

THE PUBLIC HEALTH ACT.

Statutory Instrument 281—1.

The Public Health (Building) Rules.

Arrangement of Rules.

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THE PUBLIC HEALTH ACT.

Statutory Instrument 281—1.

The Public Health (Building) Rules. *(Under sections 70 and 71 of the Act.)*

PART I—PRELIMINARY.

1. Citation.

These Rules may be cited as the Public Health (Building) Rules.

2. Application.

(1) Subject to such exceptions and exemptions as are prescribed in these Rules and as may be prescribed by the Minister by statutory instrument and subject also to such exceptions and exemptions as have already been so prescribed, these Rules shall apply to all—

- (a) municipalities and towns;
- (b) planning areas declared under the Town and Country Planning Act;
- (c) trading centres, within the meaning of the Trade (Licensing) Act;
- (d) factories wherever situated;
- (e) schools wherever situated, but excluding any building erected for use as a school classified by the chief education officer as a school of Primary VII standard or less and which is situated outside the areas defined in paragraphs (a), (b) and (c) of this subrule;
- (f) stores of an area exceeding 250 square feet used for the storage of rat-attracting material as defined in the Public Health (Plague Control) Rules;
- (g) buildings of more than one storey wherever situated;
- (h) public buildings and hospitals in areas other than those specified in paragraphs (a), (b) and (c) of this subrule, but excluding buildings the walls of which are built in temporary materials.

(2) The Minister may, from time to time, by statutory instrument apply all or any of these Rules to areas and buildings other than those specified in subrule (1) of this rule.

(3) These Rules shall not apply to buildings of one storey in areas subject to the Public Health (Grade II Building) Rules.

3. Interpretation.

In these Rules, unless the context otherwise requires—

- (a) “arcade” means an open portico or gallery along the side of any building or buildings, the roof of which is supported by pillars;
- (b) “asphalt” means mastic asphalt of natural or artificial mixtures in which the asphaltic bitumen is associated with inert mineral matter;
- (c) “base” applied to a wall means the underside of that part of the wall which immediately rests upon the footings or foundation or upon any plinth or bressummer or other structure by which the wall may be carried;
- (d) “basement” means any room which is more than one-third of its height measured from the level of the floor below the surface of any ground within 10 feet of the wall of the room, but which, as regards light and ventilation, conforms with rules 175 and 179 of these Rules;
- (e) “block of flats” means a building other than a double dwelling, special block of flats, or terrace of houses, of a minimum of two storeys in height, designed to contain exclusively more than two self-contained dwelling units and includes within its meaning the provision of such facilities and accommodation for the preparation and communal consumption of meals as may ordinarily be required for the normal convenience of the inhabitants of the block of flats;
- (f) “British Standard” means a specification of the British Standards Institution and includes a “British Standard Code of Practice”;
- (g) “British Standard amendment” means an amendment published by the British Standards Institution and amending any British Standard;
- (h) “building line” means a line drawn across a plot such that no building or permanent structure, except a boundary wall or fence of approved design enclosing the plot, may be within the area contained between that line and the regular line of the street on which the plot has frontage;
- (i) “building of the warehouse class” means a warehouse, factory, brewery or distillery, store or godown, and any building which

exceeds in cubical content 100,000 cubic feet which is neither a public building nor a domestic building;

- (j) “canopy” means a projecting cover suspended entirely from the walls of a building or buildings;
- (k) “cellar” means any room the floor of which is lower than any ground within ten feet of the room and which as regards light and ventilation does not conform with rules 175 and 179 of these Rules and includes any vault or underground room;
- (l) “cross ventilation” as applied to a room means ventilation by means of openings in two walls, the openings to be at least eight feet apart;
- (m) “crosswall” means a wall bonded into an external wall to its full height and at a horizontal angle of not less than sixty degrees therewith;
- (n) “domestic building” means a building used, constructed or adapted to be used in whole or in part for human habitation, or a shop, or an office or any combination thereof or any other building not being a public building or a building of the warehouse class;
- (o) “double dwelling” means a building of not more than two storeys designed to contain exclusively two self-contained dwelling units together with such out-buildings as are ordinarily used therewith;
- (p) “dwelling” means any house, room, shed, hut, cave, tent, vehicle, vessel or boat, or any other structure or building whatsoever used for human habitation, and includes any portion of any such structure or building which is used for human habitation;
- (q) “dwelling house” means a building designed for use exclusively as one self-contained dwelling unit by a single family, together with such out buildings as are ordinarily used therewith;
- (r) “external wall” means an outer wall or vertical enclosure of a building, not being a party wall, even though adjoining a wall of another building;
- (s) “factory” for the purpose of these Rules means a factory as defined in the Factories Act;
- (t) “fire-resisting material” means and shall include—
 - (i) properly constructed brickwork not less than 4¼ inches in thickness;
 - (ii) concrete not less than 3 inches in thickness;
 - (iii) efficiently jointed breeze slabbing not less than 3 inches in thickness;
 - (iv) hardwood not less than 1¾ inches in thickness;

- (v) glass not less than ¼-inch in thickness in the centre of which wire mesh is embedded; or
- (vi) other material approved by the local authority;
- (u) “fire wall” means a wall that is built of fire-resisting material;
- (v) “flat” means a set of living and service rooms on one floor which is self-contained, served by a separate entrance and which forms part only of a larger building;
- (w) “foundation” applied to a building means the artificially formed portion of the structure which lies on the solid ground and upon which the base or footings of any wall, pier, buttress, abutment, column or vertical component of a building rests, and through which the weight of the building and its loads are distributed;
- (x) “habitable room” or the word “habitable” as applied to a room means a room constructed or adapted to be used as a living or sleeping room, or work room, or as a place for habitual employment of any person;
- (y) “internal open space” means a space which is surrounded or is liable to become surrounded with buildings or erections of any description either wholly or to such an extent that the free passage of air into and throughout the space is or may be insufficiently provided for;
- (z) “load-bearing wall” means a wall that carries a floor, a roof or a staircase;
- (aa) “partition wall” means a wall which carries only its own weight or the weight of a ceiling;
- (bb) “party wall” means—
 - (i) a wall forming part of a building and used or constructed to be used in any part of its height or length for—
 - (A) the separation of semidetached dwellings or terrace dwellings;
 - (B) the separation of residential flats, shops or offices into separate occupancies or limited groups of such occupancies;
 - (ii) a wall forming part of a building and standing in any part of its length to a greater extent than the projection of the footings on land of different owners;
- (cc) “plot” means any piece or parcel of land whether demarcated by survey or not;
- (dd) “public utility services” means any materials or equipment which are the property of a water supply undertaking, an electricity supply undertaking, the Uganda Posts Ltd., the Uganda Telecom Ltd., sewers and surface water drains vested in the local authority, and any private services connected thereto;

- (ee) “rat-attracting material” includes jaggery, sugar cane, sugar cane refuse, sugar, cotton seed, seed cotton, cotton, cotton lint, ground-nuts, pulse, maize, grain, simsim, flour, foodstuffs of animal origin, hides, skins or any other material (whether of the same or any other kind) in bulk which is ordinarily eaten by rats or used by them for nesting purposes;
- (ff) “residential building” means a building, other than a dwelling house, double dwelling, terrace of houses, special block of flats or block of flats, and includes a hotel designed and used for residential purposes, a hostel, a residential club, a boarding house and a lodging house;
- (gg) “sky sign” means any work, letter, model, sign, device or representation in the nature of an advertisement, announcement or direction supported on or attached to any post, pole or standard, framework or other support, wholly or in part upon, over or above any building;
- (hh) “special block of flats” means a building of two or more storeys designed in part to contain one or more self-contained dwelling units, together with such out-buildings as are ordinarily used therewith, and of which the ground floor is not designed for use as a dwelling;
- (ii) “store or godown” means a building which is used or intended or designed to be used for the storage of foodstuffs or any other kind of materials;
- (jj) “swamp clay mortar” means the mortar generally known to the building trade locally as “swamp clay mortar” or of an equal quality and which is free from vegetable matter and other impurities and mixed with clean water;
- (kk) “terrace of houses” means a building designed to contain more than two self-contained dwelling units arranged in a row and attached to one another, together with such out-buildings as are ordinarily used therewith;
- (ll) “through ventilation” as applied to a room means ventilation by openings placed in opposing walls of a room;
- (mm) “town and country planning board” means the board appointed under the Town and Country Planning Act;
- (nn) “window” means any opening admitting daylight in an external wall of a building or in a roof but does not include a doorway fitted with a door unless the door is glazed for at least half its area; and
- (oo) “workshop” means any building or part of a building in which

manual labour is exercised for purposes of trade.

4. Buildings: what constitutes erection.

Every person who erects a building shall comply with the requirements of these Rules, and for the purposes of these Rules any of the following operations shall be deemed to be the erection of a building—

- (a) the erection of any new building after the 1st August, 1951;
- (b) the erection of any addition to an existing building;
- (c) the re-erection of any building or part of a building when an outer wall of that building or, as the case may be, that part of a building has been destroyed, pulled down or burnt down or damaged either wholly or partially;
- (d) the re-erection or alteration of any part of an existing building;
- (e) the roofing over of any space between a wall or building;
- (f) the changing of the purpose or purposes for which a building, part of a building or appurtenances of a building are used, or using for human habitation any building which has not been previously used for that purpose or increasing or reducing the number of dwellings or separate tenancies or occupancies in a building or using any building in a manner different from that shown on the plans for the building approved by the local authority, whether or not it is proposed to execute any alterations or work in connection with the proposed change;
- (g) the carrying out of any drainage work; or
- (h) the construction of a wall around or within any plot.

5. Exemption from rules.

Any of the following buildings shall be exempt from the operation of such of these Rules as relate to the materials and mode of construction of buildings so long as the buildings are detached and are erected and designed according to the original plans and applications for the buildings and used exclusively as—

- (a) a conservatory, plant house, potting shed, poultry house, tool house, cycle shed, fuel shed, summer house or aviary which does not exceed one hundred square feet in area; or
- (b) a sports pavilion or boat house which does not exceed two hundred superficial feet in floor area,

except that any building mentioned in paragraphs (a) and (b) of this rule shall not be exempt as aforesaid unless it has satisfactory provision made for the

collection and disposal of all subsoil and storm water, and unless any foul drains connected with the buildings are constructed and maintained in accordance with the Public Health (Drainage and Sanitation) Rules or any rules amending or replacing them.

PART II—APPROVAL OF PLANS, ETC.

6. Notice of intent to erect or alter building and description of construction, etc.

(1) Every person who intends to erect or make any alterations or additions to a building to which these Rules relate shall give to the local authority notice in writing of his or her intention and—

- (a) send or deliver the notice to the local authority together with a sufficient description in writing on the printed application form of—
 - (i) the class or nature of the building and whether it is to be used as a dwelling house or not and shall furnish any further particulars that the local authority may deem necessary;
 - (ii) the materials with which the building is to be constructed;
 - (iii) the sanitary fittings, the mode of drainage and sewage disposal;
 - (iv) the water fittings and the means of water supply;
 - (v) any machinery intended to be installed;
- (b) send or deliver to the local authority—
 - (i) elevations of the building, plans of each floor and sections of each storey, floor and roof of the building, drawn or printed in a clear and intelligible manner to a scale of not less than 1 inch to every 8 feet, or, if the building is so extensive as to render a smaller scale necessary, not less than 1 inch to every 16 feet; and if more than one dwelling is proposed, the plans shall clearly show the several apartments which are intended for each separate dwelling;
 - (ii) any other drawings, plans, documents or information that the local authority may require;
- (c) show upon the plans and sections the following particulars—
 - (i) the position, form and dimensions of the foundations, walls, floors, roofs, chimneys and the several parts of the building, and the loads which the floors are designed to carry in such detail and to such extent as may be necessary

- to show that the building complies with these Rules;
- (ii) the level of the site of the building, the level of the lowest floor of the building and the level of any street adjoining the curtilage of the building in relation to one another and above some known datum;
- (iii) the position, form, arrangement and dimensions of any machinery intended to be installed;
- (iv) the size of windows and ventilators either by giving their actual dimensions, or by reference to a British Standard;
- (d) send or deliver to the local authority a block plan of the building, drawn or printed in a clear and intelligible manner to a scale of not less than 1 inch to every 32 feet, or, if the building or buildings are so extensive as to render a smaller scale necessary, to a scale of not less than 1/500, and, if required, a key plan drawn or printed in a clear and intelligible manner to a scale of not less than 1/2500. These plans shall provide the following information—
 - (i) the position of any overhead electric supply line and any underground electric supply service cable on, or adjacent to the plot;
 - (ii) the plot boundaries and dimensions, size and position of the building, and, so far as may be necessary to show compliance with these Rules, the size and position of any appurtenances or properties immediately adjoining the building or plot;
 - (iii) the size and position of any yard or open space belonging to the building;
 - (iv) the position, width and level of any road, street or passage adjoining the curtilage of the building together with the position of curbs, storm water and soil sewers, and any public utility services crossing or on the plot, so far as may be necessary to show compliance with these Rules;
- (e) send or deliver to the local authority such drainage plans as may be prescribed by the Public Health (Drainage and Sanitation) Rules or any rules amending or replacing them to a scale approved by the local authority.

(2) All drawings and descriptions shall be furnished in quadruplicate. One copy shall be on linen; three copies (including the linen copy) shall upon the approval of the building by the local authority become the property of the local authority and may be retained by the local authority, and one copy shall

on approval by the local authority be signed and returned to the applicant; except that only two copies of drawings shall be required in the case of plans detailing the reinforced concrete and structural steel work, as required by rules 232 and 234 of these Rules. In the latter case, one copy shall be on linen which shall be retained by the local authority, and the second on approval shall be signed and sent to the applicant.

(3) When the local authority has disapproved of any building under rule 10 of these Rules, or has rejected any plan under section 84 or 85 of the Act, the local authority may retain one copy which shall not be the linen copy.

(4) All drawings and plans submitted in accordance with this rule shall be of a quality approved by the local authority, and the local authority may refuse to consider any notices given under these Rules unless the accompanying drawings and plans are of a reasonable standard of draughtsmanship.

(5) The local authority may, at its discretion, waive the submission of plans for small alterations to buildings, such as the enlargement of a window, the insertion of a door instead of a window or minor modifications to drainage work, which may be effected on receipt of permission in writing from the local authority. A fee of five shillings shall be paid for each such permit, and if it is not acted upon within six months of the date of issue it shall lapse and determine.

7. Inspection fees.

(1) Every person who sends or delivers any plan, section, elevation or drawing to the local authority under rule 6(1)(b) of these Rules shall, at the time of the sending or delivery, pay to the local authority an inspection fee based upon the superficial area of every floor of the building which he or she proposes to erect at the appropriate rate for the class to which the building belongs, as specified in the table below; except that where a plan, section, elevation or drawing is submitted to a local authority in respect of a project to erect on one estate or in one area two or more exactly similar buildings, the fee for inspecting the plan, section, elevation or drawing shall be calculated by adding together—

- (a) the inspection fee made chargeable by this subrule on any one building of the project; and
- (b) 20 percent of the inspection fees made so chargeable on every

other building of the project.

(2) The superficial area referred to in subrule (1) of this rule shall be calculated and certified as follows—

- (a) in the case of a municipality, by the municipal engineer;
- (b) in the case of a town, by the town engineer;
- (c) when there is no town engineer and in all other cases, by an officer of the Ministry responsible for works,

except that in any case the certificate shall be final and not subject to any appeal.

(3) No fees shall be payable in respect of buildings erected by the Uganda Government.

(4) No fees shall be payable in respect of any church, mosque, temple or of any school as defined by the Public Health (School Buildings) Rules or of any hostel or dormitory used exclusively in connection with such school.

(5) The fees in respect of additions to existing buildings shall be payable at the same rates as fees for new buildings.

(6) In the case of a building, parts of which are used for different purposes, the fee appertaining to the particular class shall be paid for each part.

(7) A fee of ten shillings shall be payable in respect of any other work, not specifically described elsewhere, for which the approval of the local authority is required by these Rules.

(8) The fees payable under subrules (1) to (7) of this rule shall be payable on each submission; except that—

- (a) the local authority may remit wholly or in part the fees payable where the resubmission of a plan, section, elevation or drawing is on account of minor alterations only; and
- (b) no fee shall be payable where the resubmission is due to failure on the part of the local authority to draw attention to the defect on previous submission.

Table of fees.

Class of building	Fees payable on each submission
<i>Class I.</i> Buildings for religious purposes (other than churches, mosques or temples), public baths, public wash houses, hostels (other than those referred to in rule 7(4) of these Rules), community buildings (other than flats or dwelling houses), public museums and galleries, gymnasia and clubs	Shs. 10 per 1,000 superficial feet or part thereof of plan area, per floor
<i>Class II.</i> Agricultural buildings, cowsheds, stables, stores and godowns	Shs. 15 per 1,000 superficial feet or part thereof of plan area, per floor
<i>Class III.</i> Industrial buildings, warehouses, factories, workshops and garages (other than those in connection with dwellings)	Shs. 20 per 1,000 superficial feet or part thereof of plan area, per floor
<i>Class IV.</i> Shops (both retail and wholesale), cafes, restaurants, closed-in markets, offices	Shs. 25 per 1,000 superficial feet or part thereof of plan area, per floor
<i>Class V.</i> Buildings constructed or used for human habitation	Shs. 30 per 1,000 superficial feet or part thereof of plan area, per floor
<i>Class VI.</i> Hotels, theatres, cinemas, concert halls and buildings of amusement, other than clubs	Shs. 40 per 1,000 superficial feet or part thereof of plan area, per floor

8. Plans to be signed by applicant.

Every person giving notice in accordance with rule 6 of these Rules shall sign one set of the notices, plans, sections and elevations which shall be retained by the local authority or cause the set to be signed by his or her duly authorised agent.

9. Plans when approved to be signed on behalf of local authority.

(1) So soon as the local authority is satisfied that such plans do not contravene any of the conditions set forth in these Rules, and are in other respects satisfactory, its approval shall be signified on the plans in writing and in so doing it may state any conditions to which the approval is subject. It shall be an offence to erect any building in contravention of any approved plan or of any condition to which the approval of the plan is subject, unless the local authority has given subsequent approval to the deviation from the approved plan or has revised or amended any such condition.

(2) All drawings furnished by the applicant shall be signed upon each sheet by the executive officer or town clerk, as the case may be, as having been approved by the local authority as being in conformity with these Rules and the Public Health (Drainage and Sanitation) Rules, or any rules amending or replacing them, after examination by the medical officer of health and the engineer to the authority, or their representatives.

10. Grounds on which local authority may disapprove of plans.

(1) The local authority shall disapprove of any plans on any of the following grounds—

- (a) that they show a contravention of, or do not comply with, these Rules;
- (b) that the system of drainage of the plot upon which the building is to stand does not conform to the provisions of these Rules or of the Public Health (Drainage and Sanitation) Rules, or any rules amending or replacing them;
- (c) that sufficient facilities for access for sanitary purposes are not, in the opinion of the local authority, shown;
- (d) in the case of a building to be erected on a plot on which a building or buildings already stand, that no scheme of subdivision has been sanctioned, or that the building is not in conformity with a scheme of subdivision which has been sanctioned;
- (e) that the site upon which it is proposed to build is unfit for human habitation;
- (f) where servants quarters are considered necessary by the local authority, that no provision or inadequate provision is shown for them;
- (g) that they do not adequately provide for the strength and stability

- of the building, or the sanitary requirements of the building;
- (h) that the works proposed by the plans will cause a breach of any covenant contained in the title deeds of the property;
 - (i) that the proposed building fails to comply with the requirements of the local authority in regard to siting, design, elevation, size, shape, materials or structure;
 - (j) that the plans are not correctly drawn or omit to show information required under these Rules; or
 - (k) that the proposed building is to be used for any purpose which might be calculated to interfere with the convenience or comfort of neighbouring occupiers; except that the person whose plans are returned on this ground may appeal to the Minister, who shall thereupon either confirm the decision of the local authority or direct it to issue approval.

(2) If the local authority disapproves of the erection of any building for which application has been duly made as aforesaid, or of any portion or detail of it, by reason that it will contravene some provision of these Rules, the local authority shall, by written notice, intimate to the person who made the application its disapproval and the reason for the disapproval.

11. Special circumstances under which local authority may withhold approval of plans.

In any case where the local authority is satisfied that any building, though its plan is not open to disapproval on any ground specified in rule 10 of these Rules, is nevertheless likely or liable to become objectionable on sanitary grounds, the local authority shall have power to withhold approval of the plan until the applicant has entered into such covenants binding him or her and his or her successors to do or to refrain from doing any specified acts or things, as the local authority may consider necessary to ensure that the building shall not so be or become objectionable.

12. In certain circumstances work may be commenced before plans have been approved.

If, within thirty days of the receipt of any plans and notice or further particulars delivered in accordance with these Rules, the local authority fails to intimate to the person submitting the plans its disapproval of the building or work which the person intends to erect, the person submitting the plans may proceed with the building or work in accordance with the plans, but not

so far as to contravene any of the provisions of these Rules or any other law in force for the time being.

13. Erection of buildings not to be commenced until notice has been given and approval obtained.

No person shall begin to erect any building or execute any work to which these Rules are applicable until he or she has given notice of his or her intention and has deposited the plans, sections and particulars as hereinbefore required to erect the building or execute the work and the local authority has either intimated approval of the building or work or failed to intimate disapproval of them within the period prescribed for that purpose.

14. Notices to be given when erecting a building; other requirements relating to building.

Any person who proceeds to erect any building the plans of which have been approved by the local authority or who otherwise executes any work or installs any fittings to which these Rules apply shall—

- (a) give to the local authority not less than twenty-four hours' notice in writing of the date and time—
 - (i) at which the erection of the building or the execution of the work or installation will be commenced;
 - (ii) when the concrete or other materials laid over the site, the foundation bed, the foundation, the footings or the dampproof course will be completed and ready for inspection;
 - (iii) when the reinforcement of a reinforced concrete structure will be placed in position ready for inspection;
 - (iv) when any drainage work will be commenced;
- (b) if any concrete or other material laid over the site, or any foundation bed, foundation, footing or dampproof course is covered up before it has been inspected and approved by an officer of the local authority as provided by rule 15 of these Rules, comply with a notice in writing from the local authority requiring him or her within the time specified in the notice to cut into, lay open or pull down so much of the building or work as prevents the local authority from ascertaining whether any of these Rules has been contravened;
- (c) when required by the local authority, immediately cease to continue the construction of any building or other work which

- contravenes these Rules or is not in accordance with the building plans and particulars approved by the local authority;
- (d) at all reasonable times afford to the local authority, medical officer of health, building inspector or health inspector, or other person deriving authority from the local authority, free access to the building and work for the purpose of inspection;
 - (e) not erect any building or execute any work otherwise than in conformity with the plans and particulars approved by the local authority and in compliance with these Rules;
 - (f) if he or she has received a notice from the local authority pointing out the respects in which the building or work does not conform to the plans and particulars approved by the local authority or contravenes these Rules, alter or amend the building or work to conform to the plans and particulars and to comply with these Rules within the time stated in the notice, and shall advise the local authority in writing of the completion of the alteration or amendment;
 - (g) on the completion of the building or work—
 - (i) remove from the site or from any adjacent land which he or she may have occupied all surplus building and excavated material, and all rubbish, and leave the site or land clean and tidy; and
 - (ii) restore and leave in good condition all pipes, drains, roadways, curbs, water channels, footways, pavements or other things which may have been damaged by or through his or her operations and transport; and
 - (h) notify the local authority in writing when the erection of the building or execution of the work has been completed, such notice to be given as soon as practicable after completion.

15. Inspection of works.

No foundation bed, foundations, footings, dampproof course, reinforcement in reinforced concrete or drain shall be covered up until the works have been inspected and approved by an officer of the local authority duly authorised to make the inspection; provided that the inspection shall be made within three days of the receipt of a notice in writing from the owner of the building or the builder, that the works are ready for inspection.

16. Excavations: sanction for.

The local authority may sanction excavations for foundations of buildings before the approval of the plans for the buildings at the owner's risk.

17. Lapse of approval.

The approval by the local authority of any plans for the erection of a new building or for alterations or additions to any existing building shall be null and void—

- (a) if the erection, alteration or addition has not been commenced within eighteen months after the date of the approval; or
- (b) if a commencement has been made as aforesaid but the building or work is not completed within two years and six months from the date of approval.

18. Owner's responsibility.

The approval of any plans of any building or structure shall not in any way impose or imply acceptance of any responsibility on the part of the local authority for the stability of any such building or structure.

19. Works suspended for more than four weeks.

Every person who has given notice to the local authority to erect any building, or alter any building, or do any other work in accordance with the foregoing rules shall, in the event of any such works being suspended for a period exceeding four weeks, give to the local authority fresh notice of at least twenty-four hours, not including public holidays or Sundays, before the resumption of such work, specifying the date and time when the works will be resumed.

20. Permit of occupation.

(1) Every owner who intends to occupy a new building, or permit it to be occupied, shall furnish to the local authority a certificate signed by him or her, or by his or her architect, to the effect that the building has been constructed in every respect in conformity with the approved plans of the building and these Rules, and shall apply for a permit of occupation. On receipt of the certificate and application, the local authority or any officer duly authorised for that purpose shall examine the building and, if satisfied that it has been built in conformity with such plans and with these Rules, and that it is fit for occupation, shall issue a written permit of occupation on the

Form G in the Schedule to these Rules.

(2) A person shall not occupy any new building or, being the owner of the building, shall not allow it to be occupied, until he or she has obtained a written permit of occupation for it as required by this rule; except that if, within fourteen days of the receipt of the certificate, no reply shall have been received from the local authority, the building may be occupied.

(3) If the local authority disapproves of the occupation or use of any new building for which an application to occupy has been duly made as aforesaid, or of the occupation or use of any portion or detail of the building, by reason that the occupation, use or detail will contravene some provision of these Rules, it shall by notice in writing intimate to the person who made the application its disapproval and the reason for the disapproval, and shall state any terms subject to which the necessary permit will be granted.

(4) Notwithstanding subrules (1), (2) and (3) of this rule, the owner may apply in like manner for a permit of occupation in respect of a part of a new building prior to the completion of the whole building, and the local authority, on being satisfied—

- (a) that the part of the new building in respect of which the application is made is in itself self-contained and completed in accordance with the approved plans;
- (b) that the occupation of the part of the new building in advance of the completion of the remainder of the building will not create a nuisance; and
- (c) that the continuation of the building operations on the site is practicable and safe,

may grant a permit of occupation for that part of the new building and may attach such conditions to the permit as it may think fit, including a condition for the completion of the remainder of the new building in accordance with the approved building plans within such specified time as may be reasonable in the circumstances.

(5) The exception referred to in subrule (2) of this rule shall not apply to an application for a permit of occupation for a part of a new building; and on receipt of an application for a permit of occupation for a part of a new building, the local authority may require the owner to furnish further information in regard to—

- (a) his or her intention as to the completion of the new building;
- (b) the manner in which the building operations will be carried out;

- and
- (c) the manner in which the interests and convenience of the public and any occupiers of the completed part or parts of the building will be safeguarded.

(6) Every application for a permit of occupation shall be accompanied by a fee of forty shillings; except that—

- (a) no fee shall be payable when a second application in respect of the same building or part of a building is made; and
- (b) every subsequent application in respect of the building or part of a building shall be accompanied by a fee of eighty shillings.

21. Buildings not to be altered or used otherwise than in accordance with approved plans.

Where any building has been erected, no person shall, except with written permission from the local authority and upon such terms as may be imposed, alter, use or, being the owner of the building allow it to be altered or used otherwise than in the manner and for the purposes specified or indicated in the application and plans approved in respect of the building, nor to be occupied in such a manner as to provide more dwellings than were specified or indicated in the application and plans.

22. Obstruction of owner by occupier.

Where the occupier of any premises prevents the owner of the premises from obeying or carrying into effect any provision of these Rules, any magistrate, on complaint, shall by order require the occupier to permit the execution of any works which appear to the magistrate necessary for the purpose of obeying or carrying into effect such provisions of these Rules; and if within twenty-four hours after service on him or her of the order the occupier fails to comply with the order, he or she shall be liable to a fine not exceeding two hundred shillings for every day during continuance of the noncompliance.

PART III—BUILDING SITES.

23. Sites of buildings.

(1) The foundations of any new buildings shall not be constructed on any site which has been filled up by, or has been used as a place for, the deposit of excremental matter or the carcasses of dead animals or other filthy

or offensive matter until that matter has been properly removed or otherwise dealt with to the satisfaction of the local authority.

(2) The local authority may require the whole of the ground surface enclosed within the external walls of a building to be covered with an adequate layer of concrete, asphalt or other impermeable material where the soil is unsuitable either for the reasons stated in subrule (1) of this rule or on account of excessive dampness.

24. Drainage of site.

The area and subsoil of the site of a building shall, whenever the dampness or the position of the site renders the precaution necessary, be effectually drained to the satisfaction of the local authority.

25. Control of buildings in swampy sites.

(1) No habitable building which is served by a pit latrine shall be sited in any place which is not ten feet above the maximum level of the subsoil water without the approval of the medical officer of health.

(2) Any pit latrine into which subsoil water rises within ten feet of its surface shall have its walls suitably reinforced.

26. Siting of buildings.

No building shall be sited otherwise than as approved by the local authority.

27. Siting of buildings and appurtenances.

All new buildings and all additions to existing buildings and particularly all outbuildings, latrines, and all drains and sanitary apparatus of any kind pertaining to them shall be so situated on such plot or other piece of land on which they may be built, as to ensure the best practicable sanitary conditions and avoid as much as possible any nuisance from the position and appearance of the latrines or outbuildings or from noise caused by the occupants of the outbuildings or from any other cause.

28. Plot frontage.

A building shall not be erected on any plot which has not proper and

sufficient access to a road or road reserve, such road or road reserve not being a sanitary lane or passage.

29. Access lanes and passages.

The local authority shall have power in every case to determine whether any road or road reserve is an access or passage and its decision shall be final; except that no road or road reserve measuring more than thirty-five feet in width shall in any circumstances be deemed to be an access lane or passage.

30. Paving of and gates to passages.

The local authority may by written notice call upon the owner of any plot on which there may be a passage between buildings or between buildings and plot boundaries to surface and pave the passage or part of it to its satisfaction and if the entrance to the passage is from a street, to provide suitable gates or walls, or suitable gates and walls at the entrance to its satisfaction within the period of time specified in the notice.

31. Paving and draining of yards.

Upon the advice of the medical officer of health, the local authority shall have power by written notice to require the owner of any plot to pave and drain any open space in the plot with stone or cement concrete or other impervious material to the satisfaction of the local authority.

32. Proportion of plot which may be built over.

(1) In any area where no provision has been made under the Town and Country Planning Act, a building used or adapted or designed to be used whether wholly or partly as a dwelling shall not be so erected, added to, or altered that more than 25 percent of the plot on which it stands or is to stand shall be built over, and no erection of any kind whatever shall be so erected, added to, or altered upon any plot upon which a dwelling stands that more than 25 percent of the plot shall be built over; except that—

- (a) in the case of buildings constructed, adapted or designed to be used primarily as hotels, blocks of offices or shops, or to be used partly for human habitation and partly as a shop, or offices or for business or storage, the following maximum permitted site coverages shall apply—

	Ground floor	Ground floor	First floor	First floor	Second floor
	Accommodation to be used solely for hotel, office or shopping purposes	Accommodation to be used wholly or partly for habitation	Accommodation to be used solely for hotel, office or shopping purposes	Accommodation used wholly or partly for habitation	Subject to approval by local authority
Hotels	50	50	50	50	30
Offices	60	50	60	30	60 ¹
Shops	70	50	70	50	30

¹Note—30 percent if used wholly or partly for habitation.

- (b) the addition of any floor above the first floor shall be subject to the approval of the local authority, which in giving the approval, shall specify the maximum permitted floor area or areas which shall in no case exceed the percentages specified in the table;
- (c) any open space on the first or higher storeys shall be free for a distance of at least twenty feet from the rearmost wall of that storey from any erection above the level of the floor of the storey, account not being taken of any parapets, ventilators, lantern lights or skylights not exceeding a mean three feet in height or any chimney stacks; and
- (d) the space to be left free of buildings in accordance with this rule shall be in such position and of such shape as the local authority may require.

(2) For the purposes of this rule, such portions of the plot as may be covered by the staircases, balconies or other projections shall be deemed to be built over; except that boundary or division walls shall not be included as portions of the plot deemed to be built over.

33. Declaration of residential area.

(1) Notwithstanding anything in these Rules, a local authority may, with the prior approval of the town and country planning board, declare any area to be a predominantly residential area.

(2) Where any area has been so declared to be a predominantly residential area, the local authority may—

- (a) make an order prohibiting the erection in the area of any building

- occupying more than 25 percent of the area of the plot; or
- (b) allow to be built in the area any building which has been designed to the satisfaction of the local authority, for use exclusively as a block of flats, provided that the total floor space of the building, excluding garages, does not exceed 22,000 square feet per acre.

34. Areas of plots for residential purposes.

In any area where no other provision has been made under the Town and Country Planning Act, no person shall erect or alter any building for use as a dwelling, or add to any building for the purpose of using it as a dwelling, or use any building as a dwelling on any plot having an area of less than twenty-five hundred square feet or having a road frontage of less than twenty-five feet; except that—

- (a) a smaller road frontage may be permitted by the local authority in its discretion to enable the development of terraced housing; and
- (b) any building being one single structure which, in the opinion of the local authority, is constructed, adapted or designed to be used as a hotel, block of flats or residential club shall be deemed to be one dwelling, except that this paragraph shall not apply unless the accommodation provided and all stairways, passages, corridors, closets, latrines, urinals, sculleries, bathrooms, laundry rooms, common rooms and all other parts of the premises whether used or designed to be used in common or otherwise are so constructed, adapted or designed as in the opinion of the local authority to avoid overcrowding, to secure adequate space, light and ventilation and generally to ensure decent and healthy conditions of living for the inhabitants of the premises.

35. Sky signs.

(1) No person shall erect a sky sign except in pursuance of and subject to the conditions prescribed in a licence issued for that purpose by the local authority. An application for permission to erect a sky sign and the licence issued for it shall be in the prescribed form.

(2) If a sky sign becomes unsafe or dangerous or if any licence for it becomes void, a local authority may give notice to the owner or occupier of the premises on which it is erected to remove it or render it safe within such

time as may be specified by the notice; and if the notice is not duly complied with, the local authority may itself carry out the necessary work and recover the expenses incurred summarily as a civil debt from the owner or occupier in default.

(3) Any sky sign shall be so erected as to provide adequate drainage for water.

PART IV—TEMPORARY BUILDINGS.

36. Local authority may grant permits for erection of temporary buildings.

(1) Notwithstanding anything in any other rule, the local authority may grant permits for temporary buildings whether moveable structures standing on wheels or otherwise on such terms and conditions both as to their removal and otherwise as the local authority may impose; except that—

- (a) any such permit shall be in writing and shall contain any terms or conditions on which it may have been granted;
- (b) any local authority which grants any such permit shall send a copy of it to the Minister;
- (c) except with the prior consent of the Minister, a local authority shall not grant, extend or renew any such permit so as to allow any such temporary building to remain in position for more than twelve months; and
- (d) where any temporary building is not removed in accordance with the terms or conditions of any permit, the local authority may remove the building and may recover any expenses incurred in so doing from the person to whom the permit was granted.

(2) No permit shall be granted under this rule for a building any of the walls of which are to be constructed wholly or partly of stone, brick or concrete.

(3) Permits for portable builders' offices or tool rooms shall not be required under subrule (1) of this rule if they are placed within the boundaries of the site upon which building operations are being carried out, or on a street within the limits of a hoarding around a building in the course of erection, and if they conform to the provisions of rule 162 of these Rules in regard to the distance from adjacent buildings in separate occupation or ownership.

37. Tents.

(1) Except as may be provided by rule 16 of the Urban Authorities Rules, no tent shall be erected or pitched in any town without a written permit from the local authority and subject to such conditions and for such period as shall be specified in the permit.

(2) The grant of the permit shall be in the absolute discretion of the local authority, which may, with or without assigning any reason, grant or withhold the permit, and no appeal shall lie from its decision.

PART V—HOARDINGS, SCAFFOLDING, ETC.

38. Scaffolding.

(1) Proper scaffolds shall be provided for all work that cannot safely be done on or from the ground or from part of the building or from a ladder.

(2) Working platforms and gangways of scaffolds shall be not less than 17 inches wide and when over 6 feet 6 inches in height shall be provided with toe boards and guardrails on any open side.

(3) The local authority may prohibit the erection, use or employment of any scaffolding, staging, shoring, crane or other lifting apparatus which in its opinion is liable to cause damage of any kind, whether to persons or property.

39. Hoardings to be erected during building operations.

Every person who erects or makes any alteration to a building shall erect and maintain during the execution of the work such hoardings as shall be necessary in the opinion of the local authority for the protection of the public, but no hoardings shall be erected in any street except with the written permission and to the satisfaction of the local authority.

40. Special hoardings.

(1) The local authority may grant the use of a part of a street or public way in connection with the erection, alteration or taking down or securing of any building and may require that such part be enclosed with a barricade or

hoarding to its satisfaction. The hoarding or barricade shall be properly lighted by red lamps from sunset to sunrise, and conform to all requirements of the local authority which may from time to time be notified, and be removed at any time when the local authority may so require.

(2) No building shall be erected, added to or altered so that any portion of it, or any scaffolding, hoarding, barricade, staging, shoring or crane or other lifting apparatus constructed or used in connection therewith, is nearer than seven feet to any overhead electric supply line, unless the consent of the Uganda Electricity Board has first been obtained.

41. Repair of damage.

Any damage done to any street or property by or in connection with the erection or removal of hoardings or barricades or scaffolding or otherwise shall be made good by the owner interested in, or the person authorising, the operations, or may, at the option of the local authority, be made good at the expense of that person or owner.

42. Advertisements on hoardings.

A person other than the owner or builder of the premises at which the hoardings are erected shall not use them for advertising purposes without the permission of the local authority, and the owner or builder shall only advertise with reference to his or her own business in a manner approved by the local authority.

PART VI—DESIGN AND PLANNING OF BUILDINGS.

General.

43. Height of rooms.

Every habitable room shall, taken over its entire area, be of a mean average height of at least 8 feet 6 inches from the floor to the underside of each additional storey or the underside of the ceiling or roof, and no part of a habitable room (other than a part not exceeding in all 15 percent of the whole in extent) shall be less than 7 feet 6 inches in height from the floor to the ceiling or underside of the roof except that—

- (a) in rooms designed to be used as workrooms or places of habitual employment of any person, and in any place where in the opinion

- of the local authority climatic considerations so require, the height specified above shall be not less than ten feet; and
- (b) if the chief factories inspector is satisfied that owing to the special conditions under which work is carried on in any workroom the application of the provisions of this rule to that workroom would be inappropriate or unnecessary, he or she may by certificate in writing exempt the workroom from those provisions subject to any conditions specified in the certificate.

44. Projections beyond plot boundaries.

(1) No part of a building or projection of any description from a building shall be permitted beyond the street boundary of a plot below a height of 9 feet 6 inches from the ground; except that—

- (a) a local authority may permit a single storey arcade of approved design where this is in keeping with the general character of a street or where the frontage length in question is sufficient to warrant its being considered as an individual unit on its own merit; and
- (b) a canopy projecting over the pavement of a street at about first floor level may be permitted.

(2) Any canopy or arcade permitted under subrule (1) of this rule shall conform to the requirements of rules 46 to 56 of these Rules.

45. Projections from buildings.

(1) The following parts of a building or projections from a building may be permitted at a height above 9 feet 6 inches from the ground provided that in no case, except that of canopies under rule 46 of these Rules, may the projection exceed 2 feet 6 inches—

- (a) roof eaves and downpipes for the discharge of storm water from the eaves;
- (b) shades, string courses, cornices, lettering, clocks, plaques and sculptural features; and
- (c) unenclosed balconies and bay or oriel windows conforming to the requirements of rule 57 of these Rules.

(2) Any projection from a building shall be so constructed as to provide drainage to the satisfaction of the local authority.

46. Canopies.

Where it is considered desirable that a canopy should be erected in front of a new building in order to conform with neighbouring buildings, the local authority may require the canopy to be included in the design submitted to it for approval and to be erected at the owner's expense.

47. Height of canopies and arcades.

With the exception of the piers or columns supporting an arcade, no part of any arcade or canopy shall be less than 9 feet 6 inches from the pavements over which it is constructed.

48. Pavement under canopies and arcades.

When a canopy or arcade is erected, the owner shall pave the full width of the pavement opposite the building with such materials and in such manner as shall be approved by the local authority, or the local authority may in its discretion carry out the work at the owner's expense.

49. Width of canopies and arcades.

No canopy or arcade shall extend so as to be nearer the vertical plane of the pavement curb than 2 feet 9 inches, and in no case shall the width be greater than ten feet measured at right angles to the building to which the canopy is attached.

50. Condition of canopies, etc.

The owner of any canopy, balcony or other projection shall maintain it in good repair and sightly condition and shall be responsible for any accident or damage arising from it.

51. Canopies to conform with existing canopies.

Unless there is shown to the satisfaction of the local authority good reason to the contrary, a canopy as aforesaid over the pavement of a street shall conform as nearly as practicable in line, height and detail with existing canopies adjoining.

52. Canopies to be drained.

The upper surface of every canopy and floors of all balconies as aforesaid shall be watertight and effectively drained, and rain water downpipes shall be recessed into the wall of the building for a clear height of eight feet above the level of the pavement.

53. Discharge of water.

The owner of any canopy, balcony or other projection shall prevent the discharge of water from it on to any pavement.

54. Soffit of canopies and balconies.

The soffit of every new canopy or balcony over a pavement shall be neatly plastered or ceiled with asbestos cement, steel sheeting or other hard material.

55. Loads on canopies prohibited.

(1) No canopy over any street shall be used in conjunction with, or as a means of access to, any room or apartment.

(2) No person shall place or permit or cause to be placed any article upon any canopy over a street without the approval of the local authority.

56. Fireproofing of canopies.

Any canopy or arcade constructed in any part of non fire-resisting materials shall be designed so as to prevent the spread of fire to adjoining buildings, canopies or arcades.

57. Balconies and bay windows overhanging streets.

(1) All balconies, bays and oriel windows shall be constructed of fire-resisting materials and be supported by reinforced concrete, masonry or steel cantilevers statically secure, and designed to resist the maximum overturning load which may be placed on them.

(2) The bays or oriel windows having a sill height of less than 2 feet 6 inches from the floor level shall not have an aggregate length at any one floor level of more than one-third of the building frontage.

(3) No balcony shall be the sole means of access to any room or apartment.

(4) No erection of any kind shall be placed upon a balcony except balustrades or ornamental railings of a design approved by the local authority for the safety of persons using the balcony.

(5) No balcony, bay or oriel window shall project over the road reserve.

58. Doors and windows not to open outwards.

Within a minimum height of eight feet above the level of any street, footway or pavement, any door, gate, bar, window or any other hinged or movable part of a building shall not open outwards so as to project into any street or land reserved, planned or required for the improvement of any street, beyond the street boundary.

59. Division of a large multipurpose building.

(1) No building containing separate rooms, sets of chambers or offices and tenanted by different persons shall extend to more than 100,000 square feet in area at any level or floor unless separated from all other parts of the same building by fire-resisting floors and walls without openings throughout, except at corridors where the openings shall be protected by self-closing fire-resisting doors.

(2) In every building constructed or adapted to be used in part for trade or manufacture and in part as a dwelling house, the portion used for trade or manufacture shall be separated from the dwelling portion vertically by walls or partitions and horizontally by floors, such partitions and floors to be constructed throughout of fire-resisting materials.

(3) Doorways communicating between the two parts of a building referred to under this rule shall be fitted with close-fitting doors and frames of fire-resisting materials. The doors shall be fitted with a type of fastening approved by the local authority.

60. Stairs.

(1) Stairs shall be constructed so as to have a constant and uniform rise and tread and shall be to the following minimum and maximum dimensions—

- (a) stairs in dwelling houses or stairs providing access to a single dwelling house—
 - (i) minimum width, 2 feet 6 inches;
 - (ii) maximum rise of steps, 7 inches;
 - (iii) minimum tread of steps, 9 inches;
 - (iv) minimum head room, 6 feet 9 inches;
- (b) stairs in domestic buildings (other than those provided for in paragraph (a) of this subrule) and buildings of the warehouse class where not more than ten people are employed on any floor above the ground floor—
 - (i) minimum width, 3 feet 9 inches;
 - (ii) maximum rise of steps, 6½ inches;
 - (iii) minimum tread of steps, 10 inches;
 - (iv) minimum head room, 7 feet;
- (c) stairs in buildings of the warehouse class where more than ten people are employed on any floor above the ground floor—
 - (i) minimum width, 3 feet 9 inches;
 - (ii) maximum rise of steps, 6 inches;
 - (iii) minimum tread of steps, 11 inches;
 - (iv) minimum head room, 7 feet.

(2) No flight of stairs shall exceed fourteen steps in any flight; any intervening landings shall have a minimum length of 2 feet 3 inches except for stairs provided for in subrule (1)(c) of this rule, when the landing shall extend for a length of not less than four feet. No stairway shall exceed two flights without a turning.

(3) Except for stairways provided for in subrule (1)(a) of this rule and unless the local authority otherwise directs, winders or similar steps shall not be permitted in any stairway.

(4) The following modes of measurements shall be used in connection with the foregoing —

- (a) treads shall be measured horizontally from nose of tread to a point vertically beneath the nose of the tread immediately above;
- (b) treads of winder steps shall be measured at centre of step or if over 3 feet 6 inches in width at a point 18 inches from the newel or turning point;

- (c) widths shall be measured from the inside of the handrails; and
 - (d) head room shall be measured vertically above the line of nosings,
- except that the local authority may permit a relaxation of these provisions in any special case.

61. Bannisters of balconies and stairways.

(1) Every stairway shall be provided with at least one hand rail, and stairways of the categories provided for in rule 60(1)(b) and (c) of these Rules shall have a handrail on each side, and the outer handrail shall be continuous throughout the stairway.

(2) Handrails shall not project more than three inches. Bannisters of stairways and balconies shall not be spaced more than five inches apart. Where other forms of railings or protection are used for stairs and balconies, the infilling below the handrails shall provide for the safety of the persons using the stairway or balcony to the satisfaction of the local authority.

(3) No balustrade, railing or parapet intended for the protection of human life shall be less than 2 feet 9 inches in vertical height above the nosing at the rake of the stairway, nor less than three feet in height at landings or where constructed on the level and such protection shall be of adequate strength.

(4) In addition to the requirements of subrules (1) to (3) of this rule, where a stairway exceeds eight feet in width, a centre handrail shall be provided.

(5) All common stairways and passageways to them shall be adequately ventilated, and sufficient natural and artificial lighting shall be provided.

(6) All stairways constructed in accordance with rule 60(1)(b) and (c) of these Rules shall be of fire-resisting materials throughout.

62. Lifts.

(1) The construction of all lifts and liftways shall comply in every respect with the requirements of section 27 of the Factories Act.

(2) In addition, the following provisions shall apply —

- (a) a clear space of not less than 3 feet shall be provided between the bottom of the lift shaft and the lowest point of the cage floor or fittings thereon when the cage is at the lowest landing, and between the top of the lift shaft and the crosshead of the cage when the cage is at the top landing; except that for a lift of greater speed than 350 feet per minute the clearance space in each case shall be increased to five feet;
 - (b) the bottom pits of lift shafts shall be soundly constructed so as to be kept dry. The floor of such a pit shall be level and, where necessary, provision shall be made for permanent drainage of the pit;
 - (c) at the bottom of the lift shaft a screen of adequate strength and construction shall be fixed round the path of the counterbalance weight extending to at least seven feet above the floor of the lift shaft so as to protect persons working under the counterbalance weight from accident through contact with it.
- (3) Every lift shall be examined and reported on in accordance with the provisions of section 27 of the Factories Act.
- (4) Copies of all reports shall be supplied to the local authority, and no lift shall be operated until written permission has been given by the local authority.

Residential.

63. Size of rooms intended to be used as dwellings.

- (1) In a domestic building every habitable room shall have a superficial area of one hundred square feet at the least with an allowance of forty square feet per person for each person sleeping or intending to sleep in it; except that—
- (a) if more than one habitable room is provided, all those in addition to the first habitable room may have a superficial area of not less than eighty square feet; and
 - (b) the minimum superficial area of any ironing room where there is provision for an electric iron shall be forty square feet.
- (2) For the purpose of subrule (1)(a) of this rule, domestic servants' quarters whether physically separated or not from the main building shall be considered as part of the main building which they serve.

64. Provision of kitchens, stores and bathrooms.

(1) Every dwelling shall be provided with sufficient and suitable accommodation for cooking, storing food, bathing and washing to the satisfaction of the local authority.

(2) Such accommodation shall comply with the following minimum requirements—

- (a) every dwelling shall be provided with at least one kitchen which shall have a floor area of not less than 80 superficial feet and a mean height of at least 8 feet 6 inches with a minimum height of 7 feet 6 inches in any part except where the total area of the dwelling unit is less than 800 square feet in which case the kitchen floor area shall not be less than 10 percent of the total area and in no case shall be less than 50 square feet;
- (b) every hotel, institution or communal building where food is, or is intended to be, provided for the inmates shall have a kitchen which shall have a mean height of at least 8 feet 6 inches and a minimum height of 7 feet 6 inches in any part; the floor area of the kitchen shall not be less than that laid down in the following scale—

No. of persons	Floor area
Not more than 10	100 square feet
Not more than 30	200 square feet
Exceeding 30	50 square feet for every 10 persons up to a maximum of 500 square feet;

- (c) where in addition to a kitchen complying with the provisions of paragraphs (a) and (b) of this rule a second kitchen designed solely for the personal use of household servants is erected, the second kitchen may have a minimum floor area of at least 25 superficial feet and a minimum height of 7 feet 6 inches in any part measured from floor level to the wall head;
- (d) all kitchens erected under this rule shall have an approved means of removing smoke and fumes and, unless exempted by the local authority, shall be lighted and ventilated in accordance with rules 175 and 179 of these Rules and shall have a floor constructed of concrete brought to a smooth surface or of other approved

incombustible material. Every kitchen shall be provided with adequate water supply and sink or splash basin. The local authority shall have power to require special provision for the disposal of kitchen refuse and for drainage before permission is given for the use as a kitchen of a room or rooms not on the ground floor;

- (e) every dwelling shall be provided with a cupboard or compartment for storing food and if this is of a cubic capacity of more than 100 cubic feet it shall be lighted and ventilated in accordance with rules 175 and 179 of these Rules;
- (f) every dwelling shall be provided with a bathroom or cubicle having an area of not less than sixteen superficial feet and a mean height of at least eight feet with a minimum of seven feet in any part measured from floor level to the wall head. The bathroom or cubicle shall be lighted and ventilated in accordance with rules 175 and 179 of these Rules.

65. Quarters for domestic servants.

Every person who erects any quarters for domestic servants shall construct the quarters in accordance with these Rules and the following special provisions—

- (a) the quarters shall not be erected within ten feet of any dwelling house, domestic building, public building, building of the warehouse class, kitchen or latrine; except that this requirement shall not apply to any quarters constructed of burnt brick, stone or concrete, if there is no direct communication opening between them and any such building or part of such a building as aforesaid and if the wall separating the quarters from any such building or part of a building is constructed as a solid wall of impervious material extending for the entire height from the floor to the roof of the quarters;
- (b) the floors of the quarters shall be constructed of good concrete not less than three inches in thickness finished to a smooth surface, or of such other materials as may be approved by the local authority, and the lower surface of the floors shall not be less than six inches above the level of the ground immediately adjoining and surrounding the quarters;
- (c) where the quarters are constructed of burnt brick, stone or concrete, the internal faces of the walls shall be finished to a smooth impermeable surface;

- (d) the height of the quarters shall be not less than a mean height of 8 feet 6 inches, and no part of the quarters shall be less than 7 feet 6 inches in height; and
- (e) cooking facilities and facilities for personal ablutions constructed in such a manner as to secure privacy shall be provided to the satisfaction of the local authority.

66. Position of flats and hotels.

(1) Where no provision has been made under the Town and Country Planning Act, hotels, special blocks of flats, blocks of flats and residential buildings may be erected only on plots approved by the local authority.

(2) The local authority may restrict the number of flats to be permitted on any particular plot and shall permit residential buildings to be erected only on suitable plots where the development will not unduly effect adjoining residential plots.

67. Construction of buildings of more than two storeys.

Every building consisting of more than two storeys for residential or any other purpose shall—

- (a) be constructed of incombustible materials as defined in British Standard Specification No. 476;
- (b) be provided with a sufficient number of approved fire escapes;
- (c) be so designed that satisfactory means of access to the building for public services is provided;
- (d) be provided with satisfactory means of drainage for waste, foul and storm water in accordance with the requirements of the local authority;
- (e) in addition to the main stairways providing access to each storey, be provided either with adequate means of fire escape and disposal of refuse from each floor or with a secondary stairway so sited that in no case shall entrance to any habitable room be more than ninety feet from a stairway; and
- (f) be provided with one or more central sites for the placing of refuse receptacles. The sites shall be constructed to the satisfaction of the local authority. The sites shall have an impervious floor surrounded by a curb or dwarf wall and shall be sufficient in size to accommodate the number of refuse receptacles to be used at the building or buildings on the plot.

The sites shall, if the local authority so directs, be roofed, drained and fly-proofed.

68. Kitchens in flats.

Where provision is made for communal dining and catering, the provisions of rule 64(2)(a) and (e) of these Rules need not be complied with.

Shops, offices, factories and workshops.

69. Precautions against fire in shops, etc.

(1) Every office building, factory, workshop and shop in which more than ten persons reside or are employed at any one time shall—

- (a) be constructed of fire-resisting materials;
- (b) be provided with a sufficient number of fire escapes;
- (c) be provided with a secondary means of access;
- (d) have fire-resisting floors, stairs, staircases and passages; and
- (e) be provided with suitable and convenient sites for the placing of refuse receptacles and the removal of the receptacles, the sites having an impervious floor surrounded by a curb or dwarf wall.

(2) If required by the local authority the sites shall be roofed or drained or both roofed and drained.

70. Offices in shops.

The relaxation in lighting and ventilation permitted under rule 177(2) of these Rules for shops shall not apply to any portion of the shop which is used as an office unless on two sides the head of any screen or partition from the shop is at least three feet below any ceiling or beam immediately above and the screen or partition is glazed from a height of 3 feet 6 inches above floor level to the head on two sides of the office.

71. Offices in factories and workshops.

Every part of a factory or workshop used as an office shall be lighted and ventilated in accordance with rules 175 and 179 of these Rules; except that the local authority may exempt any such part which is only screened or partitioned off in the manner stated in rule 70 of these Rules and which the local authority considers to be adequately lighted and ventilated.

72. Size of rooms in factories and workshops.

In any building used or intended to be used as a factory or workshop, other than a store, the floor area of any room of the building or portion of a room enclosed by a partition whether temporary or permanent shall be not less than is required by an allowance of forty superficial feet for every person employed or intended to be employed in the building.

73. Further requirements.

Rules 79, 83, 90(2), 101, 104, 107, 108, 109, 111, 122 and 123 of these Rules for the design and planning of public buildings and places of assembly shall apply to the design and planning of shops and offices to which the term “public building” shall be deemed to apply for this purpose, and the word “public” shall be deemed to cover all persons normally present or employed in the buildings, provided that the sum total of such persons is greater than twenty at any one time.

Public buildings and places of assembly.

74. Arrangements.

(1) The arrangement of public buildings shall be such as to secure the safety of the public to the fullest extent.

(2) Each theatre or cinematograph hall shall have the main or lowest floor provided for the accommodation of the public as near as possible to the level of the exit street.

75. Sites must be approved.

(1) A theatre, cinematograph hall, music hall, dance hall, concert hall or other place of amusement shall not be erected on any site unless the local authority shall have approved of the site therefor.

(2) The grounds upon which the local authority may disapprove of any such site shall include the following—

- (a) that the site is not suitable for the purpose;
- (b) that the erection on the site of any such public building would be contrary to the public interest;

- (c) that the site does not amply provide for the safety of persons frequenting the public building or the general public;
- (d) that the discharge of audiences or patrons from any such public building on a site is likely to create congestion of traffic, or to interfere with the safe conduct of traffic in the streets; and
- (e) that the site is so close to another public building that congestion of traffic in the streets may be possible.

(3) In the case of theatres, cinematograph halls, music halls and concert halls, each such building shall, on two sides at least, have a frontage to a public street, such street not being a sanitary lane or passage.

(4) The street shall be of such width and direction as will enable the persons accommodated in the premises to disperse rapidly in the event of fire or panic and as will afford facilities for the approach and use of fire appliances; except that, should the local authority so decide, a private open and paved passageway for the exclusive use of the audience of the theatre or hall, leading to the street and having a minimum width throughout of twenty-four feet may be regarded as equivalent to a public street.

76. Sites to be safe.

The local authority shall have power to disapprove the plans of any proposed theatre or cinematograph hall which does not provide for sufficient protection against fire from adjacent premises.

77. Places of public assembly.

Whenever large numbers of persons are likely to assemble on the occasion of any public procession, open-air meeting or other like occasion, every building, platform, balcony or other structure or part of it let or used, or intended to be let or used, for the purpose of affording sitting or standing accommodation for a number of persons, shall be safely secured, and constructed to the satisfaction of the local authority; but these Rules shall not relieve the owners of responsibility in respect of any accident which may occur by reason of the use of those structures. The local authority may object to and may prohibit the use of any such structure as defective, but is not required to advise how the defects should be rectified.

78. Area per person.

The area in public buildings to be allotted to each person for sitting accommodation shall not be less than 2 feet in horizontal depth by 1 foot 6 inches in width where no back is placed or fixed to any seating space, nor less than 2 feet 6 inches from back to back of seats by 1 foot 8 inches in width where backs and arms are fixed to the seats.

79. Public building: walls, floors and ceilings.

The walls of every public building shall be of brick or stone, or partly of brick and partly of stone, or of concrete or other approved fireproof construction to the satisfaction of the local authority, and the floors and ceilings of all passages, corridors, vestibules, stairs and staircases of every such building shall be of concrete or other approved fireproof construction.

80. Fire: separation of portions of public buildings.

If a portion only of a building is used as a theatre or a cinematograph hall, that portion shall be entirely cut off from the remainder of the building by solid fireproof walls and floors; but refreshment bars and tearooms may be deemed as parts of such theatre or hall if under the same management as the theatre or hall.

81. Buildings under or over theatres.

(1) No building shall be erected over or under the stage of a theatre, except as may be necessary in connection with that stage.

(2) Any building erected over the auditorium of a theatre or cinematograph hall shall not extend more than half the distance between the proscenium wall of the stage and the back of the auditorium or within fifty feet from the proscenium wall, whichever is the greater.

(3) In a theatre there shall be no windows or other openings in the wall above the proscenium and any windows or other openings in the other walls of the stage which are within fifty feet from any window or other opening in the theatre portion of the building shall be fitted with sprinklers and automatically operated fire shutters or doors to the satisfaction of the local authority. All such doors and openings shall be sited with due regard to the safety of persons within the building in the event of fire.

(4) Any window or other opening in the walls of the stage of a theatre

which is within twenty-five feet from any other building shall be fitted with sprinklers and shutters or doors as above prescribed.

82. Floors and ceilings to be fireproof.

The whole of the floors and ceilings of theatres, cinematograph halls, music halls and concert halls, including the floors and ceilings of all galleries and tiers, shall be of steel and concrete or of other fireproof construction to the satisfaction of the local authority. The ceiling under any portion of any gallery or tier, whether the space above the ceiling is utilised or left as a void, is included in this requirement.

83. Protecting metal work.

All steel work or structural metal work used in the construction of public buildings shall be protected against the action of fire in such a manner as may be required by the local authority and in accordance with the rules in regard to fireproofing of structural metal work.

84. Fireproofing of theatre passages, etc.

In all theatre buildings and cinematograph halls, the partitions and the walls, floors and ceilings of all porches, vestibules, stairs and every means of ingress or egress for the public shall be constructed of fireproof materials to the satisfaction of the local authority.

85. Floors and slope of floors.

No theatre or cinematograph hall building shall have more than two floors or horizontal divisions, including the gallery, above the level of the pit. Any such floor or division shall be constructed at a slope that will permit of steps in the passages or aisles being not more than six inch risers nor less than eleven inch treads measured in the direction of going.

86. Height of galleries.

Where the first floor or balcony of any public building extends over any part of the pit, stalls or area, the clear height above the latter shall not be at any part less than nine feet. The height between the floor of the highest part of the gallery and the lowest part of the ceiling over such part shall not be less than ten feet.

87. Aisles: width.

The aisles or passages within the auditorium shall at no point be less than 3 feet 6 inches in width and where required by the local authority shall be increased in width towards the exit in the ratio of 1½ inches to every 5 lineal feet. Should any such aisle or passage be of a width less than an exit door communicating therewith, it shall be widened so that opposite the door and for a distance of six feet therefrom its width shall not be less than the clear opening of the exit door.

88. Gangway around auditorium.

Where required by the local authority, a clear passage or gangway not less than 3 feet 6 inches wide shall be reserved around every portion of the auditorium.

89. Pit floor.

(1) In all public buildings the floors of the highest part of the pit shall be accessible from the street at the principal entrance to the pit or stalls by a gradient not exceeding 1 in 15; and the lowest part of the floor of the pit or stalls shall not be more than six feet below the level of the street at the principal entrance to the pit.

(2) In any case the lowest floor shall not be placed at such a level as will render it liable to flooding, and it shall be efficiently and properly drained to the satisfaction of the local authority.

90. Stairs: public buildings.

(1) The treads of each flight of stairs intended for the use of the public shall be of uniform width not less than eleven inches wide, and with risers of uniform height not more than six inches high. The treads shall be deemed to be of uniform width if, at a constant distance from a side of a stair, they are of equal width between the risers and the steps are of uniform shape from landing to landing, but the subtended angle between the risers shall not in any case exceed six degrees. No flight of stairs for public use shall consist of more than fifteen nor less than three risers, and each flight shall have a landing of adequate area. No winder steps shall be permitted, nor shall there be more than two successive flights without a turn.

(2) Every staircase required for public ingress and egress shall be enclosed by walls of brick or other approved fire-resisting construction to the satisfaction of the local authority. In every such case there shall be a handrail on either side of the stair, the ends of the handrail to be returned to the wall. In special cases, the staircases, instead of being enclosed by such walls, may, in the discretion of the local authority, have a suitable handrail or balustrade of sufficient strength on either side of the staircase.

91. Vestibules: planning of.

(1) Where stairs, passages and doorways lead into a vestibule, the width of the vestibule measured at right angles to the lines of egress shall be at least one-third greater than the combined width of all the doorways, passages and stairs leading into the vestibule from the auditorium.

(2) The doorways from the vestibule to a street shall aggregate at least one-quarter more in width than the aggregate of the widths of all doorways, passages and stairs leading from the interior into the vestibule.

(3) Where stairs discharge into any such vestibule, they shall discharge towards the street by direct lines of egress which will in no way interfere with lines of egress from the main hall, passages or other exits, and external exit doors shall be provided on all such lines of egress.

92. Proscenium wall.

(1) In any public building for the performance of stage plays, or where a proscenium is erected, the proscenium wall shall be of brick or other fire-resisting construction to the satisfaction of the local authority, not less than fourteen inches in thickness, and shall be carried across the entire width of the building, both above and below the stage to the level of the foundations of the external walls.

(2) No opening other than the proscenium opening shall be made in the proscenium wall, with the exception of a doorway into the orchestra and one doorway on each side of the stage for communication with the auditorium, through a lobby or passage.

93. Proscenium doors.

(1) Proscenium doorways shall not be more than 3 feet 6 inches wide and shall be fitted with self-closing, close-fitting fireproof doors hung in frames of fireproof materials, all to the satisfaction of the local authority.

(2) The bottom of the doorways shall not be more than three feet above the stage floor, and the doors shall have an overlap of at least three inches at each edge.

94. Proscenium decoration.

The decorations and moulding around the proscenium opening shall be constructed of fire-resisting materials, and all woodwork or stage hangings, curtains and draperies shall be rendered noninflammable by fire-resisting paint or other means.

95. Stage space.

The space above the stage shall be of sufficient height to allow of all scenery, and the fire-resisting screen, being raised above the top of the proscenium opening in one piece and without rolling if the local authority so directs.

96. Stage roof: construction.

(1) The roof over the stage shall be of fire-resisting material and shall be provided with a lantern light or lights at the back of it, equal at the base to one-sixth of the area of the stage.

(2) The lantern light or lights shall be glazed at the sides with sheet glass not more than 1/12 inch in thickness and shall be capable of being opened to an extent equal to the superficial area required at the base of the lantern light.

(3) The sashes shall be bottom hung to open outwards, and shall be of a type that cannot be rendered inoperative by warping or settlement or by dirt, and shall be capable of being opened by the cutting of a cord or by the fusing of a link. The cord shall be brought down to the stage to a position near the safety curtain release and shall be suitably indicated.

97. Stage ventilation.

The stage shall be ventilated to the satisfaction of the local authority.

98. Scene dock and flies.

No scene dock, property room or store room shall be permitted in any public building unless it is separated from the rest of the building by brick or other fire-resisting construction. Adequate means of escape shall be provided from the flies and the gridroom to the satisfaction of the local authority.

99. Dressing rooms to be fire-resisting.

(1) All dressing rooms, and the stairs and passages affording access to them, shall be constructed with one or more independent exits leading directly into a thoroughfare. No dressing room shall be situated more than one storey below the street level.

(2) No workshop, painting room or dressing room shall be formed or constructed in any public building over or under the auditorium or stage.

100. Dressing rooms to be separate.

(1) All dressing rooms shall be in a separate block or blocks or else separated by a fire wall from the public building of which they form a part, with not more than one opening in the fire wall. The opening shall be fitted with a close-fitting, self-closing fireproof door hung in a frame of fireproof materials.

(2) All dressing rooms shall be provided with windows opening directly to the external air and be adequately ventilated.

(3) All dressing rooms shall be provided with adequate washing facilities and separate sanitary accommodation.

101. Doors: swinging of.

(1) All outer and inner doors of public buildings which are used as the ordinary and usual means of public ingress and egress, shall open outwards, but may open inwards as well. The doors, where not provided with satisfactory spring hinges, shall be provided with proper and adequate means of holding them back in an open position to afford the full width of the doorway as a means of ingress and egress, and they shall be kept unlocked and fully open (or in the case of those with spring hinges, fully and

immediately available) during the time the building is in use. All doors for use by the public including emergency exits and gates in open lanes or passages outside the building, whether connected directly with the means provided for leaving the building or not, shall be made to open outwards in the direction of exit traffic; except that the local authority may approve sliding doors for factories and workshops.

(2) No door shall open immediately on to stairs or steps, but on to a landing at least four feet in width, which width shall be provided between such doors and stairs or steps.

102. Panic bolts and locks on doors.

External exit doors or gates, including those to open passages outside the building, shall not have any locks or fastenings other than satisfactory panic bolts fixed on the inside in such manner that they are easily and immediately opened by pressure from the inside on a horizontal bar or panel; except that main external entrance doors may be fitted on the inside face with long barrel or tower bolts. If in two leaves, an ordinary lock may be used; if in one leaf and a lock is required, it shall be a draw lock (without any catch pin to keep the door locked) capable of being opened from the inside without a key.

103. Door fastening prohibited.

Internal doors for use by the public shall have no locks, bolts or other fastenings, except such as are necessary to hold them in an open position, but may be fitted with spring hinges.

104. Outlet doors.

In any public building, outlet doorways (hereafter called "exit doors") and all means of egress shall be so situated and arranged and shall be of a number and capacity for each floor, tier or level or part of the building as in the opinion of the local authority shall enable all the persons whom the floor, tier, level or part can seat or accommodate, to vacate the building in a space of time not exceeding three minutes when proceeding at a walking pace of three miles per hour.

105. Notice on exit doors.

All exit doors, as required by rule 104, shall be indicated on the inside by an

adequately illuminated notice in block letters at least six inches in height, to the satisfaction of the local authority, which notice shall consist of the word "EXIT", and such letters shall, during the time that the building is open to the public, be kept uncovered and unconcealed by any obstruction.

106. Separate exits for each level.

(1) Where different floors, tiers or levels are provided for the accommodation of the public, each such floor, tier, level or subdivision of it shall have its own separate and independent staircase, corridors and passages, and at least two exits discharging directly into a street or open passage or lane. All exits shall be sited to afford the greatest degree of public safety and shall be to the satisfaction of the local authority.

(2) The width of every stair, corridor or passage outside the auditorium provided for the use of the public shall be not less than forty-five inches for every hundred persons using it, but no such stair, corridor or passage shall be less than 4 feet 6 inches wide. Where a greater width is necessary under these Rules, the width shall be in units of twenty-one inches as hereafter prescribed.

(3) All public staircases over six feet in width shall be properly divided down the centre by one or more strong handrails with adequate and substantial supports.

107. Width of exits.

The total aggregate width of exit doors required for a public building or any part of it shall not be less than forty-five inches for every hundred persons. The width of any exit door shall be measured between the leaves when wide open and shall not in any case be less than 3 feet 6 inches. Passages, stairs and corridors shall be at least four feet wide.

108. Number of exits.

(1) The exits for the ground floor shall not be less in number according to the number of persons accommodated than shown in Table 1—

TABLE 1.

Number of persons accommodated or normally present	Number of exits
Not exceeding 200	2
Over 200 and not exceeding 300	3
Over 300 and not exceeding 400	4
Over 400 and not exceeding 550	5
Over 550 and not exceeding 700	6
Over 700 and not exceeding 850	7
Over 850 and not exceeding 1,000	8
Over 1,000 and not exceeding 1,500	9
Over 1,500 and not exceeding 2,000	10
For each additional 500 persons over 2,000	at least one additional exit shall be provided

(2) For galleries the exits shall not be less in number than shown in Table 2—

TABLE 2.

Number of persons accommodated or normally present	Number of exits
Not exceeding 200	2
Over 200 and not exceeding 300	3
Over 300 and not exceeding 400	4
Over 400 and not exceeding 500	5
For each additional 100 persons over 500	at least one additional exit shall be provided

(3) There shall be provided at least two separate staircases in connection with each gallery.

109. Exits to be spaced apart.

(1) At least two of the exits from any floor or level shall be arranged as far apart as practicable on opposite sides or ends of the floor or level.

(2) If any floor or level is divided into two or more distinct parts, each part shall be regarded and treated as a separate floor or level.

110. Separate and independent exits.

If a public building is incorporated in a building, a portion of which is used for other purposes, all exits, courts, alleys, passages, gangways, corridors and staircases required for the public building shall be separate and independent from those required for the use of the rest of the building.

111. Lighting.

All entrance halls, passages, staircases, gangways or other means of approach to a public room in any public building shall be efficiently lighted during the whole time the public building is being used.

112. Artificial lighting.

(1) When artificial light is used in any public building, approved provision shall be made so that the public may not be left in darkness through any breakdown or accident.

(2) Two complete systems of electric lighting from two separate sources of supply shall be provided. All exit lamps shall be kept lit during the whole of the time the public are in the building.

113. Fire extinguishers.

Approved fire extinguishers in efficient working condition and readily available shall be provided and distributed throughout the building as follows—

- (a) one on each side of the stage level;
- (b) one on each side of the stage at every level of flies;
- (c) one in the scene dock;
- (d) one in each passage to dressing rooms; and
- (e) four in the auditorium at every level.

114. Wet blanket, buckets, etc.

Wet blankets or rugs, with buckets or other receptacles filled with water, shall always be kept in the wings, and shall have placards indicating their position legibly printed or painted, and fixed immediately above them.

115. Hatchets.

Hatchets, hooks or other means of removing hanging scenery in case of fire shall always be kept in readiness.

116. Footlights.

The footlights in front of the stage shall consist only of electric lights.

117. Fire curtain.

(1) In every public building used for theatrical purposes and having scenic accessories, a fireproof curtain of asbestos or other incombustible material shall be provided so as to completely cover the proscenium opening.

(2) The curtain shall be installed on the stage side of the proscenium wall and in such a manner that it can be immediately lowered. It shall run in grooves, the back of which shall be at least six inches from the edge of the proscenium opening and shall drop into a prepared groove not less than two inches deep, formed and surrounded by incombustible material for at least six inches on the stage side and entirely on the auditorium side. It shall be of sufficient strength and rigidity to resist the impact of falling scenery and timbers, and the whole of its material, construction and arrangement shall be to the satisfaction of the local authority.

(3) The curtain shall be arranged so as to lower itself on the cutting or loosening of a cord by a person standing on the stage floor. The curtain shall be kept lowered so as to cover the proscenium opening at all times except when the building is in actual use for performances.

(4) When lowered the curtain shall be close-fitting to the incombustible material around all its four edges, and it shall be so arranged as to prevent the passage from the stage to the auditorium of smoke or flame.

118. Lowering of fire curtain.

(1) The safety curtain in every building used for theatrical purposes shall be lowered to its full extent and raised to the necessary height in the presence of each audience.

(2) The attention of every such audience shall be drawn to the

provisions of this rule by a notice in the programme or by some other suitable means.

119. Temporary proscenia, etc.

In the case of premises in respect of which permission is desired for the occasional performance of stage plays by nonprofessional performers and where a permanent proscenium, safety curtain, or any of the other requirements of these Rules regarding the stage or seating is not in existence, the local authority may grant permission for such occasional performances upon such conditions as it may deem necessary for ensuring the safety of the performers and audience including the treatment of scenery, curtain and temporary proscenium to render them fire resisting.

120. Cinematograph chambers, etc.

The siting, construction and management of cinematograph apparatus and of cinematograph operating chambers shall be in accordance with the Electronic Media (Cinematograph) Rules.

121. Permission for changes.

No alteration, rearrangement or readjustment whatsoever may be made in respect of any of the aforesaid appliances, safeguards or means for the prevention of fire without the consent of the local authority being first obtained in writing.

122. Official inspections.

The local authority shall at all times have the right to inspect and visit any portion of any public building, place of amusement or assembly in order to ascertain that these Rules are being observed, and the same right of inspection shall be granted to the engineer to the authority, the medical officer of health, the fire brigade superintendent, and their assistants.

123. Owner to defray cost.

The owner or owners of any public building shall defray the expenses of carrying out any alterations of the building, or additions to it, which shall be required by a notice issued under these Rules.

PART VII — STRUCTURE.

Materials.

124. General.

(1) Materials other than those specified in these Rules may be used provided that the local authority is satisfied that they are of a suitable nature and quality for the purpose for which they are used and when applicable are properly mixed or prepared.

(2) The following materials are entirely prohibited, namely, damaged, insanitary or unsightly materials such as bent or disfigured corrugated iron or metal, reused portions of packing cases or containers, timber which is decayed, damaged or infected with white ants, dry rot or any material infected with vermin.

(3) No materials of a temporary nature such as cloth, canvas, grass or mats, may be used for any external wall; nor may wattle and daub be used for any purpose.

125. Testing.

(1) Where an authority is not satisfied as to the fitness of any material for the purpose for which it is proposed either as regards strength, durability, fire resistance, porosity or other structural quality, it may require evidence of its soundness to be produced.

(2) A satisfactory certificate of test issued by any recognised physics laboratory or building or industrial research centre or any public works department in East Africa will be accepted as proof thereof.

126. Water.

Water shall be clean and free from deleterious matter either in suspension or solution.

127. Sand or fine aggregate.

Sand used for mortar or concrete shall be clean, well graded, and substantially free from pebbles and large particles. It shall be of such size that

it will pass through a sieve of 3/16 inch mesh and not more than 3 percent shall pass through a No. 100 British Standard sieve and shall consist of—

- (a) hard natural sand; or
- (b) crushed hard igneous rock free from decomposed or weathered portions and from which the dust has been removed after crushing.

128. Coarse aggregate.

Coarse aggregate or “stone” shall be of sound and durable quality and of such a size that it will pass through a ring not exceeding two inches in diameter and be retained on a mesh of 3/16 inch square measured in the clear.

129. Cement.

Except as otherwise approved by the local authority, cement shall be Portland cement, Portland-Blast furnace cement or High Alumina cement complying with the relevant British Standard Specifications.

130. Bricks and blocks.

(1) Every stone, brick or block in a structural wall (including a pier or chimney forming part of a wall) shall be composed of hard, durable, incombustible material and shall be of such size, shape and surface as to permit of proper bonding and jointing.

(2) Every such block shall be suitably matured before use.

(3) Every such block shall possess resistance to crushing as follows—

- (a) brick, squared stone and other building blocks in load-bearing parts of a building shall possess such resistance to crushing that when saturated with water and loaded (under conditions corresponding with those of their functions in the actual work) with a load of fifteen hundred pounds per square inch of gross horizontal area, they shall not crack or break;
- (b) brick, squared stone and other building blocks in non-load-bearing parts of a building (other than in partition walls referred to in paragraph (c) of this subrule) shall possess such resistance to crushing under the circumstances prescribed in paragraph (a) of this subrule, that when loaded with a load of one thousand

pounds per square inch of the horizontal area, they shall not crack or break; and

- (c) brick, squared stone and other building blocks in a non-load-bearing partition wall which is adequately restrained laterally at top and bottom and at each end and is not of less thickness than when three times its height is added to its length the total does not exceed two hundred times its thickness shall possess such resistance to crushing that after having been saturated with water and dried to the normal condition of the partition wall, and when loaded, under conditions corresponding with those of their functions in the actual work, with a load of two hundred pounds per square inch of their gross horizontal area, they shall not crack or break.

(4) Nothing in this rule shall be deemed to prohibit the use of bricks or blocks of a lower strength or of unburnt bricks for single storey construction complying with rules 217 to 231 of these Rules for the use of such materials.

131. Stresses in brick and block walling.

(1) Subject to the modifications hereafter prescribed in respect of the slenderness ratio, the bearing pressures on load-bearing brickwork, masonry of squared stones and blockwork shall not exceed the values given in Table 3 and subrule (2) of this rule—

TABLE 3.

Class of block		Proportion of mixture of mortar (in volumes)			Maximum permissible pressure in tons per sq. ft.
Grade	Crushing load borne under test given in rule	Cement	Lime	Sand	
Special	Over 10,000 lbs.	1	—	2	<i>see</i> subrule (2) of this rule
First	10,000 lbs.	1	—	2½	30
Second	7,500 lbs.	1	—	2½	23
Third	5,000 lbs.	1	—	3	16
Fourth	4,000 lbs.	1	—	3	13½
Fifth	3,000 lbs.	1	—	4	11
Sixth	1,500 lbs.	1	—	4	8

(2) For the class of materials designated “Special” in Table 3 of this rule, the maximum permissible pressure in tons per square foot shall not exceed the value produced when the number of pounds per square inch of the resistance of the bricks, stone or blocks to crushing is divided by 500 and 10 is added to the quotient, but not in any case to exceed forty tons per square foot.

132. Mortar.

(1) All mortar shall be of a strength consistent with the stability of the structure in which it is used, and the proportions of the ingredients shall be in accordance with the requirements of Table 3 in rule 131 of these Rules unless a variation of those requirements is permitted by the local authority.

- (2) Subject to subrule (1) of this rule—
 - (a) “cement mortar” shall be composed of cement and clean washed sand or grit or other suitable material thoroughly mixed with clean water;
 - (b) “lime mortar” shall be composed of good lime of suitable quality and clean washed sand or grit thoroughly mixed with clean water; and
 - (c) mortar composed of such other materials and in such proportions as may be approved by the engineer of the local authority may be used.

133. Concrete.

(1) Load-bearing concrete other than reinforced concrete shall be composed of cement, fine aggregate, coarse aggregate and water as defined in Table 4 in this rule, and the grading of the aggregates between the limits specified in that table shall be such as to produce a dense concrete with no voids.

(2) In no case shall concrete containing more than twelve cubic feet of combined aggregate (i.e., sand and stone) measured separately to one cubic foot of cement be used for any purpose in the construction of a building.

(3) No concrete containing any ashes, slag, clinker or similar material shall be used in contact with any steel or other metal used in the structure of any building.

(4) Coke breeze shall not form an ingredient of any concrete or concrete blocks used in the construction of walls, floors, stairs or other parts of any structure which under any of these Rules should be of incombustible or fire-resisting materials.

(5) The bearing pressures on load-bearing concrete shall not exceed the values given in Table 4 in this rule in which the first proportional part indicates the volume of cement, the second proportional part the volume of sand or fine aggregate and the third proportional part the volume of stone or coarse aggregate—

TABLE 4.

Concrete	Maximum permissible pressure
	Tons per square foot
1 : 1 : 2	40
1 : 1 ½ : 3	35
1 : 2 : 4	30
1 : 3 : 6	20
1 : 4 : 8	5

134. Slenderness ratio: pier, etc.

(1) For isolated bearing walls and unreinforced isolated piers of concrete, brickwork, blockwork or masonry, the walls and piers being without proper lateral support, the permissible pressures specified in these Rules shall be reduced where the slenderness ratio—

$$\frac{\text{height}}{\text{least dimension}} = \frac{L}{D} \text{ exceeds } 6,$$

in accordance with Table 5 in this rule, intermediate values being interpolated—

TABLE 5.

Value of $\frac{L}{D}$	Percentage reduction in pressure from that given above
	percent
8	14
10	28
12	42

(2) In no case shall an unreinforced isolated pier or bearing wall have a slenderness ratio higher than twelve nor a least horizontal dimension less than nine inches.

135. Stresses in steel, wrought and cast iron.

The working stresses in cast iron and wrought iron shall not exceed the values in Table 6 in this rule. For working stresses in steel see rule 234(4) of these Rules—

TABLE 6.

Nature of stress	Cast iron pounds per square inch	Wrought iron pounds per square inch
Compression	16,000	10,000
Tension	3,000	11,000
Shear	4,000	7,000
Bearing	17,000	14,000

136. Timber.

Timber shall be of a quality and strength sufficient for its purpose and shall be well seasoned, sound, free from and suitably protected against termites, rot, beetle and vermin. It shall not contain large, loose or dead knots, splits or other defects to such an extent and so situated in the piece as to render it insufficient in strength and stiffness.

137. Stresses on timber.

Subject to rule 139 of these Rules, the unit stresses on deal, podocarpus, cedar, mvuli and timbers of similar strength and characteristics in pounds per square inch shall not exceed the values in Table 7 in this rule—

TABLE 7.

Nature of stress	Deal	Podo and cedar	Mvuli
Tension with the grain	700	700	1,200
Compression with grain at end bearing	1,100	900	1,200
Compression across the grain	200	150	300
Transverse extreme fibre stress (value “P” joist and beam formulae)	700	882	1,200
Shearing with the grain	100	100	150
Shearing across the grain	500	250	500

138. Stresses on timber columns.

(1) Subject to rule 140 of these Rules, the unit compressive stresses in pounds per square inch on axially loaded columns, posts, or struts of deal, podocarpus, cedar, mvuli and timber of similar strength and characteristics shall not exceed the values in Tables 8 and 9 in this rule corresponding with the slenderness ratio of the column post or strut, that slenderness ratio being the figure arrived at by dividing the length by the diameter or least transverse dimension if the same units of measurement are employed. The stresses specified in this rule are for columns, posts or struts which are unrestrained from bulging from end to end without contraflexure, but other stresses may be permitted for special methods of end fixing—

TABLE 8.

Slenderness ratio $\frac{L}{D}$	Safe unit stress in pounds per square inch		
	Deal	Podo and cedar	Mvuli
10	611	500	666
15	393	321	428
20	262	214	285
25	183	150	200
30	134	110	146

TABLE 9.

For square and rectangular columns, posts and struts—

Slenderness ratio $\frac{L}{D}$	Safe unit stress in pounds per square inch		
	Deal	Podo and cedar	Mvuli
10	687	562	750
15	468	383	510
20	323	264	352
25	231	189	252
30	171	140	187

(2) The stresses for intermediate values of the slenderness ratio shall be by interpolation and where these structural members are eccentrically loaded the stresses due to that loading shall be calculated and safely provided for.

139. Special timber.

Greater stresses than those specified in rules 137 and 138 of these Rules may be permitted on the production of authoritative and certified tests on an ample number of specimens of any particular variety of timber which will warrant the use of the greater stresses.

140. Timber column lengths.

No column or post of timber shall have an unsupported length of more than thirty times its diameter or least transverse dimension.

141. Dampproof and ant proof courses.

(1) Materials used for a dampproof and ant proof course shall be durable and impervious to moisture, and when placed in a wall shall be capable of withstanding the dead load of the wall and all superimposed loads on the wall and all horizontal and inclined forces in such a manner as will not impair the efficiency of the dampproof and ant-proof course and will not allow such movement of the wall as may lead to instability of any part of the structure.

- (2) The requirements of this rule shall be deemed to be satisfied by—
 - (a) a layer of sheet lead weighing not less than four pounds per square foot and coated on each side with bitumen, any joint being overlapped to the extent of not less than three inches;
 - (b) a layer of soft-tempered sheet copper weighing not less than twelve ounces per square foot bedded in cement mortar, any joint being overlapped to an extent of not less than three inches, or alternatively a welted joint shall be used;
 - (c) a continuous layer of mastic asphalt not less in thickness than 3/8 inch;
 - (d) a layer of bituminous dampproof course sheeting with fibre base weighing not less than six pounds per square yard laid on a level bed of good mortar, any joint being overlapped to an extent of not less than three inches;
 - (e) a layer of bituminous dampproof course sheeting with lead core and fibre base weighing not less than eight pounds per square yard laid on a level bed of good mortar, any joint being overlapped to an extent of not less than three inches;
 - (f) a layer not less than one inch thick of well consolidated cement mortar or granolithic not weaker than one part of cement to three parts of sand; or
 - (g) such other suitable material approved by the local authority.

Loads and loading.

142. Pressure on foundation beds.

(1) The pressure on foundation beds of a building being the sum of the dead and superimposed loads thereof shall be evenly spread and shall not exceed the safe bearing capacity of the foundation bed.

(2) The following permissible loads in Table 10 in this rule are given as a guide to safe bearing capacities, but the building owner shall satisfy himself or herself by means of trial holes or loading tests or other measures as to the safe bearing capacity of the ground on which the foundations of the building are to rest—

TABLE 10.

Geological formation	Permissible load on foundation bed
Alluvial soil, consolidated made ground and very wet sand	Tons per square foot $\frac{1}{2}$
Soft clay, wet or loose sand and red earth of loose and open texture	1
Red earth of firm and compact character	$1\frac{1}{2}$ to $2\frac{1}{2}$
Ordinary firm dry clay or fine sandy loam	2
Confined dry sand	3
Hard dry decomposed shale and compact gravel or murrum	4
Shaly and soft rock	6
Hard and unfissured rock	10

(3) Where it can be shown that the natural rock is capable of carrying a greater load than ten tons per square foot, the greater load shall be permitted but only to the extent of one-tenth of the ascertained crushing strength per square foot of the rock.

143. Loads on columns, walls and foundations.

(1) For the purpose of calculating the total load to be carried on columns, pillars, piers, walls and foundations in buildings of more than two storeys in height, the super-imposed load for the roof and the topmost storey shall be calculated in full in accordance with the loads specified in the rules for that purpose, but for the lower storeys a reduction of the superimposed loads may be allowed in accordance with Table 11 in this rule—

TABLE 11.

Storey	Reduction of its superimposed load
	Percent
Next storey below topmost storey	10
Next storey below above-mentioned storey	20
Next succeeding storey below	30
Each succeeding storey below	40

(2) No such reductions shall be allowed on any ground floor, nor on any floor for which a superimposed load of one hundred pounds per square foot, or more, is specified.

(3) The above reductions may be made by estimating the proportion of floor area carried by each foundation, column, pier or wall.

(4) Where any floor is intended to be used for a purpose for which a superimposed load is not specified in these Rules or where the superimposed load on any floor or roof is to exceed that so specified, the reduction, if any, of such loads shall be to the satisfaction of the local authority.

144. Loads on parapets and balustrades.

Parapets and balustrades, together with the connections and members which give them immediate structural support, shall be designed to withstand not less than the following horizontal loads which shall be assumed to act at handrail or coping level—

- (a) for light access stairs, gangways and the like: fifteen pounds per foot run;
- (b) for stairways, landings and balconies (private and domestic): twenty-five pounds per foot run;
- (c) for all other stairways, landings and balconies and all parapets and handrails to roofs: fifty pounds per foot run (or wind load, if greater).

145. Loads on floors.

(1) In all new buildings erected for any of the purposes enumerated in the first column of Table 12 in this rule and in all buildings altered or adapted for those purposes, the floors of the buildings shall be of such strength and stability that in addition to the weight of the materials of which

they are composed and the weight of any part of the structure bearing upon them, they shall be able to carry as a safe superimposed load the weights specified in the second column of the table; except that the loads specified in the second column of the table shall be deemed to be minimum floor loads, and in any case where the superimposed loads on any floor are, or are likely to exceed the minimum for the floor, such greater loads shall be safely provided for.

TABLE 12.

Type of building or floor used wholly or partially for the purpose of—	Superimposed loads in lb. per sq. ft.
Art galleries (pictures)	80
Art galleries (sculpture)	200
Assembly halls	100
Ball rooms	100
Churches and places of public worship	100
Cinematograph halls	100
Class rooms (for adults)	80
Class rooms (for juveniles)	70
Common lodging house bedrooms	50
Concert rooms	100
Corridors, stairs and landings of offices	80
Corridors, stairs and landings of public buildings	100
Corridors, stairs and landings of residential flats	60
Dance halls	100
Drill halls and floors subject to similar vibration	100
Dwelling houses	50
Factories (heavy)	200
Factories (light)	100
Flats (residential)	50
Garages (commercial and public)	200
Garages (private and similar purposes)	80
Grand stands	100
Grain and seed lofts	200
Gymnasia and floors subject to similar vibration	100
Hospitals (corridors, stairs and landings)	100
Hospitals (wards and rooms)	50
Hotels (bedrooms and private rooms)	50
Hotels (public rooms)	100
Lecture rooms	100
Libraries (bookstores)	200
Libraries (reading rooms)	100
Meeting halls	100
Mosques	100
Museums, according to exhibits, but not less than	100
Music halls	100
Offices and similar purposes (entrance floor and floors below entrance floor)	80
Offices and similar purposes (floors above entrance floor)	50
Public assembly	100

Type of building or floor used wholly or partially for the purpose of—	Superimposed loads in lb. per sq. ft.
Offices and similar purposes (floors above entrance floor)	50
Public assembly	100
Reading rooms (excluding book racks)	80
Restaurants	100
Retail shops (heavy, including book and stationery shops)	150
Retail shops (light)	80
Schools (classrooms for adults)	80
Schools (classrooms for juveniles)	70
Schools (halls, corridors, stairs and landings)	100
Theatres	100
Warehouses (heavy)	200
Warehouses (light)	100
Workshops (heavy)	200
Workshops (light)	100

(2) Except as provided in subrule (1) of this rule, corridors and stairs shall be calculated for the same superimposed load as that of the heaviest loaded floor to which they give access.

(3) In the case of garages for motor vehicles exceeding two tons dead weight, the actual load shall be calculated but the superimposed load shall not be taken as less than two hundred pounds per square foot of floor area.

(4) Every floor in buildings other than described in this rule shall be able to carry such safe superimposed load as the local authority may prescribe, and every floor shall be constructed of sufficient strength and stability to the satisfaction of the local authority.

146. Rolling loads.

(1) In cases where a rolling load is to be provided for, the rolling load shall be taken as equivalent to a static load 50 percent in excess of the rolling load.

(2) The maximum positive and negative bending moments at any section due to every position of the rolling load shall be properly provided for.

147. Cantilevers: resistance to overturning.

Due provision shall be made for the stability of any cantilever projection. The resistance to overturning must be at least 50 percent greater than the force tending to overturn.

148. Loads on flat roof and balcony, etc.

Every flat roof, balcony and canopy shall be constructed to carry safely the maximum superimposed loads hereafter specified, in addition to any dead load—

- (a) for a flat roof, and roofs inclined at an angle with the horizontal of not more than twenty-five degrees and not accessible to persons other than for maintenance purposes, thirty pounds per square foot;
- (b) for a balcony, eighty pounds per square foot; and
- (c) for a canopy where design and location render it in no circumstances likely to be made accessible to persons other than for maintenance purposes, thirty pounds per square foot, or one hundred twenty pounds per running foot along the extreme outer edge of the canopy, whichever method of loading induces the greater bending moment.

149. Loads on pitched roof.

(1) On roofs inclined at an angle with the horizontal of more than twenty-five degrees, a minimum superimposed load (deemed to include the wind load) of twelve pounds per square foot of surface shall be assumed acting normal to the surface inwards on the windward side, and eight pounds per square foot of surface acting separately and not simultaneously outwards on the leeward side.

(2) This requirement shall apply only in the design of the roof construction, and a vertical superimposed load of eight pounds per square foot of covered area shall be substituted for it in estimating the vertical superimposed roof load upon all other parts of the construction of the building.

150. Notification of floor load.

(1) The owner of every building of the warehouse class or other premises in which goods are or will be stored shall cause a notice to be permanently exhibited in a conspicuous place on each storey of the building

stating the maximum superimposed load per square foot which may be carried on any part of the floor of that storey.

(2) Any user of a building in which a floor is loaded to a greater degree than the notice allows commits an offence.

151. Test.

(1) The local authority shall have the power to require from the builder or other person directing building works of any kind reasonable proof as to the adequate stability of the works.

(2) If the local authority considers it necessary it may demand the imposition of reasonable test loads upon any part of a structure and the furnishing of accurate results of the tests.

Foundations and footings.

152. Foundation beds.

(1) Irrespective of anything shown on the approved plans, all excavations for the foundations of a new building shall be sufficiently deep to secure a foundation bed of firm and undisturbed ground free from adjacent conditions or influences likely to lessen the bearing capacity of the foundation bed. The minimum depth of a foundation bed in red earth shall be two feet.

(2) Every precaution shall be taken and where necessary remedial works executed to preserve the efficiency and safety of any foundation or trench.

(3) Excavations for foundations shall not endanger the stability of sewers, water pipes or other service lines nor any buildings in the vicinity.

(4) Any person excavating within six feet of any building or to a lower depth than the bottom of any adjacent or nearby foundation shall take such means of shoring up, securing or otherwise making safe such building so as to ensure that it shall not in any way be prejudicially affected by the excavation.

153. Foundations and internal partitions.

(1) The foundations of every wall, pier, buttress abutment column or vertical component of a building shall be formed of a bed of good concrete or masonry not less than 6 inches thick nor less in breadth than twice the thickness at the base of the wall, pier or superstructure carried, and the centre or centre line of foundations shall as near as practicable coincide with the resultant of the vertical forces bearing thereon; except that—

- (a) the breadth shall always be sufficient to distribute the load carried evenly over the foundation bed and within its safe-bearing capacity while the thickness shall be sufficient in relation to the projection of the outer edge of the foundation beyond the base of the structure immediately above to take the stresses induced; and
- (b) if the foundation bed is in the opinion of the local authority sufficiently hard in relation to the load superimposed, only sufficient concrete need be used to level the foundation to masonry courses.

(2) Single storey internal partitions built of brickwork not exceeding 4½ inches in thickness or of hollow concrete, burnt clay or other blocks of light weight and not exceeding 6 inches in thickness may be built directly on a concrete ground floor without foundations or under building, provided that this concrete floor is increased in thickness to not less than 6 inches under the whole length of the partition for a breadth of at least twice that of the partition itself.

154. Foundation concrete and masonry.

(1) In the foundations of a building, concrete which is not reinforced shall not be weaker than one part by measure of Portland cement to four parts of sand and eight parts of broken clean hard stone or other material of like hardness and durability. The concrete shall be thoroughly mixed and so placed in position as to retain the correct proportions throughout the mixture.

(2) If masonry foundations are used they shall be formed of good, solid, durable blocks of a rectangular shape and laid headerwise in mortar not weaker than one part by measure of Portland cement to three parts of clean sand.

155. Footings.

Where the thickness of the foundation in relation to the projection of the

outer edge of the foundation beyond the base of the wall, pier or superstructure carried is insufficient to take the stresses induced, suitable footings shall be provided to spread the load sufficiently over the upper surface of the foundation; alternatively, the foundations shall be adequately reinforced with steel to bear the stresses induced.

156. Underpinning.

If underpinning of walls or chimneys is required, it shall be built with concrete or with brick or stone bedded in cement to the full thickness of the old wall or work or to an additional thickness if the increased height of the wall so requires, and shall be built in short lengths, and shall rest on a concrete foundation or on other solid bearing structure or structures; and the whole shall be executed to the satisfaction of the local authority.

Retaining walls, dampproofing, floors.

157. Retaining walls.

The provisions of rules 220 and 221 of these Rules relating to the thicknesses of walls shall not apply to walls acting as retaining walls; the thickness of such walls shall be as ascertained by the necessary calculations for the materials used, and the local authority may at its discretion require such calculations to be produced for scrutiny.

158. Basement and cellars.

Any basement, passage, cellar or any room or part of a room below ground floor level shall be made dampproof, rat proof and mosquito proof to the satisfaction of the local authority and be provided with such efficient means of preventing flooding from surface water as the local authority may think fit.

159. Dampproof and ant-proof courses.

(1) Any wall, plinth, pier or column other than a reinforced concrete column or steel stanchion of a building in contact with the ground shall have a continuous horizontal dampproof course set in it in such manner as to prevent the communication of ground moisture into the walls and structure above the level of the bottom of the ground floor plate, or above the level of the bottom of a solid floor. The dampproof course shall extend throughout the thickness of the wall or structure and shall be at least six inches above the

level of the ground; except that the local authority may allow a dampproof course to be below ground level if an efficient vertical dampproof course is provided continuous with the horizontal dampproof course and extending to at least six inches above ground level.

(2) If in a building there is a basement or cellar, an additional dampproof course as in subrule (1) of this rule shall be provided at the base of the walls thereof, and any such wall in lateral contact with the ground shall be protected by a properly sealed vertical dampproof course. The vertical course shall be adequately sealed to the lower horizontal dampproof course and extend upwards to at least 6 inches above the ground.

160. Ground floor level.

The ground floor level of any part of a building shall not be less than 6 inches above the highest point within ten feet of the building of the ground adjoining such point; except that—

- (a) the local authority may allow excavation and cutting back of the ground from the building to effect compliance with this rule;
- (b) the top of any bank or retaining wall necessitated by such action shall be below the line given by a rise of 2 feet for every 5 feet measured horizontally from the building; and
- (c) where it is not reasonably practicable for the whole of a floor to be 6 inches above ground level, the local authority may allow a part to be lower on condition that rule 159 of these Rules is complied with.

161. Floors of sculleries, bathrooms and water closets.

(1) Every person who erects a new building shall cause the floor of every scullery, bathroom, kitchen and water closet of the building to be constructed of concrete or otherwise rendered impervious to liquid by a suitable covering.

(2) Every person who erects a new building in which any floor is constructed of boards, planks or wood blocks laid directly upon concrete shall cause the concrete to be covered with a layer of mineral bitumen or other similar material.

Party and external walls.

162. Separation of buildings.

(1) Every building shall be separated by an external wall or by a party wall from any building on an adjoining plot or subplot.

(2) Where any new building may be erected adjacent to the boundary of an adjoining plot or subplot, the wall of the building at the boundary shall either be a party wall or an external wall built up to the boundary line or if not so built then at a distance of not less than four feet from it unless under these Rules a greater distance is otherwise required. Any external wall less than five feet from a plot boundary shall be a fire wall.

(3) Any external wall or party wall required under this rule shall be constructed of stone, concrete, bricks or other blocks of hard and incombustible material not less than 8½ inches thick, and where the eaves of adjoining buildings would be less than ten feet apart, finished with a parapet and cope above the roof, except where the roof itself is constructed entirely of incombustible materials.

(4) No opening of any sort shall be made in any party or fire wall including any gable forming part of it except with the consent of the local authority and subject to the provision of an effective self-closing fire door and any other condition which may be imposed.

163. Party walls within plots.

(1) In the case of semidetached dwellings, offices and shops, the party wall within the plot shall be carried up at least as high as the underside of the incombustible covering of the building. The roof covering shall be properly bedded in mortar or cement at the top of the party wall; and no lath, batten, timber or woodwork of any description shall extend across or into any part of the wall.

(2) Where dwellings, offices or shops are built attached to a greater number than two in any storey, every alternate party wall shall, unless the local authority permits otherwise, be provided with a parapet as hereafter provided for, and every other party wall carried up hard against the underside of incombustible roof coverings. The end of every parapetless or other party wall shall be built out at least to the face of the eaves by means of a corbel or otherwise so as to break connection by means of incombustible material between timbers on either side.

(3) A party wall required under this rule need not be carried up through the roof if the roof is constructed entirely of reinforced concrete.

164. Parapet to party wall.

(1) Except where under these Rules a party wall may terminate at the underside of the roof covering, every party wall shall be carried up through the roof or roofs for the heights hereafter prescribed and measured in each instance at right angles to the external surface of the slope of the roof, flat or gutter. If the roofs on either side of the party wall are at different levels, the height shall be measured from the highest roof, flat or gutter. The heights as aforesaid shall be as follows—

- (a) for domestic and office buildings, nine inches;
- (b) for warehouse buildings, twenty-four inches; and
- (c) for public buildings, thirty-six inches,

except that where the highest roof slopes downwards away from the party wall the prescribed heights for classes in paragraphs (b) and (c) of this subrule may be reduced to lesser heights at the discretion of the local authority but in no case to less than nine inches.

(2) Where a party wall is carried through or above a roof the portion above the highest roof shall not be less than 9 inches thick and shall be properly coped with incombustible material, bonded to and built in continuation of the wall on which it is placed.

165. Wood in party walls.

No timber or combustible material shall be built into any party wall nearer than 4½ inches to the centre line of the party wall and if so built in shall be separated from similar material in the adjoining building by not less than nine inches of fireproof and solid material; but the distances specified in this rule may be reduced at the discretion of the local authority if every part of the timber or combustible material which is placed in the party wall is properly encased in an iron beam-box with a solid back.

166. Recesses and chases in party or fire walls.

The back of any recess or chase in a party wall shall not be less than 4½ inches from the centre line of the party wall and in a fire wall shall not be less than 8½ inches from the other face of the fire wall.

Lintels, beams and girders.

167. Arches and lintels.

Except in a wall framed of timber, every opening for doors, windows or other purposes, in any wall having any part of the wall directly above the opening shall have an arch or lintel of hard and incombustible or fire-resisting material, and of sufficient strength.

168. Strengthening of walls at openings.

Where in any wall there is an opening or recess which exceeds 5 feet 6 inches in width, or is within two feet of the corner or angle of the building, or where openings or recesses are close to each other, the wall at the jambs of the opening or recess shall be increased in horizontal sectional area where such is necessary, for a sufficient extent to sustain safely the super-incumbent weight and load on the wall as well as to resist lateral or eccentric stresses, or otherwise equally strengthened or reinforced.

169. Bearing of beams.

(1) Every beam which is borne by masonry, brickwork or block work shall rest upon a sufficient template of stone, steel or good cement concrete. The part of the beam bearing upon the template shall be of sufficient area to transmit safely the maximum superimposed and dead loads without injury to the beam or template, and the underside of the template shall be adequate in area to transmit these loads to the understructure within the safe bearing capacity of the materials thereof; but in no case shall the template be less than the full breadth of the beam nor any bearing of the latter be less than four inches in the direction of its length nor the template be less than four inches thick except where the template is of steel when it shall conform to the requirements of rule 234(20) of these Rules. At each end of every metallic beam borne as above a space shall be left equal to the proportion of 1/8 inch for every 10 feet of the beam to allow for expansion.

(2) Notwithstanding subrule (1) of this rule, in the case of reinforced concrete work in which beams and slabs are cast as one homogeneous mass, no templates are necessary under the bearing ends of the beams.

170. Girders to be central to wall.

(1) The centre line of the wall carried by the beam shall fall on the centre line of the beam or combination of beams carrying the wall.

(2) The lowest course of the wall immediately resting on the beam shall be composed of best hard-burned brickwork or hard selected stone or other incombustible material.

(3) In each case the materials resting on the beam shall have a strength within their safe bearing capacity calculated in respect of the area actually resting upon the metal of the beam.

171. Wood and concrete beams: width, etc.

(1) Every wood and concrete beam carrying a wall shall be solid and not less in width than the thickness of the wall which rests upon it.

(2) A solid wood beam may consist of planks of adequate thickness securely bolted together with horizontal bolts; except that in any class of building except a domestic building wood beams carrying a wall shall not be allowed above any exit or passage immediately leading to an exit.

Wall and ceiling finishes and stairs.

172. Weatherproofing of walls.

(1) Any external wall of stone, concrete, brick or blocks which is less than 9 inches thick shall be rendered weatherproof by a protective coating or in some other efficient manner.

(2) Any other external wall irrespective of its thickness, which will conduct moisture to its inner surface by reason of its construction, materials or position, shall be similarly treated.

173. Internal finish of walls.

(1) All internal wall faces not plastered shall be flush pointed at all joints, or the face of the wall shall be covered with tiles or other fair covering.

(2) The walls and ceilings of rooms for human habitation and internal

walls of all public buildings, factories and workshops shall be finished to the satisfaction of the local authority in such manner as to prevent the harbourage of vermin.

- (3) Every habitable room roofed with noninsulated metal roofing shall—
 - (a) be insulated against heat to the satisfaction of the local authority; or
 - (b) be provided with a ceiling.

174. Handrails to stairs and balustrades.

(1) Every flight of stairs or steps rising more than three feet without a landing shall be provided with a handrail on one side and if over five feet wide on both sides.

(2) Any part of a staircase, flight of steps, or gallery used as a passage way, or terrace which is more than three feet above the ground or the floor below shall be protected by a wall, parapet, balustrade or railing designed to carry the stresses to which it may be subjected as provided in rule 144 of these Rules.

Lighting and ventilation.

175. Provision of windows.

In all buildings, every habitable room and every bathroom, lavatory, pantry, larder, scullery and staircase shall have provided for it in the wall of the building which immediately fronts or abuts on such open spaces as are provided in pursuance of the rules for that purpose, a sufficient number of suitable windows, in such a manner and in such a position that each of the windows shall afford effectual means of ventilation and light by direct communication with the external air; except that—

- (a) a staircase may be lighted by an overhead skylight of sufficient area if ample means of ventilation are otherwise provided;
- (b) the lighting of bathrooms and larders may be by overhead skylight or artificial light or borrowed light if effective means of ventilation are provided; and
- (c) water closets shall be lighted in accordance with rule 57 of the Public Health (Drainage and Sanitation) Rules.

176. Warehouse lighting and ventilation.

Every building of the warehouse class shall be provided with proper and efficient lighting and with proper, adequate and efficient means of ventilation, to the satisfaction of the local authority.

177. Area of windows.

(1) Every window of a habitable room which opens directly into the external air shall, except in factories and workshops or unless otherwise approved by the local authority, be glazed, and the total area of the window, or if there are more than one, of the several windows, clear of the frames shall be equal at the least to 1/10th of the floor area of the room, and in the event of a window or windows occurring in a wall or walls abutting on to a verandah or beneath a balcony or canopy the area shall be increased by 5 percent for each foot over 3 feet by which the verandah, balcony or canopy extends outwards from the wall in which the window is placed. Windows shall be constructed so that an area thereof equal at the least to 1/20th of the floor area of the room shall be made to open; but—

- (a) in calculating the area of windows required to open, any area of permanent ventilation in excess of the requirements of rule 179(1) of these Rules may be deducted, but in no case shall the total area of windows provided be less than that required by this rule;
- (b) in any factory or workshop in which any special trade or process is carried on, additional light shall be provided for the requirements of the trade or process, to the satisfaction of the local authority; and
- (c) if a window is protected by means of rods or by a grille or similar device, the local authority may deem the effective area thereby reduced by 10 percent.

(2) A shop having one or more display windows shall be exempt from the requirements of this rule in regard to the provision of an opening portion in the window or windows, and may further be exempt from the requirements in regard to the lighting area of the windows if the local authority is satisfied that the shop is adequately lighted by other means.

178. Space opposite windows.

A window of a habitable room shall not be deemed to open directly into the

external air if there is opposite such a window a wall which is less than 5 feet away from the window or, where the height of the opposing wall measured from the level of the head of the window to the level of the eaves or top of the parapet, is greater than 1½ times the distance from the window to the wall; except that—

- (a) if the window opens on to an internal open space, the distance from the window to the wall opposite shall not be less than twelve feet;
- (b) if any window opens on to a court or passage, open at one end, and of a width of not less than five feet, that window shall be deemed to open directly into the external air if it is situated—
 - (i) opposite the open end; or
 - (ii) on either of the other two sides within a distance from an open end not exceeding twice the distance across the court or passage; and
- (c) in calculating, for the purpose of this rule, the effective distance between opposing walls a reduction shall be made of the amount by which any eaves, balcony, canopy or other projection extends outwards from either wall except that a projection of not more than fifteen inches may be disregarded.

179. Ventilation of rooms, etc.

(1) Every person who erects a new building other than a public building or building of the warehouse class shall cause every room, passage, hall and stairwell to have permanent ventilation openings (in addition to those required by rules 175, 176 and 177 of these Rules) so as to ensure effective cross or through ventilation; except that—

- (a) a chimney or flue may be deemed to be a ventilation opening as required by this rule;
- (b) in the case of bathrooms and food storage compartments of over 100 cubic feet, ventilation shall be directly to the external air;
- (c) ventilation of water closets shall be in accordance with rule 57 of the Public Health (Drainage and Sanitation) Rules; and
- (d) in any domestic building or workshop, the requirements of this subrule shall be deemed to be satisfied if—
 - (i) in respect of each room, passage, hall or stairwell, the aggregate superficial area of ventilation openings free from obstructions (except wire gauze) amounts to not less than 22 square inches per 100 cubic feet of air space;
 - (ii) in the case of rooms, at least half the required ventilation

comes directly from the external air, and, where on account of the design of the building it is not practicable for all required ventilation to come directly from the external air, not more than half shall come from a passage which is itself effectively ventilated with independent ventilation openings sufficient to satisfy the requirements of subparagraph (i) of this paragraph, and at least half the area of which opens to the external air;

- (iii) the ventilation openings are so designed as to ensure the free passage of air at all times but are effectively protected from the weather;
- (iv) the minimum ventilation openings required by subparagraph (i) of this paragraph are sited so that the upper limit of each opening is not more than three feet below the top of the wall in which it is situated.

(2) In addition to the requirements of subrule (1) of this rule, every boiler house and engine room and every room in any factory or workshop in which a substantial quantity of heat is used or produced, and which is situated immediately under the roof of the factory or workshop, shall be provided with permanent roof ventilators of an aggregate area of not less than 1/50th of the floor area; except that the local authority may exempt any work room from the requirements of this subrule where it is satisfied that such provision is inappropriate or unnecessary.

(3) Every room in which a fireplace is provided shall have a properly constructed flue communicating directly with the external air.

(4) In any factory or workshop in which any special trade or process is carried on, additional ventilation with or without air conditioning sufficient for the requirements of that trade or process may be required to the satisfaction of the local authority.

(5) Where a mechanical system of ventilation is installed, the requirements of this rule may be modified to the satisfaction of the local authority.

180. Ventilation of public buildings.

(1) Every person who erects a new public building shall cause the building to be efficiently through or cross ventilated by means of windows,

fanlights, air bricks or tubes distributed around the building in such positions and in such manner as to secure effective change of air, and arranged so as to communicate directly with the external air.

(2) The openings required under this rule shall be arranged so as to provide an aggregate area for each person accommodated in the building of not less than 24 square inches, the area of the openings being in every case measured with a reduction on account of any grating or other diminution or contraction placed across or in the opening. Of the 24 square inches per person thus provided, not less than 6 square inches shall be situated at a height not exceeding 5 feet above the floor, and 18 square inches at a height of not less than 9 feet above the floor. Where a mechanical system of ventilation is installed, these requirements may be modified to the satisfaction of the local authority.

Chimneys.

181. Materials for chimneys.

Every person who erects a new building shall cause every chimney of the building to be constructed of—

- (a) good whole bricks or stone, properly bonded and solidly put together, with good mortar compounded of good lime and clean sand or other suitable material, or with good cement or with good cement mortar; or
- (b) other good, hard and suitable incombustible material, properly and solidly put together.

182. Construction of chimneys.

Every person who erects a new building shall cause every chimney of the building to be properly bonded or otherwise not less securely tied into any wall against which it is built, and to be built on solid foundations and with proper footings and to be provided with a dampproof course if the wall is so provided; except that—

- (a) a chimney may be built on a metal girder, or on sufficient corbels of brick, stone or other hard and incombustible material, if the work so corbelled out does not project from the wall more than the thickness of the wall measured immediately below the corbel; and
- (b) a chimney may be built without footings if it is built against a

wall which is not required to have footings by the rule for that purpose.

183. Chimney flues to be pargeted inside.

Every person who erects a new building shall—

- (a) cause the inside of every flue forming part of a chimney of the building to be properly rendered or pargetted as it is carried up, except where the whole or any part of the flue is lined with fire-clay or stoneware not less than 3/4 inch thick, or other equally suitable incombustible material of sufficient thickness, and the spandril angles are filled in solid with brickwork or other incombustible material; and
- (b) cause the back or outside of every flue which is not constructed so as to form part of the outer face of an external wall to be properly rendered in every case where the brickwork or other material of which the back or outside may be constructed is less than 8½ inches thick.

184. Brickwork about certain flues to be extra thick.

Every person who erects a new building shall cause every flue forming part of a chimney of the building which may be intended for use in connection with any furnace, cockle, steam boiler, or close fire, constructed for any purpose of trade, business or manufacture, or which may be intended for use in connection with any cooking range or cooking apparatus of the building when occupied as a hotel, tavern or eating house, to be surrounded with brickwork or other solid and incombustible material at least 8½ inches thick for a distance of 10 feet at the least in height from the floor on which the furnace, cockle, steam boiler, close fire, cooking range or cooking apparatus may be constructed or placed; except that where an asbestos cement flue pipe is fitted to any cooking range, it shall not be necessary to surround the flue pipe with brickwork. No such flue pipe shall be carried through any storey other than the one in which it is situated.

185. Support of chimney breast above openings.

Every person who erects a new building shall cause a sufficient arch of brick or stone, or a sufficient lintel of stone or other hard and suitable incombustible material, or a sufficient bar of steel or wrought iron to be built over the opening of every chimney of the building to support the breast of the

chimney; and if the breast projects more than 4½ inches from the face of the wall, and the jamb on either side is of less width than 13½ inches, he or she shall cause the abutments of any arch so built to be tied in by a bar or bars of steel or wrought iron of sufficient strength, 18 inches longer than the opening, turned up and down at the ends, and built into the jambs on each side.

186. Jambs of chimney opening.

Every person who erects a new building shall cause the jambs of every chimney of the building to be at least 8½ inches wide on each side of the opening of the chimney.

187. Thickness of brickwork about chimney flues.

Every person who erects a new building shall cause the breast of every chimney of the building and the brickwork or other material forming part of a chimney of the building and surrounding a smoke flue or a copper flue to be at least four inches in thickness; except that the provisions of this rule in regard to thickness of material shall not apply to asbestos cement flue pipes.

188. Thickness of chimney backs.

Every person who erects a new building shall—

- (a) cause the back of every chimney opening in an external wall and the back common to any two chimney openings built back to back in a wall other than a party wall to be at least 4 inches thick, and shall cause the back of every other chimney opening to be at least 8½ inches thick; and
- (b) cause the thickness hereinbefore required to extend for a height of 12 inches at least above the chimney opening; and if in any room constructed for occupation as a kitchen, the chimney opening is in a party wall, he or she shall cause the thickness to extend up the back of the flue for a height of 9 feet at the least above the level of the hearth.

189. Thickness of brickwork of certain flues.

Every person who erects a new building shall cause the upper side of every flue forming part of the chimney of the building, when the course of the flue makes with the horizon an angle of less than 45 degrees, to be at least 8½

inches in thickness.

190. Minimum height for chimneys above roofs.

(1) Every person who erects a new building shall cause every chimney of the building to be carried up in brickwork or other equally suitable material all round at least four inches thick to a height of not less than three feet above the roof, flat or gutter adjoining thereto, measured at the highest point in the line of junction with that roof, flat or gutter; except that the provisions of this rule in regard to thickness of material shall not apply to asbestos cement flue pipes. No such flue pipe shall be carried through any storey other than the one in which it is situated.

(2) If the shaft or flue is in a party wall and not back to back with another shaft or flue, he or she shall cause the material surrounding that part of the shaft or flue which is below the roof, flat or gutter to be at least 8½ inches thick.

191. Maximum height for chimneys above roofs.

A person who erects a new building shall not cause the brickwork or other material of any shaft of the building other than a chimney shaft of the furnace of any steam engine, brewery, distillery, or manufactory, to be built higher above the roof, flat or gutter adjoining the chimney shaft, measured from the highest point in the line of junction with the roof, flat or gutter, than a height equal to six times the least width of the chimney shaft at the level of the highest point, unless the chimney shaft shall be built with and bonded to another chimney shaft not in the same line with the first-mentioned chimney shaft, or shall be otherwise made secure.

192. Metal holdfasts near flues.

A person who erects a new building shall not place any iron holdfast or other metal fastening in any wall of a chimney of the building nearer than two inches to the inside of any flue or chimney opening.

193. Timber not to be near flues.

- (1) A person who erects a new building shall not—
 - (a) place any timber or woodwork in any wall or chimney breast of the building nearer than nine inches to the inside of any flue or

- chimney opening, or under any chimney opening of the building within ten inches from the upper surface of the hearth thereof; or
- (b) drive any wooden plug into any wall or chimney breast of the building nearer than six inches to the inside of any flue or chimney opening.

194. Face of certain brickwork about chimney openings to be rendered.

Every person who erects a new building shall cause the face of the brickwork or other material about any flue or chimney opening and forming part of a chimney of the building, where the face is at a distance of less than two inches from any timber or woodwork, and where the brickwork or other material is less than 8½ inches thick, to be properly rendered.

195. Openings in chimneys.

A person who erects a new building shall not construct any chimney of the building so as to make or leave in the chimney any opening for insertion of any pipe for conveying smoke or other products of combustion or for the insertion of a ventilating valve, or for any other purpose, unless the opening is at least nine inches distant from any timber or other combustible substance.

196. Hearths.

Every person who erects a new building and constructs a hearth in connection with a chimney opening therein shall cause it to—

- (a) be fixed under and in front of the chimney opening;
- (b) be properly constructed of stone, slate, bricks, tiles, or other incombustible substance properly and securely supported;
- (c) be at least four inches in thickness;
- (d) extend at least six inches at each end beyond the chimney opening;
- (e) project at least sixteen inches from the chimney breast; and
- (f) be so laid that its upper surface is at or above the level of the floor of the room in which the chimney opening is situated.

197. Construction of chimney shafts for furnaces.

Every person who constructs any chimney shaft for the furnace of a steam engine, brewery, distillery or factory shall comply with the following rules—

- (a) the chimney shaft shall be carried up throughout in brickwork,

composed of the best hard, well burnt bricks, laid in good mortar compounded of good lime and clean sand or other suitable material or in good cement mortar, properly bonded and solidly put together upon a solid and level bed of good concrete of sufficient size and thickness, extending beyond the lowest course of footings at least eighteen inches on all sides, and having a minimum thickness of eighteen inches;

- (b) the base of the shaft shall be constructed of solid brickwork to the level of the top of the footings, and the footings shall spread equally all around the exterior of the base by regular offsets to a projection on all sides equal at least to the thickness of the brickwork enclosing the shaft at the level of the top of the footings;
- (c) the external diameter of the shaft measured immediately above the footings shall be as follows—
 - (i) where the shaft is square on plan, the external diameter of the shaft shall be at least $\frac{1}{10}$ th of the total height of the shaft;
 - (ii) where the shaft is polygonal on plan, the external diameter of the shaft shall be at least $\frac{1}{11}$ th of the total height of the shaft;
 - (iii) where the shaft is circular on plan, the external diameter of the shaft shall be at least $\frac{1}{12}$ th of the total height of the shaft;
 - (iv) in the case of a shaft which is square or polygonal on plan, the external diameter shall, for the purposes of this rule, be measured from the centre of one face or side to the centre of the opposite face or side;
- (d) the brickwork enclosing the shaft shall be built with a batter (or inclination inwards) of $2\frac{1}{2}$ inches at least in every 10 feet of height;
- (e) the brickwork enclosing the shaft shall be at least $8\frac{1}{2}$ inches in thickness at the top of the shaft and for a distance not exceeding twenty feet below the top, and shall be increased in thickness at least four inches for every additional twenty feet measured downwards. No portion of the work required by this paragraph shall be constructed of firebricks;
- (f) the shaft shall be provided for at least $\frac{1}{6}$ th of its height with an independent lining of firebricks, separated from the brickwork enclosing the shaft by a cavity at least one inch in width, and the cavity shall be covered at the top with corbelled brickwork;

- (g) the total height of the shaft shall, for the purposes of this rule, be its height measured from the top of the footings;
- (h) every cap, cornice, pedestal, plinth, string-course, or other variation from plain brickwork shall be provided as additional to the thickness of brickwork required under this rule, and every cap shall be constructed and secured to the satisfaction of the local authority; and
- (i) this rule shall not be deemed to prohibit the erection of a chimney with suitable materials in some other suitable manner so as to secure due stability as the local authority may approve.

198. Steam pipes, etc.

(1) A pipe for conveying smoke or other products of combustion, heated air, steam or hot water shall not be fixed against any building on the face adjoining to any street or public way.

(2) A pipe for conveying smoke or other products of combustion shall not be fixed nearer than nine inches to any combustible material.

(3) A pipe for conveying heated air or steam shall not be fixed nearer than 6 inches to any combustible materials, and any exhaust pipe or flue shall be carried to such points as the local authority may direct.

(4) A pipe conveying hot water shall not be placed nearer than three inches to any combustible materials; except that the restrictions imposed by this rule with respect to the distance at which pipes for conveying hot water or steam may be placed from any combustible materials shall not apply in the case of pipes for conveying hot water or steam at low pressure.

(5) For the purpose of this rule, hot water or steam shall be deemed to be at low pressure when provided with a free blow off.

Roofs.

199. Materials of roofs.

(1) Every person who erects a new building shall cause the roof of that building and every turret, dormer or other erection placed on the flat or roof of the building to be externally covered with tiles, metal or other incombustible material, except as regards any door, window, lantern light or

skylight.

(2) Notwithstanding subrule (1) of this rule, the local authority may give written permission for the erection of roofs of other materials in such areas and under such conditions as it may think fit.

(3) No person shall be prohibited under this rule from using shingles as a roof covering, provided that any part of the building so covered, shall be at least forty feet or, in the case of a building of not more than two storeys, at least twenty-five feet, distant from any part of any other building or from the boundary of any adjoining plot.

200. Thatched roofs.

(1) No thatched roof shall be constructed without the special permission of the local authority, except in special areas approved by the local authority.

(2) Notwithstanding subrule (1) of this rule, the Minister may, by statutory instrument, prohibit, to such extent as he or she may decide, the construction of grass roofs in any area.

201. Roof access.

All buildings shall be provided with satisfactory access to roof spaces.

202. Roof to be properly supported and constructed.

(1) Every roof shall be suitably and properly supported in such a manner as to secure due stability to the roof, and adequate drainage shall be provided.

(2) All roof timbers shall be so placed as to give maximum efficiency and shall be securely bolted, spiked or otherwise joined together.

Timber construction.

203. Strength of timber beams.

(1) Provided due provision is made for stiffness, the dimensions of all timber beams, whether supporting floors or not, shall not be less than the

dimensions required to equate the following formulæ, where the formulæ are applicable—

- (a) in the case where the load to be borne by the beam is applied at the centre, by the formula—

$$W = \frac{4 f b d^2}{6L}$$

- (b) in the case where the load to be borne by the beam is equally distributed along the whole length of the beam, by the formula—

$$W^1 = \frac{8 f b d^2}{6L}$$

where—

W = the safe load in pounds the beams will carry at the centre of its span;

W¹ = the safe distributed load in pounds the beam will carry;

f = the safe transverse extreme fibre stress in pounds per square inch of the timber of the beam;

b = the breadth of the beam in inches;

d = the depth of the beam in inches;

L = the effective span of the beam in inches,

(2) Where the loading of a beam is neither centrally placed nor equally distributed over the whole length of a beam, the beam shall be of sufficient strength and stability.

204. Strength of joists.

(1) Every person who erects a new building shall cause any timber used in the construction of any floor of the building to be of good quality and of such strength as may be necessary to secure due stability having regard to the intended use of the floor, and he or she shall cause every such timber to be properly fixed and supported.

(2) Provided due provision is made for stiffness, the dimensions of timber floor joists shall not be less than the dimensions required to equate the following formula—

$$W = \frac{8 f b d^2}{6L}$$

where—

- W = the safe distributed load in pounds the joist will carry;
- f = the safe transverse extreme fibre stress in pounds per square inch of the timber of the joist;
- b = the breadth of the joist in inches;
- d = the depth of the joist in inches;
- L = the effective span of the joist in inches.

205. Spacing of joists.

(1) In every floor the superimposed dead load for which under these Rules is not more than 100 pounds per square foot, the joists shall not be less in depth than $\frac{3}{4}$ inch for every foot of span up to 16 feet and where the superimposed dead load as aforesaid exceeds 100 pounds per square foot, the joists shall not be less in depth than 1 inch for every foot of span up to 10 feet and for every 3 feet of span over 10 feet, the span being measured between the bearings, and in no case shall the breadth of joists be less than 2 inches.

- (2) Every trimmer joist and every trimming joist shall—
 - (a) be one inch thicker in the case of a domestic building;
 - (b) be $1\frac{1}{2}$ inches thicker in the case of a warehouse building; or
 - (c) consist of two ordinary joists of which the floor is constructed, securely nailed or bolted together.

206. Fixing and strutting of beams and joists.

(1) Every beam and joist shall be adequately supported and shall be laid and fixed on edge, its greatest side being in a vertical position or as nearly so as may be, and when laid and fixed in that position the distance between the upper and lower surface thereof shall for the purpose of these Rules be deemed to be the depth thereof.

(2) Square bridging or herringbone or other strutting shall be constructed between the joists of every floor of a new building in accordance with the following requirements for clear bearing of joists—

- (a) exceeding twelve feet but not exceeding thirteen feet, one row of bridging or strutting;
- (b) exceeding thirteen feet but not exceeding sixteen feet, two rows of bridging or strutting; and
- (c) exceeding sixteen feet but not exceeding twenty feet, three rows of bridging or strutting.

(3) Any such bridging shall be of a depth equal to the depth of the joists and of a thickness not less than 1½ inches, and any such strutting shall be of a depth not less than two inches and of a thickness not less than 1¼ inches.

207. Boarded floors.

Where the joists are spaced not farther apart than fifteen inches from centre to centre of joists, the flooring boards shall not be less than one inch in thickness nominal, and where the joists are spaced farther apart than fifteen inches and not more than eighteen inches apart, the flooring boards shall not be less than 1⅛ inches in thickness for buildings other than those of the warehouse class and 1¼ inches in thickness for buildings of the warehouse class, but joists shall not in any case be spaced farther apart than eighteen inches from centre to centre.

208. Wooden stairs.

The woodwork of any timber staircase shall be not less than the following thickness—

- (a) the strings shall be not less than 1¼ inches in thickness;
- (b) the treads shall be not less than 1 inch in thickness; and
- (c) the risers shall be not less than ¾ inch in thickness.

209. Framed, batten, etc. floors.

In the case of a framed floor, or of a floor formed with beams at short distances apart and covered with battens, or planks, without joists, the several timbers of the floor shall be of such size as will be adequate to secure due stability.

210. Bearings for beams and joists.

The bearings of all joists and beams shall be upon proper wall plates or templates and shall in every case be of sufficient area safely to support without injury such joists or beams when loaded.

211. Notching for piping.

Notches or chases shall not be cut into any beam or floor joists, or into any

solid floor for the purpose of installing any pipes or wires, or ducts therefor, unless provision was made for adequate strength remaining in the member so notched or chased.

212. Ventilation of boarded floors.

(1) The space under all ground floors constructed of timber joists shall be not less than nine inches in every part and effectually ventilated by means of air bricks, ducts or pipes communicating directly with the open air in order to ensure a sufficient change of air to prevent deterioration of the timbers by rot; such openings shall be so placed and protected as to prevent the ingress of rodents and water.

(2) All other timber floors shall be adequately ventilated.

213. Timber frame structures carried on plinths.

(1) Any building constructed wholly with timber framing shall comprise not more than one storey, each wall of which shall be provided with a proper dampproof course as required by any rules for that purpose, and the external walls shall be constructed of properly framed timber framing and covered externally with some impervious fireproof material, and shall, to a height of not less than twelve inches above the surface of the ground adjoining the wall, either—

(a) be constructed of—

- (i) good cement concrete at least six inches wide; or
- (ii) good stone, bricks or other hard and suitable materials at least nine inches square and properly bonded and solidly put together with cement or lime mortar; or

(b) be carried upon—

- (i) sufficient piers, constructed of good cement concrete nine inches square or of good stone, brick or other hard and suitable material at least nine inches square, properly bonded and solidly put together with cement or lime mortar; or
- (ii) metal or timber standards of sufficient strength, and every such pier or standard shall be covered with a sheet metal cap projecting two inches at least beyond the face of the pier or standard on every side.

(2) The floor level of any timber frame building supported on piers

or standards shall be not less than eighteen inches above the ground level at any point adjoining the building.

214. Siting of timber frame structures.

The distance of any part of a timber frame building from the boundary of any adjoining plot shall be not less than fifteen feet.

215. All dwellings to be separated by party walls.

Where any timber frame building forms or is intended to form part of a block of new dwellings, the dwellings shall be separated by party walls which shall, notwithstanding anything herebefore contained, be constructed in accordance with the requirements of the rules for that purpose.

216. Insulation.

The walls of any timber framed domestic building shall be adequately insulated against sound and heat, and the internal surfaces shall be properly sealed against the ingress of vermin through the wall cavity.

Brick, masonry and other block construction.

217. Unburnt bricks and wattle and daub.

(1) No person shall erect a building the load-bearing walls (including piers or chimneys forming part of the walls) of which are not composed of hard wall burnt clay or terra cotta, natural or cast stone, concrete or other incombustible material of like hardness and durability or a combination thereof, and shall be of such size, shape and surface as to permit of proper bonding and jointing; except that single storey buildings may from the third course above the floor be constructed of unburnt bricks if approved by the local authority.

(2) Load-bearing walls built of unburnt bricks or load-bearing walls partly built of such bricks shall be not less than nine inches wide and not more than ten feet in height and shall be treated externally with a protective covering to the satisfaction of the local authority.

218. Mortar for walling.

Cement or lime mortar shall be used, but in the case of single storey walls not exceeding ten feet in height mud or swamp clay mortar may be used from three courses above the dampproof course to two courses below the top of the wall; except that—

- (a) no wall built in mud or swamp clay mortar shall be of less than 8½ inches in thickness, and no party wall shall be built in mud or swamp clay mortar; and
- (b) mud mortar shall not be used in the walls of factories and workshops.

219. Measurement of wall heights and lengths.

In determining the thickness and height of a wall the following standards shall apply—

- (a) the height of the lowest portion shall be measured from the base of the wall and that of any other storey from the level of the underside of the floor structure of the storey up to the level of the underside of the floor structure of the storey next above it; or if there is no such storey above, then up to the highest part of the wall;
- (b) where gables occur, the height shall be measured up to half the height of the gable, but the thickness of the gable shall in no case be less throughout than the minimum thickness specified in these Rules;
- (c) walls shall be deemed to be divided into distinct lengths by return walls, buttressing walls, buttresses or piers; except that—
 - (i) the return walls are external walls, party walls or cross walls of the thickness prescribed by these Rules and are bonded or otherwise not less securely tied into the walls so deemed to be divided;
 - (ii) each buttress or pier is of a breadth equal to not less than twice the thickness of the wall so deemed to be divided;
- (d) the clear dimensions between the return walls, buttressing walls, buttresses or piers shall be deemed to be the measure of such lengths; and
- (e) for the purpose of these Rules—
 - (i) a wall shall not be deemed a cross wall unless it is carried up to the top of the wall so deemed to be divided (or in the case of a wall comprising a gable, to the level of the base of the gable) and unless any opening in the cross wall is not nearer the wall deemed to be divided than twice the

- thickness of the latter; and
- (ii) a part of a wall thickened to contain chimneys may be regarded as a buttress or pier if its projection is at least equal to the thickness of the wall, and the width of the projection excluding flues and divisions between flues, is not less than twice the thickness of the wall deemed to be divided.

220. Domestic buildings: thickness of walls.

Except where otherwise provided in these Rules, every external and party wall of a new domestic building of good sound whole bricks, or of strong and durable stones or of other blocks of hard and incombustible material or of mass concrete of adequate strength shall be of not less than the thickness shown in Table 12 in this rule. All thicknesses are in inches—
except that—

- (a) where a thickness of fourteen inches is prescribed by this rule, that thickness may be reduced to twelve inches if the wall is of square dressed stone or solid concrete blocks and each stone or block extends throughout the full thickness of the wall;
- (b) if the building is for the purposes of a dwelling only and does not exceed one storey in height and the height from the level of the ground floor to the ceiling does not exceed ten feet, the walls may be reduced to a thickness of six inches if built of square dressed stones or solid concrete blocks, provided the length of the six inch wall does not exceed twelve feet without a support of a buttressing wall or a portion thickened to at least nine inches for a length of at least twelve inches and the wall is built in cement mortar not weaker than one part of cement to not more than six parts of sand and reinforced in each alternate course, such reinforcement being not further than 1½ inches from either face alternately;
- (c) if the building is for the purposes of a dwelling only and does not exceed two storeys in height and the first floor is constructed of reinforced concrete throughout, except where staircase wells occur, and the concrete floor extends over all the walls, the upper storey walls may be reduced to a thickness of six inches if built to comply with the conditions of paragraph (b) of this rule;
- (d) for the purposes of paragraphs (b) and (c) of this rule, a partition wall shall not be deemed to be a buttressing wall unless there is at least six inches thereof bonded into the outer wall for its full

- height and is not less than six inches thick;
- (e) a party wall shall not in any case be built of a less thickness than twelve inches, if of stone, or nine inches, if of brick; and
 - (f) the thickness of the walls of a bay for a bay window in an external wall may be reduced to nine inches if due provision is made for stability and if the opening for the bay is beamed or arched over below the level of the ceiling and in continuity of the main wall, but the projection of the bay shall not be deemed to be a provision for dividing an external wall into distinct lengths unless the jambs of the bay opening are returned to conform with the rules for that purpose.

TABLE 12.

Minimum thickness of walls for domestic buildings.

Height in feet above under surface of floor of ground floor storey	Length in feet	Number of storeys	Thickness of wall below under surface of floor of ground floor storey		1st or ground floor storey	2nd storey	3rd storey	4th storey	5th storey	6th storey	7th storey	8th storey	9th storey	10th storey
			If 5 feet or under in height	If over 5 feet in height										
Not exceeding 10 feet	unlimited	not exceeding 1	9	14	9	—	—	—	—	—	—	—	—	—
Not exceeding 15 feet	up to 40 feet	not exceeding 1	9	14	9	—	—	—	—	—	—	—	—	—
Exceeding 15 but not 25 feet	under 30 feet	not exceeding 2	14	14	9	9	—	—	—	—	—	—	—	—
Exceeding 15 but not 25 feet	over 30 feet	not exceeding 2	14	14	14	9	—	—	—	—	—	—	—	—
Exceeding 25 but not 30 feet	under 25 feet	not exceeding 3	14	14	14	14	9	—	—	—	—	—	—	—
Exceeding 25 but not 30 feet	25-35 feet	not exceeding 3	14	18	14	14	9	—	—	—	—	—	—	—
Exceeding 25 but not 30 feet	over 35 feet	not exceeding 3	18	18	18	14	9	—	—	—	—	—	—	—
Exceeding 30 but not 40 feet	under 35 feet	not exceeding 4	14	18	14	14	14	9	—	—	—	—	—	—
Exceeding 30 but not 40 feet	over 35 feet	not exceeding 4	18	22	18	14	14	9	—	—	—	—	—	—
Exceeding 40 but not 50 feet	under 35 feet	not exceeding 5	18	22	18	14	14	14	9	—	—	—	—	—
Exceeding 40 but not 50 feet	35-45 feet	not exceeding 5	18	22	18	18	14	14	14	—	—	—	—	—
Exceeding 40 but not 50 feet	over 45 feet	not exceeding 5	22	27	22	18	14	14	14	—	—	—	—	—
Exceeding 50 but not 60 feet	under 45 feet	not exceeding 6	18	22	18	18	14	14	14	14	—	—	—	—
Exceeding 50 but not 60 feet	over 45 feet	not exceeding 6	22	27	22	18	18	14	14	14	—	—	—	—
Exceeding 60 but not 70 feet	under 45 feet	not exceeding 7	22	27	22	18	18	14	14	14	14	—	—	—
Exceeding 60 but not 70 feet	over 45 feet	not exceeding 7	27	31	27	22	22	18	18	14	14	—	—	—
Exceeding 70 but not 80 feet	under 45 feet	not exceeding 8	22	27	22	18	18	18	14	14	14	14	—	—
Exceeding 70 but not 80 feet	over 45 feet	not exceeding 8	27	31	27	22	22	22	18	18	14	14	—	—
Exceeding 80 but not 90 feet	under 45 feet	not exceeding 9	27	31	27	22	22	22	18	18	14	14	14	—
Exceeding 80 but not 90 feet	over 45 feet	not exceeding 9	31	36	31	27	22	22	22	18	18	14	14	—
Exceeding 90 but not 100 feet	under 45 feet	not exceeding 10	27	31	27	22	22	18	18	18	14	14	14	14
Exceeding 90 but not 100 feet	over 45 feet	not exceeding 10	31	36	31	27	27	22	22	22	18	18	14	14

221. Warehouses and public buildings: thickness of walls.

Unless where otherwise provided in these Rules, every external and party wall of a public building or building of the warehouse class built of good sound whole bricks or of strong and durable stones or of other blocks of hard and incombustible material or of mass concrete of adequate strength shall be of not less than the thicknesses shown in Table 13 of this rule. All thicknesses are in inches; except that—

- (a) where a thickness of fourteen inches is above prescribed, that thickness may be reduced to twelve inches if the wall is of square dressed stone or solid concrete blocks and each stone or block extends throughout the thickness of the wall; and
- (b) the thickness of the walls of a bay for a bay window in an external wall may be reduced to nine inches if due provision is made for stability and if the opening for the bay is beamed or arched over below the level of the ceiling and in continuity of the main wall, but the projection of the bay shall not be deemed to be a provision for dividing an external wall into distinct lengths unless the jambs of the bay opening be returned to conform with the rules for that purpose.

TABLE 13.

Minimum thickness of walls for public and warehouse buildings.

Height in feet above under surface of floor of ground floor storey	Length in feet	Number of storeys	Thickness of wall below under surface of floor of ground floor storey		1st or ground floor storey	2nd storey	3rd storey	4th storey	5th storey	6th storey	7th storey	8th storey	9th storey	10th storey
			If 5 feet or under in height	If over 5 feet in height										
Not exceeding 11 feet, 6 inches	up to 50 feet	not exceeding 1	"	"	"	"	"	"	"	"	"	"	"	"
Not exceeding 15 feet	up to 40 feet	not exceeding 1	14	14	9	—	—	—	—	—	—	—	—	—
Not exceeding 15 feet	unlimited	not exceeding 1	14	14	9	—	—	—	—	—	—	—	—	—
Exceeding 15 but not 25 feet	under 30 feet	not exceeding 2	14	18	14	9	—	—	—	—	—	—	—	—
Exceeding 15 but not 25 feet	over 30 feet	not exceeding 2	14	18	14	9	—	—	—	—	—	—	—	—
Exceeding 25 but not 30 feet	under 25 feet	not exceeding 3	14	18	14	14	9	—	—	—	—	—	—	—
Exceeding 25 but not 30 feet	25-35 feet	not exceeding 3	18	18	18	14	9	—	—	—	—	—	—	—
Exceeding 25 but not 30 feet	over 35 feet	not exceeding 3	18	22	18	14	14	—	—	—	—	—	—	—
Exceeding 30 but not 40 feet	under 35 feet	not exceeding 4	18	22	18	14	14	14	—	—	—	—	—	—
Exceeding 30 but not 40 feet	over 35 feet	not exceeding 4	22	27	22	18	18	14	—	—	—	—	—	—
Exceeding 40 but not 50 feet	under 35 feet	not exceeding 5	18	22	18	18	18	18	14	—	—	—	—	—
Exceeding 40 but not 50 feet	35-45 feet	not exceeding 5	22	27	22	18	18	18	14	—	—	—	—	—
Exceeding 40 but not 50 feet	over 45 feet	not exceeding 5	27	31	27	22	18	18	14	—	—	—	—	—
Exceeding 50 but not 60 feet	under 45 feet	not exceeding 6	22	27	22	22	18	18	18	14	—	—	—	—
Exceeding 50 but not 60 feet	over 45 feet	not exceeding 6	27	31	27	22	18	18	18	14	—	—	—	—
Exceeding 60 but not 70 feet	under 45 feet	not exceeding 7	22	27	22	22	18	18	18	14	—	—	—	—
Exceeding 60 but not 70 feet	over 45 feet	not exceeding 7	27	31	27	22	22	22	18	18	14	—	—	—
Exceeding 70 but not 80 feet	under 45 feet	not exceeding 8	27	31	22	27	22	22	18	18	18	14	—	—
Exceeding 70 but not 80 feet	over 45 feet	not exceeding 8	31	36	27	27	27	27	22	18	18	14	—	—
Exceeding 80 but not 90 feet	under 45 feet	not exceeding 9	31	36	27	27	27	22	22	18	18	18	14	—
Exceeding 80 but not 90 feet	over 45 feet	not exceeding 9	31	36	31	27	27	27	22	22	18	18	14	—
Exceeding 90 but not 100 feet	under 45 feet	not exceeding 10	31	36	27	27	27	22	22	22	18	18	18	14
Exceeding 90 but not 100 feet	over 45 feet	not exceeding 10	31	36	31	31	27	27	27	22	22	18	18	14

222. Thin stone or block walls.

In stone or block walls of a thickness of twelve inches or less the stones or blocks shall extend throughout the full thickness of the wall and shall be squarely and evenly dressed to a rectangular shape.

223. Cross walls and partitions.

(1) Every cross wall and partition wall built of bricks, stone or other blocks of hard and incombustible material and used as a means of dividing an external or party wall into distinct lengths shall be of a thickness of at least two-thirds of the wall so deemed to be divided but shall not be less than nine inches thick, except in the cases provided for in rule 220(b) and (c) of these Rules.

(2) A partition wall not deemed to be a means of dividing a wall into distinct lengths and not exceeding ten feet in length nor ten feet in height above floor level may be less than six inches thick if suitably reinforced in each alternate course, but shall not be less in thickness than four inches. Six inch internal partition walls may be built through two storeys and nine inch internal partition walls through three storeys.

224. Special construction.

Nothing in these Rules shall prevent the erection of concrete, brick or stone walls of lesser thickness if supported by a skeleton framework of metal or of reinforced concrete, provided that the walls and the skeleton framework conform in all respects to the rules hereafter provided for the construction of buildings so designed.

225. Brickwork.

In brick walls over 4½ inches thick, English or Flemish bond shall be employed or with the prior approval in writing of the local authority some other efficient bond. All works shall be carried up true and plumb and bed joints built level. Bats or broken bricks shall not be built into any wall except as closers to effect orthodox bond. All joints shall be well and completely filled with mortar.

226. Masonry.

All stone and block walls shall be built with horizontal beds and good bonds at vertical joints, and no stone or block built into an external party or cross wall shall be of a less width than four inches. There shall be at least one header extending through the wall every nine superficial feet of face; or should the thickness of the wall exceed eighteen inches, headers shall extend into the wall for at least two-thirds of its thickness and shall overlap a similar header laid from the opposite face. All stones shall be squarely and evenly dressed to a rectangular shapes, and stone chips or fragments of stone shall not be built in to any wall. All walls shall be carried up true and plumb and all joints well and completely filled with mortar.

227. Hollow walls.

(1) Walls, with the exception of party and fire walls, may be constructed as cavity walls or with hollow blocks of approved composition, strength and shape. The cavities and hollows of such walls shall not extend lower than the ground floor and shall be sealed both top and bottom and laterally effectually to exclude rodents and vermin. Cavity walls shall comply with the following requirements—

- (a) the cavity between the inner and outer parts of the wall shall not exceed three inches in width;
- (b) the inner and outer parts of the wall shall be securely tied together with suitable bonding ties, such ties shall be placed at distances apart not exceeding 3 feet horizontally and 18 inches vertically; and
- (c) the thickness of each part of the wall shall throughout be not less than $4\frac{1}{4}$ inches. The aggregate thickness of the two parts exclusive of the space shall be not less than the minimum thickness prescribed in these Rules.

(2) Walls constructed of hollow blocks or of blocks so shaped that when built there will be a cavity in the wall shall be erected only in connection with domestic buildings, unless otherwise permitted by the local authority. Walls built of hollow blocks shall not exceed twenty feet in length if less than eighteen inches thick without a cross wall or buttress nor eleven feet in height. The cavity or cavities in any block shall not exceed in horizontal sectional area in the aggregate one-third of its horizontal sectional area, and the substance around any cavity in any such block shall not be less than three inches in thickness nor shall the length of any cavity be more than nine inches.

(3) Any person proposing to build with hollow blocks shall when required submit to the local authority the proportions of the ingredients of the blocks and certified results of tests made to ascertain their strength. The blocks shall only be used if the ingredients and tests are satisfactory and the quality is maintained.

228. Timber in walls.

Any wall plate or other timber shall not be built longitudinally in any wall within the thickness specified in these Rules except—

- (a) lintels in external or partition walls which have a relieving arch immediately above each lintel; or
- (b) a wall plate at the top of an external or partition wall.

229. Other wall construction.

(1) Where in a wall the bricks, stones or other hard and incombustible materials of the wall are not laid with horizontal beds or courses, the thickness prescribed under these Rules for the wall shall be increased by at least one-third.

(2) Where in a wall the facing is of different material from the inner portion of the wall and all beds and courses are horizontal and joints vertical, the thickness prescribed under these Rules for the wall need not be increased if the outer and inner materials are adequately and securely bonded at vertical heights not greater than the deepest course and the weakest materials employed are strong enough for the safe construction of the wall.

230. Saving as to prescribed height thicknesses.

Although in these Rules minimum thicknesses for walls according to their heights are specified, the thicknesses and heights shall be deemed valid only if the materials and the mortar in which the materials are set are of sufficient strength safely to bear the loads on each or any course or horizontal section of a wall. If the materials used are unable to do so, the height of the wall shall be decreased or its thickness increased until safe and stable construction is ensured.

231. Buttresses or piers.

Where by these Rules a buttress or buttressing pier is required for the stability of a wall, the buttress or pier shall not be corbelled out but shall be provided with a full bearing at the base and the weight conducted to the foundations in as direct a manner as possible to the satisfaction of the local authority.

Reinforced concrete work.

232. Reinforced concrete structures.

(1) Every building or part of a building constructed of reinforced concrete shall be constructed by its owner and builder in compliance with these Rules and in accordance with any further special requirements or rules which the local authority may stipulate, but not so as to contravene any other rules which may be applicable to the building.

(2) *Owner's responsibility.* The stipulations of the rules relating to reinforced concrete indicate the minimum requirements for reinforced concrete construction, and the owner of the building shall accept full responsibility for ensuring permanent stability and safety.

(3) *Definition.* "Reinforced concrete" means concrete which is reinforced with steel so combined with it that the steel will—

- (a) be sufficient to take up all tensile stresses;
- (b) assist in the resistance to shear where necessary; and
- (c) assist in the resistance to compression where necessary.

(4) *Skeleton framework.* The skeleton framework in reinforced concrete of a building, in combination with the floors, party walls, bearing walls, and bearing structures (if any) and the foundations shall be capable of sustaining, without exceeding the limits of stress specified in these Rules, the whole dead load and superimposed load of the building, together with all forces due to wind, earth or other pressure acting upon it.

(5) *Certificate and plans.*

- (a) Where reinforced concrete is to be used in the structure of a building, the application for the approval by the local authority of the plans as required by these Rules shall be accompanied by a certificate in the terms set forth in rule 233 of these Rules from a practising structural engineer who is—
 - (i) a member or associate member of the Institution of Civil

- Engineers of Great Britain;
 - (ii) a member or associate member of the Institution of Structural Engineers of Great Britain;
 - (iii) a member or associate member of the Institution of Municipal Engineers of Great Britain; and
- (b) when the application and plans for the building have been approved by the local authority and before building work is commenced, the person to whom the approval has been given shall in addition submit plans and details of all reinforced concrete work for the foundations of the building and thereafter shall submit plans and details of all reinforced concrete work for the various stages of the building so that the local authority can readily follow and check all reinforced concrete work as the building proceeds and so that the local authority will be in full possession of a complete set of plans and details of all reinforced concrete work included in the building at a reasonable time before the building is completed. All such plans and details shall be drawn and prepared by a structural engineer as defined in paragraph (a) of this subrule who shall certify on each plan that the plan and any detail supplied in relation to it complies with the requirements of rule 233(1)(a) or (b) of these Rules.
- (6) *Drawings and calculations to be certified.*
- (a) Where reinforced concrete work is of a minor or inextensive nature, the local authority may waive the necessity for the submission of the certificate required by subrule (5)(a) of this rule provided that the application is accompanied at the same time by full calculations, plans and details and specifications covering all the reinforced concrete work to be included in the building. The calculations shall clearly show the loads and stresses to be provided for and the resistance to them of the various parts of the structure. The plans and details shall show clearly to scale and by figured dimensions the size and shape of the unit and the exact size, shape and position of the reinforcement in the unit. The specification shall include a complete description of all materials and of all mixes of concrete to be used in the building. The approval of any plans shall not in any manner imply the acceptance of any responsibility on the part of the local authority for the stability of the structure;
- (b) all drawings and calculations submitted shall be certified by a qualified architect, civil engineer or structural engineer whose

qualifications to give the certificate shall be to the satisfaction of the local authority. Every architect or engineer who so certifies shall sign every drawing or calculation relating to his or her certificates; and

- (c) the local authority may in its discretion dispense, wholly or in part, with the certification of drawings and alterations submitted in accordance with paragraph (b) of this subrule.

(7) *Steel.* The reinforcement shall be of steel complying with the requirements of British Standard Specification No. 785 (1938) for rolled steel bars and hard drawn steel wire for concrete reinforcement or of any specification in amendment of or in substitution for it or of such other suitable steel as may be approved by the local authority; except that should there be no conclusive proof that the steel is in conformity with the Standard Specification, lower stresses than those specified in this rule shall be adopted. The lower stresses shall not exceed the values for them as may be prescribed by the local authority.

(8) *Stresses.*

- (a) In the calculations, design and structure, the safe stresses on the materials shall not exceed the following—
 - (i) for steel in tension in beams, slabs or columns subject to bending—18,000 pounds per square inch;
 - (ii) for steel in tension in spiral reinforcement of columns—13,500 pounds per square inch;
 - (iii) for steel in compression in beams, slabs or columns subject to bending, a stress equal to the compressive stress in the concrete multiplied by the appropriate modular ratio (normally 15);
 - (iv) for steel in compression in beams where the compressive resistance of the concrete is not taken into account—18,000 pounds per square inch;
 - (v) for steel in compression in axially loaded columns—13,500 pounds per square inch;
 - (vi) for steel in tension in web (or shear) reinforcement—18,000 pounds per square inch; and
 - (vii) for concrete in compression, shear and bond, the stresses given in Table 14—

TABLE 14.

Nominal mix of concrete	Modular ratio	Permissible concrete stresses in pounds per square inch			
		Bending	Direct	Shear	Bond
1:2:4	18	750	600	75	100
1:1.5:3	16	850	680	85	110
1:1.2:2.4	14	925	740	93	118
1:1:2	14	975	780	98	123

- (b) Notwithstanding paragraph (a) of this subrule, higher stresses may be permitted if satisfactory tests of the materials to be used are produced to guarantee that such higher stresses can safely be used and guarantees given ensuring the excellence of the materials and workmanship and the accurate placing of the reinforcement.

(9) *Costs of certificates and guarantees.* All costs incidental to compliance with these Rules shall be borne by the owner of the building.

(10) *Electrical currents.* No part of the reinforcement shall be used for conducting electrical currents.

- (11) *Cleaning and placing.* Before placing the concrete—
- (a) all steel for reinforcement shall be freed from loose mill scale, loose rust, earth, oil and grease or other deleterious substances which might affect adversely the proper combination of the reinforcement with the concrete; and
 - (b) the reinforcement shall be accurately placed in the position shown on the drawings and maintained in that position during concreting.

- (12) *Welding.*
- (a) Welding of reinforcement at joints which will be stressed in tension is prohibited;
 - (b) forge welding is prohibited;
 - (c) welding of reinforcement at joints which will be stressed in compression shall be permitted when specially authorised by the local authority, and it shall then be done only by experienced welders; and

- (d) welding at joints where transverse bars are in contact shall be permitted but only if the cross-sectional area of the bars is not diminished by the welding.

(13) *Bending.* Reinforcement shall not be bent or straightened in a manner that will injure its material. For large bars bending may be carried out at a temperature not exceeding 1,500 degrees Fahrenheit, but bars so bent shall not be cooled by quenching.

(14) *Bends in bars.* The internal radius expressed in bar diameters of a bend in a reinforcing bar shall not be less than the value obtained by dividing the stress in the steel at the commencement of the bend by four times the permissible stress in the concrete in direct compression where the minimum concrete cover is used and not less than two-thirds of this value where conditions are such that there is no danger of splitting the concrete.

(15) *Bond and anchorage.*

- (a) Exclusive of a hook or other end anchorage, a bar in tension shall extend from any section for a distance such that the product of the permissible bond stress, the perimeter of the bar and the length measured from the section is at least equal to the tension required in the bar. In the case of simply supported ends of beams and slabs at least one-quarter of the main tensile reinforcement shall extend to the centre line of the support before the hook or other end anchorage begins. In continuous beams and slabs at least one-quarter of the tensile reinforcement shall be carried for a distance not less than one-half the effective depth of the beam or slab beyond points of contraflexure before the hook or other end anchorage begins;
- (b) subject to paragraph (a) of this subrule, when reinforcement in the form of plain bars is used to resist tensile stresses induced by bending, the bond stress due to a variation in tensile stress shall not exceed twice the appropriate permissible bond stress. In members of other than uniform depth the effect of the change in depth shall also be taken into account;
- (c) a hook at the end of a bar shall have an inner diameter of at least four times the diameter of the bar, except that when the hook fits over a main reinforcing or other adequate anchorage bar, the diameter of the hook may be equal to the diameter of the bar. The length of the straight part beyond the end of the curve to the end of the hook shall be at least four times the diameter of the bar

forming the hook. Unless suitable wrapping or other reinforcement is provided, the anchorage value of the hook shall not be taken into account if the hook is employed in a place where there is danger of splitting concrete;

- (d) where a hook is not used, the end anchorage shall consist of a length of bar or any combination of suitable attachment and length of bar, having an anchorage value equivalent to the resistance produced by the permissible bond stress acting over a length of bar equal to fourteen bar diameters. The anchorage value assumed shall be such that neither the permissible stress on the concrete in direct compression nor the safe load on the end anchorage itself is exceeded. The permissible stress on the concrete may be increased to three times the value permitted for the concrete in direct compression where the end anchorage is employed in a place where either the cover of the concrete is sufficient or suitable wrapping or other reinforcement is provided to prevent local failure of the concrete; and
- (e) notwithstanding any of the foregoing requirements, in the case of secondary reinforcement such as stirrups and binding, complete bond length and anchorage shall be deemed to have been provided when a bend in the bar through an angle of at least 90 degrees passes round a bar of at least its own diameter and the bar is continued beyond the end of the curve for a length of at least eight diameters.

(16) *Bar sizes.* The diameter of—

- (a) any reinforcing bar shall not exceed 2 inches;
- (b) any reinforcing bar, including all secondary reinforcement, shall be at least 3/16 inch;
- (c) main reinforcing bars in beams and slabs shall be at least 1/4 inch; and
- (d) longitudinal reinforcing bars in columns shall be at least 1/2 inch;
- (e) wires under tensile stress in connected mesh and similar reinforcement in slabs shall be at least 1/10 inch.

(17) *Distance between bars.*

- (a) The minimum lateral distance between reinforcing bars shall be the diameter of the bar or 1/4 inch greater than the maximum size of coarse aggregate, whichever is the greater, and at points of splice the bars shall be so disposed that this distance is maintained between each pair of lapped bars and adjacent bars;

- (b) the minimum vertical distance between horizontal main reinforcing bars shall be at least one-half of an inch except at splices or where transverse bars are in contact;
- (c) the pitch of bars of main tensile reinforcement in beams or slabs shall not exceed twelve inches or twice the effective depth, whichever is the less;
- (d) the pitch of distributing bars in slabs shall not exceed four times the effective depth of the slab;
- (e) all mesh reinforcement shall be of such dimensions as will enable the coarse material in the concrete to pass easily through the meshes of the reinforcement; and
- (f) the spacing for transverse reinforcement in columns and for shear reinforcement in beams shall be in accordance with subrules (29), (32) and (33) of this rule.

(18) *Cover.*

- (a) The cover of constructional concrete measured from the outside of all reinforcing bars including transverse ties, spirals, stirrups and all secondary reinforcement shall be at all points at least one-half of an inch or the diameter of the bar, whichever is the greater;
- (b) for main reinforcing bars in beams or columns such cover shall be at least one inch or the diameter of the bar, whichever is the greater; and
- (c) the end cover to be provided beyond the anchored end of a bar shall not be less than two inches.

(19) *Effective depth.* The effective depth of a beam or slab means the distance from the compressed edge of constructional concrete to the centre of gravity of the tensile reinforcement.

(20) *Effective span.* The effective span of a beam or slab means the distance between the main vertical sides of the supports plus the effective depth of the beam or slab at the supports, or the span between the centres of the bearing surfaces, whichever is the lesser.

(21) *Depth.*

- (a) For the purpose of determining the ratio of span to depth of a beam or slab, the effective span and effective depth shall be taken; and
- (b) in general the effective span of a beam or slab should not exceed

twenty times its effective depth, but the ratio of the effective span of a beam or slab to its effective depth shall not in any case exceed the lesser of the two following ratios—

$$\frac{20 \times \text{the permissible tensile stress}}{\text{the actual maximum tensile stress}}$$

or

$$\frac{20 \times \text{the permissible compressive stress}}{\text{the actual maximum compressive stress}}$$

(22) *Lateral support.* Lateral support shall be provided for beams to resist buckling whenever the ratio of the length of a beam to the width of its compression flange exceeds—

$$20 \left(3 - 2 \times \frac{\text{calculated compressive stress}}{\text{permissible compressive stress}} \right)$$

(23) *“T” and “L” beams.*

- (a) For the purpose of computing the resistance moment of a “T” beam, the breadth of the flange shall not be taken to exceed the least of the following—
- (i) one-third of the effective span of the “T” beam;
 - (ii) the distance between the centres of the ribs of the “T” beams; or
 - (iii) twelve times the thickness of the slab plus the breadth of the rib;
- (b) in the case of “L” beams the breadth of the flange shall not be taken to exceed the least of the following—
- (i) one-sixth of the effective span of the “L” beam;
 - (ii) the breadth of the rib plus one-half of the clear distance between ribs; or
 - (iii) four times the thickness of the slab plus the breadth of the rib;
- (c) the minimum breadth of the rib of a “T” or “L” beam shall not be less than one-third the depth of the rib below the slab; and
- (d) the reinforcement in that portion of slab required to take compression in a “T” beam or “L” beam shall extend its full width and shall consist of bars transverse to the beam. The reinforcement shall not be less than 0.3 percent of the total cross-sectional area of the slab; and in cases where the slab is assumed

to be independently spanning in the same direction as the beam, the slab reinforcement transverse to the beam shall be near the top surface of the slab.

(24) *Compression reinforcement.* In cases—

- (a) of beams where the compressive resistance of the concrete is taken into account, the compression reinforcement shall be effectively anchored over the distance where it is required, at points not farther apart, centre to centre, than twelve times the diameter of the anchored bar; and
- (b) where the compressive resistance of the concrete is not taken into account, the compression reinforcement shall be effectively anchored laterally and vertically over the distance where it is required, at points not farther apart, centre to centre, than eight times the diameter of the anchored bar. The subsidiary reinforcement used for this purpose shall pass round or be hooked over both the compression and tension reinforcement. Stirrups used as shear reinforcement may be regarded as anchors under this paragraph provided they comply with this paragraph.

(25) *Beams supporting other beams.* In the case of a beam supported at its end by a transverse beam—

- (a) the longitudinal bars of the supported beam shall be carried across the farther side of the supporting beam and their ends hooked; and
- (b) provision shall be made adequately to resist any torsion in the supporting beam and to resist any negative bending moments on the supported beam, but the positive bending moments on the supported beam shall be calculated on the assumption of ends being freely supported.

(26) *Splays.* Where the end of a beam is splayed for the purpose of increasing the resistance moment, the splays shall not be calculated at a greater angle than 30 degrees to the horizontal.

(27) *Extra slab reinforcement.* For slabs spanning in one direction only, distributing bars shall be provided at right angles to the main tensile bars. The distributing bars shall have an aggregate cross-sectional area of at least 20 percent of the main tensile reinforcement, and the pitch of the distributing bars shall not be greater than four times the effective depth of the slab.

(28) *Shear.*

- (a) The shear stress “S” at any cross section in a reinforced concrete beam or slab shall be calculated from the following equation—

$$s = \frac{S}{ba}$$

where—

S = total shear across any section;

b = breadth of rectangular beam or breadth of rib of T or L beam;
and

a = arm or resistance moment;

- (b) where at any cross section of a beam or slab the value of the calculated shear stress does not exceed the permissible shear stress for plain concrete, no shear reinforcement need be provided in slabs and only minimum shear reinforcement need be provided in beams. The minimum shear reinforcement required in beams shall be one-quarter of an inch diameter stirrups spaced not farther apart than the arm of the resistance moment;
- (c) where at any cross section the value of the calculated shear stress exceeds the permissible shear stress for plain concrete, the whole shear at that section shall be provided for by the tensile resistance of the shear reinforcement acting in conjunction with the diagonal compression of the concrete in the web; and
- (d) in no case shall the calculated shear stress exceed four times the permissible shear stress for plain concrete.

(29) *Shear reinforcement.*

- (a) Tensile reinforcement which is inclined across the neutral plane of a beam and which is carried through a depth which is equal to the arm of the resistance moment may be utilised as shear reinforcement provided it is effectively anchored;
- (b) the resistance to shear at any section of a beam reinforced with bent up bars shall be calculated on the assumption that the bent up bars form the tension members of one or more single systems of lattice girders in which the concrete forms the inclined compression members. The shear resistance at any vertical section shall be taken as the sum of the vertical components of the inclined tension and compression forces cut by the section;
and
- (c) where on the foregoing assumptions the force required for

equilibrium on the horizontal portion of the bar is greater than the force in the inclined portion (i.e., whenever the angle between the inclined compression and the longitudinal axis of the beam is less than half the angle between the inclined and horizontal portions of the bar), the force in the inclined bar shall be limited to a value such that the permissible stress in the steel is not exceeded in the horizontal portion.

(30) *Stirrups.*

- (a) Where stirrups are used as shear reinforcements, the stirrups shall pass round the tensile reinforcement, and also round the compression reinforcement, if any, and shall be effectively anchored at both ends in such a manner that their full working stress can be developed. The local authority may, however, require longitudinal bars to be provided in the compression area of a beam where such is not actually required by the calculations, for the purpose of providing anchorage for the stirrups and to assist in the accurate fabrication of the reinforcement;
- (b) the spacing of stirrups shall be calculated but the space shall not exceed a length equal to the arm of the resistance moment; and
- (c) where a combination of bent up bars and stirrups is used in conjunction, the total shearing resistance of the beam shall be assumed as the sum of the shearing resistances computed for each type separately.

(31) *Longitudinal reinforcement of columns.*

- (a) The cross-sectional area of longitudinal reinforcement in a column shall not be less than 0.8 percent nor more than 8 percent of the gross cross-sectional constructional area of the column;
- (b) the gross cross-sectional constructional area of a column shall not include any external concrete cover of the longitudinal reinforcement which exceeds 2 inches or $1\frac{1}{4}$ times the diameter of the reinforcement, whichever is the lesser, nor in the case of rectangular columns an area at each corner equal to a chamfer giving the cover when measured from the corner rod towards the corner;
- (c) columns with spiral (helical) reinforcement shall have at least six bars within and around the spiral. All other columns shall have one longitudinal bar near each angle point of the column. In the case of rectangular columns in which the ratio between the breadths of the greater and lesser sides exceeds $1\frac{1}{2}$, the cross ties

and the number of bars in the longitudinal reinforcement shall be such that the distance between the bars along the longer breadth of the rectangle shall not exceed the distance between the bars along the shorter breadth of the rectangle; and

- (d) at all joints in longitudinal reinforcement the bars shall be overlapped for a length equal to twenty-four times the diameter of the upper bar or a sufficient distance to develop the force in the bar by bond, whichever is the lesser, unless they are otherwise efficiently jointed by welding, screwing or other means in such a manner as to develop the full force in the bar.

(32) *Transverse reinforcement in columns.*

- (a) The volume of transverse reinforcement in columns shall not be less than 0.4 percent of the gross volume of the column;
- (b) transverse reinforcement shall be so disposed that every longitudinal bar is held against outward buckling and shall have its ends efficiently anchored; and
- (c) where adequate restraint is afforded to the main longitudinal reinforcing bars by means of beams or slabs at points of junction with the columns, the transverse reinforcement may be modified.

(33) *Lateral ties in columns.*

- (a) The pitch of lateral ties in columns shall not exceed twelve inches or the least lateral dimension of the column, or twelve times the diameter of any longitudinal, whichever is the lesser. The minimum pitch need not be less than six inches; and
- (b) where the pitch is the maximum permitted, the diameter of a lateral tie shall be at least one-quarter of the largest longitudinal bar secured by it. Where a closer pitch is used the diameter of the ties may be reduced provided that the volume of lateral reinforcement is maintained.

(34) *Spiral ties in columns.*

- (a) Spiral reinforcement in columns shall consist of evenly spaced spirals and shall have its ends efficiently anchored;
- (b) the pitch of the spiral shall not be more than three inches or one-sixth of the diameter of the core, whichever is the lesser, and shall not be less than one inch or three times the diameter of the bar composing the spiral, whichever is the greater.

(35) *Axially loaded short columns.*

- (a) The axial load “P” on short columns reinforced with longitudinal bars and lateral ties shall not be greater than the value obtained by the following equation—

$$P = cAc + tA$$

where—

c = permissible direct stress for concrete given in subrule (8)(a)(vii) of this rule;

t = permissible stress for longitudinal steel in direct compression given in subrule (8)(a)(iii) of this rule;

Ac = cross-sectional area of concrete not including any finishing material applied after the casting of the column; and

A = cross-sectional area of longitudinal steel;

- (b) where spiral reinforcement is used the axial load “P” on the column shall not exceed the value given by the equation in paragraph (a) of this subrule or by the following equation, whichever is the greater—

$$P = cA_k + tA + 2 \cdot 0t_b A_b$$

where—

A_k = cross-sectional area of concrete in the core;

t_b = permissible stress in tension in spiral reinforcement given in subrule (8)(a)(ii) of this rule;

A_b = equivalent area of spiral reinforcement (volume of spiral per unit length of the column); and

c, t and A have the meanings given in paragraph (a) of this subrule.

In no case shall the sum of the loads borne by the concrete in the core and by the spiral exceed $1.875 cAc$.

(36) *Axially loaded long columns.*

- (a) The permissible working loads of axially loaded long columns shall not exceed the values calculated according to the methods given in subrule (35) of this rule multiplied by the buckling coefficients in Table 15—

TABLE 15.

Ratio of effective length to least lateral dimension of rectangular column	Ratio of effective length to least radius of gyration	Buckling coefficient
15	50	1.0
18	60	0.9
21	70	0.8
24	80	0.7
27	90	0.6
30	100	0.5
33	110	0.4
36	120	0.3
39	130	0.2
42	140	0.1
45	150	0

- (b) when in spirally reinforced columns the permissible load is based on the core area, the least radius of gyration of the column shall be taken to be the least radius of gyration of the core of the column;
- (c) except where only the core area is considered, the radius of gyration of a column section may be calculated on its whole effective section, allowance for the reinforcement being made by using the appropriate modular ratio;
- (d) the effective length to be assumed in determining the permissible working load shall be as follows—
 - (i) for columns adequately restrained at both ends in position and direction, the effective length shall be taken as 0.75 times the column length;
 - (ii) for columns adequately restrained at both ends in position but not in direction, the effective length shall be taken as the column length;
 - (iii) for columns adequately restrained at both ends in position and imperfectly restrained in direction at one or both ends, the effective length shall be taken at a value intermediate between 0.75 and 1.00 of the column length depending upon the efficiency of the imperfect restraint;
 - (iv) for columns adequately restrained at one end in position and direction and imperfectly restrained in both position

and direction at the other end, the effective length shall be taken at a value intermediate between the column length and twice that length depending upon the efficiency of that restraint; and

- (e) the effective length values given above are in respect of typical cases only and embody the general principles which should be employed in assessing the appropriate value for any particular column.

(37) *Bending in columns.* Bending moments—

- (a) in internal columns supporting an approximately symmetrical arrangement of beams need not be calculated;
- (b) in external columns shall be calculated and provided for;
- (c) in columns eccentrically shall be calculated and provided for.

(38) *Flat slabs.* The calculations, design and construction of flat slabs, that is to say, slabs of reinforced concrete supported generally by columns without the medium of beams shall be to the satisfaction of the local authority.

(39) *Aggregates.*

- (a) The fine and coarse aggregates, that is to say, the sand and coarse materials, shall consist of natural siliceous sands and crushed hard stone, granite, phonolite or trachyte from approved quarries. They shall be hard, strong and durable and shall be clean and free from clay films and any earthy, animal, vegetable, oily and bituminous materials;
- (b) the following prohibited materials shall not be used for or with the fine or coarse aggregates in the composition of reinforced concrete—
 - (i) coal residues, including clinkers, ashes, coke breeze, pan breeze, slag or other similar materials;
 - (ii) furnace slag, copper slag, forge breeze, dross and other similar materials;
 - (iii) sulfates, including plaster of paris, and other similar materials.

(40) *Washing.* Unless quite clean, all aggregates shall be thoroughly washed.

(41) *Grading aggregate.*

- (a) Sand or fine aggregate shall be of such a size that it will pass through a mesh 3/16 inch square measured in the clear, and not more than 3 percent by weight shall pass a No. 100 British Standard sieve;
- (b) coarse aggregate shall be of such size that it will be retained on a mesh 3/16 inch square measured in the clear. The maximum size of coarse aggregate shall be $\frac{3}{4}$ inch in normal cases. Coarse aggregate of a smaller maximum size than $\frac{3}{4}$ inch shall be used where the maximum lateral distance between reinforcing bars is less than 1 inch, and the maximum size shall then be $\frac{1}{4}$ inch less than such distance. Coarse aggregate of a maximum size greater than $\frac{3}{4}$ inch may be used provided that the maximum size is not greater than three-quarters of the cover or of the minimum clear lateral distance between any two reinforcing bars, whichever is the less;
- (c) the grading between the limits specified above shall be such as to produce a dense concrete of the specified proportions and consistence that will work into position without segregation and without the use of an excessive water content;
- (d) the fine and coarse aggregates shall be separated from each other before the materials are measured;
- (e) the volume of fine aggregate or sand shall not be greater than twice the volume of cement; and
- (f) the volume of coarse aggregate shall not be greater than twice the volume of fine aggregate.

(42) *Water.* Water for mixing concrete shall be clean and free from deleterious substances in suspension and solution and shall not be used to excess, only sufficient being used to render the mixture plastic. The proper quantity of water required shall be ascertained by experiment and only this ascertained quantity by measure shall be used for each separate batch or mix of concrete.

(43) *Concrete.*

- (a) The concrete shall be mixed in an approved mechanical batch mixer unless hand mixing is approved when 10 percent extra cement shall be used. The mixing shall continue until there is a uniform distribution of the materials and the mass is uniform in colour and consistence. When mixing by hand, the cement and sand for each batch of concrete shall first be thoroughly mixed dry until a uniform colour throughout is obtained before the

coarse material is added. After the addition of the coarse material, the batch shall again be well mixed dry and again thoroughly mixed after the ascertained quantity of water is added until every part of the batch is equal in composition and consistence throughout;

- (b) concrete shall not be of a weaker composition than one part of cement by volume to two equal volumes of sand or fine aggregate and four of coarse aggregate;
- (c) the concrete shall be conveyed as rapidly as practicable from the place of mixing to the place of deposit and by methods which will prevent the segregation or loss of the ingredients;
- (d) the concrete shall be placed in the final position before setting has commenced. Concrete shall not be dropped into position from a height, but the conveying receptacle shall be lowered as near as practicable to where the concrete is required before the receptacle is emptied. In the case of vertical components of a structure such as columns and walls, at least one portion of the framework or shuttering shall enable the conveying receptacles to be emptied therein with a drop for the concrete not exceeding four feet and the concrete laid in layers not exceeding one foot thick, each layer being well tamped before the next layer is deposited;
- (e) the builder shall keep a record on the work of the time and date of placing the concrete in each portion of the structure, and the record shall be open to inspection at all times by the officers of the local authority;
- (f) concreting shall be carried out continuously up to construction joints where such are necessary, their position and arrangement being consistent with maintaining the designed strength of the structure;
- (g) in the case of horizontal construction joints any excess water and laitance shall be removed after the concrete has been deposited and before it has set;
- (h) when work has to be resumed on a surface which has hardened, the surface shall be well roughened and all laitance removed; the surface shall then be swept clean, thoroughly wetted and covered with a thin layer of mortar composed of equal volumes of cement and fine aggregate;
- (i) concrete shall be thoroughly compacted during the operation of placing and thoroughly worked around the reinforcement and embedded fixtures and into the corners of the formwork. The agitation of reinforcement as a means of assisting the compaction

- of the concrete is prohibited; and
- (j) concrete after placing shall be protected for seven days from the harmful effects of sunshine and winds and also from running water and shocks. During this period it shall be kept damp by means of wet sacking or other material and by watering daily, Sundays and holidays included.

(44) *Approval of reinforcement before concreting.* A builder shall not place any concrete in any reinforced concrete member of a structure until permission has been given by the local authority.

(45) *Chases and cutting.*

- (a) Chases shall not be formed in any reinforced concrete structure unless they have been provided for in the design and all stresses thereat adequately provided for; and
- (b) no cutting for piping or other purposes shall be done which will reduce the strength of any part of the structure below the standard required by these Rules.

(46) *Inlaid materials.*

- (a) Fixing blocks to be used solely for fixing purposes may be embedded in the concrete provided that they do not reduce the strength of any part of the structure or the effective cover of the reinforcement therein below the standard required by these Rules and that the area of the blocks at any given cross section is not included in the calculated compression area of any beam, column or other constructional member; and
- (b) soft wood or other equally combustible material shall not be embedded in the concrete.

(47) *Overlaid materials.* Wood or other combustible materials may be placed over the surface of the concrete provided that any voids or hollow spaces between the combustible and incombustible materials are filled with materials of an incombustible nature except where spaces or ducts are necessary for the provision of essential services or a floor is designed for a special purpose which necessitates the provision of a space or void.

(48) *Formwork.*

- (a) The formwork or shuttering shall be of such dimensions and so constructed as to remain rigid during the placing, ramming and setting of the concrete, and it shall be sufficiently tight to prevent

- the loss of liquid from the concrete;
- (b) the vertical strutting shall be maintained continuously through the lower storeys to the foundations or to other floors and beams which are sufficiently set to afford the required support without injury;
- (c) all formwork shall be removed without shock or vibration;
- (d) formwork shall not be removed until the concrete has set to such an extent that it can be removed without injury to the structure; and
- (e) before the removal of any formwork from under any beam or floor slab the sideforms thereof and the columns below the beam or slab shall be partially stripped in order to ascertain if the concrete is satisfactory and sufficiently hardened. Proper precautions shall be taken to allow for the difference in the rate of hardening of normal and rapid-hardening cements, due to their nature and weather conditions.

(49) *Tests.*

- (a) The builder or other person directing the work to be executed shall furnish the local authority with reasonable proof as to the quality of the materials to be used in construction and shall make or cause to be made any tests which the local authority may consider necessary and shall furnish the local authority with the accurate results of the tests; and
- (b) if at any time during the construction or within six months after the completion of a reinforced concrete structure it is found necessary to test any part of the structure by reason of any sign of weakness or faulty work appearing in the structure, or if there is any doubt as to its stability, the builder or other person responsible for the direction of the work shall make or cause to be made such tests as the local authority may consider necessary; and if the tests show the work to be faulty or unsafe, it shall be reconstructed and reinstated in accordance with the requirements of these Rules.

(50) *Deflection.* The total deflection of beams or slabs freely supported and subject to the permissible working stresses shall not exceed 1/600th of the span when the span is twenty times the effective depth of the beam or slab and shall be in proportion for other ratios of span to depth and for other conditions of ends and stress and loading.

(51) *Test loads.*

- (a) The superimposed test load on the floor, roof or other structure shall be not more than $1\frac{1}{2}$ times the superimposed load for which the floor, roof or other structure has been designed, and this load shall be maintained for twenty-four hours before removal; and
- (b) loading tests shall not be made until the expiry of fifty-six days from the date of placing the concrete.

(52) *Walls of reinforced concrete.*

- (a) Walls of reinforced concrete shall be reinforced horizontally and vertically at both faces and shall be of such design and construction as to ensure a standard of strength equivalent to that demanded for other structural members. Where the walls are load bearing walls upon a base, they shall be deemed as columns other than columns with spiral reinforcement and shall satisfy the requirements of these Rules in this respect;
- (b) load bearing reinforced concrete walls without a base may be constructed to be self-supporting provided that due provision is made for ample resistance to all stresses and for the prevention of buckling;
- (c) load bearing walls of reinforced concrete shall not be of less thickness than two-thirds of the thickness prescribed in these Rules for brick walls unless it is proved by calculation that adequate strength and stability is being provided, but shall not in any case be less than $4\frac{1}{2}$ inches thick. Where necessary adequate additional reinforcement and strength shall be provided around openings in such walls;
- (d) panel walls of reinforced concrete shall be cast in position of concrete not weaker than one part of cement to two parts of sand and four parts of coarse aggregate (all by volume) properly reinforced with steel and, with the exception of a party wall, shall be of at least four inches solid thickness throughout exclusive of rendering, plaster or other decorative finish, and their reinforcement shall be adequately anchored to the structural framing on all sides. The height, width and thickness of a panel wall shall be to the satisfaction of the local authority; and
- (e) a reinforced concrete party wall shall not be less than eight inches thick in any part of the wall.

(53) *Special forms of construction.* Special forms of construction not otherwise provided for in these Rules may be employed where the methods

of design and construction are such as to ensure a standard of strength and durability at least equivalent to that demanded by these Rules.

233. Relaxation of Rule 232.

(1) The certificate referred to in rule 232(5) of these Rules shall state that the structural design complies with either—

- (a) the requirements of British Code of Practice C.P. 114 (1957) General Series “The Structural Use of Reinforced Concrete in Buildings”; or
- (b) the detailed provisions of rule 232 of these Rules.

(2) If the certificate shall certify that the design complies with the British Code of Practice set out in subrule (1) of this rule, the local authority shall not require compliance with such provisions of rule 232 of these Rules as require a better quality of design than the corresponding requirements of the British Code of Practice.

Structural steelwork—General.

234. Structural steel.

(1) A building or part of a building may be constructed in such a way that the loads and stresses are transmitted to the foundations by a skeleton framework of steel, or partly by such framework and partly by bearing walls or bearing structures, and reinforced concrete if incorporated in the construction shall be in accordance with the rules for that purpose.

The stipulations of this rule indicate the minimum requirements for buildings of normal type, and the owner of the building shall accept full responsibility for ensuring that the provisions of this rule cover all requirements for permanent stability and safety.

The steel framework of a building in combination with the floors, walls and bearing structures (if any) and the foundations shall be capable of sustaining with due stability and without exceeding the limits of stress hereafter specified the whole dead and superimposed loads of the building together with all forces due to wind, earth or other pressures acting upon it.

(2) *Notices and plans.*

- (a) Where structural steel is to be used in a building, the application

for the approval by the local authority of the plans as required by these Rules shall be accompanied by a certificate in the terms set forth in rule 235 of these Rules from a practising structural engineer who is in possession of at least one of the following qualifications—

- (i) a member or associate member of the Institution of Civil Engineers of Great Britain;
 - (ii) a member or associate member of the Institution of Structural Engineers of Great Britain;
 - (iii) a member or associate member of the Institution of Municipal Engineers of Great Britain;
- (b) when the application and plans for the building have been approved and before building work is commenced, the person to whom the approval has been given shall in addition submit plans and details of all structural work for the whole building. The plans shall include all necessary detail drawings, showing the cross section and dimension of structural members and the mode of jointing. All such plans and details shall be drawn and prepared by a structural engineer as qualified in terms of paragraph (a) of this subrule who shall certify on each such plan that the plan and any detail supplied in relation to it complies with the requirements of rule 235(1)(a) or (b) of these Rules; and
- (c) where the structural steel work is of a minor or inextensive nature, the local authority may waive the necessity for submission of the certificate required by paragraph (a) of this subrule, provided that the application is accompanied at the time of submission by full calculations, plans and detail drawings, showing the cross-section and dimensions of all structural members and the mode of jointing.

(3) *Steel.* All structural steel used in the construction of a building shall comply with the requirements of British Standard Specification No. 15 (1936) for Structural Steel for Bridges, etc. and General Building Construction, or of any specification in amendment of or in substitution for it.

(4) *Working stresses.* Subject to any special modifications herein, the calculated working stresses of steel as described in subrule (3) of this rule shall not exceed the following—

(a) for parts in tension—	Tons per square inch
(i) on the nett section for axial stress or extreme fibre stress of all beams	8
(ii) on the nett section of rivets for axial stress in the case of rivets driven at the works, provided that the rivets are of the usual snap-headed type with sound, well formed heads of British Standard proportions, hot driven pneumatically or hydraulically, and that the parts to be riveted together are in close contact before the rivets are driven	5
(iii) on the nett section of rivets for axial stress in the case of rivets driven at the site, provided that the rivets are of the usual snap-headed type with sound, well formed heads of British Standard proportions, hot driven, and that the parts to be riveted together are in close contact before the rivets are driven	4
(iv) on the nett section of bolts for axial stress, provided that the bolts, which shall in no case be less than $\frac{3}{4}$ inch diameter are of British Standard proportions, and that the parts to be bolted together are in close contact before the bolts are tightened up	5
(b) for compression flanges in beams—	Tons per square inch
(i) on the gross section extreme fibre stress of beams embedded in a concrete floor or otherwise laterally secured	8
(ii) on the gross section for extreme fibre stress of uncased beams where the laterally unsupported length “L” is less than twenty times the width “b” of the compressive flange	8

	Tons per square inch
(iii) on the gross section for extreme fibre stress of uncased beams where "L" is greater than twenty times "b", except that in all cases where holes not completely filled by rivets or turned bolts occur in compression flanges the extreme fibre stress on the nett section shall not exceed 8 tons per square inch;	11.0-0.15 L/b
(iv) for beams solidly encased in reinforced concrete of at least 1:2:4 quality as provided elsewhere in these Rules, the breadth "b" in the above formula may be taken as the width of the compression flange of the beam plus the least concrete cover beyond the edge of the flange on one side only, with a maximum of four inches, but in no case may the ratio "L" over "b" exceed 50;	
(c) for parts in shear—	Tons per square inch
(i) on the gross section of webs, where provision (if necessary) has been made for resistance to buckling	5
(ii) on shop rivets and tight fitting turned bolts	6
(iii) on field rivets	5
(iv) on black bolts where permissible	4
(v) the strength of rivets and bolts in double shear may be taken as twice for single shear;	

(d) for parts in bearing—	Tons per square inch
(i) on shop rivets, tight fitting turned bolts and direct bearing steel on steel	12
(ii) on field rivets	10
(iii) on black bolts where permissible	8
(iv) on packings, seatings and the like	12

(5) *Grillage beams.* The calculated working stress in steel grillage beams in a solid foundation block may exceed those specified in subrule (4) of this rule by 50 percent provided that—

- (a) the beams are encased in a 1:2:4 or richer concrete so that their entire surface is in close contact with such concrete except where they are in direct contact with and transverse to one another;
- (b) the beams are spaced not less than three inches apart, and concrete solidly tamped around them;
- (c) the thickness of the concrete above the upper flange of any tier is not less than four inches; and
- (d) the thickness of the concrete at the outer sides of the external beams is not less than four inches.

(6) *Filler floor beams.*

- (a) The strength of filler floor beams encased in a concrete floor slab may be estimated on the basis of the combined moment of inertia of the steel and surrounding concrete, calculated as in reinforced concrete, neglecting the strength of concrete in tension and taking the limit of flexural stress in the steel at nine tons per square inch; and
- (b) if the floor beams are spaced further apart than six times the thickness of the concrete floor slab, suitable transverse reinforcement shall be provided.

(7) *Encased beams.* For steel beams which are encased in solid concrete of rectangular cross section, such concrete being 1:2:4 or richer composition, the extreme fibre stress (calculated as plain steel) may be increased to 8.5 tons per square inch; except that—

- (a) the minimum width of solid casing shall be equal to the width of the flange of the beam plus four inches;
- (b) the beam shall be laterally supported by a concrete slab with no

- floor openings adjacent to the beam; and
 - (c) the top face of the upper flange of the beam shall be not less than 1½ inches below the top face of the concrete slab nor less than 2½ inches above the soffit of the concrete slab.
- (8) *Depth and deflection.* The span of any—
- (a) filler floor beam encased in concrete shall not exceed 32 times the depth measured from the bottom flange of the floor beam to the top surface of the concrete slab; and
 - (b) other beam shall not exceed 24 times its depth, unless the calculated deflection of the beam is less than 1/325 part of the span.
- (9) *Working stresses in columns.*
- (a) The permissible ratio of effective column length to least radius of gyration shall not exceed the following values—
 - (i) for all columns and struts forming part of the main structure of a building—150;
 - (ii) for subsidiary members in compression—200;
 - (b) the working stresses per square inch in the shafts of columns and other compression members of structural steel shall not exceed those specified in Table 16 except as provided in subrule (15) of this rule—

TABLE 16.

Ratio of effective length to least radius of gyration	Working stresses in tons per sq. in. of gross section	Ratio of effective length to least radius of gyration	Working stresses in tons per sq. in. of gross section
1	= F1	1	= F1
= — r		= — r	
20	7.17	120	2.93
30	6.92	130	2.58
40	6.64	140	2.28
50	6.30	150	2.02
60	5.89	160	1.81
70	5.41	170	1.62
80	4.88	180	1.46
90	4.33	190	1.33
100	3.81	200	1.21
110	3.34		

(10) *Length of a column or compression member.*

- (a) The actual length of a column or compression member shall be measured between the centres of lateral supports; and
- (b) in the case of a column or compression member provided with a cap or base, the centre of lateral support shall be assumed to be in the plane of the top of the cap or the bottom of the base.

(11) *Effective length of a column or compression member.* The effective length “1” of a column or compression member for the purpose of determining allowable axial stress shall be taken as follows—

- (a) where both ends are held in position and restrained in direction, 0.7 of the actual length;
- (b) where both ends are held in position and one end restrained in direction, 0.85 of the actual length;
- (c) where both ends are held in position but unrestrained in direction, the actual length;
- (d) where one end is held in position and restrained in direction and the other end is restrained in direction but not held in position, 1.0 to 2.0 times the actual length depending upon the degree of restraint; and
- (e) where other conditions exist, values appropriate to the circumstances.

(12) *Restrained ends.*

- (a) In direction— An end of a column or other compression member

shall not be deemed to be restrained in direction unless the end is so shaped and secured as to render the column or member equivalent to one which is continued indefinitely through and beyond such end;

- (b) In position—An end of a column or compression member shall not be deemed to be restrained in position unless the end is so securely fixed as to render it impossible to move or tend to move laterally in any direction.

(13) *Partially restrained ends.* Where compression members are only partially restrained in direction, a proportionate increase in the effective length “1” shall be made.

(14) *Compression member connections.* All connections with compression members shall be designed to resist bending moments due to eccentricity of loading, and where the resistance moment of such a connection is deficient, the strength of the connection shall be increased to provide the necessary restraint, or alternatively, the compression member shall be considered as partially restrained.

(15) *Eccentric loading on columns.*

- (a) In the case of steel columns having loads eccentric to the axis and parallel with it, the bending moment about each principal axis shall be calculated with proper regard for the eccentricity of the loading, and the maximum compressive stress at the extreme fibre due to the bending actions shall be added to the axial load per square inch. The sum of these stresses at the extreme fibre shall not exceed F_2 where—

$$F_2 = f_c + 7.5 \frac{f_c}{F_1} \frac{1}{9} A \quad \text{and} \quad 0.002 \frac{1}{r} A$$

F_1 = the working stress per square inch specified in subrule (9)(b) of this rule;

f_c = the total load on the column in tons divided by the gross cross-sectional area of the column in square inches; and

$\frac{1}{r}$ = the ratio of effective column length to the least radius of gyration;

- (b) in cases where a beam is connected to a continuing column, the

bending moment in the column due to the eccentricity of the reaction from the beam may be regarded as divided between the column lengths above and below the level of the beam proportionately to their stiffnesses, account being taken of all bending moments or shearing forces at any joint; and

- (c) in continuing columns all bending moments due to the eccentricities of loading at any one floor level may be disregarded at levels of the floor beams immediately above and below, provided that the column at these latter levels is effectively restrained in relation to the eccentric load.

(16) *Effective span.* The effective span of a beam shall be the actual length of the beam except where a beam rests upon a wall or walls or upon the top of a column or columns when the effective length of the beam shall be the length between the centres of the bearings.

(17) *Effective depth.* The effective depth of flanged beams shall be taken as the distance between the centres of gravity of the upper and lower flanges.

(18) *Sectional areas.*

- (a) In computing tension members bolt and rivet holes shall be deducted, only the nett cross-sectional area being taken;
- (b) in compression members the gross cross-sectional area may be taken where rivets and tight-fitting bolts are used, but holes for loose-fitting bolts shall be deducted;
- (c) the shearing stress on the web plates of plate girders may be calculated on the gross cross-sectional area of the full depth of the plate;
- (d) for rolled beams and channels the gross cross-sectional area of the web resisting shearing stress may be calculated on the full depth of the beam or channel.

(19) *Plate girders.*

- (a) *Flanges and web.* In plate girders the flange plates and flange angles may be calculated as resisting the whole of the bending stresses and the web plates as resisting the whole of the shearing stresses, but one-eighth of the web plate may be included to resist bending stresses provided that the web plates are efficiently covered at the joints to transmit the horizontal stresses;
- (b) *Compression flanges.* The gross area of the compression flanges of plate girders shall be not less than the gross area of the tension

- flange;
- (c) *Flange section.* The flange angles shall form as large a part of the area of the flanges as practicable and the number of flange plates shall be reduced to a minimum. To obtain as even a distribution of stress over the cross section of the flange plates as possible, they should not project beyond the outer line of rivets which pass through the flange angles more than sixteen times the thickness of the plate with a maximum of six inches. A flange plate which does not extend the full length of a girder shall be continued beyond the theoretical end of the plate for a distance to contain at the same pitch as the rivets along the plate, not less than one-half of the number of rivets required in shear to equal the strength of the plate in tension or compression;
 - (d) *Web stiffeners.* Web plates shall have stiffeners riveted on both sides at the ends and near the edges of the bearing plates and at all points of local and concentrated loads. When the thickness of the web is less than one-sixtieth of the unsupported distance between the upper and lower flange angles, stiffeners should also be provided at points throughout the length of the girder generally not further apart than the clear distance between the flange angles with a maximum spacing of six feet;
 - (e) end and intermediate web stiffeners shall be in pairs, one on each side, and the outstanding legs shall not be less than 2 inches plus $1/30$ the depth of the girder. Stiffeners over the bearing plates shall have sufficient area to carry the entire shear without exceeding the specified intensity of working stress, the stiffeners being proportioned as struts having a length equal to $3/4$ of the depth of the girder;
 - (f) all web stiffeners shall bear tightly at top and bottom against the flange angles, and stiffeners over the bearing plates shall have packings between them and the web plates of the thickness of the angle flanges, and of the full width of the stiffeners, but intermediate stiffeners may be jogged over the flange angles;
 - (g) *Flange rivets.* Rivets connecting the flanges to the webs of plate girders shall be proportioned to carry the resultant of the longitudinal and vertical shears on the rivets; and
 - (h) *Joints.* The butting ends in a girder of all spliced members, whether in tension or compression, shall be covered and riveted to develop the effective strength of the member. Web joints shall have double covers of adequate width to admit of sufficient rivets to transmit the whole of the shearing stress at the joint. Where a portion of the web is included as flange section, the web covers

and their connecting rivets shall be proportioned to transmit bending as well as shear stress;

(20) *Bearings.* Where the area of the portion of the bottom flange of a beam or girder which rests upon a wall or pier is such that the initial pressure transmitted exceeds the safe bearing capacity of the supporting material, bearing plates shall be provided to increase the bearing area to safe dimensions. The thickness of the bearing plates shall not be less than the thickness derived from the following formula—

$$t^2 = \frac{1.5yW}{fb}$$

where—

t^2 = the thickness of the plate in inches;

W = the total load in tons transmitted by the beam to the plate;

y = the projection of the plate beyond the side of the beam in inches;

b = the breadth of the plate in inches measured in the direction of the beam; and

f = the working stress in tons per square inch, to be taken as 8 tons for steel,

but the minimum shall be ½ inch.

(21) *Lateral stability.* The effective span of a beam, joist or girder should not exceed thirty times the flange width. Should this ratio be exceeded, the safe load calculated on the stresses specified herein shall be reduced by a percentage not less than the figure produced when thirty is deducted from the aforesaid ratio and multiplied by one and one-quarter, viz. — least percentage reduction = $1.25 (1/b! 30)$ where—

l = the effective span; and

b = the width of the flange.

(22) *Thickness of steel.* The steel used for external construction shall not be less than 5/16 inch thick, and for internal construction not less than ¼ inch thick. This provision does not apply to light structural work such as skylights, stairways, light single storey buildings and like structures, rolled structural shapes and packings. In built-up columns, flange-plates or web-plates shall not be less than ⅜ inch thick.

(23) *Solid round steel columns.*

(a) Solid round steel columns shall have properly machined shouldered ends and shall be provided with caps and bases the

bearing surfaces of which shall be properly machined after being shrunk or screwed on. When it can be assumed that the load on the cap or under the base is uniformly distributed, the minimum thickness in inches of a square or rectangular cap or base shall be—

$$t^2 = \frac{3 W}{4 f} \times \frac{D}{B! d}$$

where—

t^2 = the thickness of the cap or base in inches;

W = the total axial load in tons;

D = the length of the longer side of the cap or base in inches;

B = the length of the shorter side of the cap or base in inches;

d = the diameter of the reduced end of the column in inches;

f = the working stress in the steel taken as 9 tons per square inch;

- (b) when it cannot be assumed that the load on the cap or under the base is uniformly distributed, or where the cap or base is not square or rectangular, special calculations based on the same working stress shall be made; and
- (c) a cap or base plate shall not be less than 1.5 (d x 3) inches in length “B” or in diameter;

(24) *Hollow round steel columns.*

- (a) Consistent with due regard to strength and stability, hollow round steel columns having a less thickness of metal than prescribed in subrule (22) of this rule may be used;
- (b) where the columns are used as window mullions, they shall conform to the requirements of British Standard Specification No. 990 (1945) for metal casement windows or any revised edition of that standard, from time to time in force, and caps and bases shall be in compliance with that specification;
- (c) where used otherwise than for window mullions, the columns shall have a thickness of steel of not less than No. 8 Imperial Wire Gauge, and caps and bases of proper shape and adequate thickness shall be screwed or welded to the columns. The caps and bases shall completely close the ends of the hollows in the columns; and
- (d) the caps and bases of the columns shall be of adequate area to bear the loads transmitted thereto or thereby without injury to the

materials resting on the caps or on which the bases rest, and the safe bearing capacity of those materials shall not be exceeded.

(25) *Steel columns other than of round section.*

- (a) *Foot*—The foot of every steel column other than columns of solid round section shall, after riveting up complete with all gussets, stiffeners (if any), base angles and/or cleats, be machined over the whole area of the foot so formed, except as provided by paragraph (b) of this subrule, and there shall be affixed to the foot either—
- (i) a base plate in effective contact with the whole area of the machined foot. The gusset plates, angles, cleats, and stiffeners (if any) in combination with the bearing area of the machined column foot and the base plate shall be sufficient to distribute the load to the foundations without exceeding the stresses specified in these Rules; or
 - (ii) a slab or bloom base plate in effective contact with the whole area of the machined foot. When it can be assumed that the load under the slab is uniformly distributed, the minimum thickness of a rectangular slab shall be—

$$t^2 = \frac{3p}{f} \left(y^2 - \frac{z^2}{4} \right)$$

where—

- t^2 = the plate thickness in inches;
 p = the pressure transmitted by the base to the material thereunder in tons per square inch;
 f = the working stress in the steel taken at 8 tons per square inch;
 y = the greater projection of the base plate beyond the stanchion in inches;
 z = the lesser projection of the base plate beyond the stanchion and at right angles to “y” in inches.

When it cannot be assumed that the load transmitted by the base is uniformly distributed, or where the slab is not rectangular, special calculations shall be made to show that the stresses are within the specified limits.

- (b) *Ends*—Except as provided below, each bearing end of each length of all columns other than columns of round section shall, after riveting up complete with all gussets and end angle cleats,

be machined over the whole area of the ends so formed. All joints shall be close butted and all cap and joints seating plates shall be in effective contact with the whole area of the machined column end; except that where sufficient gussets and rivets are provided safely to transmit the whole load to the foundations without a base plate, the column ends need not be machined.

- (c) *Packings*—The bearing stress in any steel packing or beam interposed between the ends of a superimposed column and the column beneath shall not exceed the stress in the superimposed column, and the width across the interposed steel shall at no point be less than the width of the superimposed column.
- (d) *Joints*—All joints in columns shall occur as near as reasonably practicable to floor levels. Joints in columns where bending stresses can produce tension shall be fully spliced to resist such bending. Column joints in which the resultant stress due to all loads and bending moments is wholly compressive shall be sufficiently spliced to retain the members accurately in place, provided that the length of each splice plate on each side of the joint shall be at least equal to the maximum breadth of the column or eight inches, whichever is the greater.
- (e) *Bearings*—The area of the base of a column shall be proportioned to the column loads and pressures and the strength of the supporting material so that the safe bearing capacity of that material is not exceeded.

(26) *Latticing of compression members.*

- (a) *General*—The latticing of compression members shall be proportioned to resist a transverse shear at any point in the length of the member equal to at least 2.5 percent of the axial stress in the member, which shear shall be considered as divided equally among all transverse stiffening systems in parallel planes whether of continuous plates or of latticing.
- (b) *Width of bars*—The minimum width of lattice bars shall be—
 - (i) 2½ inches for 7/8 inch diameter rivets;
 - (ii) 2¼ inches for ¾ inch diameter rivets; and
 - (iii) 2 inches for 5/8 inch diameter rivets.
- (c) *Thickness of bars*—The minimum thickness of the lattice bars shall not be less than 1/40 of the shortest distance between the centres of the rivets in the case of single latticing, and 1/60 of this distance for double latticing, riveted at the intersections. Rolled sections of equivalent strength may be used instead of flats.
- (d) *Inclination of bars*—Lattice bars shall be inclined at an angle of

- 60 degrees to the axis of the member when single latticing is used, and at an angle of 45 degrees for double latticing.
- (e) *Spacing of bars*—The maximum spacing of lattice bars shall be such that the slenderness ratio for the portions between consecutive connections of the latticing shall be appreciably less than this ratio for the member as a whole, but in no case shall the ratio be greater than forty.
 - (f) *Tie plates*—In columns, tie plates shall be provided at the ends of lattice systems and at points where the system is interrupted. Intermediate tie plates shall have a length of not less than the distance at right angles between the lines of rivets connecting them to the flanges, and end tie plates shall have a length of not less than $1\frac{1}{2}$ times that distance. The thickness of the tie plates shall be not less than $\frac{1}{50}$ of the distance between connecting lines of rivets except where they are stiffened with angle bars on their edges when their minimum thickness shall be $\frac{5}{16}$ inch.
 - (g) *Batten plates*—In columns where batten plates are used instead of lattice bars, each plate shall be equal to an end tie plate as specified in paragraph (f) of this subrule, and the clear distance between plates shall be such that the slenderness ratio of the battened flange will be less than that of the column. The clear distance between plates shall also be not more than four times the length of the batten plate measured along the column. Alternatively the slenderness ratio of the individual members of the column shall not exceed forty.
 - (h) *Tension member plates*—When intermediate tie plates are used with tension members instead of latticing, they shall be spaced not further apart in the clear than fifteen times the width of the flange to which they are attached, and they shall be connected to the member by not fewer than two rivets on each side.
- (27) *Rivets and rivetting.*
- (a) *Effective diameter of rivets*—In calculating the number of rivets required, the rivet holes shall be adopted as the standard of dimensions of the finished rivet, the diameter of the finished rivets as marked on the drawings being taken as the effective diameter for calculating area.
 - (b) *Bearing area*—The effective bearing area of a rivet shall be the diameter multiplied by the thickness of the member or unit transmitting or receiving the stress, except that with rivets with countersunk heads, one-half of the depth of the countersink shall be omitted.

- (c) *Minimum pitch of rivets*—The distance between centres of rivets shall be not less than three times the diameter of the rivet.
- (d) *Maximum pitch of rivets*—Except as otherwise specified for tacking rivets, the straight line pitch in the direction of stress in riveted girders, columns or other members shall not exceed the following values—
 - (i) for parts in tension, 16 times the thickness of the thinnest outside plate or angle with a maximum of 8 inches;
 - (ii) for parts in compression, 16 times the thickness of the thinnest outside plate or angle with a minimum of 6 inches, except that for tension and compression members where two rows of staggered rivets occur in one flange of a single angle, the straight line pitch in the direction of stress shall not exceed $1\frac{1}{2}$ times the distance given above.
- (e) *Rivets at ends of columns, etc.*—In the ends of built-up columns and other compression members the pitch of the rivets connecting component parts for a length equal to $1\frac{1}{2}$ times the width of the member shall not exceed the following—
 - (i) $4\frac{1}{2}$ inches for 1 inch diameter rivets;
 - (ii) 4 inches for $\frac{7}{8}$ inch diameter rivets; and
 - (iii) $3\frac{1}{2}$ inches for $\frac{3}{4}$ inch diameter rivets.
- (f) *Edge distance*—The minimum distance from the centre of any rivet—
 - (i) to a sheared edge shall be—
 - (A) $1\frac{3}{4}$ inches for 1 inch diameter rivets;
 - (B) $1\frac{1}{2}$ inches for $\frac{7}{8}$ inch diameter rivets;
 - (C) $1\frac{1}{4}$ inches for $\frac{3}{4}$ inch diameter rivets;
 - (D) $1\frac{1}{8}$ inches for $\frac{5}{8}$ inch diameter rivets; and
 - (ii) and to a rolled or planed edge shall be—
 - (A) $1\frac{1}{2}$ inches for 1 inch diameter rivets;
 - (B) $1\frac{1}{4}$ inches for $\frac{7}{8}$ inch diameter rivets;
 - (C) $1\frac{1}{8}$ inches for $\frac{3}{4}$ inch diameter rivets; and
 - (D) 1 inch for $\frac{5}{8}$ inch diameter rivets.
- (g) *Maximum edge distance*—Where two or more flange plates are employed, edge distance from the centre line of the nearest rivets connecting them to the web construction shall be not greater than twelve times the thickness of the thinnest outside plate, but tacking rivets connecting the plates together shall be introduced where such edge distance exceeds nine times the thickness of the thinnest outside plate. Where a single flange plate is used, the corresponding edge distance shall not exceed nine times the thickness of the plate.

- (h) *Tacking rivets*—
 - (i) (that is rivets connecting flange plates together but not subject to calculated stress), where employed, shall have a pitch not exceeding 24 times the thickness of the thinnest outside plate or 12 inches, whichever is the lesser;
 - (ii) in tension members composed of two angles back to back, the pitch of tacking rivets shall not exceed 3 feet 6 inches, and in compression members the pitch shall not exceed 2 feet 6 inches or 40 times the least radius of gyration of either angle, whichever is the less; except that where the connected angles have two rivet gauge lines the tacking rivets may be pitched in alternate gauge lines.

(28) *Prevention of corrosion.* Structural steel shall be cleaned of all scale, loose rust and foreign matter of every description and shall be adequately protected against corrosion and damage. Before any paint is applied, the steel shall be thoroughly cleaned as aforesaid. After erection any exposed steel shall receive at least one coat of paint which shall be renewed from time to time to ensure adequate protection against corrosion.

(29) *Fire protection of steelwork.* All steel or metal columns and beams shall be completely encased and protected from the action of fire with brickwork, concrete, stone, tiles or other similar incombustible materials (or suitable combination of such materials) constructed with Portland cement and so that there are no voids between the casing and the metal, and the casing shall be adequately secured to the metal work and bonded into any adjacent walling. The casing shall not be of less than the following thicknesses at any point—

- (a) for columns built wholly or partially into external or party walls, 4 inches on all sides;
- (b) for columns built elsewhere than in external or party walls, 2 inches on all sides;
- (c) for beams, 2 inches beyond the flanges on all vertical sides, 1 inch on all upper surfaces, and 2 inches on all soffits increased to $\frac{1}{8}$ of the maximum steel width in all cases where that width exceeds 16 inches;
- (d) rivet heads, cover plates, gussets, brackets, cleats, caps and bases and such like may be within the thicknesses set forth in paragraphs (a), (b) and (c) of this subrule but with a minimum cover of 2 inches at columns and beams in external and party walls, and 1 inch in all other cases;

except that the requirements of this subrule as to casing need not apply to

industrial factories or workshops, storage sheds and hangars of one storey height or to other buildings of one storey not exceeding fifteen feet in height; and they do not apply to the portion of steel floor beams which are embedded in the concrete floor slab which affords the cover herein specified.

(30) *Fabrication and erection.*

- (a) *At works*—As much of the work of fabrication as is reasonably practicable shall be completed in the works where the steelwork is fabricated, and except in cases in which welded construction is permitted and employed, either rivets or turned bolts of driving fit shall be used for all such work, provided that black bolts may be used for the end cleat connections of secondary floor beams.
- (b) *On site*—For connections which it is impracticable to make before the erection of the steelwork on the site, rivets, turned bolts and black bolts may be used, or welded connections may be employed when permitted by the local authority. In cases where black bolts are employed for field connections, suitable dead bearings formed by seating plates, packing, brackets (or the like) shall be provided to resist the whole of the shear forces involved. The requirement as regards dead bearings shall, however, not apply to roof trusses or to the end connections of secondary floor beams.
- (c) *Bolts*—Bolts shall be provided with washers under the nuts of such thickness that the thread of the bolt is clear of the hole in the plate or member. The shanks shall project at least one full thread beyond the nuts, and nuts shall be secured to avoid the risk of their becoming loose. Washers shall be tapered where necessary to give the heads of nuts and bolts a true bearing. Bolts and nuts shall be in accordance with the British Standard Specifications Nos. 28 (1932) (for black bolts), or 190 (1924) (for turned bolts), or the latest revised edition of each of those Standard Specifications except as regards the length of the threaded portion.

(31) *Welding.* In the fabrication of steelwork, the joining of the parts by metallic-arc, oxy-acetylene or other methods of welding, instead of rivets and/or bolts may only be done if authority to do so is procured from the local authority, and then only in accordance with the conditions prescribed by the local authority and subject to a guarantee that the welding will be executed by experienced workers under the supervision of a competent foreman qualified to execute the work and a further guarantee by the fabricator that the welded work will safely withstand all stresses thereat. The local

authority may refuse to grant a permit of occupation if a guarantee by the fabricator regarding the strength of the welded work has not been supplied to the local authority.

(32) *Metals other than steel.* Metals other than steel may only be used in constructional work subject to such terms and conditions as the local authority may impose and if all parts of the metal work are designed to the satisfaction of the authority safely to withstand in relation to the yield point of the metal, all calculated stresses on the structural members or parts. New kinds of metal shall not be used unless sufficient and guaranteed tests of the metals have been made regarding all aspects of the strength of the metals.

(33) *Proof of quality of metal.* The local authority may require the builder, or other person causing or directing the work to be executed, to furnish reasonable evidence of the quality of the metal used or to be used in the construction or conversion of a building or any part of a building, and may require the builder or other person to make such tests of such metal and to drill such columns and metal members as the local authority may deem necessary.

(34) *Waiver.* The local authority may in any particular case, modify or waive at its discretion any of the requirements of this rule upon and subject to such terms and conditions as it may think fit. Any person who fails to comply with any term or condition attached by the local authority to such modification or waiver commits an offence against these Rules.

(35) *Costs.* All costs incidental to compliance with any of the provisions of this rule shall be borne by the building owner or his or her builder.

235. Relaxation of rule 234.

(1) The certificate referred to in rule 234 of these Rules shall certify that the structural design complies with either—

- (a) British Code of Practice C.P. 113 (1948) General Series, “The Structural Use of Steel in Buildings”; or
- (b) the detailed provisions of rule 234 of these Rules.

(2) If the certificate shall certify that the design complies with the British Code of Practice referred to in subrule (1) of this rule, the local authority shall not require compliance with such provisions of rule 234 of these Rules as require a better quality of design than the corresponding

requirements of the British Code of Practice.

Panel walls.

236. Panels walls: general.

(1) Panel walls, that is to say, external non-load-bearing walls occupying the space between the vertical and horizontal member of a constructional skeleton framework of steel or reinforced concrete or similar construction (a foundation being deemed a horizontal member and the end of a bearing wall a vertical member) shall be well and properly built of incombustible materials which provide adequate strength and durability.

(2) All panel walls shall be so built as to be adequately secured to the structural framework, and no panel wall shall have a greater height than twenty-five feet.

(3) All bricks, stones, blocks or other units shall be properly bonded and bedded and jointed in mortar with all joints full and solidly made.

237. Reinforced concrete panel walls.

Panel walls of reinforced concrete shall be in accordance with the requirements of rule 232(52)(d) of these Rules.

238. Unfaced panel walls.

(1) Panel walls constructed with one single thickness of brick, stone, concrete or block units set and jointed in mortar shall, except as provided in rule 243(1) of these Rules, be of at least 8½ inches overall thickness throughout exclusive of rendering, plaster or other decorative finish.

(2) In cases where the clear span of any such panel between structural supports (either horizontally or vertically, whichever is the lesser) exceeds 13 feet, the thickness of the panel walls shall throughout be increased by at least 2 inches for each 3 feet or fraction thereof of the excess span. The additional thickness shall not be provided by unduly increasing the width of the mortar joints.

239. Faced panel walls.

(1) Panel walls constructed with one single thickness of units, set and

jointed in mortar, of bricks, stones or concrete with a facing of terra cotta, faience or terrazzo or stone shall be of at least 13 inches overall thickness throughout exclusive of rendering, plaster or other decorative finish.

(2) In cases where the clear span of any such panel between structural supports (either horizontally or vertically, whichever is lesser) exceeds 16 feet, the thickness of the panel walls shall be increased by at least 2 inches for each 3 feet or fraction thereof of the excess span. The additional thickness shall not be provided by unduly increasing the width of the mortar joints.

(3) The facing shall in all cases be either bonded or otherwise adequately secured to the backing.

240. Cavity panel walls.

(1) Panel walls constructed with solid brick, concrete or stone units set and jointed in mortar may be formed as cavity walls composed of two solid walls or shells each not less than 4½ inches thick exclusive of rendering, plaster or decorative finish. Except as hereafter otherwise provided, the two shells shall be spaced not more than 3 inches apart and shall be securely tied together across the cavity with ties of substantial rust-resisting design spaced at the rate of two ties to every square yard of cavity area and so arranged that their vertical spacing is one-half of their horizontal spacing and that alternate rows of ties are staggered.

(2) The two shells may be spaced more than 3 inches apart but not more than 6 inches apart, provided that the number of ties is increased in direct proportion to the cavity width.

(3) The clear span of any single panel of cavity wall between structural supports (either horizontally or vertically, whichever is the lesser) shall not exceed 13 feet, and the overall area of any single panel (between structural supports) shall not exceed 200 square feet. In cases where this limit of either span or area is exceeded, one of the shells shall be made to conform to the requirements for panel walls of one thickness as hereinbefore enumerated.

241. Panel walls for one-storey buildings.

Panel walls constructed of one thickness of solid bricks or blocks set and jointed in cement mortar may be employed in the walls of one-storey

buildings not used for habitation. The walls shall not be less than 4¼ inches thick provided that they are adequately supported by piers, stanchions or beams. The clear horizontal span of any such panel between the vertical supports shall not exceed 10 feet, and its clear overall area shall not exceed 120 square feet.

242. Party wall panels.

In any party wall a panel wall constructed of bricks or blocks shall not be less than nine inches thick, and if constructed of stone, a panel wall shall not be less than twelve inches thick, exclusive in either case of rendering, plaster or decorative finish. There shall not in any party wall be a cavity panel wall.

243. Panel walls with reinforcement.

(1) With the exception of party walls, panel walls built with one single thickness of brick, stone or block units set and jointed in cement mortar may be constructed of a less thickness than that specified in rules 238 and 239 of these Rules provided that the walls are reinforced in each alternate course with suitable and sufficient reinforcement, such reinforcement being not further than 1½ inches from either face alternately.

(2) Exclusive of any facing, rendering, plaster or decorative finish, the panel walls shall not be less than 4 inches thick. The height of the panels shall not exceed 12 feet nor the area thereof exceed 120 square feet.

Fire escapes and fire precautions.

244. Provision of fire escapes, and fire extinguishers.

Every building which is more than two storeys in height and every public building or building of the warehouse class, hotel, boarding house or block of flats shall be provided with at least two exits at ground level and adequate means of escape in the case of fire, and there shall be provided and maintained, so as to be readily accessible, means for extinguishing fire, which shall be adequate and suitable to the satisfaction of the local authority.

245. Floors, etc. to be of fire-resisting materials.

(1) Every building which is more than two storeys in height and any building of two storeys in height other than a dwelling house for one family only shall have the structural framework of the floor of every lobby, corridor,

passage and landing and every flight of stairs constructed of concrete or other incombustible material of adequate strength and in all respects to the satisfaction of the local authority; except that this rule shall not apply to the floor of any lobby, corridor, passage, landing or any flight of stairs designed to be used otherwise than as a means of access to, or escape from, any part of the building.

(2) The walls enclosing the principal staircase of the building shall be constructed of suitable incombustible material of sufficient thickness.

246. External fire escape stairs.

In cases where external escape staircases are provided, these shall have a minimum clear breadth of twenty-one inches and shall be fitted with a strong handrail; the whole structure shall be of incombustible material, and no obstruction shall be permitted at any part of the escape stair which would reduce its breadth in any way.

247. Indication of fire escape positions.

Notices on suitable incombustible material intimating positions of fire escapes shall be fixed and maintained in positions approved by the local authority.

248. Fire hydrants and sprinklers.

Where in the opinion of the local authority the size or manner of use of any building justifies the provision of special fire precautions, the local authority may require the buildings to be installed with fire hydrants and/or a sprinkler system to its satisfaction.

249. Inspection extinguishers.

The local authority shall be entitled periodically to inspect all buildings in which fire appliances are installed and may order the owner of any building to test such appliances and to repair or renew any which may have become defective or inefficient through misuse, age or neglect.

Ratproofing.

250. Ratproofing of certain buildings.

(1) Every building or part of a building which is used or designed to be used for the storage of rat-attracting material, other than buildings or premises used exclusively for domestic purposes, shall be constructed so as to prevent effectually the ingress, passage and harbourage of rats in the building or in any space connected with it, and in every case a clear space of at least 10 feet shall be maintained between any such store and any other building on the same plot or between the store and the plot boundary; except that rat-attracting material may be stored in ratproof bins of a type approved by the local authority.

(2) Where part of a building is used or designed to be used as aforesaid, that part shall be so separated from any other part as effectually to prevent the passage of rats from one part to the other.

(3) Rules 251 to 258 of these Rules shall apply to buildings as aforesaid only.

251. Doors.

(1) The outer wooden doors of the buildings shall be adequately protected by metal plates or otherwise so as to prevent rats from gnawing a passage through those doors and the frames of those doors. This protection shall be to the satisfaction of the local authority.

(2) All doors shall be hung so that the gap between the underside of the door when closed and the finished sill level shall not exceed $\frac{1}{2}$ inch.

(3) All sliding doors shall be fitted so that the gap between the doors and the walls and sills does not exceed $\frac{1}{2}$ inch.

252. Trapdoors.

Trapdoors of timber or like materials in the floors shall be edged with heavy gauge sheet metal. The timber edges of the trapdoor openings shall be similarly treated.

253. Windows: glazing of and screens.

(1) In the basement or in the ground floor storey all windows which are made to open, or such part of the windows as is made to open, shall be screened with strong metal meshwork or wire netting so constructed and fixed as to prevent the passage of rats. The mesh of the metal screen shall not

exceed one-half of an inch square.

(2) Where any window is situated as in subrule (1) of this rule and is unscreened in whole or in part, the opening caused by any pane of glass in the window being broken shall immediately be closed to prevent the passage of rats and shall be properly reglazed without delay.

254. Rat guards at pipes.

(1) Where any pipes are fixed externally to the walls of buildings those pipes shall be so protected by the fixing of rat guards that rats are unable to gain access to any upper storey or to the roof.

(2) The rat guards shall be of an approved type and shall be constructed of heavy gauge metal or other approved material. They shall fit closely to the pipe so that there shall be no space between the guards and the wall nor between the pipe and the wall.

(3) The rat guards shall be not less in size than nine inches measured from the pipe to the outer edge of the guard and shall be firmly fixed to the building by insertion into the wall or otherwise securely fixed to the wall.

255. Eaves to be ratproof.

(1) Where the eaves of a roof project beyond the face of a wall they shall be so constructed that rats cannot gain access to the space under the roof covering.

(2) The construction shall be to the satisfaction of the local authority and may be—

- (a) beam-filling to the underside of the roof covering;
- (b) close lined soffit of the projection from the wall to the fascia board, the lining being wholly or partly of boards, approved hard sheeting, or heavy gauge metal netting the mesh of which does not exceed $\frac{1}{2}$ inch measured across the mesh;
- (c) heavy gauge metal soffit or rat guard; or
- (d) any other method approved by the local authority.

256. Walls.

(1) Where the walls of a building are built of burnt brick, stone, concrete or other similar material, the outer wall surface from ground level,

or the top of the plinth where such is provided, up to a height of three feet shall be smooth plastered with cement mortar (1-3).

(2) In any building where the walls are of corrugated sheets of metal or other material, the base of the sheets shall be so arranged that rats cannot pass thereunder or by gnawing or scraping obtain the passage. The cavities formed by the corrugations shall, at the base of the sheets, be effectively closed and sealed against the passage of rats by hard cement mortar or concrete, by substantial metal strips firmly and permanently held in position, or by some other approved method to the satisfaction of the local authority.

(3) At door and window openings the sheets shall be closely and firmly fitted and fixed to the frames of the doors and windows.

(4) Where the edges of the sheets overlap they shall be in close contact with each other.

(5) The door sills of every such building shall be not less than three feet above the level of the ground outside the building.

257. Under-floor ventilators.

All ventilators to spaces under floors shall be of substantial and permanent construction and shall be securely fixed. The interstices of the ventilators shall measure not more than $\frac{1}{2}$ inch between the ribs, bars or components of the ventilators.

258. Wiring in buildings.

(1) Where unconcealed wiring for any purpose passes through holes in friable materials or through materials which rats can gnaw or scrape, the wiring shall pass through heavy gauge metal discs having a diameter of not less than two inches greater than the diameter of the hole in the materials through which the wiring passes. The discs shall be fixed to both sides of the wall, partition wall or ceiling through which the wiring passes.

(2) The hole in the centre of the discs shall not be more than $\frac{1}{4}$ inch greater than the diameter of the wire or combination of wires; except that plugs, switches, ceiling roses or other fittings may be deemed to be the equivalent to metal discs if fixed to the satisfaction of the local authority.

259. Pipes entering buildings.

Where water, soil, waste or any other pipes pass through the external wall or any floor of any building, the aperture through which they pass shall be made ratproof—

- (a) in walls or floors of stone, bricks, blocks or concrete, by sealing the aperture with cement grouting or other approved method so that no space is left between the pipe and the edges of the aperture; or
- (b) in walls or floors of timber or other material which rats can gnaw or scrape, by affixing to both sides of the walls or structural parts, heavy gauge metal discs the internal diameter of which shall not be greater than that of the pipe by more than $\frac{1}{4}$ inch, and the discs shall be of a diameter which will overlap the edges of the aperture by $1\frac{1}{2}$ inches.

260. Ratproofing of existing buildings.

(1) The owner of any building shall, on being served with a notice by the local authority, efficiently ratproof his or her building to the satisfaction of the local authority.

(2) Any owner who fails to comply with the notice within the time specified in it commits an offence against these Rules.

261. Ratproofing of buildings: general.

As far as reasonably practicable all buildings shall be so constructed as to minimize the harbourage of rats in any part of the buildings.

262. Ratproofing provisions to be maintained.

All ratproofing precautions which have been provided or constructed in any building shall be maintained in a state of efficiency by the owner of the building.

Other methods of construction.

263. Other methods of construction.

Nothing in these Rules shall prevent the local authority from approving the use of materials, methods or forms of construction not mentioned in these Rules or the use of materials mentioned in these Rules in forms of

construction different from those named in these Rules, provided that the materials, methods and forms of construction are of a suitable nature and quality for the purpose for which they are intended and are approved by the Minister responsible for works.

PART VIII—MISCELLANEOUS.

264. Forms.

The forms set out in the Schedule to these Rules, or to the like effect, shall be used for the several purposes prescribed in these Rules.

265. British Standards.

(1) Where these Rules refer to any British Standard, the British Standard shall be read with such British Standard amendments as may be prescribed by the Minister responsible for health by notice in the Gazette.

(2) A copy of a British Standard or British Standard amendment purported to be printed or published by or by the authority of the British Standards Institution shall, in legal proceedings arising out of the provisions of the Act or of these Rules, be prima facie evidence of the terms and provisions of the British Standard or British Standard amendment.

Schedule.

rule 264.

Form A.

Application for Approval of Plans.
(To be submitted in quadruplicate.)

To: The Executive Officer,
_____ Local Authority.

I submit with this application plans, sections, elevations, block plan and details of a new building, alterations, additions for use as a domestic building, dwelling house, public building, building of the warehouse class.¹

Plot No. _____ Street or block _____
having a frontage to _____

Materials.

Foundations _____

Dampproof course _____

External walls _____

Internal walls _____

Mortar in walls _____

Floors (describe all types of floor) _____

Roofs (covering of) _____

Ceilings _____

Water fittings and supply.

Description of fittings _____

Means of supply _____

Machinery.

Description of the manufacture, process or trade intended to be carried on
and any prime movers or machinery to be installed _____

¹Delete descriptions inapplicable.

Name of architect _____

Address _____

I certify that the terms of Lease No. _____ will be fully complied with and that this application and the accompanying plans are, to the best of my knowledge and belief, in conformity with current Public Health (Building and Drainage) Rules.

Signature of Owner of Building or Agent

Dated this _____ day of _____, 20 _____

Full name and address of owner (*in block letters*) _____

Local authority _____

Date received _____

Land department.

No. of lease or grant _____

Register _____ Volume _____ Folio _____

Cost of buildings specified in lease: shs. _____

Date for completion specified in lease _____, 20 _____

Estimated cost (engineer to the local authority) _____

N.B.—Particulars of any proposed drainage must be submitted on the forms specified in the Schedule to the Public Health (Drainage and Sanitation) Rules or any rules amending or replacing them, and should accompany this application.

Republic of Uganda

Form B.
Approval of plans.

Local authority of _____
Deposit No. _____ Date of receipt _____
Owner's name _____
Description of works _____

Plot _____ Street or block _____
Plans approved _____

Republic of Uganda

Form C.
General Particulars to Contractors.

Local Authority of _____

To Architects:

This form and attached notices are to be forwarded to the builders when instructions to commence work are given.

To Builders:

These notices are to be forwarded to the local authority as the building proceeds.

Deposit No. _____ Approved _____
Owner's name _____
Description of works _____
Road _____
Site No(s). _____

In respect of this deposit any further reference in all correspondence, etc. the following number should be quoted—

No. _____

The attached notices are to be forwarded in accordance with the Public Health (Building) Rules.

Republic of Uganda

Form D.

Notice of the Completion of Building or Buildings.

Local Authority of _____

Deposit No. _____ No. on block plan _____

Owner's name _____

Dated this _____ day of _____, 20 _____

To: The Executive Officer,

I give you notice that _____

_____ in _____

has been completed in accordance with the Public Health (Building) Rules and the plans approved by the local authority of _____ and is now ready for inspection.

Name _____

Address _____

Republic of Uganda

Form E.

Notice of Intention to Erect Building or Buildings.

Deposit No. _____ No. on block plan _____

Owner's name _____

Dated this _____ day of _____, 20 ____

To: The Executive Officer,

I give you notice that I intend to commence the erection of _____

in _____ on the _____ day of _____, 20 ____ in accordance with the byelaws and regulations and the plans approved by the local authority of _____

Name _____

Address _____

Republic of Uganda

Form F.

Notice That Foundations are Ready for Inspection.

Deposit No. _____ No. on block plan _____

Owner's name _____

Dated this _____ day of _____, 20 ____

To: The Executive Officer,

I give you notice that the foundations of _____

in _____ are ready for inspection.

Name _____

Address _____

Republic of Uganda

Form G.

Certification of Compliance with Public Health (Building) Rules.

Uganda.

No. _____ Deposit No. _____

Local Authority of _____

To _____ of _____,
the owner of a certain building situated at _____
and intended to be occupied as a _____.

This is to certify that the above building is, as far as can be ascertained, in every respect in accordance with the Public Health (Building) Rules and requirements for the time being in force in the area of the local authority.

Dated this _____ day of _____, 20 _____

Executive Officer

Republic of Uganda

Form H.
Certification and Notice.

No. _____

Deposit No. _____

Local Authority of _____

To _____,
the owner of a certain building situated at _____
and intended to be occupied as a _____.

This is to certify that the above building is, as far as can be ascertained, in every respect in accordance with the Public Health (Building) Rules and requirements for the time being in force in the area of the local authority.

If the proposed building is to be a factory or workshop, a certificate of registration from the chief factories inspector, P.O. Box 9, Kampala, is required.

Dated this _____ day of _____, 20 _____

Executive Officer

Form I.
Application for Licence to Erect a Skysign.

I, the undersigned, being the _____¹
of premises known as _____
situate at _____ within the
area of the local authority of _____
apply to the local authority of the area for a licence, authorising the
_____ upon my premises of a
skysign described as follows, viz.—

General description	Materials	Mode of attachment to building

An elevation and section of the skysign are attached.

Dated this _____ day of _____, 20 ____

Signature of Applicant

Note—The elevation and section of skysign referred to in this application must show: (1) position of skysign on building; (2) if on wall, height from ground and projection; (3) if above roof, height from eaves and from ground.

¹Owner or occupier, as the case may be.

²Erection or retention, as the case may be.

Republic of Uganda

Form J.
Skysign Licence.

The _____ local authority licences
_____ of _____¹
the _____
of premises known as _____
situate at _____ within the _____
of _____, to erect and fix (*or* retain) upon his or
her premises, a certain skysign as described below, an elevation and section
of which have been deposited with the local authority with the application for
this licence, and signed by the applicant.

General description	Materials	Mode of attachment to building

In any of the following cases a licence of the local authority shall become void—

- (a) if any addition to any skysign is made except for the purpose of making it secure under the direction of the local authority;
- (b) if any change is made in the skysign or any part of the skysign;
- (c) if the skysign or any part of it falls either through accident, decay or any other cause;
- (d) if any addition or alteration is made to or in the house, building or structure on, over or to which any skysign is placed or attached if the addition or alteration involves the disturbance of the skysign or any part of it;
- (e) if the house, building or structure over, on or to which the skysign is placed or attached becomes unoccupied or is demolished or destroyed; or
- (f) if any skysign is erected or retained contrary to the provisions of the Public Health (Building) Rules or after the licence for the erection, maintenance or retention of the skysign for any period shall have expired or become void and it shall be lawful for the

¹Owner or occupier as the case may be.

local authority to take proceedings for the taking down and removal of the skysign in the same manner and with the same consequence as to recovery of expenses and otherwise in all respects as if it were a dangerous structure within the meaning of those Rules.

This licence to be in force until 31st December next.

Given by the local authority this _____ day of _____, 20 _____

Executive Officer

History: S.I. 269-13.

Cross References

British Code of Practice C.P. 113 (1948), General Series, "The Structural Use of Steel in Buildings."

British Standard Specifications.

Electronic Media (Cinematograph) Rules, S.I. 104-1.

Factories Act, Cap. 220.

Public Health (Drainage and Sanitation) Rules., S.I. 281-4.

Public Health (Grade II Building) Rules, S.I. 281-3.

Public Health (Plague Control) Rules, S.I. 281-27.

Public Health (School Buildings) Rules, S.I. 281-20.

Town and Country Planning Act, Cap. 246.

Trade (Licensing) Act, Cap. 101.

Urban Authorities Rules, 1964 Revision, S.I. 27-19.
