EBCS- 12

Ethiopian Building Code Standard

Building Spatial Design

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Ministry of Urban Development, Housing and Construction.

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NATIONAL FOREWORD

The Proclamation to define the powers and duties of The Executive organs of The Federal Democratic Republic of Ethiopia Proclamation No 691/ 2010 and Ethiopian Building Proclamation No 624/2009 empowers the Ministry of Urban Development, Housing and Construction to prepare the Country's Building Code, issue Standards for design and construction works, and follow up and supervise the implementation of same.

This Ethiopian Standard is the official English language version of "BUILDING SPATIAL DESIGN - **EBCS 11:2014**". It supersedes part of "BUILDING SPATIAL DESIGN" which is withdrawn. With an eye on the latest technological advancements and trends worldwide and with the aim of bringing the Ethiopian Construction Standard at par with the present state-of-the-art, this edition has brought a major shift in terms of contents and comprehensiveness. The major benefits to be gained in applying this standard is the harmonization of professional practice and the ensuring of appropriate level of workmanship, level of safety and quality of construction work.

EBCS 11:2014 is prepared by a Technical Committee "BUILDING SPATIAL DESIGN" the secretariat of which is held by Addis Ababa University. The document is intended to be used in conjunction with EBCS 0:2014 to EBCS 14:2014 for the design of services of buildings and civil engineering works. The normative part of this Ethiopian Building Code Standard is chosen based on the local needs and construction practice. As this standard is technical document which, by their very nature, require periodic updating, revised edition will be issued by the Ministry from time to time as appropriate.

This document does not purport to include all the necessary provisions of a contract. Users are responsible for their correct application.

Compliance with this Ethiopian Building Code Standard does not of itself confer immunity from legal obligations.

The Ministry of Urban Development Housing and Construction as mandated acknowledges this document as a national resource tool and reference document which comprises a front cover, an inside front cover, a title page, National foreword, Table of Contents, pages 1 to 63 and a back cover. This Ethiopian Construction Standard, having been prepared under the direction of the Ethiopian Building Proclamation No 624/2009, was published under the authority of the Ministry of Urban Development, Housing and Construction on 01 December 2014.

Ministry of Urban development, Housing and Construction

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INTRODUCTION

This code, named 'EBCS-General: Building Spatial Design Code', is prepared as part of a comprehensive Ethiopian Building Code and Standards (EBCS) preparation process sponsored by the Ministry of Works and Urban Development by virtue of the powers vested in it by Article 57(1) of the Ethiopian Building Proclamation No.624/2009. The EBCS is prepared by different teams by dividing it into different disciplinary areas. Accordingly, this Building Spatial Design Code is prepared by a team known as 'Architecture team'. The content of the code was defined by the team through a process consisting of two major steps, namely: defining building code and standards focusing on its objectives and means of achieving them; and isolating the Architectural parts and prescribing the code requirements.

Review of building codes from both industrialized and less industrialized countries and code related regulations and proclamations in Ethiopia have indicated that the main intent or objectives of a building code are Fire Safety, Health Safety, Life Safety, Property Safety, Accessibility and Energy (resource) Conservation. Building codes attempt to achieve these objectives by regulating building and building design components (i.e., the threats to the objectives) such as spatial design, structural, electro-mechanical and sanitary designs. The first component, spatial design, which includes building site use and organization, building use and indoor space organization, building space envelope organization and building use communication elements (signs) belongs to the Architectural component of building design.

The Architectural component also includes Art (aesthetics and expression) but art is excluded from the list because it can rarely be a threat to the code objectives, it lacks objective regulation criteria and it can hardly exist and develop in the context of regulation. The exclusion of Art from the list has made the content of the code the technical dimension of Architecture only. As a result, using the name 'Architecture Code' has become misleading and, therefore, the code is given the more accurate name of 'Building Spatial Design Code.'

Building spatial design, however, does not belong to Architectural design only even though it is its output. It belongs, also, to the engineering designs such as structural, electrical and sanitary designs since these designs all require spatial organization of their elements. For this reason the Building Spatial Design Code is also named EBCS-General.

The study was made using the research methods of document review, observation and analysis. However, it was not research, as such, since it was largely limited by finance and technical capacity to selection and transfer of relevant requirements from existing international building codes and parts of the National Building Code of Ethiopia (1995) which were not addressed in Proc. No.624/2009 and Reg. No. 243/2011.

Being part of a national code, the code is expected to be applied in all Ethiopian urban centres including those that have very limited code implementation capacities. For this reason simplicity, ease of reference for both designers and building officials and enforceability were used as additional considerations in preparation of the code.

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Relevant and applicable requirements selected using the above method are organized in the code under the issues identified first above: building site organization, building use and indoor space organization, building space envelope organization, organization of structural, electro-mechanical and sanitary elements and Signs (organization of building use communication systems). These issues are at once major parts of buildings, major parts of building spatial design and major types of potential threats to the code objectives.

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SECTION 1 SCOPE

1.1 General

1.1.1 These regulations shall be known as EBCS- General "*Building Spatial Design Code Standard"* hereinafter referred to as "Standard."

1.1.2 Where, in any specific case, different sections of this Standard specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable.

1.1.3 The purpose of this Standard is to establish the minimum requirements for building spatial design to safeguard safety, accessibility and efficiency in the built environment. Safety includes health safety, fire and other hazards safety, life safety and property safety. It concerns the needs of building occupants, owners, fire fighters and emergency responders during emergency operations and the welfare of the general public. Accessibility concerns the needs of physically challenged users of buildings and associated spaces. Efficiency concerns the needs of a city or a nation to conserve and use its scarce resources such as energy and water prudently.

1.1.4 The provisions of this Standard shall apply to elements of building spatial design such as building site use and organization including building use communication system or signage, use and indoor space organization and building space envelope organization of the construction, alteration, movement, enlargement, replacement, repair, use and occupancy of buildings and related structures.

The Standard also covers spatial organization of structural, electro-mechanical and sanitary elements that are within the scope of building spatial design.

1.1.5 References to Section or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such section or provision of this Standard.

1.1.6 The codes and standards referenced in this code shall be considered part of the requirements of this Standard to the prescribed extent of each such reference. Where differences occur between provisions of this Standard and referenced codes and standards, the provisions of this Standard shall apply.

1.1.7 Buildings and uses in existence at the time of the adoption of this Standard shall be permitted to have their existing use or occupancy continued, provided such continued use is not dangerous to life.

1.1.8 Additions, alterations or repairs shall be permitted to be made to any building or use without requiring the existing building or use to comply with the requirements of this Standard, provided the addition, alteration or repair conforms to that required for a new building or use.

1.1.9 Buildings or structures moved shall comply with the provisions of this Standard for new buildings and structures. Temporary buildings, structures and uses

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such as reviewing stands and other miscellaneous structures, sheds, canopies or fences used for the protection of the public shall be permitted to be erected, provided a special approval is received from the building official for a limited period of time. Temporary buildings or structures shall be completely removed upon the expiration of the time limit stated in the permit.

1.1.10 This Standard does not apply to new buildings for which planning consent and building permit have already been issued and whose construction has already been started before its adoption.

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SECTION 2 INTERPRETATION

2.1 General

2.1.1 Unless otherwise expressly stated, the following words and terms shall, for the purposes of this code, have the meanings shown in this Section.

2.1.2 Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

2.1.3 Where terms are not defined in this code and are defined in other codes such terms shall have the meanings ascribed to them as in those codes.

2.1.4 Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies.

2.2 Definitions

Accessible	A site, building, facility or portion thereof that can be approached, entered and used by physically disabled persons.
Addition	An extension or increase in floor area or height of a building or structure.
Alteration	A change from one occupancy to another. An addition or deduction of the whole or part of a building or a change in the internal elements of a building that would affect the requirements set by the Standard.
Anchor Building	An exterior perimeter building of a group other than having direct access to a covered mall building but having required means of egress independent of the mall.
Approved	Approved by the building official having jurisdiction.
Atrium	An opening connecting two or more stories other than enclosed stairways, elevators, hoistways, escalators, plumbing, electrical, air-conditioning or other equipment, which is closed at the top and not defined as a mall.
Automatic Sprinkler System	An arrangement of piping and sprinkles designed to operate automatically by the heat of the fire and the discharge water upon that fire, and which may also simultaneously give automatic audible alarm.
Balcony	A horizontal projection, including a hard nail, or balustrade to serve as an outside space.
Basement	That portion of a building that is partly or completely below grade.

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Building	Any structure used or intended for supporting or sheltering any use or occupancy.
Building Height	The vertical distance measured in the case of flat roofs, from the average level of the centre line of the adjoining street to the highest point of the building adjacent to the street wall; and in the case of pitched roofs, up to the point where the external surface of the outer wall intersects the finished surface of the sloping roof; and in the case of gables facing the road, the midpoint between the ridge level and the ridge level and the fascia.
Building Line	The line established by law, beyond which a building shall not extend, except as specifically provided by law.
Building Official	The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative.
Canopy	An architectural projection that provides weather protection, identity or decoration and is supported by the building to which it is attached and at the outer end by not less than one stanchion. A canopy is comprised of a rigid structure over which a covering is attached.
Court	An open, uncovered space, unobstructed to the sky, bounded on three or more sides by exterior building walls or other enclosing devices.
Covered Mall Building	A single building enclosing a number of tenants and occupants such as retail stores, drinking and dining establishments, entertainment and amusement facilities, passenger transportation terminals, offices, and other similar uses wherein two or more tenants have a main entrance into one or more malls. For the purpose of this Section, anchor buildings shall not be considered as a part of the covered mall building.
Combination Sign	A sign incorporating any combination of the features of pole, projecting and roof signs.
Detached Building	A building whose walls and roofs are independent of any other building with open spaces on all sides.
Directive	Building Directive No. 5/2003, MoUDC (effective 3 Ginbot 2003).
Drain	A line of pipes and open channels including all fittings and equipment, such as manholes, inspection chambers, traps, gullies and floor traps used for the drainage of a building and its yards.
Dwelling	A building that contains one or two dwelling units used,

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	intended or designed to be used, rented, leased, let or hired out to be occupied for living purposes.
Exit	A passage or means of egress from any building, storeys or floors to a street or other open space of safety.
Display Sign	The area made available by the sign structure for the purpose of displaying the advertising message.
Electric Sign	A sign containing electrical wiring, but not including signs illuminated by an exterior light source.
Existing Structure	A structure erected prior to the date of adoption of the appropriate code, or one for which a legal building permit has been issued.
Fire Door	A door and its assembly so constructed and assembled in place as to give protection against the passage of fire.
Fire Resistance Rating	The length of time in hours, that a building material or assembly of building elements will withstand the effects of the standard fire exposure and meet specific conditions as set out by a standard test.
Fire Separation	The distance measured from a building to any other building on the same site, or from an adjoining site or a site on the opposite side of a street that the building is facing.
Floor Area	Floor area shall mean usable covered area of a building at any floor level.
Ground Sign	A billboard or similar type of sign which is supported by one or more uprights poles or braces in or upon the ground other than a combination sign or pole sign, as defined by this code.
Habitable Room	A room, used or occupied or designated for occupancy by one or more persons.
Habitable Space	A space in a building for living, sleeping, eating or cooking. Bathrooms, toilet rooms, closets, halls, storage or utility spaces and similar areas are not considered habitable spaces.
Lot	A portion or parcel of land considered as a unit.
Lot Line	A line dividing one lot from another, or from a street or any public place.
Marquee	A permanent roofed structure attached to and supported by the building and that projects into the public right of-way.
Mezzanine Floor	An intermediate floor between successive floors limited to not more than_ the area of the lower floor.

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Occupiable Space	A room or enclosed space designed for human occupancy in which individuals congregate for amusement, educational or similar purposes or in which occupants are engaged at labour, and which is equipped with means of egress and light and ventilation facilities meeting the requirements of this Standard.
Occupancy; Use Group	The principal occupancy for which a building or part of it is used.
Open Space	An area, forming an integral part of a plot, left open to the sky.
Panic Release	A device fitted to a door which opens the door when pushed.
Permit	An official document or certificate issued by the authority having jurisdiction which authorizes performance of a specified activity.
Plinth Area	The built up covered area measured at the floor level of the ground floor.
Pole Sign	A sign wholly supported by a sign structure in the ground.
Portable Display Surface	A display surface temporarily fixed to a standardized advertising structure which is regularly moved from structure to structure at periodic intervals.
Proclamation	Ethiopian Building Proclamation No. 624/2009.
Projecting Sign	A sign other than a wall sign, which projects from and is supported by a wall of a building or structure.
Regulation	Council of Ministers Building Regulation No. 243/2011.
Repair	The reconstruction or renewal of any part of an existing building for the purpose of its maintenance.
Room Height	The vertical distance measured from the finished floor surface to the finished ceiling surface.
Roof Sign	A sign erected upon or above a roof or parapet of a building or structure.
Semi-Detached Building	A building detached on three sides with open space as provided.
Set Back Line	A line usually parallel to the plot boundaries beyond which nothing can be constructed towards the plot boundaries.
Sign	Any letter, figure, character, mark, plane, point, marquee sign, design, poster, pictorial, picture, stroke, stripe, line, trademark, reading matter or illuminated service, which shall be constructed, placed, attached, painted, erected, fastened or manufactured in any manner whatsoever, so that the same

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	shall be used for the attraction of the public to any place, subject, person, firm, corporation, public performance, article, machine or merchandise, whatsoever, which is displayed in any manner outdoors. Every sign shall be classified and conform to the requirements of that classification as set forth in this section.
Sign Structure	Any structure which supports or is capable of supporting a sign as defined in this code. A sign structure is permitted to be a single pole and is not required to be an integral part of the building.
Skylights And Sloped Glazing	Glass or other transparent or translucent glazing material installed at a slope of 15 degrees (0.26 rad) or more from vertical. Glazing material in skylights, including unit skylights, solariums, sunrooms, roofs and sloped walls, are included in this definition.
Skylight Unit	A factory-assembled, glazed fenestration unit, containing one panel of glazing material that allows for natural lighting through an opening in the roof assembly while preserving the weather-resistant barrier of the roof.
Sleeping Unit	A room or space in which people sleep, which can also include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Such rooms and spaces that are also part of a dwelling unit are not sleeping units.
Story	That portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above, measured as the vertical distance from top to top of two successive tiers of beams or finished floor surfaces and, for the topmost story, from the top of the floor finish to the top of the ceiling joists or, where there is not a ceiling, to the top of the roof rafters.
Storey	The portion of a building between two floors or between a floor and its ceiling.
Street Level; Grade	The official established elevation or grade of the centre line of the street.
Street Line	The line defining the side limits of a street, including sidewalks and any other space within the public right of way of the street.
Ventilation	The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space.
Walkway, Pedestrian	A walkway used exclusively as a pedestrian traffic way.
Wall Sign	Any sign attached to or erected against the wall of a building or structure, with the exposed face of the sign in a plane parallel to the plane of said wall.

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Yard	An open space, other than a court, unobstructed from the ground to the sky, except where specifically provided by this code, on the lot on which a building is situated.

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SECTION 3 SITE PLANNING AND LAND USE

3.1 General

3.1.1 The purpose of this section is to provide minimum requirements for fire safety, health safety, accessibility and energy efficiency of building site use and organization which includes elements such as land use, building access, building density, plot coverage, building orientation, setback, on-building and off-building planting and landscaping, organization of signs or building use communication systems and building accessibility.

3.2 Land Use

3.2.1 Approval of plans submitted for review shall be subject to compliance to this Standard, EBCS 13 s and land use and zoning regulations, when available.

3.2.2 In the event that amendment to the land use regulations is applied for the application shall also include evidence that the desired land use conforms to the intent of this Standard.

3.3 Building Organization

3.3.1 Access, Density and Coverage

3.3.1.1 Lots on which buildings are proposed to be built shall be accessible by a public road having a minimum of 4 meters width.

3.3.1.2 The total floor area of a building shall be computed in accordance with EBCS 13 in addition to the maximum Floor Area Ratio (FAR) specified for the site in city planning regulations. In the event of conflict between the two requirements, the more restrictive shall apply.

3.3.1.3 The area of plot covered by a building shall be in accordance with EBCS 13 in addition to the maximum Building Area Ratio (BAR) specified for the site in city planning regulations. In the event of conflict between the two requirements the more restrictive shall apply.

3.3.2 Building Orientation

3.3.2.1 Windows and openings to all building spaces intended for human occupancy facing intense sun radiation (facing west and south-west) shall be provided with effective radiation protection in order to prevent their covering and shifting to artificial means of lighting of the building space by users.

3.3.2.2 Windows and openings to all building spaces intended for human occupancy shall be orientated away from direction of flow of polluted air or they shall be provided with protections acceptable to the building official.

3.3.2.3 Windows and openings to all building spaces intended for human occupancy shall be orientated away from sources of distractive noise or they shall be provided with protections acceptable to the building official.

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3.3.2.4 Front, side and rear setbacks shall comply with relevant fire and energy conservation codes in addition to city planning regulations. In the event of conflict between the requirements the most restrictive shall apply.

3.3.3 Accessibility

3.3.3.1 When a building, or portion of a building, is required to be accessible, accessible routes within the site shall be provided from public transportation stops, accessible parking and accessible passenger loading zones and public

3.3.3.2 Streets or sidewalks to the accessible building entrance served.

3.3.3.3 An accessible route shall not be required between site arrival points and the building or facility entrance if the only means of access between them is a vehicular way not providing for pedestrian access.

3.3.3.4 At least one accessible route shall connect accessible buildings, accessible facilities, accessible elements and accessible spaces that are on the same site.

3.3.3.5 An accessible route is not required between accessible buildings, accessible facilities, accessible elements and accessible spaces that have, as the only means of access between them, a vehicular way not providing for pedestrian access.

3.3.3.6 When a building, or portion of a building, is required to be accessible, an accessible route shall be provided to each portion of the building, to accessible building entrances connecting accessible pedestrian walkways and the public way. Where only one accessible route is provided, the accessible route shall not pass through kitchens, storage rooms, restrooms, closets or similar spaces.

3.3.4 Planting and Landscaping

3.3.4.1 All buildings shall have on-building and off-building planting amounting in aggregate area to at least 15% of their lot area.

3.3.4.2 All new buildings and additions over 50m^2 shall be landscaped. Such landscaping shall be completed within 1 year from the date of occupancy of the building.

3.3.4.3 Front yards required by this code shall be completely landscaped, except for those areas occupied by access driveways, walls and structures.

3.3.4.4 All flanking street-side side yards shall be completely landscaped, except for those areas occupied by utilities, access driveways, paved walks, walls and structures.

3.3.4.5 All live landscaping required by this code shall be properly maintained. All dead or dying landscaping shall be replaced immediately and all sodden areas mowed, fertilized and irrigated on a regular basis.

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SECTION 4 FUNCTION & INDOOR SPACE ORGANIZATION

4.1 General

4.1.1 The function and indoor space organization of buildings shall comply to the provisions of this section with regard to:

a) Building construction type,
b) Building Size, and;
c) Building use

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4.1.2 Buildings shall be classified by construction type into one of the two types of construction.

4.1.3 The types of construction may be increased up to five types based on research and materials used in particular localities.

4.1.4 The architect is responsible for determining the fire resistance characteristics of materials used in the building and providing the required documentation.

4.1.5 The Building official is required to evaluate the documentation provided to determine compliance with this Standard.

4.1.6 The height and area of a building shall be limited by the level of safety afforded by the construction type and the level of risk associated with the building use.

4.1.7 For the purpose of this standard; height and area limitations are related to building use only and assume the lowest level of safety with regard to construction type.

4.1.8 Height and area limitations required by this standard may be expanded based on research on construction types.

4.1.9 The use of a building is defined by the function it is designed to serve and the furniture, equipment, goods and other installations that are associated with it.

4.1.10 Buildings shall be classified in accordance with the function they were originally intended for.

4.2 Construction Type Classification

4.2.1 Buildings shall be broadly classified into non-combustible and combustible construction for the purpose of determining fire resistance rating to meet the provisions of this Standard.

4.2.2 Buildings where non-combustive materials are used for structural and non-structural elements shall be classified as non-combustible construction.

4.2.3 The Building Official may approve buildings constructed with limited-combustible materials as non-combustible construction.

4.2.4 Buildings where combustible materials are used for structural and non-structural elements, except columns and exterior walls, shall be classified as combustible construction.

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4.2.5 The Building Official may classify buildings constructed with limited-combustible assemblies for beams, trusses, floors, roofs, interior load bearing walls and partitions as combustible construction.

4.3 Fire Resistance Rating

4.3.1 Requirements

4.3.1.1 For the purpose of fire resistance rating buildings shall be classified as “four-hour fire resistive”, “three-hour fire resistive”, “two-hour fire resistive” and “one-hour fire resistive”.

4.3.1.2 Buildings classified as non-combustible construction in accordance with 4.2.2 shall be at least three-hour fire resistive.

4.3.1.3 Buildings classified as combustible construction shall in accordance with 4.2.4 shall have external walls of at least one-hour fire resistive rating.

4.3.1.4 The Building official may establish notional periods of fire resistance by type and thickness of commonly used materials.

4.3.2 Structural Elements

4.3.2.1 Columns, beams trusses, interior load bearing walls and exterior walls of non-combustible material shall be classified as four-hour fire resistive.

4.3.2.2 Columns, beams trusses, interior load bearing walls and exterior walls of approved limited-combustible material shall be classified as three-hour fire resistive.

4.3.2.3 Beams trusses, interior load bearing walls, exterior walls, floors, ceilings and roofs of non-combustible assembly shall be classified as two-hour fire resistive.

4.3.2.4 Exterior walls of non-combustible material where all other structural and non-structural elements of the building are of combustible material shall be classified as one-hour fire resistive.

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4.3.3 Occupancy Separation

4.3.3.1 Occupancy separation shall be vertical or horizontal or both or, when necessary, of such other forms as may be required to afford a complete separation between the various occupancy divisions of the building.

4.3.3.2 Where the occupancy separation is horizontal, structural members supporting the separation between the various occupancies shall be protected by equivalent fire resistive construction.

4.3.3.3 Occupancy separation shall be four-hour fire resistive for non-combustible construction and two-hour fire resistive for combustible construction.

4.4 Hazard Rating

4.4.1 Hazardous Buildings

4.4.1.1 Buildings where activities potentially susceptible to risks of fire shall be classified as hazardous buildings.

4.4.1.2 Handling, fabrication, manufacturing and storage activities involving incendiary or highly flammable materials shall be considered as potential source of risk in all occupancies.

4.4.1.3 The Building official may identify particular building types and uses in each occupancy group and classify them as hazardous.

4.4.2 Non-Hazardous Buildings

4.4.2.1 Buildings where activities carried out are generally considered to constitute limited fire risk shall be classified as non-hazardous buildings.

4.4.2.2 Buildings where incendiary and flammable materials are not handled, fabricated or stored in a routine manner shall not be considered as potential sources of risk in all occupancies.

4.4.2.3 The Building official may re-evaluate building types and uses that have initially been classified as hazardous and re-classify them as non-hazardous buildings.

4.5 Dimensions & Function

4.5.1 The height and area of a building shall not exceed the limits specified for the particular type of construction occupancy group it is classified under.

4.5.2 Interior spaces shall be dimensioned in accordance with the provisions of sub-Article 33/1 of the Proclamation and Sub-clause 29.1.2 of the Directive.

4.5.3 Buildings and facilities shall be designed to be accessible in accordance with the provisions of Article 37 of the Proclamation, Article 34 of the Regulation and Clause 33 of the Directive.

4.5.4 Corridors, passageways, stairways, ramps and other means of egress shall be provided with sufficient illumination at all times.

4.5.5 All habitable rooms shall be provided with adequate ventilation either by openable windows or by mechanical means.

4.5.6 Means of escape shall be illuminated such that the failure of any single lighting unit will not leave any area in darkness.

4.5.7 Wherever possible natural ventilation shall be provided to all rooms and enclosed spaces. Where natural ventilation is not possible it shall be substituted by mechanical means of ventilation.

4.6 Means of Escape

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4.6.1 Buildings or portions thereof shall be provided with means of escape in compliance with sub-clause 41.2 and clause 43 of the Directive.

4.6.2 Buildings meant for human occupancy shall be provided with exits sufficient to permit safe escape of occupants in case of fire and other emergency.

4.6.3 An exit may be a doorway, corridor, passageways to an internal staircase or a veranda or terraces which have access to the street or to the roof of a building. An exit may also include a horizontal exit leading to an adjoining building at the same level. Lifts and Escalators shall not be considered as exits.

4.6.4 Whenever more than one exit is required for any room space or floor of a building, exits shall be placed as remote from each other as possible and shall be arranged to provide direct access in separate directions from any point in the area served.

4.6.5 In the event that roofs are used as exits, access shall be provided continuous to the street.

4.6.6 Exits shall be so located that the travel distance on the floor shall not exceed the specified in the table maximum travel distance.

4.6.7 For floors with sprinklers the travel distance may be increased by 50% of the specified maximum travel distance.

4.6.8 The travel distance to an exit from the dead end of a corridor shall not exceed half the distance specified for the particular occupancy group.

4.6.9 Exit capacity shall be determined using a unit exit width equivalent to 500mm. A clear width of 250mm shall be counted as an additional half unit and clear widths less than 250mm shall not be counted for exit width.

4.6.10 The capacity per unit exit width expressed in number of occupants shall be in accordance with the value specified for each occupancy group.

4.6.11 If an automatic sprinkler system is provided for a building the specified capacity per unit exit width may be increased by 50 percent per storey.

4.6.12 If a horizontal exit is provided, the width shall be the same as for the exit doorway and, the specified capacity per unit exit width may be increased by 50%.

4.6.13 If both automatic sprinkler and horizontal exits are provided in a building the specified capacity per unit exit width may be doubled.

4.6.14 Occupant loads used to determine the exits required shall be based on the actual number of occupants, but shall in no case be less than the value specified for each occupancy group.

4.6.15 The occupant load of a mezzanine floor discharging through a floor below shall be added to the main floor occupant load and the capacity of the exits shall be designed for the total occupancy load thus established.

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4.6.16 The width of exit corridors and passageways shall not be less than the aggregate widths of exit doorways leading from them in the direction of escape to the outside of the building.

4.6.17 No exit doorway shall be less than 1000mm in width and not be less than 2000mm in height, except otherwise specified for a particular occupancy group.

4.6.18 When stairways discharge through corridors and passageways the height of such corridors and passageways shall not be less than 2400mm.

4.6.19 Drinking fountains or other fixed or movable equipment shall be placed so that they will not obstruct the required minimum width of corridors.

4.6.20 A protected refuge area, not less than 2.5m^2, shall be provided on every floor adjacent to escape stairs for the taking of short breaks and as waiting areas for wheelchair users and other disabled persons.

4.6.21 Spiral staircases used as means of escape shall be limited to total occupant load of 100 person per story and a maximum building height of 9m unless connected to platforms, balconies, or terrace allowing pauses in the escape route at each floor level.

4.6.22 A spiral fire escape shall not be less than 1500mm in diameter and shall be placed in an enclosed compartment of non-combustible materials or of 2 hour fire resistive construction.

4.7 Fire Protection

4.7.1 All buildings shall be protected against fire in accordance with the general provisions set in Article 44 of the Proclamation and Article 41 of the Regulation.

4.7.2 Fire walls shall be constructed to subdivide buildings to restrict the spread of fire.

4.7.3 Fire walls shall be constructed of non-combustible materials with a fire-resistance rating of not less than 4 hours and shall have sufficient structural strength to withstand the effect of collapsing construction on either side during fire. Walls constructed of solid masonry units not less than 200mm thick shall be deemed-to-satisfy these requirements.

4.7.4 Fire walls shall start at the foundation and extend continuously through all storeys to and above the roof.

4.7.5 Buildings shall have roof covering giving adequate protection against the spread of fire.

4.7.6 Buildings may be finished with roof coverings considered effective only against light fire exposure provided that an underlayment of fire retardant material is used.

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4.7.7 Partitions required having more than two hour fire resistance rating shall be continuous from floor slab to the underside of the floor or roof above through any concealed spaces.

4.7.8 Approved folding, portable or movable partitions may not comply with fire resistance requirements provided that they do not block required exits and they do not establish an exit corridor, and provided their location is restricted by means of permanent tracks, guides or other approved methods.

4.7.9 Notwithstanding the fire protection requirements of this Standard, exterior walls fronting on streets or yards of not less than 13m in width may be constructed of combustible materials provided the height of such walls does not exceed 5m above grade.

4.7.10 Lintels over opening in exterior walls shall have a fire resistance rating not less than required by the provisions for the wall in which the lintel is placed.

4.7.11 Floors shall have continuous contact with the exterior walls or assemblies providing vertical separation.

4.7.12 Openings extending vertically through floors shall be enclosed in a shaft of fire-resistive construction of 2hrs rating for non-combustible construction and 1hr rating for combustible construction.

4.7.13 Cornices, overhangs, exterior balconies and similar projecting architectural elements extending beyond the floor area shall be of non-combustible materials, or of at least 1hour fire resistive construction.

4.7.14 Parapets constructed on all exterior walls shall have the same value of fire resistance as the walls on which they are erected and shall not be less than 750mm in height above the adjoining roof surface and wall junction.

4.7.15 Notwithstanding the provisions of 4.7.14 parapets may not be provided on walls which are not required to be of fire resistive construction or where unprotected openings are permitted or on buildings having a floor area of not more than 100m^2 per floor.

4.7.16 Fire and smoke vents shall be provided in public areas of all occupancies where the occupant load is greater than 200.

4.7.17 Fire and smoke vents shall be operated automatically and shall be coupled with automatic fire alarm systems.

4.7.18 Fire and smoke vents shall extend above the roof and protected from any obstructions affecting the required suction.

4.7.19 Fire fighting stairs shall be provided for buildings with a height of more than 45m and an average area per storey of 500m^2 unless otherwise specified.

4.7.20 Fire fighting lifts and fire fighting lobbies, incorporated in the same enclosure with fire fighting stairs, shall be provided for buildings with a height of more than 60m and an average area of 750m^2 per storey unless otherwise specified.

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4.7.21 The number of fire fighting stairs shall be proportional to the average area per storey as indicated in sub-clause 4.7.19 and 4.7.20 unless otherwise specified.

4.7.22 Notwithstanding sub-clause 4.7.21, fire fighting mains in the fire fighting staircase enclosure shall be no more than 60m from any part of a storey that is more than 20m above grade.

4.8 Occupancy Classification

4.8.1 A building whether existing or yet to be erected shall be classified in accordance to its use or the character of its occupancy as follows:

a) Assembly Occupancy
b) Business Occupancy
c) Commercial Occupancy
d) Dwelling Occupancy
e) Educational Occupancy
f) Factory & Industrial Occupancy
g) Goods Storage Occupancy
h) Health & Penal Occupancy

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4.8.2 Ancillary functions with uses different from that of the dominant use of the building shall be classified as part of the main occupancy, unless otherwise specified in the provisions for the particular main occupancy.

4.8.3 No Change shall be made in the character of occupancies or use of any building which will place the building in a different group of occupancy, unless such building is made to comply with the requirements of this Standard for such group of occupancy.

4.8.4 The fire safety plans required to be submitted for building permit in accordance with Article 3/1/i of the Regulation and Sub-Clause 4.4.6 and sub-Clause 28.6 of the Directive shall highlight the following features on a watermarked plan and include the required data here below:

a) Show all exits and enter alpha-numeric designations for each
b) Give the capacity of each exit.
c) Indicate escape routes, preferably with different colours and line types.
d) Enter travel distance along escape routes separately for each straight run and give total adjacent to exit designation.
e) Give widths of corridors, stairways and doors along escape routes.

4.9 Building Type Classification

4.9.1 Buildings or structures or parts thereof used for the following purposes:

a) Gathering to eat, drink, dance or participate in other recreational activities;
b) Viewing of theatrical, operatic, orchestral, choral, cinematographic or sports performances;
c) Assembling for the purpose of worshipping;
d) Viewing outdoor sports events;

e) Viewing or studying displays of art, cultural & historic artefact and books and other types of documents; shall be classified as **Assembly Occupancy.**

4.9.2 Buildings or structures or parts there f used for the following purposes:

a) Shops where merchandise is displayed and offered;
b) Offices where banking, consulting and professional services are conducted; shall be classified as **Business Occupancy.**

4.9.3 Buildings or structures or parts thereof used for the following purposes:

a) Places where non-industrial processes are carried out;
b) Wholesale stores where goods are displayed and stored and where only a limited selected group of persons is present at any one time;
c) Garages where more the 10 vehicles are stored or parked; shall be classified as **Commercial Occupancy.**

4.9.4 Buildings or structures or parts thereof used for the following purposes:

a) Transient accommodation where furnished rooms are rented;
b) Accommodation where groups of people use one room;
c) Non-transient accommodation consisting of one or more residential units;
d) Detached non-transient residential units; shall be classified as Dwelling Occupancy.

4.9.5 Buildings or structures or parts thereof used for the following purposes:

a) Places of instruction where pupils and students assemble for the purpose of learning;
b) Places where persons assemble for the purpose of tuition; shall be classified as **Educational Occupancy.**

4.9.6 Buildings or structures or parts there of used for the following purposes:

a) Places where products are fabricated, assembled or manufactured;
b) Places where industrial processes are carried out;
c) Plant rooms where mechanical or electrical devices are operated unattended; shall be classified as **Factory & Industrial Occupancy.**

4.9.7 Buildings or structures or parts thereof used for the following purposes:

a) Places where goods, wares and merchandise are stored;
b) Places where animals are sheltered; shall be classified as **Goods Storage Occupancy.**

4.9.8 Buildings or structures or parts thereof used for the following purposes:

a) Places where people are cared for or treated because of physical or mental disabilities;
b) Institutions where people who are challenged in fitness and movements due to age or other disabilities reside and are cared for;

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c) Places of detention where people are restrictedly kept for punitive or corrective reasons or because of their mental condition; shall be classified as **Health & Penal Occupancy.**

4.10 Particular Requirements

4.10.1 The general requirements prescribed in sections 4.5, 4.6 and 4.7 above apply to all occupancy groups.

4.10.2 Particular requirements pertaining to each occupancy group are prescribed in 4.11 to 4.18 here below.

4.10.3 When two or more occupancies are within the same building and if there should be conflicting provisions, the requirements securing the greater safety shall prevail.

4.10.4 When a building is used for more than one occupancy purpose, each part of the building comprising a distinct occupancy shall be separated from any other occupancy by fire separation.

4.10.5 Where an occupancy or use is not specifically provided for in the occupancy classification or building type classification in 4.8 or 4.9 above, it shall be placed in the classification that most nearly resembles it with respect to purpose and fire hazard.

4.10.6 The Building Official may issue an additional list of building types constituting each occupancy group, if these are not covered by the lists under 4.9 above.

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4.11 Assembly Occupancy

4.11.1 Dimensions & Function

4.11.1.1 Height and Area Limitations

4.11.1.1.1 The height of buildings with non-combustible construction shall not exceed 5-storeys.

4.11.1.1.2 The area of buildings with non-combustible construction shall not exceed 5,000m^2.

4.11.1.1.3 The height of buildings with combustible construction shall not exceed 3-storeys.

4.11.1.1.4 The area of buildings with combustible construction shall not exceed 3,000m^2.

4.11.1.2 Interior Space Dimensions

4.11.1.2.1 Assembly seating shall not be less than 450mm in width and 550mm in depth and the space between rows of seats shall not be less than 300mm.

4.11.1.2.2 The maximum number of seats in any row extending from one side to another shall be 14 and the maximum number of seats in any row opening to an aisle at one end only shall be 7.

4.11.1.2.3 Notwithstanding the provisions of 4.11.1.2.1 above the number of seats in a row may be increased as follows subject to the requirements of 4.11.1.2.4 below:

a. 15-18 seats in a row with a corresponding space of 400mm between each row of seats.
b. 19-35 seats in a row with a corresponding space of 450mm between each row of seats.
c. 36-45 seats in a row with a corresponding space of 500mm between each row of seats.
d. 46-100 or more seats in a row with a corresponding space of 550mm between each row of seats.

4.11.1.2.4 An increase in the number of seats in a row as prescribed in 4.11.1.2.3 above is permitted only if the following requirements are met.

a. When side aisles with a minimum width of 1200mm are provided at both ends of the rows of seats.
b. When an exit doorway with a minimum width of 1700mm is provided at both ends of each five rows of seats.

4.11.1.3 Accessibility

4.11.1.3.1 A minimum of two wheelchair spaces shall be provided in auditor with fixed seats.

4.11.1.3.2 One wheelchair space shall be provided for every additional 500 fixed seats.

4.11.1.4 Lighting

4.11.1.4.1 Except during a performance requiring dimming or darkness, the intensity of light during occupancy shall be according to the requirements of EBCS-10.

4.11.1.4.2 In places of assembly where motion pictures or other projections are made by means of directed light, the illumination of aisles is permitted to be reduced; but in no case shall the intensity of light be less than 40% of the required illumination level, measured at the walking surface.

4.11.1.4.3 Corridors, passageways, stairways, ramps, and other means of escape shall be provided with emergency lighting facilities.

4.11.1.5 Ventilation

4.11.1.5.1 All enclosed portions customarily used by human beings and all dressing rooms shall be provided with ventilation by means of exterior openings with an area of not less than one twentieth of the total floor area.

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4.11.1.5.2 As an alternative to the requirements in 4.11.1.5.1 here above, mechanically operated ventilating system can be provided. The rate shall be according to EBCS-11.

4.11.1.5.3 All registers or vents supplying air to backstage shall be equipped with automatic closing devices with fusible links. Such closing devices shall be located where the vent ducts pass through the proscenium wall and both inside and outside of the vent or duct.

4.11.2 Means of Escape

4.11.2.1 Provision of Exits

4.11.2.1.1 There shall be a minimum of 2 exits provided for a building with an additional exit for every 100 persons.

4.11.2.1.2 Spiral staircases shall not be used as a means of escape.

4.11.2.2 Travel Distance

4.11.2.2.1 Exits shall be so located that the travel distance on the floor shall not exceed 30m for all types of construction.

4.11.2.2.2 The distance from exits through unobstructed passage way to an exit discharge shall not exceed 30m.

4.11.2.3 Exit Capacity

4.11.2.3.1 The capacity per unit exit width shall be 60 occupants for stairways and 90 occupants for doors.

4.11.2.3.2 Occupant load, factor shall be:

a. 1.5m^2 in areas where tables and chairs are used, where seats are not in rows and where there are exhibits.
b. 0.6m^2 for dance floors, lodges boxes chairs in rows but not fastened to floor.
c. 0.3m^2 for waiting areas where standing is permitted

4.11.2.3.3 The occupant Load of a mezzanine floor or tier discharging through a floor below shall be added to the main floor occupant load and the capacity of the exits shall be designed for the total occupancy load thus established.

4.11.2.4 Exit Width

4.11.2.4.1 Exit doorways shall not be less than 1000mm in width.

4.11.2.4.2 Exit corridors shall not be less than 1500mm in width.

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4.11.3 FIRE SAFETY

4.11.3.1 Fire Protection

4.11.3.1.1 All rooms used for storage of combustible materials shall be located away from staircases and properly secluded from assembly areas.

4.11.3.1.2 The stage area including any proscenium opening shall be separated from the seating area by a firm wall of 3-hour fire resistance rating.

4.11.3.2 Fire & Smoke Venting

4.11.3.2.1 Automatic smoke vents, with an area not less than 2% of the total floor area of the building shall be installed and actuated by smoke detectors.

4.11.3.2.2 Vents shall be located in a sheltered position at the highest point of the area to be served.

4.11.3.2.3 The position of vents shall take into consideration the direction of the prevailing wind to provide the required suction.

4.11.3.3 Fire Fighting

4.11.3.3.1 A separate fire fighting staircase shall be provided in buildings more than 2 storeys high.

4.11.3.3.2 A fire fighting staircase and a fire fighting lift into a separate fire fighting lobby shall be provided in buildings more than 4 storeys high.

4.12 Business Occupancy

4.12.1 Dimensions & Function

4.12.1.1 Height and Area Limitations

4.12.1.1.1 The height and area of buildings with non-combustible construction is unlimited.

4.12.1.1.2 The height of buildings with combustible construction shall not exceed 8 storeys.

4.12.1.1.3 The area of buildings with combustible construction shall not exceed 2,500m^2 per floor.

4.12.1.2 Interior Space Dimensions

4.12.1.2.1 The net height of rooms shall not be less than 2600mm.

4.12.1.2.2 The net width and area of rooms occupied by persons for an average duration of 2 hours per day shall not be less than 2000mm and 5m^2, respectively.

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4.12.1.3 Accessibility

4.12.1.3.1 All floors that are intended for general public activities shall be accessible.

4.12.1.3.2 Alternative service facilities shall be provided on the ground floor in buildings where lifts are not installed.

4.12.1.4 Lighting

4.12.1.4.1 Artificial lighting shall be provided where natural lighting is not adequate to attain a general illuminance level of 500 lux and where the building may be occupied during hours of darkness.

4.12.1.4.2 The walking surfaces of corridors, passageways, stairways, ramps and other means of egress shall be illuminated at all points to intensities of not less than 1 lux measured at a walking surface, and shall be operational at all times the building is occupied.

4.12.1.5 Ventilation

4.12.1.5.1 Windows used for natural ventilation shall have a minimum area of the opening part not less than one twentieth of the floor area of the space to be ventilated.

4.12.1.5.2 A minimum of 7 air changes per hour shall be attained through a combination of natural and artificial ventilation.

4.12.2 Means of Escape

4.12.2.1 Provision of Exits

4.12.2.1.1 There shall be a minimum of 2 exits provided for a building with a population of 500 persons and with and additional exit for every 200 persons.

4.12.2.1.2 Single stairway buildings are permitted provided:

a) that the height of the uppermost floor is not more than 12m above the adjacent ground level,
b) that the gross floor area per storey does not exceed 500m^2

4.12.2.2 Travel Distance

4.12.2.2.1 Exits shall be located so that the travel distance on the floor shall not exceed 30m for all types of construction.

4.12.2.2.2 The travel distance from any point in a room to a door way opening into an access corridor shall not exceed 45m.

4.12.2.3 Exit Capacity

4.12.2.3.1 The occupant load factor shall be 10m^2 per person.

4.12.2.3.2 The capacity per unit exit width shall be 50 occupants for stairways and 75 occupants for doors.

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4.12.2.4 Exit Width

4.12.2.4.1 Exit doorways shall not be less than 1000mm in width.

4.12.2.4.2 Exit corridors shall not be less than 1250mm in width.

4.12.3 Fire Safety

4.12.3.1 Fire Protection

4.12.3.1.1 Access corridors on all floors shall be fire protected with walls of 2-hours fire resistive construction.

4.12.3.1.2 Doors opening into access corridors shall be fire doors with a 1-hour fire resistant rating.

4.12.3.2 Fire & Smoke Venting

4.12.3.2.1 Protected vent shafts shall be provided along the whole height of the building.

4.12.3.2.2 Automatic smoke vents shall be installed on every floor and shall be actuated by smoke detectors.

4.12.3.3 Fire Fighting

4.12.3.3.1 A separate fire fighting staircase shall be provided in buildings more than 21 storeys high.

4.12.3.3.2 A fire fighting staircase and a fire fighting lift opening into a separate fire fighting lobby shall be provided in buildings more than 34 storeys high.

4.12.3.3.3 Fire hoses and extinguishers shall be installed in accordance with the provisions of EBCS 9.

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4.13 Commercial Occupancy

4.13.1 Dimensions & Function

4.13.1.1 Height and Area Limitations

4.13.1.1.1 The height of buildings with non-combustible construction shall not exceed 5 storeys.

4.13.1.1.2 The area of buildings with non-combustible construction shall not exceed 2,500m^2 per floor.

4.13.1.1.3 The height of buildings with combustible construction shall not exceed 3 storeys.

4.13.1.1.4 The area of buildings with combustible construction shall not exceed 1,500m^2 per floor.

4.13.1.2 Interior Space Dimensions

4.13.1.2.1 The net height of rooms shall not be less than 300mm.

4.13.1.2.2 The net width and area of rooms occupied by persons for an average duration of 2 hours per day shall not be less than 3000mm and 10m^2, respectively.

4.13.1.3 Accessibility

4.13.1.3.1 All floors that are not intended for storage and service activities shall be accessible.

4.13.1.3.2 Alternative service facilities shall be provided on the ground floor in buildings where lifts are not installed.

4.13.1.4 Lighting

4.13.1.4.1 Artificial lighting shall be provided where natural lighting is not adequate to attain a general illuminance level of 300 lux and where the building may be occupied during hours of darkness.

4.13.1.4.2 The walking surfaces of corridors, passageways, stairways, ramps and other means of egress shall be illuminated at all points to intensities of not less than 1lux measured at a walking surface, and shall be operational at all times the building is occupied.

4.13.1.5 Ventilation

4.13.1.5.1 Windows used for natural ventilation shall have a minimum area of the opening part not less than one twentieth of the floor area of the space to be ventilated.

4.13.1.5.2 A minimum of 10 air changes per hour shall be attained through a combination of natural and artificial ventilation.

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4.13.2 Means of Escape

4.13.2.1 Provision of Exits

4.13.2.1.1 Every part of a storey shall have access to not less than 2 exits

4.13.2.1.2 Spiral staircases shall not be used as a means of escape.

4.13.2.2 Travel Distance

4.13.2.2.1 Exits shall be located so that the travel distance on the floor shall not exceed 30m for all types of construction.

4.13.2.2.2 The travel distance from any point in a room to a door way opening into an access corridor shall not exceed 45m.

4.13.2.3 Exit Capacity

4.13.2.3.1 The occupant load factor shall be:

a. for street front & basement, $3m^2$ per person
b. for upper floors, $6m^2$ per person

4.13.2.3.2 The capacity per unit exit width shall be 50 occupants for stairways and 75 occupants for doors.

4.13.2.4 Exit Width

4.13.2.4.1 Exit doorways shall not be less than 1200mm in width.

4.13.2.4.2 Exit corridors shall not be less than 1500mm in width.

4.13.3 Fire Safety

4.13.3.1 Fire Protection

4.13.3.1.1 Access corridors on all floors shall be fire protected with walls of 2-hours fire resistive construction.

4.13.3.1.2 Doors opening into access corridors shall be fire doors with a 1-hour fire resistant rating.

4.13.3.2 Fire & Smoke Venting

4.13.3.2.1 Protected vent shafts shall be provided along the whole height of the building.

4.13.3.2.2 Automatic smoke vents shall be installed on every floor and shall be actuated by smoke detectors.

4.13.3.3 Fire Fighting

4.13.3.3.1 A separate fire fighting staircase shall be provided in buildings more than 3 storeys high.

4.13.3.3.2 Fire hoses and extinguishers shall be installed in accordance with the provisions of EBCS 9.

4.14 Dwelling Occupancy

4.14.1 Dimensions & Function

4.14.1.1 Height and Area Limitations

4.14.1.1.1 The height and area of buildings with a non-combustible construction is unlimited.

4.14.1.1.2 The height of buildings with a combustible construction shall not be more than 4 storeys high.

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4.14.1.1.3 The area per floor of buildings with a combustible construction shall not exceed 1,500m^2.

4.14.1.2 Interior Space Dimensions

4.14.1.2.1 Habitable rooms shall have a minimum width of 2 and a minimum area of 6m^2.

4.14.1.2.2 The height of habitable rooms shall not be less than 2.4m.

4.14.1.2.3 The width of corridors within dwelling units shall not be less than 1m.

4.14.1.2.4 In dormitory accommodation a minimum area of 4m^2 per person and a minimum ceiling height of 2350mm shall be provided. If two tier bunks are used the floor area may be reduced to a minimum of 3m^2 per person but the ceiling height shall be a minimum of 2800mm.

4.14.1.3 Accessibility

4.14.1.3.1 In apartment blocks where no lifts are provided a minimum of 2% of the dwelling units shall be located on the ground floor and shall be accessible.

4.14.1.3.2 In hotels, hostels and guesthouses, 2% of the guest rooms shall be accessible.

4.14.1.4 Lighting

4.14.1.4.1 Habitable rooms shall be provided with natural light by means of exterior windows with an area not less than one tenth the floor area of the room or with a minimum area of 0.6m^2 whichever is the greater.

4.14.1.4.2 In cases where artificial lighting is used to supplement natural lighting a general minimum illuminance level of 100 lux shall be attained.

4.14.1.4.3 For the purpose of determining light requirements any room may be considered as part of an adjoining room when one half of the area of the wall between the rooms is open.

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4.14.1.5 Ventilation

4.14.1.5.1 A minimum of 20% of windows provided for natural lighting shall be openable.

4.14.1.5.2 A minimum of 3 air changes per hour shall be attained through a combination of natural and artificial ventilation

4.14.2 Means of Escape

4.14.2.1 Provision of Exits

4.14.2.1.1 There shall be a minimum of 2 exits provided for a building with a population of 300 persons an additional exit for every 200 persons.

4.14.2.1.2 Separate escape staircases shall be provided in buildings of more than 13 storey height.

4.14.2.1.3 Access staircases in buildings more the 5 storeys high shall extend to the roof unless a separate fire escape stair is provided.

4.14.2.1.4 Every sleeping room below the 4th storey shall have at least one exterior openable window openable from inside, with a minimum net clear opening height of 600mm and a width of 500mm.

4.14.2.1.5 Bars, grilles or grates may be installed on openable windows provided they are also open able from inside.

4.14.2.1.6 Dormitories in buildings of Educational Occupancy shall comply with provisions of Dwelling Occupancy in addition to complying with the provisions of Educational Occupancy.

4.14.2.2 Travel Distance

4.14.2.2.1 The travel distance from the furthest point in a room to the exit door from the dwelling unit shall not exceed 15m.

4.14.2.2.2 The travel distance from a dwelling unit to an exit on the same floor shall not exceed 15m.

4.14.2.3 Exit Capacity

4.14.2.3.1 The occupant load factor shall be 15m^2 per person.

4.14.2.3.2 The occupant load per unit exit width for stairways and doors shall be 25 occupants and 40 occupants respectively.

4.14.2.4 Exit Width

4.14.2.4.1 Exit doorways shall not be less than 800mm in width.

4.14.2.4.2 Exit corridors shall not be less than 1100 mm in width.

4.14.3 Fire Safety

4.14.3.1 Fire Protection

4.14.3.1.1 Fire-separating walls shall be installed between parts of a building complying with the provisions of 4.14.1.1.3 above.

4.14.3.1.2 Joints between fire-separating elements shall be fire-stopped.

4.14.3.1.3 The minimum distance between buildings with unprotected walls shall be 15m.

4.14.3.1.4 In hotels and in buildings where rooms are rented on a transient basis, walls between rooms and corridors shall be constructed of non-combustible materials or of 1hour fire resistive construction.

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4.14.3.1.5 In buildings of multifamily occupancy, dwelling units shall be separated from each other and from corridors, hallways, and passageways and from other occupancies by walls, partitions, floors and floor-ceiling assemblies of 1 hour fire resistive construction. Party walls shall be vertically extended to the underside of the roof covering and horizontally to the exterior face of the exterior walls.

4.14.3.1.6 Doorways between dwelling units and hallways, corridors or passageways shall be protected with fire resistant doors.

4.14.3.1.7 Storage or laundry rooms that are used in common by tenants shall be separated from the rest of the building by walls of 1 hour fire resistive construction.

4.14.3.1.8 Party walls between attached dwellings houses shall be shall be constructed of non-combustible materials or of 2hour fire resistive construction.

4.14.3.1.9 In building where rooms are rented on a transient basis or in buildings with more than 15 persons accommodated on a non-transient basis, an approved fire detection system with a fire alarm system shall be installed in corridors.

4.14.3.2 Fire & Smoke Venting

4.14.3.2.1 Common corridors and staircases shall be provided with vent openings with an area of not less than 1% of the total gross floor area of all dwelling units in the building.

4.14.3.2.2 Fire and smoke venting systems are not required where every habitable room located in dwelling units is provided with windows complying with 4.14.1.5.1.

4.14.3.3 Fire Fighting

4.14.3.3.1 A separate fire fighting staircase shall be provided in buildings more than 13 storeys high.

4.14.3.3.2 A fire fighting staircase and a fire fighting lift opening into a separate fire fighting lobby shall be provided in buildings more than 21 storeys high.

4.14.3.3.3 Fire hydrants and extinguishers shall be installed as per the provisions of EBCS-9.

4.15 Educational Occupancy

4.15.1 Dimensions & Function

4.15.1.1 Height and Area Limitations

4.15.1.1.1 The height of buildings with non-combustible construction shall not exceed 5 storeys.

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4.15.1.1.2 The area of buildings with non-combustible construction shall not exceed 2,500m^2 per floor.

4.15.1.1.3 The height of buildings with combustible construction shall not exceed 3 storeys.

4.15.1.1.4 The area of buildings with combustible construction shall not exceed 1,500m^2 per floor.

4.15.1.2 Interior Space Dimensions

4.15.1.2.1 The net height of classrooms shall not be less than 2600mm.

4.15.1.2.2 The net width and area of class rooms shall not be less than 5000mm and 35m^2, respectively.

4.15.1.3 Accessibility

4.15.1.3.1 Classrooms and other alternative service facilities shall be provided on the ground floor in buildings where lifts are not installed.

4.15.1.3.2 At least 5% or a minimum of one of each element of fixed seating, tables, or study carrels shall be accessible.

4.15.1.4 Lighting

4.15.1.4.1 Corridors, passageways, stairways, ramps and other components of means of circulation in buildings in which night occupancy is anticipated shall be provided with emergency lighting.

4.15.1.4.2 Storeys below grade, underground structures and windowless buildings of Educational having a capacity of more than 50 occupants per storey shall be provided with emergency lighting.

4.15.1.4.3 Artificial lighting shall be provided where natural lighting is not adequate to attain a general illuminance level of 500 lux in buildings in which night occupancy is anticipated.

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4.15.1.5 Ventilation

4.15.1.5.1 All rooms shall be provided with adequate ventilation by means of openable windows or by mechanical means; in case of openable windows the area of the openable window shall not be less than one twentieth of the floor area of the room.

4.15.1.5.2 A minimum of 6 air changes per hour shall be attained through a combination of natural and artificial ventilation.

4.15.2 Means of Escape

4.15.2.1 Provision of Exits

4.15.2.1.1 Not less than 50% of the required units of exits serving classrooms or rooms used for educational purposes and located below the storey of

discharge shall be exterior stairways, or ramps, or enclosed interior stairways or ramps discharging directly outside the building at grade and not communicating with the storey of discharge or any storey above the storey of discharge.

4.15.2.1.2 Rooms and spaces in buildings with a capacity of 50 or more occupants or more than 90m^2 in area shall have not less than two doorways remote from one another. The doorways shall have doors swinging in the direction of exit travel and shall provide access to separate exits or to corridors which provide access to not less than two separate exits.

4.15.2.1.3 Rooms for educational purposes in buildings of other occupancy and incidental to such other occupancy are permitted to use exits common to the rooms of the other occupancy, provided the rooms and the other occupancy, considered separately, have exits sufficient to meet the requirements of these standards.

4.15.2.1.4 Where the number of occupants of a building exceeds 100, doors in exterior doorways that are part of the means of escape or that are used by students shall be equipped with approved panic release devices.

4.15.2.1.5 Doors in doorways from rooms or spaces having a capacity of more than 100 occupants shall be equipped with approved panic release devices.

4.15.2.1.6 Notwithstanding the provisions of 4.15.4.1.5 above, corridors between exits in storeys directly above or below the storey of discharge are permitted to extend beyond an exit provided that such extension does not exceed 6m in length.

4.15.2.1.7 Where the number of occupants of a storey in a building exceeds 100, storey exits shall be provided with a fire-assembly.

4.15.2.1.8 Corridors connecting exits shall not have any contributory corridors or extensions that form dead-end corridors.

4.15.2.1.9 Doors which swing into corridors or hallways which provide access to exits shall be recessed to prevent interference with the full use of the corridor or shall open 180 degrees to stop against walls. Doors in any position shall not reduce the required corridor width by more than one-half.

4.15.2.2 Travel Distance

4.15.2.2.1 Exits shall be located so that the travel distance on the floor shall not exceed 30m for all types of construction.

4.15.2.2.2 The travel distance from any point in a room to a door way opening into an access corridor shall not exceed 15m.

4.15.2.3 Exit Capacity

4.15.2.3.1 Occupant loads used to determine the exits required shall be based on the actual number of occupants, but shall in no case be less than 4m^2 gross floor areas per person.

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4.15.2.3.2 The occupant load of a mezzanine floor discharging through a floor below shall be added to the main floor occupant load and the capacity of the exits shall be designed for the total occupancy load thus established.

4.15.2.3.3 The occupant load of classrooms and vocational rooms shall not be less than one person per $2m^2$ and one person per $5m^2$ respectively. The floor area considered shall be the actual occupied area excluding accessory unoccupied areas.

4.15.2.3.4 The occupant load of areas having fixed seats shall be determined by the number of seats installed. The required aisle space serving the fixed seats shall not be considered for determining the occupant load.

4.15.2.3.5 Rooms other than classrooms and vocational rooms with a capacity of 100 or more occupants, such as lecture rooms, recreation rooms, gymnasiums, assembly halls and cafeterias shall comply with the provisions of Assembly Occupancy.

4.15.2.3.6 The capacity per unit exit width shall be 25 occupants for stairways and 75 occupants for doors.

4.15.2.4 Exit Width

4.15.2.4.1 Exit doorways shall not be less than 1000mm in width.

4.15.2.4.2 Exit corridors shall not be less than 1800mm in width.

4.15.3 Fire Safety

4.15.3.1 Fire Protection

4.15.3.1.1 Openings extending vertically through floors shall be enclosed in a shaft of fire-resistive construction of 2hrs rating.

4.15.3.1.2 Classrooms and vocational rooms shall not be located above the second storey in buildings of combustible construction.

4.15.3.1.3 Storeys of combustible construction above the storeys limited in 4.15.5.1.2 here above are permitted only if the number of occupants of the additional storeys does not exceed 100.

4.15.3.1.4 Notwithstanding the provisions of articles 4.15.5.1.2 and 4.15.5.1.3 here above, it is permitted to increase the height of the building by one storey only, if the building is equipped with an automatic sprinkler system and provided that this additional storey is not used for vocational rooms, storage rooms or maintenance shops.

4.15.3.1.5 Classrooms and vocational rooms with a capacity of more than 100 occupants shall not be permitted in storeys above or below the storey of discharge except in buildings of non-combustible construction.

4.15.3.1.6 Rooms and spaces used for kindergarten and Grade 1 shall not be located above or below the storey of discharge.

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4.15.3.1.7 Rooms and spaces used for the first two grades of elementary school shall not be located below the storey of discharge or above the first storey above the storey of discharge.

4.15.3.2 Fire & Smoke Venting

4.15.3.2.1 Protected vent shafts shall be provided along the whole height of the building.

4.15.3.2.2 Automatic smoke vents shall be installed on every floor and shall be actuated by smoke detectors.

4.15.3.3 Fire Fighting

4.15.3.3.1 A separate fire fighting staircase shall be provided in buildings more than 3 storeys high.

4.15.3.3.2 Fire hoses and extinguishers shall be installed in accordance with the provisions of EBCS 9.

4.16 Factory & Industrial Occupancy

4.16.1 Dimensions & Function

4.16.1.1 Height and Area Limitations

4.16.1.1.1 The height of buildings with non-combustible construction shall not exceed 8 storeys.

4.16.1.1.2 The area of buildings with non- combustible construction shall not exceed 6,000m^2 per floor.

4.16.1.1.3 The height of buildings with combustible construction shall not exceed 4 storeys.

4.16.1.1.4 The area of buildings with combustible construction shall not exceed 1,500m^2 per floor.

4.16.1.2 Interior Space Dimensions

4.16.1.2.1 The net height of rooms shall not be less than 5000mm.

4.16.1.2.2 The net width and area of rooms occupied by persons for an average duration of 2 hours per day shall not be less than 10000mm and 50m^2, respectively.

4.16.1.3 Accessibility

4.16.1.3.1 Facilities where people are engaged in production work or machine handling are exempt from accessibility requirements under this standard.

4.16.1.3.2 Ancillary facilities in factories and industrial estates shall be accessible.

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4.16.1.4 Lighting

4.16.1.4.1 All facilities where people are engaged in production work or machine handling shall be properly lit to levels required for the specific visual task as prescribed in EBCS-10.

4.16.1.4.2 A minimum illuminance level of 500 lux shall be attained in general activity areas.

4.16.1.5 Ventilation

4.16.1.5.1 In buildings wider than 30m ventilation through windows shall be augmented by roof ventilation.

4.16.1.5.2 A minimum of 15 air changes per hour shall be attained through a combination of natural and artificial ventilation.

4.16.2 Means of Escape

4.16.2.1 Provision of Exits

4.16.2.1.1 Every part of a storey room or operating level, except when permitted in accordance with sub-clause 4.16.4.1.2 here below, shall have access to not less than two exits which are located reasonably apart.

4.16.2.1.2 In uses which requires undivided floor areas so large that distances from a point within the area to the nearest doorways in outside walls exceed the distances permitted, and basements or other floor areas do not provide suitable exits, requirements for exit access are permitted to be satisfied by:

a) Providing doorways opening to stairways leading to tunnels which lead directly outside the building,
b) Providing doorways opening to stairways leading to overhead passageways which lead directly outside the building and are enclosed by walls, partitions, and floors constructed of non-combustible or approved limited non-combustible materials, or fire retardant treated lumber, and having a fire resistance of not less than 2 hours.

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4.16.2.1.3 One means of egress is permitted in buildings of non-hazardous use with a capacity of less than 25 occupants provided the area is located in a storey at or near grade and the maximum distance from any point within the area to a doorway in an exterior wall does not exceed 15m.

4.16.2.1.4 In hazardous buildings corridors shall not extend beyond an exit.

4.16.2.1.5 Spiral staircases shall not be used as means of escape.

4.16.2.2 Travel Distance

4.16.2.2.1 Exits shall be so located that the travel distance on the floor shall not exceed 45m for all types of construction.

4.16.2.2.2 The travel distance to an exit from the dead end of a corridor shall not exceed 15m.

4.16.2.3 Exit Capacity

4.16.2.3.1 The occupant load factor shall be $10m^2$ per person.

4.16.2.3.2 The capacity per unit exit width shall be 60 occupants for stairways and 90 occupants for doors.

4.16.2.4 Exit Width

4.16.2.4.1 Exit doorways shall not be less than 1200mm in width.

4.16.2.4.2 Exit corridors shall not be less than 1800mm in width.

4.16.3 Fire Safety

4.16.3.1 Fire Protection

4.16.3.1.1 Fire walls shall be constructed to subdivide buildings to restrict the spread of fire.

4.16.3.1.2 Buildings with total capacity of more than 100 persons or with capacity of more than 25 persons in storeys above or below the storey of discharge, fire alarm systems shall be installed with a fire alarm box located adjacent to an exit discharge and at each elevator landing.

4.16.3.1.3 Hazardous buildings shall be of non-combustible construction.

4.16.3.1.4 Buildings in which a special fire hazard is inherent shall be separated from other occupancies in the building by wall, partition, floor and floor-ceiling assemblies of non-combustible materials.

4.16.3.1.5 Heating, ventilation and exhaust systems, boilers and furnaces shall be safely located and separated from other portions of the building by fire resistive construction or by detaching them from other portions of the building.

4.16.3.2 Fire & Smoke Venting

4.16.3.2.1 A smoke removal system, by either mechanical or natural ventilation, shall be provided.

4.16.3.2.2 The smoke removal system shall provide a minimum of 5 air changes per hour.

4.16.3.3 Fire Fighting

4.16.3.3.1 In multi-storey buildings, a separate fire fighting staircase shall be provided.

4.16.3.3.2 In hazardous buildings an effective fire fighting system shall be installed according to the provisions of EBCS 13.

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4.17 Goods Storage Occupancy

4.17.1 Dimensions & Function

4.17.1.1 Height and Area Limitations

4.17.1.1.1 The height of buildings with non-combustible construction shall not exceed 5 storeys.

4.17.1.1.2 The area of buildings with non- combustible construction shall not exceed 8,000m^2 per floor.

4.17.1.1.3 The height of buildings with combustible construction shall not exceed 2 storeys.

4.17.1.1.4 The area of buildings with combustible construction shall not exceed 2,500m^2 per floor.

4.17.1.2 Interior Space Dimensions

4.17.1.2.1 The net height of rooms shall not be less than 5,000mm.

4.17.1.2.2 The net width and area of rooms occupied by persons for an average duration of 2 hours per day shall not be less than 10,000mm and 50m^2, respectively

4.17.1.3 Accessibility

4.17.1.3.1 Facilities where people are engaged in goods hauling are exempt from accessibility requirements under this standard.

4.17.1.3.2 Ancillary facilities in goods storage facilities shall be accessible.

4.17.1.4 Lighting

4.17.1.4.1 All facilities where people are engaged goods hauling shall be properly lit to levels required for the specific visual task as prescribed in EBCS-10.

4.17.1.4.2 A minimum illuminance level of 500 lux shall be attained in general activity areas.

4.17.1.5 Ventilation

4.17.1.5.1 In buildings wider than 30m ventilation through windows shall be augmented by roof ventilation.

4.17.1.5.2 A minimum of 15 air changes per hour shall be attained through a combination of natural and artificial ventilation.

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4.17.2 Means of Escape

4.17.2.1 Provision of Exits

4.17.2.1.1 There shall be a minimum of 2 exits on every floor, except when permitted in accordance with sub-clause 4.17.4.1.2 here below.

4.17.2.1.2 One means of egress is permitted in buildings of non-hazardous use with a capacity of less than 25 occupants provided the area is located in a storey at or near grade and the maximum distance from any point within the area to a doorway in an exterior wall does not exceed 15m.

4.17.2.1.3 In hazardous buildings corridors shall not extend beyond an exit.

4.17.2.1.4 Spiral staircases shall not be used as means of escape.

4.17.2.2 Travel Distance

4.17.2.2.1 Exits shall be so located that the travel distance on the floor shall not exceed 25m for all types of construction.

4.17.2.2.2 The travel distance to an exit from the dead end of a corridor shall not exceed 15m.

4.17.2.3 Exit Capacity

4.17.2.3.1 The occupant load factor shall be $20m^2$ per person.

4.17.2.3.2 The capacity per unit exit width shall be 40 occupants for stairways and 60 occupants for doors.

4.17.2.4 Exit Width

4.17.2.4.1 Exit doorways shall not be less than 1200mm in width.

4.17.2.4.2 Exit corridors shall not be less than 1800mm in width.

4.17.3 Fire Safety

4.17.3.1 Fire Protection

4.17.3.1.1 Fire walls shall be constructed to subdivide buildings to restrict the spread of fire.

4.17.3.1.2 Buildings with total capacity of more than 100 persons or with capacity of more than 25 persons in storeys above or below the storey of discharge, fire alarm systems shall be installed with a fire alarm box located adjacent to an exit discharge and at each elevator landing.

4.17.3.1.3 Hazardous buildings shall be of non-combustible construction.

4.17.3.1.4 Buildings in which a special fire hazard is inherent shall be separated from other occupancies in the building by wall, partition, floor and floor-ceiling assemblies of non-combustible materials.

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4.17.3.2 Fire & Smoke Venting

4.17.3.2.1 A smoke removal system, by either mechanical or natural ventilation, shall be provided.

4.17.3.2.2 The smoke removal system shall provide a minimum of 5 air changes per hour.

4.17.3.3 Fire Fighting

4.17.3.3.1 In multi-storey buildings, a separate fire fighting staircase shall be provided.

4.17.3.3.2 In hazardous buildings an effective fire fighting system shall be installed according to the provisions of EBCS 13.

4.18 Health & Penal Occupancy

4.18.1 Dimensions & Function

4.18.1.1 Height and Area Limitations

4.18.1.1.1 The height and area of buildings with non-combustible construction is unlimited.

4.18.1.1.2 The height of buildings with combustible construction shall not exceed 8 storeys.

4.18.1.1.3 The area of buildings with combustible construction shall not exceed 2,500m^2 per floor.

4.18.1.2 Interior Space Dimensions

4.18.1.2.1 The net height of rooms shall not be less than 2600mm.

4.18.1.2.2 The net width and area of rooms used for sleeping purposes not be less than 2000mm and 5m^2, respectively.

4.18.1.3 Accessibility

4.18.1.3.1 All floors that are intended for general public activities shall be accessible.

4.18.1.3.2 Alternative service facilities shall be provided on the ground floor in buildings where lifts are not installed.

4.18.1.4 Lighting

4.18.1.4.1 Rooms used by patients for sleeping or living shall be provided with natural light by means of window openings.

4.18.1.4.2 Artificial lighting shall be provided where natural lighting is not adequate to attain a general illuminance level of 100 lux.

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4.18.1.5 Ventilation

4.18.1.5.1 Public corridors and enclosed stairways and ramps in shall be provided with natural ventilation. Mechanical ventilation may be substituted where natural ventilation is not possible.

4.18.1.5.2 A minimum of 7 air changes per hour shall be attained through a combination of natural and artificial ventilation.

4.18.2 Means of Escape

4.18.2.1 Provision of Exits

4.18.2.1.1 The distance from any point within a room used for sleeping purposes to a doorway opening to a corridor providing exit access shall not exceed 15m and the distance from the doorway to a doorway to an exit shall not exceed 22.5m.

4.18.2.1.2 Rooms used for sleeping purposes, suites and wards shall have at least one door opening directly to a corridor or hallway serving as an exit access.

4.18.2.1.3 Every part of a storey shall have access to not less than two exits which are located as far apart as possible.

4.18.2.1.4 In buildings used for detention purposes, doors to sleeping rooms and to other spaces and areas, where it would be required to evacuate inmates in case of fire or riot, shall be possible to be unlocked by a controlled system that will permit the prompt release of inmates

4.18.2.2 Travel Distance

4.18.2.2.1 Exits shall be located so that the travel distance on the floor shall not exceed 25m for all types of construction.

4.18.2.2.2 The travel distance from any point in a room to a door way opening into an access corridor shall not exceed 30m.

4.18.2.3 Exit Capacity

4.18.2.3.1 The occupant load factor shall be $15m^2$ per person.

4.18.2.3.2 The capacity per unit exit width shall be 25 occupants for stairways and 75 occupants for doors.

4.18.2.4 Exit Width

4.18.2.4.1 Exit doorways shall not be less than 1000mm in width.

4.18.2.4.2 Exit corridors shall not be less than 1250mm in width.

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4.18.3 Fire Safety

4.18.3.1 Fire Protection

4.18.3.1.1 Hospitals, sanatoriums, mental hospitals, jails, prisons and reformatories shall be of non-combustible construction.

4.18.3.1.2 Notwithstanding the provisions of 4.18.5.1.1 above, hospitals not more than one storey in height may be of combustible construction.

4.18.3.1.3 Hazardous areas such as rooms used for storage of combustible materials, heating, ventilation and exhaust systems, boilers, furnaces, workshops and garages used for repair and maintenance equipment for the building, linen rooms, rooms having cooking facilities and trash collection rooms, shall be separated from other rooms and portions of the building by walls, partitions, floor and floor-ceiling assemblies of non-combustible construction or shall be installed in buildings separated from the other portions of the building.

4.18.3.2 Fire & Smoke Venting

4.18.3.2.1 Protected vent shafts shall be provided along the whole height of the building.

4.18.3.2.2 Automatic smoke vents shall be installed on every floor and shall be actuated by smoke detectors.

4.18.3.3 Fire Fighting

4.18.3.3.1 Approved fire detection and alarm systems shall be installed in corridors, hallways, public areas and rooms used for sleeping purposes.

4.18.3.3.2 Fire hydrants and extinguishers shall be installed at intervals in corridors of every storey such that any point on each floor can be reached by the fire hydrant hose.

4.18.3.3.3 A separate fire fighting staircase shall be provided in buildings more than 8 storeys high.

4.18.3.3.4 A fire fighting staircase and a fire fighting lift opening into a separate fire fighting lobby shall be provided in buildings more than 13 storeys high.

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SECTION 5 ELEVATORS AND CONVEYING SYSTEMS

5.1 General

5.1.1 This section governs the design, construction, installation, alteration and repair of elevators and conveying systems and their components.

5.1.2 Except as otherwise provided for in this code, the design, construction, installation, alteration, repair and maintenance of elevators and conveying systems and their components shall conform to manufacturers standards.

5.1.3 Passenger elevators required to be accessible shall conform to relevant accessibility standards.

5.2 Hoist way Enclosures

5.2.1 Hoist way enclosure protection. Elevator, dumbwaiter and other hoist way enclosures shall have a fire-resistance rating not less than that specified in relevant fire code and standards.

5.2.2 Openings in hoist way enclosures shall be protected in accordance with EBCS 13.

5.2.3 Where four or more elevator cars serve all or the same portion of a building, the elevators shall be located in at least two separate hoist ways. Not more than four elevator cars shall be located in any single hoist way enclosure.

5.2.4 An approved pictorial sign of a standardized design shall be posted adjacent to each elevator call station on all floors instructing occupants to use the exit stairways and not to use the elevators in case of fire. The sign shall read: IN FIRE EMERGENCY, DO NOT USE ELEVATOR. USE EXIT STAIRS.

5.2.5 In buildings above five stories in height, at least one elevator shall be dimensioned for fire department emergency access to all floors. Such elevator car shall be of such a size and arrangement to accommodate a 600 mm by 1900 mm ambulance stretcher in the horizontal, open position and shall be identified by the international symbol for emergency medical services. The symbol shall not be less than 75 mm high and shall be placed inside on both sides of the hoist way door frame.

5.2.6 Where an elevator is installed in a single blind hoist way or on the outside of a building, there shall be installed in the blind portion of the hoist way or blank face of the building, an emergency door in accordance with relevant standards.

5.2.7 Doors, other than hoist way doors and the elevator car door, shall be prohibited at the point of access to an elevator car unless such doors are readily openable from the car side without a key, tool, special knowledge or effort.

5.2.8 Elevators shall not be in a common shaft enclosure with a stairway.

5.3 Hoist way Venting

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5.3.1 Hoist ways of elevators and dumbwaiters penetrating more than three stories shall be provided with a means for venting smoke and hot gases to the outer air in case of fire, except:

a. In occupancies of other than Dwelling Occupancy and similar occupancies with overnight sleeping quarters, venting of hoistways is not required where the building is equipped throughout with an approved automatic sprinkler system.
b. Sidewalk elevator hoistways are not required to be vented.

5.3.2 Vents shall be located below the floor or floors at the top of the hoistway, and shall open either directly to the outer air or through non-combustible ducts to the outer air. Non-combustible ducts shall be permitted to pass through the elevator machine room provided that portions of the ducts located outside the hoist way or machine room are enclosed by construction having not less than the fire protection rating required for the hoist way. Holes in the machine room floors for the passage of ropes, cables or other moving elevator equipment shall be limited so as not to provide greater than 50 mm of clearance on all sides.

5.3.3 The area of the vents shall not be less than 4 percent of the area of the hoist way nor less than 0.25 m^2 for each elevator car, and not less than 31/2 percent nor less than 0.05 m^2 for each dumbwaiter car in the hoist way, whichever is greater. Of the total required vent area, not less than one-third shall be of the permanently open type unless all vents activate upon detection of smoke from any of the elevator lobby smoke detectors.

5.3.4 Closed portions of the required vent area shall consist of windows or duct openings glazed with annealed glass not more than 3mm thick.

5.3.5 Plumbing and mechanical systems shall not be located in an elevator shaft. Floor drains, sumps and sump pumps shall be permitted at the base of the shaft provided they are indirectly connected to the plumbing system.

5.4 Conveying Systems

5.4.1 Escalators, moving walks, conveyors, personnel hoists and material hoists shall comply with the provisions of this section.

5.4.2 Escalators and moving walks shall be constructed of approved non-combustible and fire-retardant materials. This requirement shall not apply to electrical equipment, wiring, wheels, handrails and the use of 1mm wood veneers on balustrades backed up with non-combustible materials.

5.4.3 Escalator floor openings shall be enclosed, except when the following conditions are satisfied:

a. Where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator or stairway and the opening is protected by a draft curtain and closely spaced sprinklers;

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b. Where the opening is protected by approved power-operated automatic shutters at every floor penetrated and where the shutters are of non-combustible construction and have a fire-resistance rating of not less than 1.5 hours.

5.4.4 Where provided in below-grade transportation stations, escalators shall have a minimum clear width of 800mm.

5.5 Machine Rooms

5.5.1 An approved means of access shall be provided to elevator machine rooms and overhead machinery spaces.

5.5.2 Elevator machine rooms that contain solid-state equipment for elevator operation shall be provided with an independent ventilation or air-conditioning system to protect against the overheating of the electrical equipment. The system shall be capable of maintaining temperatures within the range established for the elevator equipment.

5.5.3 Elevator machine rooms and machinery spaces shall be enclosed with construction having a fire-resistance rating not less than the required rating of the hoistway enclosure served by the machinery. Openings shall be protected with assemblies having a fire-resistance rating not less than that required for the hoistway enclosure doors.

5.5.4 Plumbing systems shall not be located in elevator equipment rooms.

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SECTION 6 SPECIAL SPACE TYPES

6.1 Atriums

6.1.1 The floor of an atrium space shall not be used for other than low fire hazard uses.

6.1.2 Floor and wall finishing materials and decorations used in an atrium space must comply with EBCS 13.

6.2 Covered Mall Buildings

6.2.1 The provisions of this Section shall apply to buildings or structures defined herein as covered mall buildings not exceeding four floor levels at any point or more than 5 storeys.

6.2.2 Mall width, tenant separation, anchor building separation, means of egress and type of construction shall comply with the EBCS 13.

6.2.3 The occupant load permitted in any individual tenant space in a covered mall building shall be determined in accordance with occupant formula provided in the EBCS 13. Means of egress requirements for individual tenant spaces shall be based on the occupant load thus determined.

6.2.4 Within every store or level and from sidewall to sidewall of each tenant space facing the mall, plastic signs shall be limited in area, height and width, location, encasement, density and thickness and comply with the EBCS 13.

6.3 Yards and Courts

6.3.1 This section shall apply to yards and courts adjacent to exterior openings that provide natural light or ventilation. Such yards and courts shall be on the same property as the building.

6.3.2 Yards shall not be less than 900mm in width for one- and two-story buildings. For buildings more than two stories in height, the minimum width of the yard shall be increased at the rate of 300mm for each additional story. For buildings exceeding 14 stories in height, the required width of the yard shall be computed on the basis of 14 stories.

6.3.3 Courts shall not be less than 900mm in width. Courts having windows opening on opposite sides shall not be less than 1800mm in width. Courts shall not be less than 3000mm in length unless bounded on one end by a public way or yard. For buildings more than two stories in height, the court shall be increased 300mm in width and 300mm in length for each additional story. For

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buildings exceeding 14 stories in height, the required dimensions shall be computed on the basis of 14 stories.

6.3.4 Access shall be provided to the bottom of courts for cleaning purposes.

6.3.5 Courts more than two stories in height shall be provided with a horizontal air intake at the bottom not less than $1m^2$ in areas and leading to the exterior of the building unless abutting a yard or public way.

6.3.6 The bottom of every court shall be properly graded and drained to a public sewer or other approved disposal system complying with the EBCS 9.

6.4 High Rise Buildings

6.4.1 The provisions of this section shall apply to buildings having occupied floors located more than 25m above the lowest level of fire department vehicle access, except: of this section

a. Airport traffic control towers
b. Open parking garages
c. Buildings with assembly uses intended for participation in or viewing outdoor activities including, but not limited to: Amusement park structures, bleachers, grandstands stadia.
d. Low-hazard special industrial occupancies in
e. Buildings with occupancy in hazardous groups.

6.4.2 Occupancy type, floor area and building height shall be determined in accordance with EBCS 13.

6.4.3 Construction type, emergency power system and smoke proof exit enclosure shall be made in accordance with EBCS 13.

6.4.4 Elevators and stairways shall be provided in accordance with Section 5 of this Standard.

6.4.5 Provisions for fire protection such as automatic fire detection systems and automatic fire sprinkler systems shall be provided in accordance with EBCS 13.

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6.5 Underground Rooms

6.5.1 The provisions of this section apply to building spaces having a floor level used for human occupancy more than 10m below the lowest level of exit discharge, except:

a. Sprinklered one- and two-family dwellings,
b. Parking garages with automatic fire suppression systems
c. Fixed guide way transit systems.
d. Grandstands, bleachers, stadiums, arenas and similar facilities.
e. Where the lowest story is the only story that would qualify the building as an underground building and has an area not exceeding $150m^2$ and has an occupant load less than 10.

6.5.2 The underground portion of the building shall be of a non-combustible construction.

6.5.3 The highest level of exit discharge serving the underground portions of the building and all levels below shall be equipped with an automatic sprinkler system with supervised water-flow switches and control valves.

6.5.4 Underground spaces relevant to this section shall be compartmented.

6.5.5 A building having a floor level more than 20m below the lowest level of exit discharge shall be divided into a minimum of two compartments of approximately equal size. Such compartmentation shall extend through the highest level of exit discharge serving the underground portions of the building and all levels below, except where area of the lowest storey does not exceed 150 m^2 and has an occupant load of less than 10.

6.5.6 The separation between the two compartments shall be of minimum 1-hour fire barrier wall construction that shall extend from floor slab to floor deck above. Openings between the two compartments shall be limited to plumbing and electrical piping and conduit penetrations shall be fire stopped. Doorways shall be protected by door assemblies that are automatic-closing by smoke detection and shall be provided with gasketing and a drop sill to minimize smoke leakage. Where provided, each compartment shall have an air supply and an exhaust system independent of the other compartments.

6.5.7 Where elevators are provided, each compartment shall have direct access to an elevator. Where an elevator serves more than one compartment, an elevator lobby shall be provided and shall be separated from each compartment by a 1-hour fire barrier wall. Doors shall be gasketed, have a drop sill, and be automatic-closing by smoke detection.

6.5.8 A smoke control system shall be provided to control the migration of products of combustion. Smoke control shall restrict movement of smoke to the general area of fire origin and maintain means of egress in a usable condition.

6.5.9 Where compartmentation is required, each compartment shall have an independent smoke control system. The system shall be automatically activated and capable of manual operation.

6.5.10 A fire alarm system, public address system and means of egress shall be provided in compliance with the EBCS 13.

6.5.11 Each floor level shall be provided with a minimum of two exits. Where compartmentation is required, each compartment shall have a minimum of one exit and shall also have an exit access doorway into the adjoining compartment.

6.5.12 Every required stairway serving floor levels more than 10m below its level of exit discharge shall comply with the requirements for a smoke proof enclosure.

6.5.13 A standby power system complying with the EBCS 10 shall be provided.

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6.5.14 The underground building shall be provided throughout with a standpipe system in accordance with the EBCS 13.

6.6 Attic Spaces

6.6.1 Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing members shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain.

6.6.2 Ventilation openings are not required where continuously operated mechanical ventilation is provided and the floor area is covered with an approved vapour retarder.

6.7 Mezzanines

6.7.1 A mezzanine or mezzanines in compliance with this section shall be considered a portion of the floor below. Such mezzanines shall not contribute to either the building area or number of stories

6.7.2 The area of the mezzanine shall be included in determining the fire area.

6.7.3 The clear height above and below mezzanine floor construction shall not be less than 2100 mm.

6.7.4 The aggregate area of a mezzanine or mezzanines within a room shall not exceed one-third of the area of that room or space in which they are located. The enclosed portions of rooms shall not be included in a determination of the size of the room in which the mezzanine is located. In determining the allowable mezzanine area, the area of the mezzanine shall not be included in the area of the room, except: where the aggregate area of mezzanines in buildings and structures of non-combustible construction for special industrial occupancies in accordance shall not exceed two-thirds of the area of the room.

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6.7.5 Each occupant of a mezzanine shall have access to at least two independent means of egress where the common path of egress travel exceeds the limitations required by the EBCS 13.

6.7.6 A mezzanine shall be open and unobstructed to the room in which such mezzanine is located except for walls not more than 1000mm high, columns and posts, except:

a. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the occupant load of the aggregate area of the enclosed space does not exceed 10.
b. A mezzanine having two or more means of egress is not required to be open to the room in which the mezzanine is located, if at least one of the means of egress provides direct access to an exit from the mezzanine level. Such a mezzanine is not required to comply with the area limitation specified in this Standard.
c. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the aggregate floor

area of the enclosed space does not exceed 10 percent of the mezzanine area.

d. In industrial facilities, mezzanines used for control equipment are permitted to be glazed on all sides.

6.7.7 Industrial equipment platforms in buildings shall not be considered as a portion of the floor below. Such equipment platforms shall not contribute to either the building area or the number of stories. The area of the industrial equipment platform shall not be included in determining the fire area. Industrial equipment platforms shall not be a part of any mezzanine, and such platforms and the walkways, stairs and ladders providing access to an equipment platform shall not serve as a part of the means of egress from the building.

6.7.8 The aggregate area of all industrial equipment platforms within a room shall not exceed two-thirds of the area of the room in which they occur. Where an equipment platform is located in the same room as a mezzanine, the combined aggregate area of the equipment platforms and mezzanines shall not exceed two-thirds of the room in which they occur.

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SECTION 7 BUILDING ENVELOPE

7.1 Envelope Base

7.1.1 Floors shall be made in construction materials of appropriate fire resistance rating for the intended occupancy type in compliance with EBCS 13.

7.1.2 Exterior walls shall provide the building with a weather-resistant envelope. The exterior wall envelope shall include flashing, and shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a water-resistive barrier behind the exterior veneer, and a means for draining water that enters the assembly to the exterior of the veneer, unless it is determined that penetration of water behind the veneer shall not be detrimental to the building performance. Protection against condensation in the exterior wall assembly shall be provided.

7.1.3 Walls shall be made in construction materials of appropriate fire resistance rating for the intended occupancy type in compliance with EBCS 13.

7.1.4 Parapet walls shall be properly coped with non-combustible, weatherproof materials of a width no less than the thickness of the parapet wall.

7.1.5 For buildings in flood hazard areas, exterior walls extending below the design flood elevation shall be resistant to water damage. Wood shall be pressure-preservative treated.

7.1.6 Buildings shall be covered with approved roof coverings secured to the building or structure. Roof coverings shall be designed, installed and maintained in accordance with this code and the approved manufacturer's instructions such that the roof covering shall serve to protect the building or structure.

7.1.7 Flashing shall be installed in such a manner so as to prevent moisture entering the wall and roof through joints in copings, through moisture-permeable materials and at intersections with parapet walls and other penetrations through the roof plane.

7.1.8 Flashing shall be installed at wall and roof intersections, at gutters, wherever there is a change in roof slope or direction and around roof openings. Where flashing is of metal, the metal shall be corrosion resistant with a thickness of not less than 0.40mm galvanized steel sheet.

7.1.9 Design and installation of roof drainage systems (roof slope, gutters, downpipes) shall be according to accepted standards and shall comply with the provisions of the EBCS 9.

7.2 Envelope Finish

7.2.1 Interior wall finishes shall be made in materials of appropriate flame spread index and smoke development index in compliance with EBCS 13.

7.2.2 External wall finishes and coverings shall be fixed tightly to the building structure according to the manufacturer's specification.

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7.2.3 The surface of external wall finishes shall not be highly reflective so as to entail health risk to neighbours and the general public.

7.2.4 Flashing shall be installed in such a manner so as to prevent moisture from entering the wall or to redirect it to the exterior. Flashing shall be installed at the perimeters of exterior door and window assemblies, penetrations and terminations of exterior wall assemblies, exterior wall intersections with roofs, chimneys, porches, decks, balconies and similar projections and at built-in gutters and similar locations where moisture could enter the wall. Flashing with projecting flanges shall be installed on both sides and the ends of copings, under sills and continuously above projecting trim.

7.2.5 In exterior walls of buildings or structures, wall pockets or crevices in which moisture can accumulate shall be avoided or protected with caps or drips, or other approved means shall be provided to prevent water damage.

7.2.6 All floor finishes to spaces for human occupancy shall be of materials having appropriate flame spread index and smoke development index in compliance with the EBCS 13.

7.2.7 Slippery floor finishing materials shall not be used in wet rooms and outdoor spaces.

7.2.8 All ceilings to spaces for human occupancy shall be from materials of appropriate flame spread index and smoke development index in compliance with the EBCS 13.

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SECTION 8 SERVICES

8.1 Ventilation

8.1.1 All building spaces shall be provided with natural or mechanical ventilation.

8.1.2 All rooms used for human occupancy shall be provided with natural ventilation according to accepted standards unless conditions acceptable to the building official warrant the use of mechanical ventilation.

8.1.3 Natural ventilation of a human occupancy space shall be through windows, doors, louvers or other openings to the outdoors. The operating mechanism for such openings shall be provided with ready access so that the openings are readily controllable by the building occupants.

8.1.4 The minimum openable area to the outdoors for ventilation shall be 15 percent of the floor area being ventilated.

8.1.5 When rooms and spaces without openings to the outdoors are ventilated through an adjoining room, the opening to the adjoining room shall be unobstructed and shall have an area of not less than 15 percent of the floor area of the interior room or space, but not less than 2.5m^2. The minimum openable area to the outdoors shall be based on the total floor area being ventilated.

8.2 Lighting

8.2.1 Every space intended for human occupancy shall be provided with natural light by means of exterior glazed openings.

8.2.2 The minimum net glazed area of a space intended for human occupancy shall not be less than 15 percent of the floor area of the room served.

8.2.3 Exterior glazed openings shall open directly onto a public way or onto a yard or court in accordance with section 6, except:

a. Required exterior openings are permitted to open In to a roofed porch where the porch:

   i. Abuts a public way, yard or court.

   ii. Has a ceiling height of not less than 2100 mm

   iii. Has a longer side at least 65 percent open and unobstructed.

b. Skylights are not required to open directly onto a public way, yard or court.

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8.2.4 Glazed wall openings and skylights shall be free of obstructions and provided with means for cleaning in order to maintain adequate supply of natural light and prevent the use of artificial light.

8.2.5 All occupancies other than dwelling occupancy shall be provided with means to generate at least 5% of their energy consumption themselves.

8.2.6 For the purpose of natural lighting, any room may be considered as a portion of an adjoining room where one-half of the area of the common wall is open and unobstructed and provides an opening of not less than $1/10^{th}$ of the floor area of the interior room or 2.5 m^2, whichever is greater.

8.2.7 All building spaces shall be provided with artificial light of an average illumination complying with relevant standards and EBCS 10.

8.3 Water Supply and Sanitation

8.3.1 Every space intended for human occupancy shall be provided with access to water and sanitation.

8.3.2 All buildings for human occupancy shall be provided with toilets whose number, floor area and range of service are in accordance with acceptable standards.

8.3.3 All public buildings in areas where municipal water supply of not less than 75 litters per person per day is available shall be provided with flush type toilets.

8.3.4 All public buildings shall be provided with gender separated toilets.

8.3.5 All buildings required to be accessible to physically challenged persons shall be provided with accessible toilets in accordance with acceptable standards.

8.3.6 All buildings with flush type toilets shall be provided with reserve water supply tanks in accordance with EBCS 9.

8.3.7 All buildings intended for human occupancy in other than dry regions shall be provided with roof water harvesting mechanisms.

8.3.8 All buildings with a Building Area Ratio (BAR) of 80 percent and less shall be provided with mechanisms that can retain their surface water on lot.

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SECTION 9 SPATIAL ORGANIZATION OF STRUCTURAL, ELECTROMECHANICAL AND SANITARY ELEMENTS

9.1 General

9.1.1 Spatial organization of structural, electro-mechanical and sanitary elements shall comply with the provisions of this section.

9.2 Spatial Organization of Structural Elements

9.2.1 Spatial design of all buildings shall be based on a structural system that complies with the requirements of:

(i) EBCS 6 and EBCS 8 for masonry structures,
(ii) EBCS 5 and EBCS 8 for wood structures,
(iii) EBCS 2 and EBCS 8 for steel structures,
(iv) EBCS 3 and EBCS 88 for composite steel & concrete structures

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9.2.2 All structural elements in all buildings shall be fire protected in accordance with EBCS 13.

9.2.3 Structural members shall not interfere with egress and emergency exit spaces.

9.2.4 The size of structural members shall not reduce the minimum room area and height required for fire and life safety.

9.3 Spatial Organization of Electrical Elements

9.3.1 In areas where electric power supply is available all rooms in all buildings shall be provided with light and power (when applicable) in accordance with acceptable standards and the EBCS 10.

9.3.2 All electrical appliances and equipments in buildings served by electric light shall be provided with adequate space for installation, use, inspection and repair and shall be laid out in accordance with acceptable standards and as required by the EBCS 10.

9.3.3 Generators and other sources provided as local power sources shall be provided with space convenient for installation, operation, inspection and repair as required by the EBCS 10.

9.4 Spatial Organization of Sanitary and Mechanical Elements

9.4.1 The provisions of EBCS 9 shall apply to the installation, alteration, repair and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances, and where connected to a water or sewage system and all aspects of a medical gas system.

9.4.2 All plumbing on the exterior of buildings shall be concealed by using block masonry, suspended ceiling or any construction that can ensure human safety without compromising the visual order of the building.

9.4.3 Layout of sanitary rooms and fixtures shall be coordinated with the building's waste disposal system which shall be determined in accordance with the EBCS 9.

9.4.4 The provisions of the EBCS 9 & EBCS 11 and accepted standards shall apply to the organization of mechanical rooms and to the installation, alteration, repairs and replacement of mechanical systems, including equipment, appliances, fixtures, fittings and/or appurtenances, including ventilating, heating, cooling, air conditioning and refrigeration systems, incinerators and other energy- related systems.

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SECTION 10 SIGNS (BUILDING USE COMMUNICATION SYSTEM)

10.1 Purpose

10.1.1 The purpose of this Section is to provide minimum requirements for aspects of signs such as area, height, material, structure, location and quantity for protection of the safety and orderly development of urban areas and centres.

10.2 Scope

10.2.1 Unless otherwise expressly stated, the following words and terms shall, for the purposes of this appendix, have the meanings shown herein.

10.3 General Requirements

10.3.1 A sign shall not be erected in a manner that would confuse or obstruct the view of or interfere with exit signs or with official traffic signs, signals or devices. Signs and sign support structures, together with their supports, braces, guys and anchors, shall be kept in repair and in proper state of preservation. The display surfaces of signs shall be kept neatly painted or posted at all times.

10.3.2 The following signs are exempt from the requirements to obtain a permit before erection:

a. Temporary signs announcing the sale or rent of property.
b. Signs erected by transportation authorities.
c. Projecting signs not exceeding 0.25m^2.
d. The changing of moveable parts of an approved sign that is designed for such changes, or the repainting or repositioning of display matter shall not be deemed an alteration.
e. Official notices authorized by a court, public body or public safety official.
f. Directional, warning or information signs authorized by relevant government bodies.
g. Memorial plaques, building identification signs and building cornerstones when cut or carved into a masonry surface or when made of non-combustible material and made an integral part of the building or structure.
h. The flag of a government or non-commercial institution, such as a school.
i. Religious symbols and seasonal decorations within the appropriate public holiday season.
j. Works of fine art displayed in conjunction with a commercial enterprise where the enterprise does not receive direct commercial gain.
k. Street address signs and combination nameplate and street address signs that contain no advertising copy and which do not exceed 0.5m^2 in area.

10.3.3 Signs shall not be erected, constructed or maintained so as to obstruct any fire escape or any window or door or opening used as a means of egress or so as to prevent free passage from one part of a roof to any other part thereof.

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A sign shall not be attached in any form, shape or manner to a fire escape, nor be placed in such manner as to interfere with any opening required for ventilation.

10.3.4 No sign other than an official traffic sign or similar sign shall be erected within 610mm of the lines of any street, or within any public way, unless specifically authorized by other ordinances or regulations of this jurisdiction or by specific authorization of the building official. No sign shall be attached to any utility pole, light standard, street tree or any other public facility located within the public right-of-way.

10.3.5 No sign or sign structure shall be erected at the intersection of any street in such a manner as to obstruct free and clear vision, or at any location where by its position, shape or colour it may interfere with or obstruct the view of or be confused with any authorized traffic sign, signal or device.

10.3.6 No private signs or sign structure shall be erected on islands created by road intersections and on traffic roundabouts.

10.3.7 Every outdoor advertising display sign hereafter erected, constructed or maintained, for which a permit is required shall be plainly marked with the name of the person, firm or corporation erecting and maintaining such sign and shall have affixed on the front thereof the permit number issued for said sign or other method of identification approved by the building official.

10.3.8 Where a permit is required construction documents shall be required. These documents shall show the dimensions, material and required details of construction, including loads, stresses and anchors where applicable.

10.3.9 Signs attached to masonry, concrete or steel shall be safely and securely fastened by means of metal anchors, bolts or approved expansion screws of sufficient size and anchorage to safely support the loads applied.

10.3.10 A sign shall not be illuminated by other than electrical means, and electrical devices and wiring shall be installed in accordance with the requirements of EBCS 10. Any open spark or flame shall not be used for display purposes unless specifically approved.

10.3.11 Where internally illuminated signs have sign facings of wood or approved plastic, the area of such facing section shall not be more than 11.16 m^2 and the wiring for electric lighting shall be entirely enclosed in the sign cabinet with a clearance of not less than 51mm from the facing material.

10.3.12 Wood approved plastic or plastic veneer panels or other materials of combustible characteristics similar to wood, used for mouldings, capping, nailing blocks, letters and latticing, shall not be used for other ornamental features of signs, unless approved.

10.3.13 Individual plastic facings of electric signs shall not exceed 20 m^2 in area.

10.3.14 If the area of a display surface exceeds 20m^2, the area occupied or covered by approved plastics shall be limited to 20 m^2 plus 50 percent of the difference between 20 m^2 and the area of display surface.

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10.3.15 Signs that contain moving sections or ornaments shall have fail-safe provisions to prevent the section or ornament from releasing and falling or shifting its centre of gravity.

10.3.16 Every sign permitted by this code shall be kept in good condition and repair. When any sign becomes insecure, in danger of falling or is otherwise deemed unsafe by the code official the owner thereof or the person or firm using same shall, upon written notice by the code official forthwith in the case of immediate danger, and in any case within not more than 10 days, make such sign conform to the provisions of this ordinance, or shall remove it. If within 10 days the order is not complied with, the code official shall be permitted to remove or cause such sign to be removed at the expense of the owner and/or the user of the sign.

10.3.17 Any sign copy that no longer advertises or identifies a use conducted on the property on which said sign is erected must have the sign copy covered or removed within 30 days after written notification from the code official; and upon failure to comply with such notice, the code official shall cause removal of such sign copy, and any expense incident thereto shall be paid by the owner of the building, structure or ground on which the sign is located.

10.3.18 Any sign legally existing at the time of the passage of this code that does not conform in use, location, height or size with the requirements of the code, shall be considered a legal nonconforming use or structure and shall be permitted to continue in such status until such time as it is either abandoned or become dangerous to life.

10.3.19 Structural alterations and enlargement are permissible only where such alterations will not increase the degree of nonconformity of the signs.

10.3.20 Any legal non-conforming sign shall be rebuilt without increasing the existing height or area if it is damaged, or removed if allowed to deteriorate to the extent that the cost of repair or restoration exceeds 50 percent of the replacement cost of the sign as determined by the building official.

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10.4 Requirements by Sign Type

10.4.1 Ground Signs

10.4.1.1 The structural frame of ground signs shall not be erected of combustible materials to a height of more than 10m above the ground. Ground signs constructed entirely of non-combustible material shall not be erected to a height of greater than 30m above the ground. Greater heights are permitted where approved and located so as not to create a hazard or danger to the public.

10.4.1.2 The bottom coping of every ground sign shall be not less than 900 mm above the ground or street level, which space can be filled with platform decorative trim or light wooden construction.

10.4.1.3 Where wood anchors or supports are embedded in the soil, the wood shall be pressure treated with an approved preservative.

10.4.2 Roof Signs

10.4.2.1 Roof signs shall be constructed entirely of metal or other approved non-combustible material. Provisions shall be made for electric grounding of metallic parts. Where combustible materials are permitted in letters or other ornamental features, wiring and tubing shall be kept free and insulated there from. Roof signs shall be so constructed as to leave a clear space of not less than 1800 mm between the roof level and the lowest part of the sign and shall have at least 1500 mm clearance between the vertical supports thereof. No portion of any roof sign structure shall project beyond an exterior wall, except signs on flat roofs with every part of the roof accessible.

10.4.2.2 The bearing plates of roof signs shall distribute the load directly to or upon masonry walls, steel roof girders, columns or beams.

10.4.2.3 A roof sign having a solid surface shall not exceed, at any point, a height of 7,500 mm measured from the roof surface.

10.4.2.4 Open roof signs in which the uniform open area is not less than 40 percent of total gross area shall not exceed a height of 15,000 mm. Such signs shall be thoroughly secured to the building upon which they are installed, erected or constructed by iron, metal anchors, bolts, supports, chains, stranded cables, steel rods or braces and they shall be maintained in good condition.

10.4.2.5 A closed roof sign shall not be erected to a height greater than 10m above the roof of buildings.

10.4.3 Wall Signs

10.4.3.1 Wall signs which have an area exceeding $5m^2$ shall be constructed of metal or other approved non-combustible material, except for nailing rails.

10.4.3.2 Wall signs attached to exterior walls of solid masonry, concrete or stone shall be safely and securely attached by means of metal anchors, bolts or expansion screws of not less than 10m diameter and shall be embedded at least 150 mm. Wood blocks shall not be used for anchorage, except in the case of wall signs attached to buildings with walls of wood. A wall sign shall not be supported by anchorages secured to an un-braced parapet wall.

10.4.3.3 Wall signs shall not extend above the top of the wall, nor beyond the ends of the wall to which the signs are attached unless such signs conform to the requirements for roof signs, projecting signs or ground signs.

10.4.4 Projecting Signs

10.4.4.1 Projecting signs shall be constructed entirely of metal or other non-combustible material and securely attached to a building or structure by metal supports such as bolts, anchors, supports, chains, guys or steel rods. Staples or nails shall not be used to secure any projecting sign to any building or structure. The dead load of projecting signs not parallel to the building or structure and the load due to wind pressure shall be supported with chains, guys or steel rods having net cross-sectional dimension of not less than 10 mm diameter. If such projecting sign exceeds 3 m^2 in one facial area, there

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shall be provided at least two such supports on each side not more than 2500 mm apart to resist the wind pressure.

10.4.4.2 Signs projecting over public walkways shall be permitted at a minimum height of 2,500mm from grade level to the bottom of the sign.

10.4.5 Marquee Signs

10.4.5.1 Marquee signs shall be constructed entirely of metal or other non-combustible material.

10.4.5.2 Marquee signs shall be attached to approve marquees.

10.4.5.3 Marquee signs shall not project beyond the perimeter of the marquee, on all sides.

10.4.5.4 Marquee signs shall not extend more than 1,800 mm above, nor 300 mm below such marquee, but under no circumstances shall such signs have a vertical dimension greater than 2,500 mm.

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