NATIONAL BUILDING REGULATIONS 1996, (LI 1630)

ARRANGEMENT OF REGULATIONS

IN exercise of the powers conferred on the Minister responsible for Works and Housing by section 63 of the Local Government Act 1993 (Act 462) and in consultation with the Minister responsible for local Government these Regulations are made this 27th day of September, 1996.

PART I—APPLICATION OF REGULATIONS AND BUILDING PLANS

Regulation 1—Application of Regulations

These Regulations shall apply to the erection, alteration or extension of a building as defined in these Regulations unless otherwise provided in these Regulations.

Regulation 2—Application for Building Permit and Submission of Plans

Any person who intends to—

(a) erect any building; or

(b) make any structural alteration to any building; or

(c) execute any works or install any fittings in connection with any building

shall apply in Form A specified in Part I of Schedule 1 to these Regulations to the District Planning Authority of the district where the building, structure or works is or is intended to be and shall submit in duplicate the relevant plans with the Form.

Regulation 3—Title to Land

(1) An applicant under regulation 2 shall satisfy the District Planning Authority that he has good title to the land relevant to the plans.

(2) No approval shall be granted to any applicant who does not have a good title to the land, and, for the purposes of this regulation, good title shall be in accordance with a certificate issued by the Chief Registrar of Land Titles or any other agency so authorised.

Regulation 4—Exemption from Submission of Plans

(1) The buildings specified in column I of Part II of Schedule 1 are to the extent provided in relation to them in column 2 exempted from the requirement for submission of building plans under regulation 2.

(2) Except as provided under subregulation (1) of this regulation all other provision of these Regulations shall as are relevant apply to the buildings.

Regulation 5—Details in Plans

(1) Plans submitted an application under regulation 2 shall indicate sections, elevations, calculations and drawings, specifications of materials and such other particulars as the District Planning Authority may consider necessary to show whether the proposed building or work complies with these Regulations.

(2) The applicant shall also submit to the District Planning Authority a certificate signed by a Licensed Surveyor to the effect that the corners of the plot on which the building or work is to be carried out have been demarcated on the ground in a permanent manner in accordance with the site plan.

(3) All plans, sections and elevations required by the District Planning Authority shall be prepared by a person qualified to design the type of building in accordance with the provisions relating to such building as provided under these Regulation and shall —

(a) be clearly and accurately delineated in ink or otherwise in a suitable permanent manner on a suitable and durable material to a scale of not less than 1: 100 or if the building is so extensive as to render a smaller scale necessary, not less than 1:200;

(b) describe the class or nature of the building and show clearly for what purpose every room or part of the building is to be used;

(c) indicate the stages and method by which it is intended to construct the building if it is not to be built in one operation;

(d) indicate the materials of which the building will be constructed; and show clearly and accurately the position, form and dimensions of the foundations, walls, floors, rooms and the several parts of the buildings;

(f) indicate the method of disposal of stormwater, domestic waste-water and sewage, which shall be drawn on a block plan to a scale of not less than 1: 1250 or 1:2500 in the case of extensive sites, showing the alignment sizes and invert levels of existing or proposed drains (in relation to Ordinance Datum) including manholes, gullies, vent pipes, septic tanks, soak-aways and sewers;

(g) indicate the means of water supply and the position of existing and proposed underground water mains and pipes, including all mains and pipes within 30 metres of the site;

(h) include a plan of every floor and complete sections of the foundations and of every storey, floor and roof of the building;

(i) include a site plan to a scale of 1:1250 or 1:2500 as required by the District Planning Authority showing the position of the site and all overhead and underground services and adjoining streets roads and lanes and any further information which may be required to make the site easily identifiable.

(j) show specifically on the site plan the boundaries of sites, the position and heights of buildings on adjoining properties, the widths and Ordinance Datum levels of any street or land upon which the site may abut, and the Ordinance Datum level or the lowest floor of the proposed building;

(k) differentiate clearly between new work and existing work, if the permit applied for is for work on an existing building; and

(l) any other particulars as the District Planning Authority may require.

(4) The plans shall be signed by the person who prepared the plans, drawing or other relevant document.

Regulation 6—Design of Building

A building or group of buildings with an aggregate floor area in excess of 120 square metres, and of two storeys and above in height shall be designed by an architect or any of the following professionals —

(a) a civil engineer;

(b) a structural engineer; or

(b) a professional builder, but this description excludes draughtsman a licensed building surveyor and a building technician with a qualification lower than the higher technician diploma,

except that a building within a metropolitan or urban area shall be designed by an architect in consultation with a professional specified in this regulation.

Regulation 7—Building Permit

(1) The District Planning Authority to which plans have been submitted may in the exercise of its power under section 64(1) of the Local Government Act, 1993 (Act 462), grant the building permit in Form B specified in Schedule 1 Part III to these Regulations and may attach to the permit any conditions with respect to the proposed building or work that is not inconsistent with these Regulations including the condition that the applicant shall submit such further information or details as may be required by the District Planning Authority from time to time as the building or work progresses.

(2) Without prejudice to sub-regulation (1) of this regulation the District Planning Authority may specify in a building permit the time within which the work authorised in the permit should be commenced.

(3) The period of the validity of a building permit shall ordinarily be five years, except that if the work authorized in the permit is not completed within the time stipulated the District Planning Authority may extend the period on application by the applicant or his agent who must be a person in the building design profession.

(4) Any building or work carried on after the date of expiry of a building permit and before an application to extend the period of validity has been approved is a contravention of these Regulations.

(5) A District Planning Authority may refuse to issue a building permit if the applicant has failed to complete any building or work authorised by a building permit or other approval previously granted to him.

Regulation 8—Failure of District Planning Authority to Process Application

(1) Where a person submits an application for a building permit the District Planning Authority shall notify him within 7 days of the receipt of the application and shall within a period of 3 months thereafter notify the applicant whether the application is granted or refused.

(2) An applicant not informed of the grant or refusal of the application may after the expiry of the 3 months commence development on the basis that the application is acceptable to the District Planning Authority.

Regulation 9—Use of Unconventional Materials or Methods

(1) A person intending to use any building methods or materials for which no provision has been made under these Regulations for building shall submit an application in writing to the District Planning Authority giving details of the methods and materials intended to be used.

(2) The District Planning Authority may nominate an independent consultant and with the consent of the applicant appoint the consultant to report on whether the standard of durability and stability of the building to be constructed from materials or by methods not provided for in these Regulations are equal to the standard imposed by these Regulations for the use of the materials and the methods.

(3) The applicant shall pay the fee of the consultant, but the Building Permit fee shall be reduced by the amount of the consultant's fee provided that the reduction shall not exceed one half of the building permit fee if the plans are approved by the District Planning Authority.

Regulation 10—Notice of Commencement and Completion of Certain Stages of Work.

(1) A person to whom a Building Permit has been issued referred to in these Regulations as “developer” shall give to the District Planning Authority at least forty-eight hours notice in writing indicating the date on which it is intended to begin work, and of the dates on which the following stages of construction will be ready for inspection by the District Planning Authority —

(a) demarcation of site of the plot and siting of the buildings;

(b) foundations of buildings set out;

(c) foundations excavated and level pegs for concreting;

(d) foundations concreted;

(e) trenches for drainage work excavated to levels and gradients;

(f) drains laid and joined and ready for testing;

(g) reinforcing steel fixed in position before concreting;

(h) concrete shuttering ready for striking;

(i) walls completed to wall-plate level; and

(j) roof frame-work completed before covering.

(2) No construction work shall be covered until it has been inspected and approved by the District Planning Authority.

(3) Where a developer is notified by the District Planning Authority in writing of any contravention of his building permit in the construction and is required to rectify the contravention, he shall within a reasonable time after the completion of the rectification, notify the District Planning Authority in writing of the completion.

(4) A developer shall give to the District Planning, Authority notice in writing of —

(a) the erection of a building not more than seven days after completion or if a building or part of a building is occupied before completion, not less than seven days after completion;

(b) any alteration or extension of a building, not more than seven days after completion; or

(c) the execution of works or the installation of fittings in connection with a building, not more than seven days after completion.

(5) The requirements of subregulation (1) shall not apply to the installation of any fitting if the giving of notice and the deposit of plans, sections, specifications and written particulars are not required under any exemption permitted under these Regulations.

(6) If the procedure laid down in subregulation (1) of this regulation are not followed, the District Planning Authority may serve a notice requiring the owner to cut into, lay open or pull down as much of the building work as may be necessary to ascertain whether any of the provisions have been complied with and if such notice is not complied with the District Planning Authority may make an application to the nearest court to the place of the building for an order to cut into, lay open, or pull down any part of the building or work in order to carry out any tests necessary to ascertain whether these Regulations have been complied with and to charge the cost incurred to the owner.

(7) There shall be issued in respect of a building completed to the satisfaction of the District Planning Authority a certificate of completion for habitation or use in Form C in Schedule 1 Part III.

Regulation 11—Qualified Building Inspector

A District Planning Authority may for the purpose of giving effect to these Regulations, appoint a qualified building inspector within the meaning of these

Regulations to oversee and inspect daily work on buildings, erections and installations.

Regulation 12—Compulsory Maintenance

(1) A District Planning Authority may, in respect of any building which has in its opinion fallen into a state of disrepair or neglect, and constitutes a safety or health hazard to the public, or for aesthetic purposes serve notice in writing upon the owner of such building requiring him to carry out such reasonable repairs or painting as may be specified in the notice and within such time as may be stated in the notice.

(2) Where a person notified under subregulation (1) fails or refuses to carry out the repairs or painting within the stipulated period, the District Planning Authority may carry out the repairs or painting and may take legal action to recover the cost involved in the work.

PART II—PLOT DEVELOPMENT

Sub-Part I—Location of Building

Regulation 13—Site Requirements.

(1) No building shall be erected on a site which has been reclaimed unless there has elapsed such period as in the opinion of the District Planning Authority there will be no danger from settlement of the foundations and the erection of a building on the site will not be inimical to health and safety.

(2) No site liable to flooding shall be built upon without adequate provision for flood control.

(3) No building shall be erected over a drain, culvert, water course, high tension cable or sewer; except that a District Planning Authority may pass the building plans if it considers that it can properly agree to the proposal in the circumstances of the case.

(4) Where any watercourse or ditch is on or abuts on the site of a building, the local authority may require the owner of the land to fill it up wholly or partially, or to substitute a pipe drain or culvert.

(5) No drainage shall be permitted to be constructed on land adjoining an applicant's land where the land does not belong to the applicant unless adequate provision has been made in the approved development plans for a right to construct the drainage over that other person's land.

(6) Where the ground on which it is proposed to build has been filthed or covered with any material impregnated with faecal, offensive, animal or vegetable matter, the District Planning Authority shall reject the plans until after the satisfactory removal or sterilization of the offensive matter.

(7) Any site for the erection of a building for human habitation shall be adequately protected against dampness in accordance with regulations 20 and 21 of these Regulations, except where the building is intended to be used solely for storage or the accommodation of plant.

Regulation 14—Site Coverage of Buildings.

(1) No dwelling house shall be erected on a site of smaller area than 450 square meters with a frontage of less than 15 metres except where the plot is entirely surrounded by roads or lanes in which case the plot size shall be not less than 330 square metres and the frontage not less than 15 metres.

(2) No dwelling house together with its out-buildings shall cover a greater area of the plot than the following —

single storey detached	50%
two and three Storey detached	40%
single storey semi-detached	60%
two and three storey semi-detached	50%
two and three storey terrace	50%

provided that the total floor area of a residential building other than a block of residential flats shall not exceed 80 percent of the total area of the plot.

(3) No business premises together with its out-buildings shall cover a greater area than 75 per cent of the plot and such provision shall be made as will be required by the District Planning Authority for loading, accommodation and car parking, provided that in areas zoned for residential use, no building shall cover a greater area of the plot than that provided in sub-regulation (2) of this regulation.

(4) Where the ground floor of business premises in a commercial area is used partly or solely for human habitation the area covered by the whole building shall not exceed that laid down in sub-regulation (2) of this regulation.

(5) Where the ground floor of business premises in a commercial area is used wholly for business purposes, the area covered by the ground floor shall not exceed 75 per cent of the area of the plot.

(6) Where any floor other than the ground floor of business premises in a commercial area is used partly or solely for human habitation any floor so used shall cover an area not greater than 35 per cent of the area of the plot.

(7) No person shall construct any building on any plot unless the building abuts upon an approved street or the site of an approved street for a distance of at least 3 metres.

(8) No out-building shall be built with an upper storey.

(9) No wall of a dwelling house shall be constructed nearer to the rear boundary of the plot than a distance equivalent to 70 per cent of the height of the wall or 3 metres whichever is the greater.

(10) No part of dwelling house including enclosed staircases, shall be constructed nearer to side boundaries of the plot except in accordance with the following specifications—

	Detached on both sides	Semi-detached on one side	Terrace at ends of terrace
One storey	3.00m		
Two storey	5.00m		
Three storey	5.00m	3.00m	
	5.00m		
	5.00m	3.00m	
	5.00m		
	5.00m		

(11) In the case of business premises in non-residential areas, the business portion of the premises may be built up to the side boundaries of the site provided that no openings for light, air or access are constructed in the flank walls and provision has been made as required by the District Planning Authority for loading, accommodation and car parking. Any portion of the premises used for human habitation must conform to the provisions concerning dwelling houses.

(12) Where more than one building is constructed on the same plot, or where opposite parts of one building are separated by a void, the distance between the nearest part of any two buildings or between opposite parts of the same building excluding the eaves, shall not be less than the height of the higher wall, and in any case not less than 5 metres except for out buildings where the distance shall in no case be less than 3 metres.

(13) No out-buildings in a dwelling house shall contain more than one kitchen, one bathroom and two latrines.

(14) The requirements for site coverage provided in this regulation shall not necessarily apply to buildings of four storeys and over, which shall be subject to such

requirements as may be laid down by the District Planning Authority for each particular case.

Regulation 15—Projections Beyond Building Lines

(1) No part of a building, including any portico, verandah or other projections (with the exception of the eaves), shall be constructed as to extend beyond the building line of any street upon which the building may front, abut or adjoin unless otherwise authorised by the District Planning Authority.

(2) The eaves of any building which abuts upon any street shall not project into the street more than 600mm beyond the face of the wall of the building and shall be at a height level of not less than 3 metres above ground.

(3) Entrance gates, doors, windows and shutters shall be so hung that they open entirely on to the owner's property and in no case shall they be hung to open beyond a building line or fence line, if the building line or fence line abuts upon any street or any public road, lane or foot path.

Regulation 16—Orientation, Building Lines and Improvement Lines

(1) Buildings shall normally be oriented on the East-West axis but if site problems and topography demand otherwise, other orientation axis may be considered on condition that appropriate detailing is provided to take care of natural lighting, solar penetration and ventilation.

(2) No building shall be constructed such that any part of it cuts and projects above an imaginary line from the building line on the opposite side of the street at ground level so as to produce an angle of 45 degrees to the horizontal, except in accordance with permission granted by the District Planning Authority.

(3) No building shall be allowed to intrude into areas reserved for improvement lines.

Regulation 17—Boundary Lines

(1) Boundary lines shall conform strictly to the approved layout or development plan of the locality.

(2) Where a building abuts or adjoins a lane either at the rear or on the side, the building lines in each case shall be not less than 3 metres.

(3) No boundary wall shall be erected within 2 metres of the front of any building; and the front wall of a building shall not be less than 5 metres from the edge of a major road nor 3 metres from the edge of a minor road.

(4) Boundary and fence walls shall be constructed of wrought or cast iron work, masonry, burnt brick, cement blocks (mass or reinforced) soil blocks or a combination of any of these or other approved material and shall not exceed 2 metres in height. The front wall or the back wall if it abuts on a lane or street shall

have ventilation openings with a gross area of not less than 45 per cent of the entire surface area.

(5) No provision of these Regulations shall preclude the use of hedges for fencing.

(6) A District Planning Authority may exercise its powers to change boundary lines with respect to change of use or enlargement or reduction of any plot sizes in a revised development plan.

Regulation 18—Buildings at Street Corners

(1) A District Planning Authority may order that the boundary lines of corner plots or the corner of a building at a street corner or both be splayed or rounded such that the sight lines of the streets are not obstructed to cause danger to road users.

(2) The height of a building at the corner of a street shall be determined in accordance with regulations 13 and 14 of these Regulations.

Sub-Part II — Spatial Requirements

Regulation 19—Dimensions, Heights and Space of Rooms and Areas in Dwelling Units

(1) This sub-part applies only to dwelling units that are intended for use on a continuing basis as the principal residence of the occupant.

(2) Unless otherwise indicated in this regulation, the areas, dimensions and heights of rooms or spaces shall be measured between finished wall surfaces and between finished floor and ceiling surfaces.

(3) Minimum dimensions provided for rooms or spaces in combination with other rooms or spaces refer to the minimum dimensions of the combined space.

(4) Minimum floor areas specified in this regulation do not include closets or built-in bedroom cabinets unless otherwise indicated.

(5) Two or more areas are considered as a combination room if the dividing wall occupies less than 60 per cent of the separating plane.

(6) Areas and dimensions of rooms and spaces may be less than required in this regulation provided it can be shown to the satisfaction of the District Planning Authority that the rooms and spaces are adequate for their intended use, such as the provision of built-in furniture to compensate for reduced sizes.

(7) Heights of rooms or spaces of the rooms specified in column 1 of the table provided in Schedule 2 to these Regulations shall be as provided in column 2 in relation to the rooms or spaces.

(8) The width of a hallway within a dwelling unit shall be at least 900mm.

(9) The clear height above and below a mezzanine floor assembly in all occupancies shall not be less than 2 metres unless otherwise permitted by the District Planning authority.

(10) The clear height in a storage space or garage shall not be less than 2 m.

(11) Living areas within dwelling units, either as separate rooms or in combination with other spaces, shall have at least 13.47 square metres of floor area and shall have no dimension of one side being less than 3m within the required areas. Where the area of a living space is combined with a kitchen and dining area, the living area alone in the dwelling unit shall be at least 11.15 square metres.

(12) A dining space in combination with other space shall have a minimum floor area of 3.25 square metres. Dining rooms not combined with other spaces shall have a minimum area of 6.50 square metres.

(13) Subject to subregulation (14) of this regulation, a dining room or space combined with other space shall have no dimension of less than 2.4 metres within the required area measured between wall faces or a wall face and a built-in cabinet or appliance.

(14) Where a required dining area is provided in a kitchen the minimum dimension of one side of such space may be reduced to 1.7 metres.

(15) Kitchen areas within dwelling units either separate or in combination with other space shall have at least 7.43 square metres of floor area including the area occupied by the base cabinets, except that where a dining area is also provided in the kitchen, the minimum floor area shall be 3.72 square metres.

(16) At least 900mm clearance shall be provided in front of base cabinets, work surfaces, counter tops and appliances.

(17) Except as provided in subregulation (19) of this regulation at least one bedroom in every dwelling unit shall have at least 11.15 square metres of floor area where built-in cabinets are provided. The minimum dimension of one side within the required area shall be 2.7 metres.

(18) Except as provided in subregulation (19) additional bedrooms shall have at least 8.36 square metres of floor area where built-in cabinets are not provided and 7.57 square metres of floor area where built-in cabinets are not provided. The minimum dimension of one side within the required area shall be 2.40 metres.

(19) Bedroom spaces in combination with other spaces shall have at least 5.05 square metres of floor area and have no dimension of one side being less than 2.0 metres within the required area.

(20) In every dwelling unit an enclosed space of sufficient size shall be provided to accommodate a bath tub or shower bath, water closet and lavatory basin.

(21) At least 530 millimetres clearance shall be provided in front of the tub or shower stall to an opposite wall face or 460 millimetres in front to another fixture over at least 600 millimeters length of the bath tub or shower.

(22) The centre line of the water closet shall be at least 400 millimetres away from an adjacent side wall and from a vanity cabinet. At least 460 millimetres clearance shall be provided in front of the water closet to the opposite wall or another fixture.

(23) The centre line of a lavatory basin shall be at least 400 millimetres from an adjacent side wall. At least 530 millimeters clearance shall be provided in front of the lavatory basin to an opposite wall or 460 millimetres clearance in front to another fixture.

(24) The centre line of squatting shall be at least 500mm from an adjacent side wall and at least 600mm clearance shall be provided in front of the lavatory basin to an opposite wall.

PART III—SITE PREPARATION AND LANDSCAPE DEVELOPMENT

Regulation 20—Oversite Excavation and Sub-soil Drainage

(1) A site for a building or a structure which is intended for human habitation shall be effectively cleared of turf and other vegetable or organic matter that may be injurious to health and may cause rapid deterioration of the materials to be used for the building or structure.

(2) The subsoil of the site shall be effectively drained; or such other steps shall be taken to effectively protect the building against damage from moisture where the soil is waterlogged, damp or susceptible to seasonal flooding or periodic elevation of the subsoil water-table during wet seasons.

(3) Where an existing subsoil drain is damaged during excavation in connection with a building, works or fittings, adequate precautions shall be taken to secure the continued passage of the subsoil water through such drain or ensure that water entering damaged drain does not cause dampness to the site of the building or structure.

(4) Any of the following precautions shall be considered as satisfying the requirements for prevention of dampness in the substructure —

(a) the use of an agricultural drain which is so located that the subsoil moisture is channelled below the foundations of the building or structure;

(b) the use of cross or ringed subsoil drainage that takes into consideration the topography of the site to lower the storm water level from the bottom of the foundation of the building or structure;

(c) the injection of chemicals or cementation materials into the subsoil to improve the texture, physical stability and resistance to subsoil moisture passage; or

(d) the use of vibro-flotation or other mechanical processes which ensure adequate compaction and consolidation to mitigate dampness passage through the subsoil.

Regulation 21—Damp-proof Course to Sub-structure

(1) Prevention of ground water rising into a building or part of any building which is next to the ground shall be effected in accordance with this regulation so as not to allow the passage of ground moisture to the upper surface of the floor.

(2) Any floor close to the ground shall be so constructed as to prevent any part of the floor from being adversely affected by moisture or water vapour.

(3) Hardcore shall not contain water-soluble sulphates or other deleterious matter in such quantities as to be liable to cause damage to any part of the floor.

(4) It shall be sufficient for the purposes of satisfying subregulations (2) and (3) of this regulation if—

(a) the ground surface is covered with a layer of concrete not less than 100mm thick, composed of cement fine and coarse aggregates which conform to Ghana Standards or BS882:1954, and properly laid on a bed of hardcore;

(b) the concrete is finished with trowel or spade and so laid that its top surface is not below the highest level of the surface of the ground or paving adjoining any external wall of the building;

(c) there is space above the upper surface of the concrete of not less than 75mm to the underside of any wall plate, and not less than 115mm to the underside of the suspended timbers and the space is clear of debris and has adequate through ventilation; or

(d) there are damp-proof courses in such positions as to ensure that moisture from the ground cannot reach any timber or other material which would be adversely affected by it.

(5) It shall be adequate for the purpose of satisfying paragraphs (b) and (c) of sub-regulation (4) if the ground surface is covered in the manner described in paragraph (a) of sub-regulation (4) and—

(a) within the concrete slab there is incorporated a damp-proof sandwich membrane of a continuous layer of hot applied soft bitumen or coal-tar pitch of not less than 3mm thick; three coats of bitumen solution; bitumen or rubber emulsion or tar of not less than 3mm thickness; or

(b) the timber is laid or bedded directly upon a damp-proof course of asphalt or pitchmastice of not less than 13mm thick; or

(c) where the floor incorporates wood blocks of not less than 16mm thick the blocks are dipped in an adhesive of hot soft bitumen or coal-tar pitch and laid upon the concrete such that the adhesive forms a continuous layer.

(6) The membrane, damp-proof course or layer of adhesive mentioned in sub-regulation (5) must—

(a) be situated at a level not less than 150mm above the highest level of the surface of the ground or paving adjoining any external wall of the building; and

(b) be carried up the walls adjoining the floor to the level of the upper surface of the floor; and

(c) be continuous with, of joined and sealed to any damp-proof course inserted in any wall, pier, buttress, column or chimney adjoining the floor; and

(d) where the timber is fixed to wooden fillets embedded in concrete, the fillets are either—

(i) treated in accordance with the provision of Ghana Standard or BS3452; 1962; or

(ii) impregnated under pressure with a aqueous solution of copper-chrome-arsenate.

(7) Any surface subsequently exposed by cutting tiber for fitting into the building, shall be thoroughly treated by dipping, spraying or brushing using a aqueous solution of not less than 10 per cent of copper-chrome-arsenate or any other suitable non-leeching wood preservative.

Regulation 22—Protecting of Walls Against Moisture

(1) Any wall, pier or column of a building and any chimney shall be so constructed as not to transmit moisture from the ground to any material used in its construction which is likely to be adversely affected by such moisture.

(2) It shall be sufficient for the purposes of subregulation (1) if the wall, pier, column or chimney—

(a) has a damp-proof course which forms part of an external wall, the pier, column or chimney is at a height of not less than 150mm above the finished surface of the adjoining ground and any paving;

(b) has such other additional barriers to moisture in continuation of the damp-proof course required to ensure that moisture is not transmitted to any timber or to the interior of the building;

(c) extends below the level of the damp proof course required by sub-regulation (1) and it is constructed below that level wholly of materials not likely to be adversely affected by moisture from the ground.

Regulation 23—Weather Resistance of External Walls.

Any external wall, parapet, pier or column which forms part of an external wall and any chimney, shall be so constructed as not to allow moisture from rainfall to pass to any part of the building and shall be so constructed as to resist effectively the penetration of the moisture to the interior of the building.

Regulation 24—Prevention of Dampness in Cavity Walls.

(1) Where damp-proof courses are inserted in the leaves of any cavity wall constructed of bricks or blocks in order to satisfy the requirements of regulation 22, the cavity shall extend not less than 150mm below the level of the lower damp-proof course unless the structure forming the bottom of the cavity complies with sub-regulation (2) of this regulation.

(2) In any such wall, wherever a cavity is bridged otherwise than by a wall tie, or the bridging occurs at the top of a wall such a position that it is protected by a roof, a damp-proof course or flashing shall be inserted in such a manner as will prevent the passage of moisture from the outer leaf to the inner leaf of the wall.

(3) Where there is an opening in such a wall, the jambs shall have a suitable vertical damp-proof course unless the cavity is closed in such other manner as will prevent the passage of moisture from the outer leaf to the inner leaf of the wall.

Regulation 25—Weather Resistance of Roofs.

The roof of any building shall be weather-proofed and be so constructed as not to allow moisture from rain water to enter any part of the structure.

Regulation 26—Landscape Development.

(1) It is the duty of the District Planning Authority —

(a) to ensure, where appropriate, that in the preparation of the site for development, adequate provision is made, through the imposition of conditions, for the preservation of ecological values and for the planting of trees;

(b) to specify such landscape conditions as appear to the Authority to be necessary in connection with the grant of such permission;

(c) to ensure that in preparing the site for landscape development adequate precautions are taken against moisture deposits and dampness on buildings through vegetative transmission;

(d) to ensure that tree planting does not breed termites and other pests unduly detrimental to building preservation;

(e) to ensure that landscape development does not impair both surface and subsoil drainage;

(f) to ensure that tree planting and landscape development do not block drain pipes leading to a sewer, drain, ditch or dry well;

(g) to ensure that trees are planted at reasonable distance away from underground utility services such as water, electricity and telephone;

(h) to ensure that trees are not planted underneath or within reach or felled in the paths of overhead utility wires, such as electricity, telephone, radio and similar public utilities

Regulation 27—Tree Preservation.

(1) Where it appears to a District Assembly that it is expedient in the interest of amenity and the welfare of the community to make provision for the preservation of trees or woodlands, the authority after consultation with the Forestry Department may by bye-laws provide for the preservation of such trees, or may make the preservation of the trees a condition for approval of building plans.

(2) Such bye-laws may prohibit the cutting down, topping, lopping or wilful destruction of trees except with the consent of the District Assembly which may grant conditional consent or approval

(3) Such bye-laws may order the replanting of trees in such a manner as may be directed by the District Assembly.

Regulation 28—Advertisements.

(1) A District Assembly shall take appropriate steps for restricting or regulating the display of advertisements so far as appears to the authority to be expedient in the interest of amenity or public safety.

(2) A District Assembly shall provide —

(a) for regulating the dimensions, appearance and position of advertisements, display boards, the sites on which the advertisements may be displayed and the manner in which they are to be affixed to the land;

(b) for attaching other specified conditions of approval to the application; and

(c) for the delineation of certain "advertising free zones" where no advertising in any form shall be permitted.

PART IV—MATERIALS FOR BUILDING,

Regulation 29—Suitability of Materials.

(1) Any material used—

(a) in the erection of a building;

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

(c) in the execution of works or the installation of fittings, being works; or fittings to which any of these Regulations apply

shall be of a suitable nature and quality for the purposes and conditions in which they are to be used, and shall be adequately mixed or prepared and applied, used or fixed so as to adequately perform the functions for which they are intended.

(2) The use of any material or any method of mixing or preparing materials or of applying, using or fixing materials which conforms to an approved Ghana Standard Code of Practice or the appropriate BSCP that prescribes the quality of materials or standards of workmanship shall be accepted to be sufficient compliance with sub-regulation (1).

Regulation 30—Shortlived or Otherwise Unsuitable Materials.

(1) A District Planning Authority may reject plans for the construction of a building with materials which, in the absence of special care, are liable to rapid deterioration of are unsuitable for use in the construction of permanent buildings and may —

(a) impose condition for the use of any such material; and

(b) specify a period after which a building built with a specified type of material should be removed.

(2) Subject to regulation 30(1) no wall or roof of a building shall be constructed of any sheet material whether flexible or rigid supported directly or indirectly by air or other gaseous substances.

(3) The materials specified in column 1 of Part I of Schedule 3 to these Regulations are unsuitable where used as weather-resisting part of an external wall or roof subject to the exceptions provided in relation to them in columns 2 and 3 in the Schedule.

(4) Any material specified in column 1 of Part II of Schedule 3 to these Regulations which is of the standard specified in relation to it in column 2 or 3 of the Schedule shall be considered as satisfying the relevant provisions of these Regulations where applicable.

(5) The provisions on materials, construction and quality of materials set out in Part III of Schedule 3 to these Regulations shall apply in respect of the matters specified in the Schedule in relation to them for the purposes of these Regulations.

(6) In determining, for the purposes of these Regulations whether or not a material is used as water-resisting part of an external wall or roof, no account shall be taken of that material where it is either painted or rendered with any other material which, when so used, does not in itself constitute effective resistance against the weather.

Regulation 31—Testing of Materials.

(1) The materials, elements and components for the erection of any building or any installation for which approval has been given may be subjected to appropriate tests, if the District Planning Authority so requests.

(2) Subject to the nature and type of material, element or component or works, a District Planning Authority may specify the nature of the test to be conducted and may take samples at random for the test.

(3) Where the material, element or component has already been built, covered or buried underground, the District Planning Authority may request the works to be opened up for examination; and if found defective, the works shall be corrected to the satisfaction of the Authority.

(4) Where the defect has been corrected a certificate to that effect shall be issued by the District Planning Authority.

Regulation 32—Materials for Building,

(1) The following materials may be used in the construction of buildings so long as they conform to the provisions of these Regulations —

(a) mud or swish used in plastic state to erect an earthen wall or for atakpame walling;

(b) wattle and daub;

(c) pise or earth rammed between wooden or other formwork to make a wall in situ;

(d) unburnt earth bricks or blocks (adobe,);

(e) stabilised earth products, bricks or blocks (or landcrete);

(f) burnt clay products;

(g) sandcrete, concrete or reinforced concrete;

(h) thatch or leaves in roofing or otherwise;

(i) timber or bamboo products;

(j) asbestos-cement products;

(k) metal products,

(l) glass and synthetic materials;

(m) stone products;

(n) lime-based materials; and

(o) other approved building materials.

(2) The mortar mixes for building specified in column 1 in Table A in Schedule 3 to these Regulations shall be as specified in relation to the purpose specified in columns 2,3 and 4 in the Table.

(3) The size of aggregate and proportion of concrete cement mix shall be in accordance with Table B in Schedule 3.

Regulation 33—Rejection of Building Application.

(1) Notwithstanding the provisions of Regulation 32 a District Planning Authority may, having regard to the architectural values and the general standard of development of any particular area, reject any application for approval of a building, if in its view, the building would detract from the general trend of development in that area.

(2) A person aggrieved by a refusal under subregulation (1) of this regulation may submit a complaint to the National Development Planning Commission within 30 days of becoming aware of the refusal.

PART V—STRUCTURAL STABILITY

Sub Part I—General Application

Regulation 34—Interpretation of this Part.

In this Part unless the context otherwise requires—

"beam" includes purlins, joist, rafter, rib or truss;

"dead load" means the force due to the static mass of all walls, partitions, floors, roofs, and finishes including all other permanent construction;

"floor" includes any part of a floor to be used as a corridor and any balcony used in connection with the floor;

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

“plan area” in relation to a floor, ceiling or roof means the area of the floor, ceiling or roof measured on the plan;

“slab" includes boarding, roof dealing and any beams which are spaced apart at a distance of not less than one metre between centre;

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

Regulation 35—General Load Requirements

(1) Buildings and their structural parts including formwork or falsework shall—

(a) be fire-resisting; and

(b) be capable of safely sustaining and transmitting —

(i) the dead loads;

(ii) imposed loads;

(iii) horizontal; and

(iv) inclined forces

that may reasonably be expected to act on them without exceeding the appropriate limits of stress for the materials of which it is constructed and without undue deflection having regard to the expected service life of the building or structure.

(2) For the purpose of determining the load to which a building shall be subjected—

(a) dead load shall be calculated in accordance with BSCP3; Chapter V: Part 1 of 1967;

(b) imposed loads shall be calculated—

(i) in accordance with BSCP3 Chapter V Part I of 1967; or

(ii) in the case of the imposed load on a floor, ceiling or roof of a house that has not more than three storeys and intended for occupation by one family only, either in accordance with BSCP3: chapter V: Part I of 1967 or in accordance with the provisions of regulation 35, except that, if any actual imposed load will exceed or is likely to exceed the load so calculated, the actual load shall be substituted for the load calculated; and

(c) wind load shall be calculated in accordance with BSCP3: Chapter V Part 2 of 1970 provided that —

(i) in no case shall the factor of safety be taken as less than 1; and

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

(3) The imposed load on any floor, ceiling or roof of a house that has not more than three storeys and intended for occupation by one family only may be taken to be equivalent to a uniformly distributed load per square metre of plan area of not less than 1.44 KN/M², in the case of a floor or a roof to which there is access other than access for maintenance or repair purposes but —

(a) if it causes greater stress than the load, there shall be substituted for that load, in the case of a slab 3.5KN per metre width of slab uniformly distributed over the span of the beam; and 8.5 KN uniformly distributed over the span of the beam; and

(b) where the slab or beam forms part of a cantilever balcony, the projection of the cantilever shall be regarded as the span in the case of a ceiling, 720N/m²; or in the case of a roof (whether flat or pitched) to which there is only such access as may be necessary for the purposes of maintenance or repair, 720N/m² less 50N for every 3 degrees by which the pitch exceeds 30 degrees.

Regulation 36—Submission of Structural Design Drawing

(1) Drawings submitted with application to build shall indicate—

(a) the name and address of the person responsible for the structural design;

(b) the code of practice or standard to which the design conforms;

(c) the dimensions, location and size of all structural members in sufficient detail to enable the design to be checked;

(d) sufficient detail to enable the loads due to materials construction incorporated in the building to be determined

(e) all effects and loads other than dead loads used in the design of structural members; and

(f) all intended uses and occupancies.

(2) The designs shall be signed by the person responsible for the design.

Regulation 37—Documentation and Inspection of Structural Calculations.

The calculations and analysis made in the design of the structural members, including parts and components of a building shall be made available upon request for inspection by the District Planning Authority.

Regulation 38—Ringbeams or Continuous Reinforced Concrete Ties.

(1) All loadbearing walls and cross walls shall have continuous reinforced concrete ties or ringbeams at each floor and at the roof. Such ties shall be of the full width of the wall and not less than 225mm in depth.

(2) The amount of steel shall not be less than 0.8 per cent of sectional area of the concrete required by this regulation and the steel shall be in the form of not less than four rods at the four corners of the band and any additional rods shall be placed at intermediate positions on the sides.

(3) The reinforcements shall be hooped at intervals of not more than 300mm with 8mm round steel rods and where wall plates are used, the plates shall be bolted to the continuous ties with at least 12mm diameter steel bolts properly anchored into the ties at not more than 200mm centres.

Regulation 39—Openings in Walls.

(1) Where groups of doors or window openings are of less distance than the width of the openings apart, lintels shall be made continuous over the series. In cement block, brick or other masonry walling there shall be no opening distance of less than 450mm from any external angle of the walls.

(2) All lintels shall be reinforced in accordance with openings in walls of any storey and shall not constitute more than one-third of the length of the wall, unless the walls are proportionately thickened or adequately framed or other precautions are taken which in the opinion of the District Planning Authority ensure the stability of the structure.

Regulation 40—Ornamental Projections.

All applied or non-structural finishes, cornices, balustrading and ornamental details, whether of the exterior or interior of a building, shall be securely and permanently attached to the structure so as to form all integral part of it.

Regulation 41—Earthen Construction.

For the purpose of design in the earthen materials shown, the materials shall be considered as masonry walling and the characteristic strength of materials used in the design shall be based on the recommendations of the Ghana Standards Specifications for the Production and use of Stabilised Soil Blocks and Line Construction.

Regulation 42—Soil Tests.

In foundations for buildings of three or more storeys, the District Planning Authority may request soil tests to determine the appropriate bearing capacity of the soil.

Regulation 43—Earthquake Loads.

(1) Buildings and other structures shall be designed and constructed to safely resist earthquake effects or seismic forces in accordance with the relevant provisions of the British Standard Code of Practice or the equivalent Ghana standards.

(2) For foundations in earthquake areas, the District Planning Authority may request detailed calculations and structural drawings to accompany applications for development approval.

Regulation 44—Requirements in Respect of Foundations of Buildings.

(1) The foundations of a building shall—

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

(b) be taken down to such a depth or be so constructed as to safeguard the building against damage by swelling or shrinking of the subsoil; and

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

(2) The requirements of subregulation (1) of this regulation shall be regarded as satisfied if—

(a) the foundations of a building are constructed in accordance with the relevant recommendations of BSC; Civil Engineering Code of Practice No.4 — “Foundations”;

(b) where reinforced concrete foundations are required for any part of the construction, the work complies with CP 114: Part 2 1969;

(c) where foundations form part of a building with not more than four storeys (other than a factory or storage building), the foundations are constructed in accordance with BSCP 101: 1963; or

(d) where the foundations of a building are constructed as strip foundation of plain concrete and situated centrally under the walls—

(i) there is no made ground or wide variation in the type of subsoil within the loaded area and no weaker type of soil exists below the soil on which the foundations rest within such a depth as may impair the stability of the structure;

(ii) the width of the foundations is not less than the width specified in the table in Schedule 4 to these Regulation in accordance with the related particulars specified therein;

(iii) the concrete is composed of cement and fine and coarse aggregate conforming to BS882: 1965 in the proportion of 50kg of cement to not more than $0.1m^3$ of fine aggregate and $0.2m^3$ of coarse aggregate;

(iv) the thickness of the concrete is not less than its projection from the base of the wall or footing and is in no case less than 150mm;

(v) where the foundations are laid at more than one level, at each change of level the higher foundations extend over and unite with the lower foundations for a distance of not less than the thickness of the foundations and in any case, not less than 300mm; and

(vi) where there is a pier, buttress or chimmey forming part of a wall, the foundations project beyond the pier, buttress or chimmey on all sides to at least the same extent as they project beyond the wall.

Regulation 45—Structure above Foundations.

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

(2) The requirement of subregulation (1) of this regulation shall be regarded as satisfied as to any structural work of steel if the work complies with BS449: Part 2: 1969 or a comparative Ghana Standards specification.

(3) Subject to subregulation (4) of this regulation, the requirements of sub-regulation (1) shall be regarded satisfied as to any structural work in one of the principal or supplementary aluminium alloys designated in section 1.1 of CP 118: 1969 if the work complies with that publication.

(4) For the purposes of section 5.3 of CP118: 1969, the structure shall be classified as safe-life structure.

(5) The requirements of subregulation (1) shall be considered satisfied as to—

(a) any structural work of reinforced concrete if the work complies with CP114: Part 2: 1969; or

(b) any structural work of prestressed concrete if the work complies with CP115: Part 2: 1969; or

(c) any structural work of precast concrete if the work complies with CP116: Part 2: 1969; or

(d) any structural work of timber if —

(i) the work complies with CP 112: 1952: or CP 112 Part 2: 1967; or

(ii) in the case of work comprising a floor, ceiling or roof of a house with not more than three storeys and intended to be occupied by one family only, and including any timber member within the meaning of Schedule 5 that member complies with the rules set out in that Schedule, and the work in all other respects complies with CP112: 1952, or CP 112: Part 1: 1967.

(6) Any members of the structure which are susceptible to insect or other bacterial agent attacks shall be treated to comply with the requirements in Schedule 4 of these Regulations.

(7) The requirements of subregulation (1) shall be considered satisfied as to —

(a) any structural work of bricks, blocks or plain concrete 18—

(i) the work compares with CP111: Part 2: 1970; or

(ii) in the case of work comprising a wall constructed of bricks or blocks to which Schedule 6 applies the wall is constructed in accordance with the rules of that Schedule;

(b) any wall constructed of stone, flints, clutches of bricks or other burnt or vitrified material, if the wall is one to which Schedule 6 applies and it is constructed in accordance with the rules of that Schedule;

(c) any wholly external part of a chimney or similar structure constructed of bricks, blocks or plain concrete which is not supported by adequate ties or otherwise made secure if, at the level of the highest point in line or junction with the roof, gutter or other part of the building and at any higher level, the width of the chimney or structure is not less than one sixth (1/6) of its height measured from that level to the top of the external part, including (in the case of chimney) any pot or other flue terminal.

(8) For the purposes of paragraph (c) of this subregulation, the width of a chimney or similar structure at any level shall be taken as the small width which can be shown on the elevation of the chimney or structure from any direction.

(9) The requirements of regulation 45(1) shall be considered to be satisfied as to any composite construction in structural steel and concrete if the work complies with CP117: Part 1 1965.

Sub Part II—Additional Structural Requirements for Certain Buildings

Regulation 46—Storey Buildings.

The structural requirements specified in this sub-part shall apply to a building with five or more storeys (including basement storeys if any) in addition to the provisions in sub-part 1.

Regulation 47—Interpretation of this Sub-Part.

(1) In this Sub-Part—

“portion" in relation to a structural member, means that part of a member which is situated or spans between adjacent support or between a support and the extremity of a member; provided that, in the case of a wall, a portion shall be taken to have a length which is the lesser of the following; namely, the length determined in accordance with the preceding provisions of this definition or two and a quarter times the height of the portion (or, if its height varies, its greatest height);

“storey” means that part of a building which is situated between either—

(a) the top surfaces of two vertically adjacent floors of the building; or

(b) the top surfaces of the uppermost floor and the roof covering of the building;

“structural member” means a member essential to the structural stability of a building;

“structural failure” means the failure of a structural member fully to perform its function in contributing to the structural stability of the building of which it forms part.

(2) Dead load and imposed load shall be determined in accordance with regulation 35(2) provided that the imposed load on any structural member may be reduced by not more than two thirds for the purpose of regulation 35 but provided further that—

(a) any load especially allowed for plant, machinery or equipment shall not be reduced;

(b) in the case of a warehouse, garage or building for storage purposes, no reduction shall be made; and

(c) in the case of a factory or workshop, the load shall not be reduced below 5KN/m².

(3) Wind load may be taken as not less than one third of the load determined in accordance with regulation 35 and the load which would cause structural collapse shall exceed the combined dead load, imposed and wind load on the structure together with the loads specified in subregulation (5) by at least 5%.

(4) A building to which this sub-part applies shall be so constructed that if any portion of any one structural member, other than a portion which satisfies the conditions specified in subregulation (5), were to be removed —

(a) structural failure consequent on that removal would not occur within any storey other than the storey of which that portion forms part, the storey next above, if any, and the storey next below, if any; and

(b) any structural failure would be localised within each storey.

(5) The conditions referred to in subregulation (4) of this regulation are that the portion should be capable of sustaining without structural failure the following loads applied simultaneously —

(a) the combined dead load, imposed load and wind load;

(b) a load of 34 KN/m² applied to that portion from any direction; and

(c) the load, if any, which would be directly transmitted to that portion by any immediately adjacent part of the building if that part were subject to a load of 34KN/m² applied in the same direction.

(6) The requirements of subregulation (4)(b) of' this regulation shall be considered satisfied if the area within which structural failure would occur would not exceed 70m or 15% of the area of the storey, measured in the horizontal plane, whichever is the less.

(7) Subject to subregulation (8) of this regulation the requirements relating to the localisation of structural failure shall be satisfied in the case of a building which utilises precast concrete loadbearing wall panels of not less than one storey in height if the work complies with CP 116: Part 2: 1969.

(8) For the purposes of CP116: Addendum No.1: 1970 the building to which this sub-part applies shall be classified as a Group 1 structure.

Sub-Part III—Beams, Scaffolding, Roof—General Application

Regulation 48—General Requirements in Relation to Beams for Building.

(1) Where piles or columns are used to support the whole or part of a building, their tops shall be joined by beams which shall be capable of supporting their own weight and all imposed loads without failure or undue deflection.

(2) All beams shall be securely fixed to the tops of the piles or columns supporting them.

(3) Beams shall be reinforced concrete or pressed or rolled steel except that timber beams may be used where —

(a) a wall supported wholly or partly by the beam is wood framed; or

(b) floor supported wholly or partly by the beam is raised timber floor; or

(c) the load carried consists only of part of the roof, or

(d) it is fixed to each support by a bolt not less than 12mm diameter and built at least 225mm into support with a washer of at least 37mm diameter and a nut and each is of solid timber or made up of two or more pieces of 50mm timber on edge nailed or otherwise fixed together in an approved manner with joints in solid timber beams as over supports and joints in component pieces of laminated beams not fixed within 300mm of one another.

Regulation 49—Hoarding, Scaffolding and Temporary Structures.

(1) The design and construction of hoarding, scaffolding and other temporary structures shall comply with regulation 35 on general load bearing structures.

(2) All hoardings whether used for enclosing a building in the course of construction or for any other purpose shall be constructed of approved materials.

(3) If in the opinion of the District Planning Authority a construction work may constitute a source of danger to the public, it may request the works to be enclosed in a hoarding.

(4) In all construction works where work is carried out at height above ground and requires the use of scaffolding, the scaffolding shall comply with the provisions of the Factories, Shops and Offices Act, 1970. (Act 328).

Regulation 50—Roof Framing.

(1) The framing of roofs shall be sufficiently strong to carry its own weight and all imposed loads without failure or undue deflection, and it shall transmit the weight and load safely to the walls or beams which support it.

(2) The individual members of the framing shall be securely fixed together and the whole be adequately secured to the walls or beams supporting it.

(3) The framing shall be of —

(a) squared timber; or

(b) metal; or

(c) a combination of metal and timber; or

(d) reinforced concrete.

(4) The slope of the roof shall comply with the requirements of this regulation.

(5) Where the covering consists of corrugated galvanised iron or aluminium sheeting, the timber framing shall satisfy subregulation (1) of this regulation.

(6) For monopitch roofs with sloping rafters the framing shall consists of wall plates, rafters, and purlins.

(7) The wall plates supported by walls shall be fixed along the middle of the wall and shall be at least 100mm by 50mm.

(8) Wall plates supported by corbels or columns shall be at least 100mm by 75mm timber where the span is not greater than 1.8m. For longer spans the size shall be decided by the District Planning Authority.

(9) Wall plates shall be securely fixed to walls or corbels with 12mm bolts fixed not more than 1.8m apart.

(10) Each rafter shall consist of one piece of timber and should be not less than—

(a) 100m by 50mm;

(b) 115mm by 40mm for spans up to 3200mm; or

(c) 150mm by 50mm for spans up to 4300mm.

(11) Rafters shall be firmly fixed to wall plates.

(12) For all pitched roofs where the covering is carried on horizontal purlins supported by rafters or cross walls—

(a) purlins shall be fixed on edge and shall not be smaller than —

(i) 75mm by 50mm for spans up to 1400mm;

(ii) 100mm by 50mm for spans up to 2400mm;

(iii) 150mm by 50mm for spans up to 4000mm; or

(iv) sizes approved by the District Planning Authority for spans over 4000mm;

(b) purlins shall be nailed to each rafter with 2 nails each embedded at least 40mm into each piece of timber and joints in purlins shall be over rafters or walls;

(c) purlins shall be fixed —

(i) under each and overlap of the sheets covering the roof; and

(ii) in no case shall they be fixed more than 1200mm apart.

(13) For double pitched roofs with framed truss the type of truss shall be approved by the District Planning Authority.

(14) Alternatively ridge plates could be used with rafters fixed on both sides and opposite each other. The size of ridge plates shall depend on the span and shall in no case be less than 175mm by 25mm. Rafters shall be cut to fit the ridge plate and shall be nailed to it with not less than three nails embedded at least 25mm in each piece of timber.

(15) Where hip rafters are used they shall not be less than 175mm by 50 mm and jack rafters shall be fixed to the hip rafters in the same way as ordinary rafters are fixed to ridge plates.

(16) Where the roof covering consists of tiles of cement slates, timber framing shall be considered to satisfy regulation 45(5)(d) if—

(a) for roofs where the covering is to be cement slates, the spacing of the rafters from centre to centre are approved by the District Planning Authority;

(b) for roofs where the covering is to be flat tiles the rafters are 24mm deeper than for a roof where cement slates are used, i.e 25mm by 50mm instead of 100mm by 60mm; where flat tiles are used the spacing of the rafters is not

greater than that permitted for cement plates under paragraph (a) of this sub-regulation; and

(c) for roofs where the covering consists of half round tiles the battens to which the tiles are nailed are carried on purlins spanning between the trusses of the roof and the size and spacing of these purlins and of the trusses are approved by the District Planning Authority.

Regulation 51—Covering for Pitched Roofs.

(1) Coverings for pitched roofs shall —

(a) be capable of sustaining the expected loads without failure or undue deflection;

(b) prevent the entry of rain; and

(c) be securely fixed to the members which support them.

(2) Where lightweight coverings are used they shall consist of —

(a) galvanized steel sheets; or

(b) aluminium sheets; or

(c) cement or plastic sheets; or

(d) translucent sheets used either alone or in combination with other sheets.

(3) Where heavy roof coverings are used they shall consist of —

(a) concrete tiles; or

(b) burnt clay tiles; or

(c) corrugated asbestos sheets.

(4) No means may be provided by which occupants of the house or other persons can obtain access to the upper surface of any covering to a pitched roof except for maintenance work.

(5) A light-weight covering shall be considered to satisfy subregulation (2) of this regulation—

(a) if the slope of light weight metal sheet coverings to roofs is not less than—

(i) one in six (1:6) in the case of monopitched roofs where each sheet extends the whole length from the top to the bottom of the slope;

(ii) one in four (1:4) where the end lap of sheet is at least 225mm; or

(iii) one in three (1:3) where the end lap of sheets is at least 150mm; or

(b) if the slope of cement or plastic covering to roofs is not less than—

(i) one in six (1:6) in the case of mono-pitched roofs where each sheet extends to the whole length from the top to the bottom of the slope;

(ii) one in four (1:4) where the end lap of sheets is at least 300mm;

(iii) one in three (1:3) where the end lap of sheets is at least 250mm;

(iv) one in two and a half (1:2.5) where the end lap of sheets is at least 200mm; or

(v) one in two (1:2) where the end lap of sheets is at least 150mm.

(6) Where ridging is used it should extend over the sheets for at least—

(a) 300mm where the slope of the roof is not less than one in four (1:4); or

(b) 225mm where the slope of the roof is not less than one in three (1:3).

(7) The overlap at the sides of sheets shall not be less than one and a half corrugations in the case of corrugated sheets; in other cases the overlap shall be to the satisfaction of the District Planning Authority. At each side lap the overlying sheet shall be the one nearer to the direction from which the rain-carrying wind usually blows.

(8) Where a covering abuts against a parapet or other wall or chimney there shall be provided a metal flashing that complies with the following —

(a) galvanised steel shall be corrugated and not thinner than 0.45mm

(b) the sheets shall be fixed;

(i) to angle-iron purlins with galvanized hook bolts;

(ii) to tubular steel purlins with U bolts at lap joints and eaves and with J bolts at intermediate purlins; or

(iii) to timber purlins with sheradized drive screws or other equivalent;

(c) each sheet shall be fixed to every purlin which is beneath it, and washers shall be used with every bolt or nail;

(d) hook bolts or drive screws shall not be less than 6mm diameter and shall be spaced not more than 0.3m apart and fixed through the top of the corrugations with drive screws penetrating at least 40mm into the purlins;

(e) washers for the purpose shall be made of aluminium or galvanised steel and curved to render the hole weatherproof;

(f) the ridge cap and hip caps, if any, shall be secured to the purlins by the same means as the sheeting is secured and shall have a lap of at least 150mm; and the lap on the ridge caps shall be arranged to protect the joint from the rain-carrying wind;

(g) the hip cap, if any, shall be secured to the hip purlins by the same means as the sheeting, and the lap shall be at least 225mm;

(h) aluminium corrugated sheet used shall not be thinner than 0.5mm;

(i) aluminium sheets shall not make contact with any other metal; and the washers, drive screws and bolts for use with them shall be of aluminium, or where this is not possible, galvanized steel or bituminous based washers or flashing may be used;

(j) aluminium shall be separated from concrete or mortar bituminous based material or suitable timber or timber based product;

(k) aluminium sheets, ridge caps and hip caps shall be fixed in the same way as corrugated steel sheets in accordance with the provisions of this regulation;

(l) aluminium troughed sheet shall not be thinner than 0.6mm; shall be fixed in accordance with the manufacturer's instructions and to the satisfaction of the District Planning Authority.

(9) For the purposes of this regulation where plastic sheets are corrugated or of angular section, they shall not be less than 4mm thick; and the sheets shall be fixed in the following manner—

(a) to angle iron purlin with galvanized hook bolts;

(b) to timber purlins with galvanized drive screws;

(c) to every purlins which is beneath it with not less than two bolts or screws and a diamond galvanized washer shall be used with each bolt or screw;

(d) hook bolts or drive screws shall be at least 4mm nominal diameter, and long enough to penetrate the purlins at least 40mm and spaced not more than 300mm apart;

(e) a hole of at least 3mm larger in diameter than the bolt of screw shall be drilled through the top of corrugation over the middle of wooden purlins or the side angle iron purlins and no hole shall be within 40mm of the edge of any sheet;

(f) diamond galvanized washers or other washers approved for the purpose shall be used so as to render the hole weather-proof;

(g) the bolt or screw shall be tightened sufficiently only to seat the washer over the corrugation, so that the roof covering may move slightly relative to the framing without damaging the sheeting;

(h) at side laps, the overlapping sides shall be finished with a down turned edge; and the under-lapping side with an up turned edge, and at each side lap, the overlying sheet shall be the one nearer to the direction from which the rain-carrying wind usually blows;

(i) the ridge caps and hip caps, if any, shall be secured to the purlins by the same means as the sheeting and have a lap of at least 150mm; and the lap on the ridge cap shall be arranged to protect the joint from the rain-covering wind;

(j) the overhang of the bottom edge of the street beyond the lowest purlin shall not exceed 225mm, and the side overhang of sheet shall not exceed 150mm beyond the gable wall;

(k) where roof lights are required translucent sheets shall be used and fixed in the same way as similar shaped sheets; and

(l) where proprietary roof lights are used they shall conform to the manufacturer's instructions.

(10) Roof boards or ladders shall always be used when conducting inspection or maintaining roof coverings.

(11) A heavy covering and corrugated asbestos sheets shall be considered as satisfying this regulation if—

(a) rectangular tiles are set with the top and bottom edges being horizontal;

(b) the width of the tiles is not less than half the length; the thickness is at least 4mm and the dry density is not less than 17 kg/m3;

(c) the slope of the roof in column 2 corresponds with the related width of tile in 1 as follows —

300m or more

200mm to 250mm

below 200mm one in two (1:2);

one in one and half slope;

special permission needed and greater slope;

(d) the whole of the roof is covered by two thickness of tiles at eaves over-hang by not less than 50mm and are formed with an extra course of tiles;

(e) the overhang at a gable end is not more than 50mm and the outside row of tiles is bedded in mortar mix C in Schedule 3 Table B; and

(f) the tiles are hung by means of a fixing hug at the top end.

(12) Where a roof covering abuts against a wall or chimney there shall be provided a metal flashing in accordance with the provisions of this regulation with necessary modification, and at ridges and hips, the tiles shall maintain the proper laps, ridge and hip coverings which shall be of burnt clay, concrete or cement.

(13) Where flat tiles are used—

(a) the thickness of the tiles shall be at least 12mm;

(b) the slope of the roof shall be not less than 1 in 1 or 450;

(c) the end lap shall not be less than 75mm;

(d) eaves shall overhang by not less than 50mm and shall be formed with a tilting fillet and a second course of tiles; and

(e) the overhang at gable ends shall not exceed 75mm.

(14) Where high winds are not expected, the tiles in each third row shall be nailed to the battens with two nails to each tile and the nails shall be 40mm long in copper or cast iron metal.

(15) Where a tile roof covering abuts against a wall or chimney there shall be provided a metal flashing as described in this regulation.

(16) Where half-round tiles are used—

(a) the thickness of the tiles shall be at least 12mm;

(b) the slope of the roof shall not be less than 1 in 1 1/2;

(c) the lap shall not be less than 75mm;

(d) eaves overhang shall not be less than 50mm and the bottom course shall be bedded in mortar mix C;

(e) tiles shall be nailed to battens set on the slope of the roof under each row of overtiles and the size of these battens shall vary with the size of the tile.

(f) undertiles shall be nailed near the top of the battens on each side and overtiles nailed to the top of the battens with one nail to each tile; the nails shall be copper or galvanised steel or aluminum nails at least 90mm for the overtiles and 50mm for the undertiles.

(17) Where a roof is covered with half round tiles and abuts against a wall or chimney there shall be provided a metal flashing in accordance with this regulation.

Regulation 52—Weather Resistance of External Walls, Copings Soakers, Underground Structures

(1) Every external wall, including any parapet of a habitable building in which persons are intended to be habitually employed in any manufacture, trade or business including warehouses shall be so constructed as to adequately resist the penetration of rain, insects and vermin and other rodents from the ground to the inner surface of any storey of the building.

(2) Approved throated copings shall be provided to every wall where the wall is carried above the roof flat or gutter, so as to form a parapet.

(3) Soakers, flashings or cement filleting shall be provided where the tiling or other covering of the roof is in contact with a parapet or other wall or chimney stack carried up above such roof.

(4) Aluminium roofing shall not be built into or directly brought in contact with cement and cement products, unless protected by an approved construction method.

Regulation 53—Underground Structures and Service Ducts.

(1) No person shall construct underground habitable rooms unless the District Planning Authority grants approval in writing.

(2) No service ducts or pipework shall be buried wholly or partially in a loadbearing structural element such as beam, column slab or wall without approval by the District Planning Authority.

Regulation 54—Demolition.

(1) All demolition works shall be conveyed to the District Planning Authority or the police prior to the commencement of the demolition works and it shall be ensured that sufficient warning is given to the public of the danger posed by the works.

(2) Dust arising from demolition work shall be controlled so as not to create nuisance or danger to the health of the general public.

(3) Sufficient precautions shall be taken to safeguard public safety, health and adjoining properties.

Regulation 55—Painting and Maintenance of Building and Structures

(1) Every District Assembly shall ensure that the maintenance cycle of all buildings and other structures are adhered to.

(2) All surfaces which require to be painted shall be so painted.

(3) Subregulation (2) shall apply to both internal and external surfaces of walls, ceilings, piers or columns and all other surfaces which require painting for their preservation and durability.

(4) All paint work shall be executed in accordance with the manufacturers' directions.

(5) A District Assembly shall have the power to request a building owner to paint or carry out maintenance on his premises, if in the opinion of the authority that premises pose a health hazard to the occupants and disturbs the beauty and harmony of the environment.

(6) Where the property owner fails to carry out such request, the District Assembly shall cause the painting or the maintenance or both to be carried out and the cost of all expenses incurred in the work charged to the property owner or the residents if the duty of maintaining the property rests with them.

PART VI—STRUCTURAL FIRE PRECAUTIONS

Sub-Part I—Fire Precautions for Types of Classes of Building

Regulation 56—Interpretation of this Part.

In this Part unless the context otherwise requires—

“basement storey” means a storey which is below the ground storey;

“compartment” means the part of a building separated from other parts of the building by compartment walls and/or floors and includes in some circumstances the roof space above the top storey if the storey is a compartment;

“cubic capacity” means the cubic capacity of building or compartment measured within the inner surfaces of the enclosing wall and the upper surface of the lowest floor of the building or compartment and where the building or compartment has no enclosing wall, the measurement shall be taken from the outer edge of the floor and shall include the space occupied by walls, shafts, ducts etc.

“door” includes any shutter, cover or other form of protection to an opening in any wall or floor of a building or in the structure surrounding a protected shaft;

“elements of a structure” includes the structural frame of a building and any beam or column, a floor and a compartment floor, external walls, separating walls, compartment walls the structure enclosing a protected shaft, loadbearing walls or the load-bearing part of a wall and a gallery, all of which must possess a degree of fire resistance;

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

“separating wall” means a wall or part of a wall which is common to two adjoining buildings.

Regulation 57—Designation of Purpose Groups.

(1) Every building or compartment shall, according to its use or intended use, be classified as falling within one of the purpose groups set out in Table A provided in Part I of Schedule 7 to these Regulation and the rules specified in the Schedule shall apply.

(2) Where a building is divided into compartments and used or intended to be used for different purposes, the classification of each compartment shall be determined separately.

Regulation 58—Provision of Compartment Walls and Compartment Floors.

(1) In any building which exceeds 28 metres in height, any floor which separates one storey from another storey, other than a floor which is—

(a) within a maisonette; or

(b) above the ground storey but of a height not exceeding 9 metres above adjoining ground, shall be constructed as a compartment floor.

(2) The following walls and floors shall be constructed as compartment walls or compartment floors—

(a) any floor in a building or purpose group II Table A in Schedule 7;

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

(c) any wall or floor separating part of a building from any other part of the same building which is used or intended to be used mainly for a purpose falling within a different purpose group in Table B in Schedule 7 to these Regulations;

(d) any floor immediately over a basement storey if the storey —

(i) forms part of a building of purpose group I which has three or more storeys or a building or compartment of purpose group III or V of Table A in Schedule 7; and

(ii) has an area exceeding 100m².

(3) The dimensions specified in Table B in Schedule 7 to these Regulations shall apply to the purpose groups as indicated respectively.

(4) The rules of building measurements provided in Schedule 7 Part II shall apply for the purposes of these Regulations.

Regulation 59—Fire Resistance

(1) Every element of structure shall be so constructed as to have fire resistance for not less than the relevant period specified in Table A in Schedule 8 to these Regulation having regard to the purpose group of the building of which it forms part and the dimensions specified.

(2) The rules specified in the Schedule shall apply as indicated in the Schedule.

Regulation 60—Separating Walls.

(1) Separating walls shall normally not be perforated and shall form a complete vertical separation between any buildings separated, including any roof space in it.

(2) The passage of a pipe may be allowed, if the pipe —

> (a) is not a flue; and has a diameter not exceeding 25mm, if it is made of combustible material or 150mm, if it is made of non-combustible material and is fire-stopped where it passes through the wall; or
>
> (b) has an opening in a separating wall which is necessary as a means of escape from fire, if the opening is fitted with a fire resisting door not less than the period required for the separating wall.

Regulation 61—Fire-resisting Doors.

(1) This regulation shall apply to any door which is required by the provisions of this Part to have fire resistance.

(2) All doors subject to this regulation shall have fire resistance of not less than half an hour.

(3) Any door fitted in an opening in a protecting structure may consist of single or double leaf door which swings in one or both directions and where it has rebated meeting stiles shall —

> (a) have fire resistance of more than half an hour; or
>
> (b) have fire resistance of not less than half an hour if the door opens into a hall, lobby or corridor enclosed by walls or partitions.

(4) Any door to which this regulation applies shall be fitted with an automatic self-closing device either actuated by fusible link or without such a link, but this paragraph does not include the use of rising butt hinges.

(5) Hinges shall be made of either non-combustible material or combustible material that has a melting point of not less than 800ºc.

Regulation 62—Exceptions Relating to Certain Doors in Lift Shafts.

(1) Notwithstanding the requirements of regulation 61, the following may be accepted for a door in lift shafts—

(a) a door with a fire resistance of not less than half an hour provided with an opening into another door which is fitted with an automatic self-closing device actuated by a fusible link; or

(b) a door in a compartment wall which is one of two openings provided at the same level to allow access to a lift from different sides; and has a fire resistance for a period of not less than that prescribed by the relevant provisions of this Part for the structure surrounding the opening.

(2) "Automatic self-closing device" mentioned in subregulation (1) (a) of this regulation does not include rising butt hinges.

(3) Any door specified in this regulation shall, if exposed to test by fire in accordance with section 3 of BS 476: Part 1: 1953, satisfy the requirements of that test, when fitted in its frame, as to freedom from collapse and resistance to passage of flame for the period prescribed by sub-regulation 61(2) as the case may be but with no minimum period in respect of insulation.

Regulation 63—Stairways.

(1) Every stairway, including any landing of it which forms part of a building shall, whether the stairway is internal or external, be constructed of non-combustible materials except—

(a) an internal stairway which is situated—

(i) within a maisonette; or

(ii) within any storey which comprises elements of structure for which the fire resistance required by this Part is less than one hour; or

(iii) within the ground storey or an upper storey of a building or part of purpose group III in Table A Schedule 7 Part I which consists of flats or maisonettes if that building has not more than three storeys or that part is separated as described in regulation 60 and has not more than three storeys; or

(iv) within a building or compartment of purpose group V but not within a protected shaft; or

(b) an external stairway which is situated between the ground and a floor or flat roof, the level of which, at the head of the stairway, is not more than 6m

above the finished surface of the ground adjoining the foot of the stairway; except that nothing in this paragraph shall prohibit the addition of any combustible material to the upper surface of any stairway or landing.

(2) In any building of purpose group I of Table A in Schedule 7 Part I which has three or more storeys, any internal stairway, including any hall or landing associated with it and any part of a floor which affords passage between flights of the stairway, shall be separated from all other parts of the building by structure that complies with the following requirements—

(a) the structure shall have fire resistance for not less than the minimum period required by this regulation for elements of structure forming part of the storey in which it is situated; and

(b) any opening in the structure which gives access to a habitable room or kitchen shall be fitted with a door which has fire resistance of not less than half an hour and complies with regulation 61.

Regulation 64—Limiting the Spread of Flame Over Surfaces of Walls and Ceiling.

(1) This regulation deals with the resistance of materials and elements of structure to serious damage and weakening by fire.

(2) The matters specified in columns 2, 3, 4 and 5 of Table B in Schedule 8 shall apply to the purpose group of building or compartment specified in column 1 of the Table in relation to them.

Regulation 65—Roofs.

(1) Roofs are required to have covering of a minimum degree of resistance to external heat, in given circumstances as designated in Ghana Standards Code of Practice or B.S.476 Part 1 1953.

(2) Any part of a roof which is covered with thatch or wood shingles shall be not less than 6m from any point on a boundary.

Regulation 66—Small Garages.

(1) The following provisions shall apply to any garage or workshop which has a floor area not exceeding 40m2 .

(2) Where the garage or workshop is a separate building and —

(a) is not less than 2m from any boundary or any house within the boundary; or

(b) being less than 2m from any boundary it complies with the requirements of regulation 59; or

(c) being less than 2m from any house within the boundary complies with regulation 65(1)

it shall not be required to comply with any provision in this Part except regulation 65 and any other provisions expressly referred to in this Part.

(3) A garage which is less than 2m from any boundary shall be so constructed that any part of an external wall which is less than 2m from the boundary is externally non-combustible and the walls of the garage have an internal surface which complies with the requirements for Class 0 specified in the Table B of Schedule 8 to these Regulations.

Sub-Part II—Means of Escape

Regulation 67—General.

(1) This sub-part relates to requirements for the provision of unobstructed escape from within a building by way of definite routes (exit ways, corridors and stairs) to a street or an open space or to an adjoining building or roof from which access to the street may be obtained and applies to all buildings in which members of the public may assemble.

(2) Private houses to which members of the public are admitted occasionally or exceptionally may be excepted provided that openings such as windows are not burglary-proofed as to obstruct escape from the house in case of fire and where burglary-proof is used in such openings, habitable rooms shall be provided with adequate exits to facilitate escape in case of fire outbreak.

(3) In addition to the requirements of this sub-part, a District Planning Authority may before granting a building permit, require the provision of additional means of escape in the building plans.

(4) Dwelling houses occupied by more than one family shall have adequate means of escape. Alternative means of escape in tall residential buildings may be by the provision of open balconies, or by close planning around a single fire-resisting staircase to which there is direct access from each floor through an individual ventilated lobby or through a common cross-ventilated lobby.

(5) Buildings for public entertainment shall have comprehensive fire escape systems with the number and position of exists and stairways related adequately to the size of audience and the particular fire risk involved such as the use of the theatre scenery or film projection.

(6) Projection rooms in cinema theatres shall —

(a) be well ventilated;

(b) have direct access to the open air; and

(c) have secondary means of escape provided to both projection and rewinding rooms which can be via one or other of the rooms.

(7) Large single storey buildings shall be provided with perimeter exits at sufficiently frequent intervals of thirty metres between exit staircases, and the gangways leading to them must at all times be kept clear of obstructions.

(8) Where inflammable materials such as celluloid, petrol, oil or spirit are stored, adequate provisions must be made to isolate the spaces where possible and where these materials have to be stored within the body of the premises, fire fighting appliances shall be provided and located to the satisfaction of the District Planning Authority and regulation 58 shall apply.

(9) Solid and oil boiler rooms, electrical intake, transformer and switch rooms, if large, must be provided with secondary means of escape.

(10) Oil fuel boiler rooms and transformer rooms shall be approached only from the open air, but where complete separation is impossible from the open air, approach from the remainder of the building must be through a ventilated lobby.

Regulation 68—Exits.

(1) Exits shall be provided from every floor except for mezzanines that are not enclosed and are of size permitted to have single exit, mezzanines shall be provided with exits on the same basis as required for floor areas in this Part.

(2) An access to an exit shall be provided from every room intended for occupancy and from every podium, terrace, platform or contained open space.

(3) Where a room is intended for an occupant load of more than 60 persons, at least two separate means of escape shall be provided from the room to stairs designed to conform with the requirements for exit stairs and shall be located remote from each other.

(4) Exits may consist of doorways, passage ways, ramps, stairways, horizontal exits and escalators provided that where escalators are used as required exit, they shall be capable of moving only in direction of escape.

(5) Lifts or windows shall not be considered as being part of a required means of escape.

Regulation 69—Dimensions of Means of Escape.

(1) This provision applies to every means of escape except exits that serve not more than one dwelling unit and access to exits within dwelling units.

(2) The occupant load of floor areas or part of floor areas used in determining the minimum required width of means of escape shall be the number of persons for whom the areas are designed but not fewer than that determined under Table C provided in Schedule 7.

(3) Except as provided in regulation 72 the width of an exit corridor shall be at least 1150mm and the width of other exits at least 915mm unless greater widths are required because of the occupant load.

(4) In computing the exit width on the basis of the occupant load, the minimum aggregate width of exterior doors shall be one unit (see sub-regulation (9) of this regulation) per 90 persons, and the minimum aggregate width of other exits shall be one unit per 30 persons for residential occupancies and one unit per 60 persons for other occupancies.

(5) Except as provided in regulation 72 the minimum width of a doorway, corridor or passageway in an access to exit shall be a unit (see regulation (9)[sic] of this regulation) per 90 persons but in no case shall the minimum width of a public exit be less than 1150mm.

(6) The Table C specified in Schedule 7 to these Regulations shall be used to determine the minimum area per person in calculating occupant load.

(7) Occupant load shall be based on two persons per bedroom or sleeping area.

(8) Except as provided in regulation 72 the minimum width of a stairway or ramp in an access to exit shall be 1 unit per 60 persons.

(9) The units of exit width for the purposes of regulation 69(3) to (5) shall be determined by dividing the width (in mm) of exit by 560 and where—

(a) the remainder is less than 300mm, it shall not be considered as contributing to the number of units; or

(b) the remainder is 300mm or more, it shall be considered as contributing unit of exit width in the case of stairs and ½ unit of exit in the case of other exit facilities.

(10) Where an exit serves more than 1 floor area, the aggregate width of the exit need not be cummulative from floor to floor except that where exits from above or below converge at an intermediate level, the width beyond the convergence in the direction of exit travel shall not be less than the aggregate required width of the converging exits.

(11) Except as provided in sub-regulation (10) of this regulation and in regulation 72 the minimum height of exits and corridors which provide access to exits shall be 2.13m.

Sub-Part III—Obstructions and Hazards in Means of Escape

Regulation 70—Scope of Application of Sub-part.

(1) This sub-part applies to obstructions and hazards in every means of escape except those within a dwelling unit or serving not less than 1 dwelling unit.

(2) Where a public corridor contains an occupancy, the occupancy shall not reduce the unobstructed width of the corridor to a dimension less than the required width of the corridor.

Regulation 71—Fire Escape Shall be Completely Free of Obstructions

(1) In any mercantile occupancy, no obstruction such as posts or turnstiles shall be placed so as to restrict the width of a normal means of escape from a floor area or part of a floor area to less than 760mm unless an alternative means of escape is provided adjacent to and is plainly visible from the restricted escape.

(2) No mirror shall be placed in or adjacent to any exit which might confuse the direction of exit, and no mirror or draperies shall be placed on or over exit doors.

(3) Fuel-fined appliances shall not be installed in an exit or corridor serving as an access to exit.

(4) Service rooms containing equipment subject to possible explosion and refrigerating and transformer equipment shall not be located near or under exits required under this Part.

Regulation 72—Doors in Means of Escape, Obstruction and Doors over Landings.

(1) This regulation applies to all doors in a means of escape except exterior doors serving not more than 1 dwelling unit unless otherwise stated in this sub-part.

(2) Exit doors shall not decrease the required exit width by more than 50mm out of every 560mm of exit and where such doors lead out of stairs or ramps in the direction of exit travel, they shall not be less than ¾ of the width of the stairs or ramps.

(3) Doors in their swing shall not reduce the effective width of exit stairs or landings to less than 760mm nor shall they reduce the effective width of an exit passageway to less than the width required under this Part.

(4) No door closer or other device shall be installed in an exit in such a manner as to reduce the head room clearance to less than 2000mm.

(5) An exit door or a door that opens to or is located in the pubic corridor or other facility providing access to exit from individually rented rooms, suite of rooms or dwelling units shall not be less than 2030mm in height.

(6) Except as required in regulation 67(2) and 67(3) such doors shall be at least 813mm in width when only 1 door leaf is provided in the width of an opening. The width of an individual door leaf shall not exceed 1.22m in such openning.

Regulation 73—Direction of Swing Door.

(1) Every door that opens onto a corridor or other facility that provides access to exit from a room or suite of rooms where the room or suite of rooms is used or intended for use by more than 60 persons, and every door that is located within a corridor that is required to be separated from the remainder of the floor area by a fire separation shall swing on a vertical axis in the direction of exit travel and shall not open onto a step.

(2) Where an exit door opens onto a landing, the landing shall be not less than 305mm wider and shall be longer than the width of the door. Such doors either in the open or closed position shall be not closer than 305mm to the nearest riser.

(3) Every required exit door including exit door serving not more than one dwelling unit shall swing on a vertical axis. Such a door shall open in the direction of exit travel except that a door serving not more than one dwelling unit may swing inward.

(4) Revolving doors used as exits shall be of an approved collapsible type, and shall be permitted only at ground floor level away from the foot of any stairway. Not more than ½ unit of exit width may be assumed for such doors and swing doors shall be provided adjacent to such doors.

(5) Except for hotels and motels, doors opening into a public corridor which provides access to exit from individually owned or rented rooms, suites of rooms or dwelling units shall be designed not to lock automatically when such doors are required to be fitted with automatic self-closing devices.

Regulation 74—Exits From Floor Areas.

(1) Except as provided in subregulation (6) and (7) of this regulation, at least 2 exits shall be provided from every storey space so that the travel distance to the nearest exit shall not be greater than 3810mm in the case of business and personal services occupancies and 3050mm for all other occupancies.

(2) For the purpose of this regulation, travel distance means the distance form any point in the floor area to an exit measured along the path of exit travel, except that where all floor area is subdivided into individually owned or rented rooms, suites of rooms or dwelling units, and is served by a corridor required to provide a fire separation from adjacent rooms, suites of rooms or dwelling, units or by an exterior passageway, the travel distance shall be measured from the door of the rooms, suites of rooms or dwelling units to the nearest exit.

(3) Not more than ½ the required exits from a floor area may be horizontal exits.

(4) Where more than one exit is required from a floor area, each exit shall be considered as contributing not more than ½ the required units of exit width.

(5) Where more than one exit is required from a floor area, at least 2 exits shall be independent of each other and be placed remote from each other along the path of travel between them, the maximum distance permitted under this provision being 30 metres between exits.

(6) In buildings of one and two storeys in height, a single exit is permitted from each storey provided the floor area and travel distance requirements conform with Table D in Schedule 7.

(7) A dwelling unit with more than one storey shall have an exit or doorway opening onto a public access from each of its top and bottom storeys except that a single exit is permitted from a dwelling unit provided the exit is an exterior door leading directly from a storey of the dwelling unit at or near grade.

(8) The floor level of the uppermost storey of such dwelling unit shall not be more than 6100mm above the floor level of the storey containing the exit.

(9) Not more than one exit from a floor area above or below the entrance lobby shall lead through the lobby. The lobby shall be not more than 4570mm above grade, and the path of travel through the lobby shall not exceed 1525mm.

(10) The lobby shall conform in all respects with the requirements for exits, except that rooms other than garbage rooms, boiler rooms and rooms containing a residential occupancy may open directly onto such lobby.

Regulation 75—Exit Signs.

(1) This regulation applies to all exits except those serving one dwelling unit or less.

(2) Exits shall be located so as to be clearly visible or their locations shall be clearly indicated.

(3) Except for the main entrance door to a building, every exit in a 3-storey building with an occupancy load greater than 150, shall have an exit sign written over it.

(4) Exit direction signs shall be placed in corridors and passageways where necessary to indicate the direction of exit travel; shall be installed so as to be visible from the exit approach and shall —

(a) have the word "EXIT" in red letters on a contrasting background or white letters on a red background when the sign is internally lighted; and

(b) have white letters on a red background or red letters on a white background when the sign is externally lighted;

(c) have lettering that are made with at least 20mm1 wide strokes; and

(d) be at least 150mm high when the sign is externally lighted, and at least 115mm high when the sign is internally lighted.

Regulation 76—Certificate of Safety.

(1) No building shall be used for any of the purposes classified in Part XIX of these Regulations unless inspected and issued with a certificate of safety by the District Planning Authority and by any other authority charged with any responsibility for the

purpose; and the certificate shall be renewable such after period as may be stipulated.

(2) The cost of inspection and certification shall be borne by the owner in accordance with a fixed rate of charge determined by the District Assembly or such other authority.

PART VII—ACCESS ACCOMMODATION

Regulation 77—Verandahs and Balconies.

(1) The design and construction of verandahs and balconies shall comply with Part V of these Regulations.

(2) No verandah shall be less than 1.5m wide nor less than 10m² in area and every verandah shall have permanent openings to the external air equal to two-thirds of the floor area.

(3) Overhanging balconies supported by brackets or cantilevers shall be constructed of approved material which is fire resistant and proof against rot and rust and shall be built so as not to project over any street or lane except with the approval in writing of the District Planning Authority.

(4) The maximum projection beyond the face of the wall from which the balcony projects shall not exceed 1.20 metres unless adequate structural calculations are provided in support of the design.

Regulation 78—Corridors

(1) The design and construction of corridors shall comply with Part V of these Regulations.

(2) The width of a corridor shall not be less than 1050mm.

(3) All corridors shall be efficiently lighted and ventilated either by one or more openings into the external air in which case no part of any corridor shall be more than 9000mm from any such opening or by approved systems of artificial ventilation and lighting.

Regulation 79—Staircases.

(1) The designs and construction of staircases shall comply with Part V of these Regulations.

(2) Every flight of stairs in any staircase shall be properly constructed of approved materials and shall be securely fixed, shall be of adequate strength, and where exposed to the weather, shall be constructed of rot-proof material.

(3) Where a staircase is constructed in a verandah or corridor the passage left at the side of the stairs shall be not less than 1050mm wide in the clear.

(4) Every staircase which is not part of a public building shall be not less than 900mm wide in the clear with risers of not more than 190mm and treads of not less than 215mm exclusive of nosing.

(5) Landings shall be of a depth of not less than the width of the stairs and shall be provided at intervals of not more than 3600mm vertical rise of the stairs.

(6) Handrails, newels and balusters adequately designed and properly constructed shall be provided and shall be to the satisfaction of the District Planning Authority.

(7) Any flight of steps in a private or common stairway with an aggregate rise of more than 600mm shall have a continuous handrail fixed securely at a height of not less than 840mm and not more than one metre measured vertically above the pitch line as follows —

(a) on each side of the stairway, if the least width of the stairway is one metre or more; or

(b) on one side of the stairway, in any other case.

(8) A clearance of at least 30mm shall be provided between each handrail and the wall to which it is fastened and handrials shall be so constructed that there is no obstruction on or above the handrails to break a handhold.

(9) Handrails and stair stringers shall not project more than 100mm into the required width of a stairway.

(10) No staircase shall be closed by trap doors.

(11) There shall be a level area unobstructed by the swing of a door at the head of every staircase the dimension of which shall not be less than the width of the staircase in any direction.

(12) In buildings of three or more storeys there shall be at least two staircases from the ground to every timber floor exceeding 100m² in clear area and to every concrete floor exceeding 150m² in clear area.

(13) Where two or more staircases are provided in a building their position shall be fixed to the satisfaction of the District Planning Authority.

Regulation 80—Lifts and Hoists.

(1) Builders' works in lift shafts, hoists and escalators shall comply with Part V of these Regulations.

(2) The construction, inspection, maintenance and operation of passenger and service lifts and hoists shall comply with the recommendations of—

(a) British Standard Code of Practice C.P.407/101: Electric Lifts for Passengers and Goods Service and the provisions of the British Standard 2655: “Electric Lifts”, in the case of electrically operated lifts; or

(b) British Standard Code of Practice C.P.407/301: “Hand Power Lifts for Passengers and Goods Service”, in the case of hand operated lifts.

(3) Hand operated passenger lifts shall not be installed to serve more than two floors.

(4) Continuous passenger lifts of the paternoster type shall only be permitted with the written approval of the District Planning Authority.

(5) Lifts, hoists and escalators shall not be considered as means of exit and the requisite number of staircases shall be provided in addition and in accordance with Part V of these Regulations.

Regulation 81—Passenger Lifts.

(1) In any residential building of more than four storeys in height there shall be provided such passenger lifts as may be necessary to give access from the ground floor of that building to each floor on which the entrance of any residence is situated and every residence or flat shall have access to the lifts from the floor on which its entrance is situated.

(2) In buildings with one staircase the lifts shaft shall not be sited within the staircase enclosure and the lift shaft shall be wholly enclosed in fire resisting materials of not less than 75mm in thickness; and solid wooden or metal doors of fire resisting construction and vision panels in it shall be fire-resisting.

(3) In buildings with two or more staircases lift shafts may be within the staircase enclosure provided that each staircase is available to all occupants of the building.

(4) Lifts within staircase wells may be enclosed with metal grilles and collapsible gates provided that the machine room is above the lift shaft.

(5) Enclosed lift shafts shall be provided with a vent to the open air.

(6) Lift shafts shall not contain any service other than that concerned with the operation of the lift and no room, passage or corridor shall be erected under a lift shaft or have access to such shaft.

(7) Landing gates of the close picket type shall be used only for service and goods lifts and shall comply with the British Standard 2655.

(8) Machine rooms for lifts shall be fully enclosed with non-combustible materials and shall be situated above the lift shaft unless written approval of the District Planning Authority is obtained for their being sited elsewhere.

Regulation 82—Escalators.

(1) Escalators shall not be less than 600mm and not more than 1200mm in width measured between balustrades and shall have horizontal tread formation; and the maximum angle or inclination of the escalator with the horizontal shall be 30 degrees.

(2) All escalators shall have a solid balustrade on both sides and each balustrade shall be equipped with a handrail that moves at the same speed as the escalator.

(3) An emergency stop button or other type of switch accessible to the public shall be conspicuously located at the top and bottom of each escalator flight.

(4) Escalators shall be constructed with non-combustible material.

(5) Machine rooms for escalators shall be fully enclosed with non-combustible material.

Regulation 83—Guards.

(1) Every exterior landing, porch and balcony, mezzanine, gallery, raised walkway, roof or other external area to which access is provided other than for maintenance purposes shall be protected by guardrails on all open sides where the difference in elevation between adjacent levels exceeds 600mm.

(2) Every private stairway or common stairway shall be guarded on each side by a wall or be protected by guardrails extending to a height of not less than 840mm measured vertically above the pitch lines.

(3) Except as provided in Part V of these Regulations, all guards including those for balconies shall be at least 1.1m in height (1100mm in height).

(4) A guard rail to a landing or similar space that forms part of a stairway shall be at least 900mm in height in the case of a private stairway or 1100mm in height in the case of a public stairway.

(5) An opening through a guard on a balcony or an exit stair, except an exit stair serving not more than one dwelling unit, shall be of such a size as to prevent the passage of a spherical object with a diameter of 100mm in residential occupancies and 200mm in other occupancies, unless it can be shown to the satisfaction of the District Planning Authority that the location and size of the openings which exceed the limit do not represent a hazard.

(6) Guards around exterior balconies of buildings of residential occupancies shall be designed so that no member, attachment or opening located between 100mm and 1100mm above the balcony floor will facilitate climbing.

PART VII— AIR MOVEMENT AND VENTILATION

Regulation 84—Interpretation of this Part.

In this Part unless the context otherwise requires —

“air movement” means natural air flow such as prevailing breezes and is essential up to 2 metres above floor level when considering thermal comfort in a habitable room or any such space within the meaning of these provisions in a warm humid climate;

“borrowed ventilation” means ventilation the egress or ingress of which is through a space or room other than the space or room for which ventilation is being considered;

“mechanical ventilation” means ventilation within the meaning of this provision by mechanical means such as propeller flow fans, impeller type fans, centrifugal or tangential flow fans;

“natural ventilation” means the exchange of fresh air to or from a habitable room or any such space within the meaning of these Regulations and results from a temperature difference between a significantly cooler outdoor air and a relatively warmer air in an interior space;

“privy accommodation" means an accommodation containing a pit latrine, an earth closet, a K.V.I.P., a water closet, a urinal or any such facility;

"top ventilation" means a facility for the ventilation of a habitable room, larder, stairway or any such space within the meaning of this provision and located within a building or part thereof at a height of not less than 1.75 metres above floor.

Regulation 85—Scope of Application of this Part.

This Part applies to the air movement through and natural ventilation of any habitable room store, larder, stairway, room containing bath, urinal, privy accommodation, corridor or any such room or space which has one or more windows.

Regulation 86—Natural ventilation, Air Movement and Cross Ventilation.

(1) Every habitable room, store, larder, ventilation, stairway, room containing bath, urinal, privy accommodation, corridor or any such room or space shall be provided with facilities for the entry from and natural ventilation to the open air provided that the rooms and spaces may be considered to satisfy this provision if they are mechanically ventilated except that electric fans shall not be permitted in lieu of the requirement of this provision.

(2) Every habitable room shall be provided with windows and ventilation openings and appliances so located as to facilitate within the rooms adequate cross air movement to and from the open air but the facilities shall not be more than 1200min above floor level and the highest level shall not be less than 2100m above floor level.

(3) The requirement of this Part shall be considered satisfied if natural ventilation and air movement are to and from verandahs, balconies, conservatories or any such space or room which meets the requirements of Part VII.

(4) No door or doorway shall be taken into account when calculating the area available for air movement and the entry of natural ventilation.

(5) Windows shall open to the external air and shall be provided in all rooms. The total clear opening shall in every case be equivalent to at least one sixth (1/6) or 16% of the floor area. All habitable rooms shall have at least two windows and adjacent walls shall be so located as to ensure effective air movement and cross ventilation.

(6) Where all the windows of the habitable room have fixed glazing, the room shall be provided with two ventilation openings to open into the open air. Such openings shall be in accordance with subregulation (5) of this regulation.

(7) A window opening from a room onto a verandah shall shall be considered to open into the external air only if permanent unobstructed opening in the verandah wall is directly opposite the room window and is of at least twice its area.

Regulation 87—Ventilation of Habitable Rooms, etc.

(1) Part of the natural ventilation of every habitable room, shop or workroom may be top ventilation.

(2) The area available for top ventilation shall not be less than one sixtieth (2%) of the floor area of the room.

(3) The total area available for natural ventilation shall not be less than —

> (a) one sixth of the floor area of the room, where the ventilation is one wall only; or
>
> (b) one eighth of the floor area of the room where there is ventilation in two or more walls provided at least one quarter of the minimum area for ventilation is in each of the two walls.

Regulation 88—Natural Ventilation through Covered Balcony or Verandah.

(1) Where natural ventilation is through a covered balcony or verandah —

> (a) the minimum permissible areas of top and total ventilation to the open air from the balcony or verandah shall be calculated from the combined areas of the room and balcony or verandah added together; and
>
> (b) the minimum areas of top and total ventilation to the balcony or verandah from the room and balcony or verandah added together.

(2) Where part of a habitable room is used as a kitchen—

> (a) the minimum permissible areas of top and total ventilation shall be calculated from the total area of the room; and

(b) adequate ventilation shall be provided over the kitchen area by means of a flue, top ventilation or any other known conventional method proof of which shall lie with the applicant.

Regulation 89—Ventilation of Storage Room, Kitchen, Bathroom, Privy Accommodation.

(1) Every storage room which is used or intended to be used for storing food other than food in unopened sealed containers shall have ventilation to the open air.

(2) Ventilation of a storage room shall consist of openings for top ventilation not less than 0.15m² in area and openings for other ventilation of not less than 0.15m² in area, the lower side of which is not more than 0.3m above floor level.

(3) All such openings shall be covered with fly screens.

(4) Part of the natural ventilation of every kitchen may be top ventilation.

(5) The area of top ventilation of a kitchen shall be not less than one-twenty-fourth (5%) of the floor area of the kitchen exclusive of the area of any flue attached to a heating appliance.

(6) The area of total ventilation of a kitchen shall be at least one sixth (16%) of the floor area of the kitchen.

(7) The total area available for the ventilation of an ablution room shall be at least 0.20m².

(8) The total area available for the natural ventilation of a room containing only privy accommodation shall not be less than 0.20m².

(9) The total area available for the natural ventilation of a room containing both bath and privy accommodation shall not be less than 0.30m².

(10) Where privy accommodation is not a water closet or an aqua privy the whole area of the ventilation opening shall be covered with mosquito gauze fixed to a wooden frame.

(11) There shall be no borrowed ventilation from an enclosed place into a privy accommodation.

Regulation 90—Escape from Fire.

(1) In the event of fire it shall be possible to escape from every habitable room, shop or workroom by means of at least one opening in addition to the door. The area of this opening shall be not less than 0.40m² and neither the height nor width shall be less than 0.45m² in the clear, the bottom shall be not more than 0.75 above floor level.

(2) An escape opening shall be considered to satisfy this provision —

(a) where metal bars, expanded metal or louvres are fitted over the escape opening as a protection against burglary and are fixed to a casement which can be opened and where this casement is locked or padlocked shut, the key is kept in a glass fronted box fixed to a wall of the room at least 1.0m from the opening; or

(b) where glass louvres are used, they must be capable of being quickly smashed or otherwise removed and flyscreen cut or removed without delay.

(3) The following requirements for air flow and natural ventilation shall apply also —

(a) where each external wall of the room is not less than 0.30m thick and exerts a stress of at least 4,311 pascals of vertical superficial area, the total area available for airflow and natural ventilation shall not be less than one-fortieth of the floor area of the room provided that nothing in this provision shall require any part of the opening to be less than 2m above floor level;

(b) where an external wall located between south-east and south-west or an external wall facing between north-east and north-west is shaded from the direct rays of the sun by eaves or other projection which extends at least 1.2m from the outer surface of the wall —

(i) the total area available for the airflow and natural ventilation shall be not less than one twelfth of the floor area of the room; and

(ii) the bottom of this opening shall be not less than 1.0m above floor level.

(4) In all climates where air flow and natural ventilation is through a covered balcony or verandah the area of such an opening shall be not less than one eighth of the combined floor areas of the room and balcony or verandah added together.

PART IX—THERMAL INSULATION

Regulation 91—Scope of Application of this Part.

(1) This part applies to roofs, walls, and fenestration of any building which is used partly or wholly as a habitable dwelling, shop, workroom, storeroom or any similar purpose.

Regulation 92—Roofs.

(1) Any roof with its related structures to which this Part applies shall adequately mitigate heat gain through the roof and fenestration into an interior space fenestration and shall have an outer covering or finish with a high thermal resistance.

(2) A u-value of not more than 0.25 for any roof shall be considered to satisfy this requirement. A roof may be considered to satisfy this requirement if it has an outer finish or covering of any of the following materials or a combination of them —

(a) wood shingles;

(b) corrugated aluminium sheet;

(c) corrugated galvanised iron sheet;

(d) copper;

(e) flat aluminium sheet; or

(f) bituminous felt with an approved mineral finish or paint,

except that this provision does not prohibit the use of concrete, tiles, clay tiles or slates.

(3) A material not specified in subregulation (2) does not preclude its use but the burden of proof of the resistively of any such material used shall lie on the applicant or developer.

Regulation 93—Walls, Protection of Walls and Opening from Solar Radiation.

(1) Any external wall of any part of a building to which this provision applies, including its internal surface finish, shall, with the exception of any opening, be so constructed as to provide an adequate mitigation against the passage of heat from outside into the interior space.

(2) Any wall construction with a u-value of not more than 0.30 shall be considered as satisfying this requirement.

(3) Any wall of a room wholly or partly in the roof of a building or any part of a building to which this provision applies shall comply with subregulations (1) and (2) of this regulation and shall have a u-value of not less than 0.30.

(4) Any opening for fenestration or doorway or any wall in a building to which this provision applies shall be so constructed as to mitigate solar heat gain from the direct rays of the sun and shall be so protected by means of extension of eaves and any other projection extending to a minimum distance of 600m from the external wall or any other approved solar protection; except that any wall which is not so protected shall be considered to satisfy this requirement if its thermal performance meets the requirements of this provision.

(5) Openings for fenestration where possible, shall be located in the north or south facades and shall be protected in accordance with this provision.

(6) The specifications in Schedule 9 to these Regulations shall apply in respect of u-values of building materials.

PART X—HEARTHS, CHIMNEYS AND HEAT-PRODUCING APPLIANCES

Sub-Part I—Interpretation and Scope of Application of this Part

Regulation 94—Interpretation of this Part.

In this Part unless the context otherwise requires —

“appliance” means a heat-producing appliance including a cooker or any other such appliance which is designed to burn —

(a) solid fuel (in this Part referred to as “solid fuel appliance”);

(b) oil (in this Part referred to as a “oil burning appliance”);

(c) gaseous fuel (in this Part referred to as a “gas appliance”);

“appliance ventilation duct” means a duct that forms a passage which in one part serves

to convey combustion air to one or more gas appliances, in another part serves to

convey the products of combustion front one or more gas appliances to the external air

and intermediately serves both purposes;

“chimney” includes any part of the structure of a building that forms part of a flue other than a flue pipe;

“Class I appliance” means —

(a) a solid fuel appliance or oil-burning appliance with an output rating not exceeding 45 kw; or

(b) an incinerator with a refuse combustion chamber exceeding 0.03m³ but not exceeding 0.08m³ in capacity;

"Class II appliance" means —

(a) a gas appliance with an input rating not exceeding 45 kw; or

(b) an incinerator with a refuse combustion chamber not exceeding 0.03m3 in capacity;

“constructional hearth” means a hearth that forms part of the structure of a building;

“discharge” means the discharge of the products of combustion;

“external wall” includes any external cladding or internal lining;

“floor” includes any ceiling which is applied or fixed to the underside of the floor;

“flue” means a passage for conveying the discharge of an appliance to the external air and includes any part of the passage in an appliance ventilation duct which services the purpose of a flue;

“flue pipe” means a pipe that forms a flue, but does not include a pipe built as a lining into either a chimney or an appliance ventilation duct;

“high-rating appliance” means—

(a) a solid fuel appliance or oil-burning appliance with an output rating exceeding 45 KW; or

(b) a gas appliance with an input rating exceeding 45 KW; or

(c) an incinerator with a refuse combustion chamber exceeding 0.08m3 in capacity, and “high-rating” shall be construed accordingly;

"insulated metal chimney" means a chimney comprising a metal flue lining, non-combustible thermal insulation and a metal outer casting;

“main flue" means a flue serving more than one appliance;

“permanent vent" means a purpose made opening duct designed to allow the passage of air at all times;

“roof" includes any ceiling which is applied or fixed to the under side of a roof and is in a plane parallel to that of the roof covering;

“room-sealed appliance" means a gas appliance which draws its combustion air from a point immediately adjacent to the point where it discharges its products of combustion and is so designed that the inlet, outlet and combustion chamber of the appliance is situated, except for a door for ignition purposes;

“subsidiary flue” means flue conveying the discharge of one appliance into a main flue;

“super imposed hearth” means a hearth which does not form a part of the structure of a building;

“ventilation opening” has the meaning provided for that expression in Part VIII.

Regulation 95—Scope of Application.

(1) The provisions of this part shall apply to the construction of—

(a) a chimney which is a separate building; and

(b) an insulated metal chimney which serves a Class I or Class II appliance.

(2) Any provision in this Part which applies to a chimney, flue pipe, fireplace recess or constructional hearth serving a Class I appliance shall also apply where a solid fuel fire is intended to burn directly on a hearth without the installation of any appliance.

(3) For the purposes of this regulation, "appliance" and "incinerator" shall not include an incinerator that uses electricity as a means of igniting refuse.

Sub-Part II—Where Solid Fuel is Used

Regulation 96—Provision of Facilities, Fireplace Opening.

(1) Where in order to satisfy the requirements for the provision of kitchens or for any other reason it is intended to use an open fire or heat producing appliance which burns solid fuel, there shall be installed either—

(a) a fireplace opening which complies with sub-regulation (2) of this regulation; or

(b) in the case of a portable cooking appliance, an open cooking slab which complies with regulation 98(1) provided that an open cooking slab shall be used only with the written permission of the District Planning Authority.

(2) Every fireplace opening shall comply with the following requirements—

(a) it shall be provided with a hearth which complies with regulation 97 (1) relating to hearth;

(b) the back and sides of the fireplace opening shall be of solid non-combustible construction throughout;

(c) the thickness of the wall at the back of the fireplace opening shall be—

(i) not less than 150mm where the wall is exposed on one side to the open air; or

(ii) not less than 200mm where the wall is not exposed to the open air; and

(d) the thickness of the jambs at the sides of the fireplace opening shall not be less than 200mm.

(3) The solid non-combustible construction made in accordance with subregulation (2) of this regulation shall extend to the full height of the fireplace opening and to the underside of the lintel over the opening and shall in no case be less than 800mm above the upper finished surface of the hearth.

(4) A fireplace opening shall be considered to satisfy subregulation (2) of this regulation if —

(a) the back and sides of the fireplace opening are made of concrete mix B or approved bricks set in mortar mix C or sand cement blocks set in mortar mix C; or

(b) lintels are of concrete mix C suitably reinforced or a sufficiently strong support or steel wrought iron or other approved materials or approved burnt bricks set in arch form in mortar mix C in Schedule 3 Table B.

Regulation 97—Hearth.

(1) Every fireplace opening designed for an open fire or for a built-in or inset heat producing domestic appliance burning solid fuel shall be provided with a hearth which complies with the following—

(a) the hearth shall be of solid non-combustible construction material throughout;

(b) the hearth shall extend throughout the whole base of the fireplace and shall project not less than 400mm beyond the face of the opening or the front of the appliance where the appliance projects into the room and beyond each other side of the fire place opening for a distance of not less than 150mm; and

(c) the hearth throughout its whole area shall be not less than 100mm thick exclusive of any tiles or other non-combustible finish.

(2) Where the fireplace opening is raised above the floor level, the area of floor beneath, at the sides of, and in front of the fireplace shall be regarded as hearth and shall comply in construction and thickness with subregulation (1) of this regulation.

(3) Every free-standing heat producing appliance burning solid fuel shall be provided with hearth which complies with the following—

(a) the hearth shall be of solid non-combustible construction material throughout;

(b) the hearth shall extend throughout the area below the base of the appliance and shall extend beyond the front of the appliance for a distance of not less than 400mm and beyond each other side for a distance of not less than 150mm; and

(c) the hearth throughout its whole area shall not be less than 100mm thick exclusive of any tiles or other non-combustible finish.

(4) The upper surface of that portion of a hearth which projects in front of the fireplace or appliance shall not be lower than the upper finished surface of the floor adjoining it.

(5) No timber or other combustible material shall be fixed below a hearth within 100mm measured vertically from the upper finished surface of the hearth; and of the

timber fillets supporting the edges of the hearth at the front or sides of this measurement of 100mm, and at least 50mm shall be an air gap.

(6) A hearth shall be considered to satisfy sub-regulation (1) of this regulation if —

(a) it is constructed of concrete mix B or approved bricks set in mortar mix C in Schedule 3 Table C; and

(c) any timber supports to the edges of the hearth do not extend more than 50mm under the edge of the hearth.

Regulation 98—Open Cooking Slab.

(1) Any open cooking slab approved in a building plan shall comply with the following—

(a) it shall be constructed of solid non-combustible materials;

(b) it shall be not less than 900mm in length and 500mm in width; and

(c) no combustible materials shall be fixed nearer to the slab than 150mm measured horizontally from any edge of the slab.

(2) An open cooking slab shall be considered to satisfy subregulation (1) of this regulation if —

(a) it is constructed of —

(i) insulating board;

(ii) stones slab;

(iii) concrete mix C in Schedule 3 Table C of at least 25mm thick;

(iv) blocks; or

(v) bricks; and

(b) it is either self-supporting or supported in a suitable way.

Regulation 99—Use of Combustible Material.

(1) No timber or other combustible material shall be built into the structure of a building within 200mm from any part of a fireplace opening or an opening into a fireplace opening.

(2) Nothing in subregulation (1) of this regulation shall prevent the use of a damp-proof course composed of combustible materials if it is solidly bedded in mortar.

Regulation 100—Solid Fuel Appliance and Installation of Appliances.

(1) Every heat-producing appliance shall be designed and constructed so as to contain the fire and shall —

(a) be provided with an opening of adequate size for the removal of smoke and noxious fumes; or

(b) if the appliance is portable, be such that it can be placed on a cooking slab.

(2) Every heat producing appliance which uses solid fuel shall be of a type approved by the District Planning Authority.

(3) Every heat producing appliance other than a portable appliance shall be installed —

(a) directly on a hearth; or

(b) on a layer of non-combustible material which rests wholly on a hearth.

(4) Every such appliance shall be installed so that no distance measured horizontally between any part of the appliance and a plane rising vertically from an edge of the hearth is less than —

(a) 400mm from the front of the appliance; or

(b)150mm from the back or sides of the appliance.

(5) There shall be provided for every portable heat-producing appliance—

(a) a hearth; or

(c) an open cooking slab, with the permission of the District Planning Authority.

(6)A hearth provided under subregulation (5) shall—

(a) extend throughout the whole base of the fireplace and shall project not less than 400mm beyond the face of the opening or the front of the appliance where the appliance projects into the room and beyond each other side of the fireplace opening for a distance of not less than 150mm; and

(b) be not less than 100mm throughout its whole area exclusive of any tiles or other non-combustible surface finish.

Sub-Part II—Use of Liquid Fuel

Regulation 101—Provision of Liquid Fuel Facilities.

(1) Where in order to comply with this Part it is intended to use a heat producing appliance which burns liquid fuel there shall be provided —

(a) a fixed portable appliance no burner of which is designed to consume more than 300ml of liquid fuel per hour, in which case there shall be provided an open cooking slab which complies with regulation 98 or 106; or

(b) an appliance of which no flame is exposed and of which at least one burner is designed to consume more than 300ml of liquid fuel per hour, in which case there shall be provided a hearth or an open cooking slab; or

(c) a free standing burner with an exposed flame at least one burner of which is designed to consume more than 300ml of liquid fuel per hour; in which case there shall be provided a hearth which complies with regulation 104(4) or a surround which complies with regulation 106(3).

(2) Where in order to comply with these Regulations a hearth is provided it shall—

(a) be of solid, non-combustible material throughout;

(b) extend under the whole area of the appliance and shall project at least 150mm beyond each side or to a wall or surround constructed of solid non-combustible material whichever is the lesser distance; and

(c) be not less than 50mm thickness throughout its whole area.

(3) Where in order to comply with regulation 104(3) surround is provided for an appliance—

(a) the surround at the back and sides of the appliance shall be of solid non-combustible material throughout; and

(b) the thickness of the surround shall be not less than 150mm in any place.

(4) No combustible material shall be fixed within 225mm measured horizontally of any flame.

(5) A surround shall be considered to satisfy regulation 98(1) if it is of concrete mix C or cement aggregate dense blocks.

(6) Any open cooking slab shall conform with regulation 98 of these Regulation.

Regulation 102—Installation of Liquid Fuel Appliances.

(1) Every heat producing appliance which burns liquid fuel shall be of a type approved by the District Planning Authority.

(2) Every appliance which burns liquid fuel shall be installed in such a way and position—

(a) as to operate efficiently and safely;

(b) that no distance measured horizontally between any flame and any combustible material is less than 200mm; and

(c) that no distance measured vertically upwards from any flame to any combustible material is less than 75mm.

Sub-Part III—Use of Gaseous Fuel

Regulation 103—Provision of Appliances.

(1) Where it is intended to use a heat producing appliance which burns gaseous fuel in a building, there shall be provided —

(a) a fixed appliance, in which case there shall be provided a hearth which complies with regulation 104(4); or

(b) a portable appliance, in which case there shall be provided an open cooking slab which complies with regulation 98.

(2) For every fixed heat producing domestic appliance which burns gaseous fuel there shall be provided a hearth which complies with the following—

(a) the hearth shall be of solid non-combustible construction material throughout;

(b) the hearth shall extend over the whole area covered by the appliance and shall project in front of the appliance not less than 225mm measured horizontally from any flame or material which becomes incandescent when the appliance is in use, and beyond each other side of the appliance not less than 150mm or to any adjacent non-combustible wall which ever is the lesser distance except that this shall not apply in the case of an appliance—

(i) of which the lowest part of any flame or material becomes incandescent when the appliance is in use at a height of not less than 225mm above any combustible material; or

(ii) which is so designed that under any condition of normal operation the temperature at the base of the appliance does not exceed 1000c and provided further that where the floor is of concrete or other solid non-combustible material no additional hearth is required.

Regulation 104—Biogas Installations.

(1) Where control community biogas or individual house unit biogas systems are provided or are intended for use in a building, the distribution pipes and other fittings shall be of non-corrosive materials and of such quality as shall withstand the pressure build-up of gas in the systems.

(2) A biogas system shall be designed and constructed so as not to be a source of danger or nuisance to the environment.

(3) The use of such a system shall be subject to the approval of the District Planning Authority.

(4) A hearth shall be considered to satisfy regulation 103 if it is constructed of—

(a) asbestos insulating board;

(b) stone;

(c) concrete mix C in Schedule 3 Table C at least 25mm thick; or

(d) cement sheet at least 6mm thick.

Regulation 105—Gas Appliances and Installation.

(1) Every heat producing appliance which burns gaseous fuel shall be of a type approved by the District Planning Authority.

(2) Every gas-burning heat producing domestic appliance shall be installed in such a way as—

(a) to operate efficiently and safely;

(b) to comply with any existing gas bye law; and

(c) where the source of gaseous fuel is from a cylinder container, a compartment shall be constructed to isolate the cylinder from the gas appliance.

(3) No gas cylinder shall be left unprotected unless it is located outside the kitchen in the open air.

Sub-Part IV—Use of Electricity for Fuel

Regulations 106—Provision of Electrical Appliance.

(1) Every heat producing appliance which consumes electricity shall be of a type approved by the District Planning Authority.

(2) An electric heat producing cooking appliance shall be properly installed.

(3) Where it is intended to use a heat producing cooking appliance which consumes electricity there shall be provided—

(a) a fixed appliance in which case there shall be provided a hearth which complies with subregulation (4) of this regulation; or

(b) a movable appliance in which case there shall be provided for each kitchen an open cooking slab which complies with regulation 98.

(4) For the purposes of this regulation the hearth—

(a) shall be of solid non-combustible construction material throughout; and

(b) shall extend over the whole area covered by the appliance; and

(c) shall project in front of the appliance not less than 225mm measured horizontally and beyond each other side of the appliance not less than 150mm or to any adjacent wall whichever is the lesser distance except that where the floor is of concrete or other solid non-combustible material no additional hearth is required.

(5) A hearth shall be considered to satisfy sub-regulation (4) if it is constructed of—

(a) asbestos insulating board; or

(b) stone; or

(c) concrete mix C at least 25mm thick; or

(d) asbestos cement sheet at least 6mm thick.

PART XI—SOUND INSULATION

Regulation 107—Scope of Application of Part.

This Part applies to spaces in buildings for human habitation on and is intended for the prevention of sound transmission between dwelling houses and also from rooms used for other purposes.

Regulation 108—Sound Insulation of Walls.

(1) Any wall which—

(a) separates any dwelling from another dwelling, or from another building; or

(b) separates any habitable room in a dwelling from any other part of the same building which is not used exclusively with the dwelling and is a place used for purposes other than occasional repair or maintenance, or is a machine room or tank room

shall in conjunction with its associated structure be so constructed as to provide adequate resistance to the transmission of airborne sound provided that no requirement of this provision shall prohibit the use of any material of equal performance.

(2) A wall which separates any habitable room in a dwelling from any refuse chute in the same building shall be constructed with reinforced concrete bricks, cement block, sandcrete block or any such material with an average mass not less than that of any of the material mentioned in this provision, provided that the requirement of this

provision shall be considered satisfied if other materials or combination of the materials mentioned herein of equal performance in sound reduction is used.

(3) A wall which separates any part of a dwelling other than a habitable room from any refuse chute in the same building shall be constructed in accordance with subregulation (2) of this regulation.

Regulation 109—Sound Insulation of Floors.

(1) Any floor which separates a dwelling below its floor from —

(a) another dwelling; or

(b) any other part of the same building which is not used exclusively with that dwelling and is a place used for purposes other than occasional repair or maintenance, or if a machine room or tank room,

shall in conjunction with its associated structure be so constructed as to provide adequate resistance to the transmission of airborne and impact sound.

(2) Any floor which separates a dwelling situated above a floor from any other part of the same building which is not used exclusively with the dwelling and is a place used for purposes other than occasional repair or maintenance or is a machine room or tank room, shall in conjunction with its associated structure be so constructed as to provide adequate resistance to the transmission of windborne sound.

PART XII—PEST CONTROL AND PROTECTION AGAINST DECAY

Regulation 110—Scope of Application of this Part.

(1) This Part shall apply for the control and protection against termite attack, infestation, destruction and decay of wood or wood products used in the construction of any building.

(2) The construction of any building to which this Part applies shall conform with the following fundamental construction practices—

(a) positive site hygiene and treatment;

(b) chemical pre-treatment of wood to prevent fungal decay as well as termite attack;

(c) use of naturally durable wood; and

(d) ventilation, moisture and condensation control in enclosed spaces.

Regulation 111—Treatment of Site Against Pest, Infestation and Decays.

(1) A building site shall be initially cleared of all roots, tree stumps and vegetable deposits of any description.

(2) At start and during construction, wood of description, such as cut ends, broken shuttering and shavings shall not be left in the vicinity of the building.

(3) The site shall be graded to provide drainage away from foundation walls.

(4) The proposed height of finish grade shall assure proper clearance for timbers resting on top of the foundation.

(5) All roofs, form-boards and scraps of timber shall be removed from the immediate vicinity of the building before back filling and before any floor step.

(6) In areas of termite infestation, the back-filling materials around external foundation walling shall be liberally treated with anti-termite solution; preferably during the dry season.

(7) An apron or concrete slab protection of 100mm thick and of width not less than 600mm shall be constructed around the external walls of the building to provide a termite shield but gravel paving around the external walls well consolidated shall be sufficient for the purpose of termite apron.

(8) In the case of a basement or crawl-space, good foundation drainage, damp proofing of walls below grade and vapour barrier under basement or ground floor concrete slab shall be provided.

(9) Every concrete ground or basement floor step and supporting foundation walls shall be constructed in accordance with Part V of these Regulations.

Regulation 112—Sub-floor Ventilation.

(1) Basement and crawl-spaces under suspended timber floors shall be well ventilated by providing ample screen openings and the openings shall have a net area of not less than 600mm² for each 30m of exterior wall, plus 300mm2 for each 10m² of enclosed basement or crawl space.

(2) Openings shall be arranged in such a way as to provide maximum cross ventilation.

Regulation 113—Termite Shields or Mechanical Barriers.

(1) Termite shield or other approved mechanical barrier shall not be substituted or chemical control of building site.

(2) A termite shield shall be of not less than 26 gauge galvanised iron or other suitable material and installed on top of all foundation walls, piers and around pipes which may lead from the ground; longitudinal joints shall be welted and locked.

(3) All exposed timber surfaces, as well as adjoining masonry or concrete surfaces shall be pitched to cause rapid water runoff. Construction details which tend to trap moisture in end-grain joints shall be avoided.

(4) All timber for roof or floor structure shall be of durable timber well-seasoned and treated with an approved chemical preservative against termite infestation.

(5) Unless there is adequate protection by roof overhangs and other projections from external walls, the heads of all openings in external walls shall be protected with metal or plastic flashing material.

(6) Flashing shall be installed where a roof joins a wall, where a porch or patio floor joins to the building wall and in roof valleys.

(7) Clearance between the bottom of timber joists, or planks and the ground shall not be less than 500mm and between the ground and the bottom of any wood girder, the clearance shall not be less than 300mm.

(8) Where timber posts are used to support ground floor framing, a roof or any part of a building, they shall rest on concrete pedestals at least 500mm high above the earth. All concrete floors shall be provided with a termite shield and the bottom of posts shall be treated especially well with an approved preservative. This provision shall not preclude the use of metal shoes to timber posts or any other approved method for the protection of the bottom of the timber posts.

(9) Timber buildings in rural areas shall be constructed in accordance with approved traditional methods and practices.

(10) Timber sills which rest on concrete or block exterior walls shall not be less than 250mm above exposed earth on the exterior of the building and shall be of durable timber shield treated with an approved preservative and provided with a termite shield.

(11) Timber beams or girders which frame into masonry walls shall have 15mm air space at the top and the sides and shall be of durable timber and well treated with preservative.

(12) Timber supports shall not be embedded in the ground unless they are well treated with preservative and protected from moisture by eaves projections or other approved method except that the requirement of this provision shall not prohibit the use of timber for the construction of buildings in rural areas where the timber can be economically and effectively protected against termites by charring.

(13) Timber sleepers or sills resting on concrete slab which is in contact with the earth shall be of durable timber well treated with an approved preservative and provided with a termite shield.

Regulation 114—Insect Screening.

(1) The provisions of this regulation shall apply for the control and exclusion of insects and rodents

(2) All ventilation openings provided under suspended or basement floors and to roof spaces shall be provided with insect screening.

Regulation 115— Prevention against Fungus Attack.

For the purpose of preventing fungus attack and growth in buildings the following construction requirements shall be complied with —

(a) all basement floors and walls shall be constructed so as to resist moisture absorption in the choice of material, construction detailing and erection;

(b) all ground floors and upper floors shall be so constructed as not to allow moisture passage through the fabric of the floor;

(c) all roofs shall be constructed so that there is no moisture ingress to roof spaces; and leakage in the roof shall be so amended as to obviate the chance of dampness reaching the timber and other elements of the roof;

(d) adequate free draught shall be ensured for all enclosed spaces so as to discourage air stagnation;

(e) in any case, where it is not possible to ensure the dry air condition needed to discourage pest and fungi infestation, sufficient heating of the space shall be provided to ensure an environmentally accepted temperature;

(f) all timber used in any building shall be seasoned to an average 12% moisture content and shall be liberally treated with appropriate anti-vermin preservative; and

(g) all man-holes, inspection chambers, septic tanks, cesspools, soakaways, shall have adequately sealed covers so as to exclude pests and other vermins, such as cockroaches mice and rats from nesting in them.

PART XIII—DRAINAGE

Regulation 116—Provision and Construction of Drains.

(1) Every building shall be provided with an adequate hygiene system for the disposal of construction foul water, surface water and subsoil water.

(2) All drains shall discharge into an outfall approved by the District Planning Authority and may be a sewer, a water course, septic tank or cesspool, or a septic tank system and soakaway.

(3) Soakaway shall be used for the disposal of very large volume of wastewater provided the soil permeability allows its use.

(4) Every open drain other than an earth drain shall be —

(a) constructed of durable materials with suitable joints of adequate size;

(b) laid at a proper inclination of not less than one in eighty gradient; and

(c) suitably covered where in the opinion of the District Planning Authority, it is desirable for safety and the covers shall either be designed for self-cleansing velocity or covers shall be easily removed for drain to be cleaned.

(5) An open drain shall be considered to satisfy this regulation if it is constructed of—

(a) concrete slabs 75mm thick made of concrete mix C;

(b) concrete inverts made of concrete mix C; or

(c) cast insitu concrete mix C.

(6) Covers of drains shall be made of reinforced concrete slabs not less than 75mm and reinforcement of not less than 6mm diameter and shall be fixed at location approved by the District Planning Authority.

(7) Subsoil drains shall be either pipe drains with open joints or french drains as may be determined by the District Planning Authority and shall be inserted where directed by the District Planning Authority.

(8) A subsoil drain shall be adequate for the purpose of subregulation (7) if—

(a) the pipes are of any durable material porous or otherwise, and are at least of 75mm internal diameter;

(b) pipes are laid with open joints to line and gradient and are not less than 460mm deep to invert and where they have saw cuts or holes in the lowest third of the pipe they shall be spaced not more than 300mm apart;

(c) the width of the trench does not exceed the external diameter of the pipe by more than 150mm;

(d) after laying the pipes they are covered with a layer at least 75mm thick of stone, gravel, broken brick or rubble to prevent silt entering the joints and trench refilling is done with care to prevent displacement of the pipes;

(e) trenching drains consist of a trench with clinker, rubble, broken stone or other coarse material of 75mm gauge at the bottom of the trench graded to finer material at the top with the size of each trench determined by the District Planning Authority; and

(f) all drains are constructed starting from the outfall to upstream.

Regulation 117—Traps and Gullies.

(1) Every trap to a building sewer shall be provided with adequate means of ventilation.

(2) Every system of pipes shall be so made as to prevent the breaking of water seal in any trap.

(3) Precautions shall be taken wherever necessary to prevent the entry of surface water, flood water or tidal water into any sewer.

(4) No open gully shall be fixed inside a building except a gully fixed in the floor of a bathroom on the ground floor and which collects no waste from any other room.

Regulation 118—Inspection Chambers.

(1) A manhole shall be provided at each point where there is a change in direction or gradient in any sewer or drain other than a subsoil drain.

(2) No part of a sewer or drain other than a subsoil drain shall be further than 30m from a manhole measured along the pipe.

(3) Every manhole shall be—

(a) of such size and form as to permit ready access to the pipe for inspection and cleaning purposes;

(b) of sufficient strength and be watertight;

(c) fitted, where the depth so requires, with step-irons or a ladder;

(d) fitted with airtight cover;

(e) completed with suitable channels whose depth within the manholes shall be full diameter of the drains entering; and

(f) completed with walls of manholes extending at least 150mm above the surrounding ground.

(4) An inspection chamber shall be large enough to permit all pipes to be rodded.

(5) The minimum internal dimensions of rectangular manholes shall be for manholes up to 1830mm deep, 1070mm by 690mm and for manholes over 1830mm deep, 1370mm by 840mm.

(6) For the longer side in the direction of the pipe run, the base of manholes shall consist of mix C concrete at least 150mm thick, the walls of brick at least 215mm thick and set in mortal mix D or concrete mix C 150mm think cast in situ or of precast concrete units or blocks made of mix C concrete to the thickness required by the District Planning Authority and set in mortar C. All internal surfaces shall be rendered smooth with mix C mortar and all internal corners rounded.

(7) Manholes of more than 760mm deep shall have steps built into a wall at 300mm vertical internals. These steps shall be staggered with the highest step being 460mm below the cover and the lowest not more than 300mm above the benching. Alternatively, metal ladders may be used with the approved of the District Planning Authority.

(8) Channels and junctions of manholes shall be of specially made half round pipes.

(9) Benching shall rise vertically from the channel pipe to the level of the top of the outgoing drain and thence slope upwards at 25mm to the sides of the manholes. Benching shall be of mix C concrete finished with mix C mortar and rendered smooth.

(10) Manholes shall be covered with reinforced concrete slabs made of mix C concrete, the reinforcement of which shall be decided by the District Planning Authority. An access hole of 0.6mm by 0.46m shall be left in the slab and a manhole cover shall be set in cement over it.

(11) The opening for the cover of a manhole shall be 500mm diameter if round, 600mm by 460mm if rectangular and shall be of a type determined by the District Planning Authority.

(12) The cover of a manhole shall be so designed and constructed as to make for easy placement and removal.

Regulation 119—Ventilation of Sewers.

(1) Every building sewer shall be properly ventilated with at least one ventilation pipe of not less than 75mm in diameter which shall be situated as near as practicable to the building.

(2) The ventilation pipe shall not have any bend except where unavoidable; in which case the bend shall have an obtuse angle as large as possible with the largest practicable radius of curvature.

(3) Every ventilation pipe shall terminate with a wire dome in the open air covered with durable mosquito-proof netting or other cover which does not unduly restrict the flow of air.

(4) A ventilation pipe shall be carried upwards to such a height and so positioned as not to transmit foul air or pollute the air.

(5) It shall be sufficient for the purpose of regulation (4) if the ventilation or soil stack pipe is terminated at a minimum of 750mm above the highest opening or above the eaves.

Regulation 120—Junctions and Drain Intercepters.

(1) Where a pipe joins another pipe, it shall do so obliquely in the direction of flow in the other pipe and all such junctions shall be made within the manholes.

(2) Any connection between a drain and a public or private sewer or between a public and private sewer shall be so made that the connection will remain watertight and otherwise satisfactory under all working conditions.

Regulation 121—Sewers and Drains.

Any drain or private sewer shall —

(a) be of sufficient strength having regard to the manner in which it is bedded or supported and the maximum loads and forces to which it may be subjected; and, where necessary it shall be protected against damage; and

(b) together with its joints and fittings, be constructed of materials of sufficient durability having regard to the matter passing through it and if below ground, the nature of the ground and subsoil water through which it passes; and

(c) have all joints formed in such a manner —

(i) as is appropriate to the materials of which the drain or sewer is made;

(ii) that the joints remain watertight under all working conditions, including any differential movement as between the pipe and the ground or any structure through or under which it passes;

(iii) that the joints do not form any obstruction in the interior of the drain or private sewer; and

(d) be laid in a straight line between points where changes of direction or gradient occur; and

(e) be so designed and constructed, of such size, and laid, unless the contents are pumped, at such a gradient as to ensure that it is self-cleanings and efficiently carries away the maximum volume of matter which may be discharged into it.

(2) The internal diameter of any drain or private sewer shall at any point be not less than that of the outlet of any appliance, pipe or drain the discharge from which passes through it at that point, provided that the internal diameter shall not be less than 100mm in the case of any drain or private sewer which is intended for the conveyance of soil water or water contaminated with trade effluent, or not less than 75mm in any other case.

(3) Where any drain or private sewer passes through a building that part which is within the building shall —

(a) be adequately supported throughout its length without restricting thermal movement and any fitting giving such support shall be securely attached to the building; and

(b) be so placed as to be reasonably accessible throughout its length for maintenance and repair.

(4) Any drain or private sewer shall, after the work of laying the drain or private sewer has been carried out (including any necessary work of hunching or

surrounding the drain or private sewer with concrete and backfilling the trench) be capable of withstanding a suitable test for watertightness.

Regulation 122—Means of Access to Drains and Private Sewers.

(1) Any drain or private sewer shall have such means of access as may be necessary for inspection and cleaning, and without prejudice to the generality of the foregoing there shall be an inspection chamber—

(a) at each point where there is such a change of direction or gradient as would prevent any part of the drain or private sewer being readily cleaned without such a chamber;

(b) on a drain, within 12500mm from a junction between that drain and another drain, a private sewer or a public sewer, unless there is an inspection chamber situated at that junction;

(c) on a private sewer, within 12500mm from a junction between that sewer and another private sewer or a public sewer, unless there is an inspection chamber situated at that junction, and at the highest point of a private sewer unless there is roding at that point.

(2) No part of a drain or private sewer shall be at a distance of more than 45m measured along the line of the drain or private sewer, from an inspection chamber situated on the same drain or private sewer.

(3) Subject to the regulation 121(3) of these Regulations inspection chamber shall—

(a) sustain the loads which may be imposed upon it;

(b) exclude subsoil water;

(c) be watertight;

(d) be of such size and form as to permit ready access to the drain or private sewer for inspection, cleaning and rodding; and

(e) where the part of the drainage system within the inspection chamber is constructed of open channels, be provided with benching that has a smooth impervious finish and so formed as to guide the flow of water towards the pipe into which the main channel discharges and to provide a safe foothold.

(4) Any inspection chamber within a building, other than an inspection chamber giving access to part of a drain or private sewer which is constructed with inspection fittings with watertight covers, shall be—

(a) so constructed, in conjunction with its frame and cover, as to be watertight when subjected to the maximum internal pressure which could be caused by blockage of the drainage system at any point below the inspection chamber; and

(b) fitted with a removable and non-ventilating cover of adequate strength, constructed of suitable and durable material which is—

(i) fitted in a frame with an airtight seal; and

(ii) secured to the frame by removable bolts made of corrosion-resistant material.

Regulation 123—Inlets to Drains to be Trapped.

Any inlet to a drain, other than a junction between the drain and a soil pipe, a waste pipe or a ventilating pipe, shall be effectively trapped by means of a suitable trap with a seal of not less than 50mm in depth except that this provision shall not apply to any inlet to a drain used solely for the conveyance of surface water from a roof if such drain is intercepted by a suitable trap, with a seal of not less than 50mm in depth, from any drain or sewer used for the conveyance of water contaminated by soil water, waste water, or trade effluent.

Regulation 124—Trenches for Drains and Private Sewers.

(1) Where any drain or private sewer is constructed adjacent to a loadbearing part of a building, such precautions shall be taken as may be necessary to ensure that the trench in which the drain or private sewer is laid in no way impairs the stability of the building.

(2) Except where the nature of the ground makes it unnecessary, where any drain or private sewer is adjacent to a wall and the bottom of the trench is lower than the foundation of the wall, the trench shall be filled in with concrete to a level which is not lower than the bottom of the foundation of the wall by more than the distance from that foundation to the near side of the trench less 150mm. Provided that, where the trench is within 1000mm of the foundation the concrete filling required by subregulation (1)shall have such expansion joints as are necessary to ensure that no continuous length of filling exceeds 9000mm.

Regulation 125 —Drains or Private Sewers Passing through or under Walls or Building.

Where any drain or private sewer passes through a wall, including the wall of an inspection chamber or cesspool, or under a wall or any other part of a building, there shall be taken such precautions as may be necessary to prevent damage to, or loss of watertightness in the drain or private sewer by differential movement.

Regulation 126—Pipes Conveying Soil Water, Ventilation Pipes.

(1) Each pipe above ground level conveying soil water and every ventilating pipe relating to it shall —

(a) be constructed of durable materials with suitable joints;

(b) be capable of satisfying the appropriate test as may be determined by GS;

(c) not have any joint within the thickness of the wall where the pipe passes through the wall;

(d) have an internal diameter of at least 100mm and in any case not less than that of any pipe or outlet from an appliance conveying foul water to it;

(e) be suitably supported and attached to the building so as to permit thermal movement; and

(f) be so places as to be reasonably accessible for maintenance and provided with such means of access as are necessary for internal cleaning.

(2) Each ventilating pipe to a pipe conveying foul water shall—

(a) be carried upward to such a height and so placed that no foul air can escape into a building; and

(b) be fitted at the open end with a wire cage and mosquito gauze.

(3) Soil pipes, waste pipes and ventilation pipes satisfy this provision if—

(a) the soil pipes, waste pipes and ventilation pipes are made of asbestos cement, cast iron, ceramic ware, lead, wrought iron, galvanised steel, copper or suitable plastics;

(b) all external pipes which require maintenance or painting are fixed at a distance from the wall of at least 37mm;

(c) provision is made for expansion joints every 3 metres;

(d) soil pipes, waste pipes and ventilation pipes are not fixed in chases; and

(e) ventilation pipes are taken up to a point above the level of the eaves of a flat roof and in any case not less than 900mm above the head of any window within a horizontal distance of 3 metres from the ventilation pipe.

Regulation 127—Waste Pipes.

(1) Every pipe above ground level conveying waste water shall

(a) comply with regulation 126;

(b) have an internal diameter of at least 37mm;

(c) include, close to the waste appliance, a readily accessible trap with means of access for internal cleaning; and the trap shall have a water seal of at least 50mm provided that no trap shall be required where a waste pipe discharges over an open gully.

(2) Waste pipes satisfy subregulation (1) if—

(a) they are made of one of the materials permissible for pipes conveying soil water; and

(b) they are fixed in the same way as soil pipes of the same material and where necessary, have similar expansion joints.

Regulation 128—Further Requirements for Soil Pipes and Waste Pipes.

(1) Any soil pipe from a soil appliance and any waste pipe from a waste appliance shall have fitted close to the appliance a suitable and readily accessible trap of adequate diameter that has an adequate water seal and means of access for internal cleansing, provided that this subregulation shall not apply to—

(a) any soil pipe serving only a soil appliance or any waste pipe serving only a waste appliance if the appliance has an integral trap;

(b) any waste pipe serving a bath or lavatory basin where two or more baths or lavatory basins are so fixed in a range that the waste pipe discharges into a semi-circular and accessible open channel of glazed stoneware, or other equally suitable material, formed or fixed in, or above the floor immediately beneath the baths or lavatory basins and discharge over or into a suitable trap; or

(c) any waste pipe serving a lavatory basin or shower tray where a number of lavatory basins or shower trays or both are so fixed in a range that each waste pipe discharges into a common waste pipe which—

(i) does not exceed 5000mm in length; is fitted with a suitable trap; and

(ii) has means of access suitable and adequate for the internal cleaning of the trap and of the whole length of the pipe.

(2) No soil pipe or waste pipe shall be placed outside the external walls of a building not under formal control, except that this provision shall not apply to any waste pipe from a waste appliance situated in any part of a building the floor of which is at or above the level of the adjoining ground, if that waste pipe discharges into a trap which has a suitable grating so fitted that the discharge of waste water is effected above the level of the water in the trap but below the level of the grating and in such a way as not to cause dampness in any building.

Regulation 129—Waste Water Disposal.

(1) The method of waste water disposal shall be such that no stagnant pools of water are formed and no other nuisance is created in the compound or outside the house.

(2) Where a site or plot is situated within 30 metres from a surface water drain maintained by any public authority and where there is adequate fall between the level of the site or plot and the surface water drain, every person who erects a building or carries out any work on the site or plot shall also lay a concrete drain or pipe of adequate capacity connecting the site or plot with the surface water drain for

the discharge of surface water and waste water provided that where the connection would have to be made through private land not owned by the owner of the site or plot then this provision shall not apply.

(3) Where subregulation (2) of this regulation does not apply, an approved movable receptacle of sufficient capacity shall be provided into which all waste water shall be deposited prior to final disposal except where approval has been given by the District Assembly to discharge the waste water into an open channel or soakaway to run to earth.

(4) No surface water or waste water drain shall be connected to any sewerage system without the approval of the District Planning Authority.

Regulation 130—Private Sewer.

(1) Private sewer shall be constructed in the same way and with the same materials as drains.

(2) Inspection chamber shall be provided on private sewers at intervals not exceeding 9000mm.

(3) Manholes shall be provided at points where the sewer changes its direction or gradient and within 1200mm of a junction with a drain or public sewer unless there is an inspection chamber at the connection.

(4) Where a private sewer passes through a wall or immediately below a wall, the wall shall be supported to prevent damage to the sewer.

Regulation 131—Roof Drainage.

(1) Roofs of all building including flat roofs shall be constructed so as to drain to suitable and sufficient gutters or similar outlets connected to a sufficient number of suitable down pipes, constructed so as to carry away the rain water from the roof without causing damage to the building.

(2) In the case of thatched roofs subregulation (1) shall be considered satisfied if adequate arrangements are made to avoid dampness being caused to the building.

Regulation 132—Rainwater Gutters and Pipes.

(1) Any gutter which is on a building and intended for collecting rainwater shall be—

(a) of adequate size for its purpose;

(b) composed of suitable materials of adequate strength and durability;

(c) adequately supported throughout its length without restraining thermal movement, with fitting which gives such support being securely attached to the building;

(d) so arranged as not to cause dampness in or damage to any part of the building;

(e) joint in a manner appropriate to the material of which it is composed so as to remain watertight; and

(f) fitted with an adequate outlet or outlets so placed as to drain the whole length of the gutter.

(2) Any rainwater pipe which is situated outside a building shall be—

(a) of adequate size for its purpose;

(b) composed of suitable materials of adequate strength and durability;

(c) adequately supported throughout its length without restraining thermal movement, and any fitting which gives such support shall be securely attached to the building; and

(d) so arranged as not to cause dampness in or damage to any part of the building.

(3) Any rainwater pipe which is situated within a building shall be—

(a) so constructed that it complies with the requirements of this regulation; and

(b) of adequate size for its purpose.

(4) No rainwater pipe shall be constructed so as to discharge into, or to connect with, any pipe or drain used or intended to be used for conveying soil water or waste water, unless provision is made in the design of the sewerage system for the discharge of rainwater.

Regulation 133—Rainwater Storage.

(1) Every rainwater tank shall be—

(a) made of durable materials and be watertight;

(b) provided with an overflow pipe the end of which is covered with mosquito-proofing gauze and discharges over an open drain or a gulley to a drain; and

(c) covered and provided with means of access and a drain plug at the bottom for internal cleaning.

(2) Any draw-off tap or the end of any suction pipe shall be not less than 75mm above the bottom of the tank.

(3) Pipes conveying rainwater to a tank, the top of which is above ground level, shall discharge in the open air over an inlet which is covered with mosquito-proofing gauze.

(4) All pipes connected to a tank which is wholly below ground level shall be made of metal and the joint between any pipe and the tank shall be watertight.

(5) Rainwater storage tanks shall be considered adequate for the purposes of this Part if —

(a) tanks which are wholly above ground level are made of asbestos-cement or galvanized mild steel or concrete or suitable plastic; or

(b) tanks which are wholly or partly below ground level are made of burnt brick in mortar mix C or concrete to mix C in such a manner as to be impervious and all inside surfaces rounded to facilitate cleaning and the external surface of any metal used under ground are galvanized or suitably painted.

Regulation 134—Overflow Pipes and Testing of Drains and Sewers.

(1) Any overflow pipe connected to a waste appliance shall —

(a) discharge into a waste pipe in such a way as to be disconnected from the drainage system by the trap installed in accordance with this provision; or

(b) discharge in such other manner as not to cause dampness in or damage to any part of any building.

(2) Any drains or private sewer shall after the work of laying the drain or private sewer has been carried out (including any necessary work of hunching) or surrounding the drain or private sewer with concrete and backfilling the trench, be capable of withstanding a suitable test for watertightness.

PART XIV—SANITARY CONVENIENCES

Regulation 135—Provision of Closets and Bathrooms.

(1) Plans of a new building or extension to a building must show an adequate and satisfactory water closet where water is available or an earth closet or chemical closet where there is no water.

(2) A water closet within a building shall have at least one of its sides as an external wall of the building. A water closet shall have flushing apparatus, e.g. a cistern fitted with stopcock and supplied with water, with the overflow pipe to the cistern connected to the outside and the end projection fitted with insect proofing.

(3) An earth closet shall be well ventilated to reduce odour nuisance.

(4) Pour flush system or KVIP shall be permitted in areas of acute water supply storage.

(5) Plans of a new house or of a proposal to convert a building into a separate dwelling shall be considered for approval if each separate dwelling is provided with a bathroom containing either a fixed bath tub or a shower bath with a suitable installation to provide cold and possibly hot water to the bath or shower.

(6) Every bathroom shall be of mninimum superficial area of 3.50m².

(7) The internal part of bathroom walls shall be rendered impervious with cement mortar or other approved material to a height of not less than 1.2m.

(8) Every building used as a factory, workshop, or work place shall have adequate sanitary conveniences for persons of both sexes and have regard to the number of persons in the building.

Regulation 136—Water Closets.

(1) Water closet receptacles shall be so constructed and fitted as to avoid fouling.

(2) For the purpose of regulation 135(1) and (2) water closet shall be either a pedestal or a squat type of ceramic ware with vitereous glaze and a trap.

(3) Where it is a pedestal it shall have—

(a) a flushing rim;

(b) a flushing apparatus capable at each flush of completely discharging the contents of the pan and effectively cleansing the inside of it;

(c) a flush pipe with an internal diameter of not less than 32mm; and

(d) either a hinged seat made of plastic or hardwood or pads of plastic or hardwood affixed to the back only.

(4) Where it is a squat type it shall have—

(a) raised foot pads, with the floor of the room sloping towards the pan at a gradient of not less than 1 in 40; and

(b) flushing facilities which comply with regulation 136(3).

(5) A water closet shall be properly lighted and ventilated and must not open directly into a room used for human habitation or for the manufacture, preparation or storage of food for human consumption or any workroom.

(6) A water closet in a domestic building or dwelling flat may join with a bedroom or dressing room but there shall be a second means of entering it.

(7) Buildings such as hotels, flats and guest rooms may contain more than one water closet for rooms and such water closet may not be joined to the bedroom or dressing room.

(8) In the case of a building other than a flat the second water closet may be outside the building but shall be exclusively part of it.

Regulation 137—Earth Closets (KVIP).

(1) This provision shall apply to any earthcloset constructed for use in connection with a building.

(2) Any earth closet which is not a chemical closet shall be so constructed that it can be entered only from—

(a) the external air; or

(b) a room or space which can itself be entered directly form the external air.

(3) No earthcloset (whether it is a chemical closet or not) shall open directly into—

(a) a habitable room; or

(b) a room used for kitchen or scullery purpose; or

(c) a room in which any person is habitually employed in any manufacture, trade or business.

(4) Any earth closet which can be entered directly from the external air shall have an adequate opening for ventilation directly to the external air, situated as near to the ceiling as practicable.

(5) Any earth closet which cannot be entered from the external air shall have a window, skylight or other similar means of ventilation which opens directly into the external air and of which the area capable of being opened is not less than one twentieth of the floor area.

(6) An earth closet shall be so situated as not to pollute any spring, stream, well, adit, or other source of water which is used or is likely to be used for drinking, domestic, kitchen or scullery purposes.

(7) The floor of an earth closet shall be of non-absorbent material and, if the earth closet can be entered directly from the external air, shall in every part, including the part beneath the seat, be not less than 75mm above the surface of the adjoining ground and have a fall or inclination towards the entrance door of not less than 1 in 25.

(8) The receptacle in an earth closet shall be of non-absorbent material and shall be so constructed and placed that its contents shall not escape by leakage or otherwise, or be exposed to rainfall or to the drainage of any waste water or liquid refuse.

(9) The receptacle and other fittings of an earth closet shall be so constructed and arranged that the use, maintenance and cleansing of the earth closet shall not be a health hazard or a nuisance.

(10) No part of the receptacle, or of the interior of an earth closet, shall have outlet to a drain.

(11) A District Planning Authority may undertake the cleansing of earth closets in the district, or make bye-laws requiring occupiers to do so.

Regulation 138—Urinals.

(1) Urinals shall be provided with a slab, stall, trough or other receptacle readily cleansed and with an efficient trapped outlet with a grating.

(2) Urinals must be provided with an effective flushing apparatus and no part of the receptacle may be directly connected with any pipe except a soil pipe, drain flushing pipe or trap vent pipe from flushing apparatus.

(3) Where there is an acute water shortage, a urinal with a soakaway pit shall be recommended and it shall be kept clean and well maintained without any bad odour.

(4) Urinals in the open air without roof cover shall be permitted, provided subregulation (3) of this regulation is complied with.

(5) Adequate lighting and ventilation shall be provided in urinals.

Regulation 139—Septic Tank System.

(1) The liquid capacity of a septic tank shall be calculated according to the number of persons; and per capita waste water contribution shall be between 45-100 litres per person a day.

(2) The liquid detention time shall be between 3 to 5 days.

(3) The average depth of water in the septic tank shall not be less than 1.30 metres and not more than 1.80 metres.

(4) There shall be provided an air space between the water level in the septic tank and the underside of the roof slab the dimension of which shall be determined by the invert level.

(5) A septic tank shall be at least 30 metres from any well, water-hole, spring or stream water used, or likely to be used, by man for drinking and other domestic purposes and shall also be at an approved position which will not render any such water liable to pollution.

(6) The dimensions of one compartment of a septic tank shall be such that the total length is at least four times the width and where the tank is divided into two compartments, the length of the first compartment shall be more than half of the total length of the septic tank.

(7) The inlet shall be a "T" junction pipe which is opened at the top and which allows sewage to enter the tank at least 230mm below the surface of the water.

(8) The outlet shall be a "T" Junction pipe which is opened at the top and which allows the effluent to be drawn from at least 300mm below the surface of the water.

(9) The covering slab of a septic tank shall be of reinforced concrete either precast or cast in situ and where precast slabs are used, some shall be readily removable to provide access; where a cast in situ is used it shall have access opening at least 0.50m by 0.50m with a concrete slab over it.

(10) The walls of a septic tank shall be of concrete, plain or reinforced of at least 150mm thick or concrete mix C or of burnt brick work of at least 150mm thick set in mortar mix D.

(11) The floor of a septic tank shall be concrete mix D at least 150mm thick and slope to a gradient of not less than one in twenty downwards towards the inlet pipe.

(12) All inside surfaces of a septic tank shall be made smooth with mortar mix C.

(13) Where baffles are provided in a septic tank the tops shall extend above the water level and the bottoms shall not be less than 600mm from the first floor of the tank at any point.

Regulation 140—Filter Beds

(1) No person who constructs a septic tank shall install a filter bed unless permission is granted by the District Planning Authority.

(2) A filter bed may be constructed above or below ground and shall in all cases be made of adequately insect-proofed material.

(3) For every 230 litres of effluent treated per day, 1 metre of filtering medium shall be provided and the volume of effluent shall be at 70 litres per day for each of the persons accommodated in the premises.

(4) The filtering medium shall be composed of graded clinker, broken stone or other approved material which shall not be more than 75mm or less than 6mm in diameter, the largest sizes of the medium being placed at the bottom and the smallest at the top

(5) The effluent from the tank shall be discharged over the whole surface of the filter bed by means of fixed distributors or other approved devices and a clear space of 75mm shall be kept at the bottom of the distributors and the top of the filtering medium.

Regulation 141—Soak-away Pits and Trenches.

(1) The effluent from every septic tank or filter bed shall discharge into an approved soak-away pit, or be allowed to percolate into the ground by means of earth drains containing broken stones and covered by a top layer of earth or by means of agricultural pipes laid at least 3.6mm below the surface of the ground.

(2) If required by the Health Officer there shall be provided three channels or pipe lines, each not less than 2.0m long radiating from the tank or filter bed.

(3) Provision shall be made, if required, so that any channel or pipe line may be closed to prevent the surrounding ground from becoming water-logged.

(4) A soak-away shall be either of the pit or the trench type.

(5) Where it is a pit soak-away it shall not be less than 1.2 metres diameter and 1.8 metres deep and the inlet pipe shall discharge into the middle of the pit.

(6) Where it is a trench soak-away, it shall be not less than 6 metres in length, 1 metre wide and 600mm deep.

(7) A soak-away shall be filled to within 200mm of ground level with rubble clinker, stone or other coarse material of 75mm gauge or large.

(8) A soak-away pit may be built with cement blocks or burnt bricks with 1.0 metre by 1.0 metre internal dimension and depth not more than 2 metres unless it is reinforced; the pit shall be covered with a reinforced concrete slab making provision for all inspection chamber and may not be filled with rubble or any other unsuitable material. The walls shall be rendered with 1.3 cement-sand mortar.

(9) The effluent from every septic tank or filter bed shall be discharged into an approved soak-away pit.

Regulation 142—Cesspools

(1) A cesspool shall be—

(a) so constructed as to be impervious to liquid form the subsoil; and

(b) so sited —

(i) as not to pollute any spring, stream well, adit, or other source of water which is used, or is likely to be used for drinking, domestic, kitchen or scullery purposes;

(ii) that there is ready means of access for cleaning it and removing its contents without carrying them through any building in which any person resides or is employed in any manufacture, trade or business or to which the pubic has access; and

(iii) as not to be in such proximity to any building in which any person resides or is employed in any manufacture, trade or business or to which the pubic has access as to be liable to become a source of nuisance or a danger to health.

(2) A cesspool, not being a settlement tank or a septic tank, shall be—

(a) of suitable depth to enable it to be emptied completely;

(b) properly covered so as to be impervious to surface water and rainwater;

(c) fitted with a suitable manhole cover for the purposes of inspection (including inspection of the inlet) emptying and cleaning;

(d) adequately ventilated;

(e) without any outlet for overflow or discharge other than the outlet provided for emptying and cleaning; and

(f) of a capacity, measured below the level of the inlet, of not less than 18m^3.

(3) A settlement tank or septic tank shall —

(a) be of suitable depth, adequate size, with a capacity of not less than 2.7m^3 and covered or fenced in; and

(b) if covered, be adequately ventilated and constructed with means of access for the purposes of inspection, including inspection of the inlet and outlet, emptying and cleaning.

Regulation 143—Access to Soak-away Pits and Cesspools.

(1) All soak-away pits and cesspools shall have access to them in the form of inspection chambers.

(2) The access shall be fitted with a suitable cover for the purpose of inspection including inspection of the inlet, emptying and cleaning and shall be adequately ventilated.

(3) The cover shall be of forced in concrete slab or any other cover suitable to satisfy these requirements.

Regulation 144—Connections to Public Sewers and Combined Sewage System.

(1) Connections may be made to the public sewage system from private properties but such connections shall be executed by the District Planning Authority or under the supervision of any sewage agency that may be so charged.

(2) Small-bore sewers or shallow trench sewers are adequate for this Part if the design complies with the loading requirements under these Regulations.

(3) All connections shall be made obliquely in the direction of the main pipe or sewer.

(4) No surface water shall be connected into a septic tank, a private sewer or a main sewer.

(5) Connection to a public sewer shall be in good order under all working conditions.

PART XV—REFUSE DISPOSAL

Regulation 145—Disposal of Domestic and Other Refuse

(1) A building for residential, commercial, industrial, civic or cultural use shall have a facility for refuse disposal.

(2) Each dwelling units shall have a standardized dustbin or other receptacle approved by the District Assembly in which all refuse generated shall be stored temporarily.

(3) The refuse container shall be located at an approved position.

(4) The capacity of a refuse container shall be of such size as to be sufficient to store refuse generated for at least two days.

(5) The refuse shall be collected at a frequency not less than twice weekly by the District Assembly, or by an agent appointed by the District Assembly, from door to door.

(6) Where door to door collection of refuse is not feasible, the refuse shall be taken daily to the approved transfer station in the neighbourhood by the residents of the dwellings.

(7) Containers for the storage of industrial, commercial, institutional and other refuse shall be of a size and type approved by the District Assembly.

(8) Hazardous refuse shall be handled separately from domestic refuse.

(9) Collection of refuse from industrial, commercial and institution premises shall be on a daily basis.

Regulation 146—Transfer Stations.

(1) Transfer stations either of the stationery type or non-stationary type shall be located at vantage points within cities, towns and villages for temporary storage of refuse from dwelling and other habitable premises.

(2) The siting of the transfer station in a community shall be such that the walking distance does not exceed 200mm.

(3) For the municipalities the non-stationary transfer station in the form of roll on-roll-off container of capacity of not less than 8m shall be used.

(4) Material used for the construction of a container shall be durable and the container shall be provided with a tight fitting cover or lid.

(5) The stationary transfer station shall be in the form of a permanent masonry structure so constructed as to minimise spreading and scavenging activities.

(6) Preferably the refuse shall be protected from rain.

(7) A ramp or suitable facility shall be provided to facilitate loading onto refuse trucks.

(8) Refuse from the transfer station shall be collected at least every other day.

Regulation 147—Incineration.

Incineration shall not be permitted on a dwelling plot except that this regulation shall not prohibit incineration by the District Assembly or any other appointed agent in an approved manner and location.

Regulation 148—Refuse Storage in Multi-storey Buildings

(1) For storey buildings of more than four floors, a hopper shall be constructed for use with a refuse storage container chamber to which regulation 149 applies or with a refuse chute to which regulation 150 applies.

(2) A hopper shall be—

(a) situated in a place which is either freely ventilated or has adequate means of mechanical ventilation; and

(b) constructed of suitable non-combustible material; and,

(c) so constructed and installed as—

(i) to efficiently discharge any refuse placed in it into the refuse storage container or refuse chute;

(ii) to be incapable of remaining in any position other than the open or the closed position;

(iii) to prevent, as far as possible, whether in an open or closed position, the emission of dust or foul air from the refuse storage container chamber or refuse chute; and

(iv) not to project into the chute in the case of a hopper for use in conjunction with a refuse chute.

(3) No such hopper shall be situated within a dwelling.

Regulation 149—Refuse Storage Compartment in Multi-dwelling.

(1) This provision shall apply to any storage chamber which froms part of a building comprising more than one dwelling and which is constructed to accommodate refuse storage containers into which refuse may be delivered through a hopper or chute.

(2) The chamber shall be so constructed that the chamber from the building of which it forms part is as if it were a compartment wall or compartment floor with fire resistance.

(3) The inner surfaces of the chamber shall be impervious to moisture, the floor of the chamber shall be laid to fall towards a trapped gulley situated inside or immediately outside the chamber; and the chamber shall have as its sole means of access—

(a) a flush metal door which is situated in an external wall of the chamber and has fire resistance of half an hour as defined in regulation 60 for the removal and replacement of the container;

(b) a refuse chute which complies with regulation 150(2) or a hopper which complies with regulation 152 for the deposit of refuse in the containers.

(4) For the purpose of subregulation (2) of this regulation, where delivery is by means of hopper only, there shall be ventilation to the external air by means of—

(a) a flyproof ventilator placed as high as practicable in an external wall of the chamber and so positioned as not to transmit foul air; or

(b) a pipe or shaft which complies with regulation 150.

Regulation 150—Refuse Chutes.

(1) This regulation shall apply to any refuse chute constructed for use with a refuse storage container chamber to which regulation 148 applies.

(2) The refuse chute shall be—

(a) constructed of suitable non-combustible materials of such thickness, and so put together and arranged, as to prevent the ignition of any part of the building in the event of any refuse within the chute, or in the chamber at the bottom of the chute, catching fire;

(b) so constructed that the inner surfaces of the chute are impervious to moisture;

(c) so constructed as to prevent the lodgement of any refuse within the chute,

(d) circular in cross-section with an internal diameter of not less than 375mm;

(e) fitted with adequate means of access for inspection;

(f) ventilated to the external air by means of a pipe or shaft which complies with regulation 150; and

(g) fitted at its lower end with a shutter capable of closing the outlet of the chute.

Regulation 151—Ventilation to Refuse Storage Container Chamber.

Any pipe or shaft for ventilating either a refuse storage container chamber to which regulation 149 applies or a refuse chute to which regulation 157 applies shall—

(a) comply with the provisions of regulation 150(1) and (2)(a);

(b) be not less than 1700mm2 in cross-sectional area;

(c) be so constructed that the outlet is protected against the entry of rain; and

(d) be carried upwards to such a height and so positioned as not to transmit foul air that might cause health hazard or nuisance.

Regulation 152—Hoppers for Refuse Storage Container Chambers or Refuse.

(1) This provision shall apply to any hopper constructed for use with a storage container chamber to which regulation 149 applies or with a refuse chute to which regulation 150 applies.

(2) The hopper shall be—

(a) situated in a place which is either freely ventilated or has adequate means of mechanical ventilation; and

(b) constructed of suitable non-combustible material; and

(c) so constructed and installed as—

(i) to efficiently discharge any refuse placed in it into the refuse storage container or refuse chute;

(ii) to be incapable of remaining in any position other than the open or the closed position;

(iii) to prevent, as far as possible, whether in an open or closed position, the emission of dust or foul air from the refuse storage container chamber or refuse chute; and in the case of a hopper for use in conjunction with a refuse chute, so constructed and installed as not to project into the chute.

(3) No such hopper shall be situated within a dwelling.

PART XVI—WATER SUPPLY

Regulation 153—Provision of Water.

(1) Private water supply arrangements shall be sought or made with the permission from the Ghana Water and Sewerage Corporation in areas where there are none or

the supply is acute or with any other water supply body recognised by the District Planning Authority.

(2) Sources of water may be dug wells, springs or boreholes.

(3) In the provision of water care shall be taken to avoid groundwater pollution; wells shall be constructed at a minimum distance of 16.0 metres from a septic tank, a soak-away or a pit latrine.

(4) Wells shall be constructed upstream of a pit latrine and soak-away to avoid seepage and pollution.

(5) The Ghana Water and Sewerage Corporation shall approve of the suitability of source of water supply for various uses.

Regulation 154—Pipe-borne Water Supply.

(1) Where pipe-borne water supply is available, any habitable dwelling shall have either a house connection or a yard connection.

(2) Exemption from subregulation (1) may be made for places where there is no pipe borne water supply.

(3) A water closet shall not be directly connected to a water pipe but to a flushing cistern.

Regulation 155—Wells and Boreholes.

(1) This provision shall apply to any well constructed for use in connection with a building and intended to supply water for human consumption.

(2) The ground adjoining such well shall, for a distance of not less than 1.2m in every direction, be covered with impervious paving (in this regulation referred to as "the paving”) constructed so as to slope away from the well.

(3) The well shall be so situated as not to be liable to pollution from any source, and the sides of the well shall be rendered impervious for such a depth as is necessary to prevent contamination through the adjoining ground.

(4) Where such a well is a dug well, it shall be so constructed as to be readily accessible for cleansing and the top of the well shall be surrounded by a kerb extending not less than 900mm above the level of the paving and so constructed as to prevent the entry of surface water.

(5) The area surrounding the well or borehole shall be well drained to prevent pools of water forming in the vicinity.

(6) If such a well is a bore well, its lining tube shall project not less than 150mm above the level of the paving and the projection shall be surrounded with concrete

not less than 150mm thick, or with other adequate means of protection, for its full height.

(7) Where water is drawn by a bucket from the well, it shall have —

(a) a hinged cover which will effectively close the wall when not in use; and

(b) a stand for the bucket not less than 150mm above the level of the paving.

(8) Where water is drawn by a pump from the well it shall have a cover so fitted as to prevent the entry of surface water or other matter,

Regulation 156—Tanks and Cisterns used for Storage of Rainwater.

(1) This provision shall apply to any tank or cistern constructed or fitted for use in connection with a building and intended to be used for the storage of rainwater for human consumption.

(2) The tank or cistern shall be adequately ventilated and so covered as to prevent pollution, and, where there is a fixed cover, the tank or cistern shall have a manhole fitted with a cover of sufficient size to allow the tank or cistern to be cleaned.

(3) The tank or cistern shall have an overflow pipe and the overflow pipe and any ventilator shall be so arranged as to prevent pollution and shall be mosquito-proof

(4) Where the tank or cistern is either wholly or partly below the level of the adjoining ground —

(a) its walls, floor and roof shall be constructed of bricks, concrete or other suitable material in such a manner as to be impervious; and

(b) all pipes connected to it shall be of durable material, and the joint between any pipe and the tank or cistern shall be watertight.

(5) Any draw-off tap or the end of any suction pipe fitted to the tank or cistern shall be fitted not less than 75mm above the bottom of the tank or cistern.

(6) The tank or cistern shall be provided with a drain pipe at the lowest point in the bottom.

Regulation 157—Prevention of Water Pollution.

(1) Containers for storing water shall have tight fitting covers.

(2) Where there is a high concentration of habitable premises, there shall be provided central water bodies for 3-5 supply demands to—

(a) ensure continuous supply during interruptions of normal water supply;

(b) cater for periods of low water pressure; and

(c) fight fire.

(3) Every estate development agency shall provide community density water storage balancing tanks, and where estates are of individual ownership, the District Planning Authority shall, in consultation with the Ghana Water and Sewerage Corporation or any other water supply body, provide the community density water storage.

(4) Habitable premises shall be provided with external hydrants in case of fire and these shall be connected directly to the water mains.

PART XVII—LIGHTING AND ELECTRICAL INSTALLATIONS

Regulation 158—Natural Light or Daylighting.

(1) Every habitable room, kitchen, corridor, staircase, workroom, and any other room containing bath or privy accommodation or both shall be provided with facilities for the entry of natural light to and from the open air.

(2) No door or doorway shall be taken into account when calculating the area available for the entry of natural light provided that a fanlight over a door or glazed or louvred area of a door may be taken into account.

Regulation 159—Light to Habitable Rooms, etc.

(1) The total area available for the entry of natural light into a habitable room, workroom, shop, corridor or other similar area of a building shall be at least 15 per cent of the total floor area.

(2) All openings available for the entry of natural light to every habitable room, workroom, shop corridor or other similar area shall be protected from glare, direct rays of the sun and rain penetration by eaves and other projection which shall extend at least 600mm from the external wall and the openings; and so distributed as to ensure uniform illumination.

(3) In areas considered geographically to have hot dry or monsoon climates the subregulation (7) of this regulation shall apply instead of subregulation (2) of this regulation.

(4) Where the external wall of a room is not less than 0.30m thick and exerts a stress of at least 4.30 KPa of vertical superficial area, the total area available for the entry of natural light shall be not less than 3 percent of the floor of the room provided that nothing in this provision shall require any part of the opening to be less than 2m above floor level.

(5) Where an external wall facing between south east and south west or an external wall facing between north east and north west is shaded from the sun by eaves or other projection which extends at least 1.2m from the other surface of the wall —

(a) the total area available for the entry of natural light shall be not less than 10 per cent of the floor area of the room; and

(b) the bottom of this opening shall be not more than 1.0 metre above floor level.

(6) Notwithstanding any provision of this regulation, in all climates where the entry of natural light is through a covered balcony or verandah, this shall be not less than 15 per cent of the combined floor areas of the room and the balcony or verandah.

(7) Where part of a habitable room is used as a kitchen there shall be, in addition to the facilities for the entry of light to the remainder of the habitable room, a window area of not less than 0.47m² permanently available for the admission of light into part of the window area which shall be more than 2.4m from the cooking area.

Regulation 160—Light to Kitchen and Bathroom.

(1) The facilities for the entry of natural light to a kitchen shall and consist of a window area which shall be not less than 15% of the floor area of the kitchen and no part of this window area shall be more than 2.4m from the cooking area.

(2) The total area available for the entry of natural light to a bathroom shall not be less than 0.25m².

(3) The total area available for the entry of natural light to a room containing only privy accommodation shall not be less than 0.25m².

(4) No part of an opening providing natural light or ventilation to a room containing privy accommodation shall be less than 1.65m above floor level.

Regulation 161—Electrical Facilities.

(1) Electrical installations, including the service capacity of the installations and the number and distribution of circuits shall meet the requirements of an approved code of practice.

(2) Unless otherwise approved by the District Planning Authority, electrical facilities shall be provided for every building and every dwelling unit and public shared space in buildings containing dwelling units or multiple occupations such as blocks of offices.

(3) Electrical facilities, shall have sufficient capacity to provide, without overloading, electrical energy for lighting appliances, outlets and equipment installed in the building.

(4) Entrance switches, metres, panel boxes, time clocks and other similar equipment shall not be located in any public area unless adequate precautions are taken to prevent interference with the equipment.

Regulation 162—Exterior Lighting, Lighting Outlets, Lights in Stairway, Garages, etc.

(1) An exterior lighting outlet with fixture controlled by a wall switch located within the building shall be provided at every entrance to buildings of residential occupancy, workrooms, shops, offices or any other similar space or building.

(2) Except as provided in subregulation (3) of this regulation a lighting outlet with fixture controlled by a wall switch shall be provided in kitchens, bedrooms, living rooms, utility rooms, dining rooms, bathrooms, water-closet rooms, vestibule and hallways in dwelling units, workrooms, shops, offices or any similar space or building.

(3) Where a receptacle controlled by a wall switch is provided in bedrooms or living rooms, the rooms need not conform to the requirements in subregulation (2) of this regulation.

(4) Every stairway shall be lighted. Wall switches located at head and foot of stairway shall be provided to control at least one lighting outlet with fixture for stairways with four or more risers in dwelling units, workrooms, shops or any similar space or building.

(5) A lighting outlet with fixture shall be provided in storage rooms.

(6) A lighting outlet with fixture shall be provided for an attached, built-in or detached garage or carport and the outlet shall be controlled by a wall switch near the doorway where the fixture is ceiling-mounted above an area normally occupied by a parked car except that where a carport is lighted by a light at the entrance to a dwelling unit, additional carport lighting shall not be required.

(7) Every public or service area in buildings shall be provided with lighting outlets with fixtures controlled by a wall switch or panel to illuminate every portion of the area.

(8) Illumination levels in all habitable rooms, workrooms, shops, and stairways shall be adequate to facilitate the safe movement of persons and efficient performance of visual task and shall be in accordance with the requirements of an approved code of practice.

Regulation 163—Naked Lights.

(1) Naked lights such as gas lamps, hurricane lamps or any other similar appliance may be used in habitable rooms, workrooms, shops and similar areas and the rooms shall be adequately ventilated except that no provision in this regulation shall permit the use of such lamps in rooms and spaces where their use may cause pollution, explosion, or fire.

(2) Subregulation (1) of this regulation shall also apply to septic tanks, cesspools and privy accommodation where explosions may occur.

Regulation 164—Supplementary Lighting Mechanical Ventilation and Air-Conditioning.

(1) Deep rooms which cannot be adequately lit by daylighting shall be provided with supplementary artificial lighting.

(2) In all habitable rooms and working spaces, daylight shall be available for a minimum of 70 per cent of the working day.

(3) In addition to day-lighting, where the daylight contribution to buildings with rooms designed to be lit primarily by day-light is limited, supplementary artificial lighting shall be provided with the approval of the District Planning Authority.

(4) Where mechanical ventilation is required, this shall be approved by the District Planing Authority.

(5) Where air-conditioners are provided, the day lighting provisions in this regulation shall also apply.

(6) At least one lighting point in each habitable room, kitchen, bathroom and room containing privy accommodation shall be provided.

(7) Lighting points near the top and bottom of each stairway shall be so placed that the stairway as well as any landing, passage or hall is adequately illuminated, but where there is no stairway at least one lighting point in each hall or passage shall be provided.

Regulation 165—Security Lighting.

(1) Adequate security lighting shall be provided about a building for lighting up the premises at night.

(2) The control switches of such security lights shall be accessible only from within the building.

PART XVII—SPECIAL REQUIREMENTS FOR RURAL BUILDINGS

Regulation 166—Site Preparation and Landscape Development.

(1) The provision of Part III of these Regulations shall also apply to rural buildings except that the provisions shall be applied with such modification and discretion so as to achieve flexibility.

(2) Where local circumstances so demand, a special landscape area may be delineated and set aside for the cultivation and development of appropriate plant species for use as domestic fuel.

(3) Areas of scenic attraction and landscape beauty may be designated by the District Planning Authority as "farming free zones" and earmarked for the development of tourism.

(4) Water-falls, and other bodies of water such as lakes, lagoons, may be classified by the District Planning Authority as "Special Landscape Areas" where ecological and environmental values shall be preserved and protected.

(5) Rare trees and other plant species shall be preserved and developed into an arboretum or botanical garden.

(6) Shrines and other cultural edifices of historic importance shall be preserved as part of the national socio-cultural estate.

(7) Where appropriate, game and wildlife shall be preserved, protected and developed as national resources for tourism.

(8) As far as possible, all landscape techniques, planting and grass shall be applied to check erosion and to supplement drainage devices.

Regulation 167—Drainage in Rural Building.

(1) Buildings in rural areas shall have drainage and for that purpose regulations 116 to 134 of these Regulations shall apply to such buildings.

(2) In addition to any other requirement in these Regulations, adequate drainage shall be provided round wells, boreholes, public bath houses and other uses that discharge water.

Regulation 168—Sanitary Conveniences.

The provisions of regulations 135 to 143 on sanitary convenience other than regulation 138(1) and (4) shall apply to rural buildings.

Regulation 169—Refuse Disposal.

(1) Each house or household shall have its own refuse bin or bucket located at a convenient place either within or outside the house.

(2) Each domestic refuse bin shall be emptied daily by depositing the refuse at all approved site.

(3) Every District Assembly shall select approved sites for the communal disposal of refuse.

(4) The District Assembly shall design all acceptable method of refuse disposal in consultation with the local public health authority.

(5) The refuse disposal site shall be not less than 30 metres from the village and located on the leeward side.

(6) Refuse shall not be dumped either along a stream, into a stream, or in any manner that may create health hazards.

(7) Refuse sites may be conveniently located in dry valleys or used to reclaim specified areas approved by the local public health authority.

(8) Appropriate measures shall be take by the District Assembly to ensure that the refuse disposal site is not used as an open air public lavatory or as a breeding ground for animals and poultry.

(9) Where a structure has been constructed as a transfer disposal station, the District Assembly shall ensure regular clearance and disposal at the approved site.

Regulation 170—Water Supply.

(1) Where a house in a rural area is of "modern construction" and fulfils the approving requirements of a "town house", all the clauses on water Supply in Part XVI shall apply, especially where pipe-borne water supply is available.

(2) Where no pipe-borne treated water is available, bore-holes, wells and rain water collection in tanks shall be acceptable source of water supply.

(3) Bore-holes, wells and similar sources of water supply shall follow the specifications and construction details laid down by the Ghana Water and Sewerage Corporation or any agency charged with tile responsibility.

(4) Sources of water supply or water storage that breed mosquitoes shall be identified and checked by the District Assembly using appropriate and other insect spraying devices.

Regulation 171—Materials.

Part IV of these Regulations which deals with the various categories of materials applicable in urban buildings shall apply where appropriate to rural buildings under this Part.

PART XIX—MISCELLANEOUS PROVISIONS

Regulation 172—Material Change in use of Building.

(1) Where a building which was not constructed for occupation as a house is converted into a dwelling house for occupation, the provisions on these Regulations on dwellings shall become applicable to the building.

(2) Where a building constructed for a specific purpose is converted into a building for a different purpose, the provisions of these Regulations relevant and applicable to the new construction shall apply as appropriate.

(3) Where a building originally constructed for occupation by one family only becomes occupied by two or more families and is so altered or extended as to create separate dwellings the provisions of these Regulations shall apply accordingly with the necessary modifications.

Regulation 173—Backyard Farming.

(1) This regulation shall apply to the size and location of backyard farming including—

(a) beekeeping, fish farming, animal husbandry and stables, snail and crab farming; and

(b) the rearing of any other animals in residential, commercial or industrial areas of an urban area.

(2) Within a commercial, industrial or residential area —

(a) the rearing of pigs, goats, sheep, cattle, horses, camels and any other such animals is prohibited; and

(b) the keeping of bees and backyard poultry farming shall be within a tolerable level and no coop or structure intended for bee-keeping and poultry farming shall be located at a distance of less than six metres from any habitable building or any boundary wall or line of a habitable building.

(3) The floor area of any coop structure intended for poultry farming shall not exceed 15m^2 for the first 100m^2 and 5m^2 for every additional 1000m^2 plot area.

Regulation 174—Buildings for use by Animals.

(1) The requirements of this regulation shall apply to all buildings used or intended to be used primarily by animals, expect that this regulation shall not apply to—

(a) kennels, the total cubic content of which does not exceed 1.3m^3 and for not more than two dogs;

(b) coops or aviaries, the total cubic content of which does not exceed 2.90m^3;

(c) hutches or cages, the total cubic content of which does not exceed 0.25m^3 for the use of small animals; and

(d) aquaria, the total cubic content of which does not exceed 10.25m^3 of water, constructed for or used by domestic animals of the occupant of a dwelling.

(2) No such building shall be constructed without the written permission of the local public health authority who may determine the species of animals which may use the building.

(3) No part of the building shall be less than 6m from any part of a building used for human habitation.

(4) An animal building shall have adequate access to a street, except that this access shall not pass through or under any building used or intended to be used for human habitation.

(5) Where the cubic content of any of the buildings specified in subregulation (1) exceeds 8.9m³, the materials used for the construction of the building shall comply with Part IV of these Regulations except that no wooden framed buildings shall be constructed for use primarily by animals other than birds.

(6) All external walls and floors of the buildings shall be robust and solidly constructed of impervious and fire resisting materials, and where sub-divisions or cubicles are required, each cubicle shall have an internal area of not less than 2.15m long by 1.20m wide for cattle, 3m long by 2m wide for a board house.

(7) The design and drainage of all such buildings shall be approved by the District Planning Authority.

(8) No room intended for human habitation or storage of food shall be built over or form part of a structure for use by animals.

(9) Access for animals shall not be through any room used for human habitation or storage of food.

(10) The waste water from buildings for animals shall normally be disposed of into a public sewer. Where no pubic sewer exists a local sewer shall be constructed to take care of the effluent in accordance with Part XIII of these Regulation. The waste shall not be discharged into the open fields or drains in such a manner as to constitute a nuisance to the inhabitants.

Regulation 175—Abattoirs (Slaughter-houses).

(1) External walls of slaughter-houses shall be of solid construction and all internal finishes to walls, floors and ceiling shall be of such impervious material or other approved materials that facilitate cleansing and the design and drainage shall be to the satisfaction of the District Planning Authority.

(2) Adequate ventilation and natural lighting shall be provided in slaughter-houses.

(3) All windows and openings of slaughter-houses shall have sound insect-proofing and wherever possible insect proof lobbies shall be provided for all entry and exit points.

(4) Entry and exit points shall be provided with foot-baths containing disinfectant.

(5) The waste water from a slaughter-house shall normally be disposed of into a public sewer except that where no public sewer exists, a local sewer shall be constructed to take care of the effluent in accordance with Part XIII of these Regulations. No waste shall be discharged into the open fields or drains in such a manner as to constitute pollution of the environment.

(6) Adequate provision of water closets, urinals, showers and wash-hand basins shall be provided and these shall be located such that they will not open directly into the main hall of the slaughter-house.

(7) Foot-baths shall be located at all entry points from privy accommodation to avoid contamination.

Regulation 176—Markets and Lorry Park

(1) A market may consist of a single or two storey building with compartments or a series of open structures, some temporary, others permanent where buying and selling of food items and other wares are carried out, and where bulk-breaking takes places in the lorry park adjacent to the market.

(2) Where single or more storeys are constructed, non-combustible materials shall be used for all external walls, and all internal finishes to walls, floors and ceilings shall be non-combustible and impervious.

(3) Closed markets shall be compartmentalized so as to frustrate the spread of fire.

(4) All means of escape shall comply with sub-part II of Part VI of these Regulations.

(5) Adequate lighting and ventilation shall be provided to the satisfaction of the District Planning Authority.

(6) The design and drainage of a market complex shall be approved by the District Planning Authority.

(7) Sanitary conveniences shall satisfy Part XIV of these Regulations and shall be so located as to eliminate contamination to food items.

(8) Provision of fire fighting equipment shall satisfy Part VI of these Regulations.

(9) Open markets and lorry parks shall be well drained and erosion checks shall be provided.

Regulation 177—Swimming Pools.

(1) Swimming pools may be sited indoor or in the open air.

(2) Where swimming pools are enclosed all external walls shall be of solid construction and all internal finishes for floor, walls and ceilings shall be of impervious materials to facilitate cleansing. Floors shall be anti-static and shall be so well drained as to provide a non slippery surface.

(3) Adequate sanitary conveniences shall be provided and so located as to encourage the swimmers to wash before entering the pool.

(4) Where the facility is an indoor swimming pool, adequate ventilation and natural lighting shall be provided.

(5) The sides of open air swimming pools shall be so constructed as to drain away from the pool and to prevent rainwater from washing into the pool.

(6) First aid facilities shall be provided to cater for minor accidents.

(7) Swimming pools shall be designed and constructed in accordance with accepted international standards.

Regulation 178—Crematoria and Cemeteries.

(1) Crematoria and cemeteries intended to be used for the disposal of human remains are best located on the same site but where this is not possible they shall be located as near as possible to each other.

(2) Cremation installations shall be located away from public areas preferably at the rear of the cemetery chapel. Ancillary facilities shall be located away from the installations.

(3) Means of access shall comply with the provisions on means of escape in Part VI of these Regulation.

(4) Cremation shall be performed with electricity or gas-fired special furnaces, consuming 45km per cremation.

(5) Cremation shall be completely dust-free and odourless at a temperature of 900-1000ºC dry air.

(6) The furnace shall be pre-heated for 2 to 3 hours and the cremation shall last for 1-1.25 hours. Supervision shall be through air tight peep-holes.

(7) The ashes shall be gathered and stored in iron boxes.

(8) Cemeteries shall be well drained and landscaped to minimize erosion. Gangways shall be clearly defined so that graves are not pedestrianised.

(9) Graves shall be 1.8m deep in accordance with international standards.

(10) Graves shall normally be allowed to lie fallow for a minimum period of 30 years before the land is re-used or converted for development purposes.

Regulation 179—Incinerators.

(1) This regulation shall apply to incinerators which shall be used solely for the purpose of burning refuse and shall satisfy Part XV of these Regulations.

(2) Private incinerators shall not be allowed under this regulation but where an exception is made, the District Assembly shall inspect the site to ascertain the location and the design of the structure.

(3) A District Assembly shall, before granting an exception, determine the kind of refuse the applicant wishes to burn and if this will create a health hazard permission to construct or install the incinerator shall be refused.

Regulation 180—Garages Attached to Houses.

(1) This provision shall apply to all garages attached to houses which may be regarded as building within the scope of these Regulations.

(2) The floor of garages shall be constructed of non-combustible material.

(3) Any wall or column, ceiling or roof covering shall be constructed of non-combustible materials or if in timber shall comply with Part VI of these Regulations.

(4) Where there is a door between the garage and another part of the building—

(a) the upper surface of the threshold of the doorway shall not be less than 100mm higher than the floor of the garage; and

(b) the door and its frame shall be constructed of non-combustible material or timber which complies with Part VI of these Regulations.

(5) Where the garage is enclosed on all three sides except the entrance, it shall be provided with adequate permanent ventilation.

(6) The use of timber for building a garage shall be permitted —

(a) where used structurally if the least dimension of the timber is not less than 50mm and the least cross-sectional area is not less than 3900mm^2; and

(b) where used in doors, windows, louvres or shutters if the least dimension of the timber is not less than 25mm and the least cross sectional area is not less than 1900mm^2.

(7) Floor finishes of garages attached to houses shall be constructed of —

(a) compacted stones, gravel or laterite, with or without rendering; or

(b) concrete to mix B.

(8) All walls and columns of garages shall comply with the requirements of Part V.

(9) Where a ceiling is required, it shall be constructed of hardboard, cement or sand rendering, plasterboard or plaster in accordance with the provisions of Part VI.

(10) The roof and any framing and covering shall comply with Parts V and Part IX of these Regulations.

(11) Where permanent ventilation is required the openings in each two opposite sides of the garage shall be not less than 0.50m above floor level and additional ventilation may be arranged as desired.

Regulation 181—Detached Garages.

(1) This regulation shall apply to any garage which is a detached building.

(2) The floor of the garage shall be constructed of non-combustible material.

(3) Any wall, or column, ceiling or roof covering shall be constructed of non-combustible material or timber which complies with Parts V and Part IX of these Regulations.

(4) Where a garage is enclosed on all four sides it shall be provided with adequate permanent ventilation.

(5) The use of timber shall be permitted —

(a) where used structurally if the least dimension of the timber is not less than 50mm and the least cross sectional area is not less than 3900mm^2; and

(b) where used in doors, windows, louvres and shutters, if the least dimension of the timber is not less than 25mm and the least cross sectional area is not less than 1900mm^2.

Regulation 182—Sanitary Accommodation for Workers.

(1) Where more than three persons are employed there shall be provided for them suitable and sufficient privy accommodation separate from that provided for the occupants of the house.

(2) Where more than six persons made up of male and female are employed at the same time, there shall be provided separate privy accommodation for each sex separate from that provided for the occupants of the house.

(3) Where in order to comply with subregulations (1) and (2) of this regulation there is provided privy accommodation, suitable washing facilities adjacent to the privy accommodation shall be provided.

Regulation 183—Commercial Kitchen.

(1) Where part of a building is used as a house and another part is used for preparing or cooking food for sale, the area of that kitchen shall be at least 9.0m^2; the shortest horizontal dimension shall be at least 2.4m, and the average height shall be at least 3m and in no part of the kitchen shall the height be less than 2.4m.

(2) The equipment in the kitchen shall comply with the requirements of Part X.

(3) The materials and finishes of such kitchens shall comply with the requirements of Part IV.

(4) The floor, columns, wall and ceiling or roof covering shall be constructed of non-combustible materials.

(5) The inner surfaces of the floor, columns, walls and ceiling to the kitchen shall be smooth and impervious to moisture.

(6) Adequate and suitable arrangements shall be made where required by the District Planning Authority for the removal of fumes and excess heat.

(7) Compliance with these Regulations for buildings shall not absolve any person from compliance with other regulations relating to health.

(8) A commercial kitchen shall be considered to comply with the preceding provisions of this regulation, if—

(a) the floor complies with regulation 175(1) provided that wooden floors shall not be permitted;

(b) the walls either—

(i) comply with Part IV; or

(ii) are constructed of timber framing which complies with Part IV covered on both sides with sheet metal or cement glass or suitable plastics or plasterboard;

(c) the ceiling complies with regulation 175(1) provided that it shall be constructed of sheet metal cement or plaster board, or suitable plastics, or plaster;

(d) the columns comply with Part VI;

(e) the surfaces of the walls and ceiling are smooth, have all corners rounded, and are painted;

(f) the floor surface is finished to a smooth hard wearing fair face as approved or required by the District Planning Authority;

(g) all floor surfaces consist of approved tiles set in mortar mix C; and

(h) any hood required by the District Planning Authority for the removal of fumes complies with the requirements of Part X of these Regulations.

Regulation 184—Commercial Laundries.

(1) Where any room of a building is used as a laundry in which washing or pressing is done for commercial purpose, there shall be provided for each such room—

(a) enough and suitable sinks or other containers for water;

(b) enough supply of hot and cold water;

(c) sufficient and suitable working surfaces;

(d) walls and ceiling impervious to moisture; and

(e) floor which is impervious to moisture and adequately drained.

(2) The waste water from sinks and the floor shall be disposed of in compliance with the provisions in Part XIII on waste water.

(3) A commercial laundry shall be considered to comply with subregulation (1) if —

(a) the walls, column and ceiling are rendered or covered with a material other than soft board or other water absorbent material;

(b) each wall, column and ceiling surface or the underside of roof covering where there is no ceiling is painted in compliance with Part V; and

(c) the floor consists of concrete to mix C, of not less than 75mm thick, brought to a smooth surface by rendering or otherwise and graded to a channel or gully.

Regulation 185—Corn Mills.

(1) No corn grinding machine shall be installed in any room or building not constructed for the purpose of grinding corn or other cereals.

(2) Every such building shall be of approved design, with good ventilation, natural lighting and sound safety precautions.

(3) Walls, floors and ceiling shall be so constructed as to facilitate cleansing.

Regulation 186—Interpretation.

In these Regulations unless the context otherwise requires—

"adobe" means an earth material stabilised or unstablised and includes sundries bricks or sundries blocks;

approval" means consent given by the District Planning Authority for building development;

"approved" means approved by the District Planning Authority;

“apron” means an extension of the concrete floor of a building, a garage or any such structure beyond the face of the building;

atakpame" or "mud wall" means a wall constructed with a monolithic earth material such as swish, clay, laterite or other soils that have not more than 25% organic matter;

"building inspector" means a person employed by a District Planning Authority for the purpose of inspecting building construction to ensure compliance with the requirements of these Regulations and shall be any person who has undergone an approved training in building and is versed in the construction of buildings, structural design and analysis, building maintenance, law related to buildings, principles of town planning and design principles and for that purpose any of the following may be a building inspector—

(a) an architect;

(b) a professional building surveyor;

(c) a civil engineer; or

(c) a professional builder.

“British Standards” and “British Standard Codes of Practice” mean publications by the British Standards Institution, British Standard House, of 2, Park Street, London,, WI England;

"building" means any structure or a part of a structure and includes drains, sewers, pipes and everything regulated in these Regulations;

"building line" means a line as fixed or to be fixed by the Town and Country Planning Department in relation to a plot beyond which no building shall project;

"business premises" means a building used or constructed or adapted to be used wholly or partly for business purposes;

“ceiling” means the covering to the underside of joists, rafters, collar ties, or slab and where no such covering is used "ceiling" means the underside of the joists, rafters, coller ties, or slab above a room;

"cement" means Portland cement which complies with British Standard Specification No. 12, or No. 146, 1947 and subsequent revisions;

“Cement concrete” means a concrete made of cement, clean sharp sand, or other hard tough coarse aggregate properly mixed with clean fresh water; references to concrete mixes in these Regulations are to be construed in accordance with provisions in Schedule 3 Tables A and B of these Regulations;

“chop bar” means a temporary place or structure where food is prepared and eaten;

“cross wall" or "internal wall" means any wall built up regularly with the external or parting walls so as to divide the building into rooms;

"District Planning Authority" includes a Metropolitan Planning Authority;

“drains” means that part of the main drain and its branches conveying the discharge from the soil pipe to the first compartment of the septic tank, or to the public sewer, but does not include the vertical soil pipe above the ground level;

"dwelling house" means a building constructed, adapted or designed to be used for human habitation;

"effluent drain" means a pipe, an open channel or underground conduit, for the conveyance of sewage or other waste matter;

“end grain” means the face of a piece of lumber which is exposed when the fibres are cut transversely;

“fence line” means the fence line as fixed or to be fixed by the District Planning Authority;

“flashing” means sheet metal or other material used in roof and wall construction to shed water;

“floor” includes any horizontal platform forming the surface of any storey and joists, board, timber, stone, brick, concrete or other substance connected with or forming part of such platform;

“foundation” means the lower portion, usually concrete or masonry and includes the footings which transfer the weight and load of a building to the ground;

“GS” means Ghana Standards;

“Ghana Standards” means publications on building standards by the Ghana Standards Board;

“grade” means the level of the ground surface around the foundation wall;

“habitable room” means a room used or constructed or adapted to be used for human habitation and includes a living room,

“Health Officer” means the Public Medical Officer of Health and any person appointed by the Medical Officer of Health not below the rank of Health Superintendent;

“kitchen” means a room used for the preparation or cooking of food;

“living room” means a room designed for permanent human habitation and excludes verandahs, kitchens, sanitary annexes and outhouses;

"Minister" means the Minister responsible for Works and Housing;

“out building” means a building room used solely for kitchens, bathrooms, latrines, garages, stores and similar purposes and may include not more than three habitable rooms for servants quarter;

"prescribed" means prescribed by regulations;

“public building” means a building used or constructed or adapted to be used either ordinarily or occasionally for any of the purposes classified in the Schedule 7, Part I to these Regulations, provided that for any of the purposes classified in these Regulations — a building shall not be considered to be public building unless the accommodation provided in it exceeds 100 persons or the aggregate of the floor space exceeds 240m^2;

“refuse” means rubbish or waste materials generated in either private or public areas and may consist of mainly vegetable matter, synthetic materials, empty cans and broken bottles;

“room" means any sub-division of any storey of a building;

“sand-cement blocks" means blocks made of cement and clean sharp sand properly mixed with clean fresh water, the proportions of which shall not exceed five parts of sand to one part of cement; and the blocks shall be thoroughly compacted in the moulds and cured in the shade and kept wet for at least seven days and thoroughly dried out before being used in a building;

"small building" means one storeyed building of a capacity of less than 500m^3 (five hundred cubic metres) or a two storeyed building with neither storey having a floor area of more than 90m2 (ninety square metres)

“soil pipe" means any line of pipes receiving the discharge from any fitting, such as a water closet or urinal or slop sink and connected to a soil drain;

“storey” means the space between the under surface of every floor and the under surface of the floor next above it, or if there is no such floor above it, then the underside of the tie of collar beam of the roof or other covering when ceiled at such level, or if there is no tie or collar beam, then the level of the vertical height of the underside of the rafters or other support of the roof;

“surface water drain” includes any open channel or drain for drainage of rain water and subsoil water and for the drainage of sullage water from lavatory basins, kitchen sinks, baths and similar fittings, apart from sewage, or other deleterious fluid;

“swish” means mud or landcrete;

“temporary structure” includes scaffolding, hoardings, fences, huts, kiosks, booths, or shelters;

“thermal insulation” means material used to resist heat transmission through walls, floors or roofs;

“waste pipe” means a pipe used to convey sullage and waste water but not sewage;

wattle and daub" means a system of mud walling with an inner framework or wood twigs or palm branches;

“width” when applied to streets means the whole extend or space intended to be used or laid out in such a manner as to be used as a public way, open drain, foot-path and grass verge, measured at right angles to the course or direction or intended course or direction, of such street; and when applied to stairs, means the total length of the tread between the strings, if any, exclusive of balustrading;

"work" means work on any building and includes the alteration, extension and repair, but does not include the decoration of the building.

Regulation 187—Compliance with Other Laws.

The provisions of these Regulations are in addition to and not derogation from compliance with any other statutory requirement.

SCHEDULES

SCHEDULE 1

PART I

FORM A (Regn. 2)

APPLICATION FOR BUILDING PERMIT

..... DISTRICT/METROPOLITAN PLANNING AUTHORITY

TO:

Secretary

District/Metropolitan Planning Authority…….....

P. O. Box .....

I, ... of

…….....……

(full and current address)

....

.....

.....

hereby apply for permission to construct a building viz:

work to be executed

.....

.....

.....

..... at .....……..

for .....

(State purpose for which building is to be used)

under the National Building Regulations and in accordance with the particulars attached including the relevant drawings. Title Land Certificate No. ..... is attached.

Dated this ..... day of .....

Signature .....…….....

(Witness to signature of Applicant if illiterate)

…….....…….

Date …….....…….

(Signature and address of Agent to

be clearly furnished if application

is being submitted on behalf of

applicant).

DECLARATION

(Regulation 5(2))

I,..... hereby declare that the site of the proposed building has been demarcated as laid down in Part II sub-part 1 of the National Building Regulations, 1996, that all the documents, plans, calculations, etc., relevant to this application and here annexed have been prepared by me or under my supervision and to the best of my knowledge the execution of the work in accordance with them will not involve or entail any contravention of the National Building Regulations of 1996 or any other laws now in force.

I also declare that the following is a description of the materials, etc. to be used in the works—

Foundations ..... Materials .....

Proportions .....

Walls .....……..... Materials .....

Proportions .....

Floors: Ground ..... Materials .....

Proportions .....

Floors: Upper ..... Materials .....

Proportion .....

Joists, etc. if any, dimensions and spacing …….....

Windows ……..……. Type .....

Dimensions .....

Doors ..... Type .....

Dimensions .....

Roof .....…….. Type .....

Covering .....

Spacing of Trusses .....

Steps and Stairs .....…….. Materials.....

Verandah …..... Materials .....

Fencing ..... Materials .....

Height ….....

Drainage Soil …….....

Surface Water .....

Signature .....

Licensed Surveyor or other professional agent of applicant

PART II

EXEMPTION FROM SUBMISSION OF PLANS—REGULATION 4(1)

Type of building Extent of Exemption

1. Military buildings e.g. barracks, ammunition depots, wireless rooms and any other buildings for military purposes. No deposition of plans required.

2. Ports, airports, sea ports, and inland water ports. No deposition of plans required.

3. Security buildings, e.g. prisons, police stations, barracks, fire service stations and any other building for security purposes. No deposition of plans required

4. Civil service buildings, e.g. residential, offices, commercial hospitals, clinics, research buildings. Deposition of plans, for one month prior to award of contract or commencement of works.

5. University buildings, e.g. administration buildings, halls of residence, lecture rooms, laboratories, libraries, swim-ming pools, farm buildings, and any other buildings for university use. Deposition of plans required.

6. Mining buildings, e.g. mining operational buildings, offices, stores, processing rooms, and any other buildings for mining purposes. No deposition of plans required.

7. Mining buildings, e.g. residential, hospitals, schools, recreational buildings and any other building for non-mining purposes Deposition of plans, etc for one month prior to award of contract or commencement of works.

8. (a) Buildings for foreign missions and embassies;

(b) any existing permanent building;

(c) any building only partially exempted under this Schedule from submitting plans They are to deposit plans covering site location, indicating building lines,

height of buildings and external utility connections to building for approval by the District Planning Authority.

9. Quasi-government buildings e.g. higher institutions of learning except Universities and Corporations. They are to deposit plans covering site location, indicating building lines,

height of buildings and external utility connections to building for approval by the District Planning Authority.

10. Agricultural buildings. They are to deposit plans covering site location, indicating building lines,

height of buildings and external utility connections to building for approval by the District Planning Authority.

11. Kiosks, cornmills, carpenters shops, small garages and workshops, any other buildings or structures which are located in areas intended for use other than buildings or structure specified in this Part of this Schedule. Deposition of plans, proposals for the purpose of granting temporary approval or permit.

PART III

FORM B

BUILDING PERMIT—REGULATION 7(1)

APPROVAL is hereby granted to .....

to construct/execute work, viz..... in accordance with the plans, specifications and other particulars approved by the District/Metropolitan Planning Authority on the ……. day of …….and subject to the conditions endorsed hereon and the provisions of the National Building Regulations, 1996.

This permit shall be valid until the ……..... day of ….....……..

(Signed) …….....……

Secretary

(District/Metropolitan Planning Authority)

ENDORSEMENT

…….....

…….....

…….....

…….....

…….....

…….....

PART III

FORM C

REGULATION 10 (7)

DISTRICT/METROPOLITAN ASSEMBLY

CERTIFICATE OF COMPLETION FOR HABITATION

It is hereby certified that ....

situate a ..... has been partially completed to the extent of .... in accordance with the .....…… National Building Regulations, 1996 and Building Permit No .....

Dated .....

.....

(Metropolitan/District Engineer)

.....

Medical Officer

Dated this ..... day of .....

SCHEDULE 2

Table—Regulation 19(7)

Column 1	Column 2
Room or space of room	
Living room or space, dining room or space, kitchen or kitchen space	Minimum Height
	2.4m over at least 75per cent of the required floor area with a clear height of 2.25m at any point over the required area.
Bedroom or bedroom space	2.4m over at least 50 per cent of the required floor area or 2.2m over all of the required floor area. Any part of the floor with a clear height of less than 1.4m shall not be considered in computing the required floor area.
Unfinished basement or cellar including laundry area in it	1.9m under beams in laundry areas and in any location that would normally be used for passage to laundry and required storage areas.
Bathroom, water-closet room or laundry area above grade	2m in any area where a person would normally be in a standing position
Passage, hall or main entrance and finished rooms not specifically mentioned above	2m in any area where a person would normally be in a standing position

SCHEDULE 3

PART 1

REGULATION 30 (3)

Materials unsuitable for use in permanent building as the weather-resisting parts of external walls or roofs.

Description of Material	Particulars of Unsuitability	
1	External Walls	
2	Roofs	
3		
1. Woodwool building Slabs	Unsuitable without exception	Unsuitable without exception
2. Plasterboard	Unsuitable without exception	Unsuitable without exception
3. Fibrous Plaster	Unsuitable without exception	Unsuitable without exception
4. Canvas or cloth	Unsuitable without exception	Unsuitable without exception
5. Felt	Unsuitable without exception	Unsuitable except felt used in a roof covering of a type of construction complying with the recommendations of GS or PSCP 144, Part 3, 1970
6. Timber boarding	Unsuitable except boarding which— (a) is manufactured from— (i) timber specified in Schedule 5, (ii) timber specified in Schedule 5 subjected to preservative treatment; (b) has in either case, a thickness of not less than— (i) in case of feather-edged boarding, 16mm at the thin- ner edge; or	Unsuitable without exception

(ii) in all other cases 16mm.

7. Fibre building board Unsuitable except tampered hardwood which complies with the appropriate specification in G S or PS 1142: 1961 Unsuitable without exception

8. Wood chipboard Unsuitable without exception Unsuitable without exception

9. Straw slabs Unsuitable without exception Unsuitable without exception

10. Plywood Unsuitable except where not less than 8mm thick and satisfactorily manufactured for external use Unsuitable without exception

11. Plastering or rende-ring on wood laths or metal lathing Unsuitable except a rendered finish on metal lathing which complies with the recommendations of GS or BSCP 221: 1960 Unsuitable without exception

12. Sheet steel Unsuitable except galvanized sheet steel complying with Class A1 of GS or Type 200 of GS or Class A1 of BS 3083; 1959, or sheet steel vitreous enameled or coated with bitumen or other organic substance of like durability during the course of manufacture. Unsuitable except galvanized sheet steel complying with Class A1 of GS or Type 200 of GS or Class A1 of BS 3083; 1959, or sheet steel vitreous enamelled or coated with bitumen or other organic substance of like durability during the course of manufacture.

13. Asbestos-cement sheeting Unsuitable except—

(a) asbestos-cement sheets complying with GS or BS 690:1963 or BS 4036: 1966

(b) asbestos-cement sheets which fail to comply with GS or BS 690: 1963 only because their profile is not listed in figures 4 to 8 thereof, except that—

(i) in the case of symmetrically corrugated sheets, the average extreme fibre stress, as determined by test in accordance with Appendix B of GS or BS 690: 1963, is not less than 15N/mm2 and the width of the test specimens is the width of the sheet as manufactured and the span at which each sheet is tested is not less than the width of the test specimen; or

(ii) in the case of a symmetrically corrugated sheets, the average extreme fibre stress as determined by test in accordance with Appendix A of GS or BS 690:1963 is not less than 15N/mm2 on flat pieces cut from the sheet length and the test bearers are placed at right angles to the direction of the fibres. Unsuitable except—

(a) asbestos-cement sheets complying with GS or BS 690:1963 or BS 4036:1966

(b) asbestos-cement sheets which fails to comply with GS or B.S. 690:1963 only because their profile is not listed in figure 4 to 8 thereof except that—

(i) in the case of symmetrically corrugated sheets, the average extreme fibre stress as determined by the test in accordance with Appendix B of GS or B.S. 690:1963 is not less than 15N/mm2 and the width of the test specimens is the width of the sheet as manufactured and the span at which each sheet is tested is not less than the width of the test specimen; or

(ii) in the case of a symmetrically corrugated sheets, the average extreme fibre stress as determined by test in accordance with Appendix A of GS or BS 690:1963 is not less than 15N/mm2 and the test is carried out on flat pieces cut from the sheet length and the test bearers are placed at right angles to the direction of the fibres.

PART II

REGULATION 30(4)

STANDARDS OF BUILDING MATERIALS

Material—Description	Ghana Standards	Comparable (known) International Standards
1	2	3
1. Sand		
2. Earth construction—		
(i) monolithic: Atakpame swish		
(ii) wattle-and-daub swish		
(iii) adobe sundried bricks		
(iv) Pise		
(v) soil-cement stabilized blocks		
(vi) Soil-lime, stabilized blocks		
(vii) Burnt clay bricks and tiles	GS-Ghana Standard specifications for the production and use of Earth Blocks and Lime Constructional, 1988	
3. Ceramic sanitary appliances	GS 168-1976: glazed ceramic tiles and tiles fittings for internal walls GS 197-1978: quality of vitreous china sanitary appliances	BS 3921:1974, BSCP 121: Part 2:1973

4. Stones (for walling and concrete aggregates) sand-stone, granite

5. Grasses (for roof-Covering—

thatching:

Andropogon Gayames

Cymbopogon Gigantens

Heteropogon Contortus Imperata Cylindrica Jardirea Congoensis Schizachirium Sanguineum Marantochia Flexuousa: Leaves (for roof tiles i.e. (bamboo) Raphia Hookeri

Cocoa Nucifora

Elaeis Guincensis

Cola Gigantea

Pandanus Candelabrum

Bamboo (for frame-work, flooring, walls, roofing reinforcement for concrete

Cement, (ordinary and rapid hardening Portland cement Concrete GS:22-1970 BS 12:Part 2:1971 and BS 4027:Part 2:1972

Steel G.S. 22-1970: Galvanized corrugated steel sheets for general purposes GS: 152- 1976: Galvanized mild steel asteras and covers, tanks and cylinders.

6. Aluminium GS 163-1970: Aluminium roofing sheets

7. Asbestos-Cement GS 136-1975 for the structure use of aluminium

GS. 177:1978: sampling and inspection of asbestos cement products.

GS. 178: 1978 asbestos cement pipe fittings for building and sanitary purposes

GS. 181-1978: Guide to the use of 150 recommendation R.390 "Sampling and Inspection of Asbestos Cement Products".

GS 193-1978: for building and sanitary pipes in asbestos-cement.

GS. 204-1978: asbestos- cement pipes joints and fittings for sewerage and drainage.

GS. 212-1978: for asbestos- cement pressure pipes

8. Bituminous Products Medium curing cutback (mc2) Quick breaking (or rapid setting) Emulsion (i.e. coles)

Cut back or sow setting emulsion,

teroles

coaltar

pitch GS

9. Glass

Transparent glass

Translucent glass

Special glasses

Tonghered glass

Solar Control glass

X-ray Resistant glass

Antique glass

Glass Mosaic

Glass block

10. Glass Fibre

Glass fibre reinforced

polyester (GRP)

Glass-fibre reinforced cement (GRC)

Glass-fibre reinforced gypsum (GRG) GS

11. Plastics

Thermoplastics

Polythene

GS 45-1972: for polythene materials

Polymethyl

Methacrylate (Actylic Resins) GS 50-1972: Low and intermediate density polythene sheets for general purposes B.S. 3869:1965

Polyrinyl Acetate

Polyvinyl Acetate GS 108-1973: for polystyrene tiles for walls and ceilings

Polyrinyl Fluoride GS 49-1972. Glossary of terms used in the plastics industry

Thermosetting Plastics GS.66:1972: Thick PVC sheeting

GS 74:1972: expanded polystyrene tiles and profiles: GS 85 of 1972

GS 89 unplasticised PVC pipe for industrial purpose

GS 94-1972: methods of testing plastics.

GS 1177-1972; unbacked flexible PVC flooring

GS 182-1978: W C seats (plastics) BS 3837 of 1965

Cold water services

Paints

Oil-based paints

Water-based paints

Alkali-resisting paints Aluminium primer

Anti-corrosive primer GS 221-1978: Paints and vanishes—sampling

Resin-bounded Wood GS BS 2604

BS 1811

BS 565: 1972

BS 881:1955

BS 1186

BS 4261:1968

CP 112

Chipboard and other particle boards

Timber GS

PART III

REGULATION 30(5)

CONSTRUCTION MATERIALS, QUALITY AND PURPOSE

A. Mud Wall (Atakpame)

1. Materials

(1) Any of the following soils may be used for mud wall construction—

(a) swish;

(b) clay,

(c) laterite;

(d) other soils that have not more than 25% organic matter.

(2) Materials may be stabilised with Portland cement or bitumen.

(3) All mud wall materials shall be of composition with not less than 5% sandy particles.

(4) The mud used shall be premixed at least one day in advance of use to ensure the breaking down of lumps into clear smooth consistency and to allow excess of moisture to evaporate.

2. Foundation for mud wall

Foundation supporting external mud walls shall be made of established materials. The following shall be considered to satisfy this requirement—

(a) any of the materials specified under paragraph of Part 1 of this Schedule with at least 4% Portland cement as base;

(b) sandcrete or concrete block:

(c) soil stabilized blocks of not less than 4% of Portland Cement;

(d) soil stabilised blocks of not less than 5% bitumen used as the stabilising agent and introduced warm during the mixing of the soil.

3. Construction

(1) The top of the foundation walls shall be laid to a minimum height of 150mm above ground level.

(2) The estabilished building units for the foundation walls shall be laid in any one of the following composition mortars—

(a) one part to six parts cement/sand mortar where Portland cement is used as the stabilising agent in the manufacture of the blocks; or

(b) one part to eight parts bitumen/sand mortar where bitumen is used as the stabilizer in the manufacture of the blocks.

(3) Foundations shall be constructed to satisfy the provisions in regulation 35 of these Regulations.

(4) The foundation walls shall be not less than 255mm in thickness for ground floor buildings and not less than 325mm for one and two-storey buildings.

(5) Mud walls shall be laid in lifts of not more than 600mm heights.

(6) Each lift shall be allowed to dry out and hurden sufficiently to withstand deformation due to loading of subsequent courses laid over before the next lift is laid.

(7) The vertical faces of the walls shall be maintained plumb relative to the foundation walls.

(8) The top of a mud wall at lintel level shall be provided with a binding core to assist in the spreading of the roof loads evenly over the whole wall.

(9) There shall be laid hardwood timber flat over all the top of the walls with lapped jointing at the ends where the plates meet.

(10) Reinforced concrete course shall be provided and flat steel plate built over the walls.

(11) The roof plate shall be anchored to the binding course using hoop from iron or mild steel rods.

4. Insulation of mud walls

(1) The insulation of the walls against the effect of the weather shall be soil/ bitumen plaster smooth trowelled and sealed over with a two-coat lime wash or any other shading of cement/emulsion paint.

(2) The mortar shall be in the following mix proportions—

(a) external surface: 1: 10 bitumen/soil plaster;

(b) internal surfaces: 1: 12-14 bitumen /soil plaster.

(3) The plaster shall be of one-coat minimum 13mm thickness.

5. Fence walls

(1) The foundation walls of a fence wall shall be considered to satisfy the specification if they conform to paragraph 1(1)(a) of this Part of the Schedule.

(2) The fence walls shall conform to all the minimum requirements specified in paragraph 2 of this Part of the Schedule.

(3) Fence walls shall be provided with copings made out of stabilised materials and primary materials capable of withstanding the effects of the weather; the following materials shall be considered as suitable for the purpose—

(a) concrete,

(b) burnt bricks;

(c) sandstone,

(d) seasoned and formed timber.

(4) The copings shall be provided with reasonable weathering to throw off rain water.

6. Drainage around mud building

Adequate storm water drainage shall be provided around the mud building and in the case of compound houses, the compounds shall also be effectively and adequately provided with drainage to keep the feet of the walls dry.

B. Shingles-Shingle Roof

1. Materials

Materials for a shingle roof shall be—

(a) timber; and

(b) nails.

2. Quality of timber

Timber for shingles shall be of naturally durable type or made from durable species and shall have the following characteristics—

(a) non-twisting, non warping;

(b) less splitting;

(c) minimum shrinkage;

(d) all heartwood;

(e) edge grain quarter sawn;

(f) free of knots;

(g) be quarter sawn.

3. Types of timber recommended for shingle roof

Emeri (Idigbo) 15-20 years durability,

Odum (based on work by lrvine's Woody Plants in Ghana);

Kokrodua (F.P.R.I. Lab Test Reports);

Cedrella,

Bubinga.

4. Quality of nails

(1) Nails for fixing shingles shall be of best quality and shall be of hot smelter galvanized;

(2) Nails of aluminium or copper, may also be used. Ordinary wire nails should not be used.

(3) Rust-resistant nails should be used and zinc coated nails are also recommended.

5. Sizes and structure of shingles

(1) Wood shingles shall be a rectangular piece of wood tapering in thickness along the grain to facilitate their overlapping when covering roofs and exterior walls.

(2) Sizes of shingles shall normally be of the following measurements—

(a) length: 400/450mm and 600mm;

(b) thickness ranges from 10mm to 20mm at the butt end and may tape to about 3mm at the head, and

(c) the width varies from 100mm to 350mm.

6. Preservative Treatment of shingles—Durability

(1) To increase the life of singles it is recommended that preservatives be applied. Pressure treatment with organic solvents or tar oils or water borne preservatives that are not leacheable are suitable for exposed structures.

(2) The shingles shall be made of seasoned timber material of moisture content not greater than the equilibrium moisture content of the area where it is to be used e.g. 12-20 per cent for the Northern part of Ghana.

7. Workmanship

(1) Exposure; this means how much of each shingle contacts the weather. The amount of exposure depends upon the pitch of the roof.

(2) A good shingles roof should never be less than 3 layers thick, therefore the exposure should never exceed 1/3 of the length of the shingles. If the roof rises at 22 degrees or steeper, the recommended maximum exposure for each length of shingles should be—

(a) for 400mm shingles an exposure of 125mm;

(b) for 450mm shingles an exposure of 140mm;

(c) for 600mm shingles an exposure of 190mm.

(3) If the roof pitch is less than 22 degrees but not below 14 degrees the recommended maximum weather exposure should be—

(a) for 400rnm shingles an exposure of 85mm

(b) for 450mm shingles an exposure of 110mm

(c) for 600mm shingles an exposure of 150mm

(4) Reduction of weather exposure should not exceed 25% of the length of the shingles on lower pitched roofs. The thickness of the roof is increased from 3 to 4 layers of shingles.

8. Types of Roof Deck

Recommended spacing of rafters are—75mm x 50mm spaced at 70mm centres with battens 50mm x 25mm, alternatively rafters can be 75mm x 40mm spaced at 60mm centres with 40mm by 20mm battens.

9. How to construct a shingle roof—

(a) begin with a double thickness of shingles at the bottom edge of roof;

(b) let shingles protrude over to assure proper spillage into eavetrough or gutter;

(c) nail shingles so that next row above will cover nails by at least 20mm;

(d) nails should not be placed further than 20mm from the edge of shingle;

(e) no matter how wide the shingle is, use only two nails in each shingle;

it is easy to use a board as a straight-edge to line up rows of shingles.

Tack the board temporarily in place for guide;

(g) space shingles about 6mm apart to allow for expansion and to prevent possible 'buckling';

(h) never have two joints in line if separated by only one course of shingles;

(i) a side-lap of at least 40mm between joints in successive course should be left.

TABLE A

MORTAR MIXES AND THEIR USE SITUATIONS

REGULATION 32(2)

Position Exposure to land, rain and heat of sun Time of construction Mixes cement/lime/ sand by volume

Internal walls and partitions hot and humid season 1:3:10-12 to 1:2:8-9

(or Hydraulic lime 1:3 sand)

Harmattan season (stronger mixes) 1:2:8-9 to 1:1:5-6 (or Hydraulic lime 1:3 sand)

External walls Sheltered and moderate hot and humid 1:2:8-9

Above dpc Severe Harmattan and all seasons 1:1:5-6

Parapets: free standing walls below dpc all all 1: 1:5-6 or 1: 1/4:3

Engineering works: all all cement:sand

(Bricks> all all 1:3

50001b/sq in) Masonry all all

Sandcrete blocks	all	all	1:4 to 1:6
Soil block	all	all	1:6 to 1:8

TABLE B

REGULATION 32(3)

CONCRETE MIXES (BY VOLUME)

MIXES BY VOLUME

Class	Lime	Cement	Aggregate
A	1	1.5	3
B	1	1	3
C	1	2	4
D	1	3	6

SCHEDULE 4

REGULATION 44(2)(d)(ii)

Minimum Width of Strip Foundations

1	2	3	4
Type of subsoil	Condition of subsoil	Field test applicable	Minimum width in millimetres for total load in kilometres per lineal metre of loadbearing walling of not more than—
			20KN/m 30KN/
			40KNm 50KN/m

60KN/m 70KN/m

I

Rock Not inferior to sand- stone, limestone or firm chalk Requires a pneumatic or other mechanically operated pick for excavation In each case equal to the width of wall

II

Gravel .....

Sand ..... Compact .....

Compact ..... Requires pick for execution, Wooden peg 50m square in cross section hard to drive beyond 150mm 250 300 400

500 600 650

III

Clay .....

Sandy Clay ..... Stiff .....

Stiff ..... Cannot be moulded with the figures and requires a pick or pneumatic or other mechanically operated spade for its removal 230 300 400

500 600 650

IV

Clay .....

Sandy Clay..... Firm .....

Firm ..... Can be moulded by substantial pressure with the fingers and can be excavated with graft or spade. 200 350 450

600 750 850

V

Sandy.....

Silty sand .....

Clayed sand ..... Loose .....

Loose .....

Loose ..... Can be excavated with a spade. Wooden peg 50 square millimeters in cross-section can be easily driven 400 660

VI

Silt.....

Clay.....

Sandy Clay.....

Silty clay..... Soft .....

Soft ……...….

Soft ……....

Soft ……..... Fairly moulded with fingers and readily excavated. 450 650

VII

Silt .....

Clay .....

Sandy Clay…… Very soft .....

Very soft .....

Very soft ..... Natural sample in very cold conditions exudes between fingers when squeezed in first 600 850

Note: In relation to types V, VI and VII, foundations do not fall within the provisions of Part V of these Regulations if the total load exceeds 30KN/m.

SCHEDULE 5

REGULATION 45(5)(d)(ii)

RULES FOR DETERMINING THE DIMENSIONS OF

CERTAIN TIMBER MEMBERS

1. Interpretation of this Schedule—

In this Schedule—

"flat roof" includes a roof the pitch of which is 5cm or less to the horizontal;

"spacing" means the distance between the centres of any two adjacent timber members of the same type, measured in a plane parallel to the plane of the floor, ceiling or roof structure of which each such member forms part;

“span" means the distance between the centres of any two adjacent bearings or other forms of support given to a timber member, measured in a plane parallel to the plane of the floor, ceiling, or roof structure of which the member forms part; and

"timber member" means a piece of solid timber of any of the types more particularly specified in the headings to the tables to this Schedule.

2. Special Treatment of Timber

(1) Timber used in the construction of roof or fixed within a roof, including any ceiling joist within the void spaces of the roof, shall be adequately treated with a suitable preservative to prevent infestation by wood borers (hylotrupes bajulus-L).

(2 The requirements for special treatment of timber shall be considered satisfied if—

(a) the timber is treated in accordance with the provisions of Ghana Standards or BS 4072: 1966; or

(b) the timber, when freshly felled and milled and having an average moisture content of not less than 50% of its overdry mass, is treated by diffusion with sodium borate to produce a net dry salt retention of not less than 5.3 kg/cubic metre of boric acid equivalent; or

(c) the timber is completely immersed for not less than ten minutes in an organic solvent type wood preservation solution containing not less than 0.5% gamma HC, dieldrin or other persistent organochlorine contact insecticide and any surfaces subsequently exposed by cutting the timber for fitting in the building are thoroughly treated by dipping, spraying or brushing those surfaces with the same type of preservative.

(3) The dimensions of a timber member may be determined by reference to the appropriate table to this Schedule if—

(a) in the case of a member of a type to which any one of Table 1 to 12 of this Schedule relates, the member either consists of Ghanaian timber; or

(b) in the case of a floor board to which Table 1 of this Schedule relates,—

(i) the board complies in all respects with BS 1297: 1970; and

(ii) the span of the board does not exceed the dimension specified in Table 1 of this Schedule having regard to its finished thickness; and

(c) the imposed load to be sustained by the floor, ceiling or roof of which the timber member forms part does not exceed the load specified in regulations 34 and 35(3).

3. Preservative Treatment For Timber

Type of Preservation	Method of Application
1. Coaltar oil to BS. 144: 1954	In accordance with BS913:1954
2. Coaltar oil to BS. 3051: 1958	In accordance with BS913:1954 steeping for not less than 1 hour.
3. Copper/chrome/arsenic composition to BS 4072: 1966	In accordance with BS4072:1966
4. Copper napthenate: a solution containing not less than 2.75% expressed as copper, in a suitable organic solvent	(a) Vacuum impregnation b) Steeping for not less than one hour
5. Pentachlorophenol: a solution containing not less than 5% id a suitable organic solvent	
6. Tri-butly-tin oxide: a solution containing not less than 1% in a suitable organic solvent.	

SCHEDULE 5

TABLE 1

FLOOR JOISTS

Size of joist in millimetres	Dead load in Kilogrammes per square metre supported by joist, excluding the mass of the joist		
	Not more than 25	More than 25 but not more than 50	More than 50 but not more than 125
Spacing of joists in millimeters			

400 450 600 400 450 600 400 450 600

Max. Span of Joist in metres

38x75

38x100

38x125

38x150

38x175

38x200

38x225 1.03

1.74

2.50

2.99

3.48

3.96

4.44 0.93

1.57

2.31

2.83

3.29

3.75

4.20 0.71

1.21

1.81

2.46

2.86

3.26

3.66 0.98

1.60

2.29

2.80

3.26

3.71

4.17 0.88

1.45

2.09

2.65

3.08

3.51

3.94 0.68

1.13

1.66

2.23

2.68

3.06

3.43 0.86

1.34

1.85

2.38

2.79

3.18

3.57 0.78

1.23

1.71

2.20

2.63

3.00

3.37 0.43

0.98

1.38

1.80

2.24

2.61

2.93

44x75

44x100

44x 125

44x150

44x175

44x200

44x225 1.18

1.97

2.62

3.13

3.65

4.16

4.66 1.06

1.78

2.52

3.02

3.51

4.00

4.50 0.81

1.38

2.05

2.64

3.07

3.50

3.93 1.11

1.80

2.50

3.00

3.49

3.98

4.47 1.00

1.64

2.34

2.84

3.30

3.77

4.22 0.78

1.29

1.87

2.47

2.88

3.28

3.68 0.96 1.49 2.05 2.57 2.99 3.41 3.83 0.88 1.37 1.89 2.43 2.83 3.23 3.26 0.69

1.10

1.54

2.00

2.46

2.80

3.15

50x75

50x100 50x125 50x150 50x175 50x200 50x225 1.33 2.10 2.73 3.26 3.80 4.33 4.85 1.19 1.99 2.63 3.14 3.66 4.17 4.68 0.92 1.55 2.29 2.81 3.27 3.72 4.18 1.23

1.99

2.61

3.12

3.64

4.15

4.65 1.12

1.82

2.51

3.01

3.50

3.99

4.48 0.87

1.43

2.07

2.63

3.06

3.49

3.92 1.06

1.64

2.24

2.74

3.18

3.63

4.07 0.97

1.50

2.07

2.58

3.01

3.43

3.85 0.77

1.21

1.69

2.18

2.62

2.98

3.35

63x150 63x175 63x200 63x225 3.51 4.08 4.65 5.21 3.38 3.93 4.48 5.03 3.09 3.59 4.10 4.60 3.36 3.91 4.46 5.00 3.24 3.77 4.30 4.82 2.94 3.42 3.90 4.37 3.03 3.53 4.03 4.52 2.89 3.36 3.83 4.30 2.51 2.93 3.34 3.75

75x200

75x225 4.90 5.49 4.73 5.30 4.33 4.85 4.70 5.27 4.53 5.08 4.15 4.65 4.25

4.77 4.10

4.60 3.63 4.07

TABLE 2

CEILING JOISTS

Size of joist in millimetres Dead load in Kilogrammes per square metre supported by joist, excluding the mass of the joist

Not more than 25 More than 25 but than 50

Spacing of joists in milimetres

400 450 600 400 450 600

Max. Span of Joists in metres

38x75

38x100 38x125 38x150 38x175 38x200 38x225

44x75

44x100 44x125 44x150 44x175 44x200 44x225

50x75

50x100 50x125 50x150 50x175 50x200 50x225 1.80

2.39

2.98

3.57

4.14

4.72

5.29

1.89

2.51

3.12

3.73

4.34

4.93

5.53

1.97

2.61

3.25

3.88

4.51

5.13

5.74 1.74

2.31

2.87

3.44

4.00

4.55

5.1 1

1.82

2.42

3.01

3.60

4.18

4.76

5.34

1.90

2.52

3.13

3.74

4.35

4.95

5.55 1.58

2.10

2.62

3.14

3.65

4.16

4.67

1.66

2.20

2.75

3.29

3.82

4.36

4.89

1.73

2.30

2.86

3.42

3.98

4.53

5.08 1.68

2.23

2.78

3.32

3.86

4.40

4.94

1.76

2.33

2.91

3.48

4.04

4.61

5.17

1.83

2.43

3.03

3.62

4.21

4.79

5.37 1.61

2.14

2.67

3.20

3.72

4.24

4.76

1.69

2.25

2.80

3.35

3.90

4.44

4.98

1.76

2.34

2.92

3.49

4.06

4.62

5.18 1.46

1.97

2.41

2.89

2.36

3.83

4.29

1.54

2.05

2.55

3.06

3.56

4.06

4.56

1.61

2.14

2.66

3.19

3.71

4.23

4.74

TABLE 3

BINDERS OR BEAMS SUPPORTING JOISTS

TO WHICH S.5.2. RELATES

Size of	Dead load in Kilogrammes per square metre supported by joist, excluding the mass of the joist									
binder of	Not more that 25					More than 25 but not more than 50				
beam in	Maximum span of binder of beam in metres									
milli-										
metres	1.20	1.50	1. 80	2.10	2.40	1.20	1.50	1. 80	2.10	2.40
	Maximum span of binder of beam in metres									
38x75										
38x100	38x125	38x150	38x175	38x200	38x225					

44x75

44x100 44x125 44x150 44x175 44x200 44x225

50x75

50x100 50x125 50x150 50x175 50x200 50x225

63x150 63x175 63x200 63x225

75X200 75x225

1.12 1.49 1.86 2.22 2.59 2.95 3.32

1.20 1.60 1.99 2.39 2.78 3.17 3.56

1.28 1.70 2.12 2.54 2.96 3.37 3.97

2.84 3.31 3.77 4.23

4.06 4.55 1.00 1.33 1.66 1.99 2.32 2.65 2.98

1.08 1.43 1.19 2.14 2.49 2.85 3.20

1.15 1.53 1.90 2.28 2.66 3.03 3.40

2.55 2.97 3.39 3.80

3.68 4.13

0.91 1.22 1.52 1.82 2.12 2.42 2.72

0.98 1.31 1.63 1.96 2.28 2.60 2.93

1.05 1.39 1.74 2.09 2.43 2.77 3.11

2.34 2.72 3.10 3.48

3.37 3.79

0.85 1.13 1.41 1.69 1.97 2.25 2.53

0.91 1.21 1.51 1.82 2.12 2.41 2.71

0.97 1.29 1.61 1.93 2.25 2.57 2.89

2.17 2.52

2.88 3.23

3.13 3.52

0.79 1.06 1.32 1.58 1.84 2.10 2.36

0.85 1.14 1.42 1.70 1.98 2.26 2.54

0.91 1.21 1.51 1.81 2.11 2.41 2.71

2.03 2.36 2.70

3.03

2.94 3.30

1.01 1.34 1.67 2.00 2.33 2.66 2.99

1.08 1.44 1.80 2.15 2.51 2.86 3.21

1.15 1.53 1.91 2.29 2.67 3.04 3.42

2.57 2.99 3.40 3.82

3.70 4.15

0.90 1.20 1.50 1.80 2.09 2.39 2.68

0.97 1.29 1.61 1.93 2.25 2.57 2.88

1.03 1.37 1.71 2.05 2.39 2.73 3.07

2.30 2.68 3.06 3.43

3.33 3.73

0.82 1.10 1.37 1.64 1.91 2.18 2.45

0.88 1.18 1.47 1.76 2.06 2.35 2.64

0.94 1.26 1.57 1.88 2.19 2.50 2.81

2.10

2.45

2.80

3.14

3.04 3.42

0.76 1.02 1.27 1.52 1.77 2.02 2.27

0.82 1.09 1.36 1.63 1.91 2.18 2.44

0.87 1.16 1.45 1.74 2.03 2.32 2.60

1.45

2.27

2.59

2.91

2.82

3.17

0.17

0.95

1.19

1.42

1.66

1.89

2.13

0.77

1.02

1.28

1.53

1.78

2.04

2.29

0.82 1.09 1.36 1.63 1.90 2.17 2.44

1.83

2.13

2.43

2.73

2.65

2.97

SCHEDULE 5

TABLE 4

JOISTS FOR FLAT ROOFS WITH ACCESS ONLY FOR THE PURPOSES OF MAINTENANCE AND REPAIR

Size of joist in milli-metres	Dead load in Kilogrammes per square metre supported by joist, excluding the mass of the joist								
	Not more than 25			More than 25 but not more than 75			More than 75 but not more than 100		
	Spacing of joists in millimeters								
	400	450	600	400	450	600	400	450	600
	Maximum span of joist in metres								
38x75									
38x100									
38x125									
38x150									
38x175									
38x200									
38x225									
44x75									
44x100									
44x 125									
44x150									
44x175									
44x200									
44x225									

50x75

50x100 50x125 50x150 50x175 50x200 50x225 1.80 2.39 2.98 3.57 4.14 4.72 5.29

1.89 2.51 3.12 3.73 4.34 4.93 5.53

1.97 2.61 3.25 3.88 4.51 5.13 5.74

1.74 2.31 2.87 3.44 4.00 4.55 5.11

1.82 2.42 3.01 3.60 4.18 4.76 5.34

1.90 2.52 3.13 3.74 4.35 4.95 5.55

1.58 2.10 2.62 3.14 3.65 4.16 4.67

1.66 2.20 2.75 3.29 3.82 4.36 4.89

1.73 2.30 2.86 3.42 3.98 4.53 5.08

1.58 2.10 2.62 3.13 3.65 4.16 4.66

1.65 2.20 2.74 3.28 3.82 4.35 4.88

1.72 2.29 2.86 3.42 3.97 4.53 5.08

1.52 2.02 2.52 3.02 3.51 4.00 4.50

1.59 2.12 2.64 3.16 3.68 4.19 4.71

1.66

2.21 2.75

3.29

3.83

4.36 4.90

1.38 1.84 2.30 2.75 3.20 3.65 4.10

1.45 1.93 2.41 2.88 3.36 3.83 4.30

1.51 2.01 2.51 3.00 3.50 3:99 4.48

1.50 2.00 2.49 2.98 3.47 3.96 4.44

1.57 2.09 2.61 3.12 3.63 4.14 4.65

1.64 2.18 2.72 3.25 3.78 4.31 4.48

1.44 1.92 2.40 2.87 3.34 3.81 4.28

1.51 2.01 2.51 3.01 3.50 3.99 4.48

1.58 2.10 2.62 3.13 3.65 4.16 4.67

1.31 1.75 2.18 2.61 3.05 3.48 3.90

1.38 1.83 2.29 2.74 3.19 3.64 4.09

1.44 1.91 2.39 2.86 3.33 3.80 4.26

S.5.5.

SCHEDULE 5

TABLE 5

JOISTS FOR THAT FLAT ROOFS WITH ACCESS NOT LIMITED FOR PURPOSES OF MAINTENANCE OR REPAIR

Size of Dead load in Kilogrammes per square metre supported by joist, excluding the mass of the joist

joist in

milli- Not more than 25 More than 25 but not more than 75 More than 75 but not more than 100

metres Spacing of joists in millimeters

400 450 600 400 450 600 400 450 600

Maximum span of joist in metres

38x75

38x100 38x125 38x150 38x175 38x200 38x225

44x75

44x100 44x 125

44x150 44x175 44x200

44x225

50x75

50x100 50x125 50x150 50x175 50x200 50x225

63x150 63x175 63x200 63x225

75x200 75x225

1.23 1.85 2.50 2.99 3.48 3.97 4.46

1.32 1.98 2.62 3.13 3.65 4.16 4.66

1.40 2.10 2.73 3.26 3.80 4.33 4.85

3.51 4.08 4.65 5.21

4.90 5.49

1.14 1.76 2.39 2.88 3.35 3.82 4.29

1.25 1.88 2.52 3.02 3.51 4.00 4.50

1.33 1.99 2.63 3.14 3.66 4.17 4.68

3.38

3.93 4.48 5.03

4.73 5.30

1.87 1.49 2.10 2.62 3.05 3.49 3.92

1.00 1.64 2.24 2.75 3.20 3.65 4.10

1.13

1.74 2.38 2.87 3.34 3.81 4.27

3.09 3.59 4.10 4.60

4.33 4.85

1.12 1.70 2.26 2.71 3.21 3.66 4.11

1.23 1.81 2.40 2.89 3.36 3.83 4.30

1.31 1.91 2.51 3.01 3.50 3.99 4.48

3.24 3.77 4.29 4.82

4.53 5.08 1.02 1.61 2.15 2.65 3.09 3.52 3.96

1.15 1.72 2.29 2.78 3.24 2.69 4.15

1.24 1.81 2.42 2.90 3.37 3.85 4.32

3.12

3.63

4.14

4.64

4.37

4.90 0.71 1.29 1.84 2.41 2.81 3.21 3.61

0.90 1.46 2.03 2.53 2.95 3.37 3.78

1.01 1.60 2.14 2.64 3.07 3.51 3.94

2.84 3.31 3.78 4.24

3.99 4.48

0.07 1.64 2.17 2.66 3.10 3.53 3.97

1.20

1.74

2.30

2.79

3.25

3.71

4.16

1.27

1.84

2.43

2.91

3.38

3.86

4.33

3.13

3.64

4.15

4.66

4.38

4.92

0.97 1.53 2.07 2.56 2.98 3.40 3.82

1.09

1.66

2.20

2.68

3.13

3.57

4.01

1.20

1.75

2.31

2.80

3.26

3.72

4.17

3.01

3.51

4.00

4.49

4.23

4.74

0.54 1.23 1.73 2.25 2.68 3.06 3.44

0.87

1.37

1.92

2.44

2.85

3.25

3.65

0.96

1.51

2.06

2.55

2.97

3.39

3.81

2.75

3.20

3.65

4.10

3.86

4.33

SCHEDULE 5

TABLE 6

PURLINS SUPPORTING SHEETING OR DECKING FOR ROOFS WITH A PITCH OF 10 OR MORE

Size of purlin in millimetres Dead load in kilogrammes per square metre supported by purlin, excluding the mass of the purlin

Not more than 25 More than 25 but not more than 50 More than 50 but not more than 75

Spacing of purlins in metres

0.9 1.2 1.5 1.8 2.1 2.4 0.9 1.2 1.5 1.8 2.1 2.4 0.9 1.2 1.5 1.8 2.1 2.4

Maximum span of purlin in metres

50x100

50x125

50x150

50x175

50x200

50x225

63x150

63x175

63x200

63x225 2.28

2.85 3.40 3.96 4.51 5.06

3.80

4.42

5.03

5.63 1.98

2.47 2.96 3.45 3.93 4.41

3.31

3.85

4.39

4.92 1.78 2.22 2.66 3.09 3.53 3.96

2.97

2.46

3.95

4.43 1.63 2.03 2.43 2.83 3.23 3.63

2.72

3.17

3.61

4.06 1.51 1.88 2.25 2.63 3.00 3.37

2.52

2.94

3.53

3.77 1.41 1.76 2.11 2.46 2.8l 3.15

2.36

2.75

3.14

3.53 2.00 2.49 2.97 3.46 3.93 4.41

3.20

3.71

4.21

472

1.78 2.22

2. 65 3.09 3.52 3.96

2.92

3.40

3.87

4.34 1.59 1.98 2.38 2.77 3.16 3.55

2.66

3.10

3.54

3.97 1.45 1.81 2.17 2.53 2.89 3.25

2.44

2.84

3.24

3.64 1.35 1.68 2.02 2.35 2.68 3.01

2.26

2.63

3.00

3.37 1.26 1.57 1.89

2.20 2.51 2.82

2.12

2.46

2.81

3.16

1.75 2.19 2.62 3.05 3.48 3.90

2.82

3.28

3.74

4.19 1.60 1.98 2.39 2.78 3.18 3.56

2.58

3.00

3.42

3.83 1.45 1.81 2.17 2.53 2.89 3.25

2.39

2.79

3.18

3.57 1.33

1.66

1.99

2.31

2.64

2.97

2.23 2.59 2.96

3.32

1.23 1.53 1.84 2.15 2.45 2.74

2.06 2.40 2.74 3.08

1.15

1.44

1.72

2.01

2.29

2.58

1.93

2.25

2.57

2.89

S.5.7.

SCHEDULE 5

TABLE 7

COMMON OR JACK RAFTERS FOR ROOFS HAVING A PITCH MORE THAN 10º BUT NOT MORE THAN 221/2 WITH ACCESS ONLY FOR THE PURPOSES OF MAINTENANCE AND REPAIR

Size of rafters in milli-metres	Dead load in kilogrammes per square metre supported by purlin, excluding the mass of the rafter								
	Not more than 50			More than 50 but not more than 75			More than 75 but not more that 100		
	Spacing of rafter in millimetres								
	400	450	600	400	450	600	400	450	600
	Maximum span of rafter in metres								
38x100									
38x125									
38x150									
44x75									
44x100									
44x125									
44x150									
50x75									

50x100 50x125 50x150 2.39

2.97

3.55

1.93

2.57

3.19

3.81

2.06

2.73

3.39

4.05 2.25

2.80

3.25

1.82

2.42

3.01

3.60

1.94

2.58

3.21

3.83 1.94

2.42

2.90

1.58

2.10

2.61

3.12

1.68

2.24

3.78

3.33 2.17

2.71

3.24

1.76

2.34

2.91

3.48

1.88

2.49

3.10

3.70 2.05

2.55

3.05

1.66

2.21

2.75

3.28

1.77

2.35

2.93

3.50 1.77

2.20

2.64

1.43

1.91

2.38

2.84

1.53

2.04

2.54

3.03 2.01

2.50

2.99

1.63

2.16

2.69

3.22

1.74

2.31

2.87

3.43 189

2.36

2.82

1.53

2.04

2.54

3.04

1.64

2.17

2.71

3.24 1.63

2.03

2.43

1.32

1.76

2.19

2.62

1.41

188

2.34

2.80

SCHEDULE 5

TABLE 8

PURLINS SUPPORTING RAFTERS TO WHICH SCHEDULE 5.7. RELATES

Size of

purlin in

millimetres Dead load in kilogrammes per square metre supported by rafter as calculated for the purposes in Table S.5.7.

Not more than 50 More than 50 but not more than 75 More than 75 but not more than 100

Spacing of purlins in metres

1.50 1.80 2.10 2.40 2.70 3.00 1.50 1.80 2.10 2.40 2.70 3.00 1.50 1.80 2.10 2.40 2.70 3.00

Max. Span of purlin in metres

50x100

50x125

50x150

50x175

50x200

50x225

63x150

63x175

63x200

63x225

75x175

75x200

75x225 1.40

1.75

2.09

2.44

2.78

3.13

2.34

2.73

3.12

3.50

2.97

3.39

3.81 1.28

1.60

1.91

2.23

2.54

2.86

2.14

2.50

2.85

3.20

2.72

3.10

3.49 1.18

1.48

1.77

2.07

2.36

2.65

1.99

2.32

2.64

2.97

2.52

2.88

3.23 1.11

1.38

1.66

1.93

2.21

2.48

1.86

2.71

2.47

2.78

2.36

2.70

3.03 1.04

1.30

1.56

1.82

2.08

2.34

1.75

2.05

2.34

2.63

2.23

2.54

2.86 0.99

1.23

1.48

1.72

1.96

2.21

1.67

1.94

2.22

2.49

2.12

2.42

2.72 1.28

1.60

1.92

2.23

2.55

2.87

2.51

2.50

2.86

3.21

2.68

3.05

3.43 1.17

1.46

1.75

2.04

2.33

2.62

1.96

2.29

2.61

2.94

2.49

2.85

3.20 1.08

1.35

1.62

1.89

2.16

2.43

1.82

2.12

2.42

2.72

2.31

2.64

2.96 1.01

1.27

1.52

1.77

2.02

2.27

1.70

1.99

2.27

2.55

2.16

2.47

2.78 0.92

1.15

1.37

1.60

1.83

2.05

1.61

1.87

2.14

2.40

2.04

2.33

2.62 0.83

1.03

1.24

1.44

1.65

1.85

1.52

1.78

2.03

2.28

1.94

2.21

2.49 1.19

1.48

1.78

2.07

2.37

2.66

1.99

2.32

2.65

2.98

2.45

2.80

3.15 1.08

1.35

1.62

1.89

2.16

2.43

1.82

2.12

2.24

2.72

2.31

2.64

2.97 1.00

1.25

1.51

1.75

2.00

2.52

1.69

1.97

2.25

2.53

2.14

2.45

2.75 0.89

1.11

1.33

1.55

1.77

1.98

1.58

1.84

2.10

2.36

2.01

2.29

2.58 0.79

0.98

1.18

1.38

1.57

1.77

1.49

1.73

1.98

2.22

1.89

2.16

2.43 0.71

0.89

1.06

1.24

1.42

1.59

1.34

1.56

1.78

2.00

1.80

2.05

2.31

SCHEDULE 5

TABLE 9

COMMON OR JACK RAFTERS FOR ROOFS HAVING A PITCH MORE THAN 22½º BUT NOT MORE THAN 30º WITH ACCESS ONLY FOR THE PURPOSE OF MAINTENANCE AND REPAIR

Dead load in kilogrammes per square metre supported by rafter, excluding the mass of the rafter

Size of rafters in milli-metres	Not more than 50			More than 50 but not more than 75			More than 75 but not more than 100		
	Spacing of rafter in millimetres								
	400	450	600	400	450	600	400	450	600
	Maximum span of rafter in metres								
38x100									
38x125									
38x150									
44x75									
44x100									
44x125									
44x150									
50x75									

50x100 50x125 50x150 2.65 3.29 3.93

2.14 2.84 3.53 4.22

2.28 3.02 3.75 4.48

2.50 3.11 3.72

2.02 2.68 3.34 3.99

2.15 2.35 3.55 4.24

2.17 2.70 3.23

1.76 2.33 2.90 3.47

1.87 2.48 3.09 3.69

2.41 3.00 3.59

1.59 2.59 3.22 3.85

2.07 2.75 3.41 4.07

2.27 2.83 3.39

1.84 2.44 3.04 3.64

1.96 2.60 3.24 3.87

1.97 2.46 2.94

1.59 2.12 2.64 3.16

1.70 2.26 2.81 3.36

2.22 2.77 3.31

1.80 2.39 2.98 3.56

1.89 2.51 3.12 3.73

2.10 2.61 3.13

1.70 2.26 2.81 3.36

1.81 2.40 2.99 3.58

1.82

2.26

2.71

1.47

1.95 2.44 2.92

1.57 2.08 2.60 3.11

S.5.10

TABLE 10

PURLINS SUPPORTING RAFTERS TO WHICH SCHEDULE S.S.9. RELATES

Size of purlin in millimetre Dead load in kilogrammes per square metre supported by rafter as calculated for the purposes in Table S.5.9.

Not more than 50 More than 50 but not more than 75 More than 75 but not more than 100

Spacing of purlins in metres

1.50 1.80 2.10 2.40 2.70 3.00 1.50 1.80 2.10 2.40 2.70 3.00 1.50 1.80 2.10 2.40 2.70 3.00

Max. Span of purlin in metres

50x100

50x125

50x150

50x175

50x200

50x225

63x150

63x175

63x200

63x225

75x175

75x200

75x225 1.47

1.83

2.20

2.56

2.92

3.29

2.46

2.87

3.27

3.86

3.08

3.51

3.93 1.34 1.68 2.01 2.34 2.67 3.00

2.25 2.62 2.99 3.36

2.86 3.26 3.66

1.24 1.55 1.86 2.17 2.48 2.79

2.09 2.43 2.78 3.12

2.65 3.02 3.40

1.16 1.45 1.74 2.03 2.32 2.61

1.95 2.28 2.60

2.92

2.48 2.83 3.18

1.10 1.37 1.64

1.92 2.19 2.46

1.84 2.15 2.45 2.76

2.34 2.67 3.00

1.04 1.30 1.56 1.82 2.08 2.34

1.75 2.04 2.33 2.62

2.22 2.54 2.85

1.34 1.67 2.01 2.34 2.67 3.00

2.22 2.59 2.95 3.31

2.74 3.12 3.50

1.23 1.53 1.83 2.14 2.44 2.74

2.06 2.40 2.74 3.07

2.58 2.94 3.31

1.14 1.42 1.70 1.98 2.26 2.54

1.91 2.22 2.54 2.85

2.42 2.76 3.11

1.06 1.33 1.59 1.86 2.12 2.38

1.78 2.08 2.37 2.67

2.27 2.59

2.91

1.00 1.25 1.50 1.75 2.00 2.25

1.68 1.96 2.24 2.52

2.14 2.44 2.74

0.91

1.13

1.36 1.58 1.81 2.03

1.60 1.86 2.13 2.39

2.03 2.32 2.61

1.24 1.55 1.86 2.17 2.47 2.78

2.03 2.37 2.70 3.04

2.51 2.86 3.21

1.13 1.42 1.70 1.98 2.26 2.54

1.90 2.22 2.53 2.85

2.36 2.70 3.03

1.05 1.31 1.57 1.83 2.10 2.36

1.76 2.06 2.35 2.64

2.24 2.56 2.88

0.97 1.21 1.45 1.69 1.93 2.17

1.65 1.93 2.20 2.47

2.10 2.40 2.69

0.86 1.08 1.29 1.50 1.72 1.93

1.56 1.82 2.07 2.33

1.98 2.26 2.54

0.78 0.97 1.16 1.35 1.55 1.74

1.46 1.70 1.95 2.19

1.88 2.15 2.41

S. 5. 11

TABLE 11

COMMON OR JACK RAFTERS FOR ROOFS HAVING A PITCH MORE THAN 30º BUT NOT MORE THAN 42½º WITH ACCESS ONLY FOR THE PURPOSES OF MAINTENANCE AND REPAIR

Dead load in kilogrammes per square metre supported by rafter, excluding the mass of the rafter

Size of rafters in millimetres Not more than 50 More than 50 but not more than 75 More than 75 but not more more than 100

Spacing of rafter in mellimitres

400 450 600 400 450 600 400 450 600

Maximum span of rafter in metres

38x100 38x125 38x150

44x75

44x100 44x 125

44x150

50x75

50x100 50x125 50x150 2.81 3.50 4.17

2.27 3.02 3.75 4.47

2.40 3.17 3.93 4.63

2.65 3.30 3.95

2.15 2.85 3.54 4.23

2.29 3.03 3.77 4.49

2.31 2.87 3.44

1.87 2.48 3.09 3.69

1.99 2.64 3.28 3.92

2.55 3.18 3.80

2.03 2.70 3.35 4.00

2.12 2.81 3.49 4.16

2.41 3.00 3.59

1.95 2.59 3.22 3.85

2.04 2.71 3.36 4.01 2.09 2.60 3.12

1.69 2.25 2.80 3.35

1.80 2.39 2.93 3.56

2.35 2.93 3.50

1.86 2.46 3.07 3.67

1.93 2.57 3.19 3.81

2.22 2.76 3.31

1.79 2.37 2.96 3.53

1.86 2.47 3.08 3.68

1.92 2.40 2.87

1.56 2.07 2.58 3.09

1.66 2.20 2.75 3.29

TABLE 12

S.5.12

PURLINS SUPPORTING RAFTERS TO WHICH SECTION 5.11 RELATES

Size of purlin in Millimetres Dead load in kilogrammes per square metre supported by rafter as calculated for the purposes in Table S.5.11

Not more than 50 More than 50 but not more than 75 More than 75 but not more than 100

Spacing of purlins in metres

1.50 1.80 2.10 2.40 2.70 3.00 1.50 1.80 2.10 2.40 2.70 3.00 1.50 1.80 2.10 2.40 2.70

Max. span of purlin in metres

50x100

50x125

50x150

50x175

50x200

50x225

63x150

63x175

63x200

63x225

75x175

75x200

75x225 1.54 1.93 2.31 2.69 3.07 3.45

2.56 2.97 3.39 3.81

3.14 3.58 4.02

1.41 1.76 2.11 2.46 2.81 3.16

2.37 2.76 3.15 3.53

2.97 3.38 3.80

1.31 1.63 1.96 2.28 2.60 2.93

2.19 2.56 2.92 3.28

2.78 3.18 3.57

1.22 1.53 1.83 2.14 2.44 2.74

2.05 2.39 2.73 3.07

2.61 2.98 3.34

1.15 1.44 1.73 2.01 2.30 2.59

1.94 2.26 2.58 2.90

2.46 2.81 3.16

1.09 1.37 1.64 1.91 2.18 2.46

1.84 2.14 2.45 2.75

2.34 2.67 3.00

1.41 1.75 2.10 2.45 2.80 3.14

2.27 2.64 3.02 3.39

2.79 3.19 3.58

1.28 1.60 1.92 2.24 2.56 2.88

2.14 2.49 2.84 3.19

2.64 3.01 3.38

1.19 1.49 1.78 2.08 2.37 2.67

2.00 2.33 2.66 2.99

2.51 2.86 3.22

1.11 1.39 1.67 1.94 2.22 2.50

1.87 2.18 2.49 2.80

2.37 2.71 3.05

1.05 1.31 1.57 1.83 2.09 2.35

1.76 2.06 2.35 2.64

2.24 2.56 2.88

1.00 1.24 1.49 1.74 1.98 2.23

1.67 1.95 2.23 2.51

2.13 2.43 2.73

1.29 1.61 1.93 2.25 2.56 2.88

2.08 2.42 2.76 3.11

2.56 2.92 3.28

1.19 1.48 1.78 2.07 2.36 2.66

1.96 2.28 2.61 2.93

2.24 2.76 3.10

1.10 1.37 1.65 1.92 2.19 2.46

1.84 2.15 2.46 2.76

2.30 2.62 2.95

1.03 1.28 1.54 1.80 2.05 2.31

1.73 2.01 2.30 2.58

2.19 2.51 2.82

0.94 1.18 1.41 1.64 1.88 2.11

1.63 1.90 2.17 2.44

2.07 2.36 2.66

S.5.13

TABLE 13

FLOOR BOARDS (TONGUED AND GROOVED)

Thickness of board (finished) in millimetres	Maximum span of board in millimetres

16

19

21

28 505

590

635

790

SCHEDULE 6

Regulation 45 (7) (a) (i) and (b)

RULES FOR SATISFYING REQUIREMENTS AS TO

STRUCTURAL STABILITY OF CERTAIN WALLS

1. Interpretation of this Schedule

In this Schedule—

"base", in relation to a wall, means the underside or the part of the wall which immediately rests upon the footings or foundation or other structure by which the wall is carried;

"buttressing wall" means a wall including a return wall, which affords lateral support to any other wall (hereafter in this Schedule referred to as "the supported wall") and which—

(a) from its junction with the supported wall measures at any level not less than two and a half times its thickness; or 550mm or one sixth of its height measured from any level to the top whichever is greater; and

(b) has no opening or recess (other than an opening or recess not exceeding 0.62m2 in area) nearer to the point of junction; with the supported wall being a distance of not less than two and a half times its thickness or 550mm which ever is the greater; and

(c) is constructed of bricks or blocks which comply with rule 4 of this Schedule and are properly bonded and solidly put together with mortar; or of stone flints clunches of bricks or other burnt or vitrified material, laid otherwise than in horizontal beds or courses and jointed in mortar; and

(d) is bonded or otherwise securely tied to the supported wall; and

(e) if it is an internal load bearing wall to which rule 9 of this Schedule relates, complies with the requirements of that rule, or, in any other case, has a thickness of at least one half of that prescribed in respect of the supported wall by rule 7 or 8 except that the thickness of the wall shall be not less than—

(i) 75mm, if it forms part of a house and the supported wall does not as a whole exceed 6m in height and 10mm in length; or

(ii) 100mm, in any other case;

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

2. Application of rules

The rules in this Schedule apply to any wall of a type described in the Schedule which—

(a) forms part of any storey of a building other than a basement storey; and

(b) is constructed of bricks or blocks which comply with rule 4 and are properly bonded and solidly put together with mortar, or is constructed of stone, flints, clunches of bricks or other burnt or vitrified material laid otherwise than in horizontal beds or courses and jointed in mortar; and

(c) has at each end either a pier, buttress, buttressing wall or chimney (except in the case of a wall to which rule 13 relates and which is less than 2.5m in height and length).

3. Loading

Load carried by a wall to which this Schedule applies shall be properly distributed.

4. Strength of bricks or blocks

(1) Bricks or blocks used in any wall to which this Schedule applies (other than a wall constructed in accordance with rules 7(4) or 8 (6) shall—

(a) have an aggregate volume of solid material of not less than 50% of the total volume of the brick or block, calculated from its overall dimensions; and

(b) where the wall is a wall of a house of one or two storeys or of a building of one or two storeys which is divided into flats, have a resistance to crushing of not less than 2.75N per square millimetre of gross horizontal area; or

(c) where the wall is a wall of any other building, have a resistance to crushing of not less than—

(i) 10 N/mm2, if the bricks are solid; or

(ii) 5 N per square millimetre of gross horizontal area, if the bricks or blocks are hollow.

(2) For the purposes of this rule—

(a) a brick or block shall be considered to be—

(i) solid if the aggregate volume of solid material is not less than 75% of the total volume of the brick or block, calculated from the overall dimensions; or

(ii) hollow if the aggregate volume of solid material is less than 75% of the total volume of the brick or block, calculated from the overall dimensions;

(b) aerated concrete and concrete made with light-weight aggregate shall be considered as solid material.

5. Rules for measuring height of storeys and height of wall

(1) For the purposes of these Regulations the height of a storey or wall shall be measured in accordance with this rule.

(2) The height of the ground storey of a building shall be measured from the base of the wall, and the weight of an upper storey from the level of the underside of the floor of that storey in each case to the level of the underside of the floor next above it or, if there is no such floor, then to the top of the wall, or, in a storey comprising a gable, to have the height of the gable.

(3) The height of—

(a) a separating wall comprising a gable shall be measured from its base to the base of the gable; and

(b) any other wall comprising a gable shall be measured from its base to have the height of the gable and to the highest part excluding any parapet which does not exceed 1.2m in height.

6. Rules for measuring length of walls

(1) For the purposes of these Regulations, the length of a wall shall be measured in accordance with this rule.

(2) A wall shall be considered to be divided into distinct lengths by pairs, buttresses, chimneys or buttressing walls, and may be of any of the following—

(a) a pier or buttress which—

(i) extends upwards from the base of the wall to within a distance from the top of the wall equal to three times the least thickness of the wall;

(ii) protects at any level from the wall to a distance of not less than twice the thickness of the wall at that level;

(iii) has a horizontal sectional area at any level (excluding that portion of the wall bonded to, or within the pier or buttress, of not less than that of a pier or buttress of projection) and width equal to twice the thickness of the wall at that level;

(iv) has a width of not less than 200mm;

(b) a chimney which has a horizontal sectional area, excluding any fire place opening or flue, of not less than the area required for a pier or buttress, and an overall thickness of not less than twice the thickness of the wall it divides;

(c) a buttressing wall as defined in rule 2(2).

(3) Any measurement of length of a wall shall be made from the centre of the pier, buttress, chimney or buttressing wall.

7. Thickness of certain external walls and separating walls

(1) This rule shall apply to any external wall or separating wall which—

(a) forms part of—

(i) a building of one storey; or

(ii) a building of two storeys or more, if the imposed load on each floor above the ground storey when determined in accordance with the provisions of regulation 35 is less than 3KN/ m2; and

(b) does not exceed 12m in height.

(2) Subject to rules 10 to 17, the thickness of any such external wall or separating wall constructed of bricks or blocks shall be not less than that specified in column (3) of the Table to this rule according to its height and length.

(3) In addition, the thickness of a wall, in any storey, for not less than one quarter of the length of that wall shall be not less than one sixteenth part of the height of that storey, except that—

(a) if any part of the wall is of a thickness of less than one sixteenth part of the height of the storey, those parts of the wall which are of the thickness required by this paragraph shall be distributed safely in order to carry the loads transmitted to the wall; and

(b) the thickness of the wall beneath that storey shall be not less than the thickness of that part of the wall which it supports.

(4) In the case of a wall constructed of stone, flints, clunches of bricks or other burnt or vitrified material, the thickness of the wall shall be not less than one third the thickness required by this rule for a wall of bricks or blocks.

(Thickness of certain external walls and separating walls)

Table to rule 7 of this Schedule

Height of wall	Length of wall	Thickness of wall
1	2	3
Not exceeding 3.6m	Any length	200mm for the whole of its height
Exceeding 3.6m but not exceeding 9m	Not exceeding 9m	200mm for the whole of its height
	Exceeding 9m	300mm from the base for the height of one stories and 200mm for the rest of its height
Exceeding 9m but not exceeding 12m	Not exceeding 9m	300mm from the base for the height of one stories and 200mm for the rest of its height
Exceeding 12m	Exceeding 9m	300mm from the base for the height of one stories and 200mm for the rest of its height

8. Thickness of certain other external walls and separating walls

(1) This rule shall apply to any external wall and separating wall which—

(a) forms part of a building other than a building described in rule 7(1)(a); and

(b) does not exceed 12m in height; and

(c) has a height given in column 1 of the Table to this rule, which does not exceed in length the length given in column 2 for a wall of that height.

(2) Subject to rules 10, 11 and 13 to 17, the thickness of any such external wall or separating wall constructed of bricks or blocks shall, at any level, be not less than

300mm; except that, unless otherwise provided, the wall of the topmost storey of the building shall have a thickness of not less than 200min.

(3) In addition, the thickness of the intermediate parts of the wall between the base and 5m below the top shall be not less than the thickness which would be obtained if the wall were to be built solidly throughout the space between straight lines drawn on each side joining the thickness at the base to the thickness at 5m below the top.

(4) No offsets shall be made in the wall between its base and top except at the level of lateral supports.

(5) In addition, the thickness of the wall in any storey, for not less than one quarter of the length of that wall, shall be not less than one fourteenth apart of the height of that storey, except that—

(a) if any part of the will his a thickness of less than one fourteenth part of the height of the storey, those parts of the wall which are of the thickness required by this paragraph shall be so distributed as to safely carry the loads transmitted to the wall; and

(b) the thickness of the wall beneath that storey shall be not less than the thickness of that part of the wall which it supports.

(6) In the case of a wall constructed of stone, flints or clunches of bricks or other burnt or vitrified material, the thickness of the wall shall be not less than one and one third the thickness required by this rule for a wall constructed of bricks or blocks.

TABLE TO RULE 8

Height of wall

1 Length of wall

2

Not exceeding 7.5m Unlimited

Exceeding 7.5m but not exceeding 9m 13.5m

Exceeding 9m but not exceeding 12m 10.5m

Note: This Table only shows the length and height of walls whose thicknesses are to be regulated according to rules 2(a), 2 (b), 2(c), 2(c), 4 4(a), 4(b) and 8(6).

9. Thickness of certain internal loadbearing walls

Any internal loadbearing wall, not being a separating wall, or a wall within a dwelling with one or two storeys, shall have a thickness of not less than half the thickness required by rule 7 or 8 for an external wall or separating wall of the same height but twice the length.

10. Thickness of certain external walls and separating walls of pier construction

Subject to rule 12, if an external wall or a separating wall is built with piers distributed throughout its length, and with a pier at each end, the mean thickness of the wall (that is the horizontal sectional area of the wall and piers divided by the length of the wall) shall not be less than the thickness required by rule 7 or 8 and the thickness of the wall between the piers shall be not less than 200mm.

11. Cavity walls

(1) This rule shall apply to any wall constructed as a cavity wall of two leaves; each leaf shall be constructed of bricks or blocks to comply with rule 4 and be properly bonded and solidly put together with mortar.

(2) The leaves shall be securely tied together with ties complying with BS 1243: 1964 or with other not less suitable ties, the ties being) placed at distances apart not exceeding 900mm horizontally and 450mm vertically, and in addition, there shall be provided, as near as practicable to any opening, a tie to every 300mm of height if the leaves are not connected by a bonded jamb.

(3) The cavity shall be not less than 50mm nor more than 75mm in width at any level.

(4) The leaves shall each be not less than 100mm in thickness at any level.

(5) The overall thickness of the wall shall be not less than—

(a) the thickness required to comply with sub rules (3) and (4) of this rule; or

(b) the thickness which would be required for a solid wall by rule 7 or 8 increased by the width of the cavity, whichever is the greater.

(6) Nothing in sub-rule (4) or (5) of this rule prohibits the construction of a wall as a cavity wall with an inner leaf of not less than 75mm in thickness if—

(a) the wall forms part of a private dwelling-house having one storey; and

(b) the inner leaf has a length not exceeding 8m, and a height not exceeding 3m or (if the wall is a gable wall) 5m; and

(c) all courses are put together with mortar which is not weaker than cement lime mortar composed of Portland cement(either ordinary, rapid-hardening or blast finance), calcium lime (either non-hydraulic or semi-hydraulic) and fine aggregate, in the proportion, measured by the volume of the materials when dry, of one part of cement, two parts of lime and not more than nine parts of fine aggregate; and

(d) there are not less than twice the number of wall ties required by the provisions of subrule (2) of this rule; and

(e) the roof load is supported partly by the outer leaf.

12. External walls of certain small buildings and annexes

(1) An external wall which is constructed of bricks or blocks and which forms part of—

(a) a building with one storey other than a house, where the width of the building, measured in the direction of the span of the roof, does not exceed 9m and the height of its wall does not exceed 3m; or

(b) an annexed (which expression includes a verandah, loggia, garage, greenhouse, tool shed, fuel store, watercloset, lavatory, wash-house or other outbuilding) where the annexed does not exceed 3m in height and is attached to a house, whether or not it opens directly into the house, may be not less than 100mm in thickness.

(2) Subrule (1) shall apply where the wall is bonded at each end and intermediately with piers or buttressing walls which are not less than 200mm square in horizontal section, including the thickness of the wall, or such greater size as may be necessary to give stability, and are so place that the wall is divided into distinct lengths, each length not exceeding 3m (unless it is a wall of less than 2.5rn in height and length); and—

(a) the wall is solidly put together with mortar which is not weaker than cement lime mortar composed of Portland cement (either ordinary, rapid-hardening or blast furnace), calcium lime (either non-hydraulic or semi-hydraulic) and fine aggregate, in the proportion, measured by the volume of the materials when dry, of one part of cement, one part of lime and not smore than six parts of fine aggregate, and

(b) the wall is not subjected to any load other than the distributed load of the roof of the building or annexed of which it forms part, and is not subjected to any lateral thrust from such roof.

13. Bays and gables over bay windows

Rules 7 and 8 shall not apply to any part of an external wall which is—

(a) constructed as a bay for a bay window or as a gable over a bay window;

(b) above the level of the cill of the lowest window opening in such bay; or

(c) put together with mortar of the type specified in rule 11(6)(c).

14. Openings and recesses

(1) The thickness of any parapet to an external wall shall be not less than 200mm or the thickness of the wall on which it is carried (whichever is the less) and its height shall not exceed six times its thickness.

(2) Adequate means of supporting the superstructure shall be provided over every opening and recess.

(3) The number, size or position of openings or recesses in a wall shall not be such as to impair the stability of the wall or any part of the wall.

(4) No vertical chase shall be formed in any wall to a greater depth than one third of the thickness of the wall or, if the wall is a cavity wall, of that leaf of the wall in which the chase is formed.

(5) No horizontal chase shall be formed in any wall to a greater depth than one sixth of the thickness of the wall or, if the wall is a cavity wall, of that leaf of the wall in which the chase is formed.

(6) The number, size or position of chases in a wall shall not be such as to impair the stability of the wall or any part of the wall.

16. Overhanging not to impair stability

The extent to which any part of a wall overhangs a apart below it shall not be such as to impair the stability of the wall or any part of the wall.

SCHEDULE 7

PART 1

Table A Regulation 57(1) & 58(2)

Purpose

Group	Descriptive title	Purpose for which building or compartment is to be used
I		
II		
III		

IV

V

VI

VII

VIII Small residential

Institutional

Other residential

Office

Shop

Factory

Other price of assembly

Storage and general Private dwelling house (not including a flat or maisonette)

Hospital, home, school or other similar establishment used as living accommodation for old people, or for treatment of disabilities due to illness or old age or other physical or mental disability or for persons under the age of five years, where the people sleep on the premises.

Accommodation for residential purposes other than any premises comprised in groups I and II.

Office, or premises used for office purposes, administration, clerical work (including writing, book-keeping, sorting papers, filing, typing, duplicating, machine-calculating, drawing and the editorial preparation of matter for publication), handling money and telephone and telegraph operation or as premises occupied with an office for the purposes of the activities carried on there.

Shop that is premises used for—

(a) retail trade or business including the sale of food or drink to the public for immediate consumption on the premises;

(b) retail sales by auction;

(c) barber and hairdressing;

(d) the repair or treatment of goods.

Factory within the meaning section 83 of the Factories, Offices and Shops, Act 1970 (Act 328) and other premises referred to in paragraphs (d) and (e) of subsection (1) of that section).

Place, whether pubic or private used for the attendance of' persons for or in connection with their social, recreational, educational, business or other activities, and not comprised within groups I to VI.

Place for storage, deposit or parking of goods and materials (including vehicles), and any other premises not comprised in I to II

*Note: Certain small garages and open carports are treated as being of purpose group 1.

TABLE B

Regulation 58(3)

Purpose group	Height of building	Limits of dimensions
		Floor area of storey in building or compartment (in m2) Cubic capacity of building or compartment (in m3)
Part 1—Buildings other than single storey buildings		
I		
III		
IV		
V		

VI

VII

VIII

IX Institutional

other residential

other residential

Shop

Factory

Factory

Storage and general

Storage and general Any height

Not exceeding 28m

Exceeding 28m

Any height

Not exceeding 28m

Exceeding 28m

Not exceeding 28m

Exceeding 28m 2000 3000 2000 2000

No limit 2000

No limit 1000

No limit

8500

5500

7000

28000

5500

21000

No limit

Part 2—Single storey buildings

II

III institutional

other residential Any height

Any height 300

300 No limit

No limit

TABLE C

Regulation 69(2),(6)

Minimum area per person to he assumed in calculating occupant load

Occupancy or use of floor area

1

Residential

Dwelling units

Dormitories

Business & Personal Services

Shops

Offices

Mercantile

Retail sales floors at ground floor

cellar or basement

Other mercantile uses

Industrial

Manufacturing or process rooms

Storage garage

Warehouse storage space

Other storage space

Aircraft hangers

Other uses

Cleaning and repair

Kitchens

Maximum area per person m2

2

(1)

4.65

4.65

9.29

2.79

5.57

4.65

46.45

27.87

46.45

46.45

4.65

9.29

TABLE D

Regulation 74 (6)

Travel distance requirement

Single Exists from Floor Areas

Occupancy of

Floor Area

1 Maximum Floor Area m2

2 Maximum Travel Distance (1)m

3

(2),(3)

Group C

Group D

Group E

Group F

92.90

185.81

139.35

139.35

12.00

12.00

12.00

12.00

*Notes to Table D regulation 74 (6). Single exit permitted only when the exist is an exterior door at or near ground level.

PART II

RULES OF MEASUREMENT OF BUILDINGS—REGULATION 58(4)

1. General

(1) Any distance from any point on the boundary of land in different occupation shall be measured horizontally.

(2) A rise, slope or fall away shall be taken to be one unit measured vertically in a given number of such units measured horizontally.

2. Thickness

(1) The thickness of timber shall be take to be the actual thickness.

(2) The thickness of any plaster shall be taken to be the least thickness of the plaster.

(3) The thickness of a wall (or a leaf of a cavity wall) shall be taken to be the actual thickness exclusive of any applied surface finish.

3. Internal Vertical Measurements

(1) For the purpose of making vertical measurement—

(a) a reference to a floor shall be taken to mean the upper finishes surface of the floor;

(b) a reference to a ceiling shall be taken to refer to the underside of finished surface of the floor or ceiling, except that where there is no ceiling or where a beam or rafter (other than a beam or rafter which throughout its length in the room is an integral part of one of the walls or partitions enclosing the room) projects below the ceiling, the reference shall be taken to refer to the underside of the finished surface of the lowest beam or rafter; and

(c) the height of any part of a chimney or flue-pipe above an appliance shall be measured vertically from the highest part of the junction of the appliance with the chimney or flue pipe.

4. Internal Horizontal Measurements

All horizontal internal measurements in a room shall be measured from the inner finished surfaces of the walls of partitions forming the room.

5. Area of a Room

(1) The area of a room shall be taken to be the total area of the floor of the room; provided that for the purposes of rule 3 of this Schedule where there is within a habitable room or kitchen a stairway or part of a stairway, the area of any space occupied by any part of the stairway in any horizontal plane within that room shall be excluded from the area of the room.

(2) The area of a habitable room shall include the area of any built-in storage in that room, provided—

(a) there is a clear space of at least 0.6m measured vertically between the upper finished surface of the built-in storage and the ceiling; and

(b) the area of built-in storage does not exceed one tenth of the total area of the room.

(3) The area of a kitchen shall include the area of any built-in storage or other fixture in that room provided—

(a) the upper finished surface of the storage or other fixture is at a height of not more than 2.9m above the floor; and

(b) the area of built-in storage or other fixture does not exceed one half of the total area of the kitchen.

(4) Any part of the floor area of any room where the height of the room is less than 2m shall be considered not to form part of the room.

6. Area of a Storey

The area of a storey shall be taken to be the area measured inside the inner finished surfaces of the enclosing walls or where there are no enclosing walls the outermost edges of the floor, and shall include all internal and partition walls, provided that covered balconies or verandahs to any storey shall be taken to be within the enclosing walls of that storey.

7. Area of a Building

The floor area of a building shall be taken to be the sum of the areas of the storeys comprising that building.

8. Area of Opening

The area of any opening for ventilation or the entry of natural light shall be measured inside the frame and shall exclude any sash, bar, or other obstruction to the entry of light.

9. Height of a Room

(1) Where the ceiling over the whole part of the area of a room is equal level, the height over that area shall be taken to be the vertical measurement from floor of that area to the ceiling.

(2) Where the ceiling over the whole or part of area of a room slopes, the height over that area shall be taken to be the vertical measurement from the floor to the highest part of the ceiling over that area, less one half the vertical measurement between the highest and lowest parts of the sloping ceiling over that area.

(3) For the purpose of these Regulations where the height of part of a room exceeds the minimum permissible average height by more than 0.6m, it shall be considered to be the minimum permissible average height plus 0.6m.

10. Stairways

(1) To measure stairways the following interpretations shall apply—

“going" means the horizontal distance between the nosings of two consecutive treads;

“pitch" means the angle between the pitch line and horizontal line;

“pitch line” means a line tangential to the nosings of the treads;

“rise” means the vertical distance between the tops of two consecutive treads;

"tread width" means the horizontal distance between the front of the tread and the front face of the riser, if there is no riser at the back of the tread.

(2) Where a stairway or part of a stairway has tapering treads and the going and the tread stairway are narrow the following interpretations shall apply—

"width" means unobstructed width without any account of obstructing handrails;

"height" means any wall, railing or balustrade of the stairway measured vertically above the pitch line.

SCHEDULE 8

REGULATION 59

Interpretation

In this Schedule—

"floor area" means the floor area of each storey in the building or, if the building is divided into compartments, the floor area of each storey in the compartment of which the element of structure forms part;

"height" means the height of a building, and not the height of any compartment in the building, but if any part of the building is completely separated throughout its height both above and below ground from all other parts by a compartment wall or compartment walls in the same continuous vertical plane, any reference to height in relation to that part means the height solely of that part.

(1) In addition any external load bearing wall shall have fire resistance of not less than half an hour.

(2) Separating walls as well as compartment walls or floors falling within purpose group I and II in Table A to the Schedule shall have fire resistance of not less than one hour.

(3) Any compartment wall separating a flat or maisonette from any other part of the same building shall not be required to have fire resistance exceeding one hour unless—

(a) the wall is a loadbearing wall or a wall that forms part of a protected shaft; or

(b) it is a building which belongs to two purpose groups the separating wall of which shall have the minimum fire resistance of one and a half hours or more.

FIRE RESISTANCE

TABLE A

(Regulation 59 (1)

(Minimum periods of fire resistance)

Part 1—Buildings other than single storey buildings

Purpose group	Maximum dimensions			Minimum period of fire resistance	
				(in hours) for elements of structure	
				forming part of—	
	Height				
	(in m)	Floor area (in m2)	Cubic capacity: (in m3)	Ground storey or upper storey	Basement storey
I	(Small residential)				
House with not more than three storeys				No limit	No limit
House with storeys				No limit	No limit
House with any number of storeys				No limit	No limit

No limit

½

1(b)

1 1(a)

1

1½

II (institutional) 28

over 28 2000

2000 No limit

No limit 1

1½ 1½

2

III (Other residential) building or part (+) having not more than two storeys

Building or part (+) having three storey

Building having any number of storeys

Building having any number of storeys No limit

No limit

28

No limit 500

250

3000

2000

No limit

No limit

8500

5500 ½

1(b)

1

1½

1

1

1½

2

IV Office

7.5

7.5

15

28

No limit 250

500

No limit

5000

No limit No limit

No limit

3500

14000

No limit 0

½

1(b)

1

½ 1(c)

1

1

1½

2

V Shop 7.5

7.5

15

28

No limit 150

500

No limit

1000

2000 No limit

No limit

3500

7000

7000 0

½

1(b)

1

2 1(c)

1

1

2

4

VI Factory 7.5

7.5

15

28

28

over 28 250

No limit

No limit

No limit

No limit

2000 No limit

1700

4250

8500

28000

5500 0

½

1(b)

1

2

2 1(c)

1

1

2

4

4

VII (Assembly)

7.5

7.5

1.5 250

500

No limit No limit

No limit

3500 0

½

1(b) 1(c)

1

1

VIII (Storage and general) 7.5

7.5

15

15

28

28

Over 28 250

300

No limit

No limit

No limit

No limit

1000 No limit

No limit

1700

3500

7000

21000

No limit No limit

½

1(b)

1

2

4

4 1(c)

1

1

2

4

4

4

(*) A floor which is immediately over abasement storey is an element of structure that forms part of the basement storey.

(*) The expression "part" means a part which is separated.

TABLE B

Regulation 64 (2)

SURFACES OF WALLS AND CEILINGS (RESISTANCE TO FIRE)

Purpose group of building or compartment

Maximum floor area of small room (in m2)

Class of surface for both walls and ceilings (except where separately specified)

1

2 Small Rooms Circulation

rooms Other than spaces and

(seecol.2) small protected

rooms shafts

3 4 5

I

II

III

IV

V

VI

VII

VIII (Small residential house)

having more than two storeys

Any other house

(Institutional)

(Other residential)

(Office)

(Shop)

(Factory)

(Assembly)

(Storage and general) 4

4

4

4

30

30

30

30

30 3 (Wall)1 (Wall)1

(Ceiling)3 (Ceiling)3

3	1	0
1	(Wall)01	0
3	(Ceiling)1	0
3	1	0
3	1	0
3	1	0
3	1	0
3	1	0

SCHEDULE 9

U-VALUES OF BUILDING MATERIALS

REGULATION 93 (6)

Thermal conductivity W/m deg C U-Value 255mm wall W/m2 deg C U-Value 380mm wall W/m2 deg C

Granite

Limestone

Sandstone 2.92

1.53

1.29 3.5

2.7

2.5 2.9

2.2

2.0

Construction U-Value W/m2 deg C Material Note

Density kg/ m3 Conductivity (k) W/m deg C

Concrete 150mm

1. Cast 200mm

2. Cast, 150mm thick, with 50mm,
woodwool slab permanent shuttering
on inside face finishes with 16mm
dense plaster

3. As last, but 200mm thick

4. Pre-cast panel, 77mm thick

5. As last, but with 50mm cavity and sand-wich lining panels composed of 5mm asbestos-cementsheet, 25mm expanded polystyrene and 10mm plasterboard

6. Pre-cash sandwich panels comprising 75mm dense concrete, 25mm expanded polystyrene and 150mm lightweight concrete

7. Pre-cast 38mm on timber batterns and framing with 10mm plasterboard lining and 50mm glass fibre insulation in cavity 3.5

3.1

1.1

1.1

4.3

0.80

0.72

0.62

Concrete

2100

Woodwool slab 450

Asbestos cement sheet 1500

Concrete 2100

Light-weight concrete 200

Glass fibre Timber

1.40

0.90

0.36

1.4

0.38

0.035

0.14

Assumed 100/0 area of glass fibre

Construction U-Value W/m2 deg C Material Conductivity W/m deg C Notes

Composite clading panels:

1. Comprising 25mm asbestos cement sheets set in metal framing 50mm cavity, 100mm lightweight concrete block inner wall, finished with 16mm plaster rendering on inside face with 16mm plaster rendering on inside face

2. Tile hanging, on timber battens and framing with 10mm plaster- board lining, 50mm glass fibre insulation in the cavity and building aper behind the battens

3. Weather-

boarding on

timber-framing with 10mm plaster-board lining 50mm glass

fibre insulation in the cavity and paper behind the boarding

4. Corrugated sheeting— 5mm-thick asbestos-cement

5. As last, but with cavity and aluminuim foil-backed plaster board lining

6. Double skin asbestos-cement with 25mm glass fibre insulation in between

7. As last, but with cavity and aluminium plaster –board lining

8. Aluminium

9. As last, but with cavity and aluminium foil-backed plaster-board lining

10. Plastic cove-red steel

11. As last, but with cavity and aluminium foil backed plaster-board lining 0.8 1

0.66

0.62

5.3

1.8

1.1

7.78

2.6

1.8

5.7

1.9

Clay tiles

Whether-boarding

Asbestos-cement sheeting

0.84

0.14

0.36 Assumed 5% area of expanded expanded poly- styrene bridged by metal framing

Assumed 10% area of glass fibre bridged by timber

Assumed 10% area of glass fibre bridged by timber

No allowance has been made for effect of corrugation on heat loss

E. K. FOSU

MINISTER FOR WORKS AND HOUSING

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