacent area where normal access is provided shall be protected along the edges with suitable railings, parapets or similar devices not less than 1 metre in height or other suitable means.

117. Access to roof space.

Where the space beneath a roof is enclosed by a ceiling, access to such space shall be provided by means of a trap door at least 600millimetres in any direction.

[Subs. Sel. P.U. 142/2012]

118. [Deleted]

[Deleted - Sel. P.U. 142/2012]

119. Change of use of building.

(1) When the use of a building is changed from non-residential to residential, refuse chutes or other alternate means for the disposal of refuse shall be provided to the satisfaction of the local authority.

(2) Where the use of a building is changed from the residential to non-residential, the openings into existing refuse chute serving the converted floors shall be sealed up.

120. [Deleted].

[Deleted - Sel. P.U. 142/2012]

121. [Deleted].

[Deleted - Sel. P.U. 142/2012]

122. [Deleted].

[Deleted - Sel. P.U. 142/2012]

123. [Deleted].

[Deleted - Sel. P.U. 142/2012]

124. Lifts.

For all non-residential buildings exceeding 4 storeys above or below the main access level at least one lift shall be provided.

125. Swimming pools.

(1) The floor and wall surfaces of swimming pools shall be smooth and free from cracks.

(2) Swimming pools shall be completely surrounded by an overflow channel constructed so that-

(a) the overflow and any matter floating therein cannot return directly to the swimming pool;

(b) the arms or legs of swimmers cannot be trapped by the overflow channel; and

(c) swimmers can take hold of the edge of the overflow channel but so that the depth of the overflow channel does not enable the bottom of the overflow channel to be touched with the fingers.

126. Steps and footway.

(1) Steps shall be situated at the side walls near the ends of the swimming pool and shall be so arranged that they are not higher than the internal facing of the walls of the swimming pool, such step being constructed of non-ferrous materials with a non-slip surface and provided with a handrail.

(2) A footway with a non-slip surface shall be provided round every swimming pool.

127. Opening into swimming pool.

The openings by which the water enters a swimming pool shall be distributed in such a manner that circulation of the water in the swimming pool is uniform and dead points of stagnant place avoided.

128. Depth of water.

(1) Swimming pools shall have lines marked on the side walls of a swimming pool to indicate-

(a) the depth of the water at the shallow and deep ends of the swimming pool;

(b) the part of the swimming pool where the depth of the water is between 1.3 metres and 1.8 metres; and

(c) the depth of the water shown in figures over the lines marked on the side of the swimming pool above the overflow channel of the swimming pool.

(2) The water in swimming pools with diving boards or platforms shall have the following minimum depths as measured at any point within the swimming pool 1.53 metres from the free end of the diving boards or platforms:

(a) for diving boards up to 3 metres above the level of the water, such minimum depth shall be 3.3 metres; and

(b) for platform up to 9.7 metres above the level of the water, such minimum depth shall be 4.5 metres.

129. Location of driving boards.

Diving boards, platforms and water chutes in the swimming pool shall be situated not less than 1.8 metres from the sides of the swimming pool or from any other diving board, platform or water chute in the swimming pool.

130. Changing rooms.

(1) Swimming pools shall have separate changing rooms for each sex.

(2) The flooring of such changing rooms shall be of a non-slip impermeable material, easy to clean, and graded to drainage outlets sufficient to enable water used therein for cleaning purpose to be rapidly drained.

(3) The walls of such changing rooms shall be smooth, impermeable, and easy to clean up to a height of 1.8 metres.

131. Foot-baths and shower.

These shall be provided around the swimming pool sufficient numbers of footbaths of not less than 0.9 metres each in any dimension with a shower situated over the entrance thereto and such foot-bath shall be provided with running water.

132. Private, residential swimming pools.

By-laws 125 and 131 shall apply to public and commercial swimming pools and not to private, residential or special purpose swimming pools, the approval of which shall be at the discretion of the local authority.

PART VII FIRE REQUIREMENTS

133. Interpretations.

In this Part and Part VIII unless the context otherwise requires-

"automatic" means a device or system providing an emergency function without the necessity of human intervention;

"balcony approach" means a balcony being an external approach to a common staircase serving one or more occupancies;

"boundary" in relation to a building, means the boundary of the land belonging to the building (such land being deemed to include any abutting part of a street, canal or river but only up to the center line thereof); and boundary of the premise shall be constructed so as to include any such part to the same extent;

"circulation space" means any space which is solely or predominantly used as a means of access between a room and a protected shaft or between either a room or a protected shaft and exit from the building or compartment;

"compartment" means any part of a building which is separated from all other parts by one or more compartment walls or compartment floors or by both such walls and floors; and for the purposes of the Part, if any part of the top storey of a building is within a compartment, the compartment shall also include any room space above such part of the top storey;

"compartment wall" and "compartment floor" mean respectively a wall and a floor which comply with by-law 148, and which provided as such for the purpose of by-law 136 to divide a building into compartments for any purpose in connection with by-law 213 or 147;

"D.G.F.S means the Director General Of Fire and Rescue, Malaysia or the relevant Fire Authority;

[Am.Sel.P.U.142/2012]

"dead-end" means an area from which escape is possible in one direction only and in an open plan includes any point from which the direct routes to alternative exists subtend an angle of less than 450;

"designated floor" means the floor level at which the fire brigade has access to the fire lifts and will normally be the floor level closets to the fire appliance access level;

"direct distance" means the shortest distance from any point within the floor area measured within the external enclosures of the building to the relevant exit disregarding walls, partitions of fittings other than the enclosing walls or partitions to protected staircases;

"door" includes any shutter, cover or other form of protection to an opening in any wall or floor of a building, or in the structure surrounding a protected shaft, whether the doors is constructed of one or more leaves;

"dry rising system" *[Deleted – Sel .P.U 142/2012]*

"element structure" means-

(a) any member forming part of the structural frame of a building or any other beam or column (not being a member forming part of a roof structure only)

(b) a floor, including a compartment floor, other than the lowest floor of a building;

(c) an external wall;

(d) a separating wall;

(e) a compartment wall;

(f) structure enclosing a protected shaft;

(g) a load-bearing wall or load-bearing part of a wall; and

(h) a gallery;

"emergency lighting" means the illumination obtained through either an independent or secondary source of electricity supply such as trickle charged accumulators or separate generators to the normal or duplicate lighting.

"exit discharge" means a door from a storey, flat, or room which door gives access from such storey, flat or room on to an exit route;

"exit door" means a door from a storey, flat, or room which door gives access from such storey, flat or room on to an exit route;

"exit route" means a route by which persons in any storey of a building may reach a place of safety outside the building and may include a room, doorway corridor, stairway or other means of passage not being a revolving door, lift or escalator;

"externally non-combustible" means externally faces with, or otherwise externally consisting of non-combustible material;

"Fire Authority" means the officer in charge of the relevant Fire and Rescue Department or any officer authorized by him in writing.

[Ins.Sel.P.U.142/2012]

"final exit" means a point of discharge for the escape route from a building providing direct access to the street, passage-way or open steps sited to enable the evacuation of persons from the vicinity of a building so that they are safe from the fire or smoke;

"fire alarm installation"

[Deleted - Sel.P.U.142/2012]

"fire appliance access level" means the level at which fire appliances can approach the building for purpose of fire fighting or evacuation of occupants;

"fire fighting access level" means the highest level that a fire appliance ladder may be brought against a building for purpose of fire fighting and evacuation;

"fire fighting access lobby" means a lobby separated from the storey it serves by construction of a FRP of at least half hour, directly accessible from a fire fighting staircase and a fire lift and containing a dry or wet riser;

"fire fighting staircase" means a staircase designed as a recognised means of access into the building for fireman in the event of a fire;

"fire hydrant"

[Deleted - Sel.P.U.142/2012]

"fire lifts" means lifts capable of being commandeered for exclusive use of firemen in emergency;

"firemen's switch" means a switch located adjacent to the fire lift by the designated floor to enable the fire brigade to gain control of the fire lifts;

"fire resistance" has the meaning ascribed to it in by-law 221;

"fire resistance period" means the period for which an element will meet the requirements in respect of transmission of heat or resistance to collapse with passage of flame when tested in accordance with MS 1073

[“fire resistance period” Am.Sel.P.U.142/2012]

"fire resisting" means the construction so designated, including doors, has a minimum standard of fire-resistance of not less than half hour in accordance with the relevant Schedules of these By-laws or which achieves such standard when tested in accordance with BS 476: except that, in the case of the doors-

[Am. Sel.P.U.142/2012]

(a) the rabbets to the door frame or the door stops whichever may be are not less than 18 millimetres deep; and

(b) the door is hung on metal hinges having a melting point of not less than 800°C; and

(c) the door is rendered self-closing;

"fire stop" means a barrier or seal which would prevent or retard the passage of smoke or flame within a cavity or around a pipe or duct where it passes through a wall or floor or at a junction between elements of structure;

"F.O.C" [*Deleted - Sel.P.U.142/2012*]

"FRP" means fire resistance period;

"height of a building" has the meaning ascribed to it in by-law 135;

"horizontal exit" is a means of egress from a compartment or building to an adjacent compartment or building on approximately the same level and thence to a protected staircase or final exit either direct or via a protected corridor;

"hose reel installation"

[Deleted - Sel.P.U.142/2012]

"interior finish" means the exposed interior surface of buildings including, but not limited to fixed or movable walls, partitions, columns and ceilings;

"non-combustible" shall apply to materials as specified under BS 476: Part 4 (1970);

"open corridor" means a corridor that has wall openings open to the atmosphere primarily for the adequate dissipation of smoke;

[Ins. Sel.P.U.142/2012]

"open structure" means a structure that, at each level, has wall openings opening to the atmosphere;[*Ins. Sel.P.U.142/2012*]

"permitted limit of unprotected areas" means the maximum aggregate area of unprotected areas in any side or external wall of a building or compartment, which complies with the requirements as set out in the Sixth Schedule to these By-laws for such building or compartment;

"protected corridors" means a corridor separated from the building it serves by partitions having FRP of not less than half hour and which partitions have all openings therein fitted with fixed lights and self-closing doors each having a FRP of not less than half hour;

"protected lobby" means a lobby enclosed throughout by partitions having an FRP of not less than half hour and has all openings therein fitted with fixed lights and self-closing doors having an FRP of not less than half hour;

"protected shaft" means a stairway, lift, escalator, chute, duct or other shaft which enables persons, things or air to pass between different compartments; and which complies with the requirements of by-law 150;

"protected staircase" means a staircase separated from the building it serves by partitions having FRP of not less than half hour and which has all openings in such fitted with fixed lights and self-closing doors each having an FRP of not less than half hour;

"protecting structure" means any wall or floor or other structure which encloses a protected shaft other than-

- (a) a wall which also forms part of an external wall, separating wall or compartment wall; or
- (b) a floor which is also a compartment floor or a floor laid directly on the ground; or
- (c) a roof;

"relevant boundary" in relation to side or external wall of a building or compartment, means that part of the boundary of the premises or the notional boundary as prescribed in by-law 146 which is adjacent to that side or wall and either coincides with, is parallel to or is at an angle of not more than 80° with that side or wall;

"separating wall" means a wall or part of a wall which is common to two adjoining buildings;

"smoke lobby" means a protected lobby being the approach to a staircase and which acts as a fire and smoke check between a storey and the staircase;

"smoke stop door" means a door or pair of doors which when fitted in a frame satisfies the requirements of Section 7 of BS 476: Part 8: 1972 as to -

- (a) freedom from collapse for not less than thirty minutes; and
- (b) resistance to the passage of flame and hot gases for not less than twenty minutes,

and which is fitted so that the clearance between the leaf and frame and in the case of double doors also between the two leaves, is as small as is reasonably practical, and except in the case of doors hung to open in both directions, is provided with a rabbet to the door frame or with a door stop, which in either case is not less than 25 millimetres deep;

"sprinkler installation"

[Deleted - Sel.P.U. 142/2012]

"staircase external" means a staircase which is completely open to the external air on at least two sides from the level of the top of the balustrade to the underside of the flight of stairs immediately above;

"staircase internal" means a staircase enclosed on all sides by partitions of walls and which has all openings in the external walls glazed or otherwise protected from the weather;

"storey exit" means a fire rated door to a protected staircase or a corridor protected with a fire resisting structure in accordance with the Ninth Schedule to these By-laws and in the case of ground floor accommodation storey exit means a door leading direct to a place of safety outside the building;

"travel distance" means the distance required to be traversed from any point in a storey of a building to either-

- (a) the fire-resisting door in the staircase enclosure; or
- (b) if there is no such door, the first stair tread of the staircase;

"unprotected area" in relation to an external wall or side of a building, means-

- (a) a window, door or other opening;
- (b) any part of the external wall which has fire resistance less than that specified by this Part for the wall; and

(c) any part of the external wall which has combustible material more than 1.5 millimetres thick attached or applied to its external face, whether for cladding or any other purpose;

"wet rising system"

[Deleted - Sel.P.U.142/2012]

means an installation capable of warning persons of an outbreak of fire. Such installation must have detectors conforming to the Rules of the Fire Officers' Committee for Automatic Fire Alarm Installation, and installed in accordance with BSCP 1019;

"fire appliance access level" means the level at which fire appliances can approach the building for purpose of fire fighting or evacuation of occupants;

"fire fighting access level" means the highest level that a fire appliance ladder may be brought against a building for purpose of fire fighting and evacuation;

"fire fighting access lobby" means a lobby separated from the storey it serves by construction of a FRP of at least half hour, directly accessible from a fire fighting staircase and a fire lift and containing a dry or wet riser;

"fire fighting staircase" means a staircase designed as a recognised means of access into the building for fireman in the event of a fire;

"fire hydrant" means an installation of pipes, water tanks, pumps and hydrant outlets in a building to provide a ready means by which a jet of water can be delivered in any part of the building for the purpose of fire fighting and to comply with BSCP 402.101;

"fire lifts" means lifts capable of being commandeered for exclusive use of firemen in emergency;

"firemen's switch" means a switch located adjacent to the fire lift by the designated floor to enable the fire brigade to gain control of the fire lifts;

"fire resistance" has the meaning ascribed to it in by-law 221;

"fire resistance period" means the period for which an element will meet the requirements in respect of transmission of heat or resistance to collapse with passage of flame when tested in accordance with BS 476; Part 1: 1953;

"fire resisting" means the construction so designated, including doors, has a minimum standard of fire-resistance of not less than half hour in accordance with the relevant Schedules of these By-laws or which achieves such standard when tested in accordance with BS 476: Part 8: 1972 except that, in the case of the doors-

(a) the rabbets to the door frame or the door stops whichever may be are not less than 18 millimetres deep; and

(b) the door is hung on metal hinges having a melting point of not less than 800⁰C; and

(c) the door is rendered self-closing;

"fire stop" means a barrier or seal which would prevent or retard the passage of smoke or flame within a cavity or around a pipe or duct where it passes through a wall or floor or at a junction between elements of structure;

"F.O.C" means Fire Officers' Committee of the United Kingdom;

"FRP" means fire resistance period;

"height of a building" has the meaning ascribed to it in by-law 135;

"horizontal exit" is a means of egress from a compartment or building to an adjacent compartment or building on approximately the same level and thence to a protected staircase or final exit either direct or via a protected corridor;

"hose reel installation" means an installation of pipes, watertanks, pumps and hose reels in a building to provide a ready means by which a jet of water can be delivered in any part of the building for the purpose of fire fighting and to comply with BSCP 402.101;

"interior finish" means the exposed interior surface of buildings including, but not limited to fixed or movable walls, partitions, columns and ceilings;

"non-combustible" shall apply to materials as specified under BS 476:

[Am.Sel.P.U.142/2012]

"permitted limit of unprotected areas" means the maximum aggregate area of unprotected areas in any side or external wall of a building or compartment, which complies with the requirements as set out in the Sixth Schedule to these By-laws for such building or compartment;

"protected corridors" means a corridor separated from the building it serves by partitions having FRP of not less than half hour and which partitions have all openings therein fitted with fixed lights and self-closing doors each having a FRP of not less than half hour;

"protected lobby" means a lobby enclosed throughout by partitions having an FRP of not less than half hour and has all openings therein fitted with fixed lights and self-closing doors having an FRP of not less than half hour;

"protected shaft" means a stairway, lift, escalator, chute, duct or other shaft which enables persons, things or air to pass between different compartments; and which complies with the requirements of by-law 150;

"protected staircase" means a staircase separated from the building it serves by partitions having FRP of not less than half hour and which has all openings in such fitted with fixed lights and self-closing doors each having an FRP of not less than half hour;

"protecting structure" means any wall or floor or other structure which encloses a protected shaft other than-

(a) a wall which also forms part of an external wall, separating wall or compartment wall; or

(b) a floor which is also a compartment floor or a floor laid directly on the ground; or

(c) a roof;

"relevant boundary" in relation to side or external wall of a building or compartment, means that part of the boundary of the premises or the notional boundary as prescribed in by-law 146 which is adjacent to that side or wall and either coincides with, is parallel to or is at an angle of not more than 80° with that side or wall;

"separating wall" means a wall or part of a wall which is common to two adjoining buildings;

"smoke lobby" means a protected lobby being the approach to a staircase and which acts as a fire and smoke check between a storey and the staircase;

"smoke stop door" means a door or pair of doors which when fitted in a frame satisfies the requirements of Section 7 of BS 476: Part 8: 1972 as to -

(a) freedom from collapse for not less than thirty minutes; and

(b) resistance to the passage of flame and hot gases for not less than twenty minutes,

and which is fitted so that the clearance between the leaf and frame and in the case of double doors also between the two leaves, is as small as is reasonably practical, and except in the case of doors hung to open in both directions, is provided with a rabbet to the door frame or with a door stop, which in either case is not less than 25 millimetres deep;

"sprinkler installation" means an installation of water supplies, pump, pipes, valves and delivery points so arranged as to automatically detect a fire and attack it with water, sound an alarm and installed in accordance with the current edition of the F.O.C. Rules for Automatic Sprinkler Installations or other approved standards;

"staircase external" means a staircase which is completely open to the external air on at least two sides from the level of the top of the balustrade to the underside of the flight of stairs immediately above;

"staircase internal" means a staircase enclosed on all sides by partitions of walls and which has all openings in the external walls glazed or otherwise protected from the weather;

"storey exit" means a fire rated door to a protected staircase or a corridor protected with a fire resisting structure in accordance with the Ninth Schedule to these By-laws and in the case of ground floor accommodation storey exit means a door leading direct to a place of safety outside the building;

"travel distance" means the distance required to be traversed from any point in a storey of a building to either-

(a) the fire-resisting door in the staircase enclosure; or

(b) if there is no such door, the first stair tread of the staircase;

"unprotected area" in relation to an external wall or side of a building, means-

(a) a window, door or other opening;

(b) any part of the external wall which has fire resistance less than that specified by this Part for the wall; and

(c) any part of the external wall which has combustible material more than 1.5 millimetres thick attached or applied to its external face, whether for cladding or any other purpose;

"wet rising system" means any permanently charged vertical water main installed for fire-fighting purposes, of an appropriate size and fitted with connections suitable for use by the Fire Authority and to comply with the requirements of BSCP 402.101.

134. Designation of purpose groups.

For the purpose of this Part, every building or compartment shall be regarded according to its use or intended use as falling within one of the purpose groups set out in the Fifth Schedule to these By-laws and, where a building is divided into compartments, used or intended to be used for different purpose, the purpose group of each compartment shall be determined separately:

Provided that where the whole or part of a building or compartment, as the case may be, is used or intended to be used for more than one purpose, only the main purpose of use of that building or compartment shall be taken into account in determining into which purpose group it falls.

135. Rules of measurement.

In this Part-

(a) the height of a building, or of such of a building as described in by-law 215 means the height of such building or part, measured from the mean level of the ground adjoining the outside of the external walls of the building to the level of half vertical height of the roof to the building or part, or to the top of the walls of the parapet (if any), whichever is the higher;

(b) the area of-

(i) any storey of a building or compartment shall be taken to be the total area in that storey bounded by the finished inner surfaces of the enclosing walls or, of any side where there is no enclosing wall, by the outermost edge of the floor on that side;

(ii) any room or garage shall be taken to the total area of its floor bounded by the inner finished surfaces of the walls forming the room or garage;

(iii) any part of a roof shall be taken to be the actual visible area of such part measured on a plane parallel to the pitch of the roof;

(c) the cubic capacity of a building or compartment shall be ascertained by measuring the volume of space contained within-

(i) the finished inner surfaces of the enclosing walls or, on any side where there is no enclosing walls, a plane extending vertically above the outermost edge of the floor on that side;

(ii) the upper surface of its lowest floor; and

(iii) in the case of a building or of a compartment which extends to a roof, the under surface of the roof or, in the case of any other compartments, the under surface of the ceiling of the highest storey within the compartment, including the space occupied by any other walls, or any shafts, ducts or structure within the space to be so measured.

136. Provision of compartment walls and compartment floors.

Any building, other than a single storey building, of a purpose group specified in the Fifth Schedule to these By-laws and which has-

(a) any storey the floor area of which exceeds that specified as relevant to a building of that purpose group and height; or

(b) a cubic capacity which exceeds that specified as so relevant shall be so divided into compartments, by means of compartment walls or compartment floors or both, that-

(i) no such compartment has any storey the floor area of which exceeds the area specified as relevant to that building; and

(ii) no such compartment has a cubic capacity which exceeds that specified as so relevant to that building;

Provided that if any building is provided with an automatic sprinkler installation which complies with MS 1910, this-law has effect in relation to that building as if the limits of dimensions specified are doubled.

[Proviso Am.Sel.P.U.142/2012]

137. Compartmentation by height.

(1) In any buildings not exceeding 30 metres in height, any floor which is more than 9 metres above ground floor level which separates one storey from another storey, other than a floor which is either within a maisonette or a mezzanine floor shall be constructed as a compartment floor.

(2) In any building exceeding 30 metres in height, all floors shall be constructed as compartment floors, other than a compartment which is within a residential maisonette which may comprise two storey levels.

(3) An atrium shall comply with the requirements of by-law 252A

[Subs.Sel.P.U.142/2012]

138. Other walls and floors to be constructed as compartment walls or compartment floor.

The following walls and floors in buildings shall be constructed as compartment walls or compartment floors:

(a) any floor in a building of Purpose Group II (Institutional);

(b) any wall or floor separating a flat or maisonette from any other part of the same building;

(c) any wall or floor separating part of a building from any other part of the same building which is used or intended to be used mainly for a purpose falling within a different purpose group as set out in the Fifth Schedule to these By-laws; and

(d) any floor immediately over a basement storey if such basement storeys has an area exceeding 100 square metres.

139. Separation of fire risk areas.

(1) The following areas or uses shall be separated from the other areas of the occupancy in which they are located by fire resisting construction of elements of structure of a FRP to be determined by the local authority based on the degree of fire hazard:

- (a) boilers room and associated fuel storage areas;
- (b) laundries;
- (c) repair shops involving hazardous processes and materials;
- (d) storage areas of materials in quantities deemed hazardous;
- (e) liquefied petroleum gas storage areas;
- (f) linen rooms;
- (g) transformer rooms and substations;
- (h) flammable liquids stores.

[Am. as (1) -Sel.P.U.142/2012].

(2) For hospital and nursing home of Purpose Group II (Institutional), laboratories and kitchens shall not have sleeping accommodation above them and shall form separate compartments from in-patient treatment areas, public areas, staircase and lift discharge areas.

[(2) ins.Sel.P.U.142/2012].

140. Fire appliance access.

(1) Access way shall be provided within the site of a building to enable fire appliances to gain access to the building. Access openings shall also be provided along the external walls of buildings fronting the access way to provide access into the building for fire fighting and rescue operations.

(2) The requirements of access way shall be as follows:

- (a) the access way shall have a minimum width of 6 metres throughout its entire length and shall be able to accommodate the entry and manouvering of fire engine, extended ladders pumping appliances, turntable and hydraulic platforms;
- (b) the access way shall be metalled or paved or laid with strengthened perforated slabs to withstand the loading capacity of stationary 30 tonnes fire appliance;
- (c) the access way shall be positioned so that the nearer edge shall be not less than 2 metres or more than 10 metres from the centre position of the access opening, measured horizontally;
- (d) the access way shall be laid on a level platform or if on an incline, the gradient shall not exceed 1:15. The access road shall be laid on a incline not exceeding a gradient of 1:8.3;

(e) the dead-end access way and fire engine access road shall not exceed 46 metres in length or if exceeding 46 metres, be provided with turning facilities;

(f) the outer radius for turning of access way and fire engine access road shall comply with the requirements of the Fire Authority;

(g) the overhead clearance of fire engine access road shall be at least 4.5 metres for passage of fire appliances;

(h) public roads may serve as access way provided that the location of such public roads is in compliance with the requirements of distance from access openings as the Fire Authority may specify; and

(i) the access way and the fire engine access road shall be kept clear of obstructions and others parts of the building, plants, trees or other fixtures shall not obstruct the path between the access way and the access openings.

(3) All corners of the access way shall be marked as follows:

(a) the marking of corners shall be in contrasting colour to the ground surfaces or finishes;

(b) the access way provided on turfed area shall be marked with contrasting object (preferably reflective) that is visible at night. The markings are to be at an interval not more than 3 metres apart and shall be provided on both sides of the access way; and

(c) a sign post displaying the wordings "Fire Engine Access – Keep Clear" shall be provided at the entrance of the access way. Size of wordings shall not be less than 50 millimeteres.

(4) The proportion of the building in excess of 7000 cubic metres fronting the access way shall be in accordance with the following scale:

Volume of building in cubic metre	Minimum proportions of perimeter of building
7000 to 28000	one-sixth
28000 to 56000	one-fourth
56000 to 84000	one-half
84000 to 112000	three-fourths
112000 to above	island site.

[Subs. Sel.P.U.142/2012]

141. Separating walls.

(1) Subject to the exceptions specified in paragraph (2) no openings shall be made in any separating wall which forms a complete vertical wall separating any buildings.

(2) Nothing in this by-law shall prohibit-

(a) the passage through a separating wall of pipe, if the pipe-

(i) is not a flue pipe;

(ii) has a diameter not exceeding 25 millimetres if it is made of combustible material or 150 millimetres, if it is made of non-combustible materials; and

(iii) is fire stopped where it passes through the wall; or

(b) an opening in a separating wall which is necessary as a means of escape from fire, if the opening is fitted with a door which has in respect of separating walls FRP of not less than required in this Part.

(3) Any separating wall which forms a junction with a roof shall be carried above the upper surface of the roof to a distance of not less than 225 millimetres measured at right angles to such upper surface.

(4) No timber such as joists, beams, wall plates, tile battens and ties shall be built into the thickness of any separating wall unless there are not less than 100 millimetres of brickwork or cement between such timbers.

[(4) Ins. Sel.P.U.142/2012]

142. External walls.

(1) If any external wall is carried across the end of a separating wall, such external wall and separating wall shall be bonded together or the junction of such walls shall be fire-stopped.

(2) Subject to the provisions relating to small garages and open car parks, any side of a building shall comply with any relevant requirements relating to the permitted limits of unprotected areas specified in the Sixth Schedule to these By-laws unless the building is so situated that such side might consist entirely of any unprotected area.

(3) Any external wall which constitutes, or is situated within a distance of 1 metre from any point on the relevant boundary or is a wall of a building which exceeds 15 metres in height shall-

(a) be constructed wholly of non-combustible materials apart from any external cladding which complies with by-law 144 or any internal lining which complies with these By-laws; and

(b) be so constructed as to attain the FRP required by this Part without assistance from any combustible material permitted by this Part:

Provided that the requirements of this Part shall not apply to-

(i) an external wall of a building which is within the limits of size indicated by the letter "x" in Part 1 of the Ninth Schedule to these By-laws or an external wall of a building which is not divided into compartments and is within the limits of size indicated by the letter "z" in Part 2 of the Ninth Schedule if, in either case, that building does not exceed 18 metres in height; and

(ii) an external wall of a building or part of Purpose Group III which consists of flats or maisonettes if that building has not more than three storeys or that part is separated as described in by-law 135 and does not exceed 18 metres in height.

143. Beam or column.

Any beam or column forming part of, any structure carrying, and external wall which is required to be constructed of non-combustible materials shall comply with the provisions of paragraph (3) of by-law 142 as to non-combustibility.

144. Cladding on external wall.

(1) Any cladding on any external walls, if such cladding is situated less than 1.2 metres from any point on the relevant boundary, shall have a surface complying with the requirements for Class O specified in by-law 204.

(2) Any cladding on any external wall situated 1.2 metres or more from the relevant boundary shall, if the building is more than 18 metres in height, have a surface complying with the requirements specified for Class O in by-law 204 except that any part of such cladding below the height of 18 metres from the ground may consist of timber of not less than 10 millimetres finished thickness or of a material having a surface which, when tested in accordance with BS 476 has an index of performance not exceeding twenty.

[(2) Am.Sel.P.U.142/2012]

145. Reference to Sixth Schedule.

For the purpose of by-laws 142 to 146-

(a) any part of a roof shall be deemed to be part of an external wall of side of a building if it is pitched to an angle 70° or more to the horizontal and adjoins a space within the building to which persons have access not limited to the purpose of maintenance or repair; and

(b) any reference to the Six Schedule to these By-laws shall be construed as referring to the provisions of Part 1 of the Schedule together with, at the option of the persons intending to erect the building, either the provisions of Part II, Part III or Part IV of the Schedule.

146. Relevant boundary.

If any building is to be erected on land occupied with any other building, or two or more detached buildings are to be erected on land in common occupation and either of those buildings is within Purpose Group I or III, other than a detached building which consists only of a garage or of an open car park, in the application of the provisions of this Part to any external wall of any building to be erected which faces an external wall of such other building-

(a) the relevant boundary shall be a notional boundary passing between those buildings and such boundary must be capable of being situated in such a position as to enable the external walls of those buildings to comply with the requirements of this Part; and

(b) if such other building is an existing it shall be deemed to be (a building to be) erected on the site which it occupies, being of the same purpose and having the same unprotected areas and fire resistance as the existing building.

147. Construction of separating walls.

(1) Any separating wall, other than a wall separating buildings not divided into compartments within the limits of size indicated by the letter "x" in Part I of the Ninth Schedule to these By-laws, shall be constructed wholly of non-combustible materials, excluding any surface finish to a wall which complies with the requirements of these By-laws and the required FRP for the wall shall be obtained without assistance from such non-combustible material.

(2) Any beam or column forming part of, and any structure carrying, a separating wall which is required to be constructed of non-combustible materials shall be itself comply with the requirements of paragraph (1) as to non-combustibility.

148. Special requirements as to compartment walls and compartment floors.

(1) No opening shall be made in any compartment wall or compartment floor with the exception of any one or more of the following:

(a) an opening fitted with a door which complies with the requirements of by-law 162 and has FRP which not less than -

(i) in the case of a wall separating a flat or maisonette from any space in common use giving access to that flat or maisonette, half hour; or

(ii) in any other case, the FRP required by the provisions of these BY-laws in respect of the wall or floor;

(b) an opening for an protected shaft;

(c) an opening for a ventilation duct, other than a duct in, or consisting of, a protected shaft, if any space surrounding the duct is fire-stopped and the duct is fitted with an automatic fire damper in accordance with Australian Standard 1682 and 1668 Part I - 1974 or its equivalent where it passes through the wall or floor which fire damper shall have not less than required FRP of the material of the compartment wall or floor through which it passes;

(d) an opening for a pipe which complies with the requirements of paragraph (2) by-law 141;

(e) an opening for a refuse chute having a FRP of at least one hour and having a close-fitting door situated in an external wall of the chamber having a FRP of half-hour.

(2) Where the compartment wall or compartment floor forms a junction with any structure comprising any other compartment walls, or any external wall, separating wall or enclosing a protected shaft, such structures shall be bonded together at the junction or the junction shall be fire-stopped.

(3) Where any compartment wall forms a junction with a roof, such wall shall be carried to the under surface of the roof covering.

(4) Where any chimney, appliance ventilation duct or duct encasing one or more flue pipes passes through a compartment floor or compartment wall-

(a) any flue in chimney; or

(b) the passage in the appliance ventilation duct; or

(c) the space within the duct encasing the flue pipe or pipe,

shall be separated from that compartment floor or that compartment wall and from each compartment adjoining that wall or floor by non-combustible construction having FRP of not less than half the minimum FRP required by these By-laws in respect of that compartment wall or compartment floor through which such chimney, duct or pipe passes.

(5) If any chimney, appliance ventilation duct or duct encasing one or more flue pipes forms part of a compartment wall-

(a) any flue in the chimney; or

(b) the passage in the appliance ventilation duct; or

(c) the space within the duct encasing the flue pipe or pipes,

shall be separated from any compartment adjoining that wall by non-combustible construction which will, at any level, have FRP of not less than half the minimum FRP required by these By-laws in respect of the compartment wall at the level.

(6) Any compartment wall or compartment floor which is required by these By-laws to have FRP hour or more shall, excluding-

(a) any floor finish;

(b) any surface finish to a wall or ceiling which complies with the requirements of by-laws 204 shall; or

(c) any ceiling which complies with the description specified in the Ninth Schedule to these By-laws,

be constructed wholly of non-combustible materials and, apart from any ceiling, the required FRP of the wall or floor shall be obtained without assistance from any non-combustible material.

(7) Any beam or column forming part of, and structure carrying, any compartment wall or compartment floor which is required to be constructed of non-combustible materials, shall itself comply with the provisions of paragraph (6) as to non-combustibility.

149. Horizontal and vertical barriers at the external walls.

Openings in external located vertically above one another shall be protected by approved flame barriers either extending 750 millimetres beyond the exterior wall in the plane of the floor or by vertical panels not less than 90 millimetres in height.

150. Protected shafts.

(1) No protected shaft shall be constructed for use for any purposes additional to those specified in this Part other than for the accommodation of any pipe or duct, or as sanitary accommodation or washrooms, or both.

(2) Subject to the provisions of this Part, any protected shaft shall be completely enclosed.

(3) Any protecting structure which is required to have a FRP of one hour or more, and any beam or column forming part of that structure and any structure carrying such protecting structure shall be constructed of non-combustible materials throughout, with the exception of any external surface finish which complies with the requirements of by-law 204 relating to wall surfaces.

(4) Any wall, floor or other structure enclosing a protected shaft but not only being a protecting structure may contain such openings as shall be in accordance with other provisions of these By-laws.

(5) There shall be no opening in any protecting structure other than any one or more of the following:

(a) an opening for a pipe;

(b) an opening fitted with a fire-resisting door which complies with the provisions of by-law 162;

(c) if the protected shaft contains a lift, an opening which complies with the provisions of by-law 162; and

(d) if the protected shaft serves as, or contains a ventilating duct, an inlet to or outlet from the duct or an opening for the duct.

(6) Any opening for a pipe shall be effectively fire-stopped.

151. Ventilation to lift shafts.

Where openings to lift shaft are not connected to protected lobbies, such lift shafts shall be provided with vents of not less than 0.09 square metre per lift located at the top of the shafts. Where the vent does not discharge directly to the open air the lift shafts shall be vented to the exterior through a duct of the required FRP as for the lift shafts.

152. Openings in lift shafts.

(1) Every opening in a lift shaft or lift entrance shall open into a protected lobby unless other suitable means of protection to the opening to the satisfaction of the local authority is provided. These requirements shall not apply to open type industrial and other special buildings as may be approved by the D.G.F.S.

(2) Landing doors shall have a FRP of not less than half the FRP of the hoistway structure with a minimum FRP of half hour.

(3) No glass shall be used for in landing doors except for vision in which case any vision panel shall or be glazed wired safety glass, and shall not be more than 0.0161square metre and the total area of one of more vision panels in any landing door shall be not more than 0.0156 square metre.

(4) Each clear panel opening shall reject a sphere 150 millimetres in diameter.

(5) Provision shall be made for the opening of all landing doors by means of an emergency key irrespective of the position of the lift car.

153. Smoke detectors for lift lobbies.

(1) All lift lobbies shall be provided with smoke detectors.

(2) Lift not opening into a smoke lobby shall not use door reopening devices controlled by light beam or photo-detectors unless incorporated with a force close feature which after thirty seconds of any interruption of the beam causes the door to close within a preset time.

154. [Deleted].

[Deleted - Sel.P.U.142/2012]

155. Fire mode of operation.

(1) The fire mode of operation shall be initiated by a signal from the fire alarm panel which may be activated automatically by one of the alarm devices in the building or manually.

(2) If mains power is available all lift shall return in sequence directly to the designated floor, commencing with the fire lifts, without answering any car or landing calls, overriding the emergency stop button inside the car, but not any other emergency or safety devices, and park with doors open.

(3) The fire lifts shall then be available for use by the fire brigade on operation of the fireman's switch.

(4) Under this mode of operations, the fire lift shall only operate in response to car calls but not to landing calls in a mode of operation in accordance with by-law 154.

(5) in the event of mains power failure, all lifts shall return in sequence directly to the designated floor and operate under emergency power as described under paragraphs (2) to (4).

156. Protected shafts as ventilating duct.

(1) If a protected shaft serves as, or contains, a ventilating duct-

(a) the duct shall be fitted with automatic fire dampers together with or without subducts as Australian Standard 1668: Pt. 1:1974, so constructed at such intervals and in such positions as may be necessary to reduce, so far as practical, the risk of fire spreading from a compartment to any other compartment, or such provision shall be made as will reduce such risks so far as practicable; and

(b) the duct shall not be constructed of, or lined with, any material which substantially increase such risk.

(2) In addition, in the case of a protected shaft containing a ventilating duct, the shaft shall be so constructed with additional barriers to fire between the duct and the shaft as may be necessary to reduce so far as practicable the risk of fire spreading from a compartment to any other compartment.

157. Protected shafts consisting of staircase.

A protected staircase or a protected shaft containing a staircase shall not contain any pipe conveying gas or oil or any ventilating ducts other than a duct serving only that staircase or shaft.

158. Stages in places of assembly.

(1) In places of assembly, other than school halls or other similar halls where stage scenery is infrequently used, capable of seating more than 400 persons and in which stage scenery may be used, the stage shall be separated from the auditorium by a proscenium wall not less than 225 millimetres brickwork or other materials of equivalent FRP, carried down to a solid foundation and up to at least 0.92 metres above the roof level unless the roof is constructed of materials having the FRP as specified in the Ninth Schedule to these By-laws.

(2) No more than three openings inclusive of the proscenium opening shall be provided in the proscenium wall.

(3) No opening additional to the proscenium opening shall be more than 0.61 metres above the level of the stage nor shall such additional opening have an area exceeding 1.858 squares metres and each such additional opening shall be fitted with a door constructed of materials having the FRP as specified in the Ninth Schedule to these By-laws.

159. Open stages.

Open stages without proscenium walls may be permitted provided suitable protection devices to the satisfaction of the D.G.F.R are installed.

[Am.Sel.P.U.142/2012]

160. Fire precaution in air-conditioning systems.

(1) All air-conditioning ducts, including framing therefor, excepts ducts in detached and semi-detached residential buildings shall be constructed entirely of non-combustible materials and shall be adequately supported through their lengths.

(2) No air-conditioning ducts shall pass through fire walls unless as provided for in by-laws 148 and 156.

(3) The air intake of any air-conditioning apparatus shall be situated such that air shall not be recirculated from any space in which objectionable quantities of inflammable vapors or dust are given off and shall be so situated as to minimize the drawing in of any combustible material.

161. Fire-stopping.

(1) Any fire stop required by the provisions of this Part shall be so formed and positioned as to prevent or retard the passage of flame.

(2) Any fire stop shall-

(a) if provided around a pipe or duct or in a cavity, be made of non-combustible material or, if it is in a floor or wall constructed of combustible material, of timber not less than 37 millimetres thick; and

(b) if provided around a pipe or duct, be so constructed as not to restrict essential thermal movement.

(3) Any fire stop formed as a seal at the junction of two or more elements of structure shall be made of non-combustible material.

(4) Any cavity in an element of structure which-

(a) is continuous through the whole or part of such element; and

(b) has a surface of combustible material exposed within the cavity which is of a class lower than Class O in by-law 204 shall be fire stopped-

(i) at any junction with another element of structure or with a ceiling under a roof; and

(ii) in such a position that there is no continuous cavity without a fire stop which is one plane exceeds either 7.625 metres in a single dimension or 23.225 square metres in area;

but nothing in this by-law shall prohibit the insertion of combustible filling in a cavity.

162. Fire doors in compartment walls and separating walls.

(1) Fire doors of a appropriate FRP shall be provided.

(2) Openings in compartment walls and separating walls shall be protected by a fire door having a FRP in accordance with the requirements for that wall specified in the Ninth Schedule to these By-laws.

(3) Openings in protecting structures shall be protected by fire doors having FRP of not less than half the requirement for the surrounding wall specified in the Ninth Schedule to these By-laws but in no case less than half hour.

(4) Openings in partitions enclosing a protected corridor or lobby shall be protected by fire doors having FRP of half-hour.

(5) *[Deleted - Sel.P.U.142/2012]*

163. Fire doors.

Fire doors including frames shall be constructed in accordance with MS 1073.

[Subs.- Sel.P.U.142/2012]

164. Door closers for fire doors.

- (1) All fire doors shall be fitted with automatic door closers of the hydraulically spring operated type in the case of swing doors and of wire rope and weight type in the case of sliding doors.
- (2) Double doors with rabbeted meeting stiles shall be provided with co-ordinating device to ensure that leafs close in the proper sequence.
- (3) Fire doors may be held open provided the hold open device incorporates a heat actuated device to release the door. Heat actuated devices shall not be permitted on fire doors protecting openings to protected corridors or protected staircases.

165. Measurement of travel distance to exits.

- (1) The travel distance to an exit shall be measured on the floor or other walking surface along the centre line of the natural path of travel, starting 0.300 metre from the most remote point of occupancy, curving around any corners or obstruction with 0.300 metre clearance therefrom and ending at the storey exit. Where measurement includes stairs, it shall be taken in the plane of the trend noising.
- (2) In the case of open areas the distance to exists shall be measured from the most remote point of occupancy provided that the direct distance shall not exceed two-thirds the permitted travel distance.
- (3) In any of individual room which is subjected to occupancy of not more than six persons, the travel distance shall be measured from the door of such room:

Provided that the area of the room does not exceed 15 square metres or any other area determined by the Fire Authority

[(3) Subs.- Sel.P.U.142/2012]

- (4) The maximum travel distance to exits and dead end limits shall be as specified in the Seventh Schedule of these By-laws.

166. Exits to be accessible at all times.

- (1) Except as permitted by by-law 167 not less than two separate exits shall be provided from each storey together with such additional exits as may be necessary.
- (2) The exits shall be so sited and the exit access shall be arranged that the exits are within the limits of travel distance as specified in the Seventh Schedule to these By-laws and are readily accessible at all times.

167. Storey exits.

- (1) Except as provided for in by-law 194 every compartment shall be provided with at least two storey exits located as far as practical from each other and shall not be less than 5.0 metres and in such position that the travel specified in the Seventh Schedule to these By-laws are not exceeded.

[(1) Am.Sel.P.U.142/2012]

(2) The width of storey exits shall be in accordance with the provisions in the Seventh Schedule to these By-laws.

168. Staircases.

(1) Except as provided for in by-laws 194 every upper floor shall have means of egress via at least two separate staircases.

(2) Staircases shall be of such width that in the event of any one staircase not being available for escape purpose the remaining staircases shall accommodate the highest occupancy load of any one floor discharging into it calculated in accordance with provisions in the Seventh Schedule to these By-laws.

(3) The required width of staircase shall be the clear width between walls but handrails may be permitted to encroach on this width to a maximum of 80 millimetres.

[(3) Am.Sel.P.U.142/2012]

(4) The required width of a staircase shall be maintained throughout its length including at landings.

(5) Doors giving access to staircases shall be so positioned that their swing shall at no point encroach on the required width of the staircase or landing.

169. Exit route.

(1) No exit route may reduce in width along its path of travel from storey exit to the final exit.

[(1) Am.Sel.P.U.142/2012]

(2) For hospital and nursing home of Purpose Group II (Institutional)-

(a) corridors and landings shall be designed to accommodate stretcher and bed movement; and

(b) design shall provide for horizontal evacuation of bed patients for at least 50% of the total bed patients from the floor concerned.

[(2) Ins.Sel.P.U.142/2012]

170. Egress through unenclosed openings.

Where unclosed openings are permitted between floors and for a mezzanine floor, egress may be by way of an open staircase to an adjacent floor and thence to a storey exit:

(a) the layout is such that fire originating anywhere within the compartment will be obvious to the occupants of all communicating levels or areas;

(b) the travel distances specified in the Seventh Schedule to these By-laws are not exceeded;

(c) only 50% of the occupants of a floor are assumed to use the open staircase and storey exits are provided at every level to accommodate the other 50% of the occupants of that level in accordance with the provisions of the Seventh Schedule to these By-laws; and

(d) the storey exits on the principal floor through which other levels discharge are designed to handle the occupants of that floor plus 50% from the adjacent levels discharging through it.

171. Horizontal exits.

(1) Where appropriate, horizontal exits may be provided in lieu of other exits.

(2) Where horizontal exits are provided protected staircases and final exits need only be of a width to accommodate the occupancy load of the larger compartment or building discharging into it so long as the total number of exit widths provided is not reduced to less than half that would otherwise be required for the whole building.

(3) For institutional occupancies the total exit capacity other than horizontal exits shall not be reduced by more than one-third that would otherwise be required for the entire area of the building.

172. Emergency exit signs.

(1) All exit door should be openable from the inside without the use of a key or any special knowledge or effort.

(2) Exit doors shall close automatically when released and all door devices including magnetic door holders, shall release the doors upon power failure or actuation of the fire alarm.

(3) The design and installation of every emergency exit sign shall be in compliance with MS 983 and MS 619

[(3)Subs.Sel.P.U.142/2012]

173. Exit doors.

(1) All exit door should be openable from the inside without the use of a key or any special knowledge or effort.

(2) Exit doors shall close automatically when released and all door devices including magnetic door holders, shall release the doors upon power failure or actuation of the fire alarm.

174. Arrangement of storey exits.

(1) Where two or more storey exits are required they shall be spaced at not less than 5 metres apart measured between the nearest edges of the openings.

(2) Each exit shall give direct access to-

(a) a final exit;

- (b) a protected staircase leading to a final exit; or
- (c) an external route leading to a final exit.

(3) Basements and roof structures used solely for services need not be provided with alternative means of egress.

175. Calculation of occupancy loads.

Calculation of occupancy loads and capacity of exits shall be in accordance with the provisions of the Seventh Schedule to these By-laws.

176. Computing storey exit width.

To compute the required exit width from the individual floors of a building-

- (a) calculate the floor area net or gross whichever is applicable;
- (b) determine the allowable occupancy load factor from Table;
- (c) divide the floor area by the number of square meter per person to determine the number of persons for which exits must be provided for that floor;
- (d) determine from the table the capacity of the type of exit to be used for the purpose group being designed; and
- (e) calculate the number of units of exit width for each type of exit used based upon the capacity.

177. Computing number of staircases and staircase width.

The following factors shall be used in computing the exit widths:

- (a) in a multi-storeyed building if x units of exit width are required from each floor the staircase serving those floors do not need to be x times the number of floors served in units of exit width. The staircase need be only wide enough to serve each floor but not less than the minimum width allowed and in every case one of the protected staircases shall be assumed to be inaccessible and the remaining protected staircase shall be of sufficient width and number to accommodate the relevant occupancy;
- (b) depending on the occupancy, street floor exits have to be sized to handle not only to occupant load of the street floor but also a percentage of the load of the exits discharging to the street floors above and below;
- (c) exit should never decrease in width along their length of travel and, if two or more exits coverage into a common exit, the common exit should never be narrower than the sum of the width of the exits converging into it;
- (d) except as provided in these By-laws, the minimum number of exits is two;

(e) at least one of the staircases should be a minimum of two unit width except that 900 millimetres may be allowed where total occupancy of all floors served by staircases is less than 50; and

(f) there should be no decrease in width along path of travel of a staircase.

178. Exits for institutional and other places of assembly.

In buildings classified as institutional or places of assembly, exits to a street or large open space, together with staircases, corridors and passages leading to such exits shall be located, separated or protected as to avoid any undue danger to the occupants of the place of assembly from fire originating in the other occupancy or smoke therefrom.

179. Classification of places of assembly.

Each place of assembly shall be classified according to its capacity as follows:

Class A-Capacity	1,000 persons or more
Class B-Capacity	300 to 1,000 persons
Class C-Capacity	100 to 300 persons

180. Spaced standards for calculating occupancy loads.

The occupancy load permitted in any place of assembly shall be determined by dividing the net floor area or space assigned to the use by the square metre per occupant as follows:

(a) assembly area of concentrated use without fixed seats such as an auditorium, places of worship, dance floor and lodge room - 0.65 square metre per person;

(b) assembly area of less concentrated use such as a conference room, dining room, drinking establishment, exhibit room, gymnasium, or lounge-1.35 square metre per person;

(c) standing room or waiting space - 3 square metre per person;

(d) the occupancy load of area having fixed seats shall be determined by the number of fixed seats installed. Required aisle space serving the fixed seats shall not be used to increase the occupant load.

181. Width of means of egress.

Means of egress shall be measured in units of exits width of 552 millimetres. Fractions of a unit shall not be counted, except than 300 millimetres added to one or more full units shall be counted as one half of a unit exit width and no individual access to exit shall be less than 700 millimetres.

182. Rate of discharge.

The rate of travel per floor of persons shall be sixty persons per minute through doors or along level passage ways and forty-five persons per minute down stairs.

183. Exit details for places of assembly.

Every places of assembly, every tier or balcony and every individual room used as a place of assembly shall have exits sufficient to provide for the total capacity thereof as determined in accordance with by-law 180 and as follows:

- (a) no individual unit of exit width shall serve more than one hundred persons;
- (b) doors leading outside the building at ground level or not more than three risers above and below ground one hundred persons per exit unit;
- (c) staircases or other types of exit not specified in by-law 177 above seventy-five persons per exit unit;
- (d) every Class A place of assembly (capacity one thousand persons or more) shall have at least four separate exits as remote from each other as practicable;
- (e) every Class B place of assembly (capacity three hundred to one thousand persons) shall have at least two separate exits as remote from each other as practicable, and if of a capacity of over six hundred at least three such exists;
- (f) every Class C place of assembly (capacity one hundred to three hundred persons) shall have at least two means of exit, consisting of separate exits or doors leading to a corridor or other space giving access to separate exists in different directions.

184. Seating.

(1) (a) The spacing of rows of seats from back to back shall be not less than 825 millimetres, nor less than 675 millimetres plus the sum of the thickness of the back and inclination of the back.

(b) There shall be a space of not less than 300 millimetres between the back of one seat and the front of the seat immediately behind it as measured between plumb-lines.

(c) Row of seats between gangways shall have not more than fourteen seats.

(d) Rows of seats opening on to a gangway at one end only shall have not more than seven seats.

(e) Seats without dividing arms shall have their capacity determined by allowing 450 millimetres per person.

(2) (a) With Continental seating the spacing of rows of unoccupied seats shall provide a clear width between rows measured horizontally as follows (automatic or self-rising seats shall be measured in the seat-up position, other seats shall be measured in the seat-down positions);

450 millimetres clear width between rows of 18 seats or less;

500 millimetres clear width between rows of 35 seats or less;

525 millimetres clear width between rows of 45 seats or less;

550 millimetres clear width between rows of 46 seats or more.

(b) With continental seating, the number of intervening seats between any seat and a gangway may be increased to 49 where exit doors are provided along each side gangway of the row of seats at the rate of 1 pair of exit doors for each 5 rows of seat. Such exit doors shall provide a minimum clear width of 1680 millimetres.

185. Gangways in places of ass

(1) A clear gangway not less than 1200 millimetres in width shall be provided around the stalls and balcony in a place of assembly leading to exit doors therein:

Provided that if the gangways in the balcony lead to exit doors not less than 1200 millimetres in width the rear gangway may be omitted.

(2) Gangways not less than 1200 millimetres wide running parallel to the rows of seating in a place of assembly shall be provided where required by the local authority.

(3) All floors of balconies or tiers in a place of assembly shall be constructed entirely of reinforced concrete.

(4) Steps shall not be used to overcome differences in level in a gangway in a place of assembly unless the slope of such gangway exceeds one in ten.

(5) Where steps of a pitch exceeding 30° or ramps of a slope exceeding one in ten are provided in gangways flanking the seating in a place of assembly, suitable handrails shall be provided.

(6) The treads of steps in gangways in a place of assembly shall have a non-slip surface and the edges of such steps shall be illuminated at step level.

(7) In circles and galleries or areas where the incline exceeds 15° , guard rails not less than 1050 millimetres above floor level shall be provided at the foot of gangways in places of assembly.

186. Exit doors in places of assembly.

(1) All doors used by the public as exit doors from any part of the place of assembly or leading to the open air, shall open only in the direction of exit.

(2) In a place of assembly all exit doors and doors through which the public pass on the way to the open air shall be without lock, bolts or other fastenings while the public are in the building:

Provided that doors used for exit only may be fitted with panic bolts.

(3) Panics bolts fitted to doors in a place of assembly shall be not less than 750 millimetres or more than 1100 millimetres above the floor.

(4) Turnstiles, if installed in a place of assembly. shall be arranged clear of the line of exit, and shall not be included in the calculation of exit width.

(5) In a place of assembly every external door used by the public and every collapsible gate shall be capable of being locked in the fully open position in such a way that a key is required to release such door or gate from such open position.

187. Notice affixed to door of gate.

A notice or notices so arranged as to be visible from both sides of the door, gate or shutter whether the door, gate or shutter is in the open or in the closed position shall be affixed to, or in position adjacent to every door and gate referred to above, such notice bearing the words "This gate/door is required to be kept open and lock in that position the whole time the audience/gathering is in the building". The height of the lettering for such notice shall not be less than 75 millimetres.

188. Travel distance in places of assembly.

Exits in any place of assembly shall be arranged that the travel from any point to reach an exit shall not exceed 45 metres for unsprinkle buildings and 60 metres for sprinkled buildings.

189. Enclosing means of escape in certain buildings.

(1) Every staircase provided under these By-laws in a building of four storeys or more, or in building where the highest floor level is more than 12 metres above the ground level, or in any place of assembly, or in any school when such staircase is to be used as an alternative means of escape shall be enclosed throughout its length with fire resisting materials.

[(1) Am.Sel.P.U.142/2012]

(2) In a building of Purpose Group IV (Office), open corridor design may have unenclosed staircases if provided with extended landings of not less than twice staircase width and walls separating the staircase from the occupancy be returned for a distance of not less than 1 metre along the frontage of adjacent occupancies.

[(2) Subs.Sel.P.U.142/2012]

190. External staircase.

Any permanently installed external staircase is acceptable as a required exit under the same condition as an internal staircase:

Provided that such staircase shall comply with all the requirements for internal staircases. External staircases shall be separated from the interior of the building by walls and fire door of the same fire resistance as required for internal staircases.

191. Openings in adjacent walls not permitted.

(1) No opening shall be permitted to be formed in the walls adjacent to any external staircase within a distance of 2 metres measured horizontally and 9 metres measured vertically below the staircase.

(2) Ventilation openings to toilets or other protected areas area however exempted from this restriction.

(3) Where windows or other glazed openings are required within these dimensions, they shall be fitted with wired glass and be kept in permanently closed position.

192. Moving walks.

(1) An inclined moving walk exit shall comply with the applicable requirements of ramps.

(2) No moving walk capable of being operated in the direction contrary to normal exit travel be used as a means of egress.

193. Power operated doors as means of egress.

A power operated door shall only be regarded as a means of egress if it is possible to be swung in the direction of exit travel by manual means.

194. Building with single staircase.

A single staircase may be permitted in the following premises:

(a) any dwellings at a height of 12 metres measured from the fire appliance access level to the highest and lowest floor; and

(b) any shop houses or dwellings not exceeding two (2) storeys or the first storey not exceeding 6 metres from the ground level.

[Subs.Sel.P.U.142/2012]

195. Staircases to reach roof level.

In buildings exceeding 30 metres in height all staircases intended to be used as means of egress shall be carried to the roof level to give access thereto.

196. Smoke lobbies.

- (1) Access to a staircase smoke lobby shall be by means of fire doors opening in the direction of escape.
- (2) The width of the smoke lobby shall at no point be less than the required exit width.
- (3) Smoke lobbies shall be provided at the basement levels where an escape staircase serving an upper storey is extended to a basement.
- (4) Where practical smoke lobbies and fire fighting access lobbies shall have permanent openings or openable windows of not less than 1 square metre giving the direct access to the open air from an external wall or internal light well.
- (5) Where natural ventilation is impractical smoke lobbies and fire fighting access lobbies may be ventilated by means of a vertical shaft or mechanically pressurised.

197. Protected lobbies.

- (1) Protected lobbies shall be provided to serve staircases in buildings exceeding 18 metres above ground level where the staircase enclosures are not ventilated through external walls.
- (2) In buildings exceeding 45 metres above ground level, such protected lobbies shall be pressurised to meet the requirements of Section 7 of the Australian Standard 1668, Part 1 - 1974 or any other system meeting the functional requirements of the D.G.F.R.

[(2) Am.Sel.P.U.142/2012]

- (3) Protected lobbies may be omitted if the staircase enclosures are pressurised to meet the requirements of by-law 200.

197A. Means of access and fire fighting in building over 18.0 metres high.

- (1) Buildings in which the topmost floor is more than 18.0 metres above fire appliance access level shall be provided with means of gaining access and fighting fire from within the building consisting of fire fighting access lobbies, fire fighting staircases, fire lifts and dry or wet rising systems.
- (2) Fire fighting access lobbies shall be provided at every floor level and shall be so located that the level distance from the furthest point of the floor does not exceed 45.0 metres.
- (3) Fire fighting access lobbies may be omitted if the fire fighting staircase is pressurised to meet the requirements of by-law 200 and all fire fighting installations within the pressurised staircase enclosure do not intrude into the clear space required for means of egress.
- (4) A fire fighting staircase shall be provided to give direct access to each fire fighting access lobby and shall be directly accessible from outside the building at fire appliance access level. This may be one of the staircases required as a means of egress from the building.
- (5) A fire lift shall be provided to give access to each fire fighting access lobby or in the absence of a lobby to the fire fighting staircase at each floor level.

(6) The fire lift shall discharge directly into the fire fighting access lobby fire fighting staircase or shall be connected to it by a protected corridor.

(7) In a building where the top occupied floor is over 18.5 metres above the fire appliance access level fire lifts shall be provided.

(8) A penthouse occupying not more than 50% of the area of the floor immediately below shall be exempted from this measurement.

(9) The fire lifts shall be located within a separate protected shaft if it opens into a separate lobby.

(10) Fire lifts shall be provided at the rate of one lift in every group of lifts which discharge into the same protected enclosure or smoke lobby containing the rising main, provided that the fire lifts are located not more than 61 metres travel distance from the furthest point of the floor.

(11) All lifts serving upper floors shall not extend to basement floors except where the basement floors only contain low fire loads or are used solely for car parking. In all the permitted situations, protected lobbies shall be provided which shall be interposed between the lift openings and the areas served.

[Ins.Sel.P.U.142/2012]

197B. Fire fighting access lobbies.

Fire fighting access lobbies shall conform to the following requirements:

(a) each lobby shall have a floor area of not less than 6.0 square metres; and

(b) the openable area of windows or area of permanent ventilation shall be not less than 25% of the floor area of the lobby and, if ventilation is by means of openable windows, additional permanent ventilation having a free opening of 464 square centimetres shall be provided except that mechanical pressurisation may be provided as an alternative.

[Ins.Sel.P.U.142/2012]

198. Ventilation of staircase enclosures.

(1) All staircase enclosures shall be ventilated at each floor or landing level by either permanent openings or openable windows to the open air having a free area not less than 1 square metre per floor.

(2) Openable windows shall meet the operational requirements of the D.G.F.R.

[(2) Am.Sel.P.U.142/2012]

(3) *[Deleted - Sel.P.U.142/2012]*

199. Ventilation of staircase enclosures in buildings not exceeding three storeys or 18 metres.

In buildings not exceeding three storeys or 18 metres above ground level, staircase enclosures may be unventilated provided that access to them at all levels excepts the top floor is through ventilated lobbies

and the staircase enclosures are permanently ventilated at the top with at least 5% of the area of the enclosures.

[Am. Sel.P.U.142/2012].

200. Ventilation of staircase enclosures in buildings exceeding 18 metres.

For staircase in buildings exceeding 18 metres above ground level that are not ventilated in accordance with by-law 198, two alternative methods of preventing the infiltration smoke into the staircase enclosures may be permitted by providing-

(a) permanent ventilation at the top of the staircase enclosure of not less than 5% of the area of the enclosure and in addition at suitable intervals in the height of the staircase a mechanically ventilated shaft to achieve not less than 20 air charges per hour to be automatically activated by a signal from the fire alarm panel; or

(b) mechanical pressurisation of the staircase enclosure designed and installed in accordance with MS 1472.

[(b) Am. Sel.P.U.142/2012].

201. Staircase enclosures below ground level.

All staircases enclosure below ground level shall be provided with suitable means of preventing the ingress of smoke.

202. Pressurized system for staircases.

All staircases serving buildings of more than 45 metres in height where there is no adequate ventilation as required shall be provided with a staircase pressurization system designed and installed in accordance with MS 1472.

[Subs.Sel.P.U.142/2012].

203. Restriction of spread of flame.

(1) Finished floor or floor covering may be exempted from the requirements of this Part:

Provided that in any case where the authority having jurisdiction finds a floor surface of unusual hazard, the floor surface shall be considered a part of the interior finish for the purpose of this Part.

(2) The classification of interior finish materials specified shall be that of the basic materials used, without regard to subsequently applied paint or wall-paper, except that the Fire Authority having jurisdiction shall include such finishes in the determination of classification in any case where in the opinion of the Fire Authority having jurisdiction they are of such character or thickness or so applied as to affect materially the flame spread characteristics.

204. Classification of restriction of flame over surfaces of wall and ceiling.

For the purpose of this Part and the Eight Schedule to these By-laws any reference to a surface being of a specified class shall be construed as a requirement that the material of which the wall, ceiling or soffit is constructed, shall comply with the following requirements:

Class O. Surface of no flame spread.

(a) Any reference to a surface being Class O shall be construed as a requirement that-

(i) the material of which the wall or ceiling is constructed shall be non combustible throughout; or

(ii) the surface material, or if it is bonded throughout to a substrate, the surface material in conjunction with the substrate, shall when tested in accordance with BS 476;

[(a)(i) & (ii) Am.Sel.P.U.142/2012].

[Proviso: Deleted *Sel.P.U.142/2012*].

(i) the material is bonded throughout to a substrate which is not a plastic material and the material in conjunction with the substrate satisfied the test criteria prescribed in (a) above; or

(ii) the material satisfies the test criteria prescribed in (b) above and is used as a lining of a wall so constructed that any surface which would be exposed if this lining were not present, satisfies the said test criteria and is the face of a material other than a plastic material having a softening point less than 120⁰C.

(b) Any reference to a surface being of a class other than Class O shall be construed as a requirement that the material of which the wall or ceiling is constructed shall comply with the relevant test criteria as to surface spread or flame specified in relation to that class in clause 7 of BS 476: Part 1:

[(b) Am.Sel.P.U.142/2012].

(c) In relation to a requirement that a surface shall be of a class not lower than a specified class. Class O shall be regarded as the highest class followed in descending order by Class 1, Class 2, Class 3 and Class 4.

[Am.Sel.P.U.142/2012]

Class 1. Surface of Very Low Flame Spread.

Those surfaces on which not more than 150 millimetres means spread of flame occurs.

Class 2. Surfaces of Low Flame Spread.

Those surface on which during the first 1 1/2 minutes of test, the mean spread flame is not more than 375 mm and the final spread does not exceed 450 mm.

Class 3. Surfaces of Medium Flame Spread.

Those surfaces of which, during the 1 1/2 minutes of the test, the means spread of flame is not more than 375 millimetres and during the first 10 minutes of test is not more than 825 millimetres.

Class 4. Surfaces of Rapid Flame Spread.

Those surfaces on which during the first 1 1/2 minutes of test, the mean spread of flame is not more than 375 millimetres and during the first 10 minutes of test is more than 825 millimetres.

205. Classification of interior finish materials.

(1) Any material shown by test to have a life hazard greater than that indicated by the flame spread owing to the amount or character of smoke generated shall be included in the group shown in by-law 204 appropriate to its actual hazard as determined by the Fire Authority.

(2) Classification of interior finish materials shall be in accordance with tests made under conditions simulating actual installations.

(3) Where a complete standard system of automatic sprinklers is installed, interior finish with flame spread rating not over the Class 3 may be used in any location where Class 2 is normally specified, and with rating of Class 2 in any location where Class 1 is normally specified and with rating of Class 1 where Class 0 is specified.

(4) In all buildings other than private residences Class 0 or Class 1 interior finish shall be used in all basements or other underground spaces from which there is no direct exit to the outside of the building if subject to occupancy for any purpose other than storage or service facilities.

206. Classification of surface of wall or ceiling.

(1) The surface of a wall or ceiling in a room, circulation space or protected shaft shall be of a class not lower than that specified as relevant in the Eighth Schedule to these By-laws:

Provided that-

(a) a wall may have a surface of any class not lower than Class 3 to the extent permitted by paragraph (3); and

(b) a ceiling may either have a surface of any class not lower than Class 3 to the extent permitted by paragraph (3) or may consist of plastics material to the extent permitted by paragraph (1) of by-law 207.

(2) Any part of the surface of a wall in a room may be of any class not lower than Class 3 if the area of the part, or, if there are two or more such parts, the total area of those part does not exceed the lesser of the following :

(a) half the floor area of the room; or

(b) in the case of a building or compartment of Purpose Group I, II or III, 2.2 square metres or in any other case 6.5 square metres.

(3) Any part of the surface of a ceiling may be of any class not lower than Class 3 if that part of the surface is the face of a layer of material the other face of which is exposed to the external air and -

(a) (i) the ceiling is that of a room in a building or compartment of Purpose Group II, III, IV, V or VII or that of a circulation space in a building or compartment of any purpose group;

(ii) the area of that part does not exceed 2.5 square metres; and

(iii) the distance between that part and any other such part is not less than 4 square metres; or

(b) (i) the ceiling is that of a room in a building or compartment of Purpose Group VI or VIII;

(ii) the area of that part does not exceed 5 square metres;

(iii) the distance between that part and other such part is not less than 150 millimetres; and

(iv) that part and all other such parts are evenly distributed over the whole area of the ceiling and together have an area which does not exceed 15% of the floor area of the room; or

(c) the ceiling is that of a balcony, verandah, open car park, covered way or loading way which, irrespective of its floor area, has at least one of its longer sides wholly and permanently open; or

(d) the ceiling is that of a garage, conservatory or outbuilding which, irrespective of whether it forms part of a building or is a building which is attached to another to another building or wholly detached, has a floor area not exceeding 44 square metres.

207. Exception relating to ceilings.

Walls and ceiling finishes in the form of thin sheet of not more than 1 millimetre thickness mounted on a non combustible substrate shall not be subject to the requirement of surface spread of flame provisions provided that this exception shall not apply to smoke stop or fire fighting lobbies, and exit staircase and passageway.

[Subs.Sel.P.U.142/2012].

208. Reference to roofs.

Any reference in this Part to a roof or part of a specified designation shall be construed as meaning a roof or part of a roof so constructed as to be capable of satisfying the relevant test criteria specified in respect of that designation of roof in BS 476. Part 3:

Provided that any roof or part of a roof shall be deemed to be of such a designation if-

(a) it conforms with one of the specifications set out against the designation in the Eight Schedule to these By-laws; or

(b) a similar part made to the same specification as that roof is proved to satisfy the relevant test criteria.

209. Reference to buildings.

Any reference in this Part to a building shall, in any case where two or more houses adjoin, be construed as a reference to one of those houses.

210. Construction of roofs.

(1) No part of the roof of a building which-

(a) has a cubic capacity exceeding 1416.43 cubic metres;

(b) is wholly or partly of Purpose Group VI or VII; or

(c) is a house in a continuous terrace of more than two houses;

shall be so constructed as to be designated in accordance with by-law 212 BD, CA, CB, CC, CD, DB, DC or DD, or be covered with attap or wood shingles.

(2) Any part of a roof which is so designated BA, BB, or BC, shall not be less than 2.29 metres from any point on a boundary.

(3) Any part of a roof which is so designated AD, BD, CA, CB, CC, or CD is covered with attap or wood shingles, shall not be less than 4.58 metres from any point on a boundary unless such part is-

(a) of an area not exceeding 3 square metres; and

(b) separated from any other part of the same roof which is so designated or covered with attap or wood shingles by an area of roof which is at least 15.3 metres wide and which is covered by non-combustible material,

in which case such designated part or parts covered with attap or wood shingles shall be not less than 2.29 metres from any such point.

211. Roofing materials.

(1) Surface or materials for roof covering and roof construction shall have a surface spread of flame rating not lower than class 1, except in the case of Purpose Groups I and III shown in Fifth

Schedule of these By-laws and in buildings that are protected throughout with automatic sprinkler system.

(2) D.G.F.R. may approve the use of combustible material for roof construction for buildings of Purpose Groups II, IV, V and VI as shown in Fifth Schedule to these By-laws if the following

requirements are satisfied:

(a) the building does not exceed four storeys;

(b) the roof space between the roof and the ceiling shall be cavity barrier where required to comply with relevant provisions, and openings in cavity barriers shall be fire-stopped; and

(c) if the underside of the roof serves as ceiling to room or space, the elements of the underside or the roof shall comply with the relevant provision of by-law 204.

(3) At the junctions with separating wall or compartment wall, the roof construction shall comply with the requirements as the Fire Authority may specify.

[Subs.Sel.P.U.142/2012].

211A. Materials for construction.

(1) Materials used in the construction of building elements shall comply with the requirements stated under this Part in addition to the performance requirements such as for fire resistance and limit to spread of flame.

(2) Instumescent paints is allowed to be used for protection of structural steel member of all building provided that-

(a) the paints shall be of proprietary system that has been tested to achieve the fire resistance performance as required in BS 476; and

(b) coating of instumescent paint onto structural steel, and subsequent maintenance shall conform to BS 8202.

(3) In buildings which are protected by automatic sprinkler system, fire rated glass can be used for the construction of compartment wall, compartment floors, enclosure to smoke stop lobby, fire fighting lobby, protected shafts not containing exit staircase and fire lift, subject to the following:

(a) the wall and doors shall have necessary fire resistance, including insulation, when subject to test under BS 476 for the wall and MS 1073 for the door; and

(b) the walls and door shall meet the Class A of impact performance requirements when subject to test under BS 6206 or AS 2208.

(4) Walls, ceiling, roof covering and finishes shall not contain any plastic material.

(5) For the purpose of this by-law, "AS" means the latest published edition of the Australian Standard.

[Ins.Sel.P.U.142/2012].

212. Category designation for fire penetration and spread of flame on roof surface.

Each category designation for roofing material shall consist of two letters, the first letter referring to fire penetration and the second letter to spread of flame on the roof surface, these being determined as follows:

(a) First letter-

(i) A- Those specimens which have not been penetrated within 1 hour;

(ii) B- Those specimens which are penetrated in not less than 1/2 hour;

(iii) C- Those specimens which are penetrated in less than 1/2 hour;

(vi) D- Those specimens which are penetrated in the preliminary test.

(b) Second letter-

(i) A- Those specimens on which there is no spread of flame;

(ii) B- Those specimens on which there is not more than 525 millimetres spread of flame;

(iii) C- Those specimens on which there is more than 525 millimetres spread of flame;

(iv) D- Those specimens which continue to burn for 5 minutes after the withdrawal of the test flame or spread more than 375 millimetres across the region of burning in the preliminary test.

213. Fire resistance.

Subject as otherwise provided by this Part every element of structure shall be so constructed as to have fire resistance for not less than whichever of the periods specified in the Ninth Schedule to these By-laws is relevant, having regard to the purpose group of the building of which it forms part and the dimensions specified in that Schedule.

214. Additional requirements.

(1) In addition to any relevant requirements under by-law 213-

(a) any external wall shall have fire resistance of not less than half-hour; and

(b) any separating wall shall have fire resistance of not less than one hour.

(2) Nothing in by-law 213 or paragraph (1) above shall apply to any part of an external wall which is non-load bearing and such external wall may, in accordance with by-law 142, be an unprotected area.

215. Height of buildings.

(1) Subject to the provisions of paragraph (2) and any other express provision to the contrary, any reference to a building of which an element of structure forms part of such building means the building or if a building is divided into compartments any compartment of the building of which the element forms part of such building.

(2) Any reference to height means the height of a building, not of any compartment in the building, but if any part of the building is completely separated throughout its height both above and below ground from

all other parts by a compartment wall or compartment walls in the same continuous vertical plane, any reference to height in relation to the part means the height solely of that part.

216. Single storey buildings.

(1) In any case of a single storey building nothing in by-law 213 or in by-law 214 shall apply to any element of structure in a ground storey which consists of-

(a) a structural frame or a beam or column, provided that any beam or column, whether or not it form part of a structural frame, which is within of forms part of a wall, and any column which gives support to a wall or gallery, shall have fire resistance of not less than the minimum period, if any, required by these By-laws for the wall or that gallery;

(b) an internal load-bearing part of wall, unless that wall or part is, or forms part of, a compartment wall or a separating wall, or forms part of the structure enclosing a protected shaft or support a gallery; or

(c) part of an external wall which does not support a gallery and which may, in accordance with by-law 142 be an unprotected area.

(2) In any element of structure forms part of more than one building or compartment and the requirements for fire resistance specified in the Ninth Schedule to these By-laws in respect of one building or compartment differ from those specified in respect to any other building or compartment of which the element forms part, such element shall be so constructed as to comply with the greater or greatest of the requirements specified.

217. Fire resistance of structural member.

Any structural member or overloading wall shall have fire resistance of not less than the minimum period required by these By-laws for any element which it carries.

218. Compartment wall separating flats and maisonnette.

Any compartment wall separating a flat or maisonnette from any other part of the same building shall not be required to have fire resistance exceeding one hour unless-

(a) the wall is a load-bearing wall or a wall forming part of a protected shaft; or

(b) the part of the building from which the wall separates the flat or maisonnette is of a different purpose group and the minimum period of the fire resistance required by this Part for any element of structure in that part is one and a half hours or more.

219. Application of these By-laws to floors.

In the application of these By-laws to floors, no account shall be taken of any fire resistance attributable to any suspended ceiling other than a suspended ceiling constructed as described in the Ninth Schedule to these By-laws.

220. Floor area and capacity of buildings and compartments.

Where reference is made in this Part to floor areas and capacity of buildings or compartments, the maximum floor area or cubic capacity or the maximum floor area and cubic capacity of the building or compartment may be doubled where the building or compartment is fitted throughout with an automatic sprinkler system, or with such other means of fire protection of not less efficiency in relation to the nature of the building or compartment and its contents, which the fire extinguishing system is required to protect.

221. Test of fire resistance.

(1) For the purpose of this Part requirements as to fire resistance shall be construed as meaning that an element of structure shall be capable of resisting the action of fire for the specified period under the conditions of test appropriate to such element in accordance with BS 476: Part 1: subject to such modifications or applications of such conditions of test as are prescribed to these By-laws.

(2) Any compartment floor shall, if the underside of such floor is exposed to test by fire, have fire resistance for not less than the minimum period required by this Part for elements of structure forming part of the compartment immediately below such floor.

222. Fire resistance for walls.

(1) Any structure, other than an external wall, enclosing a protected shaft shall, if each side of the wall is separately exposed to test by fire, have fire resistance for not less than the minimum period required by this Part.

(2) Any compartment wall or separating wall shall, if each side of the wall is separately exposed to test by fire, have fire resistance for not less than the minimum period required by this Part.

(3) Any part of an external wall which constitutes, or is situated less than 0.92 metre from any point on the relevant boundary shall, if each side of the wall is separately exposed to test by fire, have fire resistance for not less than the minimum period required by this Part.

(4) Any part of an external wall which is situated 0.92 metre or more from the relevant boundary and which is required by these By-laws to have fire resistance, shall, if the inside of the wall is exposed to test by fire, have fire resistance for not less than the minimum period required by this Part:

Provided that, for the purpose of these By-laws, the wall shall be capable of satisfying the requirements of clause 11c of section 3 of BS 476: relating to insulation, for a period of not less than fifteen minutes.

[Proviso Am. Sel.P.U.142/2012]

223. Fire resistance for floors above ground floor.

Any floor above the ground storey of a house falling within Purpose Group 1 shall, if the underside of such floor is exposed to test by the fire in accordance with BS 476: Part 1: be capable of satisfying the requirements of that test as to freedom from collapse for a period of not less than half an hour and as to insulation and resistance to passage of flame for not less than fifteen minutes.

224. Fire resistance for any element of structure.

Any element of structure shall be deemed to have the requisite fire resistant if-

- (a) it is constructed in accordance with the specifications given in the Ninth Schedule to these By-laws and the notional period of fire resistance given in that Schedule as being appropriate to that type of construction and other relevant factors is not less than requisite fire resistance; or
- (b) a similar part made to the same specification as the element is proved to have the requisite fire resistance under the conditions of test prescribed in the foregoing By-laws.

PART VIII FIRE DETECTION, FIRE ALARM AND FIRE EXTINGUISHMENT

225. Detecting, warning and extinguishing fire.

(1) Every building shall be provided with means of detecting, warning and extinguishing fire in accordance with the requirements as specified in the Tenth Schedule.

(2) Every building shall be served by at least one fire hydrant located not more than 45 metres from the fire brigade access, designed and installed in accordance with MS 1489. In any case, hydrants shall be located not more than 90 metres apart.

[Subs. Sel. P.U.142/2012]

(3) Depending on the size and location of the building and the provision of access for fire appliances, additional fire hydrant shall be provided as may be required by the D.G.F.R.

[(3) Am. Sel. P.U.142/2012]

226. Automatic system for hazardous occupancy.

Where hazardous processes, storage or occupancy are of such character as to require automatic sprinklers or other automatic extinguishing system, it shall be of a type and standard appropriate to extinguish fires in the hazardous materials stored or handled or for the safety of the occupants.

226A. Hose reel systems.

Hose reel systems shall be designed and installed in accordance with MS 1489.

[Ins. Sel. P.U.142/2012]

227. Portable extinguishers.

Portable extinguisher shall be designed and installed in accordance with MS 1539.

[Subs. Sel. P.U.142/2012]

228. Sprinkles systems.

Sprinkler systems shall be designed and installed in accordance with MS 1910.

[Subs. Sel. P.U.142/2012]

229. Means of access and fire fighting in building over 18 metres high.

(1) Buildings in which the topmost floor is more than 18 metres above fire appliance access level shall be provided with means of gaining access and fighting fire from within the building consisting of fire fighting access lobbies, fire fighting staircases, fire lifts and dry or wet rising systems.

[Am. Sel.P.U.142/2012]

(2) Fire fighting access lobbies shall be provided at every floor level and shall be so located that the level distance from the furthestmost point of the floor does not exceed 45 metres.

[Am. Sel.P.U.142/2012]

(3) Fire fighting access lobbies may be omitted if the fire fighting staircase is pressurised to meet the requirements of by-law 200 and all fire fighting installations within the pressurised staircase enclosure do not intrude into the clear space required for means of egress.

(4) A fire fighting staircase shall be provided to give direct access to each fire fighting access lobby and shall be directly accessible from outside the building at fire appliance access level. This may be one of the staircases required as a means of egress from the building.

(5) A fire lift shall be provided to give access to each fire fighting access lobby or in the absence of a lobby to the fire fighting staircase at each floor level.

(6) The fire lift shall discharge directly into the fire fighting access lobby fire fighting staircase or shall be connected to it by a protected corridor.

230. Dry riser systems.

(1) Dry riser systems shall be provided in every building in which the top most occupied floor is more than 18 metres but less than 30 metres above fire appliance access level.

(2) Dry riser systems shall be designed and installed in accordance with MS 1489 such that all parts of the floor are within 45 metres from a landing valve.

[Subs.Sel.P.U.142/2012]

231. Wet riser systems.

(1) Wet rising systems shall be provided in every building in which the top most occupied floor is more than 30 metres above fire appliance access level.

(2) Wet riser systems shall be designed and installed in accordance with M.S. 1489 such that all parts of the floor are within 45 metres from a landing valve.

[Subs.Sel.P.U.142/2012]

232. Wet or dry rising system for buildings under construction.

(1) Where either wet or dry riser system is required, at least one riser shall be installed when the building under construction has reached a height of above the level of the fire brigade pumping inlet with connections thereto located adjacent to a useable staircase.

(2) Such risers shall be extended as construction progresses to within two floors of the topmost floor under construction and where the designed height of the building requires the installation of a wet riser system fire pumps, water storage tanks and water main connections shall be provided to serve the riser.

233. [Deleted].

[Deleted - P.U.142/2012]

234. [Deleted].

[Deleted - P.U.142/2012]

235. Fixed extinguishing systems.

Fixed Extinguishing systems shall either be total flooding system or unit protection system depending upon the nature of hazard process and occupancy as may be required and approved by the D.G.F.R.

[Am.P.U.142/2012]

236. Special hazards.

Places constituting special hazards or risk due to the nature of storage, trade, occupancy or size shall be required to be protected by fixed installations, protective devices, systems and special extinguishers as may be required by the D.G.F.R.

[Am. Sel.P.U.142/2012]

237. Fire detection and fire alarms systems.

Fire detection and fire alarm systems shall be designed and installed in accordance with MS 1745.

[Subs. Sel.P.U.142/2012]

238. Fire Command Centre.

Where it is specified in the Tenth Schedule to these By-Laws that a fire command centre shall be provided, the fire command centre shall be located on the designated floor with easy fire appliances access and shall contain a panel to monitor the public address, fireman intercom, sprinkler, water flow detectors, fire detection and alarm systems and with a computerised monitoring system connected to the appropriate fire station by-passing the switchboard.

[Subs. Sel.P.U.142/2012]

239. Voice communication system.

There shall be two separate approved continuously electrically supervised voice communications systems, one a fire brigade communications system and the other a public address system between the central control station and the following areas:

(a) lifts, lift lobbies, corridors and staircases;

(b) in every office area exceeding 100 square metres in area;

[(b) Am.Sel.P.U.142/2012]

(c) in each dwelling unit and hotel guest where the fire brigade system may be combined with the public address system.

240. Electrical isolation switch.

(1) Every floor or zone of any floor with a net area exceeding 1000 metres shall be provided with an electrical isolation switch complying with IEC 60947-3 and located within a staircase enclosure to permit the disconnection of electrical power supply to the relevant floor or zone served.

[(1) Am.Sel.P.U.142/2012]

(2) For purpose for this by-law, "IEC" means the latest published edition of the International Electrotechnical Commission Standard.

[(2) Subs. Sel.P.U.142/2012]

241. Special requirements for fire alarm systems.

In places where there are deaf persons and in places where by nature of the occupancy audible alarm system is undesirable, visible indicator alarm signals shall be incorporated in addition to the normal alarm system.

242. [Deleted].

[Deleted - Sel.P.U.142/2012]

243. [Deleted].

[Deleted - Sel.P.U.142/2012]

243A. Emergency mode of operation in the event mains power failure.

(1) On failure of mains power of lifts shall return in sequence directly to the designated floor, commencing with the fire lifts, without answering any car or landing calls and park with doors open.

(2) After all lifts are parked the lifts on emergency power shall resume normal operation:

Provided that where sufficient emergency power is available for operation of all lifts, this mode of operation need not apply.

[Ins. Sel.P.U.142/2012]

244. [Deleted].

[Deleted – Sel. P.U.142/2012].

245. Approval of D.G.F.R.

(1) Any construction, development or installation of fire fighting equipment or fire safety installation other than those conforming to the requirements provided in Parts VII and VIII of these By-laws shall be submitted to and approved by the D.G.F.R. before the commencement of work.

(2) Plans, drawings and calculations of all fire fighting installations shall be submitted to the Fire Authority in a manner prescribed by the D.G.F.R. before commencement of work.

[Subs.Sel P.U.142/2012].

246. [Deleted].

[Deleted –Sel. P.U.142/2012].

247. [Deleted].

[Deleted –Sel. P.U.142/2012].

248. Marking on wet riser, etc.

(1) Wet risers, dry risers, sprinkler and other fire installation pipes and fittings shall be identified in red colour.

(2) All cabinets and areas recessed in walls for location of fire installations and extinguishers shall be clearly identified to the satisfaction of the D.G.F.R. or otherwise clearly identified.

[Am.Sel P.U.142/2012].

249. Smoke and heat venting.

In windowless buildings, underground structures and large area factories, smoke venting facilities shall be provided for the safe use of exit.

250. Natural draught smoke vent.

(1) Natural draught smoke venting shall utilise roof vents or vents in walls at or near the ceiling level.

(2) Such vents shall normally be in open positions or if they are closed they shall be so designed to open automatically by an approved means in the event of a fire.

251. Smoke vents to prevent dangerous accumulation of smoke.

Smoke control systems where specified shall be designed and installed in accordance with MS 1780.

[Subs.Sel P.U.142/2012].

252. [Deleted].

[Deleted – Sel P.U.142/2012].

252A. Atriums in buildings.

An atrium may be permitted in a building provided that—

- (a) the horizontal dimension is not less than 6 metres and the area of opening is not less than 95 square metres;
- (b) the exits are separately enclosed from the atrium though exit access may be within the atrium;
- (c) the atrium is open and unobstructed;
- (d) the building is fully protected by automatic sprinklers;

- (e) sprinklers may be omitted for ceiling of the atrium if it is more than 17 metres above the floor;
- (f) a smoke control or smoke exhaust system of the atrium and adjacent spaces be provided as per Table 1 below or other approved standards;
- (g) the smoke control or smoke exhaust system shall be activated by—
- (i) smoke detectors located at the top of the atrium and adjacent to each return air intake from the atrium;
 - (ii) the automatic sprinkler system;
 - (iii) the automatic detector system (but not the manual break glass system); and
 - (iv) manual controls readily accessible to the Fire Authority; and
- (h) the atrium be separated from adjacent spaces by one hour fire resistance fire barriers except that—
- (i) any three levels of the building may open directly to the atrium without enclosure; and
 - (ii) glass walls may be used in lieu of fire barriers where automatic sprinklers are spaced 1.8 metres or less apart along both sides of the glass wall, not more than 0.3 metres from the glass so that the surface of the glass is wet upon operation of the sprinklers. The glass shall be float glass held in place by a gasket system allowing the frame to deflect without the glass before the sprinklers operate.

Table 1: ATRIUM SMOKE EXHAUST SYSTEM

<i>Height of Atrium in M</i>	<i>Volume of Atrium Cubic M</i>	<i>Smoke Exhaust System (whichever is greater)</i> <i>Cubic M/ Sec or</i>	<i>Smoke Exhaust System (whichever is greater)</i> <i>Air Change/ Hour</i>	<i>Air Supply (Lowest Level)</i>
17 or less	17 or less	19	6	Gravity - natural flow due to difference in density. 75% of exhaust
17 or less	17 or less	19	4	Gravity 17% of Exhaust
17 or more	-	-	4	Mechanical 75% of Exhaust

[Ins.Sel P.U.142/2012].

253. Emergency power system.

(1) Emergency power system shall be provided to supply illumination and power automatically in the event of failure of the normal supply or in the event of accident to elements of the system supplying power and illumination essential for safety to life and property.

(2) Emergency power systems shall provide power for smoke control systems, illumination, fire alarm systems, fire pumps, public address systems, fire lifts and other emergency systems.

(3) Emergency systems shall have adequate capacity and rating for the emergency operation of all equipment connected to the system including the simultaneous operation of all fire lifts and one other lift.

(4) All wiring for emergency systems shall be in metal conduit or of the fire resisting mineral insulated cables, laid along areas of least fire risk.

(5) Current supply shall be such that in the event of failure of the normal supply to or within the building or group of buildings concerned, the emergency lighting or emergency power, or both emergency lighting and power will be changed over within 60 seconds immediately after the interruption of the normal supply. The supply system for emergency purposes shall comprise one or more of the following approved types:

[(5) Am.Sel P.U.142/2012].

(a) Storage Battery

Storage battery of suitable rating and capacity to supply and maintain at not less than 87 1/2 percent of the system voltage the total load of the circuits supplying emergency lighting and emergency power for a period of at least 1 1/2 hours;

(b) Generator set

A generator set driven by some form of prime mover and of sufficient capacity and proper rating to supply circuit carrying emergency lighting or lighting and power with suitable means for automatically starting the prime mover on failure of the normal service.

253A. Emergency lights.

Emergency lighting shall be installed to provide sufficient illumination for escape purposes. Such lighting shall be of the self-contained type to MS 619 or supplied with emergency power from an emergency power system or central battery bank. In all cases, the duration of emergency illumination in the event of failure of normal supply shall not be less than one hour.

[Ins.Sel P.U.142/2012].

**PART IX
MISCELLANEOUS**

254. Buildings to which Parts VII and VIII apply.

Buildings which on the date of commencement of these By-laws have been erected, or in the course of being erected or have not been erected but plans have been submitted and approved, and which according to by-law 134 fall within classification of Place of assembly, Shop, Office, Other Residential and buildings exceeding 18.5 metres and buildings which are classified as hazardous or special risks shall be modified or altered to comply with Parts VII and VIII of these By-laws within-

(a) one year from the date of commencement of these By-laws in the case of buildings up to three storeys; and

(b) three years from the date of commencement of these By-laws in the case of buildings exceeding three storeys.

255. Power of local authority to extend period, etc.

(1) Notwithstanding by-law 254 the local authority may where it is satisfied that it is justifiable to do so-

(a) allow an extension or further extensions of the period within which requirements under Parts VII and VIII of these By-laws are to be complied with; or

(b) allow variations, deviations or exemptions as it may specify from any provision of Parts VII and VIII of these By-laws.

(2) Any person aggrieved by the decision of the local authority under paragraph (1) may within thirty days of the receipt of the decision appeal in writing to the State Authority, whose decision shall be final.

256. Buildings exempted.

Except for by-law 134 and 141 and paragraph (2) of by-law 225 the provisions under Part VII and VIII of these By-laws shall not apply to private dwelling houses, detached or semi-detached and terrace houses intended for single family occupancies.

[Am.Sel P.U.142/2012].

257. Application of standard or code of practice.

Where any standard or code of practice is referred to in these By-laws, and there is subsequently published a corresponding Malaysian Standard or any other corresponding standard or code of practice which is acceptable to the local authority or D.G.F.R., as the case may be, on the same subject matter, the corresponding Malaysian Standard or standard or code of practice shall be deemed to have superseded such standard or code of practice referred to and shall be complied with.

[Subs.Sel P.U.142/2012].

258. Failure to Buildings.

(1) In the event of any failure to any building or part of the building, whether in the course of erection or after completion, the principal submitting person or submitting person who-

- (a) submitted the plans, drawings or calculations for such building;
- (b) supervised the setting out of such building;
- (c) certified that the setting out was carried out in accordance with the approved site plan;
- (d) supervised the erection of such building;
- (e) certified that the proper supervision of such building as carried out.

[(1) & (1)(d) Am. Sel. P.U.142/2012].

shall within one week of the occurrence of such failure or such further period as may be specified by the local authority within whose jurisdiction such building is situated-

- (i) report such failure;
- (ii) explain the cause of failure; and
- (iii) if such failure occurred during the erection of such building, state the remedial action taken.

[(i), (ii), (iii) Am. Sel. P.U.142/2012].

(2) Such principal submitting person or submitting person shall submit such further information in such manner and within such period as may be specified by the local authority.

(3) Where to local authority has reason to believe that a failure to any building or part of the building has occurred which failure has not been reported to such local authority it shall serve a notice on the principal submitting person or submitting person who-

- (a) submitted the plans, drawings or calculations for such building;
- (b) supervised the setting out of such building;
- (c) certificate that the setting out was carried out in accordance with the approved site plan;
- (d) supervised the erection of such building;

[(3)(d) Am. Sel P.U.142/2012].

- (e) certified that proper supervision of such building was carried out;

requiring him within one week of such service to-

(i) state whether such failure occurred;

(ii) explain why he failed to report such failure;

(iii) if such failure occurred during the construction of such building, state the remedial action taken.

[*(e) (i), (ii), (iii) Am.Sel P.U.142/2012*].

(4) Any principal submitting person or submitting person who fails to comply with paragraph (1), (2) or (3) shall be guilty of an offence.

(5) Notwithstanding that any plan, drawing or calculation has been approved by the local authority, the responsibility for the failure of any building or part of a building shall *prima facie* lie with the principal submitting person or submitting person who submitted such plan, drawing or calculation.

(6) The principal submitting person or submitting person, as the case may be, as mentioned under paragraph (1)(a) of by-law 2F or paragraph (1)(a) of by-law 7 shall be subject to the same provision as specified under this by-law.

[*Am. Sel. P.U. 9/2007*]; [*(6) Subs.Sel P.U.142/2012*].

259. Repeal.

Petaling Jaya (Building) By-laws, 1959 [*Sel G.N. 547/59*] and Klang Town Council Private Sewage Plant Construction By-laws, 1962 [*Sel. L.N. 15/62*] are repealed.

FIRST SCHEDULE

FEES FOR CONSIDERATION OF PLANS, PERMITS, ETC..

(By-laws 3 (1) (a), 12 (1), 19 (2), 21 (2), 26 and 29)

Half the fees set out below shall be in respect of plans for buildings used exclusively for places of religious worship, schools or for charitable purpose.

New buildings.

1. Fee for the consideration of plans submitted for approval in respect of new buildings shall be calculated as follows:

Ground Floor	..	RM14.00 per every 9 square metres or part thereof subject to a minimum of RM140.00.
1st Floor	..	RM12.00 per every 9 square metres or part thereof subject to a minimum of RM120.00.
2nd Floor	..	RM10.00 for every 9 square metres or part thereof subject to a minimum RM100.00.
3rd Floor	..	RM8.00 for every 9 square metres or part thereof subject to a minimum of RM80.00.
4th Floor and above or basement storey (other than an open basement)	..	RM6.00 for every 9 square metres or part thereof subject to a minimum of RM60.00.

[1. Am. Sel.P.U. 142/2012]

Buildings approved on a temporary basis and tentative sketch plans.

2. In respect of plans of a building submitted for approval on a temporary year to year basis and tentative sketch plans submitted for approval in principle, one half of the fee specified in paragraph 1 shall be payable.

Sheds with open sides.

3. For plans submitted for approval of a shed type of building having all its sides open, one half of the fee specified in paragraph 1 shall be payable.

Open basements.

4. For plans submitted for approval of basement exceeding 2.5 metre in height which are open on all sides (excepting where retaining walls occur) one half of the fees specified in paragraph 1 shall be payable.

Buildings of warehouse class.

5. For every building of the warehouse or godown class of which no part is intended for habitation (other than provision for a watchman) and which is not constructed in reinforced concrete or structural steel, one half of the fees specified in paragraph 1 shall be payable.

Alterations to existing buildings.

6. (1) For plans submitted for approval of alterations to existing buildings, one half of the fees specified in paragraph 1 shall be payable.

(2) If the alterations to an existing building are generally spread over the whole area of the building, then the fee payable shall be computed on the whole area of the building, but if a clear subdivision of the building is not affected by the alteration scheme, such unaffected subdivision shall be excluded from the area on which the fee shall be computed.

(3) If a storey of any existing building is not affected by alteration to the building, such storey shall be excluded from the areas on which the fee payable for the alterations shall be computed.

(4) If alterations to an existing building involve an alteration to the frontage line or elevation to a street (where such elevation abuts a street) the following fees shall be paid on submission of plans for such alterations in addition to the fees payable under subparagraph (1), (2) and (3) of this paragraph:

(a) alterations to frontage line	RM36.00 per storey
(b) alterations to street elevation ..	RM36.00 per storey

[(4) (a) & (b) Am. Sel.P.U. 142/2012]

(5) Where the alterations to an existing building involve only subdivision of rooms into smaller rooms, the fees payable on submission of plans for such alterations shall be RM50.00 per smaller room or cubicle.

[(5) Am. Sel.P.U. 142/2012]

Wharves, bridges, etc

7. For plans submitted for approval of wharves bridges, or other special buildings, the fee payable shall be RM50.00 per 9 square metres or part thereof.

[7. Am. Sel.P.U. 142/2012]

Retaining walls.

8. For plans submitted for approval of retaining walls, the fee payable shall be RM6.00 per 9 square metres or part thereof, of its total elevational area measured from the top of the footings.

[8. Am. Sel.P.U. 142/2012]

Series or rows of building.

9. For a series or row of buildings of the same plan and materials when plans are submitted for approval at the same time, a deduction of the fees specified in the preceding paragraphs shall be made on the following basis:

First building	full free
2nd to 5th building (inclusive)	90% of fees
6th to 10th building	85% of fees
11th to 25th building	75% of fees
26th and above building	60% of fees

Amendment plan to an approved plan.

10. (1) When an amendment plan to an approved plan is submitted for approval, a fee of RM120.00 shall be payable for each such amendment plan.

[10.(1). Am. Sel.P.U. 142/2012]

(2) If an amendment to an approved plan involves additional area, then such additional area shall be charged on the basic set out in paragraph 1 in addition to the fee specified in subparagraph (1) of this paragraph.

(3) If the amendments to an approved plan are in the opinion of the local authority substantial, a fee equal to one half of the fee chargeable under paragraph 1 in respect of the approved plan shall be payable in addition to any fees payable under subparagraphs (1) and (2) of this paragraph.

Inspection of plans.

11. (1) An approved plan may be inspected in the office of the local authority subject to the payments of the prescribed fee.

(2) An approved plan may be copied in the office of the local authority subject to the applicant submitting with his application to copy such plan the written consent of the owner of the building.

(3) The fees payable shall be as follows:

(i) for inspecting an approved plan	RM100.00 per set of plans
(ii) for copying an approved plan	RM200.00 per set of plans

(4) The fee for an endorsement by the local authority to certify any copy as a true copy of an approved plan shall be RM100.00 per copy.

[(3)(i), (ii) & (4) Am. Sel.P.U. 142/2012]

Permits for minor works in lieu of plans.

12. Free for permits issued under by-law 18 shall be payable as follows:
for minor erections, alterations and additions under paragraph (1) thereof and for erection of any fence under paragraph (2) thereof RM100.00 per permit

[12. Am. Sel.P.U. 142/2012]

Temporary permits.

13. The following fees shall be payable for the temporary permits issued under by-law 19:

- | | |
|---|---|
| (a) shed for shows | RM100.00 per day. |
| (b) place for worship | RM40.00 per day. |
| (c) deposit building materials on streets with the consent of the local authority | RM36.00 per sq. metre per month or part thereof |
| (d) builder's working shed store or other shed in connection with new buildings | RM200.00 per shed per 6 months or part thereof |
| (e) scaffolding erected on a store | RM10.00 per scaffold pole per month or part thereof |
| (f) staging, framework, platform or temporary structure of any kind erected on a roof abutting a street | RM100.00 per month or part thereof |
| (g) hording on streets or footways in connection with building works | RM6.00 per metre of street or footway per month or part thereof |
| (h) any building for which a temporary permit has been issued under paragraph (2) | RM10.00 per 9 square metres per annum with a minimum charge of RM100.00 per permit being renewable on 1st January each year |

[13. Am. Sel.P.U. 142/2012]

Temporary Occupation permits

14. [Deleted by Sel. 9/2007]

Refund of plan fees

15. (1) One half of the fees paid on the submission plans shall be refunded on application when-

(a) a plan is withdrawn before approval by the local authority within one year of submission; or

(b) a plan is not approved by the local authority; or

(c) notice of abandonment is received within one year after the date of approval of plan;

Provided that no fees will be refunded if the plans have been abandoned under section 70 (6) of the Act.

(2) Full fees shall be payable if a plan is re-submitted.

(3) The submission of plans under by-law 12 shall be deemed to be in continuation of the submission of the tentative sketch plans under that by-law and the fee paid on the submission of the tentative sketch plans shall be credited against the fees payable on the submission of the plans under that by law subject to any adjustment in the computed areas:

Provided that where such plans are submitted no refund of fees shall be made whether such plans are approved or not.

Additional copy of notice or permit.

16. The fee for each additional copy of any notice, certificate or permit shall be RM100.00.

[16. Am. Sel.P.U. 142/2012]

Work commenced before approval of plans.

17. In all cases where work has been commenced before plans have been approved or a permit obtained a fee equal to ten times that specified in the relevant preceding paragraph may be charged. The payment of this enhanced fee will not exempt any person from being prosecuted by the local authority should it decide to do so.

SECOND SCHEDULE:

Form A - Form G 21

UNIFORM BUILDINGS BY-LAWS 1984

FORM A

CERTIFICATION OF DEMOLITION BUILDINGS / STRUCTURAL PLANS

(for endorsement on plans to be submitted for approval)

(By-law 2B(2), 3(1) (c) and 16 (2))

[Am. Sel. P.U. 142/2012]

.....19.....

To the Local Authority,
.....

I certify that the details in the plans namely on Lot/s
.....Section..... Jalan.....
for.....are in accordance with the requirements of the Uniform Building By-
laws 1984 and I accept full responsibility accordingly.

.....
Submitting person

Name

Address.....

Registration No.....

Class.....

.....
* delete which is inapplicable

UNIFORM BUILDINGS BY-LAWS 1984

FORM B

NOTICE OF COMMENCEMENT/RESUMPTION OF BUILDING OPERATIONS

(By-laws 2D and 22)

[Am. Sel.P.U. 142/2012]

.....19.....

To the Local Authority,
.....

I give notice that after the expiration of 4 days from the date of receipt of this notice I intend to
commerce/resume building operations namely : on
Lot/s..... Section..... Jalan for
..... in accordance with the Approved Plan No

Dated.....

.....
Submitting person

Name

Address.....

Registration No.....

Class.....

* delete which is inapplicable

FORM C

NOTICE OF COMPLETION OF SETTING OUT

[Deleted by Sel. P.U. 9/2007]

FORM D

NOTICE OF COMPLETION OF FOUNDATIONS

[Deleted by Sel. P.U. 9/2007]

FORM E

APPLICATION FOR THE ISSUE OF CERTIFICATE OF FITNESS FOR OCCUPATION

[Deleted by Sel. P.U. 9/2007]

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM F

CERTIFICATE OF COMPLETION AND COMPLIANCE

[by-law 25]

Date:.....

To:

*

.....
.....

I hereby issue the Certificate of Completion and Compliance for the building/s on Lot/s..... Section..... Jalan..... upon being satisfied that it has been completed in accordance with approved plan No..... dated I have supervised the erection and completion of the building/s and it is to the best of my knowledge and belief that such work/s is/are in accordance with the Act, Selangor Uniform Building By-Laws 1986 and approved plans. I hereby certify that the building/s is/are safe and fit for occupation.

(Principal submitting person)

1. Particulars of the principal submitting person

Name:.....

Address:.....

** BAM/BEM Registration No.:.....

2. Copy to:

(a) Local Authority:.....

(Name of Local Authority)

(b) ** Board of Architects Malaysia (BAM)/Board of Engineers Malaysia (BEM)

* The developer, if it is for development other than individually built buildings or, the owner if it is for an individually built building.

** Delete whichever is inapplicable.

[Form F: Subs. Sel.P.U.9/2007]

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM F1

PARTIAL CERTIFICATE OF COMPLETION AND COMPLIANCE

[by-law 27]

Date:.....

To:

*

.....
.....

I hereby issue the Partial Certificate of Completion and Compliance for the building/s on Lot/s..... Section..... Jalan..... upon being satisfied that it has been completed for the portion as approved by local authority in accordance with approved plan No.dated.....

I have supervised the erection and partial completion of the building/s and it is to the best of my knowledge and belief that such work/s is/are in accordance with the Act, Selangor Uniform Building By-Laws 1986 and approved plans. I hereby certify that the building/s is/are safe and fit for occupation.

(Principal submitting person)

1. Particulars of the principal submitting person

Name:.....

Address:.....

*BAM/BEM Registration No.:

2. Copy to:

(a) Local Authority:..... (Name of Local Authority)

(b) **Board of Architects Malaysia (BAM)/Board of Engineers Malaysia (BEM)

* The developer, if it is for development other than individually built buildings or, the owner if it is for an individually built building.

** Delete whichever is inapplicable.

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 1

STAGE CERTIFICATION : EARTHWORKS

[by-law 25 or 27]

Project Title:

* 1. We certify that we have supervised and/or carried out the construction and completion of the earthworks and that to the best of our knowledge and belief such works are in accordance with the Approved Earthwork Plans Ref. No.:and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Contractor	_____	_____ (<i>Construction Industry Development Board</i>)	_____ (<i>Date:_____</i>)
(b) Submitting person	_____	_____ (<i>Board of Engineers Malaysia</i>)	_____ (<i>Date:_____</i>)

OR

*2. I certify that this form is not applicable.

(*Principal submitting person*)

I.C. No., if there is no relevant body in respect of registration.

* Delete whichever is not applicable.

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 2

STAGE CERTIFICATION : SETTING OUTS

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the setting out of the building and that to the best of our knowledge and belief such works are in accordance with the approved plans Ref. Noand that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Contractor	_____	_____ (<i>Construction Industry Development Board</i>)	_____ (<i>Date:_____</i>)
(b) Licensed Land Surveyor	_____	_____ (<i>Board of Engineers Malaysia</i>)	_____ (<i>Date:_____</i>)
(c) Principal submitting person	_____	_____ (<i>Board of Engineers Malaysia</i>)	_____ (<i>Date:_____</i>)

OR

*2. I certify that this form is not applicable.

(*Principal submitting person*)

I.C. No., if there is no relevant body in respect of registration.

* Delete whichever is not applicable.

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 3

STAGE CERTIFICATION : FOUNDATIONS

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the foundation and that to the best of our knowledge and belief such works are in accordance with the Deposited Plans Ref. No.:and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Contractor	_____	_____ (<i>Construction Industry Development Board</i>)	_____ (Date: _____)
(b) Submitting person	_____	_____ (<i>Board of Engineers Malaysia</i>)	_____ (Date: _____)

OR

*2. I certify that this form is not applicable.

(*Principal submitting person*)

I.C. No., if there is no relevant body in respect of registration.

* Delete whichever is not applicable.

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 4

STAGE CERTIFICATION : STRUCTURAL

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the structural works and that to the best of our knowledge and belief such works are in accordance with the Deposited Structural Plans Ref. No.: and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Contractor	_____	_____ (<i>Construction Industry Development Board</i>)	_____ (<i>Date:_____</i>)
(b) Submitting person	_____	_____ (<i>Board of Engineers Malaysia</i>)	_____ (<i>Date:_____</i>)

OR

*2. I certify that this form is not applicable.

(*Principal submitting person*)

I.C. No., if there is no relevant body in respect of registration.

* Delete whichever is not applicable.

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 5

STAGE CERTIFICATION : INTERNAL WATER PLUMBING

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the internal water plumbing works and that to the best of our knowledge and belief such works are in accordance with *approved plan/Deposited Plans Ref. No.:.....and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor (<i>Licensed plumber</i>)	_____	+(_____)	(<i>Date:_____</i>)
(b) Submitting person	_____	(<i>*Board of Architects Malaysia/Board of Engineers Malaysia</i>)	(<i>Date:_____</i>)

OR

*2. I certify that this form is not applicable.

(*Principal submitting person*)

+ *Relevant regulatory body.*

I.C. No., if there is no relevant body in respect of registration.

* *Delete whichever is not applicable.*

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 6

STAGE CERTIFICATION : INTERNAL SANITARY PLUMBING

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the internal sanitary plumbing works and that to the best of our knowledge and belief such works are in accordance with *approved plan/Deposited Plans Ref. No.:..... and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor (<i>Licensed plumber</i>)	_____	+ (_____)	_____ (<i>Date: _____</i>)
(b) Submitting person	_____	(<i>*Board of Architects Malaysia/Board of Engineers Malaysia</i>)	_____ (<i>Date: _____</i>)

OR

*2. I certify that this form is not applicable.

(*Principal submitting person*)

+ *Relevant regulatory body.*

I.C. No., if there is no relevant body in respect of registration.

* *Delete whichever is not applicable.*

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 7

STAGE CERTIFICATION : INTERNAL ELECTRICAL

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the internal electrical works and that to the best of our knowledge and belief such works are in accordance with the submitting person's Endorsed Plans and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor (Competent person)	_____	_____ (<i>Energy Commission</i>)	_____ (<i>Date:_____</i>)
(b) Submitting person	_____	_____ (<i>Board of Engineers Malaysia</i>)	_____ (<i>Date:_____</i>)

OR

*2. I certify that this form is not applicable.

(*Principal submitting person*)

I.C. No., if there is no relevant body in respect of registration.

* Delete whichever is not applicable.

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 8

STAGE CERTIFICATION : FIRE-FIGHTING (PASSIVE)

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the fire-fighting (passive) works and that to the best of our knowledge and belief such works are in accordance with *approved plan/Deposited Plans Ref. No.:..... and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor (Competent person)	_____	_____ (<i>Construction Industry Development Board</i>)	_____ (<i>Date:_____</i>)
(b) **Principal submitting	_____	_____ (* <i>Board of Architects Malaysia/Board of Engineers Malaysia</i>)	_____ (<i>Date:_____</i>)

OR

*2. I certify that this form is not applicable.

(*Principal submitting person*)

I.C. No., if there is no relevant body in respect of registration.

** Letter of Clearance from the Fire Department Malaysia (except for residential buildings not exceeding 18 metres height) shall be attached.

* Delete whichever is not applicable.

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 9

STAGE CERTIFICATION : FIRE-FIGHTING (ACTIVE)

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the fire-fighting (active) works and that to the best of our knowledge and belief such works are in accordance with *approved plan/Deposited Plans Ref. No.:and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor	_____	+ (_____)	(Date: _____)
(b) **Submitting person	_____	(* <i>Board of Engineers Malaysia</i>)	(Date: _____)

OR

*2. I certify that this form is not applicable.

(Principal submitting person)

+ *Relevant regulatory body.*

I.C. No., if there is no relevant body in respect of registration.

** *Letter of Clearance from the Fire Department Malaysia (except for residential buildings not exceeding 18 metres height) shall be attached.*

* *Delete whichever is not applicable.*

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 10

STAGE CERTIFICATION : MECHANICAL VENTILATION

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the mechanical ventilation works and that to the best of our knowledge and belief such works are in accordance with the submitting person's Endorsed Plans and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor	_____	+(_____)	(Date: _____)
(b) Submitting person	_____	(* <i>Board of Engineers Malaysia</i>)	(Date: _____)

OR

*2. I certify that this form is not applicable.

(Principal submitting person)

+ *Relevant regulatory body.*

I.C. No., if there is no relevant body in respect of registration.

* *Delete whichever is not applicable.*

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 11

STAGE CERTIFICATION : LIFT/ESCALATOR INSTALLATION

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the lift/escalator installation works and that to the best of our knowledge and belief such works are in accordance with the submitting person's Endorsed Plans and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor	_____	+(_____)	(Date: _____)
(b) Submitting person	_____	(<i>Board of Engineers Malaysia</i>)	(Date: _____)

OR

*2. I certify that this form is not applicable.

(Principal submitting person)

+ *Relevant regulatory body.*

I.C. No., if there is no relevant body in respect of registration.

** *Certificate of Fitness from the Department of Occupational Safety and Health shall be attached.*

* *Delete whichever is not applicable.*

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 12

STAGE CERTIFICATION : BUILDING

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the building works and that to the best of our knowledge and belief such works are in accordance with approved plan Ref. No.:and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor	_____	_____ (<i>Construction Industry Development Board</i>)	_____ (<i>Date:_____</i>)
(b) Principal Submitting person	_____	_____ (* <i>Board of Architects Malaysia/Board of Engineers Malaysia</i>)	_____ (<i>Date:_____</i>)

OR

*2. I certify that this form is not applicable.

(*Principal submitting person*)

I.C. No., if there is no relevant body in respect of registration.

* *Delete whichever is not applicable.*

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 13

STAGE CERTIFICATION : EXTERNAL WATER SUPPLY SYSTEM

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the external water supply system and that to the best of our knowledge and belief such works are in accordance with approved plans Ref. No.: and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor	_____	+ (_____)	(Date: _____)
(b) **Submitting person	_____	(<i>Board of Engineers Malaysia</i>)	(Date: _____)

OR

*2. I certify that this form is not applicable.

(Principal submitting person)

+ *Relevant regulatory body.*

I.C. No., if there is no relevant body in respect of registration.

** *Letter of Confirmation from the Water Authority that the water supply is ready for connection shall be attached.*

* *Delete whichever is not applicable.*

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 14

STAGE CERTIFICATION : SEWERAGE RETICULATION

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the sewerage reticulation works and that to the best of our knowledge and belief such works are in accordance with approved plans Ref. No.:and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor	_____	+ (_____)	(Date: _____)
(b) **Submitting person	_____	(<i>Board of Engineers Malaysia</i>)	(Date: _____)

OR

*2. I certify that this form is not applicable.

(Principal submitting person)

+ *Relevant regulatory body.*

I.C. No., if there is no relevant body in respect of registration.

** *Letter of Clearance from the *Department of Sewerage Services/Indah Water Consortium shall be attached.*

* *Delete whichever is not applicable.*

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 15

STAGE CERTIFICATION : SEWERAGE TREATMENT PLANT

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the sewerage treatment plants works and that to the best of our knowledge and belief such works are in accordance with approved plans Ref. No.:and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor	_____	+(_____)	(Date: _____)
(b) **Submitting person	_____	(<i>Board of Engineers Malaysia</i>)	(Date: _____)

OR

*2. I certify that this form is not applicable.

(Principal submitting person)

+ *Relevant regulatory body.*

I.C. No., if there is no relevant body in respect of registration.

** *Letter of Clearance from the *Department of Sewerage Services/Indah Water Consortium shall be attached.*

* *Delete whichever is not applicable.*

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 16

STAGE CERTIFICATION : EXTERNAL ELECTRICAL SUPPLY SYSTEM

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the external electrical supply system and that to the best of our knowledge and belief such works are in accordance with approved plans Ref. No.: and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) ^Trade Contractor (Competent person)	_____	_____ (<i>Energy Commission</i>)	_____ (<i>Date:_____</i>)
(b) **Submitting person	_____	_____ (<i>Board of Engineers Malaysia</i>)	_____ (<i>Date:_____</i>)

OR

*2. I certify that this form is not applicable.

(*Principal submitting person*)

I.C. No., if there is no relevant body in respect of registration.

^ Not applicable if works are carried out by Tenaga Nasional Berhad.

** Letter of Confirmation from Tenaga Nasional Berhad that the electrical power supply is ready for connection shall be attached.

* Delete whichever is not applicable.

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 17

STAGE CERTIFICATION : ROAD AND DRAIN

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the road and drain works and that to the best of our knowledge and belief such works are in accordance with *approved plan/Deposited Plans Ref. No.: and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor (Competent person)	_____	_____ (<i>Construction Industry Development Board</i>)	_____ (<i>Date:_____</i>)
(b) **Submitting person	_____	_____ (<i>Board of Engineers Malaysia</i>)	_____ (<i>Date:_____</i>)

OR

*2. I certify that this form is not applicable.

(*Principal submitting person*)

I.C. No., if there is no relevant body in respect of registration.

+ Letter of Confirmation from the *relevant local authority/Public Works Department shall be attached. If the submitting person does not receive the Letter of Confirmation within 14 days from the date of application, the Letter of Confirmation shall be deemed to have been given.

* Delete whichever is not applicable.

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 18

STAGE CERTIFICATION : STREET LIGHTING

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the street lighting works and that to the best of our knowledge and belief such works are in accordance with the *approved plans/Deposited Plans Ref. No.:and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor (<i>Competent person</i>)	_____	_____ (<i>Energy Commission</i>)	_____ (<i>Date:_____</i>)
(b) *Submitting person	_____	_____ (<i>Board of Engineers Malaysia</i>)	_____ (<i>Date:_____</i>)

OR

*2. I certify that this form is not applicable.

(*Principal submitting person*)

I.C. No., if there is no relevant body in respect of registration.

* Delete whichever is not applicable.

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 19

STAGE CERTIFICATION : EXTERNAL MAIN DRAIN

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the external main drain works and that to the best of our knowledge and belief such works are in accordance with the approved plans Ref. No.: and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor (<i>Competent person</i>)	_____	_____ (<i>Construction Industry Development Board</i>)	_____ (<i>Date: _____</i>)
(b) *Submitting person	_____	_____ (<i>Board of Engineers Malaysia</i>)	_____ (<i>Date: _____</i>)

OR

*2. I certify that this form is not applicable.

(Principal submitting person)

I.C. No., if there is no relevant body in respect of registration.

* Delete whichever is not applicable.

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 20

STAGE CERTIFICATION : TELECOMMUNICATIONS

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the telecommunication works and that to the best of our knowledge and belief such works are in accordance with *approved plans/Deposited Plans Ref. No.: and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor	_____	_____ +(_____)	_____ (Date: _____)
(b) **Submitting person	_____	_____ (*Board of Engineers Malaysia)	_____ (Date: _____)

OR

*2. I certify that this form is not applicable.

(Principal submitting person)

+ *Relevant regulatory body.*

I.C. No., if there is no relevant body in respect of registration.

* *Delete whichever is not applicable.*

SELANGOR UNIFORM BUILDING BY-LAWS 1986

FORM G 21

STAGE CERTIFICATION : LANDSCAPE

[by-law 25 or 27]

Project Title:

*1. We certify that we have supervised and/or carried out the erection and completion of the landscape works and that to the best of our knowledge and belief such works are in accordance with the approved plans Ref. No.:and that we accept full responsibility for the same.

	Name (<i>Individual</i>)	#Registration No.	Signature
(a) Trade Contractor	_____	+(_____)	(Date:_____)
(b)*Architect/Landscape Architect	_____	+(_____)	(Date:_____)

OR

*2. I certify that this form is not applicable.

(Principal submitting person)

+ Relevant regulatory body.

I.C. No., if there is no relevant body in respect of registration.

* Delete whichever is not applicable.

[Form F1 - Form G21 - Ins. Sel. P.U. 9/2007]

THIRD SCHEDULE

Interpretation

1. In this Schedule, unless the context otherwise requires-

"air changes" means the hourly replacement of the volumetric content of air within an enclosure;

"cmm" means cubic metre of air per minute;

"enclosure" means room, ward, toilet, theatre, auditorium or any similarly enclosed space;

"foul air" means vitiated air and includes exhaust air from lavatories, bathrooms, urinals, toilets, kitchens, canteens, chemical stores, restaurants, hairdresser shops, laboratories, dark rooms, battery rooms, car parks or similar areas, and air discharged from smoke extract systems associated with fire protection services of buildings;

"fresh air" means normal outdoor air not unduly affected by odours, smoke, effluents, dust, vapours, fumes, discharges from mechanical plant and similar artificial influences which may affect the fresh air in any manner or form;

"fresh air changes" means air changes per hour and shall constitute that proportion of the air change which is wholly fresh air;

"occupancy" means the number of persons occupying an enclosure, the average rate of which shall be the equivalent of one person occupying an enclosure for a continuous period of twenty minutes in any one hour.

Windowless rooms

2. (1) Habitable rooms with no external walls and other enclosures shall be provided with mechanical ventilation or air-conditioning having a minimum fresh air change at the rate of 0.28 cmm per person, but in no case less than that specified in ASHRAE Standard Code 62-73.

(2) Isolation wards and other such areas for infectious, contagious or other dangerous diseases shall be provided with mechanical ventilation or air-conditioning having a minimum fresh air change at the rate 0.42 cmm per person.

Filters for exhaust air

3. (1) Filters for the removal of airborne bacteria shall be provided for all exhaust air discharge points to the requirements of the governing health authority.

(2) Exhaust air discharge points shall be at high or roof level and shall not in any case be lower than 5 metres from the external ground or pavement level.

Operating theatres

4. (1) Operating theatres and anaesthetic rooms should be dealt with by combined input and extract systems to provide at least ten complete air changes per hour. It is essential that the relative quantities of input to extract air should be such that there is an outward movement of air from the operating theatre and anaesthetic room.

(2) The air inlets should be at high level with extraction points at low level. Recirculation arrangements should not be provided. The incoming air should be filtered and air-conditioned (the theatre temperature

being capable of adjustment with mechanical requirements within the range 20°C to 24.4°C). Control over humidity of the air in the rooms should be provided to ensure that it will be within the range of 55% to 65%.

(3) Sterilizing rooms whether part of or separate from the operating theatre should be dealt with in the similar manner to cater for the use of operating theatre except that humidity control is not required. The extract should be at high level to ensure the removal of water vapour rising from the sterilizers.

(4) X-ray rooms and dark rooms should be provided with a minimum rate of ventilation of six complete air changes per hour and the temperature within the space should be maintained within the range of 20°C to 24.4°C. In addition a simple extract system will suffice.

(5) Air inlet points shall be not lower than two-thirds of the height of the room and exhaust air openings shall be within 1 metre of the finished floor level of the enclosure.

(6) Air shall not be re-circulated nor combined with any other air-conditioning or ventilation system and all air introduced into the enclosure shall be exhausted to the atmosphere without recirculation.

Openings for mechanical ventilation for air-conditioning systems.

5. Where mechanical ventilation or air-conditioning is provided-

(a) foul air shall not be discharged into an airwell and this requirement shall not be applicable to window room units in residential applications;

(b) the underside of openings for the entry of air into any mechanical ventilation or air-conditioning plant shall be not less than 1 metre from any external pavement, road way, ground level or similar external surface;

(c) the underside of openings for the exhaust of air from any mechanical ventilation or air-conditioning plant shall be not less than 2.5 metres from any external pavement, road way, ground level or similar external surface;

(d) to any of the enclosures from which foul air will be exhausted, the ducts, trunking, service shafts or other such items containing or conveying the foul air from such enclosure shall in no way be connected to any air inlet system.

Filtration

6. Unless otherwise specified, where air-conditioning is mentioned herein, it shall be deemed to include air filtration down to a particle size of ten microns with an efficiency of not less than 70% arrestance.

Mechanical ventilation systems in basement areas

7. (1) Basement and other enclosures below ground level used for working areas or for occupancy of more than two hours duration shall be provided with mechanical ventilation having a minimum of six air changes per hour.

(2) Basement or underground car parks shall be provided with mechanical ventilation such that the air exhausted to the external atmosphere should constitute not less than six air changes per hour. Air extract opening shall be arranged such that it is not less than 0.5 metres above the floor level period system.

(3) Basement and other enclosures below ground level used for working areas or for occupancy of more than two hours' duration shall be provided with a minimum of one fresh air change per hour, or the minimum of 0.28 cmm per person working in such area.

Projection rooms

8. Cinemas or other projection rooms where photographic film is being used, processed or stored, which are situated in the internal portion of the building, and in respect of which no such external walls (or those overlooking verandahs, pavements or walkways) are present, shall be provided with mechanical ventilation or air-conditioning, and all plant conveying extract or exhaust air shall not be combined in any way to other such plant serving the auditorium or any other parts of the premises.

Any other rooms

9. Where rooms or enclosures in any building not specified in this Schedule are situated in the internal portions of the building and no such external walls (or those overlooking verandahs, pavements or walkways) are present, a minimum of one fresh air change per hour shall be provided.

Water-closets and toilets

10. Water closets, toilets, lavatories, bathrooms, latrines, urinals or similar rooms or enclosures used for ablutions which are situated in the internal portions of the building and in respect of which no such external walls (or those overlooking verandahs, pavements or walkways) are present, shall be provided with mechanical ventilation or air-conditioning having a minimum of fresh air change at the rate of 0.61 cmm per square metre of floor area of ten air changes per hour, whichever is the lower.

Room, window, etc., air-conditioning units

11. Where room, window or wall air-conditioning units are provided as means of air-conditioning, such units shall be capable of continuously introducing fresh air.

Fresh air changes

12. (1) The minimum scale of fresh air ventilation in conjunction with recirculated, filtered and conditioned air meeting with the requirements of ASHRAE STANDARD 62-73 shall be as follows:

Residential building	0.14 cmm per occupant
Commercial premises	0.14 cmm per occupant
Factory and Workshop	0.21 cmm per occupant
School classroom	0.14 cmm per occupant
Projection room	0.14 cmm per occupant
Theatre and Auditorium	0.14 cmm per occupant
Canteen	0.28 cmm per occupant
Building of Public Resort	0.28 cmm per occupant
Offices	0.14 cmm per occupant
Conference Room	0.28 cmm per occupant
Hospital wards	0.14 cmm per occupant

Computer Room	0.14 cmm per occupant
Hotel rooms	0.14 cmm per occupant

(2) The minimum scale of fresh air ventilation in conjunction with the mechanical ventilation systems shall be as follows:

<i>Basement and garages</i>	<i>minimum of 6 air changes per hour</i>
Commercial premises (excluding laundry and boiler houses)	0.28 cmm per occupant
Factory and Workshop (the shall be based on the actual requirements)	0.56 cmm per occupant
Projection rooms	10 air changes per hour
Theatre and Auditorium	0.28 cmm per occupant
Kitchen	20 air changes per hour

NOTE - that all other areas shall meet with the minimum requirements of the ASHRAE STANDARD 62-73

FOURTH SCHEDULE

[Deleted -Sel. P.U.142/2012]

FIFTH SCHEDULE

Designation of purpose groups

DESIGNATION OF PURPOSE GROUPS

(By-laws 134, 138)

<i>Number of purpose group</i>	<i>Description Title</i>	<i>Purpose for which building or compartment is intended to be used</i>
I	Small residential	Private dwelling house detached or semidetached. <i>[I.Am. Sel.P.U.142/2012]</i>
II	Institutional	Hospitals, schools, colleges, libraries, nursing homes or other similar establishment used for education or as living accommodation for, or for treatment, care or maintenance of, persons suffering from disabilities due to illness or old age or other physical or mental disability or under the age of 5 years, where such persons sleep in the premises. <i>[II.Am. Sel.P.U.142/2012]</i>
III	Other residential	Other Accommodation for residential purpose other than any premises comprised in groups I and II, including hotels, hostels, dormitories, apartments, flats, old folks homes and orphanages. <i>[III. Am. Sel.P.U.142/2012]</i>
IV	Office	Office, or premises used for office purposes, meaning thereby the purposes of administration, clerical work (including writing, book-keeping, sorting papers, filing, typing, duplicating, machine-calculating, drawing and the editorial preparation of matter for publication), handling money and telephone and telegraph operating

V	Shop	<p>Shop, or shop premises, shopping complexes, food courts, wet and dry markets, premises used for the carrying on there of retail trade or business (including the sale to members of the public of food or drink for immediate consumption, retail sales by auction, the business of lending books or periodicals for the purpose of gain, and the business of a barber or hairdresser) and premises to which members of the public are invited to resort for the purpose of delivering their goods for repair or other treatment or of themselves carrying out repairs to or other treatment of goods.</p> <p style="text-align: right;"><i>[V. Am. Sel.P.U.142/2012]</i></p>
VI	Factory	<p>Factory means all premises as defined in section 2 of the Factories and Machinery Act 1967, but excluding those buildings classified under purpose group VIII - Storage and general</p>
VII	Place of Assembly	<p>Place, whether public or private, used for the attendance of persons for or in connection with their social, recreational, educational, business or other activities, and not comprised within group I to VI, including convention centres, museums, art galleries, cinemas, theatres, auditoriums, places of worship, transportation passenger terminals;</p> <p style="text-align: right;"><i>[VII. Am. Sel.P.U.142/2012]</i></p>
VIII	Storage and general	<p>Place for storage, deposit or parking of goods and materials (including vehicles), and other premises not comprised in groups I to VII</p>

DIMENSIONS OF BUILDINGS AND COMPARTMENTS

(By-law 136)

<i>Purpose Group</i>	<i>Height Of Building</i>	<i>Limits Of Dimensions</i>	
(1)	(2)	<i>Floor area of storey in building or compartment (in m²)</i> (3)	<i>Cubic capacity of building or compartment (in m³)</i> (4)
<i>Part I - Buildings other than single storey buildings</i>			
II (Institutional)	Any height	2,000	No limit
III (Other residential)	Not exceeding 28m	3,000	8,500
IV (Other residential)	Exceeding 28m	2,000	5,500
V (Shop)	Any height	2,000	7,000
VI (Factory)	Not exceeding 28m	No limit	28,000
VI (Factory)	Exceeding 28m	2,000	5,500
VIII (Storage and general)	Not exceeding 28m	No limit	21,000
VIII (Storage and general)	Exceeding 28m	1,000	No limit
<i>Part II - Single storey buildings</i>			
II (Institutional)	Any height	3,000	No limit
III (Other residential)	Any height	3,000	No limit

NOTE - Purpose Groups I, IV and VII are excluded as there are no limits applicable under by-law 138

SIXTH SCHEDULE

CALCULATION OF PERMITTED LIMITS OF UNPROTECTED AREAS

(By-laws 142, 145)

PART I

GENERAL RULES

1. The permitted limit of unprotected areas in any side of a building or compartment shall be calculated by reference to the requirements of Part II, III or IV.

2. In calculating the size of unprotected areas or the permitted limit of unprotected areas, the following provisions shall apply:

(a) where any part of an external wall is an unprotected area, only because it has combustible material attached to it as cladding, the area of that unprotected area shall be deemed to be half the area of such cladding;

(b) no account shall be taken of any of the following:

(i) an unprotected area unless it is an area specified in subparagraph (iii) hereof, which does not exceed 0.1 square metre and which is not less than 1.5 metres from any other unprotected area in the same side of the building or compartment;

(ii) one or more unprotected areas having an area, or if more than one, an aggregate area not exceeding 1 square metre and not less than 4 metres from any other unprotected area in the same side of the building or compartment, except and such area as is specified in subparagraph (i) above;

(iii) an unprotected area in any part of an external wall which forms part of a protected shaft;

(iv) an unprotected area in the side of a building not divided into compartments, if the area is not less than 28 metres above any ground adjoining that side of the building.

PART II

RULES FOR CALCULATION BY REFERENCE TO AN ENCLOSING RECTANGLE

1. The conditions of this Part shall be satisfied if a building or compartment is so situated that no point on the relevant boundary is either between the relevant plane of reference and the side of the building or compartment or at a distance from the relevant place of reference which is less than the distance specified in the Tables to this Part, according to the purpose group of the building or compartment, the dimensions of the enclosing rectangle and the unprotected percentage.

2. For the purposes of this Part-

"plane of reference" means any vertical plane which touches the side or some part of the side of a building or compartment, but which (however far extended) does not pass within the structure of such building or compartment (and for this purpose, any balcony, coping or similar projection shall be deemed not to be part either of the side or of the structure; and the relevant plane of reference shall in each case be taken as the most favourable in that respect to the person erecting the building;

"enclosing rectangle" means the smallest rectangle on the relevant plane of reference which would--

(a) enclose all the outer edges of any unprotected areas of the building or, if the building is divided into compartment, of the compartment (other than any part of unprotected area which is at angle of more than 80° to the Plane of reference), the outer edges being for this purpose projected on the plane of reference by lines perpendicular to such plane; and

(b) have two horizontal sides; and

(c) have height and width falling within those listed in the Tables to this Part;

"unprotected percentage" means the percentage of the area of the enclosing rectangle which is equal to the aggregate of the unprotected areas taken into account in calculating the enclosing rectangle as projected on it.

TABLES TO PART II

TABLE I - BUILDINGS OR COMPARTMENTS OF PURPOSE GROUPS
I (Small Residential), II (Institutional), III (Other Residential),
IV (Office) and VII (Assembly)

Width of enclosing rectangle in metres	Distance in metres from relevant boundary for unprotected percentage not exceeding								
	20	30	40	50	60	70	80	90	100
Enclosing rectangle 3 m high									
3	1.0	1.0	1.0	1.5	1.5	1.5	2.0	2.0	2.0
6	1.0	1.0	1.5	2.0	2.0	2.0	2.5	2.5	3.0
9	1.0	1.0	1.5	2.0	2.5	2.5	3.0	3.0	3.5
12	1.0	1.5	2.0	2.0	2.5	3.0	3.0	3.5	3.5
15	1.0	1.5	2.0	2.5	2.5	3.0	3.5	3.5	4.0
18	1.0	1.5	2.0	2.5	2.5	3.0	3.5	4.0	4.0
21	1.0	1.5	2.0	2.5	3.0	3.0	3.5	4.0	4.5
24	1.0	1.5	2.0	2.5	3.0	3.5	3.5	4.0	4.5
27	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.0	4.5
30	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.0	4.5
40	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.0	5.0
No limit	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.0	5.0

Enclosing rectangle 6 m high

3	1.0	1.0	1.5	2.0	2.0	2.0	2.5	2.5	3.0
6	1.0	1.5	2.0	2.5	3.0	3.0	3.5	4.0	4.0
9	1.0	2.0	3.0	3.0	3.5	4.0	4.5	4.5	5.0
12	1.5	2.5	3.5	3.5	4.0	4.5	5.0	5.0	5.5
15	1.5	2.5	3.5	4.0	4.5	5.0	5.5	5.5	6.0
18	1.5	2.5	3.5	4.0	4.5	5.0	5.5	6.0	6.5
21	1.5	2.5	3.5	4.0	5.0	5.5	6.0	6.5	7.0
24	1.5	2.5	3.5	4.5	5.0	5.5	6.0	7.0	7.0
27	1.5	2.5	3.5	4.5	5.0	6.0	6.5	7.0	7.5
30	1.5	2.5	3.5	4.5	5.0	6.0	6.5	7.0	8.0
40	1.5	2.5	3.5	4.5	5.5	6.5	7.0	8.0	8.5
50	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.0	9.0
60	1.5	2.5	3.5	5.0	5.5	6.5	7.5	8.5	9.5
80	1.5	2.5	3.5	5.0	6.0	7.0	7.5	8.5	9.5
100	1.5	2.5	3.5	5.0	6.0	7.0	8.0	8.5	10.0
No limit	1.5	2.5	3.5	5.0	6.0	7.0	8.0	8.5	10.0

Enclosing rectangle 9 m high

3	1.0	1.0	1.5	2.0	2.5	2.5	3.0	3.0	3.5
6	1.0	2.0	2.5	3.0	3.5	4.0	4.5	4.5	5.0
9	1.5	2.5	3.5	4.0	4.5	5.0	5.5	5.5	6.0
12	1.5	3.0	3.5	4.5	5.0	5.5	6.0	6.5	7.0
15	2.0	3.0	4.0	5.0	5.5	6.0	6.5	7.0	7.5
18	2.0	3.5	4.5	5.0	6.0	6.5	7.0	8.0	8.5
21	2.0	3.5	4.5	5.5	6.5	7.0	7.5	8.5	9.0
24	2.0	3.5	5.0	5.5	6.5	7.5	8.0	9.0	9.5
27	2.0	3.5	5.0	6.0	7.0	7.5	8.5	9.5	10.0
30	2.0	3.5	5.0	6.0	7.0	8.0	9.0	9.5	10.5
40	2.0	3.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5
50	2.0	4.0	5.5	6.5	8.0	9.0	10.0	11.5	12.5
60	2.0	4.0	5.5	7.0	8.0	9.5	11.0	11.5	13.0
80	2.0	4.0	5.5	7.0	8.5	10.0	11.5	12.5	13.5
100	2.0	4.0	5.5	7.0	8.5	10.0	11.5	12.5	14.5
120	2.0	4.0	5.5	7.0	8.5	10.0	11.5	12.5	14.5
No limit	2.0	4.0	5.5	7.0	8.5	10.5	12.0	12.5	15.0

Enclosing rectangle 12 m high

3	1.0	1.5	2.0	2.0	2.5	3.0	3.0	3.5	3.5
6	1.5	2.5	3.0	3.5	4.0	4.5	5.0	5.0	5.5
9	1.5	3.0	3.5	4.5	5.0	5.5	6.0	6.5	7.0
12	1.5	3.5	4.5	5.0	6.0	6.5	7.0	7.5	8.0
15	2.0	3.5	5.0	5.5	6.5	7.0	8.0	8.5	9.0
18	2.5	4.0	5.0	6.0	7.0	7.5	8.5	9.0	10.0
21	2.5	4.0	5.5	6.5	7.5	8.5	9.0	10.0	10.5
24	2.5	4.5	6.0	7.0	8.0	8.5	9.5	10.5	11.5
27	2.5	4.5	6.0	7.0	8.0	9.0	10.5	11.0	12.0
30	2.5	4.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5
40	2.5	5.0	6.5	8.0	9.5	10.5	12.0	13.0	14.0
50	2.5	5.0	7.0	8.5	10.0	11.0	13.0	14.0	15.0
60	2.5	5.0	7.0	9.0	10.5	12.0	13.5	14.5	16.0
80	2.5	5.0	7.0	9.0	11.0	13.0	14.5	16.0	17.0
100	2.5	5.0	7.5	9.5	11.5	13.5	15.0	16.5	18.0
120	2.5	5.0	7.5	9.5	11.5	13.5	15.0	17.0	18.5
No limit	2.5	5.0	7.5	9.5	12.0	14.0	15.5	17.0	19.0

Enclosing rectangle 15 m high

3	1.0	1.5	2.0	2.5	2.5	3.0	3.5	3.5	4.0
6	1.5	2.5	3.0	4.0	4.5	5.0	5.5	5.5	6.0
9	2.0	3.0	4.0	5.0	5.5	6.0	6.5	7.0	7.5
12	2.0	3.5	5.0	5.5	6.5	7.0	8.0	8.5	9.0
15	2.0	4.0	5.5	6.5	7.0	8.0	9.0	9.5	10.0
18	2.5	4.5	6.0	7.0	8.0	8.5	9.5	10.5	11.0
21	2.5	5.0	6.5	7.5	8.5	9.5	10.5	11.0	12.0
24	3.0	5.0	6.5	8.0	9.0	10.0	11.0	12.0	13.0
27	3.0	5.5	7.0	8.5	9.5	10.5	11.5	12.5	13.5
30	3.0	5.5	7.5	8.5	10.0	11.0	12.0	13.5	14.0
40	3.0	6.0	8.0	9.5	11.0	12.5	13.5	15.0	16.0
50	3.5	6.0	8.5	10.0	12.0	13.5	15.0	16.5	17.5
60	3.5	6.5	8.5	10.5	12.5	14.0	15.5	17.0	18.0
80	3.5	6.5	9.0	11.0	13.5	15.0	17.0	18.5	20.0
100	3.5	6.5	9.0	11.5	14.0	16.0	18.0	19.5	21.5
120	3.5	6.5	9.0	11.5	14.0	16.5	18.5	20.5	22.5
No limit	3.5	6.5	9.0	12.0	14.5	17.0	19.0	21.0	23.0

Enclosing rectangle 18 m high

3	1.0	1.5	2.0	2.5	2.5	3.0	3.5	4.0	4.0
6	1.5	2.5	3.5	4.0	4.5	5.0	5.5	6.0	6.5
9	2.0	3.5	4.5	5.0	6.0	6.5	7.0	8.0	8.5
12	2.5	4.0	5.0	6.0	7.0	7.5	8.5	9.0	10.0
15	2.5	4.5	6.0	7.0	8.0	8.5	9.5	10.5	11.0
18	2.5	5.0	6.5	7.5	8.5	9.5	11.0	11.5	13.0
21	3.0	5.5	7.0	8.0	9.5	10.5	11.5	12.5	13.0
24	3.0	5.5	7.5	8.5	10.0	11.0	12.0	13.0	14.0
27	3.5	6.0	8.0	9.0	10.5	11.5	12.5	13.5	14.5
30	3.5	6.5	8.0	9.5	11.0	12.0	13.5	14.5	15.5
40	4.0	7.0	9.0	11.0	12.0	13.5	15.0	16.5	17.5
50	4.0	7.0	9.5	11.5	13.0	15.0	16.5	18.0	19.0
60	4.0	7.5	10.0	12.0	14.0	16.0	17.5	19.5	20.5
80	4.0	7.5	10.0	13.0	15.0	17.0	19.0	21.0	22.5
100	4.0	7.5	10.0	13.5	16.0	18.0	20.5	22.5	24.0
120	4.0	7.5	10.0	14.0	16.5	19.0	21.0	23.5	25.5
No limit	4.0	8.0	10.0	14.0	17.0	19.5	22.0	24.0	26.5

Enclosing rectangle 21 m high

3	0.5	1.5	2.0	2.5	3.0	3.0	3.5	4.0	4.5
6	1.5	2.5	3.5	4.0	5.0	5.5	6.0	6.5	7.0
9	2.0	3.5	4.5	5.5	6.5	7.0	7.5	8.5	9.0
12	2.5	4.0	5.5	6.5	7.5	8.5	9.0	10.0	10.5
15	2.5	5.0	6.5	7.5	8.5	9.5	10.5	11.0	12.0
18	3.0	5.5	7.0	8.0	9.5	10.5	11.5	12.5	13.0
21	3.0	6.0	7.5	9.0	10.0	11.0	12.5	13.5	14.0
24	3.5	6.0	8.0	9.5	10.5	12.0	13.0	14.0	15.0
27	3.5	6.5	8.5	10.0	11.5	13.0	14.0	15.0	16.0
30	4.0	7.0	9.0	10.5	12.0	13.0	14.5	16.0	16.5
40	4.5	7.5	10.0	12.0	13.5	15.0	16.5	18.0	19.0
50	4.5	8.0	11.0	13.0	14.5	16.5	18.0	20.0	21.0
60	4.5	8.5	11.5	13.5	15.5	17.5	19.5	21.0	22.5
80	4.5	8.5	12.0	14.5	17.0	19.0	21.0	23.5	25.0
100	4.5	9.0	12.0	15.5	18.0	20.5	22.5	25.0	27.0
120	4.5	9.0	12.0	16.0	18.5	21.5	23.5	26.5	28.5
No limit	4.5	9.0	12.0	16.0	19.0	22.0	25.0	26.5	29.5

Enclosing rectangle 24 m high

3	0.5	1.5	2.0	2.5	3.0	3.5	3.5	4.0	4.5
6	1.5	2.5	3.5	4.5	5.0	5.5	6.0	7.0	7.0
9	2.0	3.5	5.0	5.5	6.5	7.5	8.0	9.0	9.5
12	2.5	4.5	6.0	7.0	8.0	8.5	9.5	10.5	11.5
15	3.0	5.0	6.5	8.0	9.0	10.0	11.0	12.0	13.0
18	3.0	5.5	7.5	8.5	10.0	11.0	12.0	13.0	14.0
21	3.5	6.0	8.0	9.5	10.5	12.0	13.0	14.0	15.0
24	3.5	6.5	8.5	10.0	11.5	12.5	14.0	15.0	16.0
27	4.0	7.0	9.0	11.0	12.5	13.5	15.0	16.0	17.0
30	4.0	7.5	9.5	11.5	13.0	14.0	15.5	17.0	18.0
40	4.5	8.5	11.0	13.0	14.5	16.0	18.0	19.0	20.5
50	5.0	9.0	12.0	14.0	16.0	17.5	19.5	21.0	22.5
60	5.0	9.5	12.5	15.0	17.0	19.0	21.0	23.0	24.5
80	5.0	10.0	13.5	16.5	18.5	21.0	23.5	25.5	27.5
100	5.0	10.0	13.5	17.0	20.0	22.5	25.0	27.5	29.5
120	5.5	10.0	13.5	17.5	20.5	23.5	26.5	29.0	31.0
No limit	5.5	10.0	13.5	18.0	21.0	24.0	27.5	30.0	32.5

Enclosing rectangle 27 m high

3	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.0	4.5
6	1.5	2.5	3.5	4.5	5.0	6.0	6.5	7.0	7.5
9	2.0	3.5	5.0	6.0	7.0	7.5	8.5	9.5	10.0
12	2.5	4.5	6.0	7.0	8.0	9.0	10.5	11.0	12.0
15	3.0	5.5	7.0	8.5	9.5	10.5	11.5	12.5	13.5
18	3.5	6.0	8.0	9.0	10.5	11.5	12.5	13.5	14.5
21	3.5	6.5	8.5	10.0	11.5	13.0	14.0	15.0	16.0
24	3.5	7.0	9.0	11.0	12.5	13.5	15.0	16.0	17.0
27	4.0	7.5	10.0	11.5	13.0	14.0	16.0	17.0	18.0
30	4.0	8.0	10.0	12.0	13.5	15.0	17.0	18.0	19.0
40	5.0	9.0	11.5	13.0	15.5	17.5	19.0	20.5	22.0
50	5.5	9.5	12.5	15.0	17.0	19.0	21.0	22.5	24.0
60	5.5	10.5	13.5	16.0	18.5	20.5	22.5	24.5	26.5
80	6.0	11.0	14.5	17.5	20.5	22.5	25.0	27.5	29.5
100	6.0	11.0	15.5	19.0	21.5	24.5	27.0	30.0	32.0
120	6.0	11.5	15.5	19.5	22.5	26.0	28.5	32.0	34.0
No limit	6.0	11.5	15.5	20.0	23.5	27.0	29.5	33.0	35.0

TABLE 2 - BUILDINGS OR COMPARTMENTS OF PURPOSE GROUPS
V (Shop), VI (Factory) and VIII (Storage and General)

Width of enclosing rectangle in metres	Distance in metres from relevant boundary for unprotected percentage not exceeding								
	20	30	40	50	60	70	80	90	100
Enclosing rectangle 3 m high									
3	1.0	1.5	2.0	2.0	2.5	2.5	2.5	3.0	3.0
6	1.5	2.0	2.5	3.0	3.5	3.5	4.0	4.0	4.0
9	1.5	2.5	3.0	3.5	4.0	4.0	4.5	5.0	5.0
12	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	5.5
15	2.0	2.5	3.5	4.0	4.5	5.0	5.5	6.0	6.0
18	2.0	2.5	3.5	4.0	5.0	5.0	6.0	6.5	6.5
21	2.0	3.0	3.5	4.5	5.0	5.5	6.0	6.5	7.0
24	2.0	3.0	3.5	4.5	5.0	5.5	6.0	7.0	7.5
27	2.0	3.0	4.0	4.5	5.5	6.0	6.5	7.0	7.5
30	2.0	3.0	4.0	4.5	5.5	6.0	6.5	7.5	8.0
40	2.0	3.0	4.0	5.0	5.5	6.5	7.0	8.0	8.5
50	2.0	3.0	4.0	5.0	6.0	6.5	7.5	8.0	9.0
60	2.0	3.0	4.0	5.0	6.0	7.0	7.5	8.5	9.5
80	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	9.5
No limit	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0

Enclosing rectangle 6 m high

3	1.5	2.0	2.5	3.0	3.0	3.5	3.5	4.0	4.0
6	2.0	3.0	3.5	4.0	4.5	5.0	5.5	5.5	6.0
9	2.5	3.5	4.5	5.0	5.5	6.0	6.5	7.0	7.0
12	3.0	4.0	5.0	5.5	6.5	7.0	7.5	8.0	8.5
15	3.0	4.5	5.5	6.0	7.0	7.5	8.0	9.0	9.0
18	3.5	4.5	5.5	6.5	7.5	8.0	9.0	9.5	10.0
21	3.5	5.0	6.0	7.0	8.0	9.0	9.5	10.0	10.5
24	3.5	5.0	6.0	7.0	8.5	9.5	10.0	10.5	11.0
27	3.5	5.0	6.5	7.5	8.5	9.5	10.5	11.0	12.0
30	3.5	5.0	6.5	8.0	9.0	10.0	11.0	12.0	12.5
40	3.5	5.5	7.0	8.5	10.0	11.0	12.0	13.0	14.0
50	3.5	5.5	7.5	9.0	10.5	11.5	13.0	14.0	15.0
60	3.5	5.5	7.5	9.5	11.0	12.0	13.5	15.0	16.0
80	3.5	6.0	7.5	9.5	11.5	13.0	14.5	16.0	17.5
100	3.5	6.0	8.0	10.0	12.0	13.5	15.0	16.5	18.0

120	3.5	6.0	8.0	10.0	12.0	14.0	15.5	17.0	19.0
No limit	3.5	6.0	8.0	10.0	12.0	14.0	16.0	18.0	19.0

Enclosing rectangle 9 m high

3	1.5	2.5	3.0	3.5	4.0	4.0	4.5	5.0	5.0
6	2.5	3.5	4.5	5.0	5.5	6.0	6.5	7.0	7.0
9	3.5	4.5	5.5	6.0	6.5	7.5	8.0	8.5	9.0
12	3.5	5.0	6.0	7.0	7.5	8.5	9.0	9.5	10.5
15	4.0	5.5	6.5	7.5	8.5	9.5	10.0	11.0	11.5
18	4.5	6.0	7.0	8.5	9.5	10.0	11.0	12.0	12.5
21	4.5	6.5	7.5	9.0	10.0	11.0	12.0	13.0	13.5
24	5.0	6.5	8.0	9.5	11.0	12.0	13.0	13.5	14.5
27	5.0	7.0	8.5	10.0	11.5	12.5	13.5	14.5	15.0
30	5.0	7.0	9.0	10.5	12.0	13.0	14.0	15.0	16.0
40	5.5	7.5	9.5	11.5	13.0	14.5	15.5	17.0	17.5
50	5.5	8.0	10.0	12.5	14.0	15.5	17.0	18.5	19.5
60	5.5	8.0	11.0	13.0	15.0	16.5	18.0	19.5	21.0
80	5.5	8.5	11.5	13.5	16.0	17.5	19.5	21.5	23.0
100	5.5	8.5	11.5	14.5	16.5	18.5	21.0	22.5	24.5
120	5.5	8.5	11.5	14.5	17.0	19.5	21.5	23.5	26.0
No limit	5.5	8.5	11.5	15.0	17.5	20.0	22.5	24.5	27.0

Enclosing rectangle 12 m high

3	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	5.5
6	3.0	4.0	5.0	5.5	6.5	7.0	7.5	8.0	8.5
9	3.5	5.0	6.0	7.0	7.5	8.5	9.0	9.5	10.5
12	4.5	6.0	7.0	8.0	9.0	9.5	11.0	11.5	12.0
15	5.0	6.5	8.0	9.0	10.0	11.0	12.0	13.0	13.5
18	5.0	7.0	8.5	10.0	11.0	12.0	13.0	14.0	14.5
21	5.5	7.5	9.0	10.5	12.0	13.0	14.0	15.0	16.0
24	6.0	8.0	9.5	11.5	12.5	14.0	15.0	16.0	16.5
27	6.0	8.0	10.5	12.0	13.5	14.5	16.0	17.0	17.5
30	6.5	8.5	10.5	12.5	14.0	15.0	16.5	17.5	18.5
40	6.5	9.5	12.0	14.0	15.5	17.5	18.5	20.0	21.0
50	7.0	10.0	13.0	15.0	17.0	19.0	20.5	23.0	23.0
60	7.0	10.5	13.5	16.0	18.0	20.0	21.5	23.5	25.0
80	7.0	11.0	14.5	17.0	19.5	21.5	23.5	26.0	27.5
100	7.5	11.5	15.0	18.0	21.0	23.0	25.5	28.0	30.0
120	7.5	11.5	15.0	18.5	22.0	24.0	27.0	29.5	31.5
No limit	7.5	12.0	15.5	19.0	22.5	25.0	28.0	30.5	34.0

Enclosing rectangle 15 m high

3	2.0	2.5	3.5	4.0	4.5	5.0	5.5	6.0	6.0
6	3.0	4.5	5.5	6.0	7.0	7.5	8.0	9.0	9.0
9	4.0	5.5	6.5	7.5	8.5	9.5	10.0	11.0	11.5
12	5.0	6.5	8.0	9.0	10.0	11.0	12.0	13.0	13.5
15	5.5	7.0	9.0	10.0	11.5	12.5	13.5	14.5	15.0
18	6.0	8.0	9.5	11.0	12.5	13.5	14.5	15.5	16.5
21	6.5	8.5	10.5	12.0	13.5	14.5	16.0	16.5	17.5
24	6.5	9.0	11.0	13.0	14.5	15.5	17.0	18.0	19.0
27	7.0	9.5	11.5	13.5	15.0	16.5	18.0	19.0	20.0
30	7.5	10.0	12.0	14.0	16.0	17.0	18.5	20.0	21.0
40	8.0	11.0	13.5	16.0	18.0	19.5	21.0	22.5	23.5
50	8.5	12.0	15.0	17.5	19.5	21.5	23.0	25.0	26.0
60	8.5	12.5	15.5	18.0	21.0	23.5	25.0	27.0	28.0
80	9.0	13.5	17.0	20.0	23.0	25.5	28.0	30.0	31.5
100	9.0	14.0	18.0	21.5	24.5	27.5	30.0	32.5	34.5
120	9.0	14.0	18.5	22.5	25.5	28.5	31.5	34.5	37.0
No limit	9.0	14.5	19.0	23.0	27.0	30.0	34.0	36.0	39.0

Enclosing rectangle 18 m high

3	2.0	2.5	3.5	4.0	5.0	5.0	6.0	6.5	6.5
6	3.5	4.5	5.0	6.5	7.5	8.0	9.0	9.5	10.0
9	4.5	6.0	7.0	8.5	9.5	10.0	11.0	12.0	12.5
12	5.0	7.0	8.5	10.0	11.0	12.0	13.0	14.0	14.5
15	6.0	8.0	9.5	11.0	12.5	13.5	14.5	15.5	16.5
18	6.5	8.5	11.0	12.0	13.5	14.5	16.0	17.0	18.0
21	7.0	9.5	11.5	13.0	14.5	16.0	17.0	18.0	19.5
24	7.5	10.0	12.0	14.0	15.5	16.5	18.5	19.5	20.5
27	8.0	10.5	12.5	14.5	16.5	17.5	19.5	20.5	21.5
30	8.0	11.0	13.5	15.5	17.0	18.5	20.5	21.5	22.5
40	9.0	12.0	15.0	17.5	19.5	21.5	23.5	25.0	26.0
50	9.5	13.0	16.5	19.0	21.5	23.5	26.0	27.5	29.0
60	10.0	14.0	17.5	20.5	23.0	26.0	27.5	29.5	31.0
80	10.0	15.0	19.0	22.5	26.0	28.5	31.0	33.5	35.0
100	10.0	16.0	20.5	24.0	28.0	31.0	33.5	36.0	38.5
120	10.0	16.5	21.0	25.5	29.5	32.5	35.5	39.0	41.5
No limit	10.0	17.0	22.0	26.5	30.5	34.0	37.0	41.0	43.5

Enclosing rectangle 21 m high

3	2.0	3.0	3.5	4.5	5.0	5.5	6.0	6.5	7.0
6	3.5	5.0	6.0	7.0	8.0	9.0	9.5	10.0	10.5
9	4.5	6.5	7.5	9.0	10.0	11.0	12.0	13.0	13.5
12	5.5	7.5	9.0	10.5	12.0	13.0	14.0	15.0	16.0
15	6.5	8.5	10.5	12.0	13.5	14.5	16.0	16.5	17.5
18	7.0	9.5	11.5	13.0	14.5	16.0	17.0	18.0	19.5
21	7.5	10.0	12.5	14.0	15.5	17.0	18.5	20.0	21.0
24	8.0	10.5	13.0	15.0	16.5	18.0	20.0	21.0	22.0
27	8.5	11.5	14.0	16.0	18.0	19.0	21.0	22.5	23.5
30	9.0	12.0	14.5	16.5	18.5	20.5	22.0	23.5	25.0
40	10.0	13.5	16.5	19.0	21.5	23.0	25.5	27.0	28.5
50	11.0	14.5	18.0	21.0	23.5	25.5	28.0	30.0	31.5
60	11.5	15.5	19.5	22.5	25.5	28.0	30.5	32.5	33.5
80	12.0	17.0	21.0	25.0	28.5	31.5	34.0	36.5	38.5
100	12.0	18.0	22.5	27.0	31.0	34.5	37.0	40.0	42.0
120	12.0	18.5	23.5	28.5	32.5	36.5	39.5	43.0	45.5
No limit	12.0	19.0	25.0	29.5	34.5	38.0	41.5	45.5	48.0

Enclosing rectangle 24 m high

3	2.0	3.0	3.5	4.5	5.0	5.5	6.0	7.0	7.5
6	3.5	5.0	6.0	7.0	8.5	9.5	10.0	10.5	11.0
9	5.0	6.5	8.0	9.5	11.0	12.0	13.0	13.5	14.5
12	6.0	8.0	9.5	11.5	12.5	14.0	15.0	16.0	16.5
15	6.5	9.0	11.0	13.0	14.5	15.5	17.0	18.0	19.0
18	7.5	10.0	12.0	14.0	15.5	16.5	18.5	19.5	20.5
21	8.0	10.5	13.0	15.0	16.5	18.0	20.0	21.0	22.0
24	8.5	11.5	14.0	16.0	18.0	19.5	21.0	22.5	24.0
27	9.0	12.5	15.0	17.0	19.0	20.5	22.5	24.0	25.5
30	9.5	13.0	15.5	18.0	20.0	21.5	23.5	25.0	26.5
40	11.0	14.5	18.0	20.5	23.0	25.0	27.5	29.0	30.5
50	12.0	16.0	19.5	22.5	25.5	27.5	30.0	32.0	33.5
60	12.5	17.0	21.0	24.5	27.5	30.0	32.5	35.0	36.5
80	13.5	18.5	23.5	27.5	31.0	34.5	37.0	39.5	41.5
100	13.5	20.0	25.0	29.5	33.5	37.0	40.0	43.0	45.5
120	13.5	20.5	26.5	31.0	36.0	39.5	43.0	46.5	49.0
No limit	13.5	21.0	27.5	32.5	37.5	42.0	45.5	49.5	52.0

Enclosing rectangle 27 m high

3	2.0	3.0	4.0	4.5	5.5	6.0	6.5	7.0	7.5
6	3.5	5.0	6.5	7.5	8.5	9.5	10.5	11.0	12.0
9	5.0	7.0	8.5	10.0	11.5	12.5	13.5	14.5	15.0
12	6.0	8.0	10.5	12.0	13.5	14.5	16.0	17.0	17.5
15	7.0	9.5	11.5	13.5	15.0	16.5	18.0	19.0	20.0
18	8.0	10.5	12.5	14.5	16.5	17.5	19.5	20.5	21.5
21	8.5	11.5	14.0	16.0	18.0	19.0	21.0	22.5	23.5
24	9.0	12.5	15.0	17.0	19.0	20.5	22.5	24.0	25.5
27	10.0	13.0	16.0	18.0	20.0	22.0	24.0	25.5	27.0
30	10.0	13.5	17.0	19.0	21.0	23.0	25.0	26.5	28.0
40	11.5	15.5	19.0	22.0	24.5	26.5	29.0	30.5	32.5
50	12.5	17.0	21.0	24.0	27.0	29.5	32.0	34.5	36.0
60	13.5	18.5	22.5	26.5	29.5	32.0	35.0	37.0	39.0
80	14.5	20.5	25.0	29.5	33.0	36.5	39.5	42.0	44.0
100	15.5	21.5	27.0	32.0	36.5	40.5	43.0	46.5	48.5
120	15.5	22.5	28.5	34.0	39.0	43.0	46.5	50.5	53.0
No limit	15.5	23.5	29.5	35.0	40.5	44.5	48.5	52.0	55.5

PART III

RULES FOR CALCULATION BY REFERENCE TO
AGGREGATE NOTIONAL AREA

1. The conditions of this Part shall be satisfied if a building is so constructed that the aggregate notional area of the unprotected areas in the side of a building or compartment does not exceed-

(a) 210 square metres (if the building or compartment is of Purpose Group I, II, III, IV or VII); or

(b) 90 square metres (if the building or compartment is of Purpose Group V, VI or VIII)

such calculation being made by reference to any one of a series of vertical data, measured at intervals of not more than 3 metres from one another along the relevant boundary.

2. For the purposes of this Part-

"aggregate notional area" means the aggregate of the areas of any unprotected areas in the side of a building or compartment, each such area being multiplied by the factor specified in the Table to this Part according to the distance of such unprotected areas from the vertical datum;

"vertical datum" means a vertical line of unlimited height at any point on the relevant boundary;

"the datum line" means the line joining a vertical datum to the nearest point of the side of the building or compartment.

3. For the purposes of this Part, no account shall be taken of any unprotected area in the side of a building or compartment which is-

(a) screened from the vertical datum by any part of an external wall which is not an unprotected area; or

(b) outside a horizontal arc having its centre at a point through which the vertical datum passes and having a radius measuring 50 metres and extending 90° on either side of the datum line; or

(c) facing away from the vertical datum, or making an angle not exceeding 10° with a line drawn from it to the vertical datum.

TABLE OF FACTORS

<i>Distance of unprotected area from vertical datum in metres</i>		<i>Factor</i>
<i>Not Less than</i>	<i>Less than</i>	
1	1.2	80
1.2	1.8	40
1.8	2.7	20
2.7	4.3	10
4.3	6.0	4
6.0	8.5	2
8.5	12.0	1
12.0	18.5	0.5
18.5	27.5	0.25
27.5	50	0.1
50	No limit	0

PART IV

RULES FOR CALCULATION IN RESPECT OF CERTAIN BUILDINGS OF PURPOSE GROUP I OR III

1. The provisions of this Part apply only to any building of Purpose Group I or III, which has not more than three storeys and of which no side (measured on an elevation) exceeds 24 metres in length.

2. The conditions of this Part shall be satisfied if the distance between any part of a side of a building and the relevant boundary is not less than the minimum distance specified in the Table to this Part according to the length of such side and the total area of any unprotected areas to be taken into account.

TABLE TO PART IV

PERMITTED UNPROTECTED AREAS IN CERTAIN
RESIDENTIAL BUILDINGS

<i>Minimum distance (in metres) between side of building</i>	<i>Length of side (in metres) not exceeding</i>	<i>Total area of unprotected areas (in square metres) not exceeding</i>
(1)	(2)	(3)
1	24	5.6
2.5	24	15
5.0	12	up to the whole area of the wall
6.0	24	up to the whole area of the wall

SEVENTH SCHEDULE

Maximum travel distance and Calculation of occupant load and capacity of exits.

MAXIMUM TRAVEL DISTANCE

(By-laws 165(4), 166(2), 167(1), 170 (b))

<i>Purpose Group</i>	<i>Limit when alternative exits are available (1) (2) (3) (metre)</i>		
	<i>*Dead-End Limit (metre)</i>	<i>Un-sprinklered</i>	<i>Sprinklered</i>
I. Small Residential	NR	NR	NR
II. Institutional			
Hospitals, Nursing Homes, etc.	15	30	45
School	15	45	75
Open Plan	NR	30	45
Flexible Plan	NR	45	60
III. Other Residential			
Hotels	15	30	45
Flats	20	30	75
Dormitories	15	45	75
IV. Office	15	45	75
V. Shops	15	45	60
VI. Factory			
General and Special Purpose	15	30	60
High Hazard	0	22	35
Open Structures	NR	NR	NR
VII. Places of Assembly	15	45	60
VIII. Storage and General			

Low and Ordinary hazard	15	30	60
High Hazard	10	20	35
Parking Garages	15	45	60
Aircraft Hangars (Ground Floor)	15	30+	45+
Aircraft Hangars (Mezzanine Floor)	15	20	20

NR-No requirements or not applicable.

NR– No requirements or not applicable.

* The dead-end limit shall be the distance to a storey exit or to a point where alternative means of escape is available provided that the total travel distance shall not exceed the limits under (2).

+ Refers only to aircraft hangars. In any building used for aircraft assembly or other occupancy requiring undivided floor areas so large that the distances from points within area to the nearest outside walls where exit doors could be provided are in excess of 45 metres requirements for distance to exits may be satisfied by providing stairs leading to exit tunnels or to overhead passageways. In cases where such arrangements are not practicable other arrangements for one-storey buildings with distances in excess of the maximum, travel distances of not more than 30 metres or 45 metres in building protected by a complete automatic sprinkler system, may be permitted if complete automatic sprinkler protection is provided and if the height of ceilings, ceiling curtain boards and roof ventilation is such as to minimise the possibility that employees will be overtaken by the spread of fire or smoke within of 1.8 metres of the floor level before they have time to reach exits provided however that in no case may the distance to travel to reach the nearest exit exceed 120 metres.

In an open plan the direct distance shall be two-thirds of the travel distance.

[Subs. Sel.P.U.142/2012]

SEVENTH SCHEDULE

CALCULATION OF OCCUPANT LOAD AND CAPACITY OF EXITS

(By-laws 167 (2), 168 (2), 170 (c), 171 (c), (175)

Purpose Group	Occupant load square metre per	CAPACITY EXITS					
		No. of persons per unit-Exit Width					
		Doors outside	Horizontal Exit	Ramp Main Exit	Ramp Sec. Exit	Escalator	Stairs
I. Small Residential	NR	NR	NR	NR	NR	NR	NR
II. Institutional		100	100	100	60	-	60
Class-room Area	2 net						
Workshop and Vocational areas	4.5 net						
Day Nurseries with sleeping facilities	3.5 net						
Hospital	-	30	30	30	30	-	15
Sleeping Departments	12 Gross						
In-patient	24 Gross						

Departments							
III. Other Residential	20 Gross	50	50	50	50	45	30
Flats	24 Gross						
General public areas in Hotels (Bedrooms in hotels at 2 persons per room)	24 Gross						
IV. Office	10 Gross (4)	100	100	100	60	60	60
V. Shops	10 Gross	100	100	100	60	60	60
Street floor and sale basement	3 gross (4)						
Other floors	6 Gross (4)						
Storage and shipping	10 Gross						
VI. Factory	10 Gross	100	100	100	60	60	60
VII. Places of Assembly	1.5 net	100	100	100	75	75	75
Areas of concentrated use without fixed seating	0.7 net						
Standing space	0.3 net						

NR - No requirements or not applicable.

Exits are measured in units of 550 milimetres width

The width of an access to exit should be at least 700 milimetres.

The capacity in number of persons of a unit of exit width varies from 30 persons per unit of exit width for hospitals to 100 persons per unit of exit width for office buildings, assembly buildings for travel in horizontal direction.

For travel in an inclined direction-22 persons per unit of exit width in hospitals to 75 persons per unit of exit width in places of assembly.

Main exit 50% of the total required exit width.

In determining the units of exit width for an exit doorway, only the clear width of the doorway when the door is in the open position is to be measured.

Excluding any areas occupied by staircases, lifts, sanitary accommodations and any other space occupied by machinery for any lift, air-conditioning system or similar service provided for the building.

[Subs. Sel.P.U.142/2012]

EIGHT SCHEDULE

CLASSIFICATION OF RESTRICTION OF SPREAD OF FLAME OVER SURFACES OF WALLS AND CEILINGS

(By-laws 204, 206)

<i>Purpose Group</i>	<i>Exits</i>	<i>Access to Exits</i>	<i>Other Spaces</i>
I. Small Residential	NR	NR	NR
II. Institutional Open plan or flexible plan	0	0	3 2
Hospitals, nursing homes or residential-custodial care	0	0	3 for movable partitions not over 2.1 m high 1 2 in individual room with capacity not more than 4 person
III. Other Residential Flats	1 1	1 1	3 3
Dormitories	0	0	3
1 and 2 family houses lodging or boarding houses	0	0	3
Hotels	0	0	3
IV. Office	1	1	3
V. Shop-Class A	0	0	Ceilings 2 Walls 3
Shop-Class B	0	0	Ceilings 2 Walls 3
Shop-Class C	0	0	3
VI. Factory	3	3	3

NR-No requirements or not applicable.

Class A Places of Assembly-1000 persons or more.

Class B Places of Assembly-300 to 1000 persons.

Class C Places of Assembly-100 to 300 persons.

Class A shops-stores having aggregate gross area of 3000 square metres or more, or utilizing more than 3 floor levels for sales purposes.

Class B Shops-stores of less than 3000 square metres aggregate gross area, but over 300 square metres or utilizing any floors above or below ground floor level for sales purposes, except that if more than 3 floors are utilized, store shall be Class A.

Class C Shops-stores of 300 square metres or less gross area, used for sales purposes on ground floor level only.

Class O

Asbestos-cement sheets

Asbestos insulation board

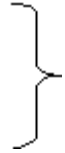
Asbestos insulation board, or plaster, on concrete, or metal sheets finished with oil-based or polymer paints.

Plasterboard

Fibre insulation board

Hardboard

Compressed straw slabs



Finished with not less than 3.2 mm of non-combustible surface

Class 1

Wood-wood slabs

Fibre insulation board with asbestos felt surface, on the exposed face.

Compressed straw slabs, with asbestos felt surface on the exposed face.

Fibre insulation board, 3 coats non-washable distemper.

Fibre insulation board, 1 coat non-washable distemper on a sized board.

Timber or plywood or fibre insulation board or hardboard painted with a fire retardant paint.

Class 2 or 3

Fibre insulation board finished with one coat of washable distemper or one coat of flat oil-paint.

Timber or plywood of density greater than 0.4 g/cm³.

Hardwood or softwood finished with oil-based or polymer paints.

Plywood finished with oil-based or polymer paints.

Hardboard.

Hardboard finished with oil-based or polymer paints.

Hardboard with wall paper finished with oil-based or polymer paints.

Class 4

Untreated fibre insulated board.

NOTIONAL DESIGNATIONS OF ROOF CONSTRUCTIONS

(By-laws 207 (1) (b), 208 (a))

PART I

PITCHED ROOFS COVERED WITH SLATES OR TILES

<i>Covering material</i>	<i>Supporting structure</i>	<i>Designation</i>
1. Natural slates	Timber rafters with or without underfelt on sarking or boarding, wood wool slabs, compressed straw slabs, wood chipboard or insulating fireboard.	AA
2. Asbestos cement slates		
3. Clay tiles		
4. Concrete tiles		
5. Bitumen felt strip slates, asbestos or fibre based	Timber rafters and boarding	CC
6. Bitumen felt strip slates, asbestos based, mineral surfaced with an under layer of self-finished asbestos left minimum 13.6 kg	Timber rafters and boarding	BB

The test referred to in BS 476; Part 1.

PART II

[Deleted Sel. P..U. 142/2012]

PITCHED ROOFS COVERED WITH PREFORMED SELESUPPORTING SHEETS

<i>Covering material</i>	<i>Supporting structure</i>	<i>Designation</i>
(a) galvanised steel, or	<i>Main structure of timber, steel or concrete and covering in either-</i>	AA
(b) aluminium, or	(a) single-skin construction without underlay or with underlay of:	
(c) composite steel and asbestos sheets, or	(i) asbestos insulating board, or	
(d) asbestos-cement	(ii) plasterboard, or	
	(iii) fibre board treated to achieve Class 1 in spread of flame test*, or	
	(iv) compressed straw slab, or	
	(v) Wood wool Slab, or	
	(b) double-skin construction without interlayer or with interlayer of resin-bonded or bitumen-bonded glass fibre	AA

PART III

[Deleted Sel. P..U. 142/2012]

PITCHED OR FLAT ROOFS COVERED WITH FULLY SUPPORTED MATERIALS

<i>Supporting structure</i>				
	Timber joists and boarding not less than 22.4 mm thick Tongued Plain and edged grooved	Steel or timber joists with deck of-- (a) wood wool slabs, or (b) compressed straw slabs 50.11 mm thick, or (c) wood chipboard not less than 22.4 mm or (d) insulating fibreboard not less than 25 mm thick	Slab of concrete or clay pot, insitu or precast concrete: or non-combustible deck or steel, aluminium or asbestos-cement with or without insulation	
Aluminium, copper or zinc sheets.	AA	AA	AA	AA
Lead sheet	AA	BA	AA	AA
Mastic asphalt	AA	AA	AA	AA

PART IV –

[Deleted Sel. P..U. 142/2012]

PART IV

A. FLAT ROOFS

ROOFS COVERED WITH BITUMEN FELT

DETAILS OF FELT: TYPE, WEIGHT BASE AND FINISH

	Under layer or layers	Upper layer	Combustible Deck		Steel or timber beams		Non-combustible Deck		Concrete or claypot slab cast in situ precast
			Timber joists with 25 mm (nom.) P.E. or T. and G boarding (lower layer nailed)	Stressed skin plywood cavity deck: Thickness of plywood 19 mm	Supporting compressed straw slabs	Supporting wood wool slabs	Asbestos cement cavity deck	Steel or aluminium deck: single skin or cavity	
Flat roof with two or three layer felt, 13 kg/10 sq. metres bitumen bonding compound and between layers of felt	1. Type IC, self-finished or lightly sanded bitumen felt, minimum 13 kg	Type IC, self-finished or (a) lightly sanded bitumen felt (b) minimum 13 kg	AA	AA	AA	AA	AA	AA	AA
	2. Type IC, self-finished or lightly sanded bitumen felt, minimum 13 kg	Type 2B, self-finished or (a) lightly sanded bitumen asbestos felt (b) minimum 13 kg	AA	AA	AA	AA	AA	AA	AA
	3. Type 2B, self-finished or lightly sanded bitumen asbestos felt minimum 13 kg	Type 2B, self-finished or (a) lightly sanded bitumen asbestos felt (b) minimum 13 kg	AA	AA	AA	AA	AA	AA	AA
	4. Type 5A, bitumen glass fibre felt, minimum 13 kg	Type 5A, bitumen (a) glass fibre felt (b) minimum 13 kg	AA	AA	AA	AA	AA	AA	AA

NOTES:

- Any reference in this part of this table to a type of layer of felt is a reference to that type as listed in BS 747:1961—
 (a) with bitumen-bedded mineral chippings 9.54 mm by 15.9 mm spread evenly shoulder to shoulder 49.18—57.37 mm² per tonne
 (b) with bitumen-bedded tiles of asbestos cement or tiles of other non-combustible material.

B. PITCHED ROOFS

DETAILS OF FELT: TYPE, WEIGHT BASE AND FINISH

	Under layer or layers	Upper layer	Combustible Deck		Steel or timber beams		Non-combustible Deck		Concrete or claypot slab cast in situ precast
			Timber joists with 25 mm (nom.) P.E. or T. and G boarding (lower layer nailed)	Stressed skin plywood cavity deck: Thickness of plywood 6 mm	Supporting compressed straw slabs	Supporting wood wool slabs	Asbestos cement cavity deck	Steel or aluminium deck: single skin or cavity	
Pitched roof with two or three layer felt, 13 kg/10 sq. metres bitumen bonding compound between layers of	1. Type 1C, self-finished or lightly sanded bitumen felt, minimum 13 kg	Type 1E, Mineral surfaced bitumen felt 36.3 kg	CC	CC	AC	AC	AC	—	AC
	2. Type 1C, self-finished or lightly sanded bitumen felt, minimum 13 kg	Type 2C, mineral surfaced, asbestos bitumen felt 36.3 kg	BB	BB	AB	AA	AA	AA	AA
	3. Type 2B, self-finished or lightly sanded bitumen asbestos felt, minimum 13 kg	Type 2C, mineral surfaced asbestos bitumen felt 36.3 kg	AB	AB	AB	AA	AA	AA	AA
	4. Type 5A, bitumen glass fibre felt, minimum 13 kg	Type 5B, mineral surfaced bitumen, glass fibre felt 27.4 kg	BC	BC	AC	AB	AB	AB	AB
Pitched roof with single layer felt	Type 1E, mineral surfaced bitumen felt 36.3 kg.		CC	CC	AC	AC	AC	AC	AC

Notes:

Any reference in this part of this table to a type of layer of felt is a reference to that type as listed in BS 747:1961—

(a) with bitumen-bedded mineral chippings 9.54 mm by 15.9 mm spread evenly shoulder to shoulder 49.18—57.37 mm² per tonne

(b) with bitumen-bedded tiles of asbestos cement or tiles of other non-combustible material.

NINTH SCHEDULE

LIMITS OF COMPARTMENTS AND MINIMUM PERIODS OF FIRE RESISTANCE FOR ELEMENTS OF STRUCTURE

(By-laws 142 (3), 147, 158 (1), 162, 213, 216 (2))

(Minimum periods of fire resistance)

In this Table-

"cubic capacity" means the cubic capacity of the building or if the building is divided into compartments, the compartments of which the element of structure forms part;

"floor area" means the floor area of each storey in the building or, if the building is dividend into compartments, of each storey in the compartment of which the element of structure forms part;

"height" has the meaning assigned to the expression by paragraph (2) of by-law 215.

"NL" means no limits applicable.

PART I - BUILDINGS OTHER THAN SINGLE STOREY BUILDINGS

<i>Purpose group</i> (1)	<i>Maximum dimensions</i>			<i>Minimum period of fire resistance (in hours) for elements of structure(*) forming part of--</i>	
	Height (in m) (2)	Floor area (in m ²) (3)	Cubic capacity (in m ²) (4)	Ground storey or upper storey (5)	Basement storey (6)
I (Small residential)					
House having not more than three storeys	NL	NL	NL	1/2	1(a)
House having four storeys	NL	250	NL	1 (b)	1
House having any number of storeys	NL	NL	NL	1	1 1/2
II (Institutional)	28	2 000	NL	1	1 1/2
	over 28	2 000	NL	1 1/2	2
III (Other residential)					
Building or part (+) having not more than two storeys	NL	500	No limit	1/2	1
Building or part	NL	250	NL	1(b)	1

(+) having three storeys					
Building having any number of storeys	28	3000	8500	1	1 1/2
Building having any number of storeys	NL	2000	5500	1 1/2	2
IV (Office)	7.5	250	NL	1/2	1(a)
	7.5	500	NL	1/2	1
	15	NL	3500	1(b)	1
	28	1000	14000	1	2
	NL	2000	NL	2	4
V (Shops)	7.5	150	NL	1/2	1(a)
	7.5	500	NL	1/2	1
	15	NL	3500	1 (b)	1
	28	1000	14000	1	2
	NL	2000	NL	2	4
VI (Factory)	7.5	250	NL	0	1(a)
	7.5		1700	1/2	1
	15	NL	4250	1 (b)	1
	28		8500	1	2
	28	NL	28000	1	4
	over 28		5500	2	4
			NL		
		NL			
		2000			
VII (Places of assembly)	7.5	250	NL	1/2	1(a)

	7.5	500	NL	1/2	1
	15	NL	3500	1(b)	1
	28	5000	7000	1	1 1/2
	NL	NL	7000	1 1/2	2
VIII (Storage and general)	7.5	150	NL	1/2	1(a)
	7.5	300	NL	1/2	1
	15	NL	1700	1(b)	1
	15	NL	35000	1	2
	28	NL	7000	2	4
	28	NL	21000	4(c)	4
	over 28	1000	NL	4(c)	4

Notes to Part I

For the purpose of paragraph (2) of by-law 142 the period of fire resistance to be taken as being relevant to an element of structure is the period included in column (5) or (6), whichever is appropriate, in the line of entries which specifies dimensions with all of which there is conformity or, if there are two or more such lines, in the topmost of those lines.

(*) A floor which is immediately over a basement storey shall be deemed to be an element of structures forming part of a basement storey.

(+) The expression "part" means a part which is separated as described in paragraph (2) of by-law 215.

(a) The period is half an hour for elements forming part of a basement storey which has an area not exceeding 50 m².

(b) This period is reduced to half an hour in respect of a floor which is not a compartment floor, except as to the beams which support the floor or any part of the floor which contributes to the structural support of a building as a whole.

(c) No fire resistance is required if the elements form part of a basement storey which has an area not exceeding 50 m²/This period is reduced to 2-hours for open-sided buildings which are used solely for car parking.

[Subs. Sel.P.U.142/2012]

PART 2 - SINGLE STOREY BUILDINGS

<i>Purpose group</i> (1)	<i>Maximum floor area</i> <i>(in m²)</i> (2)	<i>Minimum period of fire resistance (in</i> <i>hours) for elements of structure</i> (3)
I.Small residential	NL	1/2
II. Institutional	3000	1/2
III. Other Residential	3000	1/2
IV.Office	3000	1/2
	NL	1
V. Shops	2000	1/2
	3000	1
	NL	2
VI.Factory	2000	1/2
	3000	1
	NL	2
VII. Places of assembly	3000	1/2
	NL	1
VIII. Storage and general	500	1/2
	1000	1
	3000	2
	NL	4(a)

Notes to Part 2

For the purpose of paragraph (2) of by-law 142, the period of fire resistance to be taken as being relevant to an element of structure in the period included in column (3) in the line of entries which specifies the floor area with which there is conformity or, if there are two or more such lines.

(a) This period is reduced to 2-hours for open-sided buildings which are used solely for car parking.

[Subs. Sel.P.U.142/2012]

SUSPENDED CEILINGS

(By-laws 148 (6), 219)

<i>Height of building</i> (1)	<i>Type of floor</i> (2)	<i>Required fire resistance of floor</i> (3)	<i>Description of suspended ceiling</i> (4)
Less than 15 m	Non-compartment	1 hour or less	Surface of ceiling exposed within the cavity not lower than Class 1 (as to surface spread of flame).
	Compartment	Less than 1 hour	
	Compartment	1 hour	Surface of ceiling exposed within the cavity not lower than Class O (as to surface spread of flame): supports and fixings for the ceiling non-combustible.
15 or more	Any	1 hour or less	Surface of ceiling exposed within the cavity not lower than Class O (as to surface spread of flame) and jointless; supports and fixings for the ceiling non-combustible.
Any	Any	more than 1 hour	Ceiling of non-combustible construction and jointless; supports and fixings for the ceiling non-combustible.

Notes:

(1) References to classes are to classes as specified in by-law 204.

(2) Where the space above a suspended ceiling is protected by an automatic sprinkler system it shall be exempted from the requirements for non-combustibility and surface spread of flame classification as specified in the above table provided the ceiling is not situated over an exit passageway, protected lobby or other required protected means of escape.

[Subs. Sel.P.U.142/2012]

NOTIONAL PERIODS OF FIRE RESISTANCE

(By-laws 158 (3), 224)

In this Table:

(a) "Class 1 aggregate" means foamed slag, pumice, blastfurnace slag, pelleted fly ash, crushed brick and burnt clay products (including expanded clay), well-burnt clinker and crushed limestone.

"Class 2 aggregate" means flint gravel, granite, and all crushed natural stones other than limestone.

(b) Any reference to plaster means:

(i) in the case of an external wall 1 m or more from the relevant boundary, plaster applied on the internal face only;

(ii) in the case of any other wall, plaster applied on both faces;

(iii) if to plaster of a given thickness on the external face of a wall, except in the case of a reference to vermiculite-gypsum or perlitegypsum plaster, rendering on the external face of the same thickness;

(iv) if to vermiculite-gypsum plaster, vermiculite-gypsum plaster of a mix within the range of 1 1/2 to 2:1 by volume.

(c) Load assumed to be on inner leaf only except for fire resistance period of four hours.

PART I

WALLS

A. Masonry construction

<i>Construction and materials</i>	<i>Minimum thickness excluding plaster (in mm) for period of fire resistance of</i>									
	<i>Loadbearing</i>					<i>Non-loadbearing</i>				
	<i>4 hrs.</i>	<i>2 hrs.</i>	<i>1 1/2 hrs.</i>	<i>1 hr.</i>	<i>1/2 hr.</i>	<i>4 hrs.</i>	<i>2 hrs.</i>	<i>1 1/2 hrs.</i>	<i>1 hr.</i>	<i>1/2 hr.</i>
1. Reinforced concrete, minimum concrete cover to main reinforcement of 25 mm.										
(a) unplastered	180	100	100	75	75					
(b) 12.5 mm cement-sand plaster	180	100	100	75	75					

(c) 12.5 mm gypsum-sand plaster	180	100	100	75	75					
(d) 12.5 mm vermiculite-gypsum plaster	125	75	75	63	63					
2. No-fines concrete of Class 2 aggregate:										
(a) 12.5 mm cement-sand plaster						150				
(b) 12.5 mm gypsum-sand plaster						150				
(c) 12.5 mm vermiculite-gypsum plaster						150				
3. Bricks of clay, concrete or sand-lime:										
(a) unplastered	200	100	100	100	100	170	100	100	75	75
(b) 12.5 mm cement-sand plaster	200	100	100	100	100	170	100	100	75	75
(c) 12.5 mm gypsum-sand plaster	200	100	100	100	100	170	100	100	75	75
(d) 12.5 mm vermiculite-gypsum or perlite-gypsum plaster	100	100	100	100	100	100	100	100	75	75
4. Concrete blocks of Class 1 aggregate:										
(a) unplastered	150	100	100	100	100	150	75	75	75	50
(b) 12.5 mm cement-sand plaster	150	100	100	100	100	100	75	75	75	50
(c) 12.5 mm gypsum-sand plaster	150	100	100	100	100	100	75	75	75	50
(d) 12.5 mm vermiculite-gypsum plaster	100	100	100	100	100	75	75	62	50	50
5. Concrete blocks of Class 2 aggregate:										
(a) unplastered		100	100	100	100	150	100	100	75	50
(b) 12.5 mm cement-sand plaster		100	100	100	100	150	100	100	75	50
(c) 12.5 mm gypsum-sand plaster		100	100	100	100	150	100	100	75	50
(d) 12.5 mm vermiculite-gypsum plaster	100	100	100	100	100	150	75	75	75	50
6. Autoclaved aerated concrete blocks density 475-1200 kg/m ³	180	100	100	100	100	100	62	62	50	50
7. Hollow concrete blocks, one cell in walthickness, of class 1 aggregate:										
(a) unplastered		100	100	100	100	150	100	100	100	75

(b) 12.5 mm cement-sand plaster		100	100	100	100	150	100	75	75	75
(c) 12.5 mm gypsum-sand plaster		100	100	100	100	150	100	75	75	75
(d) 12.5 mm vermiculite-gypsum plaster		100	100	100	100	100	75	75	62	62
8. Hollow concrete blocks, one cell in wallthickness, of class 2 aggregate:										
(a) unplastered						150	150	125	125	125
(b) 12.5 mm cement-sand plaster						150	150	125	125	100
(c) 12.5 mm gypsum-sand plaster						150	150	125	125	100
(d) 12.5 mm vermiculite-gypsum plaster						125	100	100	100	75
9. Cellular clay blocks not less than 50% solid:										
(a) 12.5 mm cement-sand plaster									100	75
(b) 12.5 mm gypsum-sand plaster									100	75
(c) 12.5 mm vermiculite-gypsum plaster						200	100	100	100	62
10. Cavity wall with outer leaf of bricks or blocks of clay, composition, concrete or sand-lime, not less than 100 mm thick and:										
(a) inner leaf of bricks or blocks of clay, composition, concrete or sand-lime	100	100	100	100	100	75	75	75	75	75
(b) inner leaf of solid or hollow concrete bricks or blocks of Class 1 aggregate	100	100	100	100	100	75	75	75	75	75
11. Cavity wall with outer leaf of cellular clay blocks as 9 above and inner leaf of autoclaved aerated concrete blocks, density 475-1200 kg/m ³	150	100	100	100	100	75	75	75	75	75

* Perlite-gypsum plaster to clay bricks only.

B. Framed and composite construction (non-loadbearing)

<i>Construction and materials</i>	<i>Period of fire resistance in hours</i>
1. Steel frame with external cladding of 16 mm rendering on metal lathing and internal lining of autoclaved aerated concrete blocks, density 480-1 120 kg/m ³ of thickness of-	
50 mm	2
62 mm	3
75 mm	4
2. Steel frame with external cladding of 100 mm concrete blocks and internal lining of 16 mm gypsum plaster on metal lathing.	4
3. Steel frame with external cladding of bricks of clay, concrete or sand-lime 100 mm thick and internal lining of asbestos insulating board of thickness of 9 mm.	3
4. Steel frame with external cladding of 16 mm rendering on metal lathing and internal lining of--	
9 mm asbestos insulating board - [<i>Deleted Sel.P.U.142/2012</i>]	1/2 [<i>Deleted Sel.P.U.142/2012.</i>]
16 mm gypsum plaster on metal lathing	1
5. Steel or timber frame with facings on each side of--	
(a) metal lathing with cement-sand or gypsum plaster of thickness of--	
19 mm	1
12.5 mm	1/2
(b) metal lathing with vermiculite-gypsum or perlite-gypsum plaster of thickness of--	
25 mm	2
19 mm	1 1/2
12.5 mm	1
(c) 9.5 mm plasterboard with gypsum plaster of thickness of 5 mm	1/2
(d) 9.5 mm plasterboard with vermiculite-gypsum plaster of thickness of--	
25 mm	2
16 mm	1 1/2
10 mm	1
5 mm	1/2
(e) 12.5mm plasterboard-- unplastered	1/2

With gypsum plaster of thickness of 12.5mm [(e) Subs.Sel.P.U.124/2012]	1
(f) 12.5 mm plasterboard unplastered	1
25 mm	2
16 mm	1 1/2
10 mm	1
(g) 19 mm plasterboard (or two layers of 9.5 mm fixed to break joint) without finish	1
(h) 19 mm plasterboard (or two layers of 9.5 mm) with vermiculite-gypsum plaster of thickness of--	
16 mm	2
10 mm	1 1/2
(i) 12.5 mm fibre insulating board with gypsum plaster of thickness of 12.5 mm	1 1/2
(j) asbestos insulating board not less than 9 mm thick with 9 mm fillets to face of studs [(j) Deleted -.Sel.P.U.124/2012]	1/2
(k) asbestos insulating board not less than 12 mm thick [(k) Deleted -.Sel.P.U.124/2012]	1/2
(l) 25 mm wood wools slabs with gypsum plaster of thickness of 12.5 mm	1
6. Compressed straw slabs in timber frames finished on both faces with gypsum plaster of thickness of 5 mm	1
7. Plasterboard 9.5 mm cellular core partition--	
(a) unplastered	1/2
(b) 12.5 gypsum plaster	1
(c) 22 mm vermiculite-gypsum plaster	2
8. Plasterboard 12.5 mm cellular core partition--	
(a) unplastered	1/2
(b) 12.5 mm gypsum plaster	1
(c) 16 mm vermiculite-gypsum plaster	2
9. Plasterboard 19 mm finished on both faces with 16 mm gypsum plaster	1
10. Plasterboard 12.5 mm bonded with neat gypsum plaster to each side of 19 mm plasterboard	1 1/2
11. Three layers of 19 mm plasterboard bonded with neat gypsum plaster	2
12. Wood wool slab with 12.5 mm render or plaster of thickness of--	
75 mm	2
50 mm	1
13. Compressed straw slabs, with 75 mm by 12.5 mm wood cover strips to joints, of thickness of 50 mm	1/2

C. External walls more than 1 m from the relevant boundary (non-load bearing)

<i>Construction and materials</i>	<i>Period of fire resistance in hours</i>
1. Steel frame with external cladding of non-combustible sheets and internal lining of-	
(a) 9 mm asbestos insulating board	4
(b) 12.5 mm cement-sand or gypsum plaster on metal lathing	4
(c) sprayed asbestos of thickness of 12.5 mm	4
(d) two layers of 9.5 mm plasterboard	1/2
(e) 9.5 mm plasterboard finished with 5 mm gypsum plaster	1/2
(f) 12.5 mm plasterboard finished with 5 mm gypsum plaster	1/2
(g) 50 mm compressed straw slabs	1/2
(h) 50 mm compressed straw slabs finished with 5 mm gypsum plaster	1
*2. Timber frame with external cladding of 10 mm cement-sand or cement-lime rendering and internal lining of-	
(a) 9 mm asbestos insulating board	1
(b) 16 mm gypsum plaster on metal lathing	1
(c) 9.5 mm plasterboard finished with 12.5 mm gypsum plaster	1
(d) 12.5 mm plasterboard finished with 5mm gypsum plaster	1
(e) 50 mm compressed straw slabs	1
(f) aerated concrete blocks--	
500 mm	3
62 mm	4
75 mm	4
100 mm	4
3. Timber frame with external cladding of 100 mm clay, concrete or sand-lime bricks or blocks, finished internally with--	
(a) asbestos insulating board	4
(b) 16 mm gypsum plaster on metal lathing	4
*4. Timber frame with external cladding of weather boarding or 9.5 mm plywood and internal lining of--	

(a) 9 mm asbestos insulating board	1/2
(b) 16 mm gypsum plaster on metal lathing	1/2
(c) 9.5 mm plasterboard finished with 12.5 mm gypsum plaster	1/2
(d) 12.5 mm plasterboard finished with 5 mm gypsum plaster	1/2
(e) 50 mm compressed straw slabs	1/2
(f) 75 mm wood wool slabs faced each side with asbestos cement	2
(g) aerated concrete block--	
50 mm	3
62 mm	4
75 mm	4
100 mm	4

*The presence of a combustible vapour within the thickness of these construction will not affect these periods of fire resistance.

PART II

REINFORCED CONCRETE COLUMNS

Construction and materials	Minimum dimension of concrete column* without finish (in mm) for a fire resistance of--				
	4 hrs.	2 hrs.	1/2 hrs.	1 hr.	1/2 hrs.
1. (a) without plaster	450	300	250	200	150
(b) with 12.5 mm cement-sand or gypsum-sand plaster on mesh reinforcement fixed around column	300	225	150	150	150
(c) finished with 12.5 mm encasement of vermiculite-gypsum plaster	275	200	150	120	120
(d) with 2.5 mm hard drawn steel wire fabric, of maximum pitch 150 mm in each direction, placed in cover to main reinforcement	300	25	150	150	150
(e) with limestone or light-weight aggregate as coarse aggregate	300	225	200	200	150
2. Built +any separating wall, compartment wall or external wall++					
(a) with plaster	180	100	100	75	75

(b) finished with 12.5 mm of vermiculite-gypsum plaster	125	75	75	63	63
---	-----	----	----	----	----

* The minimum dimension of a particular.

+ No part of column projecting beyond either face of wall.

++ Having not less fire resistance than that of the column and extending to the full height of, and not less than 600 mm on each side of, the column.

PART III

REINFORCED CONCRETE BEAMS

<i>Construction and materials</i>	<i>Minimum concrete over without finish to main reinforcement (in mm) for a fire resistance of--</i>				
	<i>4 hrs.</i>	<i>2 hrs.</i>	<i>1 1/2 hrs.</i>	<i>1 hr.</i>	<i>1/2 hrs.</i>
(a) without plaster	63	45	35	25	12.5
(b) finished with 12.5 mm vermiculite-gypsum plaster	25	12.5	12.5	12.5	12.5
(c) with 12.5 mm cement-sand or gypsum-sand plaster on mesh reinforcement fixed around beam	50	30	20	12.5	12.5

PART IV

PRESTRESSED CONCRETE BEAMS WITH POST-TENSIONED STEEL

<i>Cover reinforcement</i>	<i>Additional protection</i>	<i>Minimum concrete cover to tendons (in mm) for a fire resistance of--</i>			
		<i>4 hrs.</i>	<i>2 hrs.</i>	<i>1 1/2 hrs.</i>	<i>1 hr.</i>
None	(a) none		38	25	38
	(b) vermiculite concrete slabs (permanent shuttering) 12.5 mm thick		50	38	25
	(c) plaster 12.5 mm thick on mesh reinforcement fixed around beam		38	25	25
	(d) vermiculite-gypsum plaster 12.5 mm thick or sprayed asbestos 10 mm thick				25
Light mesh reinforcement	(a) none	100	63	63	

(having a minimum concrete cover of 25 mm) to retain the concrete in position around the tendons	(b) plaster 12.mm thick on mesh reinforcement	90			
	(c) vermiculite concrete slabs (permanent shuttering) 12.5 mm thick	75			
	(d) vermiculite concrete slabs (permanent shuttering) 25 mm thick	50			
	(e) vermiculite-gypsum plaster 12.5 mm thick	50			
	(f) vermiculite-gypsum plaster 22 mm thick	50			
	(g) sprayed asbestos 10 mm thick	75			
	(h) sprayed asbestos 19 mm thick	50			

PART V

STRUCTURAL STEEL

A. Encased steel stanchions (Mass per metre not less than 45 kg)

<i>Construction and materials</i>	<i>Minimum thickness (in mm) of protection for a fire resistance of--</i>				
	<i>4 hrs.</i>	<i>2 hrs.</i>	<i>1 1/2 hrs.</i>	<i>1 hr.</i>	<i>1/2 hrs.</i>
(A) Solid Protection* (unplastered)					
1. Concrete not leaner than 1:2:4 mix with natural aggregates--					
(a) concrete not assumed to be loadbearing, reinforced+	50	25	25	25	25
(b) concrete assumed to be loadbearing reinforced in accordance with BS 449: Part 2: 1969	75	50	50	50	50
2. Solid bricks of clay, composition or sandlime	75	50	50	50	50
3. Solid blocks of foamed slag or pumice concrete reinforced+ in every horizontal joint.	62	50	50	50	50
4. Sprayed asbestos of density 140-240 kg/m ³ .	44	19	15	10	10
5. Sprayed vermiculite-cement		38	32	19	12.5
(B) Hollow Protection++					

1. Solid bricks of clay, composition or sand-lime reinforced in every horizontal joint, unplastered	115	50	50	50	50
2. Solid blocks of foamed slag or pumice concrete reinforced# in every horizontal joint, unplastered	75	50	50	50	50
3. Metal lathing with gypsum or cement-lime plaster of thickness of		38#	25	19	12.5
4. (a) Metal lathing with vermiculite-gypsum plaster of thickness of	50#	19	16	12.5	12.5
(b) Metal lathing spaced 25 mm from flanges with vermiculite-gypsum or perlite gypsum plaster of thickness of	44	19	12.5	12.5	12.5
5. Gypsum plasterboard with 1.6 mm wire binding at 100 mm pitch--					
(a) 9.5 mm plasterboard with gypsum plaster of thickness of		12.5	10	12.5	12.5
(b) 19 mm plasterboard with gypsum plaster of thickness of				7	7
6. Gypsum plasterboard with 1.6 mm wire binding at 100 mm pitch--					
(a) 9.5 plasterboard with vermiculite-gypsum of thickness of	32#	16	12.5	10	7
(b) 19 mm plasterboard with vermiculite-gypsum plaster of thickness of		10	10	7	7
7. Metal lathing with sprayed asbestos of thickness of	44	19	15	10	10
8. Vermiculite-cement slabs of 4:1 mix reinforced with wire mesh and finished with plaster skim. Slabs of thickness of	63	25	25	25	25
9. Asbestos insulating boards of density 510-880 kg/m ³ (screwed to 25 mm thick asbestos battens for 1/2 hour and 1 hour periods)		25	19	12	9

*Solid protection means a casing which is bedded close to the steel without intervening cavities and with all joints in the casing made full and solid.

+ Reinforcement shall consist of steel binding wire not less than 2.3 mm in thickness, or a steel mesh weighing not less than 0.48 kg/m². In concrete protection, the spacing of that reinforcement shall not exceed 150 mm in any direction.

++ Hollow protection means that there is a void between the protective material and the steel. All hollow protection to columns shall be effectively sealed at each floor level.

Light mesh reinforcement required 12.5 mm to 19 mm below surface unless special corner beads are used.

B. Encased steel beams (Mass per metre not less than 30 kg)

Construction and materials	Minimum thickness (in mm) of protection for a fire resistance of--				
	4 hrs.	2 hrs.	1 1/2 hrs.	1 hr.	1/2 hrs.
(A) Solid Protection +(unplastered)					
1. Concrete not leaner than 1:2:4 mix with natural aggregates--					
(a) concrete not assumed to be loadbearing, reinforced++	63	25	25	25	25
(b) concrete assumed to be loadbearing, reinforced in accordance with BS 449: Part 2: 1969	75	50	50	50	50
2. Sprayed asbestos of density 140-240 kg/m ³	44	19	15	10	10
3. Sprayed vermiculite-cement		38	32	19	12.5
(B) Hollow Protection*					
1. Metal lathing--					
(a) with cement-lime plaster of thickness of		38	25	19	12.5
(b) with gypsum plaster of thickness of		22	19	16	12.5
(c) with vermiculite-gypsum or perlite-gypsum plaster of thickness of	32	12.5	12.5	12.5	12.5
2. Gypsum plasterboard with 1.6 mm wire binding at 100 mm pitch--					
(a) 9.5 mm plasterboard with gypsum plaster of thickness of				12.5	12.5
(b) 19 mm plasterboard with gypsum plaster of thickness of		12.5	10	7	7
3. Plasterboard with 1.6 mm wire binding at 100 mm pitch--					
(a) 9.5 mm plasterboard nailed to wooden cradles finished with gypsum plaster of thickness of					12.5
(b) 9.5 mm plasterboard with vermiculite-gypsum plaster of thickness of		16	12.5	10	7
(c) 19 mm plasterboard with vermiculite-gypsum plaster of	32+	10	10	7	7

thickness of					
(d) 19 mm plasterboard with gypsum plaster of thickness of			12.5		
4. Metal lathing with sprayed asbestos of density 140-240 kg/m ³ and of thickness of	44	19	15	10	10
5. Asbestos insulating boards of density 510-880 kg/m ³ (screwed to 25 mm thick asbestos battens for 1/2 hour and 1 hour periods)		25	19	12	9
6. Vermiculite-cement slabs of 4:1 mix reinforced with wire mesh and finished with plaster skin. Slabs of thickness of	63	25	25	25	25
7. Gypsum-sand plaster 12.5 mm thick applied to heavy duty (Type B as designated in BS 1105:1963) wood wool; slabs of thickness of		50	38	38	38

*Hollow protection means that there is a void between the protective material and the steel. All hollow protection to columns shall be effectively sealed at each floor level.

+ Solid protection means a casing which is bedded close to the steel without intervening cavities and with all joints in that casing made full and solid

++ Reinforcement shall consist of steel binding wire not less than 2.3 mm in thickness, or a steel mesh weighing not less than 0.48kg/m². In concrete protection, the spacing of that reinforcement shall not exceed 150 mm in any direction.

PART VI

STRUCTURAL ALUMINIUM

Encased aluminium alloy stanchions and beams (Mass per metre not less than 16 kg)

<i>Construction and materials</i>	<i>Minimum thickness (in mm) of protection for a fire resistance of--</i>				
	<i>4 hrs.</i>	<i>2 hrs.</i>	<i>1 1/2 hrs.</i>	<i>1 hr.</i>	<i>1/2 hrs.</i>
(A) Solid Protection*					
1. Sprayed asbestos of density 140-240 kg/m ³		48	32	19	10
2. Sprayed vermiculite-cement				44	19
(B) Hollow Protection+					
1. Metal lathing with vermiculite-gypsum or perlite-gypsum plaster of thickness of		32	32	16	12.5
2. Metal lathing finished with neat gypsum plaster of thickness of				19	12.5
3. Gypsum plasterboard 19 mm thick with 1.6 mm wire binding at 100 mm pitch finished with gypsum-vermiculite plaster of thickness of		22	16	10	10
4. Asbestos insulating board of density 510-880 kg/m ³ (screwed to 25 mm thick asbestos battens for the 1/2 hour period)			34	21	9

*Solid protection means a casing which is bedded close to the alloy without intervening cavities and with all joints in the casing made full and solid.

+Hollow protection means that there is a void between the protected material and the alloy. All hollow protection to columns shall be effectively sealed at each floor level.

PART VII

TIMBER FLOORS

<i>Construction and materials</i>	<i>Minimum thickness (in mm) for fire resistance of-</i>		
	1 hr.	1/2 hr.	modified++ 1/2 hr.
(A) Plain edge boarding on timber joists not less than 38 mm wide with ceiling of--			
(i) timber lath and plaster--thickness of plaster			16
(ii) timber lath and plaster with plaster of minimum thickness of 16 mm covered on underside with plasterboard of thickness		12.5	
(iii) metal lathing and plaster--thickness of plaster			
(a) gypsum		16	
(b) vermiculite		12.5	
(iv) one layer of plasterboard of thickness			12.5
(v) one layer of plasterboard of minimum thickness of 9.5 mm finished with gypsum plaster of thickness			12.5
(vi) one layer of plasterboard of minimum thickness of 12.5 mm finished with gypsum plaster of thickness		12.5	
(vii) two layers of plasterboard of total thickness		25	19
(viii) two layers of plasterboard each of minimum thickness of 9.5 mm finished with gypsum plaster of thickness			5
(ix) one layer of fibre insulating board of minimum thickness of 12.5 mm finished with gypsum plaster of thickness			12.5
(x) one layer of asbestos insulating board of minimum thickness		12	
(xi) wood wool slab 25 mm thick finished with gypsum plaster of thickness		5	
(B) Tongued and grooved boarding of not less than 16 mm (finished) thickness* on timber joists not less than 38 mm wide with ceiling of--			
(i) timber lath and plaster--thickness of plaster			16
(ii) timber lath and plaster with plaster of minimum thickness of 16 mm covered on underside with plasterboard of thickness		9.5	
(iii) metal lathing and plaster--thickness of plaster			
(a) gypsum	22	16	
(b) vermiculite	12.5	12.5	

(iv) one layer of plasterboard of thickness			9.5
(v) one layer of plasterboard of minimum thickness of 9.5 mm finished with--			
(a) gypsum plaster of thickness		12.5	
(b) vermiculite-gypsum plaster of thickness	12.5		
(vi) one layer of plasterboard of minimum thickness of 12.5 mm finished with gypsum plaster of thickness		5	
(vii) two layers of plasterboard of total thickness		22	
(viii) one layer of fibre insulating board of minimum thickness of 12.5 mm finished with gypsum plaster of thickness			5
(ix) one layer of asbestos insulating board of minimum thickness		9	
(x) one layer of asbestos insulating board of minimum thickness of 12 mm finished on top with glass fibre or mineral wool of thickness	25		
(xi) wood wool slab 25 mm thick finished with--			
(a) gypsum plaster of thickness		5	
(b) vermiculite-gypsum plaster of thickness	10		
(C) Tongued and grooved boarding of not less than 21 (finished) thickness* on timber joist not less than 175 mm deep by 50 mm wide with ceiling of--			
(i) timber lath and plaster--thickness of plaster		16	
(ii) metal lathing and plaster--thickness of plaster		16	
(iii) metal lathing and sprayed asbestos+ to thickness of	19	12.5	
(iv) one layer of plasterboard of thickness			9.5
(v) one layer of plasterboard of minimum thickness of 9.5 mm finished with--			
(a) gypsum plaster of thickness		12.5	
(b) vermiculite-gypsum plaster of thickness	12.5		
(vi) one layer of plasterboard of minimum thickness of 12.5 mm finished with gypsum plaster of thickness		5	
(vii) two layers of plasterboard of thickness		19	
(viii) one layer of fibre insulating board of thickness			12.5
(ix) one layer of fibre insulating board of minimum thickness of 12.5 mm finished with gypsum plaster of thickness		12.5	
(x) one layer of asbestos insulating board of thickness		6	
(xi) wood wool slab 25 mm thick finished with--			
(a) gypsum plaster of thickness		5	
(b) vermiculite-gypsum plaster of thickness	10		

* Or an equivalent thickness of wood chipboard.

+ Sprayed asbestos in accordance with BS 3950: 1970

++ The term "modified 1/2 hour" refers to the requirements specified in by-law 223.

PART VIII
CONCRETE FLOORS

Construction and materials	Minimum thickness of solid substance including screed (in mm)	Ceiling finish to a fire resistance of--				
		4 hours	2 hours	1 1/2 hours	1 hour	1/2 hour
Solid flat slab or filler joist floor. Unit of channel or T section	90	22 mm V or 25 mm A	10 mm V or 12.5 mm A	10 mm V or 12.5 mm A	7 mm V or 7 mm A	nil
	100	19 mm V or 19 mm A	7 mm V	7 mm V	nil	nil
	125	10 mm V or 12.5 mm A	nil	nil	nil	nil
	150	nil	nil	nil	nil	nil
Solid flat slab or filler joist floor with 25 mm wood wool slab ceiling base	90			12.5 mm G	nil	nil
	100		nil	nil	nil	nil
	125	12.5 mm G	nil	nil	nil	nil
	150	nil	nil	nil	nil	nil
Units of inverted U section with minimum thickness at crown	63				nil	nil
	75				nil	nil
	100		nil	nil	nil	nil
	150	nil	nil	nil		nil
Hollow block construction or units of box or 1 section	63				nil	nil
	75				nil	nil
	90		nil	nil	nil	nil
	125	nil	nil	nil		nil
Cellular stell with concrete topping	63	12.5 mm V suspended on metal lathing or 12.5 mm A (direct)	12.5 mm G suspended on metal lathing	12.5 mm G suspended on metal lathing	12.5 mm G suspended on metal lathing	nil

"V"-vermiculite-gypsum plaster

"A"-Sprayed asbestos in accordance with BS 3590:1970

"G"-gypsum plaster

Note: Where a column relating to ceiling finish contains no entry opposite a specification, the notional period of fire resistance specified in that column is not applicable.

TENTH SCHEDULE: Table of requirements for fire detection, fire alarm and fire extinguishment systems.

TABLE OF REQUIREMENTS FOR FIRE DETECTION, FIRE ALARM

AND FIRE EXTINGUISHMENT SYSTEMS

(By-law 225 (1), 238)

Occupancy Hazard	Extinguishing System Note 2	Detection and Fire Alarm Systems Note 3
<p>I. SMALL RESIDENTIAL</p> <p>(i) Private dwelling up to 2 storey</p> <p>(a) Terrace Type</p> <p>(b) Semi Detached</p> <p>(c) Detached</p> <p>(ii) Private dwelling more than 2 storey</p>	<p>(See Note 5)</p> <p>(See Note 5)</p> <p>(See Note 5)</p> <p>(See Note 5)</p>	<p>-</p> <p>-</p> <p>-</p> <p>(See Note 6)</p>

Occupancy Hazard	Extinguishing System Note 2	Detection and Fire Alarm Systems Note 3
<p>II. INSTITUTIONAL</p> <p>1. Educational Occupancies</p> <p>(i) Rooms or halls used for instructional purposes only.</p> <p>(a) Open corridor design</p> <p>(A) 2 storeys and below</p> <p>(B) 3 to 5 storeys</p> <p>(C) 6 storeys and above</p> <p>(b) Other designs</p> <p>(A) Two or more storeys</p> <p>(B) Less than 1,000 sq. m per floor</p> <p>(C) 1,000 sq. m to 2,000 sq. m per floor</p> <p>(D) Exceeding 2,000 sq. m per floor or more than 30 m height</p> <p>(ii) Canteen/kitchen detached</p> <p>(iii) Laboratories and Workshops (total floor area per block)</p> <p>(a) Low hazard Laboratories and workshops such as physics lab, electronics lab, computer lab and for metal work over 1,000 sq. m in floor area</p> <p>(b) High hazard laboratories and workshops such as chemical lab and for wood work</p> <p>(A) Less than 1,000 sq. m</p> <p>(B) 1001 to 2,000 sq. m</p> <p>(C) Exceeding 2,000 sq. m</p> <p>(iv) Library (total floor area)</p> <p>(a) Less than 500 sq. m</p> <p>(b) 501 sq. m to 1,000 sq. m</p> <p>(c) 1001 sq. m to 2,000 sq. m</p> <p>(d) Exceeding 2,000 sq. m</p>	<p>-</p> <p>A</p> <p>A</p> <p>-</p> <p>A</p> <p>A</p> <p>A & B</p> <p>-</p> <p>A</p> <p>A & B</p> <p>-</p> <p>A</p> <p>A</p> <p>A & B</p> <p>-</p> <p>A</p> <p>A</p> <p>A & B</p>	<p>-</p> <p>1</p> <p>1 & 2</p> <p>-</p> <p>1</p> <p>1 & 2</p> <p>1, 3, 4 & 5</p> <p>-</p> <p>1 & 2</p> <p>-</p> <p>1 & 2</p> <p>1 & 3</p> <p>-</p> <p>- 1</p> <p>1 & 2</p> <p>1, 3, 4 & 5</p>

Occupancy Hazard	Extinguishing System	Detection and Fire Alarm Systems
	Note 2	Note 3
(v) Vocational School (total floor area)		
(a) Low hazard workshops such as for metal work over 1,000 sq. m in floor area	A	1 & 2
(b) High hazard laboratories and workshops such as for wood work		
(A) Less than 1,000 sq. m	-	-
(B) 1001 to 2,000 sq. m	A	1 & 2
(C) Exceeding 2,000 sq. m	A & B	1 & 3
(vi) Multi-purpose hall (total floor area)		
(a) Single storey and less than 2,000 sq. m	-	-
(b) 2 storey and above or exceeding 2,000 sq. m	A	1
(vii) Buildings with Central Air-conditioning (total floor area)		
(a) Less than 1,000 sq. m	-	-
(b) 1,001 sq. m to 2,000 sq. m	A	1 & 2
(c) exceeding 2,000 sq. m	A & B	1, 3, 4 & 5
(viii) Educational Institutions in office complexes and shopping complexes	To be considered as part of overall risk in the complex.	
2. HOSPITALS AND NURSING HOMES (Total floor area)		
(i) Clinic-day care	-	-
(a) 1,001 sq. m. to 2,000 sq. m	A	1
(b) 1,001 sq. m. to 2,000 sq. m	A	1 & 2
(c) above 2,000 sq. m	A & B	1, 3, 4 & 5
(ii) In-patient Treatment		
(a) Part of office or shopping complex	To be considered as part of overall risk with special requirements for emergency lighting stretcher lifts.	

Occupancy Hazard	Extinguishing System	Detection and Fire Alarm Systems
	Note 2	Note 3
(b) Not exceeding 250 sq. m per floor		
(A) Single storey	-	-
(B) 2 storeys	-	1
(C) 3 or 5 storeys	A	1 & 2
(D) 6 storeys and over	A & B	1, 3, 4 & 5
(c) Exceeding 250 sq. m per floor		
(A) Single storey	-	-
(B) 2 storeys	A	1
(C) 3 or 4 storeys	A	1 & 3
(D) 5 storeys and over	A & B	1, 3, 4 & 5
NOTE:		
(i) Stretcher lift facilities to be provided for buildings above 4 storeys.		
(ii) All fire alarm systems within wards shall be of the signal indicator type.		
III. OTHER RESIDENTIAL		
1. Hotels		
(i) Open corridor design with open staircase with extended lobby or tower staircase		
(a) 1 to 3 storeys		
(A) 50 rooms or less per block	-	(See Note 7)
(B) More than 50 rooms per block	A	(See Note 7)
(b) 4 or 5 storeys		
(A) 20 rooms or less per block	-	(See Note 7)
(B) 21 to 50 rooms per block	A	(See Note 7)
(C) 51 rooms and over per block	A	1 & 2
(c) 6 to 10 storeys		
(A) 50 rooms or less per block	A	1 & 2
(B) 51 rooms and over per block	A & B	1, 3, 4 & 5
(d) 11 storeys and over		
	A & B	1, 3, 4 & 5

Occupancy Hazard	Extinguishing System Note 2	Detection and Fire Alarm Systems Note 3
<p>(ii) Other Designs</p> <p>(a) Less than 10 rooms per block</p> <p>(b) 11 rooms to 20 rooms per block</p> <p>(c) 21 rooms to 50 rooms per block</p> <p>(d) 51 rooms and over per block</p> <p>(A) 3 storeys and below</p> <p>(B) 4 storeys and above or exceeding 18 m height</p> <p>(iii) Hotel above shops or office occupancies</p> <p>2. Hostels, Dormitories, Old Folk Homes and Ophanages</p> <p>(i) (a) Single storey</p> <p>(b) 2 or 3 storeys</p> <p>(c) 4 or 5 storeys</p> <p>(A) Less than 250 sq. m per floor</p> <p>(B) More than 250 sq. m per floor</p> <p>(d) 6 to 10 storeys</p> <p>(e) 11 storeys and over</p> <p>(ii) Open corridor design 11 storeys and over and for other designs 6 storeys and over</p>	<p>-</p> <p>-</p> <p>A</p> <p>A</p> <p>A & B</p> <p>But not less than that required for over all occupancy risk or 1 & 2 above</p> <p>-</p> <p>A</p> <p>A</p> <p>A</p> <p>A</p> <p>A & B</p> <p>A & B</p>	<p>(See Note 7)</p> <p>1 & 2</p> <p>1 & 2</p> <p>1 & 2</p> <p>1, 3, 4 & 5</p> <p>-</p> <p>1</p> <p>1, (See Note 7)</p> <p>1 & 2</p> <p>1 & 2</p> <p>1, 3, 4 & 5</p> <p>1, 3, 4 & 5</p>
<p>NOTE:</p> <p>Hotels at locations that cannot be reached within reasonable time or not accessible to required type and number of fire appliances shall be required to provide higher standard of protection as required by D.G.F.R.</p>		
<p>3. Apartments and Flats</p> <p>(i) Apartments/flats 5 storeys and below</p> <p>(ii) Open corridor design</p> <p>(a) Apartments/flats 6 storeys to 10 storeys or less than 30 m height</p>	<p>(See Note 5)</p> <p>-</p> <p>A, (See Note 5)</p>	<p>-</p> <p>-</p> <p>1</p>

Occupancy Hazard	Extinguishing System Note 2	Detection and Fire Alarm Systems Note 3
(b) Apartments exceeding 10 storeys or 30 m (iii) Internal staircase or core design (a) 6 storeys to 10 storeys or less than 30 m (b) Exceeding 10 storeys or 30 m height (iv) Duplex or multi-level units (v) Apartments with common central air-conditioning with ducted systems (a) 3 storeys to 5 storeys (b) 6 to 10 storeys (less than 30 m) (c) 11 storeys and over	A, (See Note 5) A, (See Note 5) A, (See Note 5) - A A A & B	1 1 1, 2 & 5 (See Note 6) 1 1 & 2 1, 3 & 5
IV. OFFICES (total gross floor area) 1. 4 storeys and less or less than 1,000 sq. m 2. 5 storeys and above or exceeding 1,000 sq. m 3. Exceeding 18 m but less than 10,000 sq. m 4. Exceeding 30 m but less than 10,000 sq. m	- A A A & B	- 1 1 & 2 1, 3, 4 & 5
V. SHOPPING COMPLEXES, SHOPS AND MARKETS 1. (i) Floor area not exceeding 250 sq. m per floor built as separate compartments with building less than 4½ storeys or 18 m height (ii) Combination of ground floor shop and/or residential and/or office on upper floors 2. Single storey (i) Less than 750 sq. m (ii) 750 to 1000 sq. m (iii) 1,001 to 2000 sq. m (iv) More than 2,000 sq. m 3. 2 storeys (Total floor area) (i) Less than 750 sq. m	- - - (See Note 8) A A & B -	- - - 1 & 2 1 & 3 -

Occupancy Hazard	Extinguishing System Note 2	Detection and Fire Alarm Systems Note 3
<ul style="list-style-type: none"> (ii) 750 to 1,000 sq. m (iii) 1,001 to 2,000 sq. m (iv) More than 2,000 sq. m 4. 3 storeys and above (total floor area) <ul style="list-style-type: none"> (i) Less than 1,000 sq. m (ii) 1,000 – 3,000 sq. m (iii) 3,000 sq. m and over 5. Hawker Centers, Food Courts, Wet and Dry Markets <ul style="list-style-type: none"> (i) Detached building less than 2,000 sq. m with open structure design and naturally ventilated (ii) 2,000 sq. m and over 6. Combined shop and hotel occupancy and combined office and shop occupancies 	<ul style="list-style-type: none"> (See Note 8) A A & B A A A & B - A 	<ul style="list-style-type: none"> 2 1 & 2 1 1 1, 3 & 5 - 1 & 2
<p>VI. FACTORY</p> <ul style="list-style-type: none"> 1. Single Storeys detached or terrace units <ul style="list-style-type: none"> (i) Less than 750 sq. m (ii) 750 to 1,000 sq. m (iii) 1001 to 2,000 sq. m (iv) More than 2,000 sq. m 2. Open Structure Design <ul style="list-style-type: none"> (i) Steel or metal fabrication works, engineering or metal works or similar low fire risk establishments (ii) Sawmill (iii) Steel mills 3. Two Storeys detached or terrace units: each floor built as separate compartment single or terrace type construction <ul style="list-style-type: none"> (i) Each floor area less than 500 sq. m (ii) Each floor area 500 – 1,000 sq. m (iii) Exceeding 1,000 sq. m per floor area 	<ul style="list-style-type: none"> - (See Note 8) A A & B - A & D A & D (See Note 8) A A & B 	<ul style="list-style-type: none"> - 1 1 & 2 1, 3 & 5 - 1 1 1 1 & 2 1, 3 & 5
	Gross area calculated against the highest risk requirement.	

Occupancy Hazard	Extinguishing System Note 2	Detection and Fire Alarm Systems Note 3
<p>4. Flatted Factories Block</p> <p>(i) 2 storeys and over</p> <p>(a) Less than 500 sq. m per compartment</p> <p>(b) 500 – 1,000 sq. m per compartment</p> <p>(c) Exceeding 1,000 sq. m per compartment</p> <p>(d) Compartment Exceeding 7,000 cu. m</p> <p>(ii) Three storeys and over</p> <p>(a) With compartment exceeding 1,000 sq. m</p> <p>(iii) Vehicle Assembly and similar Plants</p> <p>(a) Less than 1,000 sq. m</p> <p>(b) 1001 to 2,000 sq. m</p> <p>(c) 2001 to 5,000 sq. m</p> <p>(d) Exceeding 5,000 sq. m</p> <p>5. Special hazards</p> <p>(i) Factory complexes such as palm oil mill complex, palm oil refinery, sugar mills, paper mills, paint shops, cement works</p> <p>(ii) (a) Buildings with wet processes</p> <p>(b) Building with hazardous processes</p>	<p>(See Note 8)</p> <p>A</p> <p>A & B</p> <p>-</p> <p>A & D</p> <p>A, B & D</p> <p>-</p> <p>(See Note 8)</p> <p>A & D</p> <p>AB & D</p> <p>A & D</p> <p>A</p> <p>A, B, C or D</p>	<p>1</p> <p>1</p> <p>1, 3, 4 & 5</p> <p>-</p> <p>1 & 2</p> <p>1, 3, 4 & 5</p> <p>-</p> <p>-</p> <p>1</p> <p>1, 2, 3 & 5</p> <p>1</p> <p>1</p> <p>1, 2, 3, 4, 5</p>
<p>NOTE:</p> <p>1. Factories in operation after hours of darkness shall be required to provide emergency light as required by the D.G.F.R.</p> <p>2. Special risks or hazardous processes or storage shall be required to provide fire protection requirements as required by D.G.F.R.</p>		
<p>VII. PLACE OF ASSEMBLY</p> <p>1. Place of assembly below level of exit discharge exceeding 500 sq. m (Total floor area)</p> <p>2. Convention Center, Community Centers, Private Clubs, Exhibition Centers, Museums And Art Galleries (total floor area)</p> <p>(i) Single storey not exceeding 1,000 sq. m</p>	<p>A & B</p> <p>-</p>	<p>1</p> <p>-</p>

Occupancy Hazard	Extinguishing System	Detection and Fire Alarm Systems
	Note 2	Note 3
(ii) Single storey 1,001 sq. m to 2,000 sq. m	A	1
(iii) 2 storey and above or exceeding 2,000 sq. m	A & B	1, 3, 4 & 5
3. Theatres, Cinemas, Concert Halls, Auditoriums (total floor area)		
(i) Single storey or not exceeding 1,000 sq. m	-	1 & 2
(ii) 2 storeys and above or exceeding 1,000 sq. m	A & B	1, 3, 4 & 5
4. Amusement centers (total floor area)		
(i) Single storey or not exceeding 1,000 sq. m	A	1 & 2
(ii) 2 storeys and above or exceeding 1,000 sq. m	A & B	1 & 3
5. Bus terminals, train stations, airports (total floor area)		
(i) Single storey or not exceeding 1,000 sq. m	-	1
(ii) 2 storeys 1000 sq. m to 2,000 sq. m	A	1 & 2
(iii) 3 storeys and above or exceeding 2,000 sq. m	A & B	1, 3, 4 & 5
6. Place of worship		
Place of assembly used purely for religious purposes	-	-
VIII. STORAGE AND GENERAL		
1. Car parks		
(i) Open structure car-parks above ground		
(a) Single storey or less than 750 sq. m	-	-
(b) 2 storeys and above or more than 750 sq. m per floor	A	1
(ii) Underground car parks		
(a) Less than 2000 sq. m (total floor area)	A	1
(b) 2000 sq. m and above (total floor area)	A & B	1, 3, 4 & 5
(iii) Automated multi level car parks	A & B	1 & 3

Occupancy Hazard	Extinguishing System Note 2	Detection and Fire Alarm Systems Note 3
2. Warehouse and storage of non-combustible such as clay and bleaching earth (i) Single storeys and less than 2,000 sq. m (ii) 2 storeys and above or more than 2,000 sq. m	- A	- 1
3 Warehouse and Storage of combustible products (i) Single storeys (total floor area) (a) Open sided exceeding 1,000 sq. m (b) Less than 250 sq. m (c) 250 – 500 sq. m (d) 501 – 1,000 sq. m and less than 7,000 cu. m (e) More than 1,000 sq. m or 7,000 cu. m (ii) Two storeys and over (total floor area) (a) Less than 1000 sq. m and less than 7000 cu. m (b) Exceeding 1,000 sq. m and over or more than 7,000 cu. m	A - (See Note 5) A A & B A A & B	1 - 1 1 & 2 1, 3 & 5 - 1, 3 & 5

NOTE:

Open Structure

- (1) Total surface area of openings is to be no less than 40% of the total perimeter wall area enclosing the floor or compartment.
- (2) The opening(s) is too be shaped and located in such a way that total length in plan of the opening(s) is to be no less than 50% of the perimeter of the floor or compartment.

Open Corridor

- (1) Total surface area of openings is to be no less than 25% of the total perimeter wall area enclosing the balcony.
- (2) The opening(s) is too be shaped and located in such a way that total length in plan of the opening(s) is to be no less than 50% of the perimeter of the balcony.

“Openings” is to be opened to outside, unenclosed space or permitted airwells. Any individual opening having surface area less than 600 mm² or area width of opening is less than 25 mm is not to be regarded as an opening for the purpose.

NOTE 1

The hazardous areas and processes within any building referred to in Group VI and VIII are the following areas:

- (a) Boiler Room and Associated Fuel Storage spaces.
- (b) Laundries.
- (c) Repair Shops.
- (d) Rooms or spaces used for storage of materials in quantities deemed hazardous.
- (e) Kitchen.
- (f) Soiled Linen Room.
- (g) Transformer Rooms and Switch Rooms.
- (h) Plant Room.
- (i) Flammable liquid processing or refining operations.
- (j) Indoor Storage of flammable liquids.
- (k) Chemical plants, solvent extraction plants, distillation plants, refineries.
- (l) Process equipment, pump rooms, open tanks, dip-tanks, mixing-tanks.

NOTE 2:

The letters in the second column of this Schedule refer to the types of fixed extinguishing system, as follows:

- A –Hose Reel System.
- B –Sprinkler System.
- C –Gaseous Extinguishing System.
- D –Pressurized Fire Hydrant.

NOTE 3:

The figures in the third column of this Schedule refer to the types of fire alarm and fire detection systems as follows:

- 1. Automatic Fire Detectors SystemManual Electric Fire Alarm System.
- 2. Manual Electric Fire Alarm SystemAutomatic Fire Detectors System.
- 3. Signal Indicator Alarm SystemCentralized Monitoring System.
- 4. Manual Alarm SystemPublic Address System.
- 5. Fire Command Center

NOTE 4:

For the purpose of this Schedule, measurement of heights shall be taken from the level of the highest point of fire appliance access to the highest habitable floor level.

NOTE 5:

Portable fire extinguishers are to be provided for private dwellings.

NOTE 6:

Smoke detector of the self contained type is to be provided at the top of the staircase.

NOTE 7:

Smoke detector of the self contained type is to be provided in bedrooms.

NOTE 8:

Trolley type 25 kg fire extinguishers to be provided.

[Sub. Sel.P.U. 142/2012]

LIST OF AMENDMENTS

<i>Amending law</i>	<i>Short title</i>	<i>In force from</i>
Act 160	Malaysian Currency (Ringgit) Act 1975	29-08-1975
Sel. P.U. 95/1994	Selangor Uniform Building (Amendment) By-Laws 1993	20-01-1994
Sel. P.U. 15/2000	Selangor Uniform Building (Amendment) By-Laws 2000 <i>[This By-law shall be applicable only to the Kawasan Perbadanan Putrajaya.]</i>	27-04-2000
Sel. P.U. 40/2000	Selangor Uniform Building By-Laws (Amendment) 1999	31-08-2000
Sel. P.U. 9/2007	Selangor Uniform Building By-Laws (Amendment) 2007	12-04-2007
Sel. P.U. 40/2012	Selangor Uniform Building By-Laws (Amendment) 2012	22-03-2012
Sel. P.U. 142/2012	Selangor Uniform Building (Amendment)(No.2) By-Laws 2012	27-12-2012