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No. 54] PERTH: FRIDAY, 23rd JUNE [1961

AT a meeting of the Executive Council held in the Executive Council Chamber, at Perth, this 21st day of June, 1961, the following Order in Council was authorised to be issued:—

Local Government Act, 1960.

Uniform General By-laws.

ORDER IN COUNCIL.

L.G. 483-61.

WHEREAS it is enacted by section 433A of the Local Government Act, 1960, that the Governor may make and publish in the *Government Gazette* uniform general by-laws for all or any of the purposes for which by-laws may be made by a Council under the Act: Now, therefore, His Excellency the Lieutenant-Governor and Administrator, acting with the advice and consent of the Executive Council, and in exercise of the powers conferred by the said Act and by the Interpretation Act, 1918-1957, doth hereby make the uniform general by-laws set out in the First Schedule hereto and declare that those by-laws shall have the force of law on and after the 1st day of July, 1961, in each municipal district specified in the Second Schedule hereto.

R. H. DOIG
Clerk of the Council.

First Schedule.

UNIFORM BUILDING BY-LAWS.

SECTION 1.

1. In these uniform building by-laws unless inconsistent with the context or subject matter, or some other meaning is clearly intended:—

"**adjoining occupier**" means the occupier, or one of the occupiers, of land, buildings, storeys, or rooms adjoining those of the building owner;

"**adjoining owner**" means the owner, or one of the owners, of land, buildings, storeys, or rooms adjoining those of the building owner;

"**advertising device**" includes any sign, signboard, awning, blind, illuminated sign, hoarding, poster, or other means of advertisement;

"**alteration**" includes addition and extension and "alter" has a corresponding interpretation;

"**approved**" means approved by the Council;

"**arcade**" means a right-of-way or passage, whether open to the sky or not, on to which shops open on one or both sides;

"**area**" applied to a building means the superficies of a horizontal section thereof made at the point of its greatest surface inclusive of the external walls and of such portions of the party walls as belong to the building;

"**attic**" means any floor area built wholly or partly in the roof of a building and an attic shall not be regarded as a storey if it is wholly contained within a roof pitched at the level of the ceiling of the storey next below the attic;

"**base structure**" means the structure below the level of the lowest floor which transmits the loads of the building to the footings;

"**builder**" means the person employed to erect or construct any building or structure, or to demolish, alter or execute any work on a building or structure already erected, and includes the owner or occupier of the land upon which any such building or structure is or is intended to be erected or constructed, or other person for whom, or by whose order or under whose direction and control such alteration or work was done or is intended to be done, as the case may be;

"**building**" means any structure or appurtenance thereto whether temporary or permanent and includes wall, water supply, and drainage;

"**business district**" means an area or district set aside for business or commercial purposes under a zoning scheme of a municipality;

"**Chief Fire Officer**" means Chief Fire Officer as defined in Section 4 of the Fire Brigades Act, 1942.

"**Council**" means the municipal council in whose district a building is constructed or proposed to be constructed;

"**cubical extent**" applied to the measurements of a building means the space contained within the external surfaces of its walls and the upper surface of the floor of its lowest storey and the topmost ceiling or the level of the top of the roof plate when there is no ceiling;

"**dangerous material**" means any substance liable to sudden explosion, inflammation or ignition, whether so liable inherently or by reason of contact with another material or other materials;

"**dead load**" of a building means the actual weight of all permanent structural and finishing work, including partition walls contained within the building;

"**duplex house**" means a building comprising two dwellings, on ground level, each being complete and self contained;

"**dwelling**" means any building or portion of a building which is used or is intended, adapted, or designed for use for living purposes and and is a self-contained unit;

"**fire doors,**" "**fire windows**" and "**fire shutters**" mean, respectively, doors, windows and shutters constructed in conformity with Section 13 of these by-laws;

"**fire resistance rating**" means the minimum period of time during which an element of a structure may be expected to function satisfactorily while subjected to the standard fire test provided for by by-law 167 of these by-laws;

"**flat**" means that portion of a building used or intended, adapted or designed for use as a separate tenement in a building containing two or more such tenements;

"**floor area**" means the aggregate superficial area of so many horizontal sections of a building as there are floors or storeys in that building and the horizontal section of each floor shall be made at the point of its greatest surface dimensions, inclusive of external walls and of such portions of the party walls as belong to the building and also of all verandah and balcony floors, covered ways and light courts;

"**footing**" means the construction by which the weight of the building or structure is transferred to the foundations;

"**foundations**" means the ground upon which the footing of a building or structure is constructed;

"**frontage**" means the boundary line between a site and the street upon which that site abuts, and when the site abuts on more than one street, then the boundary line between the site and the street to which any building that may be erected thereon fronts. (For measurement of width or frontage see by-law 31 of these by-laws;

"**habitable room**" includes every room in which any person sleeps, eats or carries on his usual domestic business or social vocations or avocations, but does not include laundries, bathrooms, water closet compartments, serving and storage pantries and closets, boiler rooms, cellars, corridors and similar spaces used neither frequently nor during extended periods;

"**height**"—

(a) in relation to a building means the measurement taken from the permanent footpath level immediately in front of the centre of the face of the building to the level of the top of the eaves, parapet or flat roof whichever is the highest;

In the case of buidings of Classes I and II Occupancy, the height shall be measured from the mean level of the ground immediately in front of the building;

(b) in relation to a building when defined in terms of number of storeys means the number of storeys above the permanent footpath level, or, where there is a basement, above the basement;

(c) in relation to storeys means the measurement taken from one floor to the floor above or in the case of the topmost storey, the measurement from floor to ceiling, but if there is no ceiling, the height shall be measured from the floor to the underside of the roof tie or, if there is no tie, to the level of half the vertical height of the rafters or other support of the roof;

(d) in relation to a room means the measurement taken from the floor to the ceiling, or where there is no ceiling to the underside of the rafters measured at the lowest level of such rafter, or of the floor joists of the floor next above, except in the case of a building of Class I, II, III or IV Occupancy, where the term means the measurement to the soffit of the lowest beam or other projection below the ceiling level;

"**high hazard occupancy**" means any occupancy in which there are goods or materials liable to burn with extreme rapidity or from which poisonous fumes or explosions are likely to arise or occur in the event of fire;

"**incombustible**" in relation to material means material which neither burns nor gives off inflammable vapours in sufficient quantities to ignite at a pilot flame when heated in the manner specified in the British Standard Specification being Item 40 of the Appendix;

"**inflammable liquid**" means liquid petroleum, kerosene and any oil, liquid, spirit or similar liquid which will flash or emit an inflammable vapour at or below a temperature of 150 degrees Fahrenheit, Abel Close Test;

"**length of wall**" in relation to requirements for wall thickness means the distance of any wall between the nearer faces of cross walls, external walls, or party walls bonded into such walls and constructed in accordance with these by-laws;

"**live load**" means any load other than dead load and includes wind load;

"**masonry**" means stone, brick, terra cotta block, solid or hollow concrete block or other similar building unit or a combination of any two or more of them laid up unit by unit and set in mortar;

"**mezzanine floor**" means an intermediate floor constructed in any storey, in accordance with by-law 284 of these by-laws;

"**new building**" **includes**—

(a) any building erected after the date of commencement of these by-laws;

(b) any building which has been taken down entirely or for more than one-half of its cubical extent, and has been re-erected or commenced to be re-erected, wholly or partially, whether on the same site or elsewhere, after the commencement of these by-laws; and

(c) any space between walls or between buildings which is roofed or commenced to be roofed, after the commencement of these by-laws;

"**owner**" includes any person in possession or receipt either of the whole or any part of the rents or profits of any land or tenement or in the occupation of any land or tenement otherwise than as a tenant from year to year, or for any less term, or as a tenant at will;

"**parapet**" means that portion of any wall which is carried up above the line of junction with a roof or gutter;

"**partition**" means a temporary or easily removable structure made of panelwork, wood framing, covered with metal, wood or plaster sheets or other similar material used for the subdivision of spaces within a building;

"**party structure**" means any partition wall or floor required to have a fire resistance rating and used for the purpose of separating storeys or rooms in separate occupancies;

"**plot ratio**" **means**—

(a) in the case of buildings of Classes I and II Occupancy the ratio of the gross total of floor areas to the area of the land within the site boundaries measured from the outer faces of external walls, including passages and amenities, but excluding lifts, stairs, and areas used exclusively for the parking of wheeled vehicles if such areas are either within the building, or below the surface of the ground and finished with a flat roof of reinforced concrete;

(b) in the case of buildings of Classes IV, V, VI, VII, VIII and IX Occupancy the ratio of the gross total of floor areas to the area of the land within the site boundaries, excluding lifts, toilets and amenities, stairs, external wall thicknesses, plant rooms and the gross area of any floor space in basements or ground floor areas used for the parking of wheeled vehicles including access to and from that space within the building; and

(c) in the case of buildings of Class III Occupancy the plot ratio set out in paragraph (a) in cases where the building is being erected in a residential or residential flat area and the plot ratio set out in paragraph (b) in any other case;

"**pylon**" means a sign supported on one or more piers or columns but not attached to a building;

"**qualified engineer**" means a corporate member of the Institution of Engineers, Australia, or a corporate member of any other civil or structural institution or combination of them recognised by the Institution of Engineers, Australia, or any other engineer who possesses equivalent academic and professional qualifications;

"**reinforced concrete**" means the concrete containing reinforcement embedded in such a manner that the two materials act together in resisting forces and complying with the requirements of by-law 151 of these by-laws;

"**repair**" means the reconstruction or renewal of any part of an existing building for the purpose of its maintenance but does not include alteration;

"**roadway**" in relation to any street, road or way, means the whole space open for traffic, whether carriage traffic and foot traffic, or carriage or foot traffic only;

"**S.A.A. code or specification**" means any specified code or specification issued by the Standards Association of Australia and mentioned in the Appendix;

"**shop front**" means such portion of the structure of a shop on the ground storey which abuts or faces a street, way, or arcade and includes the frame, glass doors and door frame, ingo and ingo floors, facing to piers or pilasters, fascia wall, between head of shop front frame and underneath of verandah or lintel over openings, and any signs or trade marks incorporated in the design of the shop front;

"**site**" in relation to a building, includes the curtilage to or area of land around that building;

"**sprinklered building**" means a building in which a sprinkler system has been installed as provided by by-law 444 of these by-laws and "unsprinklered building" has the reverse meaning;

"**sprinkler system**" means an automatic sprinkler installation conforming to the requirements of the Fire and Accident Underwriters' Association of Western Australia, covered by Item 23 of the Appendix;

"**square**" in relation to the measurement of any area, means one hundred square feet;

"**storey**" means the space or distance or portion of a building included between the underside of a concrete or fire-resisting floor or the floor joists of any other floor and the underside of the concrete or fire-resisting floor or floor joists next above it, or the underside of the tie beam, or collar tie, or half the vertical height of the rafters above, as the case may be, but a gallery or mezzanine floor is not deemed to divide a wall or building into storeys;

"**ground storey**" means that storey closest to the ground level in which the height of the ceiling above the level of the adjoining ground is greater than the distance from the level of that adjoining ground to the floor measured at the centre of the building frontage;

"**basement or basement storey**"' means any storey of a building which is under the ground storey;

"**first storey**" means that storey of a building which is next above the ground storey, the successive storeys above the first storey being the second storey, the third storey and so on to the topmost storey;

"**topmost storey**" means the uppermost storey whether constructed partly in the roof or not;

"**street alignment**" means the line of demarcation between any street or way or part thereof and any land abutting thereon;

"**the Act**" means the Local Government Act, 1960; and the several words mentioned in section three of the Health Act, 1911, shall have the same meaning as is attached to them by that section;

"**the Appendix**" means the Appendix to these by-laws;

"**the Surveyor**" means building surveyor as defined by the Act;

"Walls"—

(a) "**bearing wall**" means a wall which supports any load in addition to its own weight;

(b) "**cross wall**" means an internal wall dividing party or external walls into distinct lengths;

(c) "**external wall**" means an outer wall or vertical enclosure of a building not being a party wall;

(d) "**fire wall**" means a wall which subdivides a building to resist the spread of fire;

(e) **"non-bearing wall"** means a wall which supports no load other than its own weight;

(f) **"panel wall"** means a non-bearing wall in frame construction built between columns or piers and wholly supported at each storey;

(g) **"partition wall"** means an internal vertical structure used solely for the purpose of subdividing any storey of a building into sections and which supports no load other than its own weight;

(h) **"party wall"** means a wall forming part of a building and used or constructed to be used in any part of its height or length for the separation of adjoining buildings;

(i) **"retaining wall"** means a wall used to resist the lateral displacement of any material.

SECTION 2.

ADMINISTRATION.

2. **Fees.**—The scale of fees, more particularly specified in section 32 of these by-laws, are the fees to be paid by a builder in respect of any orders, licenses, matters and things required or permitted by the municipality or by these by-laws.

3. **Notices to Other Authorities.**—(1) Every builder who intends to erect, construct or alter any building shall prior to the commencement of any work give notice of that intention to any authority, such as the Town Planning Board, the Licensing Court, the Water Supply, Sewerage and Drainage Department, the Public Works Department, the Public Health Department, the Factories and Shops Department and the power and light authority for the district, which may have power over the proposed building operations.

(2) The Surveyor shall not issue a Building License under the provisions of Section 3 of these by-laws unless or until satisfied that the provisions of sub-by-law (1) of this by-law have been complied with and that the approval of such of the authorities therein mentioned as may apply to the particular case has been obtained.

4. **Powers of Surveyor to Enter and Inspect.**—The Surveyor may at all reasonable times after receipt of the notice mentioned in by-law 11 of these by-laws, or upon learning of the commencement of building operations in his municipality and until thirty days after his receipt of notice of completion of the building operations, enter and inspect any site, building, erection, structure or work, for the purpose of ascertaining whether the builder is complying or has complied with, or whether those building operations are exempt from, the provisions of these by-laws.

5. **Service of Notices.**—Any notice that in pursuance of these by-laws is to be given by the municipality, the Surveyor or other officer of the municipality:—

(a) is deemed to be properly given if left on or affixed to the land, building, structure or premises to which the notice relates or at the place of residence or business of the person to whom that notice is to be given or if sent by registered letter directed to the address of residence or business of that person;

(b) is deemed to have been given or received when left as aforesaid, or when it would have reached its destination in due course of post; and

(c) may be signed by the Clerk or by the Surveyor.

6. **Exemptions.**—The following buildings and work are exempt from the provisions of these by-laws, that is to say—

(a) any building which is exempted by Statute;

(b) temporary offices and sheds used by builders, on or about the site of any building being erected, repaired, altered or reinstated, or used by contractors in carrying out works for any public body or corporation on or about the site of the work and used exclusively for the purpose of that building or work; but that exemption shall, however, continue only during the time occupied in completing the building or work, and in any case shall not exceed a period of six months, except by special permission of the municipality;

(c) any building the plans of which were approved by the Surveyor prior to the date of these by-laws coming into operation if that building is completed in accordance with and subject to the provisions of any by-laws in force at the time of that approval; and

(d) minor repairs not involving—

(i) replacement, addition or alteration of structural members; and

(ii) the cutting or building up of any opening in any wall.

7. Loading Notice Plate.—(1) On completion of any building of Class VI, VII, or VIII Occupancy, constructed pursuant to a permit granted under these by-laws, and before the occupation of any portion of that building, the owner shall affix in such conspicuous places on the walls thereof, as the Council may direct, not less than 3 ft. above the floor, permanently attached plates having ineffaceable characters in the following form, showing the safe live load for which the floor has been designed.

FORM—LOADING NOTICE.

SAFE FLOOR LOAD.

.....

Pounds per Square Foot Uniformly Distributed.

(2) The minimum height of letters on a Loading Notice Plate shall be 1 inch in the upper two lines and ½ inch in the remaining lines.

8. Change of Class.—Any builder or building owner who contemplates changing or converting a building of one class into a building of another class, or using a building of one class as a building of another class, whether in that change any building operations are intended or not, shall first give notice in writing to the Surveyor of his intention, and shall subject to the provisions of Section 30 of these by-laws (Restoration of Buildings and Alteration to Existing Buildings) comply with all conditions prescribed for the other class contemplated.

9. Certificate of Occupancy.—Before a building license is issued for any building of Class I or II Occupancy the building owner shall lodge with the Surveyor a certificate of occupancy in one of the forms 2-6 set out in the First Schedule to these by-laws, and the certificate of occupancy shall be signed by the building owner.

10. Plans of Buildings may be Inspected with the Owner's Consent:—The owner or mortgagee of any building or any person authorised in writing by the owner or mortgagee shall be permitted to inspect the plans of that building during office hours.

SECTION 3.

APPLICATIONS FOR AND GRANTING OF BUILDING LICENSES.

11. Application.—Every builder intending to erect or construct any building or alter, add to, repair or underpin, demolish or remove any building shall before commencing to erect, construct, alter, add to, repair or underpin that building, make written application to the municipality at the office of the Surveyor for approval by means of Form I in the First Schedule to these by-laws, and deposit with the Surveyor all necessary drawings, specifications, and other information as required by by-law 12 of these by-laws; and the approval of the municipality shall be indicated by the issue of a license, as set out in form 7 or 8 in the First Schedule to these by-laws.

12. Drawings, etc., to be submitted.—(1) Every builder making application for a building license shall deposit with the Surveyor—

(a) two complete sets of drawings (to a scale of not less than 1 in. to every 8 ft.) showing a plan of every storey, at least two elevations of external fronts and one or more sections, transverse or longitudinal, showing the heights of the storeys, depths of foundations, underpinning, levels of the ground, the construction of the walls, floors and roofs, all clearly figured and dimensioned thereon in feet and inches together with any other information that the Surveyor may require;

(b) a block and drainage plan (to a scale of not less than 1 in. to every 40 ft.) showing street names, lot number and title reference of the proposed site with the north point; the size and shape of the block of land on which it is proposed to erect, alter or add to the building, alteration or additions, the dimensioned position of proposed new and existing buildings on the site; the relative levels of the site with respect to the street or way adjoining; the position and size of any existing sewers and existing stormwater drains, and the position of street trees, if any, between the site and the roadway;

(c) two copies of specifications describing materials to be used in the construction and where not indicated on the drawings, the sizes thereof together with all other information not shown on the drawings, which is necessary to show that the building will, if constructed in accordance with the specifications comply with the provisions of these by-laws;

(d) when required by the Surveyor, a complete set of detailed calculations of the stresses and detailed drawings covering the structural members;

(e) a statement in writing signed by the building owner setting out the purpose for which the building and lands are intended to be used and the building, when erected or altered as the case may be, and the lands shall not, without the written consent of the municipality first having been obtained and subject to such conditions or provisions as the municipality may impose when granting such consent being fully complied with, be used for any other purpose or purposes whatsoever; and

(f) an estimate of the cost of the proposed construction and when so required by the Surveyor the name, and address of the registered architect or qualified engineer, or both under whose supervision the construction is to be carried out.

(2) The drawings referred to in sub-bylaw (1) of this by-law shall be in ink on drawing paper or tracing cloth, or shall be approved duplicate prints and shall not in any case be less in size than 16 in. long by 13 in. wide.

(3) Any new work shall be clearly delineated on the drawings as distinct from existing work, by means of colouring or other suitable means.

13. Information to Accompany Permit to Pull Down or Remove.—Every application for a permit to demolish or remove a building shall be accompanied by particulars of the location of the building and such other information as the municipality may require and, in the case of an application for a permit to remove a building for re-erection within the boundary of a district of a municipality by—

(a) complete plans and specifications of the building, including all proposed alterations and additions as would be required by these by-laws in the case of a new building; and

(b) a statement showing the purposes for which—

(i) the building has been used; and

(ii) the building is proposed to be used.

14. Copies for Record.—One copy of any drawing, plan, statement, specification or calculation shall remain in the office of the Building Surveyor as a permanent record.

15. Commencement of Work.—A builder shall not commence to erect, construct, alter, add to or underpin, demolish or remove any building until the Surveyor has signified his approval to the drawings and specifications of that building by stamping the drawings and specifications with the official stamp showing the number of the application and the date of his approval and by subscribing his signature, and until the builder has obtained a license or special license in the form 7 or 8 in the First Schedule to these by-laws and has paid the prescribed fees assessed by the Surveyor.

16. Examination of Drawings, etc.—(1) The Surveyor shall examine all drawings, and specifications deposited with him, but if any such drawings or specifications are, in the Surveyor's opinion, not in conformity with the requirements of Section 3 of these by-laws or not clear or not easily legible, or do not contain sufficient information, he may, within 14 days of their deposit

with him, return them to the builder for amendment, and in that case the drawings and specifications shall be considered as not having been deposited with the Surveyor until re-submitted by the builder.

(2) When the Surveyor signifies his disapproval of any drawings or specifications, notice of the disapproval shall be given in writing to the builder and the reasons for the disapproval shall be stated in the notice.

17. Issue of License.—(1) When the Council has given its approval to and the Surveyor has stamped and signed the drawings and specifications, and after the payment by the builder of the prescribed fees, a license in the form of Form 7 in the First Schedule to these by-laws shall be issued by the Surveyor.

(2) The license referred to in sub-bylaw (1) of this by-law is void if the work covered by the license (of the building) is not substantially commenced within one year of the date of issue of the license; but at any time after the expiry of one year the approval of the municipality to the drawings and specifications previously approved for such building may, if in conformity with the building by-laws, be again obtained with or without the payment of any further fees and the lodging of such further drawings and specifications as the municipality may at its discretion require.

18. Departure from Drawings.—No variation from or alterations of approved plans and specifications shall be made by any builder without the consent of the Surveyor in writing having been first obtained, and any alteration or departure from the approved drawings and specifications shall, on the consent of the Surveyor therefor being notified, be drawn, described, and endorsed on and in the drawings and specifications.

19. Submission of Preliminary Plans.—Notwithstanding anything contained in this Section any person having paid the fees prescribed in Section 32 of these by-laws may submit to the Surveyor preliminary plans and specifications of any building proposed to be constructed, accompanied by the written consent of the owner of the site of the proposed building to the lodging of those plans and specifications for examination and report as to whether such proposal is capable of being executed in conformity with these by-laws.

20. Buildings Constructed Contrary to these By-laws.—Where any building, work or structure is constructed in breach of any provision of these by-laws, the municipality may give notice to the owner or builder requiring him, within a period specified therein, to bring that building, work or structure into conformity with the provisions of these by-laws and the approved plans and specifications, and should the owner or builder fail to comply with the requirements of that notice within the time specified, or show good and sufficient reason for not so doing, the municipality may order the building work or structure to be demolished, or removed, within a specified period.

21. Buildings Left Incomplete.—Where a license becomes void under the provisions of by-law 17 of these by-laws or where a building has been partly erected and left incomplete, the municipality may, at any time after a period of 12 months from the date of issue of the license, give notice to the owner or builder of the uncompleted building, requiring him to show cause within a specified period why the building should not be demolished and removed, and if within the specified period the owner or builder does not furnish good and sufficient reason why the building should not be demolished or removed the municipality or any person authorised by the municipality may demolish and remove the building.

SECTION 4.

CLASSIFICATION OF BUILDINGS BY OCCUPANCY.

22. In and for the purposes of these by-laws, buildings or parts of buildings now existing or hereafter erected, altered or enlarged shall be classified as follows:—

(a) **Class I—Private Dwelling.**—A private dwelling, being any building designed or used or intended or adapted for use in single tenancy and includes a duplex house, but not a flat.

(b) **Class II—Residential Flat Building.**—A residential flat building, being a dwelling, other than a duplex house, constructed or adapted for use as two or more tenancies.

(c) **Class III—Residential Building.**—A residential building, being any building or portion of a building other than of Class I, II or IV occupancy, used or intended, adapted or designed to be used for human habitation and includes a residential club, lodging and boarding houses, residential hotel, and residential portion of premises licensed under a Publican's General License or a Hotel License.

(d) **Class IV—Dwelling Attached to a Building of Another Class.**—A dwelling attached to a building of another class, being that portion of a combined shop and dwelling, office and dwelling, warehouse and dwelling, or factory and dwelling, designed as a residence for occupiers of the shop, office, warehouse, or factory, and includes that portion of any building designed as a residence for the caretaker of that building.

(e) **Class V—Office Building.**—An office building, being any building or portion of a building used for professional or commercial purposes (other than as a shop, warehouse, or factory) and includes a bank, broadcasting studio, office, professional chambers, stock exchange, and the office section or sections in buildings of all classes of occupancy.

(f) **Class VI—Shop.**—A shop, being any building or portion of a building required by the provisions of the Factories and Shops Act, 1920, to be registered as a shop, and also any tearoom, eating house, hotel bar, market, saleroom, motor repair shop, service station and petrol selling station.

(g) **Class VII—Warehouse.**—A warehouse, being any building or portion of a building used for the bulk storage or the display or sale of goods or any combination of them other than a shop and includes a fire station, public garage (other than a garage used solely for repair), hangar, showroom and storage building or any other building required to be registered as a warehouse.

(h) **Class VIII—Factory.**—A factory being any building or portion of a building in which goods or materials are manufactured or converted, or not being a warehouse or shop, are stored or sold or any other building required by the provisions of the Factories and Shops Act, 1920, to be registered as a factory.

(i) **Class IX—Public Building.**—A public building, being—

(a) any church, chapel, and place of public worship;

(b) any public or assembly or dance hall, library, art gallery and museum, concert hall, exhibition hall, skating rink, bowling alley, stadium, circus or grandstand;

(c) any theatre, opera house and any building constructed or adapted for the exhibition of photographic or projected pictures, either moving or still;

(d) any hospital, sanatorium, convalescent home, orphanage, and other similar charitable institution, baby health centre, creche and other similar welfare institution;

(e) any school, college and similar educational institution;

(f) any other building, structure, gallery, enclosure, or platform whatsoever in or upon which numbers of persons are usually or occasionally assembled.

(j) **Class X—Outbuilding.**

23. Buildings Not Specifically Classified.—A building or portion of a building which is not included in by-law 22 of these by-laws shall for the purpose of these by-laws be classified by the Council as belonging to that class of occupancy, being one of the classes mentioned in by-law 22 of these by-laws, which it most nearly resembles.

24. Use Incidental to any Occupancy.—Where a relatively small portion of a building is used for a purpose other than a purpose endorsed on the Certificate of Occupancy, but merely incidental to the class or classes of occupancy endorsed on the Certificate of Occupancy, that portion may, if the use does not involve a material increase in hazard to the remainder of the building, be regarded as being of the same class of occupancy as the occupancy to which that use is incidental.

SECTION 5.

TYPES OF CONSTRUCTION.

25. **Types of Construction.**—(1) In and for the purposes of these by-laws, buildings are classified into types of construction, based upon their resistance to fire, type 1 being deemed the most fire resistant and type 5 being the least fire resistant type of construction, that is to say—

Type 1. Framed fire resisting construction, which includes light weight fire resisting construction;

Type 2. Bearing wall protected construction;

Type 3. Ordinary construction;

Type 4. Unprotected metal construction;

Type 5. Wood frame construction.

(2) **Type 1—Framed Fire Resisting Construction.**—Framed fire resisting construction means that type of construction in which the imposed loads are carried on columns and beams or on reinforced concrete walls, where those columns and beams or walls are used for shaft enclosures around stairs, lifts or other vertical openings and in which structural members are of incombustible materials having an ultimate fire resistance of not less than, in the case of—

(a) columns (including reinforced concrete walls acting as columns) internal structural members carrying walls, fire walls and party walls—4 hours;

(b) exterior panel walls, beams, girders, trusses, roofs (except in the case of roofs, as qualified by by-law 293 of these by-laws) and non-bearing shaft enclosures, around stairs, lifts and other vertical openings—3 hours; and

(c) panel walls on street frontages and walls set back not less than 10 feet from the boundary of any land in other occupation, if those walls are separated at each floor level, either by a horizontal floor projection of 2 feet beyond the wall alignment or a vertical wall of not less than 3 feet in height having a fire resistance rating in the case of buildings of classes VI, VII and VIII Occupancy of not less than 3 hours; and in the case of buildings of classes II, III, IV and V Occupancy not less than 2 hours,—2 hours.

(3) Light weight fire resisting construction means that type of construction referred to in sub-bylaw (2) of this by-law, protected in accordance with the requirements for light weight construction set out in Table 170B and in accordance with provisions 6 and 7 relating to Table 170C of these by-laws and is limited to buildings of Class II, III, IV and V Occupancy.

(4) **Type 2—Bearing Wall Protected Construction.**—Bearing wall protected construction means that type of construction of which the walls are of masonry or reinforced concrete and structural members are of incombustible materials, having an ultimate fire resistance of not less than, in the case of—

(a) external, fire and party walls—4 hours;

(b) bearing walls, piers, trusses (other than roof trusses) and columns or girders supporting walls—3 hours;

(c) panel walls, columns and girders not otherwise specified and shaft enclosures around stairs, lifts and other vertical openings—2 hours; and

(d) roof trusses and roofs, including beams and girders (except as qualified by by-laws 292 of these by-laws) and floors, including beams, girders and trusses—2 hours.

(5) **Type 3—Ordinary Construction.**—Ordinary construction means that type of construction of which the exterior walls have a fire resistance rating of 3 hours and of which the interior framing and construction are wholly or partly of wood or of unprotected steel, iron or reinforced concrete, supported on unprotected steel.

(Note: The term "ordinary construction" corresponds generally with that variously called "non-fire-resisting masonry walls and wooden joists" or "ordinary brick" construction.)

(6) **Type 4—Unprotected Metal Construction.**—Unprotected metal construction means that type of construction in which the imposed loads are carried by a skeleton framework of steel or other metal which is not fire protected and of which the exterior walls and roof are of asbestos, sheet metal or other incombustible material.

(7) **Type 5—Wood Frame Construction.**—Wood frame construction means that type of construction of which the structural parts and materials are of wood or are dependant upon a wood frame for support and includes any construction having an incombustible exterior veneer.

26. Construction to Accord with Requirements for Specified Type.—Where a building is required by these by-laws to be of any given type of construction, it shall be constructed in accordance with the requirements specified for that type.

27. Buildings of Mixed Construction.—A building may contain more than one type of construction but where two or more types of construction occur in the same building and are not separated by a complete fire separation conforming to the provisions of Section 25 of these by-laws, the whole building shall be regarded as that of the type of construction offering least resistance to fire.

28. Supports in Buildings of Mixed Construction.—Every building of mixed construction shall comply with the following, that is to say—

(a) the support to any wall shall have a fire resistance rating throughout at least equal to the fire resistance rating of that wall;

(b) the support to any floor or roof having a fire resistance rating for all its members shall have a fire resistance at least equal to the fire resistance rating of that floor or roof; and

(c) the support to any wall, floor or roof referred to in paragraphs (a) and (b) of this by-law means the direct support and does not include any lateral member of a floor system connected to any wall, roof or floor and not essential for the normal structural stability of the wall, roof or floor.

Exceptions.

29. Roof Structures.—Structures not exceeding 10ft. either in length or in width and not exceeding 8ft. in height and intended for the protection of lift ventilating machinery or for like purposes, may be erected above the level of the roof of a building of Type 1, 2, or 3 Construction with external walls constructed in accordance with the provisions of by-law 224 of these by-laws and with a roof of impervious material.

30. Mezzanine Floors.—Mezzanine floors may be of timber on unprotected steel supports or of unprotected steel or iron as provided by by-law 284 of these by-laws.

SECTION 6.

SITE REQUIREMENTS

31. Interpretations.—(1) In and for the purposes of these by-laws—

(a) the width of the frontage of any land is deemed to be the distance measured in a horizontal plane at right angles to one of the boundaries of the side of the land from its intersection with the alignment of the street to the opposite boundary of the land or a prolongation of the boundary and in the event of the side boundaries of the land not being parallel, the average of the distances so measured is the width of the frontage;

(b) where a corner of an allotment at the junction or intersection of any streets has been truncated—

(i) the width of the frontage shall be measured from a point at the intersection of the prolongations of the side and front boundaries of the allotment; and

(ii) the area shall be calculated as if the land thereby excised were portion of the allotment;

and

(c) wherever a minimum distance is provided by these by-laws, that distance shall be measured horizontally from the boundary to the outermost projection from the exterior wall; but where a chimney back, not more than 5ft. 6in. in width is projecting, the extent of the projection shall be determined by the horizontal distance by which the projection exceeds 14in.

(2) In and for the purposes of this Section the length of a wall means its total length measured as if it were continuous in one plane, irrespective of any projections or set backs between the exterior faces of outside walls of the building, but nothing in this Section prohibits the length of a portion of a wall containing windows of habitable rooms being measured independently from the portion of the wall not containing those windows.

32. **Distance from Street alignments in Residential Districts.**—(1) A person shall not erect or construct in a residential district, any building or any addition to any building within the space, if any, between the street boundary of any site and the building line as fixed by the municipality for that particular street, or part thereof and where a building line has not been fixed by the municipality the minimum distance between any building or any addition to any building and the boundary of the street it faces, shall be 25ft.

(2) The building line referred to in sub-bylaw (1) of this by-law shall, when fixed by the muncipality, be marked upon a plan or clearly described in a resolution of the municipality and that plan or resolution shall be open for inspection by the public free of charge during the office hours of the municipality.

33. **General Site Restrictions applying to Buildings of Class I, II or III Occupancy**—(1) A person shall not construct or erect—

(a) any building of Class I, II or III Occupancy on any site on which there exists any other building of any of those classes, unless the site is capable of being, and is in fact, subdivided into a separate site or separate sites satisfying the provisions of the Town Planning and Development Act, 1928, and this Section with regard to any existing and any intended building;

(b) any building of any kind on any space or part of any space existing between a building of Class I, II, or III Occupancy and the frontage of its site unless—

(i) the building to be erected is an addition to or an extension of the existing building; or

(ii) the land or part of the land contained in the space between the existing building and the frontage of its site is comprised in a certificate of title other than that relating to the land on which the existing building is erected;

(c) any building of Class I, II or III Occupancy so that any part of the building is closer than two feet six inches to a site boundary; or

(d) any outbuilding which does not comply with the provisions of Section 28 of these by-laws.

(2) **Dispersed Buildings.**—The restriction imposed by paragraph (a) of sub-bylaw (1) of this by-law does not apply to any building on an area which the municipality has set aside, under a Town Planning Scheme or Zoning By-law, as a special area for—

(a) motels or buildings of a similar nature; or

(b) buildings of a recreational and holiday facility nature.

34. **Site Restrictions for Buildings of Class I.**—Private Dwellings—(1) A person shall not erect a building of Class I Occupancy—

(a) on any site having an area, in the case of a single occupancy dwelling, of less than 6,000 square feet or a frontage of less than 49 ft. 6 in., and, in the case of a duplex house, an area of not less than 8,000 square feet or a frontage of not less than 66 ft., except as provided by by-law 39 (3) of these by-laws;

(b) so that any wall of any storey is of a less distance from a boundary, not being a street boundary, of the site, than 3 ft. in the case of a building not exceeding two storeys in height with a wall length of 50 ft.; or where the wall exceeds 50 ft. in length, a less distance than 3 ft. plus 1 ft. for each 10 ft. or part of that distance by which the wall exceeds that length;

(c) having outbuildings which do not comply with by-law 335 and Section 28 of these by-laws; and

(d) which together with any buildings appurtenant thereto is of a total gross area which exceeds a plot ratio of 0.33 ($\frac{1}{3}$), as provided by by-law 43 of these by-laws.

(2) For the purposes of this by-law, the area occupied by a building includes any areas occupied by out-buildings, but not unroofed terraces.

35. Site Requirements for Buildings of Class II—Residential Flat Buildings.—(1) A person erecting a building of Class II Occupancy, shall erect it so that—

(a) in the case of a building having its respective walls parallel to the side and rear boundaries of a site, the distance of any wall from its nearest boundary is not less than that prescribed in the table to this by-law for buildings of the number of storeys indicated in each case:

TABLE 35 (A)

Number of Storeys	Distance from Boundary	
	Feet	Inches
1 to 3	10	0
4	13	4
5	16	8
6	20	0
7	23	4
8	26	8
9	30	0
10	33	4
over 10	35	0

(b) in the case of a building having any wall not parallel to the boundary of the site nearest to it,

(i) the average distance of the wall from that boundary is not less than; or

(ii) the centre point of a straight line drawn from the foremost to the rearmost point of the building on that nearest side is not less than; or

(iii) no portion of the building projects beyond the line mentioned in subparagraph (ii) of this paragraph or is (with a minimum of 10ft.) less than half,

the distance prescribed by paragraph (a) of this by-law, from that boundary;

(c) there is a drying area of at least 20ft. by 20ft. located at the side or rear of the building, for each laundry in the building;

(d) any external walls facing each other and containing windows to habitable rooms are not less than 20ft. apart;

(e) the width of any court or area, having a depth of more than 20ft. and walls fronting from its opposite sides, is at least equal to its depth; and

(f) any window of a habitable room does not face into an enclosed court.

(2) The municipality may prescribe frontages for flats, but a residential flat building shall not be erected on a site with a frontage of less than 66ft.

(3) Subject to the approval of the Minister, the municipality may declare plot ratios and site coverage not exceeding those set out in the following table, and in the case of single person flats, shall declare densities not exceeding 120 per acre.

TABLE 35 (B)

Percentage of Site Coverage	Plot Ratio
33	1
27½	1·1
25	1·2
20	1·25
16½	1·33

In the case of single person flats the plot ratio indicated above shall not apply where the number of flats involved does not exceed 120 to the acre.

36. Site Restrictions Applying to Buildings of Class III.—Residential Buildings—(1) Where the zoning by-laws of a municipality permit the erection of buildings of Class III Occupancy in residential flat areas, those buildings shall comply with the provisions of by-law 35 of these by-laws.

(2) Any residential club or hotel in a business or other area zoned for commercial or similar purposes shall be constructed so that it occupies not more than 66 per cent. of the total area of the site, which has a frontage to one street, 75 per cent. where there is a frontage to two streets, and 80 per cent. where there is a frontage to three streets.

(3) Notwithstanding the provisions of sub-bylaw (2) of this by-law the whole of a site may be occupied by the ground floor of a building therein mentioned if—

(a) no part of that floor is used for sleeping purposes;

(b) natural light is provided in accordance with these by-laws; and

(c) adequate natural or artificial means of ventilation is provided in conformity with Section 10 of these by-laws to the approval of the Surveyor.

37. Site Restrictions Applying to Buildings of Class IV Occupancy.—Dwelling attached to a Building of Another Class.—Any building of Class IV Occupancy shall have constructed therewith for the use of the occupants a space open to the air and without roof, which—

(a) shall have an area of not less than 450 square feet;

(b) may be provided in the form of a flat roof higher than that of the floor of the ground storey; and

(c) shall be of a dimension of not less than 10 ft. in any direction.

38 Site Restrictions for Buildings of Class VI Occupancy (Shops).—A person shall not erect any building of Class VI Occupancy on any site, unless—

(a) the area of the site is not less than 2,000 square feet; and

(b) the width of the frontage of the site is not less than 16 ft. 6 in.

39. Site Restrictions for Buildings of Class I and VI Occupancy (Shops and Private Dwellings Combined)—(1) Subject to sub-bylaw (3) of this by-law a person shall not erect any shop and dwelling house combined unless—

(a) the area of the site is not less than 6,000 square feet; and

(b) the width of the frontage of the site is not less than 49 ft. 6 in.

(2) A shop shall not be built or erected in front of any dwelling unless—

(a) the shop or in the case of two or more shops about to be built or erected, one of those shops is connected to the dwelling so that when completed the whole will form one building and be in one occupation;

(b) the dwelling has a clear uninterrupted frontage of not less than 15 ft. but the municipality may permit the dwelling to be located on the first floor over the shops with an unobstructed frontage and a separate fire isolated staircase for the dwelling leading to the street; and

(c) any lock-up shop is isolated from the combined shop and dwelling and from any other lock-up shop by horizontal and vertical party structures.

(3) A municipality may permit—

(a) a building of Class I Occupancy (Private dwellings) or a shop or a shop and dwelling combined, as the case may be, to be erected on a site smaller in area than in this by-law prescribed, if the site comprises the whole of any lot shown on a plan of subdivision approved by the appropriate authority, prior to the coming into operation of these by-laws; or

(b) a building of Class I or II Occupancy, or a shop and dwelling combined to be erected on a site not less than 4,000 square feet in area which has been reduced below the area prescribed by this by-law by severance due to resumption by the municipality for street widening or other purposes.

(4) A shop having a dwelling attached shall be provided with an open space as required for a private dwelling of Class I Occupancy.

40. Buildings of Class V, VI, VII and VIII Occupancy.—A municipality may permit the ground floor of buildings of Class V, VI, VII or VIII Occupancy to occupy the whole of a site, if lighting is provided in accordance with these by-laws and adequate natural or artificial means of ventilation is provided to the approval of the Council.

41. Rear Access.—Every building of Class VI Occupancy (Shop), or a shop and dwelling combined, or Classes VII or VIII shall be provided with means of access for the removal of rubbish and servicing to every separate tenement, shop, warehouse, or factory within the building and the means of servicing shall be provided in such a manner that every separate tenement or occupancy can be serviced without passing through the front entrance thereof or through any other shop or tenement, or in the case of arcades, through the arcade or street entrance.

SECTION 7.

BUILDING HEIGHT RESTRICTIONS.

42. **Width of Street.**—The width of street is determined by measuring at right angles from the building line at the centre of the frontage of the building to the opposite building line of the street.

43. **Maximum Building Height.**—(1) No portion of any building shall project beyond the continuation of a line drawn from the ground level at the building line on the opposite side of the street to a point at the centre of the building vertically above the building line thereof at a height equal to twice the horizonal distance between those two building lines.

(2) **Frontages to Two Streets of Equal Width.**—The maximum building height in respect of a site having a frontage to two streets equal in width shall be taken from the permanent footpath level at the centre of the frontage to the street at the higher level.

(3) **Frontages to Two Streets of Differing Widths.**—The maximum building height in respect of a site having a frontage to two streets differing in width shall be determined by the wider street for a depth of twice the width of the street from that wider street and by the narrower street for any balance of the depth from the wider street.

(4) **Maximum Heights and Plot Ratios.**—A municipality may, with the approval of the Minister, fix a maximum height and a plot ratio for any portion of its district, but in any event the heights of buildings and plot ratios shall not exceed—

(a) in single occupancy residential districts so designated by the municipality 30 ft. in height and a plot ratio of .33(1/3rd) in the case of a single occupancy dwelling and .5(½) in the case of a duplex house;

(b) in a residential flat district so designated by the municipality, the plot ratio and site coverage set out in Table 35B of these by-laws; and

(c) in any other district the plot ratio of five.

44. **Decorative Features.**—In measuring the height of buildings, ornamental towers, spires, domes, architectural features or decorations, lift machinery rooms, bulkheads, pent houses, overstairs, or other super-structures erected above the main roof of the building, shall not be included but an erection exceeding in width one-fourth of the frontage of the building shall not project beyond the maximum height as prescribed by by-laws 43, 45 and 46 of these by-laws.

45. **Height of Type 1 and Type 2 Construction.**—The maximum height—

(a) in the case of a building of Type 1 Construction is the maximum height permitted by by-law 43 of these by-laws; and

(b) except as provided by by-law 44 of these by-laws in the case of a building of Type 2 Construction is 90 ft.

46. **Height of Other Types of Construction.**—(1) A building shall not be constructed—

(a) of Type 3, 4 or 5 Construction to contain a greater number of storeys than that set out in the Table to this by-law subject to the provisions of by-law 23 of these by-laws; and

(b) of Class IV Occupancy above the first floor in any building of Type 3 Construction.

Table 46

Type of Construction.	Class of Occupancy.	Maximum No. of Storeys.
Type 3 (ordinary construction).	I, II, III, IV, V, VI, VII, VIII, IX	2
Type 4 (unprotected metal construction).	VII, VIII where specially approved by the municipality	1
Type 5.—Wood frame construction (where specially approved by the municipality).	I	2
	VIII	1

(2) **Number of Storeys not to Include Basements.**—The number of storeys referred to in the Table to the by-law does not include a basement, where the ceiling of that basement is not more than 4 ft. above the pavement level at the front of the building.

(3) **Mezzanine Floors.**—A mezzanine floor complying with the requirements of by-law 284 of these by-laws shall not be considered as a storey.

(4) **Height of Storeys.**—For the purpose of the Table to this by-law a storey exceeding 20 ft. in height in a building of any class other than Class IX shall be considered as two storeys.

(5) **Ground Floors in Reinforced Concrete.**—The ground floor of any building of Class V, VI, VII, VIII or IX constructed with a basement shall be of reinforced concrete.

47. **Additional Storeys to Floors of Existing Building.**—Subject to the provisions of Section 30 of these by-laws, additional storeys may be added to a building of Type 3 construction if those floors comply with the provisions of Table 46 of these by-laws.

SECTION 8.

PROJECTION BEYOND STREET ALIGNMENT.

48. **Construction of Projections.**—(1) Except as provided in Section 27 of these by-laws, every coping, cornice, string course, fascia, window dressing, portico, balconette, bridge connecting buildings, balustrade, architectural projection or decoration, where projecting beyond the street alignment, shall be of brick, tile, stone, artificial stone, slate, cement, or other fire-resisting material approved for the purpose by the Council.

(2) A projection mentioned in sub-bylaw (1) of this by-law shall not form part of the structural design of the building.

(3) Eaves, soffits, and barge boards to any overhanging roof, if within 2 ft. 6 in. of any adjoining building or land in other occupation, shall be of fire-resisting materials, unless separated by brickwork at least 9 in. thick, or reinforced concrete 4 in. thick, projecting 4 in. beyond the woodwork.

(4) A pitched roof shall not project over any street or way and any pitched roof within 2 ft. of any street or way shall be protected by a parapet constructed in accordance with the provisions of Section 18 of these by-laws.

49. **Minimum Height above Pavement.**—A projection shall not extend beyond the street alignment at any height less than 9 ft. from the level of the public footway but—

(a) the provisions of this by-law do not apply to footings constructed in accordance with the provisions of by-law 214 or mouldings or shopfronts constructed in accordance with by-law 411 of these by-laws; and

(b) a plinth of a building erected prior to the coming into force of these by-laws not exceeding 2 ft. in height may project 2½ in. beyond the street alignment.

50. **Limits of Projection.**—(1) No part of any projection shall extend beyond the street alignment more than—

(a) 3 ft., in a street exceeding 40 ft. in width; or

(b) 2 ft., in a street 40 ft. or less in width.

(2) A projection shall not be permitted in a street or right-of-way of less than 20 ft. in width.

51. **Window Balconies, etc.**—A balcony, balconette, window or turret shall not project more than 3 ft. beyond the street alignment in a street over 40 ft. in width or not more than 2 ft. in a street from 33 ft. to 40 ft. in width and—

(a) any part of the projection where it overhangs a street shall be not less than 9 ft. above the level of the street and be not nearer than 4 ft. to the centre of the nearest party wall or to any adjoining building or land not in the same occupation;

(b) the aggregate width of any projections shall not exceed one-half of the length of the wall of the building on the level of the floor on which the projections are made;

(c) a projecting window shall not exceed a total overall width of 12 ft. and the distance between any two projecting windows shall not be less than one-half of the aggregate width of those windows;

(d) projecting windows shall not be connected by a balcony having any portion projecting beyond the street alignment;

(e) a projection shall be constructed of fire-resisting materials to the satisfaction of the Council; and

(f) a projection shall not be permitted in a street less than 33 ft. in width.

52. **Timber Window Shutters.**—Notwithstanding the provisions of by-law 48 of these by-laws, louvred window shutters are permitted if they project not more than 2 in. beyond the street alignment when in the fully open position.

53. **Cat Heads.**—Cat heads or hoists shall not project beyond the street alignment.

54. **Service Pipes.**—Service pipes shall not project, unless at least 9 ft. above a public footway and then not more than 8 ins., beyond the street alignment and rainwater heads shall not project more than 12 ins. beyond that alignment.

55. Whenever so ordered by the municipality the owner of any building or premises shall fill up, secure or remove any pavement light, cellar way or opening which is appurtenant to, and under any footway abutting on, that building.

56. **Gates, Doors, etc., Abutting on Street.**—A person shall not construct or hang any gate, door, window, or shutter in such a manner that any part of the gate, door, window, or shutter, when being opened, projects over any street or public way at a height less than 9 ft. above the level of the pavement.

57. **Removal of Obstructions, etc.**—The owner of any building or premises when so ordered by the municipality shall, at his own expense, remove any verandah, balcony or other obstruction used in connection with or appurtenant to that building or premises which obstructs the footway or street or is dangerous, whether the verandah, balcony or other obstruction was erected before or after the commencement of these by-laws.

SECTION 9.

ROOM SIZES AND HEIGHTS.

58. **Minimum Number of Rooms.**—(1) Every building of Class I Occupancy shall comply with the requirements of by-law 401 of these by-laws.

(2) Every building of Class II Occupancy shall comply with the requirements of by-law 402 of these by-laws.

59. **Minimum Size of Rooms.**—(1) Except as provided elsewhere in these by-laws, every habitable room shall have a minimum floor area of not less than 80 square feet.

(2) Every habitable room shall be not less than 8 ft. wide in its minimum dimension, except a kitchen which may have a minimum width of 7 ft.

(3) A kitchenette which is constructed in the form of an annex to a habitable room and separated therefrom by an unobstructed opening not less than five feet wide and seven feet high shall not be deemed to be a separate habitable room.

(4) In buildings of Class I, II and IV Occupancy there shall be one living room with a superficial area of not less than 144 sq. ft. and a minimum width of not less than 10 ft. and one bedroom with a minimum area of not less than 120 sq. ft.

60. **Minimum Height of Rooms in Buildings of Class I, II, III and IV Occupancy.**—(1) The minimum height from floor to ceiling of a habitable room shall be not less than eight feet.

(2) Where a habitable room of less than nine feet in height from floor to ceiling is contained in a building having a roof pitch of less than fifteen degrees, the topmost ceiling of that building shall be insulated by not less than 2 ins. of slag wool fibre glass vermiculite or, alternatively, double faced sisalation, or other material having similar insulating values.

61. **Sleepouts.**—Sleepouts shall comply with the provisions of by-law 76 of these by-laws as regards light and ventilation and shall have an average height of not less than 8 ft., a minimum height of not less than 7 ft., and a floor area of not less than 80 sq. ft.

62. **Minimum Height of Rooms in Office Buildings.**—In a building of Class V Occupancy, the height of any room measured from floor to ceiling shall be not less than 9 ft., in any part.

63. **Minimum Height of Rooms in Shops.**—The height or, where the ceiling is pitched or sloping, the minimum height from floor to ceiling, or if there is no ceiling to the underside of the rafters or underside of floor next above, as the case may be, in every room hereafter constructed or adapted in a building of Class VI Occupancy shall not be less than 10 ft.; but—

(a) in the case of a room not exceeding 450 sq. ft. in area lighted and ventilated in conformity with the requirements of by-laws 74 (a) or 75 of these by-laws the height may be reduced to 9 ft.; and

(b) where the ceiling is pitched or sloping the minimum height in any part shall not be less than 9 ft.

64. **Minimum Height of Rooms in Warehouses.**—The minimum height or, where the ceiling is pitched or sloping, the minimum height from floor to ceiling or, where there is no ceiling, to the underside of the rafters or floor next above, in every room hereafter constructed or adapted in a building of Class VII Occupancy shall not be less than 9 ft., and where the circumstances so warrant, the municipality may require a greater ceiling height or the installation of a system of mechanical ventilation complying with the provisions of Section 10 of these by-laws, or both.

65. **Minimum Height of Rooms in Factories.**—The height or, where the ceiling is pitched or sloping, the minimum height from floor to ceiling or, where there is no ceiling, to the underside of the rafters or underside floor next above, in every room hereafter constructed or adapted in a building of Class VIII Occupancy shall not be less than 9 ft. and the municipality may, on the recommendation of the Chief Inspector of Factories, in any particular case, require a greater height or the installation of a system of mechanical ventilation complying with the provisions of Section 10 of these by-laws, or both.

66. **Public Buildings.**—The size and height of rooms, passages, and corridors in public assembly and institutional buildings shall conform to the requirements of regulations made under Part VI of the Health Act, 1911.

67. **Bathroom and Water Closets.**—(1) Any bathroom shall be not less than 30 sq. ft. in floor area with a minimum width of 5 ft. and every water closet shall be not less than 13 sq. ft. in area.

(2) Where the water closet is contained within a bathroom, the floor area of the bathroom shall be not less than 40 sq. ft.

(3) The height of a bathroom or of a water closet shall be not less than 7 ft. 6 in.

68. **Laundries.**—Any laundry and wash-house shall have a floor area of not less than 50 square feet and the walls of any such building shall be of an average of 7 ft. 6 in. in height from the floor level to the underside of the ceiling, or, if there be no ceiling, to the underside of the rafters.

69. **Basements Used for Storage Purposes.**—Any cellar or basement used for storage purposes only shall have a minimum ceiling height of 8 ft. with a minimum headroom under beams, ducts or other obstructions of 7 ft.

70. **Car Parking Buildings.**—Provision shall be made in car parking buildings for a minimum clearance under beams of 7 feet.

71. **Outbuildings, Garages, etc.**—Any outbuilding or garage appurtenant to a building of another class shall comply as regards size and height with the provisions of Section 24 of these by-laws.

72. **Projections and False Ceilings.**—Notwithstanding anything contained in this section, in buildings of Class II, III, IV, V, VII or VIII Occupancy—

(a) beams, service pipes, or ducts may project below the minimum height prescribed, if the area in plan of those projections does not exceed 20 per cent. of the floor area of the room; with a minimum clear height of 8 ft.; and

(b) false ceilings shall be constructed at a height of not less than 7 ft. 6 in. in lavatory blocks, and at a height of not less than 8 ft. in corridors, passages and recesses, except that in the case of buildings of Class II, III or IV Occupancy, false ceilings may be constructed at a height of 7 ft. 6 in. in corridors, passages and recesses.

73. **Mezzanine Floors.**—Mezzanine floors shall comply with the requirement of by-law 284 of these by-laws.

SECTION 10.

LIGHT AND VENTILATION.

Part I—Special Requirements for Buildings of Certain Classes.

Classes I, II, III and IV Occupancies.

74. Habitable Rooms, Laundries and Bathrooms.—In every building of Class I, II, III or IV Occupancy hereafter constructed or adapted—

(a) every habitable room and enclosed laundry shall—

(i) have one or more windows opening directly into the external air with superficial area clear of sash frames and free from any obstruction to the light equal to at least one tenth of the floor area of the room and so constructed that a portion of such window equal to at least one-twentieth of such floor area is openable; and the opening shall extend to at least 6 ft. 6 in. above the floor level; and

(ii) be provided with air bricks, registers, vents, cowls, or ducts at or near the level of the ceiling and of which the total unobstructed area shall be not less than 24 square inches or 24 square inches for each 100 sq. ft. of floor area, whichever is the greater; and

(b) every bathroom shall be lighted and ventilated in accordance with the provisions of paragraph (a) of this by-law, but a bathroom may be provided with artificial lighting and a system of mechanical ventilation complying with the requirements of Part III of this Section.

75. Common Dining Rooms and Kitchens, etc.—Notwithstanding the provisions of by-law 74 of these by-laws, kitchens and common dining rooms, lounges and similar public rooms in buildings of Class III Occupancy, and catering flats and kitchens of buildings of Class VI Occupancy may be lighted—

(a) by means of roof or ceiling lights having a total superficial area free from all obstructions to the light of not less than one-tenth of the floor area subject to the provision of an approved system of natural ventilation or of a system of mechanical ventilation complying with the requirements of Part III of this Section; or

(b) by means of artificial lighting and air-conditioned ventilation as required by these by-laws.

76. Sleep-outs.—Any specially constructed sleep-out or enclosed verandah attached to a dwelling and complying with the requirements of by-law 61 of these by-laws may be approved if a length not less than that of the longest side is enclosed above a dado which does not exceed 3 ft. 6 in. in height with windows having a height of not less than 3 ft. and not less than 50 per cent. of the windows are constructed with adjustable glass blade louvres.

Class V Occupancy—Office Buildings.

77. General Requirements.—Every room constructed or adapted in a building of Class V Occupancy shall be provided with light and ventilation as prescribed in by-law 74 (a) of these by-laws, except that—

(a) roof or ceiling lights may be substituted for or provided in addition to windows;

(b) no part of the floor of the building shall be distant more than 40 feet, and no part of the building used as an office more than 30 feet, from a clear unobstructed window or skylight; the distance being in each case measured horizontally;

(c) where any part of the floor is at a distance from the nearest window greater than twice the height of the head of the window above the floor that part shall be lighted by roof or ceiling lights or by artificial lighting in conformity with Part II of this Section; and

(d) where roof or ceiling lighting is provided, an approved system of natural ventilation or a system of mechanical ventilation complying with the requirements of Part III of this Section shall be installed.

Class VI Occupancy—Shops.

78. General Requirements.—Every building of Class VI Occupancy, other than an hotel bar, eating house, dining-room or kitchen, hereafter constructed or adapted, shall be provided with natural light and ventilation in accordance with the provisions of by-law 74 (a) of these by-laws, except that—

(a) natural lighting from roof or ceiling may be substituted for lighting from windows;

(b) the clear unobstructed area of the windows or skylights may be reduced to one-twentieth of the floor area, one half of the windows or skylights being openable and so located as to provide effective through-ventilation;

(c) where any part of the floor is at a distance from the nearest window greater than twice the height of the head of the window above the floor that part shall be lighted by roof or ceiling lights or by artificial lighting in conformity with Part II of this Section;

(d) every lock-up shop, the depth of which exceeds twice its width, shall be provided with an approved system of mechanical or induced ventilation, unless through, natural ventilation, approved by the Council, can be provided;

(e) an approved system of mechanical ventilation shall be provided where adequate natural ventilation cannot be provided; and

(f) natural light and ventilation may be omitted, subject to the building being artificially lit in accordance with Part II of this Section, the installation of an approved system of mechanical ventilation or air conditioning complying with the requirements of Part III of this Section and the provision of an auxiliary power plant capable of lighting the building and operating the mechanical ventilating or air conditioning plant.

79. Hotel Bars, Eating Houses and Dining Rooms.—Every bar of a licensed premises and every eating house or dining room shall be provided with—

(a) natural light and ventilation as specified in by-law 74 of these by-laws, except that the required registers, vents, cowls or ducts shall be fixed in the ceiling and carried through above the roof;

(b) natural light as prescribed in paragraph (a) of this by-law and a system of mechanical ventilation or air conditioning complying with Part III of this Section; or

(c) artificial lighting and a system such as is mentioned in paragraph (b) of this by-law.

Class VII Occupancy—Warehouses.

80. General Requirements.—(1) Every room used for the display or sale of goods shall be provided with light and ventilation as prescribed by by-law 78 of these by-laws.

(2) Every room used for bulk storage only shall be lighted in accordance with by-law 78 of these by-laws and shall have, fixed near the ceiling, registers, vents, cowls, or ducts having an effective airway clear of all obstructions of not less than 12 square inches for each 100 square feet of floor area, except that natural ventilation may be dispensed with where a system of mechanical ventilation of a capacity approved by the Surveyor, having regard to the nature of the storage for which such room is intended. is installed.

Class VIII Occupancy—Factories.

81. General Requirements.—Every room in a building of Class VIII Occupancy shall be provided with light and ventilation in accordance with the provisions of any regulations under the Factories and Shops Act, 1920.

Class IX Occupancy—Public Buildings.

82. General Requirements.—Every public building shall be lighted and ventilated in accordance with the provisions of the regulations under Part VI of the Health Act, 1911.

Part II—General Provisions for Lighting and Ventilation.

83. Change of Use.—If the use or occupancy of any building is changed involving a change of class or use, that building shall be altered to provide light and ventilation as required by these by-laws for the use or occupancy to which the building is changed.

84. Artificial Lighting.—Where artificial lighting is required by these by-laws, or is installed in any building, that artificial lighting shall conform with the requirements of the S.A.A. Code, being Item 24 of the Appendix.

85. Minimum Value of Illumination.—(1) The illumination value shall not be less than the lower illumination value set out opposite the description of the particular task in Tables 2 and 3 of the S.A.A. Code, being Item 24 of the Appendix.

(2) Without prejudice to the additional illumination required by the nature of the task, a minimum value of illumination of 5 foot-candles shall be provided over all the working area.

(3) A minimum value of illumination of 2 foot-candles shall be provided for all passages, corridors, stairways, exits and spaces other than working areas.

86. Water Closets.—Water closets and air locks shall be lit and ventilated in accordance with any by-laws made under the Metropolitan Water Supply, Sewerage and Drainage Act, 1909.

87. Sub-floor Ventilation.—Sub-floor ventilation shall be in conformity with the provisions of by-law 286 of these by-laws.

88. Lighting of Corridors, etc.—Any corridor, passageway, stairway or landing shall be provided with natural or artificial lighting and artificial lighting shall be provided in any corridor, passageway, stairway or landing likely to be used at night.

89. Lighting and Ventilation of Basements.—(1) Any basement or room below the level of the street shall be provided with light and ventilation as specified in these by-laws for its class of occupancy, but where the requisite natural light and ventilation cannot be obtained in any basement or room, a system of artificial lighting and a system of mechanical ventilation complying with the requirements of this Section shall be installed.

(2) With the approval of the Council the provisions of this by-law in relation to mechanical ventilation may be modified or remitted in the case of a room used solely for storage purposes.

90. Pavement Lights.—(1) Any pavement light or grating to an area shall be enclosed by solid masonry or brickwork surmounted by a proper stone kerb, and be covered with an approved horizontal iron grating, or be fitted with floor lights not greater than 4in. square or less than $\frac{3}{4}$in. thick set in metal frames, level with the surface of the footway, and secured to the kerbing by being run thereto with lead, zinc or other approved material which shall be maintained in good order and condition, to the satisfaction of the Council.

(2) Subject to the approval of the Council, prisms set in reinforced concrete may be used in lieu of the materials prescribed by sub-bylaw (1) of this by-law.

(3) A light or area shall not extend beyond the building line under the footway in any public street and shall not be more than 6 ft. in length, unless supported by iron or steel or reinforced concrete joists or beams.

91. Skylights.—Any skylight in a verandah or building and the sloping sides of any lantern light shall be glazed in accordance with the provisions of by-law 348 of these by-laws.

92. Exemptions.—(1) The provisions of this Part do not apply to a room used solely as a strong room or for the purpose of storage, in which case the room may, if ventilated by natural or artificial means to the satisfaction of the Council, be built without windows.

(2) Where a strongroom is not frequented by the public, ventilation of that room may be omitted.

Part III.—Mechanical Ventilation.

93. General.—(1) In this Part "air change" means the complete replacement of the air in a room or building by an equal quantity of fresh air drawn from outside the room or building from a source free from contamination and impurity.

(2) A system of mechanical ventilation or air conditioning shall be installed where there is and by reason of there being, no natural ventilation as required by these by-laws.

(3) Where a system of mechanical ventilation is used in place of natural ventilation, the system shall be operated at all times when the area it ventilates is occupied.

(4) The requirements laid down in the Table to this by-law are the minimum capacity of the ventilating equipment which shall be installed.

(5) Re-circulation of air shall not be permitted in the case of bathrooms, sanitary compartments and water closets, garages or rooms where noxious or dangerous fumes or gases are likely to occur, or of kitchens, hospitals for infectious diseases, laundries, dry cleaning establishments, or of any section of a building where the trade or occupation contaminates the air.

(6) Re-circulation of air may be permitted in cases other than those mentioned in sub-bylaw (5) of this by-law if added fresh air is introduced in accordance with the requirements of this Part.

TABLE 93.

Minimum Requirements for Mechanical Ventilation.

Class of Building.	No. of air changes per hour.	Cubic feet per minute per person.	Remarks.
Class V.			
Offices	6	30	
Class VI.			
Shops, including Departmental Stores, Chain Stores, Sales Rooms and Basements	6	—	
Public Dining Rooms and Eating Houses	12	—	
Kitchens and Serveries	30	—	Kitchens and Serveries shall be so ventilated that there shall be no flow of air from such kitchen or servery to other rooms.
Garages and Service Stations	15	—	
Class VII.			
Warehouses	4	—	Additional number of changes per hour may be required having regard to the nature of the contents.
Class VIII.			
Factories	6	30	Where the process being carried out introduces contamination into the atmosphere or is liable to render the atmosphere injurious through heat and excessive moisture, special provisions shall be made to reduce such contamination, heat or moisture.
Class IX.			
Theatres and Auditoriums; Dance Halls	10	30	Installation to be in accordance with the requirements of the regulations under Part VI of the Health Act, 1911.
Special Cases.			
Laundries	15	—	
Bathrooms	—	50*	*Cubic feet per minute per bath.
Sanitary Compartments	10	50*	*Cubic feet per minute per toilet fixture.
Basements, general	6	—	Unless occupancy requires a greater number of air changes.
Hotel Bars	8	—	

94. Sources of Air.—Air for ventilating purposes shall be drawn from the exterior of the building only; any intake being so located that the air entering the system contains no bacteria, dust, odour, toxic substance or moisture other than is contained in the normal exterior air of the locality in which the building is situated.

95. Discharge of Foul Air.—Foul or vitiated air shall not be discharged from a mechanical exhaust ventilating system to any place where it may become a nuisance.

96. Design and Construction.—Any system of mechanical ventilation or air-conditioning used in buildings constructed under the provisions of these by-laws shall be designed and constructed in accordance with accepted good commercial practice.

97. Air-conditioning.—(1) Where an air-conditioning plant is installed at least 12 and one half (12½) cubic feet of fresh air per person per minute shall be provided; but re-circulation of other air may be permitted except in the case of uses where prohibited by by-law 93 (5) of these by-laws.

(2) Any air-conditioning plant shall be tested with regard to conditions of temperature, humidity, and air movement to the satisfaction of the Surveyor.

Part IV.—Light Courts.

98. Definitions.—In this Part unless inconsistent with the context or subject matter—

"angle of light" in relation to any window in a wall of a light court means the angle formed by the vertical plane of the face of that wall and a line drawn from a point in the vertical plane at the level of the lowest part of that window bisecting diagonally a rectangle having for two of its sides the height and the width of the light court.

"height" in relation to a light court means the vertical distance measured—

(a) from the lowest part of the lowest window set in any wall of the light court that admits light through that window to any room or floor; or

(b) where the bottom of a light court is formed by the roof of a storey in which a skylight is set, admitting light to that storey, from the lowest point of the ceiling surrounding that skylight or, if there is no ceiling, then the lowest part of the skylight,

to a horizontal plane at the highest point of the wall opposite that in which the lowest window is set or, where there is no wall opposite, then, of the wall in which that window is set.

"light court" means a court or unoccupied space wholly open at the top and constructed or adapted for admitting light to a building and includes such parts of light courts of an adjoining building abutting on the common boundary of any buildings as will when combined, form a common court if the reciprocal light easements thereover have been permanently created by endorsement on the titles of the land on which the buildings are erected and includes also a street, way or lane over which the building is permanently entitled to access of light.

"totally enclosed court" means a light court enclosed on four sides by the walls of a building and any boundary of the site on which an adjoining owner has the right to build is for the purposes of this Section deemed a wall of the building.

"width" in relation to a light court means the shortest horizontal distance from the face of a wall of that court at the level of the lowest window to the vertical plane of the face of the wall or parapet on the opposite boundary of the light court, or, if there be no opposite wall, to the vertical plane of the opposite boundary of the light court.

99. Required Angle of Light.—(1) Any window abutting on a light court other than a window lighting a corridor, lavatory or sanitary convenience, shall have an angle of light not less than the angle of light resultant from the ratio of height to width of the light court in the Table to this by-law applicable to that window and shall receive unobstructed light from the sky at that angle of light; but where the opposite boundary of the light court on which the window abuts is also the boundary of an adjoining property the window need not receive that unobstructed light but shall be deemed to have the required angle of light if a window at the same light level erected on the opposite boundary of the light court would have the angle of light required under that Table.

(2) The provisions of the table to this by-law shall not apply to windows of buildings of Class III other than those erected in residential and residential flat areas, or buildings of Classes V, VI, VII and VIII which are lighted from a court with a side open to a street or from unoccupied space along the entire length of the side or rear of the building having an angle of light of 2 to 1, if the width of that court is not less than one-half of its depth measured from the face of the building.

TABLE 99.

Class of Building.	Angle of Light.
Buildings of Class I, II, also buildings of Class III erected in residential and residential flat areas	These buildings shall comply with the provisions of Section 6 of these by-laws.
Buildings of Class III other than those erected in residential and residential flat areas, also buildings of Class IV, V and VIII Occupancy	3½ to 1.
Buildings of Class VI and VII	5 to 1.

100. Minimum Widths.—(1) The minimum width of any light court shall be—

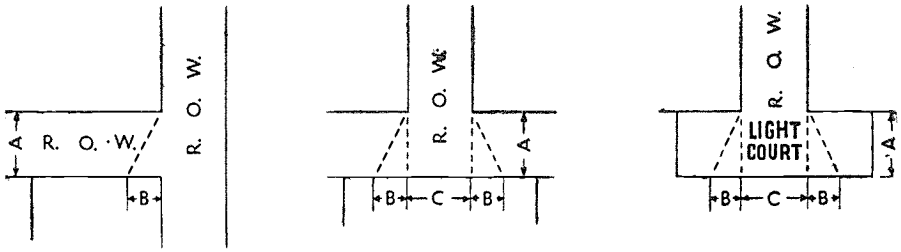
(a) 10 ft. in the case of any building of more than one storey;

(b) in the case of light courts having required windows in one or more walls, not less than such width exceeding 10 ft. as may be necessary to comply with the provisions of Table 99 to these by-laws; and

(c) not less than one-sixth of the height of the light court and in no case less than 10 ft. in the case of a light court lighting a corridor, lavatory or sanitary convenience only, and not containing required windows.

(2) Ventilating ducts serving lavatories and sanitary conveniences which are mechanically ventilated or air-conditioned shall comply with the requirements of any by-laws made under the Metropolitan Water Supply, Sewerage and Drainage Act, 1909.

101. Courts Formed by Streets or Rights-of-Way.—Where a street or right-of-way being a light court abuts wholly or partly on a building and is intersected by or connected with another street, lane or right-of-way at right angles thereto, the Surveyor may permit windows, not having the required angle of light, to be constructed in that section of the wall of the building abutting on the light court and located within a distance of half the width of the light court on one or both sides of the intersecting street, lane or right-of-way.



Illustrating By-law 101.

Distance "B" =½ "A."

Windows in space "B" may be treated as windows in space "C."

102. Ventilation of Totally Enclosed Light Courts.—(1) Where a totally enclosed court, wholly or in part open at the top is constructed or used for admitting light and air to a building of Class I, II, III or V Occupancy and the height of the court from the eaves or top of the parapet to the ceiling at the ground storey exceeds the length or breadth of the court, then ventilation shall be provided by means of—

(a) a system of mechanical ventilation capable of giving six changes of air per hour and designed to introduce plenum air from a clean source and to distribute the air from the bottom of the light court in such a manner as to ensure even distribution over any part of the court pierced by windows, louvres, or vents; or

(b) a flue constructed between the lower end of the court and the outer air having a thoroughway, the least sectional area of which shall measure not less than 5 square feet or one-twentieth of the average horizontal area of the court, whichever is the greater, being not less than 18 in. across in any direction and being constructed in such a manner that it can be cleaned out; but in no case shall the maximum sectional area of the ventilating flue be required to exceed 20 square feet.

(2) Where a court is situated upon an allotment boundary and at the time of construction of the court the walls of buildings on adjoining allotments are not such as to make the provisions of this by-law applicable—

(a) the flue required by paragraph (b) of sub-bylaw (1) of this by-law; or

(b) the system of mechanical ventilation required by paragraph (a) of that sub-bylaw,

shall be provided during construction of the court or approved provision made for future installation of the flue or the system, as the case may be, at such time as the court becomes completely enclosed.

(3) The owner of the building in connection with which the light court is constructed shall, if and when called on by the Council, complete the installation of a system of mechanical ventilation as by this by-law prescribed but ventilation of totally enclosed light courts is not required for light courts of two or less storeys in height.

103. Access to Light Courts.—In any closed court there shall be means of access at the lowest level.

104. Erections in Light Courts.—(1) Vent ducts, flues, service pipes, and erections of like nature are permitted in light courts if they are of fire-resisting materials, but where their combined area exceeds 10 per cent. of the area of the light court, the area of the light court shall be increased by the equivalent of that excess percentage.

(2) For the purposes of this by-law, the area of the erections mentioned in sub-bylaw (1) thereof shall be their horizontal projection between any two floors of a building.

SECTION XI.

MEANS OF EGRESS.

105. Provisions of Exits Generally.—(1) Exit facilities in accordance with the requirements of these by-laws shall be provided in—

(a) every new building hereafter constructed ; and

(b) every existing building to which any major alteration or repair is made or which has its class of occupancy changed if required under the provisions of Section 30 to conform to the requirements of these by-laws.

(2) Where any alteration to an existing building is required, other than by Section 30 of these by-laws, to make it conform with these by-laws, except as to means of egress, then, if in the opinion of the Surveyor the alterations are such as to warrant the provision of additional means of egress, the Council may require the provision of any such additional means as do not exceed the requirements of these by-laws for a new building of a similar class of occupancy and type of construction.

(3) In the case of an existing building or portion of a building which has no adequate alternative means of egress, the municipality may, on the recommendation of the Surveyor and the Chief Fire Officer, require adequate alternative means of egress to be provided.

106. Kinds of Exits.—Exits shall consist of interior stairways, fire-isolated stairways, ramps, horizontal exits, gangways, exterior stairways, passageways and doorways or any of them used either singly or in association with others of them to provide the necessary direct passage to a street, or to an open space leading to a street.

107. Position of Exits.—When more than one exit is required the exits shall be as far apart as practicable and distributed as uniformly as possible within or around the floor area or space they are to serve.

108. Distance to Exits.—(1) Except as provided in sub-bylaw (2) of this by-law, an exit shall be so located that no point in a floor area, room, or space served by it is distant from the exit more—

(a) in the case of a building of high hazard occupancy, than—
  (i) 80 ft. in an unsprinklered building; and
  (ii) 100 ft. in a sprinklered building; and

(b) in the case of a building not of high hazard occupancy, than—
  (i) 100 ft. in an unsprinklered building; and
  (ii) 150 ft. in a sprinklered building.

(2) The distance mentioned in sub-bylaw (1) of this by-law shall be measured from the most remote point to the exit except where a building, not having a high hazard occupancy, is divided into rooms or apartments (as in office or residential buildings), the distance shall be measured from the corridor entrance to any of those rooms to the nearest exit.

(3) In buildings of Type 3, 4 and 5 Construction, an exit shall be so arranged that there is no pocket or dead end in which a person may be trapped.

109. Basements.—Except in a building of Class I Occupancy, every basement shall have direct access to at least two independent exits one of which shall be fire-isolated but—

(a) where the basement is used solely for the housing of mechanical equipment, the non-fire-isolated exit may be in the form of a fixed ladder or steepstair; and

(b) the alternative means of escape is not required where the floor area does not exceed two thousand five hundred (2,500) square feet and a single stairway provided is a fire-isolated stairway.

110. Exits from Buildings of Class I Occupancy (Private Dwellings).—Every building of Class I Occupancy of more than two storeys shall be provided with a fire escape stairway, unless a second internal staircase is provided.

111. Exits from Buildings of Class II and III Occupancy (Flats, Hotels, etc.)—(1) Every room intended for the use of more than 50 persons shall have at least two doorways remote from each other, and each serving as a direct exit or leading to an exit either direct or through another room or rooms through which there is unobstructed egress to an exit.

(2) Every building of two or more storeys shall have alternative exits one of which shall be a fire-isolated stairway.

(3) Additional means of exit shall be provided where the distance of travel exceeds the limits prescribed by by-law 108 of these by-laws and where more than three stairways are required at least two shall be fire-isolated and where more than six stairways are required at least three shall be fire-isolated.

(4) Notwithstanding the provisions of sub-bylaw (2) of this by-law, means of egress shall be provided at a distance not greater than 40 ft. from the end of every corridor and passage.

112. Exits from Buildings of Class IV Occupancy.—Every part of a building of Class IV Occupancy situated above the ground storey shall have direct unobstructed access to a fire-isolated stairway.

113. Exits from Buildings of Class V, VI, VII and VIII Occupancy.—Every building of Class V, VI, VII or VIII Occupancy shall have exits in accordance with the following requirements:—

(a) every building of not more than two storeys in height shall have an alternative means of escape but alternative means of escape may be omitted in buildings of Type 1 or 2 Construction not exceeding 3,000 square feet in area on any floor or of Type 3 Construction not exceeding 1,500 square feet in area on the first floor if the single stair is a fire-isolated stair;

(b) every building of more than two storeys in height shall have alternative means of egress, one of which shall be a fire-isolated stair;

(c) additional means of exit shall be provided where the distance of travel exceeds the limit prescribed by by-law 108 of these by-laws; and

(d) where more than three stairways are required by these by-laws at least two shall be fire-isolated, and where more than six stairways are required at least three shall be fire-isolated.

114. Relation of Population to Exits.—(1) In and for the purpose of this by-law, floor area means the total occupied area within the enclosing wall or partition.

(2) The required total width of exits from any floor area is determined by the number of persons for whose accommodation the floor area is designed or intended, and in no case shall the number of persons be assumed to be less than the number obtained by dividing the floor area by the area per person prescribed in the Table to this by-law.

(3) The number of persons accommodated on a mezzanine floor discharging on to a floor shall be added to the number of persons accommodated on the latter floor.

(4) Where any occupancy is not specified in the Table to this by-law and in any case where the provisions of this by-law are inapplicable or where extraordinary circumstances render its application unreasonable the Surveyor may determine the basis on which the total width of exits shall be calculated.

Table 114.

Maximum Area of Floor Space Per Person to be Assumed in Determining the Number of Persons to be Accommodated by Exits.

Occupancy	Maximum Area of Floor Space Per Person in Square Feet.
Restaurants, Eating Houses and Dining Rooms	15
Retail Shops and Markets—	
(a) Ground floor and sales basements	30
(b) Other floors	60
Office and Show Rooms	100
Warehouses, Bulk Stores, Public Garages and Show Rooms	300
Factories	60

115. Aggregate Width of Exits.—The required aggregate width of exits from any floor shall be sufficient to provide for the number of persons to be served by those exits, on the basis of 3 ft. 4 in. of width for each 100 persons and an additional width of 20 in. for each additional 100 persons or part of that number; except that—

(a) in calculating the number of persons to be served by those exits, there shall be added to the number of persons accommodated on that floor 50 per cent. of the number accommodated on the floor immediately above, 25 per cent. of the number accommodated on the two floors above the last-mentioned floor and 10 per cent. of the number accommodated on the two floors next above, those additional numbers being in each case persons having access to the exits;

(b) the aggregate width of exits shall be increased by 20 per cent. in the case of an unsprinklered building of Type 3 Construction; and

(c) when fire-isolated stairs are required by these by-laws, the total width thereof shall be not less than 50 per cent. of the aggregate width of exits required by these by-laws.

116. Minimum Width of Exits.—Except as required by by-law 406 of these by-laws in the case of residential flats of Class II Occupancy, every exit shall have a minimum width of 3 ft. 4 in. but a stair serving a floor area accommodating not more than 25 persons may be reduced to 2 ft. 8 in. in width.

117. Exits from Buildings of Class IX Occupancy (Public Buildings).—Exits from public buildings of Class IX Occupancy shall be provided in accordance with the requirements of the regulations under Part VI of the Health Act, 1911.

118. **Change of Width of Exits.**—A means of exit shall not be so constructed as to decrease in width, in the direction of travel.

119. **Construction of Stairways Generally.**—Stairways shall be constructed in conformity with the following, that is to say—

(a) **Winders**—the use of winders is prohibited in exit stairways except in buildings of Class I and Class IV Occupancy.

(b) **Treads and Risers**—Treads and risers shall—

(i) be of uniform dimensions throughout;

(ii) be so proportioned that the product of the width of tread, exclusive of the nosing, and the height of the riser in inches shall not be less than 65 nor more than 75; but risers shall not exceed seven (7) inches in height, and treads exclusive of nosing, shall not be less than ten (10) inches wide; but external escape stairs may be of risers not exceeding eight (8) inches in height and treads, exclusive of nosing, not less than nine (9) inches wide.

(c) **Headroom**—Every stairway shall have a headroom clearance of not less than 6 ft. 8 in., measured vertically above any landing or above a line connecting the nosings of the stair treads.

(d) **Landings**—

(i) Except in winders or geometric stairs where permitted, every stair shall have straight flights with half-space or quarter-space landings at intervals of not more than 17 nor less than two risers, but no stair shall have more than 34 successive risers, whether in two or more flights, without a change of direction.

(ii) The length and width of a landing shall be not less than the width of the stairway on which the landing occurs, except that in a straight flight the distance between risers on a stairway shall be not less than 36 in.

(e) **Guards and Handrails**—

(i) Every stairway shall have a wall or a well secured balustrade or adequate guard on each side.

(ii) Every stairway when 40 in. or less in width shall have handrails on at least one side, and when more than 40 in. in width shall have handrails on both sides.

(iii) Where a stairway exceeds 80 in. in width, one or more intermediate handrails continuous between landings, shall be provided, the number and positions of intermediate handrails being such that there shall not be more than 60 in. between any two handrails.

(iv) Handrails shall be fixed at a vertical height of not less than 34 in. above the nosing of the tread and not less than 36 in. above the landing, and shall be so constructed that there will be no obstruction on or above them tending to break a hand hold.

120. **Measurement of Width.**—The width of a stairway shall be measured

(a) where the stairway is enclosed on each side with walls, between the finished surfaces of the walls;

(b) where a stairway has a wall on one side only, between the finished surface of the wall and the inner side of the balustrade; and

(c) where balustrades are provided on both sides, between the inner surfaces of those balustrades.

121. **Space under Stairways.**—Except in the case of a stairway in a building of Class I, II, III or IV Occupancy and in the case of a reinforced concrete stairway, the space under any stairway shall be left entirely open or shall be entirely closed without openings thereto.

122. **Interior Stairways**—(1) **Generally.**—Interior stairways shall conform with the requirements of by-law 119 of these by-laws (construction of stairways generally).

(2) In all buildings exceeding two storeys in height stairways and landings shall be constructed of fire resisting materials.

123. **Fire-isolated Stairways—General.**—Except as in this Section otherwise specified fire-isolated stairways shall conform with the requirements of by-law 119 of these by-laws (Construction of stairways generally).

124. **Construction.**—(1) When a stairway is required to be fire-isolated, the walls, ceilings, floors and doors shall provide complete enclosure of the stairway from the room or space served, to the exterior of the building but—

(a) a stairway on the uppermost storey need not be enclosed except where the stairway is the only means of exit from that storey or where it provides access to the roof of the building; or

(b) where a stairway on the uppermost storey is not enclosed a solid balustrading of incombustible material shall be constructed on that storey to a height of 3 ft. above the level of its floor.

(2) Walls, floors, ceilings and all construction which supports those walls, floors and ceilings or any part of a fire enclosed stairway or exit shall have a fire-resistance rating of two hours except that in Type I Construction the requirements of by-law 25 (2) of these by-laws shall be observed.

(3) Where any exit stairway leading from an upper floor to an exit from the building is continued past the level of that exit to provide access to any lower floor, the continuation shall be assumed to be part of that exit stairway and shall be fire-isolated if the exit stairway is required to be fire-isolated.

(4) Every opening in enclosing walls of a fire-isolated stairway shall conform with the requirements of by-law 343 of these by-laws, except that a door opening on to a street or exterior passageway and not required to be protected pursuant to by-law 346 of these by-laws shall not be required to have a fire-resistance rating.

125. **Electricity and Gas Service.**—Electric or gas service ducts, meters and switchboards shall not be placed or installed within fire-isolated stairways.

126. **Exterior Stairways**—(1) **General.**—Except as hereinafter specified, exterior stairways shall conform with the requirements of by-law 119 of these by-laws (Construction of Stairways generally).

(2) **Substitution for Fire-isolated Stairways.**—Exterior stairways may be substituted for fire-isolated stairways in buildings not exceeding six storeys in height.

(3) **Materials.**—An exterior stairway shall be constructed of metal not less than $\frac{1}{4}$ in. in thickness or of reinforced concrete but in a building not exceeding two storeys in height that stairway may be constructed of jarrah or other approved hardwood not less than $1\frac{3}{4}$ in. finished thickness.

(4) **Openings Protected.**—Any door or window opening on, under or within five (5) feet of a required exterior stairway shall be protected in accordance with the provisions of by-laws 175, 176 and 177 of these by-laws.

(5) **Overhanging Public Space.**—An exterior stairway shall not overhang any public space without the written permission of the municipality and that permission shall not be given in relation to any road other than a back or side lane.

127. **Ramps.**—(1) A ramp shall not be substituted for a stairway unless the ramp conforms to such of the requirements of this Section for stairways as are applicable.

(2) A ramp shall be in straight lengths with a landing having a length and a width at least equal to the width of the ramp situate at each change of direction.

(3) A ramp serving an exit or giving access to an exit shall have a slope not greater than one in eight.

128. **Outgoing Car Ramps.**—The grade of outgoing car ramps from buildings shall not exceed one in twelve for a distance of twelve (12) feet from the street alignment.

129. **Horizontal Exits**—(1) In and for the purposes of this by-law a horizontal exit means the connection by a bridge, balcony, vestibule, or doorway of two floor areas at substantially the same level, those floor areas being located in the same building and entirely separated from each other by a construction having a fire-resistance rating of two hours.

(2) **Clear Width of Parts.**—When vestibules, open-air balconies, or bridges are used as parts of any horizontal exit, they shall be constructed of fire-resisting material and their clear width shall be at least as great as that of the total width of exit doorways opening into them, except that hand-rails may project into this clear width not more than 4 in.

(3) **Gradients.**—In any horizontal exit where there is a difference in level between the connected floor areas, gradients shall not exceed those specified in by-law 127 of these by-laws for ramps; and stairways or steps shall not be used in a horizontal exit in conjuction with a gradient.

(4) **Doors.**—Every opening used in connection with a horizontal exit shall be protected by a door having a fire-resistance rating of two hours and

(a) when located in a fire wall there shall be a door having a fire resistance rating of two hours on each side of the wall, and if practicable a vestibule on one side of the opening; and

(b) those doors shall not have any lock or fastening that would prevent their being opened from either side.

(5) **Exits.**—There shall be at least one exit accessible to or from the space on each side of a horizontal exit.

130. **Gangways.**—A gangway or a bridge may, with the consent of the municipality, be erected over a private lane or right-of-way to connect buildings in the one occupation, but that gangway or bridge shall be constructed of fire-resisting materials and in the case of an enclosed gangway, doors complying with the requirements of by-law 353 of these by-laws shall be provided.

131. **Height of Exit.**—An exit shall have a minimum clear height of 6 ft. 8 in. throughout.

132. **Aisles and Passages.**—Access shall be provided to every exit from each floor by means of continuous aisles or passageways which shall—

(a) be so arranged that the occupants of every compartment shall have convenient access at all times to every exit leading from the floor on which such compartment occurs;

(b) have an aggregate width at least equal to the width required for the exit to which such aisles or passageways discharge, but in no case less than 3 ft. 4 in.; and

(c) be of a height throughout of not less than 8 ft., except, where an aisle or passage passes under a stairway the height of the aisle or passage may be reduced to 6 ft. 8 in.

133. **Doorways.**—(1) Any door of an exit doorway shall be so hung and arranged that when open it does not diminish or obstruct the required width of the doorway, passageway, hallway, stairway, or other means of exit and a swinging door in its swing shall not reduce the effective width of any stairway or landing, nor the effective width of a passageway or hallway to less than the minimum required width.

(2) Any door of an exit doorway shall open in the direction of exit travel, excepting a door in a building of Class I, II or IV Occupancy, or a door serving only a ground floor area of not more than 1,500 square feet, but this requirement does not prohibit the use of a door swinging both inwards and outwards.

(3) Any door abutting on a street shall be so recessed as not to encroach on the public way, but may open inwards if capable of being locked back.

(4) Except in the case of a door the sill of which is not more than 2 ft. above ground level, an exit door shall not open immediately on to a flight of stairs, but shall open on to a landing of which the width shall be not less than the width of the door and the length in the direction of travel shall not be less than 3 ft. or half the width of the door, whichever is the greater, and in no case shall the width of a landing when at right angles to the direction of travel be less than the width of the stair required by these by-laws.

(5) Any door to a fire-isolated stairway shall be self closing, but that door may be kept open by an approved fusible link, if an additional self closing door is fitted in the door opening, in such manner as to cause no obstruction to the stairway when opened and that additional door—

(a) is constructed of hardwood of not less than $1\frac{3}{4}$ in. in thickness or of other material having equivalent fire resisting qualities; and

(b) if glazed, is glazed with a fire resistant glazing having an area not exceeding 30 per cent. of the area of the door.

134. **Door Fastenings.**—(1) A door fastening where fitted—

(a) on any exit door pursuant to the provisions of these by-laws shall be such that the door may be readily opened from the inside, without the use of a key;

(b) on a door across an exit passage shall be such that the door may be readily opened from either side, without the use of a key; and

(c) in any case mentioned in paragraph (a) or (b) of this sub-bylaw, shall be maintained in good repair and working order.

(2) Any door guard, lock, catch, handle, door pull or any similar appliance shall be affixed to the door of any exit in such manner that when the door is in the fully opened position that appliance does not project or to any extent obstruct the exit.

135. **Maintenance of Exits.**—Every exit shall be maintained in an efficient condition and shall at all times during occupancy of the building be kept readily accessible and clear of obstructions.

136. **Safety Devices in Refrigerators, Cooling Chambers and Strong Rooms.**—(1) A refrigerator or a cooling chamber which is of sufficent size to permit the entry of a person shall be provided with a door having a minimum height and width of two feet which can at all times be operated from both sides without the use of a key.

(2) A strong room in any building shall be provided with—

(a) internal lighting;

(b) a pilot light located outside the room but controlled from within the room; and

(c) an approved mechanical bell to be located outside but controllable from within the room.

137. **Loading Docks.**—Every building of Class VI, VII or VIII Occupancy hereafter constructed shall be provided with loading docks and access ways sufficient in size wholly to contain vehicles within the building or on the site occupied by the building and to permit the passage of vehicles from and on to the street, without backing.

138. **Revolving Doors.**—A revolving door may be used in a doorway giving direct access to a street only, but in no case shall a revolving door form part of a means of exit required under these by-laws.

SECTION 12.

MATERIALS AND WORKING STRESSES.

Part I.—Materials.

139. **General Requirements.**—(1) Materials of good quality only shall be used and shall conform with the requirements set out in this Section.

(2) Old or secondhand timber, bricks, iron, steel or other material, unless of equal quality to new material and free from all defects resulting from its age or previous use, shall not be used in the construction of any building.

140. **Clay or Shale Bricks.**—Bricks used in any building shall be wholly sound, hard and well burnt, and in conformity with the S.A.A. specification being Item 34 of the Appendix.

141. Sand lime (calcium silicate) bricks shall comply with the S.A.A. specification being Item 33 of the Appendix.

142. **Pre-cast Concrete and Masonry Units.**—(1) Concrete blocks and sand-cement bricks shall not be used in external, bearing or party walls without the written sanction of the Surveyor and in that event those blocks and bricks shall conform with the requirements of the S.A.A. specification being Item 32 of the Appendix, but a pre-cast concrete masonry unit used in load bearing construction shall not in any case, be of less than 4 ins. in thickness.

(2) Every pre-cast concrete slab shall—

(a) have an ultimate strength of not less than 2,700 lb. per square inch at an age of 28 days and shall be prepared, stored and tested in accordance with the appropriate S.A.A. specifications, being one or the other or both of Items 13 and 18 of the Appendix as the case may be; and

(b) when intended for use in external walls, show an absorption rate not in excess of 8 per cent. of its dry weight when tested for absorption of water in accordance with the S.A.A. specification being Item 10 of the Appendix.

143. **Cast Stone.**—Every cast stone unit intended for structural purposes shall comply with the S.A.A. specification being Item 7 of the Appendix.

144. **Hollow Blocks.**—(1) Every hollow block intended for use in an internal panel wall shall be made of—

(a) concrete complying with the requirements of Item 32 of the Appendix;

(b) well burnt clay or shale; or

(c) gypsum

with an aggregate width of voids (measured horizontally at right angles to the face of the block as laid in the wall) of two-thirds the total thickness of the block and as a quality requirement shall have an average minimum ultimate compressive strength calculated on the gross area as follows:—

	Pounds per sq. in.
Hollow clay or shale blocks	450
Hollow gypsum blocks	75

(2) Where the aggregate width of voids is less than the above ratio of two-thirds, the compressive strength shall be increased proportionately with the additional, actual thickness of material.

145. **Cement.**—(1) Cement shall comply with the S.A.A. specification being Item 2 of the Appendix.

(2) For the purposes of these by-laws, the weight per cubic foot of cement shall be taken as 94 lb., being the contents of the commercial bag of cement (24 to 1 ton.).

146. **Lime.**—(1) The lime used for lime mortar shall be either—

(a) freshly burnt quicklime in conformity with the tentative S.A.A. specification being Item 3 of the Appendix subject to the combined calcium and magnesium oxides being at least 80 per cent., and be properly slaked before being mixed with the sand; or

(b) hydrated lime in the form of fine white powder and in conformity with the tentative S.A.A. specification being Item 3 of the Appendix.

(2) For the purposes of these by-laws the weight per cubic foot of dry powdered hydrated lime is 40 lb.

147. **Sand and Fine Aggregate.**—(1) Fine aggregate for concrete shall consist of clean, hard, strong, durable uncoated grains, free from injurious substances and conforming to the requirements for fine aggregate set out in the S.A.A. code being Item 18 of the Appendix, and sand shall comply with those requirements being Item 43 of the Appendix.

(2) Sand for mortar for brickwork, masonry or plastering shall conform to the requirements for fine aggregate set out in the S.A.A. code being Item 18 of the Appendix except as to the requirements for grading set out in that code.

(3) For the purposes of these by-laws, the weight per cubic foot of sand or fine aggregate shall be taken as 90 lb. except where actual weights per cubic foot of dry sand or aggregate can be ascertained by tests of the material being used in the construction work, in which case the actual weights so ascertained shall be used.

148. **Coarse Aggregate For Concrete.**—(1) Coarse aggregate for Grades "A" and "B" concrete as set out in Table 151A of these by-laws shall conform to the requirements for coarse aggregate set out in the S.A.A. code being Item 18 of the Appendix.

(2) Coarse aggregate for grade "C" concrete shall consist of broken stone, clinker, broken well-burnt brick or terracotta of a maximum gauge of 3 in. and be free of injurious amounts of deleterious matter, honeycombed, weathered or disintegrated stone, flaky or elongated pieces, and dust, and, if considered necessary by the Surveyor, coarse aggregate shall be washed before use.

149. **Water.**—Water used for mixing concrete and mortars shall conform to the requirements for the mixing of concrete and mortars set out in the S.A.A. code being Item 18 of the Appendix.

150. **Mortars.**—(1) Lime mortar shall be made of one part of lime and not more than three parts of sand measured dry by volume, but where in these by-laws the use of lime mortar is permitted, mortar gauged one part of cement to five or less parts of sand measured dry by volume may be substituted for lime mortar.

(2) Composition mortar shall be composed of a mixture of cement, hydrated lime and dry sand in which not less than one part of cement shall be used to every two parts of lime; the mortar shall contain not less than one part of cement-lime mixture to every three parts of sand and sufficient water only shall be used as will render the mixture plastic.

(3) Cement mortar shall be made of one part of cement and not less than three parts of dry sand with an allowable addition of hydrated lime not exceeding 10 per cent. of the cement by weight, the cement and sand being measured dry by volume and as much water only shall be used as will render the mixture plastic.

(4) Before water is added, the other component parts of any type of mortar shall be accurately and separately measured and thoroughly mixed together and mortar containing cement shall be used before initial setting has commenced, and without re-tempering by the addition of further cement, water, or both.

(5) For the purposes of this by-law, sand shall comply with the requirements of Item 43 of the Appendix.

151. Concrete.—(1) Concrete shall—

(a) consist of cement, fine aggregate, coarse aggregate and water conforming with the requirements for such materials set out in by-laws 145, 147 and 148 of these by-laws;

(b) be proportioned preferably by weight, the method of measuring being as set out in the S.A.A. code being Item 18 of the Appendix, but additional materials may be used with the approval of the Surveyor to improve workability if the use of materials in the proportions specified does not detract from the necessity of compliance with paragraph (d) hereof;

(c) be of quaking consistency but not sloppy, the slumps, when tested in accordance with the Australian Standard Method for determination of Consistency of Cement Concrete being Item 13 of the Appendix, being not in excess of those set out in Table 151B of these by-laws; and

(d) be tested for compressive strength 28 days after mixing by Australian Standard Method for making compressive tests on Concrete being Item 18 of the Appendix and where cubes are used for testing instead of cylinders the compressive strength of such cubes for purposes of design shall be considered as 80 per cent. of the strength indicated by such test.

Table 151A.

Grade of Concrete.	Concrete Proportions.			Required Compressive Strength in lb. per square inch.
	Cement.	Fine Aggregate.	Coarse Aggregate.	Concrete.
	lb.	cub. ft.	cub ft.	
A	94	1½	3	2,500
B	94	2	4	2,000
C	94	2½	5	1,700

Table 151B.

Concrete.	Maximum Slump in Inches.
In Sections not thicker than 6 in. requiring forms both sides	6
In columns, heavy sections, beams and slabs	5
In footings	4
If consolidated by vibration method	2

Concrete used in reinforced concrete is required to give a minimum compressive strength at 28 days of 2,000 lb. per square inch.

(2) As a guide, concrete containing 94 lb. of cement, 190 lb. of dry sand, 380 lb. of coarse aggregate or its equivalent by volume, and not more than a total of 5 gallons of water per cubic foot of cement properly mixed, placed and cured should comply with the above requirements.

(3) Concrete of other strengths may be designed and used.

(4) If the structural design is based on an ultimate strength greater than 2,000 lb. per square inch at 28 days, preliminary tests shall be made, prior to the commencement of the work, in addition to making tests at regular intervals of samples taken from the work, to the satisfaction of the Surveyor.

(5) Allowance shall be made for the bulking of fine aggregate in accordance with the Australian Standard being Item 12, appended to the S.A.A. code being Item 18, of the Appendix.

152. **Ready Mixed Concrete.**—Where concrete used in the construction of any building is not mixed on the job, such concrete shall conform to the S.A.A. specification being Item 11 of the Appendix.

153. **Reinforced Concrete.**—Reinforced concrete shall—

(a) consist of concrete as prescribed by by-law 151 of these by-laws and steel or other approved metal reinforcement combined; and

(b) conform to the requirements of Section 21.

154. **Steel.**—Mild steel reinforcements for reinforced concrete and structural steel used in members subject to stress shall comply with the requirements of the S.A.A. specification being Item 1 of the Appendix.

155. **High Tensile Steel.**—High tensile structural steel may be used in special cases where permitted by the Surveyor and that steel shall comply with the requirements of the British Standard specification being Item 41 of the Appendix.

156. **Rivets.**—Rivets shall conform—

(a) as to materials with the requirements of the S.A.A. specification being Item 1 of the Appendix; and

(b) as to form and dimensions with the requirements of the S.A.A. specification being Item 9 of the Appendix.

157. **Bolts and Nuts.**—Bolts and nuts shall conform—

(a) if bright, with the requirements of the S.A.A. standard being Item 17 of the Appendix; and

(b) if black, with the requirements of the Australian Standard being Item 16 of the Appendix.

158. **Cast Iron.**—Any cast iron shall be made of clean, tough, grey iron and shall conform with the requirements of the S.A.A. specification being Item 28 of the Appendix.

159. **Castings.**—Steel castings shall conform with the requirements of the S.A.A. specification being Item 14 of the Appendix.

160. **Electric Arc Welding.**—Electric arc welding shall be in conformity with both the S.A.A. codes being Items 22 and 37 of the Appendix; and electrodes shall conform with the requirements of the S.A.A. specification being Item 15 of the Appendix.

161. **Timber.**—(1) The timber of any structural timber work used in any building shall conform with the requirements and standards as set down in the S.A.A. specification being both Items 27 and 30 of the Appendix.

(2) Jarrah and karri shall conform with Bulletin No. 56-1948, appendices A and B of the Forests Department of Western Australia.

162. **Galvanised Sheets.**—Galvanised (Zinc coated) sheets shall conform with the requirements set out for the appropriate class of sheets in the S.A.A. specification being Item 6 of the Appendix.

163. **Roofing Tiles.**—(1) Cement concrete roofing tiles shall conform with the requirements of the S.A.A. specification, being Item 5 of the Appendix.

(2) Terra cotta roofing tiles shall conform with the requirements of the S.A.A. specification, being Item 4 of the Appendix.

164. Asbestos Cement.—(1) Asbestos cement slates, unreinforced flat sheets and corrugated sheets shall conform with the British Standard specification, being Item 42 of the Appendix, with the exception of dimensions of corrugated sheets, tests for resistance to acidic waters and transverse strength of corrugated sheets.

(2) The minimum average breaking load per inch width of specimen tested in the manner prescribed in the Standard shall be 8 lb. in the case of small sections, and 15lb. for large and angular sections.

Part II.—Permissible Working Stresses.

165. Permissible Working Stress.—(1) Except where prescribed to the contrary in these by-laws, the maximum stresses computed as prescribed by by-law 180 shall not exceed in the case of—

(a) structural steel members, the values prescribed in Section 21;

(b) steel or iron castings, the values prescribed in Section 21;

(c) reinforcing steel, the values prescribed in Section 21;

(d) brickwork, the values set out for the appropriate conditions in the appendix to the S.A.A. code, being Item 36 of the Appendix, but mortar shall be as specified in by-law 150 (1), (2) or (3) of these by-laws and the maximum stresses in the case of brickwork in composition mortar shall be two-thirds of the maximum stresses in brickwork in cement mortar;

(e) reinforced brick masonry, the values set out in Part II of Section 21;

(f) stonework, the values set out in appropriate conditions in the appendix to the S.A.A. code, being Item 36 of the Appendix;

(g) concrete blocks and sand-cement bricks, when laid in cement or composition mortar, values as follows:—
(i) Solid blocks—175lb. per sq. in.; and
(ii) Hollow blocks—70lb. per sq. in. of gross area;

(h) terra cotta blocks, when laid in cement or composition mortar, 70lb. per sq. in. of gross area;

(i) concrete, the values set out in by-law 151 of these by-laws;

(j) foundations—loading on foundations by footings, the values set out in by-law 210 of these by-laws;

(k) timber, with the exception of Jarrah and Karri, the values set out in the handbook, being Item 45 of the Appendix; and

(l) timber, being Jarrah or Karri, the value set out in Appendix "A" of the S.A.A. Grading Rules, being Item 29 of the Appendix.

(2) In the case of materials for which the allowable working stress is not presented in these by-laws, the allowable unit working stress shall be taken as one-quarter of the ultimate strength for metals (other than castings) subject to tension or transverse forces, one-sixth of the ultimate strength for timbers and castings and one-tenth for natural or cast stone.

(3) Gypsum blocks shall not be used to carry any load other than their own weight.

166. Tests.—(1) The builder shall, when required by the Surveyor, cause to be made such of the tests relating to materials set out in the various Australian Standard Specifications and Codes referred to in this Section as the Surveyor may direct and when no applicable Australian Standard Specification or Code exists, the builder shall, when required by the Surveyor, cause such tests to be made as the Surveyor may direct and those tests shall be carried out in the presence of the Surveyor.

(2) Frequent compression tests shall be made, during the progress of the works, of specimens of concrete taken from the place where it is being finally deposited in the work, to enable the Surveyor to ascertain if the concrete conforms with the requirements of these by-laws.

(3) The work may be subjected by the Surveyor to approved analytical tests made from samples taken from placed work, and those tests, if made, shall be made at the rate of not less than one test for each 2,000 sq. ft. of floor area executed in concrete.

SECTION 13.

FIRE RESISTING MATERIALS.

167. **General.**—(1) Materials of construction and any combination of them shall be classified for fire-resistant purposes in terms of hours of resistance to destruction when subjected to the Standard Fire Test, as set out in the British Standard, being Item 39 of the Appendix.

(2) The materials or combinations of materials set out in this section are deemed to have the fire-resistance ratings given.

(3) Materials or any combination of materials, other than the materials mentioned in sub-bylaw (2) of this by-law may be used, if those materials or any combination of them, have a fire resistance rating equal to that required by these by-laws, for the part of the structure in which it is proposed to use them; and it shall not be necessary to submit those materials, or the combination of them, to the Standard Fire Test mentioned in sub-bylaw (1) of this by-law, if the builder satisfies the municipality that they have, in fact, a fire resistance rating of no less than the fire resistance rating prescribed by these by-laws.

(4) The thickness and size of materials, and of any combination of them, prescribed by this section are, in each case, the minimum thickness and size and, in addition, those materials and the manner of their use shall comply, in all respects, with any other provision of these by-laws, in that regard.

168. **Requirements for Materials.**—In order to be given the fire-resistance ratings set out in this section, materials shall comply with the relevant requirements of Section 12 of these by-laws and with the following requirements, namely—

(a) bricks, terra cotta blocks and concrete blocks shall be laid in cement or composition mortar, or in the case of buildings of one storey only, lime mortar;

(b) gypsum blocks shall be laid in gypsum or lime mortar;

(c) expanded metal used as a base or reinforcement for plastering, shall have not less than $2\frac{1}{2}$ meshes per inch;

(d) except where the use of gypsum plaster is permitted, plaster shall consist of cement mortar not less than $\frac{1}{2}$ inch thick and may be finished in gypsum plaster or lime putty if the gypsum plaster consists of not less than two and a half parts of sand to one part of gypsum; and in any case where plastering is required, the thickness of plaster is additional to the thickness of material specified in by-law 170 of these by-laws;

(e) pre-cast concrete for steel encasement shall be in large units with metal re-inforcement equivalent to that specified for concrete encasement of steel work in the S.A.A. code, being Item 18 of the Appendix; and the method of jointing those units shall be approved by the Surveyor. (See also Table 170C); and

(f) where gypsum vermiculite plaster is permitted for a thickness—

(i) up to one inch, the plaster may be applied either in one or two coats, consisting of $2\frac{1}{2}$ cubic feet of vermiculite and, if applied in two coats, then 5 lb. of hydrated lime, for the first coat, to 100 lb. of gypsum plaster; and

(ii) exceeding one inch, the plaster shall be applied in two coats, the first consisting of 2 cubic feet of vermiculite and 5 lb. of hydrated lime to 100 lb. of gypsum plaster, and the second of 3 cubic feet of vermiculite to 100 lb. of gypsum plaster.

169. **Protection of Columns.**—In factories, garages and warehouses and other buildings in which the fire protection covering of columns may be injured by the movement of vehicles, materials or equipment, the Council may require that covering to be protected by metal or other suitable materials.

170. Fire Rating of Materials.—The fire-resistance rating of materials or combinations of materials, when used for the purposes described, shall be as set out in Tables 170A, 170B or 170C and their provisions hereunder.

TABLE No. 170A.

MATERIALS, THICKNESSES AND RATINGS FOR FIRE-RESISTING WALLS AND PARTITIONS.

Material	Construction		Finished Thickness face to face in inches (Including any plaster)			
			4 hrs.	3 hrs.	2 hrs.	1 hr.
Brick, sand-lime brick or concrete blocks	Solid construction no plaster	A	8	8	6	6
		B	8	6	6	4
	Solid construction plastered both sides	B	....	....	5	4
	Solid construction plastered one side	B	....	....	....	3½
	Continuous cavity (two leaves each not less than 4 in. thick)—					
	(*a*) no plaster	A	....	....	10	10
		B	....	10	10	10
	(*b*) plastered both sides	A	11	11	11	11
	(*c*) plastered one side	A	....	10½	10½	10½
Ashlar Masonry	Solid	A	9	9	....	....
Concrete	Reinforced, no plaster (see Note (2))	A	6	5	4	4
		B	....	4	3	3
	Not reinforced	A	8	6	6	6
		B	....	5	4	4
Terra cotta or hollow concrete blocks	Plastered one side	B	....	8½	6½	5½
	Plastered both sides	B	9	7	7	4
Gypsum blocks	Plastered both sides with gypsum plaster	C	....	....	4	4
Plaster on expanded metal	Portland cement plaster or gypsum plaster on expanded metal or wire lath on incombustible studding	C	....	....	....	2½

PROVISIONS RELATING TO TABLE 170A.

1. A—Bearing walls, external and internal and party walls.

   B—External panel walls and internal non-bearing walls, partitions, lift and stair enclosures.

   C—Internal walls only.

2. Thickness includes plaster, if any, in Type A.

3. Where thicknesses in Table include plaster, the thickness of wall material exclusive of plaster shall not be less than the thickness given in Table, less ½ in. for walls plastered on one side or 1 in. for walls plastered on both sides.

TABLE 170B.
DETAILS AND RATINGS FOR FIRE RESISTING FLOORS, ROOFS AND CEILINGS.

Material	Construction	Minimum thickness in inches			
		4 hrs.	3 hrs.	2 hrs.	1 hr.
Reinforced concrete	Cover of reinforcement not less than ½ in.	5	4	4	3
Ribbed floor construction (ribs not further apart than 2 ft. 6 in. face to face)	With fillers of hollow terra cotta, gypsum or concrete blocks—Minimum thickness of fire resisting material, *i.e.* thickness of slab plus thickness of shells	4	3½	3	3
	No fillers—Minimum slab thickness	4½	4	3½	2½
Pre-cast Concrete	Thickness of pre-cast reinforced concrete with concrete laid in situ above, the thickness given being exclusive of cavities and no portion of any concrete or pre-cast concrete being less than 1 in. thick	....	4	4	....
Wood Joist construction	Fire stopped by filling all openings around pipes and flues with incombustible material and covered with double board floor and ceiling of plaster or gypsum plaster on metal or wire lath weighing not less than 2·2 lb. per sq. yd.—				
	Floor thickness	....	....	....	1⅛
	Plaster thickness	....	....	....	¾
Light weight construction	Floor and beam construction consisting of 2 in. reinforced concrete floor on steel units mounted on steel beams, or steel joists or light steel construction carrying 2½ in. reinforced concrete or gypsum slab, in each case having a securely suspended ceiling consisting of expanded metal lath weighing not less than 3 lb. per sq. yard covered with gypsum vermiculite plaster ¾ in. thick, as measured from the underside of the metal lath to the under surface of the plaster ceiling. The upper surface of the metal lath shall not be less than ¾ in. from the steel load-bearing members. The ceiling shall be continuous, but in any 100 sq. ft. it may have duct openings of a total area not exceeding 70 sq. in. spaced not less than 8 in. clear from any load-bearing member, and one electrical outlet. All duct openings shall be protected by approved fire dampers	....	3	....	....
	Floor and beam construction consisting of 2 in. reinforced concrete floor on steel joists or light steel construction, with a securely suspended ceiling consisting of ⅜ in. perforated gypsum lath covered with gypsum-vermiculite plaster ⅜ in. thick. The upper surface of the gypsum lath shall not be less than ¾ in. from the steel loadbearing members. The ceiling shall be continuous but in any 100 sq. ft. it may have duct openings of a total area not exceeding 70 sq. in. spaced not less than 8 in. clear from any load bearing member, and one electrical outlet. All duct openings shall be protected by approved fire dampers	....	....	....	1

TABLE 170C.

FIRE RESISTANCE RATING FOR VARIOUS THICKNESSES OF MATERIALS USED TO PROTECT STRUCTURAL MEMBERS.

Structural Member	Protective Material	Minimum net thickness in inches required to afford fire-resistance ratings indicated		
		4 hrs.	3 hrs.	2 hrs.
Steel Columns (see Notes (1) and (3))	Concrete—			
	Unplastered	2½	2	2
	Plastered	2	2	1½
	Pre-cast concrete (see Note (2))—			
	Unplastered	2½	2	1½
	Plastered	2	1½	1
	Brick	4½	3	3
	Solid concrete block—Grade A or B	4	3	2
	Terra cotta—plastered	4	3	2
	Hollow concrete block—plastered	4	3	2
Steel columns	Sprayed asbestos Gypsum Vermiculite and gypsum plaster (see Note (6))	2	1½	1
Steel beams, girders and trusses	Sprayed asbestos	2	1½	1
	Gypsum Vermiculite and gypsum plaster (see Note (7))	1½	1	1
Combination columns	Concrete cover over face of main steel members (see Note (3))	2	2	2
Reinforced concrete and composite columns	Concrete cover over the main reinforcement (see Note (4))—			
	Unplastered	2	1½	1
	Plastered	1½	1	1
Steel beams, girders and trusses	Concrete (see Note (3) and (5))—			
	Unplastered	2	1½	1
	Plastered	1½	1	1
Reinforced concrete beams, girders and trusses	Concrete cover over main reinforcement including stumps	1½	1½	1

PROVISIONS RELATING TO TABLE 170C.

1. Thicknesses given are the minimum thicknesses exclusive of plaster measured from the face of steel column exclusive of rivet heads. In columns required to have a four hour or three hour rating, re-entrant or other accessible spaces behind the specified outer protection shall be filled with concrete or with the material of the outer protection.

2. Pre-cast concrete for fire-proofing shall have rebated or interlocking joints and sufficient projecting rods or wires to ensure adequate bond to poured concrete. The space between the steel and pre-cast concrete shall be filled with concrete.

3. In Building of Class VI and Class VII Occupancy the thicknesses given in the table shall be increased by ½ in.

4. All structural steel must be covered at least three inches in buildings of Class VI and Class VII Occupancy and two and a half inches in all other buildings.

5. Where the thickness of concrete fire-proofing on the soffit of steel beams and girders is less than one-twelfth of the width of the bottom flange plus one and a half inches, such fire-proofing shall be:—

(a) rammed in from the side, the bottom of the side forms being made removable for the purpose; or

(b) of pre-cast concrete,

6. (i) 4 hours—

$1\frac{1}{2}$ in. gypsum-vermiculite plaster over expanded metal lath weighing not less than 3 lb. per square yard, spaced $\frac{1}{2}$ in. from the faces and edges of the steel by means of 16 gauge steel channels at 24 in. vertical spacings and expanded metal corner beads, the space between the resultant casing and column being not necessarily filled.

$1\frac{1}{2}$ in. of gypsum-vermiculite plaster over two layers of $\frac{1}{2}$ in. gypsum wall-board held by tie wires and wrapped with 1 in. 20 gauge wire netting and expanded metal corner beads, the space between the resultant casing and the column being not necessarily filled.

(ii) 3 hours—

1 in. of gypsum-vermiculite plaster over two layers of $\frac{1}{2}$ in. thick gypsum wall-board held by tie wires and wrapped with 1 in. 20 gauge wire netting and expanded metal corner beads, the space between the resultant casing and the column being not necessarily filled.

(iii) 2 hours—

1 in. of gypsum-vermiculite plaster over one layer of $\frac{3}{8}$ in. perforated gypsum lath held by tie wires and expanded metal corner beads, the space between the resultant casing and the column being not necessarily filled.

(iv) All columns shall be cased solid up to a height of not less than 4 ft. above floor level or to a greater height if liable to damage owing to the type of use for which the building is designed.

(v) Satisfactory provision shall be made for the prevention of penetration of damp or condensation of moisture on the metal surface of all columns and steelwork.

7. (i) 4 hours—

$1\frac{1}{2}$ in. gypsum-vermiculite plaster in accordance with 4 hours rating under Provision (6).

(ii) 3 hours—

1 in. gypsum-vermiculite plaster in accordance with 3 hours rating under Provision (6).

(iii) 2 hours—

1 in. gypsum-vermiculite plaster in accordance with 2 hours rating under Provision (6).

171. Lintels.—Lintels and beams shall have or shall be so protected as to have the same degree of resistance to fire as the walls or floors in which they occur, but steel or iron angles, plates, or bars carrying the outer portions of external walls and structural beams or lintels spanning over openings in walls and partitions of one or two-hour rating, or over openings in walls of Class I or Class II Occupancy are not required to have a fire-resistance rating.

172. Base Structures.—A base structure shall have a fire rating at least equal to that of the portion of the building which it supports.

173. Stairs.—(1) The following materials are permitted for the construction of stairs, other than fire-isolated stairs which shall be constructed of materials having fire-resistance ratings as required by by-laws 25 (2) and 123 of these by-laws—

(a) reinforced concrete;

(b) iron or steel, not less than $\frac{1}{4}$ in. in thickness; or

(c) jarrah or other approved hardwood having a finished thickness of not less than $1\frac{5}{8}$ in. except as provided in by-law 126 (3) of these by-laws.

(2) The following materials are permitted for the construction of ceilings or soffits of staircases:—

(a) $\frac{3}{4}$ in. plaster or gypsum plaster or expanded metal or wire lath;

(b) asbestos cement sheeting of not less than 3/16 in. in thickness;

(c) tongued and grooved jarrah or other hard timber having a finished thickness of not less than $\frac{1}{2}$ in.; or

(d) sheet metal, not less than No. 26 B.W.G.

174. Fire-Retardant Materials.—The following materials are classified as fire-retardant materials:—

(a) for roof coverings—

(i) sheet metal of not less than No. 26 B.W.G.;

(ii) slates;

(iii) terra cotta or cement roofing tiles;

(iv) asbestos cement sheets of not less than 3/16 in. in thickness;

(v) built-up roofing, consisting of successive layers of roofing felt, the final layer consisting of asbestos felt impregnated with tar or asphalt, or other roofing felt impregnated with tar or asphalt and covered with gravel or granulated slate or stone; and

(vi) concrete, granolithic, terrazzo, cement mortar, and other similar incombustible materials;

and

(b) for internal construction—

(i) iron, steel, or copper sheets, of not less than No. 26 B.W.G.;

(ii) asbestos cement sheets having a thickness of not less than 5/32 in.;

(iii) fibrous plaster sheets;

(iv) jarrah boarding dadoes of $\frac{1}{2}$ in. or more in thickness; and

(v) any material specified under paragraph (a) (vi) of this by-law.

175. Fire Doors.—Fire doors are classified as two-hour or one-hour fire doors to be constructed according to this by-law, that is to say—

(a) a two-hour fire door shall be wood-cored metal-clad door complying with the specification for Construction and Installation of Fire Doors of the Fire and Accident Underwriters' Association of Western Australia, comprising Items 8, 39 and 40 of the Appendix, or any other type which will provide equivalent resistance to fire, the spread of fire and smoke, and transmission of heat when subjected to the Standard Fire Test, mentioned in by-law 167 (1) of these by-laws, and which is otherwise suitable;

(b) a one-hour fire door shall be a hollow metal or a metal-clad door, capable of providing a resistance of one hour to fire, to spread of fire and smoke, and to transmission of heat when subjected to the Standard Fire Test, referred to in paragraph (a) of this by-law and conforming with the specification of the Fire and Accident Underwriters' Association of Western Australia, comprising Items 8, 39 and 46 of the Appendix;

(c) where a one-hour fire door is required by these by-laws, a properly framed solid or solid-core hardwood door of not less than $1\frac{3}{4}$ in. finished thickness, and of scantlings in no case less than $3\frac{5}{8}$ in. x $1\frac{5}{8}$ in. in sectional area, is permitted;

(d) where a one-hour fire door is required by these by-laws, a door having a higher fire rating may be used in lieu thereof;

(e) except as provided in by-laws 340 and 342 of these by-laws and in special circumstances approved by the Surveyor, an opening protected by a fire door shall not exceed 56 square feet in area;

(f) where, in these by-laws, glazing is permitted in fire doors, that glazing shall not exceed two square feet in superficial area, shall be secured with metal beads, and shall consist of—

(i) wired glass, not less than $\frac{1}{4}$ in. thick; or

(ii) electro-copper glazing not less than $\frac{1}{4}$ in. thick, the area of each individual pane being not more than 16 square inches;

and

(g) any fixing, frame, sill, fastening, or other detail of a fire door shall be in accordance with the specification for Construction and Installation of Fire Doors of the Fire and Accident Underwriters' Association of Western Australia, being Item 46 of the Appendix.

176. **Fire Windows.**—(1) One-hour fire windows shall be constructed of—

(a) electro-copper glazing or steel-framed windows glazed with wired glass, complying with the specification for Construction and Installation of Fire Windows and Electro-Copper Glazing of the Fire and Accident Underwriters' Association of Western Australia, being Item 48 of the Appendix; or

(b) glass masonry assembled, constructed, and installed in accordance with the specifications of the Fire and Accident Underwriters' Association of Western Australia, being Item 48 of the Appendix.

(2) Two-hour fire windows shall consist of two one-hour windows built into the one opening, with an air space between them.

(3) An opening protected by a fire window shall not exceed 56 square feet in superficial area.

(4) A one-hour wire glass skylight shall be similar in construction and glazing to a fire window, and shall be supported on a steel or concrete kerb and a skylight opening shall not exceed 100 square feet in superficial area.

(5) Any fixing, frame, sill, fastening, or other detail of a fire window or skylight shall be in accordance with the specification for Construction and Installation of Fire Windows, Electro Copper Glazing, and Wired Glass Skylights of the Fire and Accident Underwriters' Association of Western Australia, being Item 48 of the Appendix.

177. **Fire Shutters.**—A fire shutter shall be a tin-clad, steel-clad, iron or steel gauze shutter or a steel interlocking roller shutter complying with the specification for Construction and Installation of Fire Shutters of the Fire and Accident Underwriters' Association of Western Australia, being Item 47 of the Appendix.

SECTION 14.

LIVE AND DEAD LOADS.

178. **Buildings to be Designed for Loading.**—Every building and every portion thereof shall be designed to withstand the forces of, and to support the whole of, the loads both live and dead to which it is subject, without exceeding the stresses allowed for the various materials elsewhere in these by-laws.

179. **Loading Notice Plates.**—In a building of Class VI, VII, or VIII Occupancy a notice conforming with the requirements of by-law 7 of these by-laws shall be kept posted on each floor stating the safe live loads which that floor has been designed to carry safely.

180. **Determination of Dimensions of Structural Members.**—The method of determining the dimensions of structural members shall, except where prescribed to the contrary in these by-laws—

(a) in the case of a reinforced concrete structural member, be in conformity with the S.A.A. code, being Item 18 of the Appendix;

(b) in the case of a structural steel member, be in conformity with the S.A.A. code, being Item 36, the S.A.A. code, being Item 22 or the S.A.A. Interim being Item 37 of the Appendix, whichever is applicable;

(c) in any case not provided for in the S.A.A. Codes specified in the preceding paragraphs of this by-law admit of a rational analysis and be in accordance with the established principles of mechanics and structural design; and

(d) in the case of a timber member, be in conformity with the Handbook of Structural Timber Design, being Item 45 of the Appendix, or, in the case of Jarrah and Karri, Australian Standard grading rules, being Item 29 of the Appendix, so far as that Item is applicable.

181. **Live Loads.**—The minimum live load for which a building or portion of a building may be designed shall be the load specified in the S.A.A. code, being Item 35 of the Appendix, for the particular occupancy or for the occupancy most closely resembling that occupancy, but if the actual live load to be imposed thereon exceeds the load specified in that code, the design shall provide for the actual live load.

182. **Impact.**—(1) In the design of any structure carrying machinery, cranes, conveyors, or any other apparatus liable to set up vibration or to cause impact effects, 20 per cent., or such greater allowance as the circumstances may require, shall be added to the stresses due to the effect of the static load.

(2) In the case of a building subject to heavy shocks the live load shall be calculated in such manner as the Surveyor may determine.

183. **Live Load Reduction.**—In designing structures, reductions in live loads may be made in conformity with the provisions of the S.A.A. code, being Item 35 of the Appendix.

184. **Weight of Materials.**—(1) The weight of materials actually employed in the structure under the provisions of these by-laws shall be determined from the material delivered on the site for use in the building; and shall not exceed those used in the design, without the approval of the Surveyor.

(2) The weights of materials given in the S.A.A. code being Item 35 of the Appendix shall be taken as a guide only.

185. **Partitions.**—A partition or other structure superimposed on a floor may be included in the live load provided the weight of the partition or other structure per square foot of base does not exceed the permissible live load per square foot of floor area and where the type and weight of a partition or other structure has not been determined, provision may be made in the design for an estimated weight and any partition subsequently erected shall not exceed that estimated weight.

186. **Maximum Loading during Construction.**—The maximum stress imposed on any part or member of a structure, during the course of erection, shall not be more than 25 per cent. in excess of the working stress specified in these by-laws.

187. **Wind Loading.**—Any building or part of a building exposed to wind pressure shall be designed to resist safely any wind load, both during erection and after completion.

188. **Temperature Effect.**—In a special case, such as a long span roof truss, provision shall be made for expansion and contraction.

189. **Expansion Joints.**—Where a building is divided into sections by expansion and contraction joints, each section shall be considered separately with regard to wind pressure, unless the sections are suitably anchored together.

190. **Load on Roof Covering.**—Any roof covering which is required to support loads incidental to maintenance shall be capable of carrying the following loads on any one square foot that is to say, where—

(a) the roof is flat or the slope is such that workmen could stand directly on the roof—200lb.; and

(b) the slope is such that workmen would have to use a ladder or similar support laid on the covering—100lb.

SECTION 15.

PRECAUTIONS DURING BUILDING OPERATIONS.

191. **Commencement of Work.**—A builder shall not commence to erect, or proceed with any building work or alteration to, or demolition of, a building or to make any excavation or carry out any underpinning, until the plans covering the work have been lodged with the Surveyor and a license issued for such work in accordance with the requirements of Section 3 of these by-laws.

192. **Protection of Public and Provision of Protective Hoarding.**—(1) Where a building is to be constructed or demolished near or adjacent to the building line of any street or footway, precautions shall be taken by the builder to ensure the safety of the public using the street or footway and particulars of the precautionary measures to be taken shall be submitted to, and approved by, the Surveyor before any work is commenced.

(2) A builder shall not commence to make any excavation near or adjacent to any street or footway or do any act whereby that street or footway may be obstructed or rendered dangerous or inconvenient to the public, until he has obtained from the municipality a license, and a hoarding license in the form of Form 9 in the First Schedule to these by-laws, signed by

the Surveyor, and has erected a proper hoarding or fence, to the satisfaction of the Surveyor, together with, if required, a platform and hand railing to serve as a suitable footway or traffic way.

(3) Where any hoarding or fence has been erected pursuant to this by-law, the builder shall—

(a) cause the hoarding or fence to be—

(i) maintained in good condition;

(ii) painted, if so required by the Surveyor;

(iii) so lighted during the hours of darkness as to be readily visible; and

(iv) removed, upon the completion of the building work in respect of which it was erected, or as soon as practicable, either before or after the completion of that work:

(b) take such further or other precautions for the safety or convenience of the public, as the Surveyor may require; and

(c) upon the removal of the hoarding or fence, cause any damage to the adjoining street or footway to be made good, to the satisfaction of the Surveyor.

(4) A builder shall not cause or permit any hoarding or fence to encroach over the building line, without a license issued for that purpose by the municipality and then only to a distance not exceeding half the width of the footway, at pavement level but that hoarding or fence may, and when required by the Surveyor shall, extend to the kerb alignment or such other alignment as may be determined by the Surveyor, if constructed in the form of a gantry being—

(a) not less than nine feet above the pavement level;

(b) floored or so covered, over the area of the encroachment, as to provide protection to passengers on the footway; and

(c) if used by the builder as working space, provided with a closely boarded or other approved balustrade.

193. Protection of Workmen.—The builder shall make due provision for safe working throughout any building operation, so that a workman is not subjected to unnecessary risks or danger and shall put into effect, at his own expense, any further precautionary measures which the Surveyor may deem necessary.

194. Scaffolding.—(1) Where a scaffolding is necessary for any building operation, the footway or ground adjacent to that scaffolding shall be covered and be kept covered, to the satisfaction of the Surveyor, until the completion of the work, so that a person may not be endangered or inconvenienced by falling materials; the covered working space referred to in by-law 192(3) of these by-laws is a compliance with the requirements of this by-law.

(2) The scaffolding shall be erected in conformity with the requirements of the Scaffolding Act, 1924, and the regulations prescribed under that Act, and be maintained to the satisfaction of the Surveyor and any other person having constituted legal authority over that scaffolding and shall be removed as soon as possible after completion of the work requiring its use.

(3) Where scaffolding has been erected over or upon a public footway that footway shall, upon the removal of the scaffolding, be reinstated, and all damaged portions made good or renewed to the satisfaction of the Surveyor.

195. Protection of Adjacent Property.—(1) Where an excavation or demolition is to be made in proximity to an existing building, the walls of that building shall be shored, or underpinned or both and be so protected as may be necessary to ensure stability.

(2) Where the foundation of an existing building is of material likely to become unstable as a result of the excavation of adjoining ground, additional precautions, to the satisfaction of the Surveyor shall be taken to ensure its stability.

(3) Whenever any part of the foundation of a building to be altered or erected, is, or is to be, below the foundation of an adjoining building, as provided in by-law 213 of these by-laws the foundations of that adjoining building shall be underpinned in accordance with the provisions of section 391 of the Act, and in conformity with the requirements of by-law 231 of these by-laws.

196. Protection of Excavation.—Every excavation for a building shall be properly guarded and protected and shall, where necessary, be sheetpiled so as to prevent caving in of the adjoining earth or pavement and in any case required by the Surveyor, sheetpiling of an approved type shall be utilised to protect the subsoil from damage by scour of subsoil or surface waters.

197. Demolition of Buildings.—Any person demolishing or removing any building or part of a building shall—

(a) unless otherwise approved by the Surveyor, completely remove storey after storey;

(b) not, unless permitted by the Surveyor, place upon a floor of the building any materials being removed, but shall lower those materials to the ground immediately upon their being displaced and thereafter remove them from the site;

(c) not demolish any part of an external wall abutting on a street or road, except during such hours as the Surveyor may permit;

(d) not cause or permit any materials to be thrown on to any street or right of way; and

(e) cause any displaced material to be kept sprayed with water in such manner as will tend to prevent any nuisance from dust.

198. Alterations to Buildings.—Where any alteration is to be made to a building, every portion of the building likely to become structurally insecure, by reason of the alteration, shall be adequately shored up and supported.

199. Storage of Materials.—(1) A builder shall not deposit or store any material whatsoever on a public street, footway, or other public ground, except for the purpose of immediate transportation of that material onto the building site or ground being used for the purposes of building operations and the deposit and transportation shall be carried out as expeditiously as possible, and at such times, as in special circumstances, the Surveyor may direct, so as to cause the least possible obstruction to the traffic on the street or footway, and with due precautions for the public safety and convenience.

(2) Any part of the street or footway for which the builder has procured a license for use and enclosure by a hoarding shall be deemed part of the building site for the purposes of this section of these by-laws, for the period covered by that license.

200. Height of Walls during Construction.—Until such time as roof or floor ties or cross walls are in position, a wall or portion of a wall shall not be built to a height greater than 5 ft. or six times its thickness, whichever is the greater, unless it is supported by temporary shores, proper scaffolding or buttresses, at intervals of length not greater than 30 times the thickness of the wall.

SECTION 16.

DAMPNESS AND DRAINAGE OF SITE.

201. Land Liable to Flooding.—A building shall not be constructed upon any land defined by the municipality as being liable to flooding or inundation.

202. Land Without Proper Means of Drainage.—A building intended or adapted for use, either wholly or partly, for residential purposes, shall not be constructed upon land which cannot at all times be efficiently drained, by gravitation, into some adjoining street, channel, or drainage easement on to, through, or over which such drainage may lawfully be discharged.

203. Drainage of Subsoil.—Wherever the Surveyor considers such action necessary the subsoil of the site of every new building shall be effectively drained by means of suitable earthenware subsoil drains, properly laid to an approved outfall, and where possible those drains shall be connected to the municipality's stormwater drains.

204. Stormwater Drains.—(1) Any new building or existing building being altered shall be provided by the builder, to the satisfaction of the Surveyor, with a complete and effective system of stormwater drains capable—

(a) where roof drainage is required under by-law 291 of these by-laws, of collecting any stormwater discharged from the roof of the building;

(b) where required by the municipality, of intercepting and collecting any storm or surface water from the site on which the building is or is to be erected; and

(c) of conveying any storm or surface water to some point where it may lawfully be discharged.

(2) The drains mentioned in sub-bylaw (1) of this by-law shall be constructed—

(a) of cast iron, brick, stone, salt-glazed earthenware or other material approved by the Surveyor;

(b) to regular falls and be at every point of sufficient capacity to carry the whole of the water collected; and

(c) if its line crosses any public footway, in conformity with the requirements of the Surveyor.

(3) Any downpipe, connected to a drain for the collection of roof water and exposed within a building, shall be constructed of cast iron or of sheet metal of not less than 24 B.W.G.

(4) Any downpipe inside a building and being encased in such a manner as to be inaccessible, shall be of copper, wrought iron, cast iron, or other approved non-corrodible material.

205. Seepage to be Diverted.—Any seepage shall be diverted from a retaining wall or a brick or concrete fence, in a manner approved by the Surveyor but in no case shall seepage be discharged on to a public foopath.

SECTION 17.

EXCAVATIONS, FOUNDATIONS AND FOOTINGS.

206. Depth of Foundation Excavation.—(1) Notwithstanding the provisions of by-law 210 of these by-laws, excavations for footings shall be taken to such depth as will, in the opinion of the Surveyor, ensure that the foundation can effectively support the loads imposed thereon by the structure.

(2) A footing shall not be founded less than 12 inches below the ground surface.

207. Inspection of Excavations.—Twenty-four hours' notice shall be given to the Building Surveyor, of intention to place footings.

208. Retaining Walls.—Any permanent excavation with a slope steeper than the angle of repose or natural slope of the soil shall have retaining walls of masonry or reinforced concrete of sufficient strength and stability to retain the embankment together with any surcharged loads.

209. Removal of Water from Excavations.—(1) Water shall be removed from excavations before concrete is deposited, unless otherwise directed by the Surveyor and any flow of water into the excavation shall be diverted through proper side drains to a sump, or shall be removed by such other approved method as will avoid washing the freshly deposited concrete.

(2) Water and vent pipes and drains, if left in position, shall be filled by grouting, or other means, after the concrete has thoroughly hardened.

210. Loading on Foundations.—(1) The maximum loading per square foot which any footing shall be permitted to transmit to its foundation shall—

(a) where the bearing capacity of the foundation has not been tested, be not more than the allowable loading shown in the Table to this by-law for the particular material comprising the foundation;

(b) where the bearing capacity of the foundation has been tested, be not more than the bearing capacity disclosed by that test as prescribed in Civil Engineering Code of Practice, as comprised in Items 50 and 51 of the Appendix, with a factor of safety of 2; and

(c) where the Surveyor has reason to doubt the bearing capacity of the ground be not more than 66⅔ per cent. of the loads authorised by paragraphs (a) and (b) hereof, if he so directs.

(2) Any value fixed under this by-law shall not be greater than the safe bearing capacity.

(3) Table No. 210 hereunder gives the maximum permissible loads in various subsoils, as a general guide to their safe bearing capacity, but the designer shall be responsible, on consultation with the Surveyor, for providing such trial holes, loading tests, or other measures, as may be necessary to ascertain the safe bearing load of the ground concerned.

(4) Intermediate values and values for other materials shall be determined in consultation with the Surveyor and the pressures given in the table to this by-law may be exceeded by an amount equal to the weight of material in which the foundation is bedded and which is displaced by the foundation itself, measured downwards from the final, finished, lowest adjoining floor or ground level.

TABLE 210.

TABLE OF SAFE BEARING CAPACITIES FOR SOILS.

Type of Soil	Tons per Sq. Ft.	Remarks
Made Ground	....	To be determined after investigation.
Alluvial soil	½	
Clay or loam with high clay content—		
(a) permanently dry	3	
(b) damp clay	2	
(c) soft or wet clay	1	
Loam with low clay content—		
(a) permanently dry	4	
(b) damp	3	
(c) wet	2	
Sand—		
(a) very wet sand where scour is prevented	2	
(b) dry firm sand	2⅔	
Local dune limestone or soft sandstone	1 to 6	Value depending on porosity and quality.
Shale rock	8	In thick beds safe from shear failure.
Hard sandstone and igneous rock	20 to 40	Subject to approval and depending on type of rock, location, etc.

211. Pile Foundations.—(1) Where the maximum safe bearing capacity of the ground is inadequate to support any portion of a building, that building or portion thereof may be supported on a suitable pile foundation.

(2) Should a pile foundation be required that foundation shall comply in all respects with the recommendations of Part 3 of the Civil Engineering Code of Practice (British), No. 4 (1954)—Foundations, and further, the Surveyor may select one or more piles for testing in accordance with the procedure recommended in that code.

212. Foundations and Footings.—(1) Every building shall have a complete and properly designed footing or system of footings constructed of concrete, reinforced concrete, steel grillages encased in concrete, or piles of approved steel, timber or reinforced concrete, capable of transmitting the whole of the dead, live and wind loads from the building in such a manner that the allowable bearing pressure on the foundations beneath the footings in no place exceeds that permitted by by-law 210 of these by-laws, and the stresses in the materials of the footings do not exceed those permitted for such materials pursuant to Section 12 of, or as required elsewhere by, these by-laws.

(2) Footings of brick or stone may be substituted for concrete in buildings of Type 3 construction not exceeding one storey in height, erected on foundations of firm dry sand.

(3) Where a wall has a continuous footing which is not suitably reinforced, the minimum width and depth of that footing shall be—

(a) width—at least 8 in. wider than, or one and one-half times the thickness of, the wall resting upon it, whichever is the greater, and the thickness of the wall shall be measured at the ground floor level and the footing shall extend equally on each side of the wall except where it adjoins a boundary or another wall; and

(b) depth—so that the diminution of the footing is formed in regular offsets and the height from the bottom of the footing to the base of the wall shall be at least equal to one-half the thickness of the wall at its base, but not less than 9 in. in the case of brick or concrete and 12 in. for stone.

(4) In any pier or column foundation designed as a rigid footing, the centroid of pressure of each footing shall reasonably coincide with the centre of gravity of the load supported by the footing.

213. **Levels of Footings.**—(1) Where two footings of a building abut or touch one another, the underside of the footings shall be placed at the same level, unless otherwise permitted by the Surveyor; but where the footings do not abut or touch one another, the difference of level, between the underside of the one footing and the underside of the other footing, shall not exceed the shortest horizontal distance between the two footings, or such other difference as the Surveyor may, in any circumstance, direct.

(2) The underside of the underpinning of an adjoining building wall shall be a footing within the meaning of this by-law.

(3) Nothing in this by-law shall prevent the gradual stepping of footings where in long lengths.

214. **Projection of Footings.**—A footing shall not project beyond the street alignment except that where the top of the footing—

(a) is more than 2 ft. 6 in. and less than 10 ft. below the pavement level, the footing may extend 12 in. beyond the street alignment; and

(b) is 10 ft. or more below the pavement level the footing may extend 30 in. beyond the street alignment.

SECTION 18.

WALLS AND PARTITIONS.

Part I.—General Provisions.

215. **Materials.**—Every building shall be enclosed with external walls of brick, masonry, concrete, reinforced concrete or other hard incombustible material, except as otherwise provided in these by-laws.

216. **Wood and Brick and Feature Walls.**—An external wall of a building of Class I Occupancy shall not be deemed to contravene the provisions of by-law 215 of these by-laws by reason only of the fact that it incorporates a portion or feature of material other than brick, masonry, concrete, reinforced concrete or other hard incombustible material if—

(a) the area of the portion or feature is not greater than one quarter of the area of the exposed portion of the wall, excluding gables, above floor level and inclusive of windows set in the wall; and

(b) the portion or feature incorporates timber framed construction, sheeted externally with asbestos, timber or marine grade plywood complying with the S.A.A. specification, being Item 31 of the Appendix or other similar durable material approved by the municipality and having a "U" factor of not more than .3 which is for the purpose of this by-law deemed to be the equivalent of 9 in. brickwork.

217. **Hollow Masonry Blocks.**—Hollow masonry blocks shall not be used in bearing walls except in a building of one storey.

218. **Wall Fulfilling more than One Function.**—Where any wall is required to fulfil more than one of the functions specified in these by-laws, it shall be constructed in accordance with the highest standard prescribed, in any respect of each of those functions.

219. **Permissible Tolerance.**—A tolerance of $\frac{1}{4}$ in. is permitted in each $4\frac{1}{2}$ in. of thickness for variation of brick sizes, but this tolerance does not apply to foundation widths.

220. **Framing into Walls.**—Where structural steel beams or other metal members frame into an external, party, or fire wall, the ends shall have protection against fire appropriate to the rating specified for the wall and where wooden joists, beams or other combustible members frame into any such wall, the ends shall not project beyond the centre line of the wall, and shall be not less than $4\frac{1}{2}$ in. from members framing into the opposite side of the wall.

221. **Expansion Joints.**—Expansion joints shall be provided in any masonry wall continuing for a distance of more than 100 ft., and in any concrete or reinforced concrete wall continuing for a distance of more than 80 ft. without a set-off greater than three times the thickness of the wall.

222. **Facings.**—(1) Facings or veneerings shall consist of—

(a) stone or synthetic stone not less than 2 in. thick;
(b) architectural terra cotta not less than 4 in. thick;
(c) ceramic veneer not less than 1 in. thick;
(d) flat tiles not less than 1 in. thick; or
(e) other approved materials.

(2) Each unit of facing used on the outer face of reinforced concrete or masonry walls shall be tied to the structural walling with substantial non-corrosive metal wall ties; except in the case of tiles having a thickness of less than 1 in. which may be used in lieu of facings to a height not exceeding 11 ft. from the level of the footpath.

(3) Facings required to contribute to the strength of a wall—

(a) shall be not less than 4 in. in thickness in every part;
(b) shall be built concurrently with the wall and bonded into the backing for not less than 4 in., every third course;
(c) shall have an ultimate compressive strength equal to or greater than that of the masonry wall to which they are bonded; and
(d) may be considered as part of the wall in computing the thickness and strength of the wall.

(4) In computing the strength or thickness of a wall, facings shall not be considered as part of the wall, unless the provisions of sub-bylaw (3) of this by-law are observed.

(5) In the case of facings 2 in. or less in thickness, horizontal chases at not more than 18 in. centres shall be provided in the structural walling and vertical steel rods not more than 16 in. apart secured to non-corrosive metal anchors shall be built into the walling and the facings shall be filled in solid at the back, with cement mortar.

(6) In the case of tile facings on reinforced concrete walls, open or mastic joints shall be provided at intervals of not more than 5 ft., both horizontally and vertically.

(7) Where necessary, additional fixings for the support of facings and flashings to prevent moisture penetrating behind the veneer, shall be provided to the satisfaction of the Surveyor.

223. **Facing to Internal Wall Surfaces.**—The backing of any timber panelling upon the surface of an internal wall shall be filled in solid with non-inflammable material or adequately firestopped to prevent the spread of fire behind the panelling.

224. **Structures Above Level of Roof.**—Notwithstanding anything contained in Section 5 of, or elsewhere in, these by-laws, structures not exceeding 10 ft. either in length or in width and not exceeding 8 ft. in height and intended for the protection of ventilating machinery, or for a like purpose, may be constructed above the level of the roof of a building of Type 1, 2 or 3 Construction, with external walls of masonry not less than 4 in. in thickness, and with a roof of impervious material.

225. **Arches and Lintels.**—(1) Arches shall be constructed of masonry or reinforced concrete, shall be well built and keyed, and shall have good and sufficient abutments, for their purpose.

(2) A lintel shall be of stone, reinforced concrete, reinforced masonry, or of iron or steel of approved sections, but in the case of internal walls, precast gypsum lintels may be used.

(3) Re-inforced brick lintels shall be built in accordance with Part II of Section 21 of these by-laws.

(4) Where steel angles are used for lintels, in external walls, the masonry shall bear at least $2\frac{3}{4}$ in. on those angles.

(5) A lintel shall have a bearing on the wall at each end of not less than 9 in., measured in the direction of its length.

226. **Bonding.**—A masonry wall shall be properly bonded and solidly put together with mortar, and all return walls shall be properly bonded together at junctions (see also by-law 233 of these by-laws).

227. **Corbelling.**—No portion of a masonry wall supported on corbelling shall overhang any part below it to a greater extent than 9 in., and then only if the projection is well and solidly corbelled out and the inside of the wall carrying the corbelling is carried up vertically in continuation of the lower face thereof to sufficient height to ensure stability.

Part II—Base Structures and Structural Members.

228. **Construction.**—A base structure shall be a continuous wall, or a system of piers and beams capable of transmitting the whole weight of the building, together with the live loads, to the footings, and shall be constructed of solid masonry, concrete, or reinforced concrete; but hollow masonry shall not be used below ground level, unless voids are filled with concrete or cement mortar.

229. **Thickness.**—(1) The thickness of a base structure shall be not less than the wall it supports, and if constructed of solid masonry shall be built in cement or composition mortar.

(2) Where a base structure constructed as a continuous wall is of the same thickness as the wall it supports, and in addition supports a floor load, the structural members of that floor shall be carried, in the case of—

(a) base structures, 4½ in. or less in thickness, on 9 in. x 4½ in. piers at 4 ft. 6 in. centres, bonded into the base structure; and

(b) base structures more than 4½ in. in thickness, on piers as required by paragraph (a) of this sub-bylaw or on offset or corbel courses; but where the floor is continuous through the wall, offsets or corbels are not required.

(3) For the purposes of this by-law, the inner portion of a hollow wall used as a base structure shall be deemed to be the base structure.

230. **Hollow Wall.**—In the case of a base structure supporting a hollow wall, the base structure may be built as a hollow wall if a filling of concrete is placed therein, as the wall is built, to a height at least 3 in. above ground level.

231. **Underpinning.**—The underpinning of walls, piers, columns and chimneys shall be carried out in conformity with the provisions of Section 391 of the Act, and—

(a) shall rest upon solid ground or upon a footing conforming to the requirements of Section 17 of these by-laws;

(b) shall be built of cement, concrete, or of brick or stone bedded in cement mortar, and securely wedged up, caulked, or both, to the full thickness and length of the old wall or work, or to an additional thickness, if the increased height of the wall, or additional soil pressure so requires; and

(c) may, notwithstanding the provisions of the preceding paragraph, be carried out by a system of isolated piers, or piers and beams.

232. **Ventilation.**—Base structures shall be ventilated in accordance with the provisions of by-law 286 of these by-laws.

Part III—External Bearing and Party Walls.

A.—Masonry Walls.

233. **Bonding and Mortar.**—Any masonry, external bearing or party wall shall be properly bonded and solidly put together with cement or composition mortar, except in the case of a building of not more than one storey, when lime mortar may be used; but the thickness shall be not less than that shown in figures 234A and 234B to these by-laws for a wall built in composition mortar.

234. **Thickness of Walls.**—The minimum thickness of any external or party wall in buildings of Type 2 and 3 Construction shall be as shown in figures 234A and 234B to these by-laws for the appropriate class and storey, subject to the provisions of by-law 165 and to the modifications set out in by-laws 235 to 240 of these by-laws.

FIGURE 234A

THICKNESS of EXTERNAL and PARTY WALLS in TYPES 2 & 3 CONSTRUCTION BUILDINGS of CLASSES I. II. III. IV. V. X. occupancies

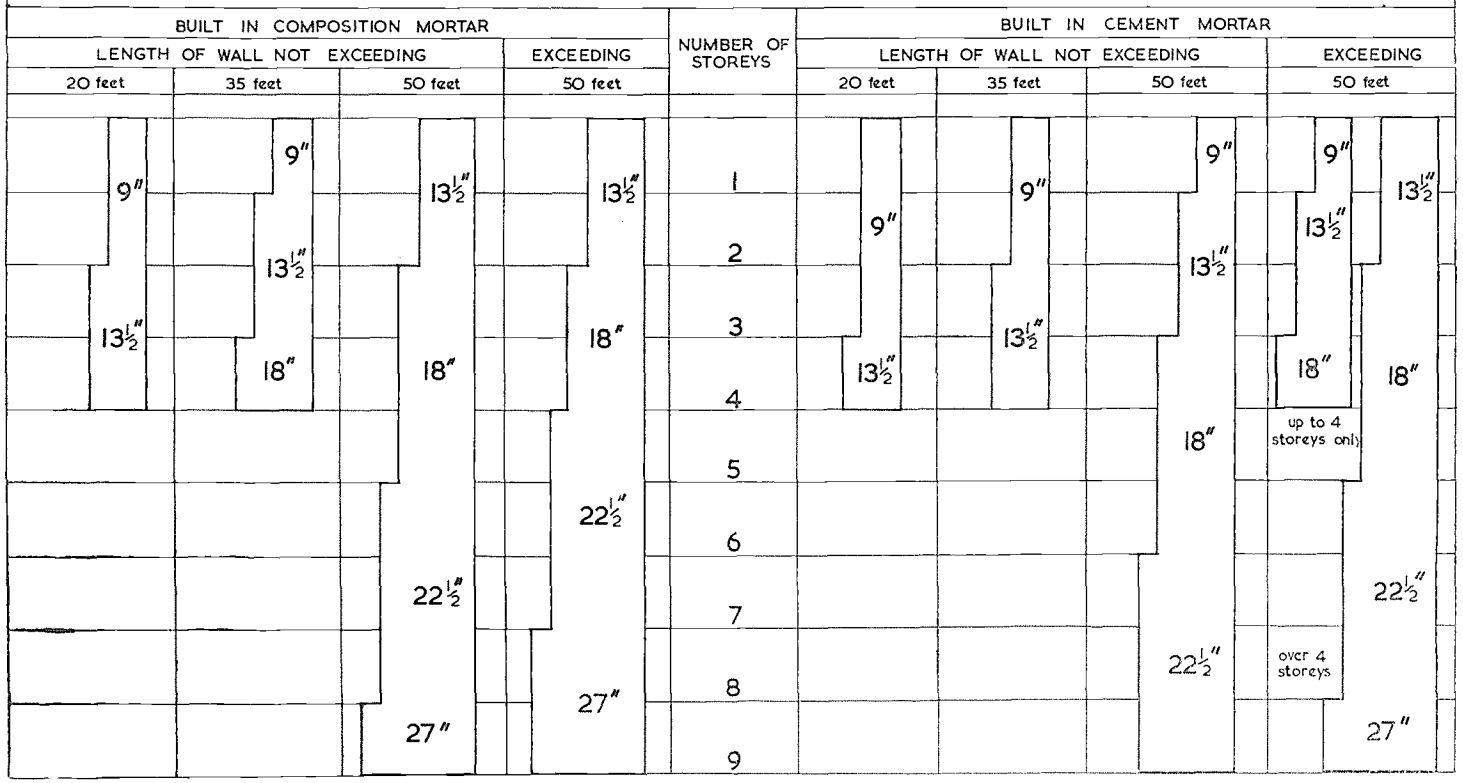
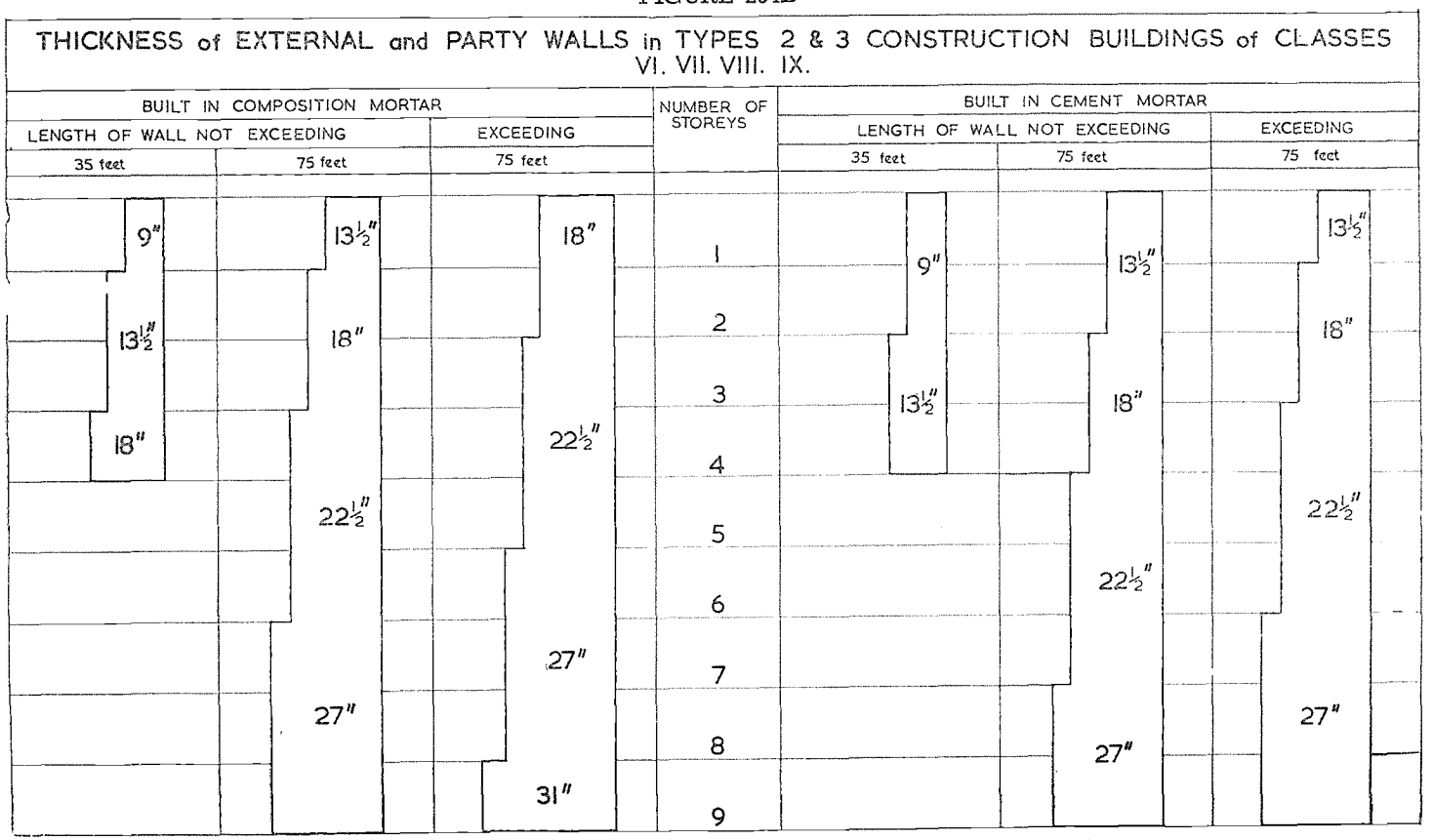


FIGURE 234B

THICKNESS of EXTERNAL and PARTY WALLS in TYPES 2 & 3 CONSTRUCTION BUILDINGS of CLASSES VI. VII. VIII. IX.



235. Additional Thickness by Piers.—Where, by figure 234A, walls exceeding 50 ft. in length are required to have a greater thickness than walls of 50 ft. or less in length, and where, in figure 234B to these by-laws, walls exceeding 75 ft. in length are required to have a greater thickness than walls of 75 ft. or less in length, that additional thickness may be in the form of equally spaced piers projecting 4½ in.; but the aggregate width of the piers shall amount to at least one-quarter part of the length of the wall.

236. Reductions in Thickness of Walls.—(1) In buildings of Type 2 Construction, the thickness required by figure 234A, for walls exceeding 50 ft. in length, may be reduced to that required for walls of 35 ft. to 50 ft. in length; and the thickness required by figure 234B to these by-laws, for walls exceeding 75 ft. in length, may be reduced to that required for walls not exceeding 75 ft. in length.

(2) In buildings of Type 2 and 3 Construction the thickness of an external or party wall of reinforced brick masonry may be 4½ in. less than that prescribed by figures 234A and 234B; but the wall shall be constructed in accordance with the requirements of by-laws 309, 311 and 312 of these by-laws and shall not in any case be less than 9 in. in thickness.

237. Thickness in Relation to Height of Storey.—If any storey exceeds in height 18 times the thickness prescribed by these by-laws for the walls of that storey, the thickness of every external wall or party wall throughout the storey shall be increased to one-eighteenth part of the height of the storey, and the thickness of every external or party wall below the storey shall be increased to a similar thickness, but 4½ in. of the additional thickness may be confined to piers properly distributed and having an aggregate width of not less than one-fourth part of the length of the wall.

238. Walls in Buildings of Classes VII and VIII Occupancy—In buildings of Classes VII and VIII Occupancy containing not more than one storey, walls from 35 ft. to 75 ft. in length may be constructed to a thickness of 9 in. if—

(a) they are strengthened by equally spaced piers projecting 4½ in. and having an aggregate width of not less than one-fifth part of the length of the walls; and

(b) the height of the walls does not exceed 12 ft. where built in lime mortar, or 13 ft. 6 in. where built in cement or composition mortar.

239. Buildings of One Storey.—A building containing not more than one storey and not intended or adapted for habitable purposes may be enclosed with external walls not less than 4½ in. in thickness built in cement or composition mortar if—

(a) the building does not exceed five squares in area;

(b) the width of the building measured in the direction of the span of the roof does not exceed 25 ft. and the height of the walls does not exceed 9 ft.;

(c) piers measuring not less than 9 in. by 4½ in. properly bonded to the walls are formed at intervals of not more than 9 ft.;

(d) the roof is so constructed that the walls are not subject to any thrust therefrom; and

(e) the walls are not required to support any load other than the distributed load of the roof.

240. Hollow Walls.—External walls of buildings of all classes of occupancy may be constructed as hollow or cavity walls if—

(a) the inner and outer leaves of the wall are separated by a cavity which is of width throughout not greater than 3 in., except in the case of panel walls;

(b) every square yard of wall area is tied between the inner and outer leaves with not less than four rust-proof ties of adequate strength, so placed that their vertical spacing is approximately half their horizontal spacing and the cavity is kept clear during construction;

(c) any hollow wall 11 in. or less in thickness is not of greater superficial extent than three squares in any one storey, unless strengthened by a cross wall, fireplace, or projecting pier to the satisfaction of the Surveyor;

(d) the aggregate thickness of the two leaves, excluding the width of the cavity, shall be throughout not less than the minimum thickness prescribed in figures 234A and 234B to these by-laws, for solid walls of the same height and length and for the same class of building; and

(e) piers or stanchions are provided under the ends of any roof truss or girder, having a span of more than 25 ft., in the case of a building of Class I, II, III or IV Occupancy which has 11 in. hollow walls.

241. Structural Piers.—Structural piers of sufficient strength to transmit the load bearing thereon shall be provided where necessary under the ends of all roof principals, beams, girders and other concentrated loads and shall, except as provided in by-law 238 of these by-laws, have a minimum width of 13½ in., and a thickness of not less than 13½ in. including wall thickness (e.g. in the case of an 11 in. cavity wall the projection shall not be less than 9 in.).

242. Cavity Walls Required for Residential Buildings.—(1) The external walls of any habitable room including a sleep-out and sleep-out dado, and any bathroom or laundry constructed as an integral part of a brick or masonry building of Class I, II, III, IV or V Occupancy shall be constructed with a continuous cavity; but in the case of a single storey dwelling or of the upper storey of a single occupancy two-storey dwelling, the municipality may permit—

(a) gables; and

(b) external walls over the tops of doors and windows,

to be of timber frame construction, sheeted externally with asbestos, timber or marine grade plywood complying with the S.A.A. specification, being Item 31 of the Appendix.

(2) The provisions of this by-law shall not apply to a detached washhouse, laundry, W.C., or garage, or to a garage attached to a dwelling or outbuilding which may have external walls 4½ in. thick, in compliance with by-law 239 of these by-laws.

243. Recesses and Openings.—(1) A recess or an opening or both may be made in an external or party wall, if—

(a) the thickness of the wall at the back of that recess is not less than 9 in.;

(b) an arch of at least two rings of brickwork, an approved reinforced concrete lintel of the full depth of the recess, or an approved steel section is constructed over the recess, except a recess formed for a lift, on every storey; but where a recess does not exceed 5 in. in depth and where the wall at the back of the recess is of not less thickness than is required for the next highest storey, corbelling in brick or stone may be substituted for the arch or lintel;

(c) the total area of any recesses or opening or both in any storey of the wall does not exceed one-half of the whole elevational area of the wall in that storey, if segmental arch or lintel construction is used, or three-fifths of that area, if approved semi-arch or continuous lintel construction is used;

(d) the recess is not closer than 13 in. to the nearer face of any abutting external or party wall;

(e) the aggregate width of the recesses in any storey does not exceed three-quarters of the whole length of the wall in that storey, if segmental arch or lintel construction is used, or four-fifths of that length if approved semi-arch or continuous lintel construction is used;

(f) the opening complies with the provisions of Sections 24 and 25 of these by-laws;

(g) an arch or lintel conforming to by-law 225 of these by-laws be constructed over such opening; and

(h) piers between openings in any wall are not less than one-third of the full sectional area of the wall on plan, in case of segmental arch or lintel construction, or one-fourth, in the case of continuous lintel or semi-arch construction; but these limits do not apply to any shop front or show window constructed to the approval of the Surveyor;

(2) The requirements of sub-bylaw (1) of this by-law as to sectional area do not apply to a shop front.

(3) A shop front or other large opening may be framed wholly or partly in structural steel or reinforced concrete to give the necessary strength and stability, if all the component parts are properly tied or bonded to one another.

244. Chases.—Chases may be made in any external or party wall but they shall not—

(a) be constructed in such manner to impair the strength of any part of the building;

(b) have less than 9 in. of solid material remaining at the back of each chase;

(c) be more than 14 in. wide or more than 4½ in. deep, measured from the face of the wall; or

(d) be less than 7 ft. apart if on the same side of the wall and 5 ft. apart if on the opposite sides.

245. Designed Walls.—Compliance with the provisions of by-laws 235 to 240, and paragraphs (c), (d) and (h) of sub-bylaw (1) of by-law 243, of these by-laws may be dispensed with, if detailed computations, demonstrating that the walls of the subject building have the necessary strength and stability and otherwise conform with the requirements of these by-laws, are submitted to the Surveyor.

246. Hollow Concrete Blocks and Pre-cast Concrete Slabs.—A building of one storey may be enclosed above the base structure with external walls constructed of pre-cast concrete blocks not less than 6 in. in thickness (inclusive of cavities) or of pre-cast concrete slabs not less than 4 in. in thickness complying with the requirements of by-law 142 of these by-laws if—

(a) the walls of that building excluding parapets do not exceed 12 ft. in height;

(b) the length of any wall does not exceed 20 ft. unless strengthened by cross walls or by external walls bonded into those walls or by a fireplace or projecting piers to the satisfaction of the Surveyor;

(c) the blocks are bedded and jointed in composition or cement mortar;

(d) trusses, joists or beams rest on templates let into the walls in such a manner as to transfer the loads to an adequate bearing area of concrete;

(e) in the case of walls required by by-law 242 of these by-laws to be built with a continuous cavity which are constructed of hollow concrete blocks, those blocks are designed and laid so as to maintain a cavity not exceeding 2 in. in width at the joints between the blocks; and

(f) in the case of walls built of pre-cast concrete slabs, those slabs extend in a single length for the full height of the wall.

B.—Concrete Walls.

247. Concrete Walls.—An unreinforced concrete wall shall be of the same thickness as required by these by-laws for masonry walls based on a unit thickness of 4 in.

248. Reinforced Concrete Walls.—(1) Every reinforced concrete wall shall have a thickness of at least 1/25th of its height or length between supports, whichever is the shorter, but in no case of less than 4 in., and shall have the necessary strength and stability.

(2) A built-in pier or pilaster introduced to reduce the length between supports shall be not less in width or depth than 1/12th of the height of such pier or pilaster.

(3) A horizontal support introduced to reduce the height between supports shall consist of a concrete slab joining the wall for the full length on at least one side or of a reinforced concrete beam of a width equal to at least 1/16th of the span.

249. Reinforcement.—Every reinforced concrete wall shall have in each direction an amount of reinforcement of not less than .0025 of the cross-sectional area; but the amount of reinforcement in any direction may be varied in special circumstances, if the total reinforcement is not less than .005 of the cross-sectional area.

250. Chases and Recesses.—A chase or a recess which would impair the stability of the wall or reduce its minimum thickness to less than 4 in. shall not be cut or formed in any concrete or reinforced concrete wall.

Part IV—External Non-bearing Walls.

251. Panel Walls.—(1) An external panel wall may be constructed of masonry laid in composition or cement mortar if—

(i) where the unsupported area of such wall does not exceed 300 square feet, the wall has a thickness of not less than 9 in. if a solid wall or 11 in. if a cavity wall;

(ii) where the unsupported area exceeds 300 square feet, the wall has a thickness of not less than 13½ in. if a solid wall or 15½ in. if a cavity wall;

(iii) the unsupported area between structural members does not exceed 500 square feet;

(iv) where the outer 4½ in, of such wall is supported on continuous steel angles bolted to the face of the structural framework, it bears on those steel angles for not less than 3 in.;

(v) any panel wall constructed as a hollow wall is securely tied as specified in by-law 240 (b) of these by-laws;

(vi) veneered walls or ashlar facing to such walls shall be permitted on condition that the total thickness shall not be less than 13 in. in the solid unless bonded as prescribed by by-law 222 (5) of these by-laws.

(2) An external panel wall may be constructed of reinforced concrete, if the thickness of that reinforced concrete—

(a) is not less than 4 in.; and

(b) is not less than 1/30th of the unsupported height between successive floors or beams unless laterally supported by cross walls, piers, or built-in columns, at intervals not exceeding 30 times the thickness of the wall.

(3) The requirements of sub-bylaws (1) and (2) of this by-law as to minimum thicknesses may be waived, if detailed computations are submitted, demonstrating that the structure has the necessary strength and stability and that the maximum permissible working stresses under dead, live and wind loading are not exceeded.

Part V—Cross Walls, Fire Walls, and Internal Bearing Walls.

A.—Masonry Walls.

252. Materials.—Every cross wall shall be constructed of the same kind of material and in the same manner as the wall to which it provides lateral support, or be constructed so as to act in an equivalent manner.

253. Construction.—(1) Every cross wall, fire wall, or internal bearing wall constructed of masonry shall be properly bonded and solidly put together with composition or cement mortar or as provided in by-law 233 of these by-laws with lime mortar, and walls shall be properly bonded at junctions.

(2) Every cross wall shall be carried up to the plate level of the topmost storey.

254. Thickness of Walls.—Where computations covering design of cross walls, fire walls, and internal bearing walls are not submitted, the following requirements shall be observed:—

(a) **General Provisions.**—Every such wall shall have a thickness of not less than two-thirds the thickness required in figures 234A and 234B to these by-laws for external and party walls of the same dimensions and in the same class of building, except that—

(i) where the external or party wall is required by either of those figures to be 9 in. in thickness, a cross wall or an internal bearing wall may be 4½ in., in thickness in the topmost and second topmost storeys of buildings of Classes I, II, III, IV and V and in the topmost storey, only of buildings of Classes VI, VII, VIII and IX;

(ii) every fire wall shall have a thickness of not less than 9 in.;

(iii) where any part of a cross wall becomes an external wall, the external portion of that cross wall shall be of the thickness required for an external wall of the same height and length and belonging to the same class of building.

(b) **Thickness in Relation to Height of Storey.**—If any storey exceeds in height 32 times the thickness prescribed by paragraph (a) of this by-law, the thickness of every cross wall, fire wall and internal bearing wall shall be increased to 1/32nd part of the height of that storey, and the thickness of every such wall below that storey shall be increased to a similar thickness provided that, except in the case of cross walls 4½ in. of such additional thickness may be confined to piers properly distributed, the aggregate widths of which amount to at least 1/4th part of the length of the wall.

(c) **Recesses and Openings.**—The aggregate superficial area of all recesses and openings in cross walls, fire walls, and internal bearing walls shall not exceed that permitted for external and party walls constructed of similar materials; except that if a cross wall is carried on a girder across the ground storey and is supported by piers to the satisfaction of the Surveyor, it shall be deemed to be a cross wall, for the purpose of these by-laws.

B.—Concrete Walls.

255. An unreinforced concrete wall shall be of the same thickness as required by these by-laws for masonry walls, based on a unit thickness of 4 in.

256. Junctions.—Where a reinforced concrete cross wall joins a masonry external wall, the two walls shall be bonded to the satisfaction of the Surveyor with steel reinforcing rods, spaced at intervals of not more than 13½ in.

257. Reinforcement.—Every reinforced concrete wall shall have, in each direction, an amount of reinforcement of not less than .0025 of the cross sectional area, but the amount of reinforcement in any direction may be varied, in special circumstances, if the total reinforcement is not less than .005 of the cross sectional area.

258. Chases and Recesses.—A chase or recess shall not be cut or formed in any concrete or reinforced concrete wall if that cutting or forming would impair the stability of the wall or reduce the minimum thickness to less than 3 in. or, in the case of a fire wall, 4 in.

Part VI—Internal Non-bearing Walls, Partition Walls and Partitions.

259. Internal Non-bearing Walls.—An internal non-bearing wall not required to be a party or a fire wall shall be constructed of masonry, concrete or reinforced concrete and, except as regards thickness, shall comply with the requirements of Part V of this Section and if constructed—

(a) of masonry or concrete that wall shall be sufficiently thick to withstand the stresses to which it may be subjected and in any event shall not be less than the following minimum thickness—

	Brick or Concrete in.	Stone. in.
Topmost two storeys	4½	8
Three storeys next below	9	12

For additional storeys an increase shall be made of not less than 4½ in. for each three storeys including the basement; or

(b) of reinforced concrete the minimum thickness shall be 3 in.

260. Partition Walls.—(1) a partition wall which is not required to have a higher fire rating, may be constructed of brickwork, concrete blocks, terra cotta, gypsum blocks or any material shown on Table 170A of these by-laws as having a fire rating of one hour.

(2) The minimum thickness of every partition wall constructed of masonry or concrete shall be as determined by the following formula, but the length of the wall may be reduced by the introduction of stiffening piers to the approval of the Surveyor:—

$$T = \frac{3H+L}{200}$$

Where T = thickness in inches.
H = height in inches.
L = length in inches.

(3) A partition wall shall be of no less thickness than 3 in., unless anchored at each end.

(4) A partition wall shall be supported on reinforced concrete floors or steel or reinforced concrete beams unless designed and constructed so as to be self-supporting.

(5) A partition wall not required by these by-laws to have a fire rating, may have the upper portion glazed if that glazing does not exceed 8 ft. in height, unless constructed of steel frames glazed with wired glass.

261. Cupboard Walls.—A partition wall separating habitable rooms in a residential building of Class I Occupancy, if not required for the structural stability of the building or to have a fire resistance rating, may be constructed of materials other than those required by by-law 260 of these by-laws; but a partition wall used in connection with a bedroom shall have a sound insulation value of not less than a decibel reduction of 20 which, for the purposes of this by-law, shall be taken as being equivalent to a timber stud wall, sheeted on both sides with fibre board or plaster.

262. Partitions.—A partition not exceeding 7 ft. 6 in. in height may be constructed of any material specified in by-law 174 (b) of these by-laws, but—

(a) the upper portion of that partition may be glazed above a dado 3 ft. or more in height;

(b) 12 lineal inches of partition for each 100 square feet of floor area in the case of unsprinklered buildings or 15 lineal inches of partition for each 100 square feet of floor area in the case of sprinklered buildings may with municipal approval, be built to the height of the underside of the ceilings or, where there is no ceiling, the roof plate level, but that approval shall be granted only where the provision of light and ventilation to all portions of the building is in conformity with the provisions of Section 10 of these by-laws; and

(c) this by-law does not prohibit the construction of a partition from floor to ceiling of glass in either timber or metal frames within tenancies, subject to the provision of light and ventilation in accordance with the provisions of these by-laws.

Part VII.—Parapets.

263.—When Required to External Walls and Roofs.—(1) Every external wall built within 3 ft. of land not in the same occupation or within 3 ft. of any adjoining building or within 2 ft. of any street shall be carried up to form a parapet and shall have a fire-resistance rating of three hours, except in the case of outbuildings appurtenant to buildings of Classes I, II or III Occupancy, which shall have a fire-resistance rating of not less than one hour.

(2) Every roof built within 2 ft. 6 in. of land not in the same occupation or within 2 ft. 6 in. of any adjoining building or within 2 ft. of any street shall be protected by means of a parapet wall having a fire-resistance rating of three hours, except in the case of outbuildings appurtenant to buildings of Classes I, II or III Occupancy which shall have a fire-resistance rating of one hour.

(3) Notwithstanding the foregoing provisions of this by-law, a parapet shall not be required by reason only of a wall being within 2 ft. of a street where—

(a) the roof has a fire resistance rating of three hours, or

(b) the roof is flat or sloping away from the street, or

(c) the roof is sloping towards the street and any eave projects not more than 2 feet and the building for its full width is fitted with a street verandah not less than 8 feet in width, the roof of which slopes towards the building to which it is attached.

264. In Party and Fire Walls.—A party or a fire wall shall be carried up to form a parapet except that a party wall separating residential flats of Class II Occupancy may be finished at the ceiling level of the topmost storey.

265. Construction.—(1) Every parapet shall be constructed of—

(a) masonry set in cement or composition mortar properly weathered on top, and of a thickness not less than $\frac{1}{8}$th of its height or 8 in., whichever is the greater, except in the case of single storey buildings permitted by by-law 233 of these by-laws to be constructed in lime mortar where the thickness shall be not less than 1/6th of its height or 8 in., whichever is the greater;

(b) concrete of a thickness not less than 1/10th of its height or 6 in., whichever is the greater; or

(c) where the parapet is connected to a reinforced roof or wall, reinforced concrete, not less than 4 in. in thickness.

(2) In the case of a building of one storey permitted by by-law 239 of these by-laws, to be constructed with external walls 4½ in. in thickness, the parapet may be 4½ in. thick.

266. Minimum Heights.—Every parapet in a building of Classes I, II, III, IV, V, VI, VII, VIII, IX and X Occupancy shall be carried to a height of 15 in. from its highest part of the adjoining gutter, or where no gutter adjoins, from the roof covering measured at right angles to the slope of the roof.

267. Parapets above Dormers.—A parapet on an external or party wall shall be carried up above any dormer, lantern light, skylight or other erection of combustible material, fixed above the roof or flat on any building within 4 ft. of that parapet wall, and to the thickness required by by-law 265 of these by-laws.

268. Damp Proofing.—Every masonry parapet shall have a horizontal damp course as required by by-law 271 of these by-laws.

Part VIII.—Damp Courses.

269. Horizontal Damp Courses.—(1) Every masonry wall and fire place shall have a complete and continuous damp course, constructed of approved, durable material impervious to moisture, beneath the level of the lowest floor and at a height of not less than 3 in. above the surface of the ground adjoining the wall or chimney of the fire place.

(2) Where factory premixed damp course is used, the requisite gauging water only shall be added, on the site.

270. Crushing Strength of Mortar.—Damp-proofing mortar shall have a crushing strength of at least equal to that of the mortar of which the wall is built.

271. Damp Proofing of Parapets.—Where a wall is finished with a parapet, a damp-proof course, as prescribed in by-law 269 of these by-laws, shall be inserted, at the base of the parapet, unless the parapet is effectively rendered with cement or composition mortar on both sides and on the top.

272 Vertical Damp Course.—Where any portion of the walls of the lowest storey of a building is below the level of, and in contact with, the ground adjacent to those walls, that portion shall be enclosed with walls impervious to moisture or with cavity walls, having an intervening cavity between those walls of a width of not less than two inches and extending from the base of such walls to a height of not less than 6 in. above the surface of the ground immediately adjoining the exterior of such storey; the cavity shall be effectively drained and a continuous horizontal damp course, as described in by-law 269 of these by-laws shall be inserted in the wall at the base and the top of the vertical damp course or cavity.

273. Junction of Damp Courses.—Where a horizontal damp course provided in a wall or floor meets any vertical damp course that damp course shall be effectively junctioned.

274. Flashings of approved material shall be provided about a door, window or other opening in an external wall (such as beneath sills and over heads of frames) in a manner that will effectively prevent the passage of moisture from outside to inside.

Part IX—Existing Walls and Buildings.

275. **Approval Required to Increase Thickness.**—An existing wall shall not be increased in thickness, without the approval of the Surveyor.

276. **Construction.**—Where an increase in the thickness of an existing wall is approved, the additional thickness shall (unless otherwise approved by the Surveyor)—

(a) have a minimum thickness of 4½ in.;

(b) be constructed of material similar to that of the existing wall; and

(c) be bonded in to the existing wall to a depth of not less than 4 in. and for at least one-fourth of its area.

277. **Additional Storey on an Existing Building.**—Where the walls of an existing building are already the minimum allowable by these by-laws, an additional storey may be constructed on the existing building without the walls being increased in thickness, subject to the approval in writing of the Surveyor and then only if—

(a) the walls and floor of such storey are constructed of reinforced concrete; or of framed fire resisting construction with panel walls;

(b) the roof is constructed of reinforced concrete or the tops of opposite walls are effectively tied together with reinforced concrete, to the approval of the Surveyor;

(c) special provision is made for reinforcing the junctions of columns and of roof and floor beams and slabs;

(d) the additional storey complies in all respects with the provisions of these by-laws;

(e) the total height of the building does not exceed the maximum height permitted by these by-laws; and

(f) the total load on any portion of the building and the bearing on the soil does not exceed that permitted by these by-laws.

(**Note.**—For walls of Lift Wells see by-law 435 of these by-laws.)

SECTION 19.

FLOORS.

278. **Floors in Buildings of Type 1 and 2 Construction.**—In a building of Type 1 or 2 Construction, floors required to have a fire resistance rating of two or three hours shall be constructed in accordance with the requirements of Sections 13 and 21 of these by-laws.

279. **Floor Fulfilling More than One Function.**—Where any floor is required to fulfil more than one of the functions specified in these by-laws, it shall be constructed in accordance with the highest standard prescribed in any respect for any of its functions.

280. **Structural Steel Floors.**—All structural steel in any floor shall be designed in accordance with the provisions of Section 21 of these by-laws.

281. **Concrete Floors not Required to have a Fire-resistance Rating.**—A floor constructed of concrete, steel and concrete, or rib and hollow block construction and not required to have a fire-resistance rating shall be designed in accordance with the provisions of Section 21 of these by-laws.

282. **Timber Floors.**—A timber floor shall conform as regards construction and size with the requirements of Section 23 of these by-laws.

283. **Timber in Floors of Fire-resisting Construction.**—Timber may be used in a floor of fire-resisting construction for the construction or securing of floor or ceiling coverings if—

(i) the prescribed thickness of fire-resisting material is maintained, throughout the whole area of the floor; and

(ii) in eating houses, and any other buildings required by the municipality, the intervening spaces between battens beneath the wooden flooring is completely filled with fire-resisting materials.

284. Mezzanine Floors.—A mezzanine floor or gallery may be constructed of timber, unprotected steel, or both, subject to the following conditions, namely—

(a) a mezzanine floor shall not be constructed in any storey with a clear height from floor to ceiling of less than 15 ft.;

(b) the height, width, and area of a mezzanine floor shall be in conformity with the following table:—

Use	Minimum Ceiling Height	Maximum Width	Maximum Area of Mezzanine Floors
	ft. in.	ft. in.	
Storage and display	7 0	15 0	⅓ area of room.
Purposes other than storage and display	7 6	10 0	⅕ area of room.
Do. do. do.	8 3	12 0	¼ area of room.
Do. do. do.	9 0	15 0	⅓ area of room.

(c) a mezzanine floor shall not exceed the maximum width set out in paragraph (b) of this by-law, or the width in subparagraph (i), (ii) or (iii) of this paragraph, whichever is the least, that is to say—

(i) when placed along both sides of a room, one-sixth of the width of the room;

(ii) when placed along one side of a room, one-third of the width of the room; and

(iii) when placed across the end of a room, one-third the length of the room;

(d) mezzanine floor areas shall be provided with light and ventilation in accordance with these by-laws, in that regard;

(e) a mezzanine floor shall not be enclosed above a height of 5 ft. 6 in. and the upper 2 feet of any enclosure shall consist of glass or louvres securely fitted in proper frames;

(f) a mezzanine floor with a ceiling height of less than 9 feet shall not be approved for the purpose of providing accommodation for extra operatives where those extra operatives would cause the number of operatives to exceed those allowed under the Factories and Shops Act (General) Regulations, 1939; and

(g) every mezzanine floor shall be provided with alternative means of egress, complying with the requirements of Section 11 of these by-laws; but alternative means of egress may be omitted in the case of a mezzanine floor on which a person cannot be trapped, in the event of fire, if that floor does not exceed 1,000 sq. ft. in area.

285. Protection of Floors from Damp.—(1) The ground floor of any building, and the floors of any basement, cellar, or other room below the level of the ground immediately adjoining the building shall be constructed of 4 in. concrete with air space to permit the provision of sub-floor ventilation, subject to such floors being provided with an efficient damp course when required by the Surveyor.

(2) Sub-soil drains complying with the requirements of by-law 203 of these by-laws shall be provided when considered necessary by the Surveyor.

286. Sub-Floor Ventilation.—(1) When the lowest floor in any building is constructed clear of the ground, the space between the bottom of the bearers and the ground immediately below shall be not less than 6 in. and shall be ventilated—

(a) by openings in the external walls properly protected by rat-proof air-bricks or gratings of a sufficient size to provide a nett ventilating area of 1½ square inches per foot run of external wall; and

(b) by openings in the internal base walls of a nett area of 3 square inches per foot run of base wall.

(2) The openings required by paragraphs (a) and (b) of sub-bylaw (1) of this by-law shall be arranged so as to permit a continuous circulation of air to pass beneath the whole of the flooring.

287. **Openings through Floors.**—Where openings are formed through floors, each of those openings shall be trimmed for, with trimmers and trimming joists of sufficient size to support the additional loads.

288. **Floors of Bathrooms, Laundries and W.C's.**—The floor of every bathroom, laundry or W.C. shall be constructed of concrete not less than 3 in. in thickness, properly surfaced and graded to an approved floor outlet; but in the case of brick veneer and wood-framed construction buildings, approved materials, as specified in by-laws under the Health Act, 1911, may be used.

289. **Residential Flats.**—The floors of a residential flat building shall comply with the provisions of by-law 404 of these by-laws.

290. **Construction of Floors under Gas or Electric Stoves.**—The floor under any oven or stove heated by gas or electricity shall be formed of incombustible and non-conducting materials, unless a space of not less than 6 in. is provided between the floor and the bottom of the oven or stove.

SECTION 20.

ROOFS AND ROOF STRUCTURES.

291. **Drainage from Roofs.**—Drainage from roofs shall be provided in accordance with the by-laws of the Local Health Authority.

292. **Fire-resisting Roofs.**—(1) Any building exceeding three storeys in height, built in an industrial or business district, shall have a flat roof with a fire-resistance rating of not less than three hours, but a pitched roof not having a fire-resistance rating may be constructed above a roof with that fire-resistance rating, subject to the provision of a flat walkway not less than 8 ft. in width around the pitched roof; and a pitched roof not having a fire-resistance rating may be constructed over caretakers' quarters.

(2) The provisions of this by-law do not apply to buildings erected at a greater distance than 20 ft. from the boundaries of the site.

293. **Roof Coverings.**—(1) A concrete roof with a fire rating shall, unless otherwise permitted, be covered with mineral asphalt of not less than half an inch in thickness or with two layers of approved bituminous roofing felt and a surface covering of bituminous roofing material or with other approved impervious material.

(2) Every roof not required to have a fire-resistance rating, together with every flat and gutter forming part of the roof and every turret, dormer, lantern light, skylight, or other erection placed thereon, shall be externally covered with fire-retardant materials, as defined for the purpose in by-law 174 (a) of these by-laws, securely fixed to withstand wind loads; except that—

(a) cornices, and barge boards, of dormers, if not exceeding 12 in. in depth, and the doors, door-frames, windows and sash frames of dormers, turrets, lantern lights, skylights and other erections other than those at the bottom of light courts may be of wood;

(b) flat roofs shall be covered externally with sheet metal of a thickness not less than 26 gauge or with two layers of approved felt and a surface covering of bituminous roofing material or with such other materials as may be approved by the Surveyor; and

(c) plastic roof sheeting may be used in positions where, in the opinion of the Surveyor, this does not constitute a fire hazard.

294. **Only One Storey in Roof.**—Not more than one storey shall be constructed in the roof of any building.

295. **Pent Houses or Bulkheads on Roofs.**—(1) A pent house, bulkhead or any structure, or shaft extending, above the roof (whether used to enclose a stairway, tank, lift machinery or other apparatus, or not), but not including an aerial support less than 10 ft. in height or a flag pole, cooling tower or other structure excluded by the Surveyor, shall, in the case of buildings of four or more storeys, be constructed with walls and roof having a fire-resistance rating of not less than two hours and shall, if so required by these by-laws, have a higher fire-resistance rating.

(2) Unless the walls of any structure to which the provisions of sub-bylaw (1) of this by-law applies are supported by walls conforming with the requirements of Section 18 of these by-laws for external walls, they shall be supported by fire-protected encased steel or reinforced concrete girders.

(3) Any roof structure to which this by-law refers and which is not required to have a fire rating shall be constructed of approved fire-retardant materials.

296. **Tanks.**—(1) A tank to contain water or other fluid on or above the roof of any building shall be supported on masonry, structural steel, or reinforced concrete except that the decking supporting an iron tank may be of jarrah not less than 2 in. in thickness.

(2) A tank containing more than 500 gallons shall, if placed in or on a building, be supported by structural members having a fire rating as specified in Table 170C of these by-laws, or not less than two hours.

(3) A cover on top of a water tank placed on a roof shall slope towards the outer edges of the tank and, if of wood, shall be covered with metal.

(4) Facilities shall be provided for cleaning out and for emptying any tank, in case of emergency.

297. **Access to Roof Space.**—Convenient access by means of a manhole or otherwise shall be provided to the space between any ceiling and the roof and to the space above a false ceiling in the case of a building where the clear air space above the ceiling or false ceiling and the roof or floor over exceeds two feet in height.

298. **Timber Roof Construction.**—Sizes and spacing of roof timber shall be as prescribed by Section 23 of these by-laws.

299. **Enclosure of Flat Roofs.**—Every flat roof to which access is provided by lift or stairs shall be enclosed by a parapet conforming with the requirements of Part VII of Section 18 of these by-laws, except that that parapet shall either be continued to a height of 3 ft. 6 in. or be surmounted by an approved metal guard railing to a total height of 3 ft. 6 in. above the roof and the parapet may be replaced by a railing not less than 3 ft. 6 in. high.

(**Note.**—For requirements of roofs above furnaces see Section 26 of these by-laws. For requirements relating to roofs of buildings of unprotected metal and timber frame construction see Section 23 of these by-laws.)

SECTION 21.

STEEL FRAME, REINFORCED CONCRETE AND REINFORCED BRICK MASONRY CONSTRUCTION.

Part I.

300. **Structural Steel and Steel Frame Construction.**—Except where prescribed to the contrary by these by-laws any structural steel and steel frame construction in any building shall be designed, fabricated and erected in accordance with the requirements of the S.A.A. specifications, being Item 36, 37 or 22 of the Appendix, whichever is applicable.

301. **Reinforced Concrete Construction.**—Any reinforced concrete construction shall, except where prescribed to the contrary by these by-laws, conform to the requirements of the S.A.A. code, being Item 18 of the Appendix.

302. **Drawings and Calculations to be Prepared by Qualified Persons.**—A structural drawing or calculation of the stresses of a steel-framed or reinforced concrete structure shall not be accepted unless that drawing or calculation has been prepared by or under the control of a qualified engineer or architect who has had experience in the design and construction of that type of framed construction.

303. **Working Stresses.**—Subject to the provision of by-laws 300 and 301 of these by-laws, working stresses shall not exceed, in the case of—

(a) structural steel members, the values set out in the S.A.A. specifications, being Items 35 and 36 of the Appendix;

(b) reinforcing steel, the values set out in the S.A.A. specification, being Item 35, and the S.A.A. code, being Item 18 of the Appendix;

(c) steel or iron castings, the values set out in the S.A.A. specification being Item 35 of the Appendix;

(d) concrete, the values set out in the S.A.A. code, being Item 18 of the Appendix.

304. Pre-cast Concrete Units.—The use of pre-cast reinforced concrete units is permitted in the construction of floors and other suitable portions of buildings, subject to compliance with the provisions of these by-laws in regard to—

(a) quality of materials;

(b) loading and stresses on the materials; and

(c) workmanship;

if it be shown that the building has the necessary strength and stability.

305. Exemptions from Stress Limitations.—(1) The stress limitations prescribed by these by-laws do not apply to a pre-cast reinforced concrete unit if—

(a) the unit is manufactured under approved factory conditions and competent engineering control to the satisfaction of the Council and is branded with the permanent identification mark of the manufacturer;

(b) proper testing facilities are provided for testing the unit;

(c) at its age on delivery, the unit is capable of sustaining, without damage, a superimposed test load, calculated as half the dead load, plus 1½ times the live load; and

(d) when so required, tests are carried out, by the manufacturer, in the presence of the Surveyor.

(2) In any test conducted under the provisions of paragraph (d) of sub-bylaw (1) of this by-law—

(a) specimens to be tested shall be selected by the Surveyor;

(b) as many as 10 per cent. of the batch of units under test may be tested as provided by paragraph (c) of sub-bylaw (1) of this by-law;

(c) one per cent. of the batch of units under test may be tested to the point beyond which those units will sustain no further load and the load at failure shall be not less than 2½ times the design load consisting of dead load plus live load; and

(d) failure of selected units to pass any test, under the provisions of this sub-bylaw, shall occasion the rejection of the whole batch of units under test.

306. Reinforcement in Hydraulic Works.—In any hydraulic works, the tensile stress in the steel reinforcement shall be reduced sufficiently to keep cracks in the concrete within the limits required for water tightness.

Part II.—Reinforced Brick Masonry.

307. Working Stresses.—The allowable unit working stresses in reinforced brick masonry constructed under the supervision of a qualified engineer, shall not exceed the values given in the table to this by-law.

Table 307.

Types of Stress	Allowable Unit Working Stress. lb. per sq. in.
Compression (extreme fibre stress in bending)	400
Direct compression on piers	300
Shear (no web reinforcement)	25
Shear (with web reinforcement taking entire shear)	50
Bond—deformed bars, horizontal and vertical	60
Modulus of elasticity, E.	1,200,000

308. Design.—The formulæ, assumptions and requirements used in the design of reinforced brick masonry shall, as far as practicable, be the same as those set out in these by-laws for reinforced concrete.

309. Mortar.—(1) Mortar shall be mixed in the proportions of 1 part cement to 3 parts of sand and 1/10th part slaked lime.

(2) Lime shall be in the form of lime putty or sound hydrate, or may be added to the mixing water.

(3) Mortar shall be used within sixty minutes of mixing.

310. Reinforcement.—Any reinforcement shall be of round, mild steel rods or high tensile wire.

311. **Construction.**—(1) Any joint shall be completely filled with mortar and all reinforcing steel shall be entirely bedded in the mortar; and the clearance between the bar and the brick shall be at least one-half the diameter of the bar.

(2) Reinforcement shall be braced and held in place firmly enough to prevent the breaking of the bond while the brickwork is being laid.

(3) Any reinforced brick masonry shall be laid with full header courses, at least every fourth course in height, or there shall be at least one full header in every 60 square inches of wall surface, except that in brickwork laid up with all interior joints flushed, headers need not be used.

(4) In lieu of headers metal ties may be used in the number of one tie for every two headers and those metal ties shall consist of not less than $\frac{1}{4}$in. hot drawn mild steel wire, with hooks at both ends, or of $\frac{3}{8}$in. corrugated steel bars without hooks, extending to within not less than $\frac{3}{4}$in. of the wall faces, in number of one per stretcher, in every sixth course.

312. **Reinforced Brick Masonry Walls.**—A reinforced, brick masonry wall shall conform with the following, that is to say—

(a) **Thickness—**

(i) A reinforced brick masonry wall shall be designed to resist any lateral or other pressure to which it may be subjected, including eccentric loads;

(ii) A reinforced, brick masonry wall shall be not less than $4\frac{1}{2}$in. thick;

(iii) a reinforced, brick masonry bearing wall shall have a minimum thickness of 1/25th of the unsupported height and buttresses, built-in columns, or piers, may be designed to carry all the vertical loads;

(iv) a non-bearing panel wall of reinforced brick masonry shall have a thickness of not less than 9in. and not less than 1/30th of the unsupported height; and

(v) subject to any other requirement of this Section, a reinforced, brick masonry wall shall have a thickness at least equal to that specified elsewhere in these by-laws, for reinforced concrete bearing walls.

(b) **Working Stresses.**—The working compressive stresses in a reinforced, brick masonry wall shall not exceed 75lb per sq. in. when the wall is 25 times the thickness in height, proportionately increasing to 150lb. per sq. in. when the wall is 15 times the thickness in height.

(c) **Reinforcement.**—A reinforced, brick masonry wall shall—

(i) be reinforced with at least one-quarter of 1 per cent. of steel in each of the horizontal and vertical directions;

(ii) if more than 9in. thick, have the reinforcement for each direction placed in two layers or planes parallel to the wall faces, not less than 2 in. or more than one-third of the wall thickness, from the exterior wall face and not less than 1 in. or more than one-third of the wall thickness, from the interior wall face;

(iii) if the vertical steel is relied on to carry load, have that steel tied and arranged, as in columns; and

(iv) have the reinforcing bars spaced no further apart than 18 in. and no smaller than the equivalent of a $\frac{3}{8}$ in. round bar.

Part III.—Tests.

313. **Tests.**—(1) Where tests carried out in any portion of a building indicate deficiency in the construction to such an extent as unduly to reduce the factor of safety, that portion of the work shall be subjected to a load test, in which the superimposed load shall be equal to one half of the dead load plus one and one-half times the live load and the load shall be left in position for a period of 24 hours, before removal.

(2) The structure shall be considered to have passed the test if the maximum deflection at the end of the 24-hours period mentioned in sub-bylaw (1) of this by-law does not exceed the value of D as given by the following equation:

$$D = \frac{.001\,L^2}{12t}$$

in which—

L is the span, t is the total depth of the slab or beam, and D is the maximum deflection—all expressed in the same units.

(3) If the deflection exceeds the value of D as given in the equation set out in sub-bylaw (2) of this by-law the construction shall be considered to have passed the test if, within 24 hours after the removal of the load, the slabs or beams show a recovery of at least 75 per cent of the observed deflection.

(4) Any construction which does not pass the test by this by-law prescribed shall be reconstructed and reinstated in accordance with the provisions of these by-laws.

SECTION 22.

REINFORCED CONCRETE AND MASONRY VENEER CONSTRUCTION.

314. Limitation.—Private dwellings of Class I Occupancy may be constructed with external walls of reinforced concrete or masonry veneer, in accordance with the provisions of this Section.

315. Limitation of Height.—Buildings of veneer construction shall not exceed one storey in height.

316. Wall Construction.—The external walls of a building of veneer construction shall consist of an inner framework of timber construction, conforming with the requirements of by-law 338 of these by-laws, and an outer veneer of masonry or reinforced concrete.

317. Loading on Timber Framework.—The timber framework of the external walls, together with that of the internal walls, shall sustain and transmit to the base structure the live loads prescribed by Section 14 of these by-laws, together with the dead load of the building, exclusive of the masonry or concrete veneer.

318. Supports of Timber Framework.—The timber framework of an external wall shall—

(a) rest upon—

(i) stumps of jarrah or other approved timber, not less than 4 in. x 4 in. in size, spaced at 4 ft. centres, securely braced and resting upon the footings of the masonry or concrete veneer;

(ii) masonry piers 8 in. x 4 in. in size, spaced at not more than 5 ft. centres and bonded to the outer veneer; or

(iii) masonry not less than 8 in. in thickness carried to the level of the underside of bearer plates;

and

(b) otherwise conform to the requirements of Section 23 of these by-laws.

319. Construction of Outer Veneer of External Walls.—The outer veneer of an external wall shall consist of masonry or reinforced concrete, which shall be—

(a) constructed on footings not less than 15 in. wide and 10 in. deep and otherwise conforming to the requirements of Section 17 of these by-laws;

(b) not less than 4 in. in thickness;

(c) in the case of masonry veneer, constructed with cement or composition mortar;

(d) bonded to the timber framework with approved galvanised wire or other approved non-corrodible wall ties, spaced not further apart than 24 in. horizontally and 18 in. vertically; and

(e) so constructed as to leave a clear airspace between the veneer and the timber of not less than 1 in. and not more than 2 in.

320. **Requirements for Base Structures.**—The base structure of an external wall shall be provided with—

(a) ventilation openings, as prescribed in by-law 286 (1) (a) of these by-laws; and

(b) dampcourse below floor plates as prescribed in Part VIII of Section 18 of these by-laws.

321. **Fixings for Pipes in Veneer Walls.**—Except where approved types of fixings are used, flashing to a depth of 1¾ in. and bolts for the full thickness of the wall shall be built in, during the construction of a veneer wall, to provide adequate fixings for down-pipes, vents and sewer pipes.

322. **Maximum Dimensions of Veneer Walls.**—(1) A veneer wall having a thickness of 4½ in. or less shall not be constructed—

(a) to a greater height than 14 ft.; or

(b) to a greater length than 24 ft. unless a set off of at least 2 ft. 6 in. is made or adequate stiffening piers are introduced.

(2) A brick veneer wall shall not have a thickness of brickwork less than 4½ in.

323. **Distance of Veneer Walls from Boundary.**—A wall having a timber framework and outer veneer of masonry or concrete, in accordance with the provisions of this Section, shall not be constructed within 3 ft. of the boundary of any allotment of land not in the same occupation.

324. **Internal Linings.**—Internal linings of walls and ceilings shall conform to the requirements therefor, set out in Section 23 of these by-laws.

SECTION 23.

UNPROTECTED METAL AND WOOD FRAME CONSTRUCTION.

325. **General.**—A building of wood framed or unprotected metal construction, when approved by the municipality under the provisions of Section 399 of the Act, shall comply with the provisions of this Section.

326. **Buildings to be Wholly in One Occupation.**—Every building to which this Section applies shall be constructed or adapted for one occupation only, except in the case of duplex houses where the two dwelling units are separated by a party wall having a fire rating of not less than three hours and carried up to the underside of the roof covering.

327. **Height of Walls.**—The external walls of a building to which this section applies shall not exceed in height 15 ft., measured from the floor level to the top of the wall plate nor be more than one storey in height, except in the case of an industrial building where the particular use or manufacturing process necessitates a building of greater height.

328. **Support for Framework.**—(1) The framework of any wall to which this Section applies shall rest upon—

(a) a sleeper wall of masonry or concrete not less than 4 in. in thickness; and where the height of that sleeper wall exceeds 3 ft. 6 in. the wall shall be stiffened with piers not less than 8 in. in width and 4 in. thicker than, and bonded into, the sleeper wall.

(b) piers of masonry or concrete, measuring not less than 9 in. square;

(c) reinforced concrete piers, not less than 5 in. square, with integrally cast sole plates having a bearing area of not less than 72 square inches; or

(d) stumps of jarrah or other approved timber not less than 4 in. square sunk to a depth below the natural surface of the ground equal to one-fourth of their length but in no case less than 18 in., and resting upon and securely fastened to—

(i) a base of concrete not less than 72 square inches in area,

(ii) a base of masonry constructed in cement mortar 9 in. square by 6 in. thick; or

(iii) a sole plate of jarrah or other approved timber not less than 72 square inches in area and 2 in. in thickness.

(2) In addition to the requirements of paragraph (a) of sub-bylaw (1) of this by-law, piers shall be provided under any concentrated load.

(3) Any stump projecting more than 4 ft. above the surface of the ground shall be adequately braced.

329. Ant Stopping.—Every wood framed building of Type 5 construction, including its stumps, sleeper walls, chimneys and piers, shall be adequately ant stopped with non-corrodible sheet metal projecting not less than one-inch and turned down at an angle of 45° to the horizontal.

330. Damp Course.—Where the framework of any wall is supported upon a sleeper wall, a damp course conforming to the requirements of Part VIII of Section 18 of these by-laws shall be provided.

331. Vermin Plates.—Vermin plates shall be provided in any case where the floor is of timber construction.

332. External Covering for Walls.—Every building of Type 4 or 5 Construction to which this Section applies, shall, unless otherwise provided in these by-laws, be enclosed externally with—

(a) weatherboard or other approved class of boarding, having not less than an average thickness of ½ in.;

(b) asbestos cement sheets of not less than 3/16 in. in thickness;

(c) stucco or roughcast, fulfilling the requirements of composition, or cement mortar, as prescribed in by-law 150 (2), (3) and (4) of these by-laws; or

(d) other durable materials having a satisfactory resistance to the penetration of moisture and approved by any Advisory Committee appointed under the Act or any other Act enacted in substitution therefor.

333. Stucco or Roughcast.—(1) Stucco or roughcast shall be applied in accordance with good commercial practice, in three coats, unless it is pneumatically placed, in which case two coats are sufficient.

(2) The minimum thickness of stucco from the face of the base shall be ¾ in., at every point.

(3) Stucco shall be applied to metal lathing or reinforcement weighing not less than 3 lb. per square yard, except where approved strengthening is provided behind the stucco, in which case the weight of sheathing may be 1.8 lb. per square yard.

(4) Any metal lathing or reinforement shall be galvanised or otherwise effectively protected against corrosion.

(5) Before stucco is applied, the timber frame shall be covered with a 3-ply waterproof paper, having a central ply consisting of some bituminous compound or other approved waterproof substance.

334. Internal Wall and Ceiling Lining.—The internal lining of any wall or ceiling shall be lath and plaster, finished to a hard surface, hardwood panelling, T. & G. timber lining, plaster sheets, open screening of non-inflammable material, open screening of inflammable material where this does not exceed 10 per cent. of the area of the wall or ceiling in which it is to be used, or asbestos and cement sheets or other approved material.

335. Distance of Walls from Boundary.—A wall of a building of unprotected metal and wood framed construction shall not be constructed closer to the boundary of any site not in the same occupation than 4 ft., and the municipality may require that distance to be not less than 10 ft. or the height of the walls, whichever is the greater, in the case of buildings erected in commercial or industrial areas.

336. Re-erection of Removed Buildings.—Every building or erection removed or transported shall, when re-erected, comply with all the provisions of these by-laws, relating to new buildings of the appropriate class of occupancy and type of construction.

337. Outbuildings (Distance from Dwellings).—An outbuilding appurtenant to a dwelling and detached therefrom shall be at least 5 ft. from that dwelling.

338. Minimum Sizes and Spacing of Materials.—(1) In the construction of a wood frame or other building where timbers are used, the minimum sizes, dimensions and maximum spacings of the timbers shall, in the case of a dwelling or other similar building, be in conformity with the requirements of S.A.A. code, being Item 30 of the Appendix, but not less than the dimensions and spacings set out in the table to this by-law.

(2) Other forms of unprotected metal and timber construction may be used, if proved structurally sound by supporting computations or by practical tests to the satisfaction of any Advisory Committee appointed under the Act or any other Act enacted in substitution thereof.

Table 338.

Minimum Dimensions and Maximum Spacing of Timbers in Dwellings and Similar Buildings.

Stumps—4 in. by 4 in. at not more than 4 ft. centres.

Bearers—4 in. by 3 in. fixed on edge and spaced not more than 5 ft. centres apart.

Floor Joists—4 in. by 2 in. spaced not more than 18 in. centres; double joists are to be fixed in all cases where joists are parallel to the vermin plates; all floor joists are to be supported at least every 5 ft.

Wall Framing—
either (a);
Vermin Plates and Top Plates—4 in. by 2 in. housed three-eights of an inch for studs.
Intermediate Studs—4 in. by 2 in. spaced up to 24 in. centres and housed three-eights of an inch into plate.
Corner Studs—4 in. by 4 in. or two 4 in. by 2 in.
Openings—Heads, sills and studs to all openings not less than 4 in. by 2 in.
or (b);
Vermin Plates and Top Plates—3 in. by 2 in. housed three-eights of an inch for studs.
Intermediate Studs—3 in. by 2 in. spaced up to 18 in. centres and housed three-eighths of an inch into plates.
Corner Studs—3 in. by 3 in. or two 3 in. by 2 in.

Ceiling Joists—3 in. by 2 in. spaced up to 18 in. centres.

Angle Stops—2 in. by 1¼ in.

Hangers—Not less than 8 in. in depth by 1¼ in. in thickness spaced up to 6 ft. on centres with hanging straps to joists of either No. 16 gauge galvanised hoop iron or 1¼ in. square hardwood securely spiked to hangers and joists.

Rafters—For tile or slate or similar roofs 4 in. by 2 in. spaced not more than 24 in. centres.
For sheet metal roofs the spacing may be 4 in. by 2 in. increased to 36 in. or 3 in. by 2 in. spaced not more than 30 in. centres.

Roof Battens—For tile roofs, a bearing batten of 2 in. by 1 in. to each row of tiles and tiles shall be securely wired to such tie battens.
For sheet metal roofs battens 3 in. by 1½ in. shall be used spaced up to 36 in. centres.

Roof Purlins—4 in. by 3 in.

Roof Struts—3 in. by 3 in.

Collar Ties—3 in. by 2 in.

Valleys, Barge Boards and Fascias—7 in. by 1¼ in.

Ridges, Hips—7 in. by 1 in.

Flooring Boards—Shall not exceed 6 in. in width nor be less than 9/16th in. thick and shall be tongued and grooved well cramped up and securely nailed and cleaned off.

Weatherboards—Shall have a lap of not less than 3/16 in. for each inch of the board width.

Bracing—The framework of all external and internal walls shall be well braced with battens not less than 3 in. by ⅝ in. All gable roofs shall be braced against lateral movement with timber not less than 1½ in. in width.

Sashes and Doors.—The minimum thickness for sashes shall not be less than 1⅜ in. and for panelled doors not less than 1¼ in.

Unsupported Floors—The floor joists for all unsupported floors of residential buildings shall not be less than 8 in. by 2 in. where the span is less than 10 ft.; 9 in. by 2 in. then for spans up to 13 ft.; and 10 in. by 2 in. then for spans up to 16 ft. and to the approval of the Surveyor for greater spans than 16 ft.; such joists shall not be spaced at more than 18 in. on centres and shall be laterally supported by herring bone or other approved strutting or bridging.

339. (1) A single storey dwelling house may be erected or constructed with load bearing walls of pre-cast plaster of paris slabs, constructed in accordance with the following provisions, that is to say:—

(a) a wall shall be supported by an adequate footing or joist or similar structural member;

(b) each slab shall be constructed of plaster of paris and shall be not less than 2¼ in. thick;

(c) each slab shall be constructed on a casting table and shall be constructed to the full height of the wall;

(d) each slab shall be re-inforced by pre-fabricated 6 in. x 6 in. high tensile steel square mesh of not less than No. 10 gauge;

(e) each plaster slab shall be sarked on the outer face with a waterproof membrane;

(f) a wall shall not exceed 9 ft. in height, from the floor to the ceiling;

(g) a wall shall not exceed a length of—

(i) 22 ft., if it is an external wall tied to and supported by a brick or masonry outer leaf or if it is covered with asbestos cladding, secured to battens which are tied to the plaster wall as in this by-law provided; or

(ii) 16 ft. if it is an internal wall;

(h) each wall shall be ventilated in accordance with the provisions of these by-laws; and

(i) an opening using a plaster lintel shall not be of a greater width than 8 ft. and every lintel used in a pre-cast plaster wall shall be so designed and reinforced that it will carry the load imposed upon it.

(2) Internal walls shall be constructed of slabs in accordance with sub-bylaw (1) of this by-law.

(3) The external walls shall be constructed of slabs, each constructed in accordance with sub-bylaw (1) of this by-law under the following conditions, that is to say:—

(a) there shall be an outer leaf of brick, stone or concrete separated from the plaster slab by a cavity of 2 in. in width and tied to the plaster slab by galvanised steel wire ties of not less than No. 10 gauge and those ties shall be embedded in the slab at every 24 inches horizontally and at every 18 in. vertically, and be hooked around the reinforcing mesh; or

(b) there shall be, on the exterior of the slabs, timber battens of not less than 2 in. x 1½ in. in size or 22 gauge iron channel of not less than 2 in. x 1 in. in size and in each case spaced at not more than 4 ft. 6 in. centres, if covered with super-six corrugated asbestos cement sheets, or spaced at not more than 2 ft. centres, if covered with other asbestos cement sheets or any other material approved by the Surveyor and the battens shall be wired to the slabs with not less than 10 gauge galvanised steel wire, hooked around the reinforcing mesh at every 24 in. horizontally and at every 18 in. vertically.

(4) In the case of a duplex dwelling the party structure separating the two occupancies shall be constructed of a cavity wall, consisting of two plaster of paris slabs constructed as provided by sub-bylaw (1) of this by-law and separated by a cavity of not less than 4½ in. in width.

(5) A dwelling having external walls constructed with an outer leaf of brick, stone or concrete, and with an inner leaf of plaster slabs, in accordance with this by-law, may be erected in brick areas, but where the outer walls are covered with asbestos cement sheets, they may be erected only in areas in which the erection of wood framed buildings is permitted.

SECTION 24.

FIRE PROTECTION OF OPENINGS.

340. Doorways in Party Structures.—Doorways will be permitted in party structures if—

(a) those doorways open on to a staircase, landing or passageway;
(b) the net area of each doorway does not exceed 56 square feet, without the express permission of the Surveyor;
(c) the aggregate width of the doorways in any one storey does not exceed 50 per cent. of the length of the wall; and
(d) those doorways are protected with fire doors hung in such a manner as not to obstruct the landings or passage-ways and having a fire-resistance rating of two hours.

341. Windows in Party Structures.—Glazed openings in party structures will be permitted if—

(a) those openings are provided with two-hour fire windows;
(b) none of those openings exceeds 15 square feet in area;
(c) the glazing in each opening is divided into panels not exceeding 5 square feet in area; and
(d) the aggregate area of those openings in any one storey does not exceed 20 per cent. of the area of the wall in that storey.

342. Openings in Fire Walls.—(1) Where fire walls are required to limit the floor area of a building as prescribed in by-law 360 of these by-laws, openings will be permitted in these walls if the net area of any opening does not exceed 56 square feet in area excepting in sprinklered buildings where the opening may be 80 square feet in area.

(2) The width of the opening or openings, when taken together shall not exceed one half of the length of the wall in which they occur.

(3) Where an opening larger than that permitted by sub-bylaw (1) of this by-law is essential, it may, if approved by the municipality, be constructed.

(4) Such openings shall be protected with automatic double fire-doors which when combined will have a fire-resistance rating of four hours.

343. Openings in Walls of Fire-isolated Stairways.—Any opening in the wall of a fire-isolated stairway shall be protected by a one-hour fire door as defined in by-law 175 (b) of, and conforming with the requirements of by-law 133 of, or by glazing in conformity with the provisions of by-law 341 of, these by-laws; but the provisions of this by-law do not apply to openings in external walls which are not required to be protected pursuant to by-law 346 of these by-laws.

344. Openings near Exterior Stairways.—(1) Any window opening within 5 ft. of an exterior exit stairway shall be fitted with self closing windows or shutters with a fire resistance rating of one hour complying with the provisions of by-law 176 of these by-laws.

(2) Any door within 5 ft. of an exterior exit stairway shall conform with the requirements for doors to fire isolated stairways prescribed by by-law 343 of these by-laws.

345. Doorways to Lift Shafts.—A doorway to a lift shaft of any building of Type 1 or 2 construction or a building of Type 3 construction over 3 storeys in height, including basement, shall be fitted with—

(a) an approved roller shutter; and
(b) a one-hour fire door and glazing therein conforming to the provisions of by-law 175(f) of these by-laws.

346. Openings in External Walls.—(1) Every building except a building of Class I, II or III Occupancy not more than three storeys in height, shall have one-hour fire doors, fire shutters or one-hour fire windows complying, as the case may be, with the requirements of by-law 175, 176 or 177 of these by-laws, fitted to every opening in the external walls, as may be appropriate, when the opening is less than 20 ft. distant, in a direct line, from an opening in another building.

(2) An opening in the external wall of a building built within three feet of, and overlooking, land in another occupancy and any opening in an external wall abutting on an enclosed light court, common to separate buildings, shall either be—

(a) fitted with a one-hour fire window, or
(b) protected with a tin clad or wire gauze shutter.

(3) The provisions of this by-law shall not apply in the case of—

(a) show windows on a street front; or

(b) shop fronts in an arcade building fitted with an automatic sprinkler system approved by the Surveyor, or having window backs and shop doors with a one-hour fire rating.

(4) For the purpose of this by-law, when a building is divided into two or more sections, by fire walls, each section shall be regarded as a separate building.

347. Vertical Separation.—(1) Any opening in an external wall of a building of Type 1 or 2 Construction which is situate vertically above another opening in that wall and not protected by a one-hour fire door, one-hour fire window or a shutter complying, as the case may be, with the requirements of by-law 175, 176 or 177 of these by-laws, shall have not less than 3 ft. of solid masonry or concrete between the bottom of that opening and the top of the opening next below it.

(2) The masonry or concrete separating two openings under the provisions of sub-bylaw (1) of this by-law may be comprised of a horizontal projection of not less than 2 ft. beyond the face of the wall but shall have a fire-resistance rating, in the case of buildings of Class I, II, III or IV Occupancy, of not less than 2 hours and, in the case of a building of Class V, VI, VII or VIII Occupancy, of not less than three hours.

348. Skylights.—(1) Any skylight placed in a court or well, constructed in a building, or constructed on a roof of fire-resisting construction, shall be constructed of glazed metal or a glazed concrete frame having a fire-resistance rating of one hour.

(2) Every skylight not required to comply with sub-bylaw (1) of this by-law shall be glazed with wired glass or shall be protected by a substantial wire screen placed below the skylight.

349. Openings Connecting Dwelling with Trade Building.—Where a wall or floor separating a portion of a building used for purposes of trade or manufacture from that used for dwelling purposes is required by by-law 357 of these by-laws to have a fire-resistance rating, then any door opening in that wall or floor shall be protected by a fire door or fire window, as the case may be, as required for party structures by by-laws 340 and 341 of these by-laws.

SECTION 25.

UNITING OF BUILDINGS AND SUBDIVISION OF BUILDINGS BY FIRE RESISTING STRUCTURE.

350. United Buildings.—(1) Buildings shall be deemed to be united when any opening fitted with an approved door is made in the party wall or in an external wall of those buildings, or when those buildings are so connected that there is access from one building to the other, without passing into the open air.

(2) Buildings shall not be united except where they and all of them are wholly in one occupancy.

(3) Buildings shall not be united if, when united and considered as one building only, the buildings would not be in conformity with the provisions of these by-laws, for one building.

(4) United buildings shall be connected on every floor, except where specially exempted by the municipality and that exemption shall only be granted if the means of egress from every portion of the building complies with the requirements of these by-laws.

351. Procedure when Buildings no longer United.—Where any buildings deemed to be united to form one building cease to be in one occupancy, the owner thereof, or if the buildings are the property of different owners, then each such owner shall—

(a) give notice of the cessation of the one occupancy to the Surveyor;

(b) forthwith submit plans and specifications of any work required in order that each building shall conform to the requirements of these by-laws; and

(c) have any work carried to completion, as early as practicable after issue of building permit by the municipality.

352. **Stopping up of Openings.**—Any opening or gangway connecting openings between buildings deemed to be united to form one building shall be maintained until the consent of the municipality has been obtained to their being stopped up and that consent shall not be given unless and until each of those buildings conforms to the requirements of these by-laws.

353. **Buildings may be Connected.**—Buildings not deemed to be united may with the approval of the municipality be conducted by—

(a) a doorway in an external wall or party structure opening on to a stairway, landing or passage, if that doorway does not exceed 56 sq. ft. in area and is protected with a two-hour fire-resisting door complying with the requirements of by-law 175 of these by-laws and that door is so hung as not to obstruct the egress space of any landing or passage; or

(b) an open gangway or bridge of fire-resisting construction.

354. **Separation of Flats.**—In every building of Class II Occupancy hereafter constructed (including every existing building hereafter converted to a building of Class II Occupancy) every flat shall be separated from every other flat and from any common entrance hall, stair well, or corridor by—

(a) walls having a fire resistance rating of three hours; and

(b) floors having a fire resistance rating of two hours;

and any of those floors or walls shall comply with the requirements of by-laws 404 and 405 of these by-laws.

355. **Subdivision of Residential and Institutional Buildings.**—Any wall or partition between rooms or between a room and a corridor in a building of Class III Occupancy and institutional buildings of Class IX Occupancy shall have a fire-resistance rating of one hour in the case of a building of Type 1 or 2 Construction and of two hours in the case of a building of Type 3 Construction; but any opening in that wall or partition is not required to have a fire-resistance rating.

356. **Separation of Occupancy in Other Buildings.**—(1) In a building of Class VI, VII or VIII Occupancy, different occupancies shall be separated by party structures having a fire-resistance rating of one hour.

(2) In an assembly building of Class IX Occupancy, different occupancies shall be separated by party structures having a fire-resistance rating of four hours in the case of walls and three hours in the case of floors.

357. **Separation of Different Classes of Occupancy within a Building.**—(1) In any building constructed in part as a dwelling of Class I or IV Occupancy, and in part to be used for business purposes of Class V, VI, VII or VIII Occupancy, those parts shall be separated by a party structure when the floor area of the part used for business purposes exceeds 2,000 sq. ft.; and that party structure shall have a fire-resistance rating of two hours.

(2) In any building constructed in part as a building of Class II or Class III Occupancy, and in part to be used for business purposes, those parts shall be separated by a party structure having a fire-resistance rating of three hours in the case of a wall and two hours in the case of a floor or a ceiling.

(3) In any building constructed to contain in part an assembly building of Class IX Occupancy, that part shall be separated from the remainder of the building by a party structure having a fire-resistance rating of four hours in the case of a wall and three hours in the case of a floor or a ceiling.

(4) In any building containing mixed Occupancies of Class VI, VII or VIII, the various classes of Occupancy shall be separated by a party structure conforming to the requirements of sub-bylaw (1) of by-law 356 of these by-laws, unless otherwise approved by the municipality.

358. **Garages Attached to Buildings.**—(1) A Commercial garage, motor repair shop or petrol selling station shall not be located within or attached to another building, unless it is separated from every other Occupancy by a party structure having a fire-resistance rating of four hours in the case of a wall and three hours in the case of a floor.

(2) A private garage may be attached to a building of Class I, II or III Occupancy or Type 1, 2 or 3 construction if that garage is separated from the rest of the building by a wall having a fire-resistance rating of one hour or by a floor having a fire-resistance rating of two hours, or by both; but an opening shall not be constructed in the wall except in compliance with sub-bylaw (4) of this by-law.

(3) In the case of a private dwelling of Class I Occupancy and Type 5 (wood frame) Construction, the municipality may approve the attachment of a private garage if it is lined internally on the walls and ceiling with 3/16th in. asbestos; but an opening shall not be permitted between the garage and the dwelling and a room shall not be constructed over the garage.

(4) Except in the case of a building of Class III Occupancy or a wood framed dwelling of Class I Occupancy, a doorway not more than 3 ft. wide is permitted in the wall separating the garage from the residence, if the door sill is raised at least 6 in. above the garage floor and the doorway is fitted with a self-closing metal clad door.

(5) A private garage may be attached to a building of another class if the garage is separated from the rest of the building by a wall having a fire-resistance rating of four hours and a floor or a ceiling of three hours fire-resistance rating; and any opening in the wall shall be protected by a self-closing fire door with a fire-resistance rating of two hours, and any door sills between the Occupancies shall be raised at least 12 in.

(6) The floor of any garage shall be of concrete or other hard incombustible material.

(7) Where fire-resistance ratings of four hours for walls and three hours for floors are required by this by-law, those ratings may be reduced to three hours and two hours, respectively, if a sprinkler system is installed in accordance with the requirements of the Fire Underwriters' Association, being Item 23 of the Appendix.

359. Separation of Different Types of Construction.—Where different types of construction in a building are separated by a fire-resisting structure, that structure shall have a fire-resistance rating of four hours in the case of a wall and of three hours in the case of a floor, including its beams, girders and trusses.

360. Limitation of Floor Area.—(1) A building or portion of a building of Type 3, 4 or 5 Construction used as a shop, warehouse or factory shall not extend to more than 35,000 square feet total floor area, or where a sprinkler system is installed to more than 55,000 square feet whether on one or more floors, unless divided by walls having a fire-resistance rating of four hours or by floors having a fire-resistance rating of three hours, in such a manner that the total floor area within any division shall not exceed 35,000 and 55,000 square feet, respectively, except that—

(a) the municipality may consent to a larger area, subject to satisfactory provision being made and maintained for lessening, as far as reasonably practicable, danger from fire, but so that the consent expires when the building ceases to be used for the purpose in respect of which the consent was given; and

(b) this provision does not apply to assembly shops and similar buildings one storey in height, where the manufacturing process requires an undivided area.

(2) A staircase or lift well connecting two or more divisions shall be fire-isolated by walls having a fire-resistance rating of three hours.

(3) Any door opening on to a staircase or lift well connecting two or more divisions shall be a two-hour fire door.

361. Additions to Existing Buildings.—A building shall not hereafter be added to or extended on any site so as to exceed the limits of undivided area as fixed in this Section but this by-law does not prohibit the extension of any building heretofore lawfully erected which exceeds the limiting area as set forth in this Section, if that extension complies with the area limitations fixed by this Section and is separated from the existing building by a fire wall.

SECTION 26.

CHIMNEYS, FLUES, FIREPLACES, ETC.

Part I—General Provisions.

362. Materials for Chimneys.—Every chimney shall be constructed of—

(a) reinforced concrete;

(b) solid masonry properly bonded and solidly put together with mortar; or

(c) other approved, good, hard, durable, non-inflammable, fire-resisting material, properly and solidly put together, and this requirement as to material shall be deemed to be satisfied by the use of any

material which complies with the list for materials for flues, furnace casings, hearths, and similar purposes prescribed in the S.A.A. specification, being Item 8 of the Appendix.

363. Construction of Chimneys.—Every chimney shall be—

(a) built upon solid foundations with footings complying with the requirements of Section 17 of these by-laws;
(b) carried upon steel girders bearing directly upon walls having the necessary strength and stability; or
(c) carried upon corbels of masonry, steel, concrete, or reinforced concrete, the work so corbelled being constructed for the full width of the jamb and projecting not more than 14 in. from the face of the wall.

364. Construction of Hearths.—(1) A hearth constructed of stone, slate, bricks, tiles, cement or other approved, non-inflammable, fire-resisting material shall be fixed under and in front of every fireplace opening.

(2) Every hearth shall—

(a) be solidly and securely supported;
(b) have a thickness of not less than 4 in.;
(c) extend not less than 6 in. beyond each end of the fireplace opening;
(d) project not less than 14 in. from the face of the chimney breast; and
(e) be so laid that its surface is not lower than the floor of the room in which the hearth is situated.

365. Jambs of Fireplaces.—The jambs of every fireplace opening shall be at least 8 in. in thickness on each side of the fireplace opening.

366. Fireplace Backs.—The back of every fireplace opening from the hearth up to a height of 12 in. above the arch or lintel shall be constructed of—

(a) solid masonry at least 8 in. thick;
(b) reinforced concrete at least 6 in. thick; or
(c) reinforced concrete faced with masonry or fire-brick of a total thickness of 6 in.;

but an opening for a stove or a fire-brick grate may be of brickwork 4 in. thick.

367. Chimney Breasts.—The breast of every chimney shall be of incombustible material at least 4 in. in thickness.

368. Arches and Lintels.—An arch of brick, stone, or concrete or a lintel of steel or reinforced concrete of sufficient strength shall be built over the opening of every fireplace to support the breast of the fireplace.

369. Location of Steam Pipes, etc.—A pipe for conveying steam or smoke or other products of combustion shall not discharge into a street, or be fixed against any building on the face adjoining any street.

370. Distance of Steam Pipes from Combustible Material.—A pipe for conveying steam or air at a temperature exceeding 212 degrees Fahrenheit, shall not be fixed nearer than 6 in. to any combustible material and any lagging used shall be of incombustible material.

371. Cutting Away of Chimney Breast in Party Walls.—A chimney breast or shaft built with or in any party wall shall not be cut away, unless the Surveyor certifies that the cutting away can be done without injuriously affecting the stability of any building.

372. Gas Cooking Stoves.—(1) Every gas cooking stove which is not situated in a fireplace or fire recess shall be provided with a hood or canopy, the receptive area of which shall not be less than the total area of the top of the stove.

(2) The top of any hood or canopy shall slope upwards at an angle of not less than 20 degrees from the horizontal to a flue which shall be carried through the roof to the open air and be fitted with a cowl to prevent down draughts.

(3) Notwithstanding the provisions of sub-bylaw (2) of this by-law, in a single occupancy dwelling of Class I or a duplex house, where the Surveyor is satisfied that adequate ventilation exists in the roof space under all conditions, the flue may discharge into the roof space without a cowl; but in all cases where the eaves of the residence or duplex house are "boxed in" or of a closed type, such vent must be taken direct to the open air.

(4) Every vent pipe required to be installed, under this by-law, shall have a diameter not less than—

(a) 4 in., in the case of a building of Class I, II, III or IV Occupancy; and

(b) 7 in., in the case of a building of Class VI, VIII or IX Occupancy.

(5) A hood or canopy shall not be required, pursuant to sub-bylaw (1) of this by-law, if a mechanical exhaust is provided.

373. Flue Pipes for Gas Appliances.—Any flue pipe for gas appliances shall be constructed in accordance with the requirements of the State Electricity Commission of Western Australia.

374. Flue Pipes for Fuel Bath Heaters and Portable Coppers.—Any flue pipes for a fuel bath heater shall be carried through the roof to a height of not less than 18 in. and the projecting portion of the flue pipe shall be provided with an outer casing 2 in. clear of the flue pipe, commencing at the ceiling level and terminating in an approved cowl, cap, or terminal.

375. Prevention of Emission of Smoke.—(1) Every furnace and chimney shall be so used and managed as to minimise, as far as possible, the emission of smoke.

(2) If, in the opinion of the Surveyor, any furnace or chimney emits an unreasonable amount of smoke, the municipality may serve notice on the owner or occupier of the land on which such furnace or chimney exists, requiring the carrying out of any specified alterations or additions thereto [within a time specified in the notice] in order to minimise the emission of smoke.

(3) Every owner or occupier served with a notice under the last preceding clause shall comply therewith, to the satisfaction of the Surveyor.

Part II.—Chimneys Not Used for Trade Purposes.

376. Height of Chimneys.—Every chimney shaft shall be carried up not less than 1 ft. above any part of the roof structure within a horizontal distance of 12 ft. and a chimney shall not be built higher above the roof, flat, or gutter adjoining thereto than a height equal to six times the least width of the chimney shaft, at the level of the highest point in the line of junction, unless the chimney shaft is built with, and bonded to, another chimney shaft not in the same line with the former, or is otherwise rendered secure, to the satisfaction of the Surveyor.

377. Inclination of Chimneys and Flues.—A chimney or flue shall not be inclined at a less angle than 45 degrees to the horizontal and every angle shall be properly rounded; but where the chimney or flue has soot doors (approved by the Surveyor), of not less than 40 square inches, the Surveyor may sanction any other angle.

378. Thickness of Flues.—Every chimney, smoke flue or chimney shaft shall be carried up in solid masonry not less than 4 in. in thickness throughout; but, where the upper side of any such chimney or flue is constructed at an angle of less than 45 degrees with the horizontal, the thickness of the upper side shall not be less than 9 in.

379. Soot Doors.—Every soot door shall be distant at least 15 in. from any woodwork.

380. Rounding of Angles.—Every angle at a change of direction in a chimney shall be properly rounded.

381. Lining of Flues.—The inside of every flue, and also the outside where passing through any floor, roof or space enclosed by the roof or behind or against any woodwork, shall be rendered or pargetted, or lined with fire-resisting piping or stoneware.

382. Plugs in Chimneys.—A wooden plug shall not be driven nearer than 5 in., or an iron fastening nearer than 2 in., of the inside of any flue or chimney opening.

383. Timber near Chimneys.—Timber or woodwork shall not be placed—

(a) under any chimney opening, within 6 in. of the upper surface of the hearth of the chimney opening; or

(b) within 2 in. of the face of the brickwork or stonework about any chimney or flue, unless the face of the brickwork or stonework is rendered.

384. **Flashings of Chimney Stacks.**—Every chimney stack shall be effectively flashed at its junction with the roof.

385. **Construction near Boiler or Furnace.**—(1) Every floor or portion of a floor under or within a distance of 6 in. of any boiler or furnace shall be constructed of materials having a fire-resistance rating of two hours.

(2) Every portion of a ceiling over, and within 6 ft. of, a furnace shall be constructed of materials having a fire-resistance rating of two hours.

(3) Every portion of a wall within a distance of 6 ft. of any boiler or furnace shall be constructed of materials having a fire-resistance rating of one hour.

(4) Where the heating unit is adequately self-insulated the provisions of sub-bylaws (2) and (3) of this by-law do not apply.

386. **Construction of Floors near Fuel Stoves.**—The floor under every stove not heated by gas or electricity and the floor surrounding that stove for a space of 15 in. in front of every fire and 9 in. elsewhere shall be formed of materials of an incombustible and non-conducting nature, having a thickness of not less than 3 in.

387. **Solid Fuel Burning Slow Combustion Stoves and Space Heating Appliances.**—Notwithstanding anything contained in Parts I and II of this Section, insulated solid fuel burning stoves and slow combustion space heating appliances of a type and construction approved by the Surveyor may be installed in a dwelling or residential flat, subject to the following conditions, that is to say:—

(a) **Hearths.**—Every stove or space heating appliance to which this by-law applies shall stand on a hearth or slab of concrete not less than 3 inches in thickness or other approved durable material providing not less than the same measure of thermal resistance (that is, a fire resistance rating of 1½ hours).

(b) **Backing Wall.**—The backing wall to that stove or appliance shall have a fire resistance rating of not less than 2 hours over an area of not less than the back of the stove or appliance unless separated therefrom by a space of not less than 12 inches; but that space may be reduced to 6 inches in the case of a stove or appliance with an approved insulated back, subject to the space at the rear being enclosed along its top and sides with heavy gauge wire mesh or perforated metal to prevent the entry of combustible materials when the back of the stove or appliance is within 12 inches of the backing wall.

(c) **Hoods.**—Every free standing stove shall be provided with a hood or canopy of cross sectional area of not less than the area of the top of the stove.

(d) **Flues.**—(i) Any flue shall provide not less than 20 square inches of airway with no cross sectional dimensions less than 4 inches and shall be connected directly to the smoke outlet of the stove or appliance and be carried up continuously and vertically to a point not less than 12 inches above the highest part of the roof at the point of emergence.

(ii) In the case of a stove, the flue shall be surrounded throughout its full height from the top of the stove or from the top of the hood or canopy over the stove to a height not less than 6 inches above the roof with a sleeve or casing providing not less than 2 inches of clear airway between the flue and the casing.

(iii) A flue shall be of steel not thinner than 20 S.W.G. or asbestos cement pipe not thinner than 5/16th in. and the casing of the flue shall be of steel not less than 20 S.W.G. or asbestos cement pipe not less than 5/16th in. in thickness, in the case of a stove, and of asbestos not less than ½ in. in thickness, in the case of a space heater.

(iv) A flue shall be constructed in such a manner that it is removable for replacement and be held in position centrally in the casing by metal spacers of the minimum cross sectional area necessary for stability.

(v) Combustible material shall not be placed within 2 in. of the flue casing or 9 in. of the outlet or flue of a space heating appliance, where it passes through the external wall of a timber framed building.

(vi) An external flue shall be carried up 6 in. clear of combustible materials.

388. **Solid Fuel Burning Open Fires.**—Notwithstanding anything contained in Parts I and II of this Section, solid fuel burning open fires may be installed in a dwelling or residential flat subject to the following conditions, that is to say:—

(a) **Hearths.**—(i) Every solid fuel burning open fire shall be provided with a hearth of stone, brick or concrete of not less than 3 inches in thickness and 14 inches in width, extending around the open portions of such fireplace.

(ii) A hearth may be constructed of approved, durable material, other than those mentioned in subparagraph (i) of this paragraph, if of an equivalent or greater measure of thermal value than those materials and having a fire resistance rating of not less than 1½ hours.

(b) **Hoods.**—Every solid fuel burning open fireplace shall be provided with a hood or canopy of cross sectional area of not less than the area of the fireplace.

(c) **Flues.**—(i) The flue leading from a hood or canopy shall provide not less than 60 square inches of airway with no cross sectional dimension less than 6 inches and shall be carried up continuously and vertically to a point not less than 12 inches above the highest part of the roof at the point of emergence.

(ii) The flue shall be surrounded from the ceiling level to a height of not less than 6 inches above the roof with a sleeve or casing providing not less than 2 inches of clear airway between the flue and the casing.

(iii) Flues shall comply with the requirements of by-law 387 (d) (iii), (iv), (v) and (vi) of these by-laws; but flues may be of copper or other approved metal not less than 20 S.W.G.

Part III.—Factory Chimneys and Chimneys Used for Commercial Purposes.

389. **Flues Generally.**—A flue used for the purpose of any factory, trade or business, or for the range or cooking apparatus of any hotel, tavern or eating-house shall be surrounded with brickwork at least 9 in. thick, or by reinforced concrete at least 6 in. thick, from the floor of the storey on which the oven, furnace, steam boiler or other fire served by the flue is situate, to 18 in. above the highest part of the roof structure.

390. **Construction of Masonry Chimney Shafts.**—Every brick or masonry factory, or commercial, chimney shaft shall be constructed in conformity with the following provisions, that is to say—

(a) every detached shaft shall be carried up throughout in masonry or brickwork and if detached shall be built with a batter from the base to the top of the shaft at the rate of at least 1¼ in. in 10 ft. of height;

(b) the brickwork of the topmost 25 feet of any shaft of which the perimeter does not exceed 20 feet or the circumference 16 feet (as the case may be) shall be not less than 9 inches in thickness and, in the case of a shaft having greater dimensions, shall be not less than 14 inches;

(c) the thickness of the brickwork of any portion of a shaft, below the topmost 25 feet, shall be at least 4½ inches greater than that of any 25 feet of the shaft above it.

(d) every cap, cornice, pedestal, plinth, string course or other variation from plain brickwork shall be provided as additional to the thickness of brickwork required by this by-law; and the foundation of the shaft shall be on concrete or other sufficient foundation;

(e) the footings inside and outside the shaft shall be spread around the base, by regular offsets to a projection at least equal to the thickness of the enclosing brickwork at the base of the shaft;

(f) the width of the base of the shaft, if square or rectangular, shall be at least one-tenth of the proposed height of the shaft, or, if round or of any other shape, then one-twelfth of the height, but the footing shall also be so proportioned as not to exceed the allowable pressure on the soil;
(g) the height of the shaft shall be measured from the top of the footings to the shaft; and
(h) the top six courses of the shaft shall be laid in cement mortar.

391. Chimney Shafts Constructed of Materials Other Than Masonry.—A chimney shaft of reinforced concrete, steel or any material conforming to the requirements of by-law 362 (c) of these by-laws shall be constructed in accordance with plans and computations approved by the Surveyor.

392. Distance of Flues from Combustible Material.—A flue for conveying smoke or other products of combustion shall not be placed nearer than 9 in. to any combustible material and any lagging used shall be of incombustible material.

393. Lining of Flues.—(1) the inside of every chimney shall be rendered or pargetted or lined with approved fire-resisting material.

(2) Any firebrick lining built inside the lower portion of any chimney shaft shall be additional to and independent of the thickness of the masonry prescribed by these by-laws and shall not be bonded therewith.

394. Construction of Floors and Ceilings Near Ovens, Boilers or Furnaces.—(1) Every floor or portion of a floor under or within 6 ft. of any oven, boiler or furnace shall be constructed of materials having a fire-resistance rating of not less than three hours.

(2) Any floor, ceiling, or roof or portion thereof above and within a distance of 6 ft. of any oven, boiler or furnace, shall be constructed of materials having a fire-resistance rating of not less than three hours.

(3) Where any heating unit is adequately self-insulated the provisions of sub-bylaw (2) of this by-law do not apply.

395. Construction of Walls Near Ovens, Boilers, or Furnaces.—Every wall of any room or enclosure housing or surrounding any oven, boiler or furnace shall have a fire-resistance rating not less than—
(a) four hours, in the case of any wall or portion of a wall, within a distance of 6 ft. of the oven, boiler or furnace; and
(b) one hour, in the case of every wall or portion of a wall distant more than 6 ft. of the oven, boiler or furnace.

396. Boiler Rooms.—Notwithstanding the provisions of by-laws 394 and 395 of these by-laws, the municipality may require any oven, boiler or furnace, to be housed within a room constructed of materials having a fire-resistive rating of three hours, in the case of floors, walls and ceilings.

SECTION 27.

SPECIAL CLASS REQUIREMENTS INCLUDING FLATS.

General Provisions—Residential Buildings of Classes I, II and IV Occupancy.

397. Kitchens.—Every kitchen shall comply with the requirements of by-laws 59 (1) and 59 (2) of these by-laws and have a minimum width of 7 ft., but notwithstanding the provisions of this by-law, a kitchen may be replaced by a kitchen annexe in a dwelling of Class I Occupancy or a duplex house, if one wall is an external wall and the annexe has a floor area of not less than 50 square feet and is separated from a living room by an opening having a width of not less than 5 ft. and a height of not less than 7 ft.

398. Bathrooms.—(1) Every bathroom shall comply with the provisions of by-law 67 of these by-laws.

(2) The floor of every bathroom shall be constructed of concrete not less than 3 in. thick, complying with the provisions of by-law 288 of these by-laws.

399. Water Closets.—Every water closet shall comply with the requirements of by-laws 67 and 429 of these by-laws.

400. Laundries.—Every laundry or wash-house shall be enclosed by walls to provide protection against storm and rainwater and comply with the provisions of by-law 68 of these by-laws.

Class I—Private Dwellings.

401. Minimum Number of Rooms and Size.—Every dwelling hereafter erected, altered or extended shall conform to the following requirements, that is to say—

(a) the minimum accommodation shall comprise four habitable rooms complying with the requirements of by-law 59 of these by-laws, in addition to any bathroom, laundry or water closet required to be provided by any by-laws made under the Health Act, 1911; but a municipality, by special resolution, may approve of lesser accommodation; and

(b) where an existing dwelling is converted into a duplex house the floor area of each dwelling unit of that duplex house shall not be less than 600 sq. ft.

Class II—Residential Flat Buildings.

402. Minimum Accommodation.—Every residential flat hereafter erected constructed, adapted or altered shall comprise not less than three habitable rooms complying with the requirements of by-law 59 of these by-laws, in addition to any bathroom, laundry or water closet required to be provided by any by-laws made under the Health Act, 1911.

403. Single Unit Flats.—Notwithstanding the provisions of by-law 402 of these by-laws, a municipality may (by zoning) prescribe areas wherein single unit flats may be erected, comprising a bed-sitting-room of not less than 180 sq. ft., a kitchen of not less than 50 square feet, together with any bathroom, laundry or water closet required to be provided by any by-law made under the Health Act, 1911; but the kitchen of such a flat may be of a minimum width of 6 ft., if it is so arranged that all fittings can be arranged on one wall, but in other cases the minimum width shall be 7 ft.

404. Floors.—The floors of a residential flat building shall be so constructed as to minimise the passage of impact and air-borne noises; and any reinforced concrete floors shall not be less than 4 in. in thickness.

405. Walls Separating Flats.—Any wall dividing separate flats or separating flats from a common hall or passage shall comply with the requirements of by-law 251 of these by-laws and be taken up to the underside of the roof, unless the ceilings of the adjoining flats are insulated with the equivalent of 2 inches of approved sound insulating material.

Note.—If constructed of brick the wall shall have a thickness of 9 in.

406. Stairs.—(1) A stairway other than an alternative escape stair, shall not be less than 3 ft. 4 in. in width and a stairway serving more than one flat and a common hall or passageway shall be not less than 4 ft. in width.

(2) An escape or back service stairway shall be not less than 2 ft. 8 in. wide and any kitchen of a residential flat shall have direct access to escape stairs.

(3) Any external access stairway to a flat shall be constructed in brick or reinforced concrete and shall have treads of not less than 10 in. and risers of not more than 7 in. and every flat not situated on a ground floor shall have an escape stair or unobstructed access, at all times, to a stairway providing an alternate means of escape.

Class III Occupancy—Residential Buildings.

407. Lodging and Boarding Houses, Residential Clubs, etc.—Any Lodging house, boarding house, residential club, or like establishment offering or letting accommodation for reward, shall be provided with bathrooms, washbasins, water closets and a laundry, in accordance with the provisions of any by-laws made under the Health Act, 1911.

408. Residential Hotels.—The residential portions of any hotel licensed under the provisions of the Licensing Act, 1911, shall be provided with bathrooms, washbasins, water closets and a laundry in conformity with the requirements of the Licensing Court and any by-laws made under the Health Act, 1911.

409. Kitchens and Dining-rooms.—Every building of Class III Occupancy hereafter erected, constructed, adapted or altered shall be provided with a kitchen, dining-room and sitting-room of sufficient size to serve the persons accommodated therein in accordance with the requirements of any by-laws made under the Health Act, 1911, and, in the case of a licensed hotel, with the requirements of the Licensing Court.

Class IV Occupancy—Dwellings Attached to Buildings of Other Classes.

410. Minimum Accommodation.—Every building of Class IV Occupancy hereafter erected, constructed, adapted or altered shall comprise not less than three habitable rooms complying with the requirements of by-law 59 of these by-laws, in addition to any bathroom, laundry or water closet required to be provided by any by-laws made under the Health Act, 1911.

Class VI Occupancy—Shops.

411. Shop Fronts.—(1) No part of any shop front shall be fixed—

(a) nearer than 3 in. to the centre line of a reinforced concrete party wall;

(b) nearer than 4 in. to the centre of a masonry party wall; or

(c) nearer than 4 in. to a wall of adjoining premises, when those premises have a separate wall.

(2) A shop front, within a distance of 20 ft. of an opening in an external wall of another building, shall be constructed in conformity with the provisions of by-law 346 of these by-laws, but the shutters mentioned in that by-law may be in the form of window backs, not more than 2 ft. from the building line.

(3) The upper section of a shop front may, if that portion is constructed not less than 9 ft. above the pavement, project—

(a) not more than 18 in., if the street which the shop front faces is 33 ft. or more in width; or

(b) not more than 12 in., if the street which the shop front faces is less than 33 ft. in width.

(4) a moulding shall not project more than ½ in. beyond the street alignment in any portion of a shop front, at a lesser height than 9 ft. above the pavement.

412 Show Cases and Mirrors.—Mirrors and show cases shall be affixed flat against a wall, pier, or pilaster, in such a way that no portion projects beyond the street alignment.

413. Stall-boards.—Any stall-boards under a shop front shall be constructed of brickwork, stonework, concrete or other materials having a fire-resistance rating of not less than one hour, and be provided with sub-floor ventilation.

414. Shop Fronts Abutting on Exits.—Where a shop front, abutting on an exit from a stairway required to be fire-isolated, is returned along a passage or a lobby to a depth greater than the width of that passage or lobby, the shop front shall be protected by a sprinkler system, an approved self-coiling rolling corrugated steel shutter running in metal grooves and fitted with proper appliances on the outside thereof, suitable for raising and lowering the shutter, or by material having a fire-resistance rating of one hour.

415. Floors and Walls in Shops Used for the Sale of Perishable Foodstuffs, Eating Houses, etc.—The floor and walls of any shop used for the sale of perishable foodstuffs, eating house, restaurant, or like premises hereafter erected, constructed or adapted shall comply with the requirements of any by-laws made under the Health Act, 1911.

416. Openings in Shops Close to Street.—An opening in any wall, shop front, or window for the purpose of sale at retail of any goods or articles shall not be made within 4 ft. 6 in. of any street or public way.

417. Kiosks.—(1) A kiosk shall not be placed within 4 ft. 6 in. of a street or public way.

(2) A kiosk may, subject to approval of the municipality, be placed in an arcade, and every kiosk so placed shall have—

(a) a minimum height of 8 ft., measured from the floor to the ceiling;

(b) a minimum internal dimension of 3 ft. 6 in., and a minimum floor area of 16 sq. ft.;

(c) adequate ventilation communicating directly with the external air; and

(d) a minimum floor area of 20 sq. ft. per person, when occupied by more than one person.

(3) For the purpose of this by-law, a kiosk means a stall or enclosed apartment for the sale or distribution of goods, which the public does not enter.

418. Class VIII Occupancy—Factories.—General.—Any factory shall comply with the requirements of the Chief Inspector of Factories.

419. Sanitation—Buildings of Classes IV, V, VI, VII and VIII Occupancy.—A building of Class IV, V, VI, VII or VIII Occupancy shall have water closets, urinals, and wash basins, provided in conformity with the requirements of any by-laws made under the Health Act, 1911.

420. Class IX Occupancy, Public Buildings.—Every public building within the meaning of Part VI of the Health Act, 1911, shall be constructed in conformity with the requirements of the regulations made under that Act.

Section 28.

OUTBUILDINGS.

Part I—Outbuildings Appurtenant to Private Dwellings of Class I, Duplex Houses, Lodging and Boarding Houses of Class III and Buildings of Class IV.

421. Construction.—(1) The municipality may by by-law declare special areas where any outbuilding shall be constructed of brick.

(2) No outbuilding other than a kennel, aviary or fowl house shall be less than 7 ft. in height from the floor to the ceiling, and where there is no ceiling, from the floor to the underside of the rafters at the lowest point; and, in the case of a wash-house, the average height shall be not less than 7 ft. 6 in.

(3) In a brick area, any outbuilding exceeding four squares in area shall be built of masonry.

(4) Any brick outbuilding shall comply with the provisions of by-laws 239 and 242 of these by-laws.

(5) Except at the rear of a dwelling to which it is appurtenant, an outbuilding shall not be erected within 3 ft. of the boundary of a site.

(6) A wall of an outbuilding which is erected within 3 ft. of a boundary shall be constructed of brick, stone, or concrete, shall have a fire-rating as prescribed by these by-laws, and be carried up, as a parapet, 15 in. in height above the roof, flat or gutter of the outbuilding; but a boundary wall may be of material other than brick, stone or concrete if it abuts on a right-of-way or lane over which the owner of the outbuilding has rights.

422. Stables.—A stable containing not more than two stalls may be built if—

(a) the external walls do not exceed 10 ft. in height from the level of the ground to the top plate of the wall or the underside of the eaves;

(b) the floor is laid with hard bricks, blue-stone pitchers, or wood blocks, jointed in cement mortar, with sleepers, grouted in tar, or with cement, concrete, or other approved impervious material;

(c) the building, of whatever material constructed—

(i) is distant not less than 80 ft. from the property alignment of the street or road to which such property has its main frontage;

(ii) is distant not less than 30 ft. from any other street or road to which such property has a frontage;

(iii) is distant not less than 3 ft. from the boundary of the site other than a street boundary, unless the external wall adjoining that boundary is carried up, as a parapet, at least 15 in. in height, above the roof, flat or gutter of the building; and

(iv) is distant not less than thirty (30) feet or any greater distance required by any by-laws made under the Health Act, 1911, from any other building used as a dwelling-house, whether on the same allotment of land or on any adjoining allotment;

and

(d) the provisions of any health by-laws of the municipality relating to stables are complied with.

(2) A stable containing more than two stalls shall be erected in accordance with the provisions of these by-laws relating to main structures.

423. Private Workshops, Sheds, etc.—(1) Outbuildings for use as private workshops which are not required to be registered under the Factories and Shops Act, 1920, sheds and similar structures may be built; but where those structures are—

(a) attached to the main building, they shall be constructed of similar materials to the main buildings and conform to the requirements as to distance from the boundaries prescribed by these by-laws for the main building; or

(b) detached from the main building they shall be distant not less than—

(i) 6 ft. from any dwelling on the same allotment;

(ii) 50 ft. from the boundary of the street or road to which the land upon which the structure is to be constructed has its main frontage; and

(iii) 20 ft. from any other street, or road to which that land has a frontage, unless especially approved by the municipality.

(2) The floor area of an outbuilding used as a private workshop shall not exceed 2½ squares.

424. Wash-houses.—A detached wash-house not exceeding 1½ squares in superficial area may be built as appurtenant to any dwelling, and, if distant 6 ft. or more from the main building, shall comply with all the provisions, other than those of paragraph (b) (i), of sub-bylaw (1) of by-law 423 of these by-laws; but, if built within a distance of 6 ft. from the main building or attached thereto, then the wash-house shall comply with such conditions, as to distance from boundaries, as apply to the main building.

425. Garages.—Any private motor garage shall be built so that—

(a) no portion of the garage projects beyond the alignment of the street to which the site has its principal frontage, or is nearer to that alignment than—

(i) the building line, or the minimum distance, prescribed by by-law 32 of these by-laws, or the front of the house of which the garage forms an integral part, whichever distance is the lesser;

(ii) the building line prescribed by by-law 32 of these by-laws or the front of the dwelling, whichever distance is the lesser, where the garage is detached and of brick construction; or

(iii) the rear of the dwelling, where the garage is of Type 4 or 5 Construction; but in optional areas the municipality may approve of the erection of the garage within the limits prescribed by sub-paragraph (ii) of this paragraph;

except where the configuration of the ground renders it impossible or impractical; in which case the municipality may permit the erection at a lesser distance from the street alignment.

(b) if detached, no portion of the garage is within 20 ft. of any street or road to which the site has a frontage, except with the approval of the municipality.

(c) the walls are not more than 10 ft. in height, if the superficial area of the garage does not exceed 4 squares;

(d) the walls are built of brick or concrete and comply with any of these by-laws applying to buildings of those materials, where the garage exceeds 15 ft. in height to the highest point of the roof or has a superficial area exceeding 4 squares, unless the garage is appurtenant to a wood framed dwelling of Type 5 Construction;

(e) it complies with such provisions of these by-laws, as to distance from boundaries or other buildings, as apply to the main building, where the garage is built at a distance less than 6 ft. from, or is attached to, or forms part of, that building;

(f) the floors are constructed of approved incombustible material;

(g) it complies with the provisions of by-law 358 of these by-laws, where attached to, or forming part of, any dwelling, shop or other building; and

(h) the doors do not open over or upon or obstruct any street, footway or right of way.

426. **Car Ports.**—(1) A car port comprising an open-sided garage, without doors may be located in conformity with the requirements for garages as set out in by-law 425 of these by-laws.

(2) In the case of a building of Class I Occupancy, the municipality may permit the erection of a car port in a position other than that prescribed for garages.

(3) A car port referred to in sub-bylaw (2) of this by-law may be a pergola type of flat-roofed construction supported by posts or columns, but without walls or doors, if complying with the following requirements:—

Timber (Jarrah—Dressed)—
Spans up to 8 ft.—4 in. x 4 in.
Spans over 8 ft.—5 in. x 5 in.
Steel piping.
Brickwork or masonry—9 in. x 9 in.
Concrete—6 in. x 6 in. reinforced.

427. **Water Closets and Urinals.**—A water closet or urinal not forming part of a main building may be built in the yard or area appurtenant to each building, if—

(a) the water closet, or urinal is distant not less than fifty (50) feet from the building line of the street or road, to which the site upon which it is intended to erect it has its main frontage, and 20 ft. from the boundary of any other street, or road to which the site has a frontage and, if built within 3 ft. of the boundary of any adjoining allotment of land, is separated therefrom by a wall of brick, or concrete, not less than 4 in. in thickness, carried up to a height of 12 in. above the level of the roof as a parapet wall;

(b) the water closet or urinal is properly screened from public view;

(c) the water closet or urinal is constructed with walls of brick, or concrete not less than 4 in. in thickness and floored and roofed to the requirements of the Surveyor; but nothing in this by-law prevents the erection of a water closet attached to or within a dwelling-house or other building, subject to any conditions governing that building in these by-laws.

428. **Conservatories, Shade Houses, Pigeon Lofts and Aviaries.**—A conservatory, shade house, pigeon loft or aviary may be constructed, subject to the municipality's approval of the location, design and materials of construction, and subject to compliance with any by-laws under the Health Act, 1911.

429. **Fowlhouses, Kennels, etc.**—A fowlhouse, kennel, or like structure may be constructed, if it—

(a) has a height not exceeding 8 ft. and a total superficial area not exceeding 100 square feet;

(b) is not less than 60 ft. distant from the boundary of any street, or road to which the building has a frontage, except in cases where any health by-laws permit a lesser distance; and

(c) complies with the requirements of any by-laws made under the Health Act, 1911.

Part II—Outbuildings Appurtenant to Buildings of Other Classes.

430. **General.**—Except as provided by by-laws 431 and 432 of these by-laws, any outbuildings shall comply with requirements set out in Part I of this Section.

431. **Outbuildings to be of Brick.**—Any outbuilding shall be constructed of brick; but the municipality may, by Special License approve of garages and sheds of wood frame construction, appurtenant to buildings in areas where the erection of buildings of Types 4 and 5 Construction is permitted by the municipality.

432. **Location from Boundaries.**—An outbuilding shall not be built nearer to the street alignment than the alignment of the front of the building to which it is appurtenant or closer than 20 ft. to any other street, to which the site has a frontage, but the municipality may, if the circumstances so warrant, grant special approval for outbuildings closer to the street frontages.

SECTION 29.

SERVICES AND EQUIPMENT.

433. Gas Installations.—Where any gas appliance is installed in any building that installation shall be in accordance with the rules and regulations of the State Electricity Commission and Gas Department; and gas cooking stoves shall be installed in accordance with the provisions of by-law 372 of these by-laws.

434. Electrical Installations.—Any electric apparatus or wiring for lighting, heating or power supply or other application of electricity shall be in accordance with the regulations of the State Electricity Commission and the S.A.A. wiring rules, being Item 26 of the Appendix.

435. Lifts and Lift Shafts.—(1) A lift shall be provided for the use of the occupants of every building exceeding 3 storeys in height.

(2) Every lift installation shall conform to the requirements of the S.A.A. Lift Code being Item 19 of the Appendix and the requirements of the Chief Inspector of Machinery.

(3) Except as provided by sub-bylaw (4) of this by-law the shaft of every lift shall be constructed and enclosed throughout its height with walls having a fire-resistance rating of two hours and the shaft shall be enclosed, at the bottom, in cases where it is not carried down to the foundations of the building, and at the top, in cases where it is not carried up to the roof, with material having a similar fire-resistance rating.

(4) Nothwithstanding the provisions of by-law 341 of these by-laws, the shaft of any passenger lift constructed within the well hole of a fire-resisting stair enclosure may be enclosed with open metal grilles or guards and open metal doors.

(5) A goods lift shall not be constructed in, or communicate directly with, a fire-isolated stairway.

(6) Any door to a lift shaft shall comply with the provisions of by-law 345 of these by-laws.

(7) Glazed Openings may be inserted in the walls of a lift well, subject to compliance with the requirements of by-law 341 of these by-laws.

436. Escalator Installations.—One or more escalators for the transport of passengers may be installed in any building, if every escalator so installed is designed, constructed, installed and operated in conformity with the relevant provisions of the S.A.A. Lift Code, being Item 19 of the Appendix.

437. Fire Services in Buildings.—(1) Fire Services as prescribed by by-law 438 of these by-laws shall be provided in—

(a) every residential flat building of Class II Occupancy exceeding three storeys in height of Type 1 or 2 Construction or exceeding two storeys of Type 3 Construction;

(b) every building of Class III Occupancy exceeding one storey in height in which more than 25 persons usually reside;

(c) every building of Class V, VI or VII Occupancy of two or more storeys in height; and

(d) every building of Class VIII Occupancy.

(2) Every public building shall be provided with fire services as required by any regulations made under the Health Act, 1911.

438. Fire Equipment.—Every building specified in by-law 437 of these by-laws shall be provided with pipes of not less than 4 in. diameter, conducting water from a street water main to pipes and rising mains with a diameter of not less than 3 in., fitted with 2½ in. fire hose cocks (hydrant valves) and hoses in such number and such position as the Chief Fire Officer may direct or chemical extinguishers or both those pipes and extinguishers, as required by the Chief Fire Officer; but extinguishers shall be provided in the proportion of not less than one to every 2,250 sq. ft. of floor area, with not less than two on any one floor.

439. Exemption.—Where, in the opinion of the Surveyor and, in the case of factories, of the Chief Inspector of Factories, after consultation with the Chief Fire Officer, the application of any of the provisions of by-law 438 of these by-laws is unnecessary or unsuitable, having regard to the occupancy of any particular building, those provisions may be dispensed with or alternative requirements for that building may be required.

440. Timber and Storage Yards, Buildings over Three Storeys in Height, etc.—Every timber or storage yard, every building more than three storeys in height, and not coming within the provisions of the foregoing by-laws, and every other building where, by reason of the construction of the building, the nature of its use, the nature of its contents or any other special circumstances, the Chief Fire Officer so directs, shall be provided with a water supply service and such equipment for fire extinction purposes, as may be required by the Chief Fire Officer.

441. Fire Service in High Buildings.—(1) Any building exceeding 80 ft. in height, and any other building where required by the Chief Fire Officer, shall be provided with a rising main of not less than 4 inches in diameter, except in the three topmost floors which may be protected by means of 3 in. diameter rising mains; and those rising mains shall have outlets fitted with approved 2½ in. cocks and hoses, on each floor and the roof, in positions approved by the Chief Fire Officer.

(2) A booster connection shall be installed on the fire service in any building mentioned in sub-bylaw (1) of this by-law, if required by the Chief Fire Officer.

442. Fire Extinguishers.—(1) Any chemical fire extinguisher required by the foregoing provisions of this Section shall be of a type approved by the Fire and Accident Underwriters' Association of Western Australia list, being Item 49 of the Appendix.

(2) The owner of any building fitted with a fire service shall arrange with the Fire Brigades Board for the periodical testing and inspection of all appliances for the extinction of fire and fire alarm systems (if any) and, in the event of any such appliance or fire alarm system being found defective by the inspecting officer of that Board, shall on receipt of a report to that effect immediately cause the defects to be rectified.

(3) The owner of the building shall maintain in proper order and condition all appliances required by these by-laws to be provided for the control or extinction of fire or for the saving of life at fires.

443. Certain Buildings to be Connected to a Fire Station.—(1) Where required by any regulations made under the Health Act, 1911; or where, by reason of—

(a) the construction of any building;
(b) the nature of the use of any building;
(c) the nature of the contents of any building; or
(d) any other special circumstances,

the municipality, after consultation with the Chief Fire Officer, considers necessary, a building shall be connected by direct fire alarm to the nearest Fire Brigade Station.

(2) The position and numbers of alarms in any building to which this regulation applies shall be determined by the Chief Fire Officer and the installation of the alarms shall be carried out to his satisfaction.

444. Sprinkler Installation.—A sprinkler system complying with the requirements of the Fire Underwriters' Association of Western Australia, being Item 23 of the Appendix shall be provided in—

(a) every building of more than two storeys in height, used as a parking station or public garage; and
(b) unless specially exempted by the municipality after consultation with the Chief Fire Officer, every building of Class VI, VII or VIII Occupancy which has a floor area on any floor exceeding 15,000 sq. ft. in the case of a building of Type 1 or 2 Construction or 12,000 sq. ft. in the case of a building of Type 3, 4 or 5 Construction; but the provisions of this paragraph do not apply to a building with floors subdivided into cells less than 10,000 sq. ft. in area and separated by walls having a fire rating of two hours.

445. Sewerage and Drainage.—The sewerage and drainage of any building shall be in accordance with the requirements of the Local Health Authority.

446. Hot Water Installations.—Flues to any hot water installation shall conform with the provisions of section 26, and the construction of any boiler room shall comply with the provisions of by-laws 385, 394, 395 and 396, of these by-laws.

447. Mechanical Ventilation.—The installation of any system of mechanical ventilation shall conform with the provisions of Part II of Section 10 of these by-laws.

SECTION 30.

RESTORATION OF BUILDINGS AND ALTERATION TO EXISTING BUILDINGS.

448. Restoration of Buildings.—If, in the opinion of the Surveyor, 50 per cent. or more of the cubic content of any building, exclusive of foundations, is destroyed or demolished, that building shall not be restored, repaired or reconstructed, except in accordance with the provisions of these by-laws.

449. Re-erection of Buildings.—Where any building, exceeding the maximum height permitted under Section 7 of these by-laws, is destroyed by fire or other calamity, that building shall not be reconstructed, except in conformity with these by-laws.

450. Other Reconstruction.—If any external wall, external enclosure or floor is at any time destroyed or demolished for the height of one storey or for an area equal to one-half of its whole surface, as the case may be, the whole of that wall, enclosure, or floor shall be made to conform in all respects with the requirements of these by-laws.

451. Alterations and Additions to Buildings.—(1) General.—Any alteration, addition or repair to a building shall conform with the provisions of these by-laws.

(2) **Major Alterations and Repairs.**—(a) Where, in any period of three years, any repairs, alterations, additions or all of them, affecting more than 50 per cent. of the cubic content of a building are made, that building shall be made to conform with the requirements of these by-laws.

(b) Where repairs necessary for the preservation of any building are, at any one time, in excess of 50 per cent. of the value of the building which, where loss of value has been occasioned by fire or other calamity, shall be the value prior to that loss, that building shall either, be demolished, or made to comply with the requirements of these by-laws.

(3) **Changed Occupancy.**—(a) Where the use or occupancy of a building is changed and the building does not conform with the requirements of these by-laws for the proposed new use or occupancy, the entire building shall be brought into conformity with these by-laws, except that where the use or occupancy of a portion only of the building is changed and that portion is separated from the remainder of the building in accordance with the provisions of section 25 of these by-laws, then that portion of the building shall be made to comply with the requirements of these by-laws.

(b) Any existing building, not being a building covered by paragraph (a) of this sub-bylaw, of which the floor area or storeys are increased or the use or occupancy is changed shall be provided with such exits and fire-protection facilities as are required by these by-laws for a building of the resultant size, use or occupancy.

(4) **Minor Alterations and Repairs.**—(a) Minor alterations and repairs to which sub-bylaws (1), (2) and (3) of this by-law do not apply may be made with material of the type used in the original construction, but if more than 25 per cent. of the roof or wall covering is replaced in any period of twelve months the entire roof or wall covering (as the case may be) shall be made to conform with the requirements of these by-laws.

(b) Any roofing complying with the requirements of these by-laws may be placed over the existing roof when that existing roofing and the existing roof framing are such as to permit the new roofing to be properly supported and securely fastened.

SECTION 31.

CONSTRUCTION OF BUILDINGS FOR STORAGE OF INFLAMMABLE LIQUIDS, DANGEROUS GOODS, ETC.

452. Inflammable Liquids.—For the purposes of these by-laws inflammable liquids are subdivided into classes as follows, namely:—

Class A: Any liquid which will flash or emit an inflammable vapour at or below a temperature of 73 degrees Fahrenheit, Abel Close Test.

Class B: Any liquid which will not either flash or emit an inflammable vapour at a temperature less than 73 degrees Fahrenheit, Abel Close Test.

453. **Buildings for the Storage of Inflammable Liquids.**—(1) Any room or building designed for the purpose of and capable of storing, or in which there is stored, inflammable liquids in quantities exceeding, in the case of Class A, 50 gallons, or, in the case of Class B, 250 gallons shall—

(a) be ventilated, to the satisfaction of the Surveyor;

(b) be constructed with walls having a fire-resistance rating of four hours and floors and ceilings having a fire-resistance rating of three hours; and

(c) have any door which—

(i) is an internal door; or

(ii) is an external door, which is within 20 feet of another opening, other than an opening in the same wall as, and parallel to, that external door,

of a fire-resistance rating of two hours, complying with by-law 175 of these by-laws.

(2) Any room or building designed for the purpose of and capable of storing, or in which there is stored, inflammable liquids of Class A, in quantities not exceeding 250 gallons, shall, where practicable, be constructed so as to have a door opening directly into the outer air; and, where not practicable to have a door so opening, shall be constructed so that its floor level is sunk below that of any adjoining floor to such depth, being not less than 12 inches, as may be required by the Surveyor.

(3) Any room or building designed for the purpose of and capable of storing, or in which there is stored, inflammable liquids of Class A or B in quantities exceeding 250 gallons shall be so constructed that—

(a) where the liquids are in bulk or in containers exceeding 50 gallons capacity, the cubic capacity of that room or building, below the lowest opening in any wall, exceeds, by at least one-eighth, the maximum cubic capacity of those liquids capable of being there stored; or

(b) where the liquids are in containers of less than 50 gallons capacity, the cubic capacity of that room or building, below the lowest opening in any wall, is not less than half the maximum cubic capacity of those liquids capable of being there stored.

(4) Notwithstanding the provisions of sub-bylaw (3) of this by-law, where the whole of a ground floor of any building is to be used for the storage therein mentioned, the minimum cubic capacity prescribed by that sub-bylaw may be provided by means of an external well formed by a wall or walls of brick, stone or concrete, completely surrounding the ground floor, having no openings and having a height not less than 12 inches above the level to which the liquids, if stored to maximum capacity, would rise if permitted to run free.

(5) In any area, or on any site, approved by the municipality, a building of type 4, unprotected metal construction, may be erected or used for the storage of inflammable liquids, if surrounded by a wall or walls, as prescribed by sub-bylaw (4) of this by-law or by an earthen dam, of an approved construction, having a like capacity as is prescribed for a surrounding wall and having a height not less than 2 feet above the level to which liquids, if stored to the maximum capacity of that building, would rise if permitted to run free.

454. **Buildings for the Storage of Dangerous Materials.**—Any room or building designed for the purpose of storing, or in which there is stored, any quantity of dangerous material, not being an inflammable liquid, exceeding 5 cwt. shall be upon a site approved by the municipality and shall—

(a) be of a construction fire-protected by walls having a fire-resistance rating of four hours and floors and ceilings having a fire-resistance rating of three hours, except in such area and on such site as the municipality may approve for a room or building for that purpose to be of unprotected metal construction;

(b) not be used or continue to be used for that purpose, after the commencement of these by-laws, unless the building shall first have been approved by the Surveyor for that purpose.

455. **Nitro-cellulose Products.**—(1) In this Section, unless inconsistent with the context or subject matter—

"film" means inflammable motion picture, photographic or x-ray film having nitro-cellulose as a main constituent;

"nitro-cellulose product" means celluloid or any other inflammable solid substance having nitro-cellulose as a main constituent and includes film;

"fireproof room" means a room, other than a workroom, used for the storage of any nitro-cellulose product;

"workroom" means any room in which any nitro-cellulose product is manufactured, examined or repaired.

(2) For the purposes of this Section, one thousand lineal feet of standard motion picture film is deemed to weigh 5 lb.

456. Construction of Fireproof Rooms.—A fireproof room shall be constructed so that—

(a) its cubic capacity does not exceed 750 cu. ft.;

(b) its walls have a fire-resistance rating of four hours;

(c) its floor and roof have a fire-resistance rating of three hours;

(d) every doorway is provided with two doors, one on each face of the wall, each having a fire-resistance rating of two hours, and complying with the provisions of Section 13 of these by-laws;

(e) it is ventilated to the outside air, by an opening or openings having—

(i) a minimum sectional area or, where there is more than one, an aggregate minimum sectional area of 15 sq. in., for every 100 lbs. of film capable of being stored in the room;

(ii) a metal frame, a glazed sash, capable of opening automatically, in the event of fire in the room and a light wire screen and guard, all of which are made and fitted in accordance with the Fire Underwriters' Association specification, being Item 48 of the Appendix;

(iii) an aspect on to a street, lane or other open space, not being an enclosed light area;

(iv) a situation which is not within 25 ft. of any fire escape or stairway and is not such that any flame or gas issuing from the opening will or will be likely to endanger any other building or adjoining premises; and

(v) provision for the prevention of anything stored in the room being placed against it or them;

(f) any flue used for its ventilation is of not less than 5 in. reinforced concrete;

(g) any rack, used for the storage of nitro-cellulose products, is of metal or other non-combustible material and does not obstruct any opening for ventilation;

(h) it is not artificially lighted other than by a permanent system of incandescent electric lighting, having every lamp enclosed in an additional casing of glass or similar material and a pilot light situate immediately outside the room, indicating whether or not any lamp in the room is alight;

(i) a system of automatic sprinklers is installed, in accordance with the Fire Underwriters' Association specification, being Item 23 of the Appendix;

(j) it is so situated that any fire occurring in the room will not or will not be likely to endanger any workroom, ventilating shaft, stairway, passage or exit, in any building of which it forms a part; and

(k) any door opening from the room, directly into a room where any person is or is likely to be employed, is screened to the satisfaction of the Surveyor.

457. Construction of Workrooms.—(1) Every workroom shall be constructed of fire-resisting material.

(2) Any fittings of a workroom shall be of fire-resisting material and any door shall have a fire-resistance rating of one hour and shall be self-closing.

(3) There shall be in every workroom a system of automatic sprinklers installed in accordance with the specification of the Fire Underwriters' Association, being Item 23 of the Appendix.

(4) There shall be in every workroom a chemical fire extinguisher for every 20 squares of floor area, or part of that area.

(5) A workroom shall not be artificially lighted other than by a permanent system of incandescent electric lighting, installed and wired in accordance with the S.A.A. code, being Item 26 of the Appendix, and the regulations of the supply authority.

(6) Any electric resistance, including the heating element of an electric heater or radiator, in a workroom shall—

(a) be so guarded or enclosed as to prevent ignition or decomposition of any nitro-cellulose product;

(b) have the top of any guard or enclosure sloped at an angle of not less than 45 degrees to the horizontal; and

(c) be so constructed that the external part of any guard or enclosure thereon at no time exceeds a temparature of 212 degrees Fahrenheit.

(7) Every workroom and every building containing a workroom shall be provided with adequate means of escape in case of fire; and that means of escape shall not be deemed adequate unless—

(a) at least two separate safe exits are provided from every workroom and two safe means of escape from the building are available to every person employed or likely to be employed, in that workroom or building;

(b) every door in an exit or means of escape is so arranged as readily to open outwards; and

(c) the word "Exit" is conspicuously written above every escape door in a workroom and in the case of a dark room that word is provided with adequate illumination.

(8) Any hatchway, lift well, or similar opening out of a workroom shall be so fitted, constructed and arranged as to prevent the escape through that opening of fire or products of combustion of any nitro-cellulose product in the workroom.

458. Approval of Drawings of Workrooms, Etc.—Notwithstanding, and in addition to compliance with, the foregoing provisions of this Section, a person shall not use any building or any part of a building, whether constructed before or after the passing of these by-laws, for the manufacture, examination or repair of any nitro-cellulose product; and a person shall not construct or cause to be constructed any building or part thereof intended to be so used or materially alter or add to any building so used or intended to be so used or use any building as so altered or added to; unless and until drawings of the premises to be so used or of the alterations or additions, as the case may be, together with full particulars of the arrangements for that use and for the compliance with the provisions of this Section, have been submitted to and approved in writing by the Surveyor.

SECTION 32.

FEES.

459. Scale of Fees.—The scale of fees set out hereunder shall be chargeable by and received by a municipality for any license issued or services rendered or provided under these by-laws.

SCALE OF FEES.	£	s.	d.
1. For application form in every case	0	1	0
2. For a license for a new building and additions to an existing building—			
(a) For each square or portion of a square up to 50 squares (with a minimum fee of £1)	0	6	0
(b) For each additional square or portion of a square up to 100 squares	0	5	0
(c) For each additional square or portion of a square in excess of 100 squares	0	4	0
3. For a license for alterations to an existing building—			
(a) For each square or portion of a square up to 100 squares (with a minimum fee of £1)	0	4	0
(b) For each additional square or portion of a square in excess of 100 squares	0	2	6
(c) For cutting an opening in an external, internal or party wall when no other work is undertaken at the same time	0	15	0

		£	s.	d.
4.	For a license for the construction of a furnace, chimney shaft, or shaft for ventilation or for any other purpose (in addition to the fee for any other work undertaken at the same time)—			
	(a) If the height does not exceed 75 ft.	3	0	0
	(b) If the height exceeds 75 ft. but does not exceed 100 ft.	4	0	0
	(c) If the height exceeds 100 ft. for every additional 10 ft. or portion of 10 ft.	0	12	0
5.	For a license to carry a flue from an oven, stove, steamboiler, furnace or close fire into an existing flue	1	0	0
6.	For examination and report on preliminary plans—25 per cent. of the fee for a license to carry out the work described in such plans.			
7.	For a license to install a new shop front—			
	(a) If no structural alteration is required	1	10	0
	(b) If new girders or columns are required, for each foot thereof (with a minimum fee of £3)	0	1	6
8.	For a license to erect a transmitting wireless mast attached to a building, for each foot	0	1	0
9.	For survey and report on a dangerous structure	3	0	0
10.	(a) In the case of buildings of reinforced concrete or steel framed construction:—			
	(i) 6s. per square for the first 50 squares or part thereof with a minimum of £1.			
	(ii) The fee per square shall be reduced by 2d. per square for each additional 50 squares by which the area of the building exceeds 50 squares in area with a minimum charge of 3s. 6d. per square.			
	(b) In the case of buildings of brick or stone in which the floors are carried by internal pillars or columns, the fee shall be two-thirds the amount of the fee calculated under paragraph (a) of this item.			
	(c) For the purposes of calculating computation fees, a square means 100 square feet measured over the outside of external walls at each floor level.			
	(d) In the case of alterations to existing buildings, the fee shall be assessed over the area covered by such alterations.			
	(e) For reinforced concrete or fire-resisting floors including girders and beams	2	0	0
	(f) For reinforced concrete or fire-resisting floors, without girders or beams	1	0	0
11.	For a license for deposit of building material on a street, sixpence for each month or part of a month, for each superficial yard of the area of the street enclosed by any hoarding or fence as required by by-law 192 of these by-laws and threepence for each superficial yard for each week of any renewal of such a license.			

460. Penalties.—(1) Where, by these by-laws, anything is directed, or forbidden, to be done, or authority is given to any person to direct, or forbid, anything to be done and that authority is exercised, any person failing or neglecting to do anything so directed, or doing anything so forbidden, commits an offence.

(2) Any person guilty of an offence against these by-laws is liable to a penalty not exceeding one hundred pounds.

APPENDIX.

LIST OF AUSTRALIAN AND OTHER STANDARD SPECIFICATIONS AND CODES REFERRED TO IN THESE BY-LAWS.

1. A.1-1956—Structural Steel and Rolled Steel sections for structural purposes.
2. A.2-1953—Portland Cement.
3. A.3 and 4-1928T—Quick lime (No. 3) and Hydrated Lime (No. 4).
4. A.13-1950—Terra Cotta Roofing Tiles—(Bound with C.A. 5-1950).
5. A.14-1952—Concrete interlocking Roofing Tiles, with weathering check. (Bound with C.A.6-1948).
6. A.20-1947—Zinc Coated (Galvanised) Sheets (Plain and Corrugated).

7. A.22-1934—Cast stone (with Portland Cement Base).
8. A.30-1958—Fire Tests on Buildings and Structures.
9. A.34-1938—Dimensions of Rivets from $\frac{1}{2}$ inch to $1\frac{3}{4}$ inch diameter.
10. A.35-1957—Concrete Drainage Pipes (Pre-cast).
11. A.64-1960—Ready mixed concrete.
12. A.77-1957—Aggregated for Concrete (excluding lightweight aggregate).
13. A.101 and A.102 (Incorporated in A.100 to A.110) making and storing specimens of cement concrete for compression test.
14. B.27-1942—Carbon Steel Castings.
15. B.28-1955—Covered Electrodes for Metal Arc Welding of Carbon Steel.
16. B.100-1958—Black bolts and nuts, Hexagon and square, B.S.W. and B.S.F. (being British Standard 916-1953).
17. B.117-1953—Dimensions of Bolts, Nuts and Setscrews (Machine Bolts) B.S.W. and B.S.F. (being British Standard 1083-1951).
18. C.A. 2-1958—Australian Standard Rules for the design, fabrication and erection of concrete in building (known as the S.A.A. code for concrete in buildings).
19. C.A. 3-1954—Australian Standard Rules for the design and installation, testing and operation of lifts and escalators (known as the S.A.A. lift code).
20. C.A. 5-1950—Code of recommended practice for fixing Terra Cotta roofing tiles (Bound with A.13-1950).
21. C.A. 6-1948—Code of recommended practice for fixing cement concrete roofing tiles (Bound with A.14-1952).
22. C.A. 8-1939—Australian Rules for the design and application of Metallic Arc Welding (hand or machine) to mild steel construction (partly superseded by S.A.A. Interim 352).
23. C.A. 16-1948—Automatic Sprinkler Installations.
24. C.A. 30-1957—Code for Interior illumination of buildings by artificial light.
25.
26. C.C. 1-Part 1-1961—S.A.A. wiring rules.
27. (E) O.54-1942—Grading rules for Sawn and Hewn structural timbers (partly superseded by Interim 360-367).
28. G 8-1959—being British Standard 1452-1956 endorsed by S.A.A. without amendment.
29. O 10/45-1948—Australian Standard grading rules for jarrah, karri and wandoo.
30. O 56-1948—Dimensions of structural timber.
31. O 59-1952—Waterproof plywood, standard and marine grade.
32. S.A.A. Interim 306—Pre-cast concrete building units.
33. S.A.A. Interim 315—Calcium silicate bricks.
34. S.A.A. Interim 323—Burnt clay and shale building bricks.
35. S.A.A. Interim 350—Minimum Design Loads on Buildings.
36. S.A.A. Interim 351—Use of structural steel in buildings.
37. S.A.A. Interim 352—Metallic arc welding in building construction.
38. S.A.A. Interim 353—Artificial Lighting of Dwellings.
39. British Standard 476-1953 (Part I). Fire tests on building materials and structures.
40. British Standard 476-1955 (Part II). Flammability tests for thin, flexible materials.
41. British Standard 548-1934—High tensile steel for bridges and general building construction.
42. British Standard 690-1953—Asbestos Cement Sheets.
43. British Standard 1198/1200-1955—Building Sands from natural sources.
44. Forest Department of W.A. Bulletin 56-1948 Appendices A and B, Australian Grading rules for Jarrah, Karri and Wandoo.
45. C.S.I.R.O. Handbook of Structural Timber Design (Third Edition) being technical paper No. 32.
46. Fire and Accident Underwriters' Association—Specification for Construction of Fire Doors—issued 1st June, 1955.
47. Fire and Accident Underwriters' Association.—Specification for Construction and Installation of fire shutters—issued 1st June, 1955.
48. Fire and Accident Underwriters' Association—Specification for Construction and Installation of fire windows, electro copper glazing and wired glass skylight—issued 1st June, 1955.
49.
50. Civil Engineering Code of Practice (British)—Part 3-No. 4 (1954)—Foundations.
51. Civil Engineering Code of Practice (British)—No. 1—Site Investigations.

FIRST SCHEDULE.

Form 1.

.....
(Name of Municipality.)

BUILDING SURVEYOR'S OFFICE.

Application Form No..... Date.....19.....

To the Building Surveyor:

As the builder or person causing and directing the work undermentioned to be executed, I hereby apply for a Building License for same.

The following are the particulars of the proposed works:—

Situation:
Ward..... Street.....
Town Lot..... Subdivision..... House No.....
New Building to be used as.....
Additions and/or alterations to.....
The nature of the work is.....
.....
.....
Estimated Value £.....:.....:.....
Dimensions of building or structure.....
Area.....ft.; Depth.....ft.; Width.....ft.; Height.....ft.;
Number of Storeys.....
Owner: Name..... Address.....
Occupier: Name..... Address.....
Signature of person giving notice.....
Address.....

Form 2.

CERTIFICATE OF OCCUPANCY.

Lot No.....
Street.....

This building is being erected as a residence of one occupancy only.

.....Owner
.....19.....

Form 3.

CERTIFICATE OF OCCUPANCY.

Lot No.....
Street.....

This building is being erected as a Duplex House of two occupancies only.

.....Owner
.....19.....

Form 4.

CERTIFICATE OF OCCUPANCY.

Lot No.....
Street.....

This building is being converted into a Duplex House of two occupancies only.

.....Owner
.....19.....

Form 5.

CERTIFICATE OF OCCUPANCY.

Lot No.....
Street.....

This building is being converted into ..... flats each for one occupancy only.

.....Owner
.....19.....

Form 6.

CERTIFICATE OF OCCUPANCY.

Lot No.....

Street.....

This building is being erected to contain.....flats each for one occupancy only.

.....Owner

.....19.....

Form 7.

.....

(Name of Municipality.)

BUILDING LICENSE.

Date....., 19.....

No.....

Granted to.....

Address .....

Authorising the erection of certain buildings in the..... Ward, ... Street, Town Lot....., Subdivision..... as per application No..... and in accordance with the plans and specifications approved by the Surveyor and subject to the provisions of the Building By-laws made under the Local Government Act, 1960.

Whenever required so to do by the Building Surveyor, the holder of this license shall produce the approved plans for inspection.

.....

Building Surveyor.

Form 8.

.....

(Name of Municipality.)

SPECIAL LICENSE.

(Issued in pursuance of the provisions of Building By-laws made under the Local Government Act, 1960).

Date.....19.....

No.....

In pursuance of the powers in that behalf contained in these Building By-laws the municipality hereby grants permission, subject, however, to the conditions set out hereunder to.....to erect and maintain until the.....day of.....19....., on Town Lot .....Subdivision..... situate in..... Street, a building in accordance with the plans and specifications which have been lodged with the Building Surveyor and approved by him.

Conditions.

1. The municipality may in its discretion on or after the..... day of.....next, and on or after the..... day of..... in each succeeding year, grant a license, to be called a Special Renewal License, to maintain the above described building for a further period of twelve months, upon payment by the abovenamed .....of the approximate fee in that behalf contained in Section 32 of these by-laws.

2. The municipality may at any time revoke this license or any Special Renewal License granted in respect to the above-described building, and direct the removal of such building, and in default of such removal may proceed to enforce the provisions of any by-law made under the Local Government Act, 1960, or under any other Act, in the same manner as if this license had not been granted.

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Building Surveyor.

Form 9.

.....
(Name of Municipality.)

LICENSE FOR DEPOSIT OF BUILDING MATERIAL ON STREET.

.....of.....is hereby licensed to deposit building material on that portion of..... Street abutting on Town Lot.....subdivision.....and to excavate if required, on such portion of the said ..... for a period commencing the .....day of..... and ending the.....day of.....19....., subject to the following conditions and also subject to the provisions of any by-laws made under the Local Government Act, 1960, or under any other Act.

Conditions.

Every excavation shall be securely fenced off from the street to the satisfaction of the Building Surveyor.

Around that portion of the street on which the building materials are to be deposited, a hoarding and gangway shall be strongly and securely constructed of materials and to a design to be approved by the Building Surveyor, and the hoarding and gangway shall be maintained in good order and condition throughout the currency of this license, and at any time during the currency the Building Surveyor may, if he thinks fit order any alteration or additions to be made to the hoarding and gangway for the better protection and convenience of the public.

The gangway and all water channels shall at all times during the continuance of the license be kept clear.

A sufficient light shall be displayed and maintained at the exterior angles of the hoarding each night from sunset to sunrise. The fee to be paid for this license shall be the amount as set out in Section 32 of these by-laws, which fee shall be paid in advance.

A renewal of the license may be granted at the discretion of the Building Surveyor, and the abovementioned fee shall be paid for such renewal.

The area to be enclosed shall be restricted to a frontage of..... lineal feet, a maximum width of.....feet, height.....feet.

At the expiration of the period for which this license is granted or renewed, the hoarding shall be cleared away and all necessary repairs shall be effected by the licensee to the footpath, kerbing, channelling, and road, and the same put in good order to the satisfaction of the Building Surveyor.

If default be made by the licensee in complying with the last condition or any part thereof, the work required may be done by the municipality and all expenses thereof may be recovered by the municipality from the licensee.

The licensee shall deposit with the Building Surveyor the sum of £..... as a security for the satisfactory performance of these conditions.

Dated this.....day of....., 19.....

.....
Building Surveyor.

SECOND SCHEDULE.

The municipal districts of the cities of Perth, Fremantle, Subiaco, Nedlands and South Perth: the towns of Albany, Boulder, Bunbury, Carnarvon, Claremont, Cottesloe, East Fremantle, Geraldton, Kalgoorlie, Midland, Narrogin, Northam, North Fremantle, and York; and the shires of Bassendean, Bayswater, Belmont, Canning, Cockburn, Gosnells, Melville, Mosman Park, Peppermint Grove and Perth.

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