THE REPUBLIC OF THE UNION OF MYANMAR

MINISTRY OF CONSTRUCTION

MYANMAR NATIONAL BUILDING CODE - 2020

PART 1 - ADMINISTRATION OF PLANNING, BUILDING AND BUILT ENVIRONMENT

PART 2 - ARCHITECTURE AND URBAN DESIGN

THE REPUBLIC OF THE UNION OF MYANMAR

MINISTRY OF CONSTRUCTION

MYANMAR NATIONAL BUILDING CODE

2020

PART 1 - ADMINISTRATION OF PLANNING, BUILDING AND BUILT ENVIRONMENT

PART 2 - ARCHITECTURE AND URBAN DESIGN

JUNE, 2020

Printing Record

Printing	–	First Printing, June, 2020
Publisher	–	Published by
		International Relation and Legal Section
		Department of Building
		Ministry of Construction
Printed Number	–	500

FOREWORD

National Building codes are important tools for planning, design, construction and maintenance of buildings and built environment, as well as improving living standards, quality of life and safety of people. Many countries have national building codes, developed by government agencies and applied to all buildings and construction work across the country. It is a set of rules that must be followed to satisfy the minimum acceptable level of safety for buildings.

When there was realization among the policy makers on the importance of a National Building Code to cover the whole country, Cyclone Nargis (2008) and its destruction brought in political commitment to develop Myanmar National Building Code. Subsequently, the Ministry of Construction (MOC) initiated Myanmar National Building Code (MNBC) Project in collaboration with United Nations Human Settlements Programme (UN-Habitat) and Myanmar Engineering Society (MES) in 2011 with the funding support from Norwegian Ministry of Foreign Affairs.

The Provisional Myanmar National Building Code (2012) was the first step. It had been distributed and asked for comments from concerned government departments and nongovernment organizations. The Provisional version was revised and modified based on the feedbacks and comments where were necessary and was completed in 2015.

Myanmar National Building Code (2016) was distributed to concerned stakeholders as a reference document. Moreover, the Ministry of Construction issued the letter to Myanmar Engineering Council, Myanmar Architect Council and High-Rise and Public Building Projects Committee (HPBC) in order to give instructions to professionals to follow Myanmar National Building Code (2016) starting from 1st October, 2018.

Myanmar National Building Code (2016) was reviewed and modified by the members of Technical Working Groups during 2018 and 2019 in order to improve it according to updated international codes and standards. This updated version is endorsed as Myanmar National Building Code (2020).

I would like to acknowledge the Chairman of Special Project Committee, Federation of Myanmar Engineering Societies, all the members of Technical Working Groups of Myanmar National Building Code development project for their commitment and dedication, and those who involved in this important work.

Han Zaw
Union Minister
Ministry of Construction

ACKNOWLEDGEMENT

Myanmar is exposed to natural hazards and it is characterized by small and medium scale disaster events adversely affecting a number of communities. Cyclone Nargis in 2008 was the most devastating event by far in the country and it highlighted the vulnerability of built environment. Post Cyclone Nargis, there was lack of clarity on safety standards in building back better. In order to achieve suitable and sound quality, construction works have to be inspected according to respective standards and specifications.

As National Standards are very important for country's dignity, the Ministry of Construction has been trying earnestly for the development of Myanmar National Building Code since 2011. The Ministry of Construction and United Nations Human Settlement Programme (UN-Habitat) made an agreement to support funding for the development of Myanmar National Building Code. The code formulation was undertaken by Technical Working Groups (TWGs) comprising of government officials from the Ministry of Construction, other concerned ministries, City Development Committees, Universities, members of professional societies and independent professionals from private sector on voluntary basis. Myanmar National Building Code was completed with English language in 2015 and it included 1050 pages. Myanmar National Building Code (2016) was reviewed and some sections were modified by the members of Technical Working Groups during 2018 and 2019 in order to improve it according to updated international codes and standards. Myanmar National Building Code (2020) version could be finalized in 2020.

I would like to express great honour and deep appreciation to Union Minister (Retired) U Kyaw Lwin, Union Minister U Win Khaing (now Union Minister for Ministry of Electricity and Energy), Union Minister U Han Zaw, Deputy Ministers (Retired), Managing Director of Public Works U Kyaw Linn (now Deputy Minister), Director General U Win Tint (Permanent Secretary (Retired)), Director General (Retired) U Thein Zaw and all responsible persons from the Department of Building, U Than Myint (Past President), President U Aung Myint and Central Executive Committee Member U Nyunt Maung San from the Federation of Myanmar Engineering Societies for their valuable guidance and dedication in this Myanmar National Building Code development project. I also would like to thank everyone who have been supporting in this initiative.

Ye Min Zaw
Director General
Department of Building

MYANMAR NATIONAL BUILDING CODE 2020

PART 1

ADMINISTRATION OF PLANNING, BUILDING AND BUILT ENVIRONMENT

MYANMAR NATIONAL BUILDING CODE - 2020

PART - 1 ADMINISTRATION OF PLANNING,

BUILDING AND BUILT ENVIRONMENT

CONTENTS

NO.		TITLE	PAGE
1. 1.		**GENERAL**	
	1.1.1.	Title and Scope	1
	1.1.1.1	Title	1
	1.1.1.2	Scope	1
	1.1.2	Definitions	1
	1.1.3	Applicability of the code	3
	1.1.4	Alternative materials, design and methods of construction and equipment	4
1. 2		**ORGANIZATION AND ENFORCEMENT**	
	1.2.1.	Development Planning and Building Authority	4
	1.2.1.1	The Authority	4
	1.2.1.2	Appointment of Team of Officials	4
	1.2.1.3	Organization	4
	1.2.1.4	Delegation of Powers	5
	1.2.1.5	Qualification of the Officials	5
	1.2.1.6	Restriction on Employees	5
	1.2.1.7	Records	5
	1.2.2.	Power and Duties of the Officials	5
	1.2.2.1	Application and permit	5
	1.2.2.2	Building Notices and Orders	5
	1.2.2.3	Right of Entry	5
	1.2.2.4	Inspection	5
	1.2.2.5	Construction Not According to Plan	6
	1.2.2.6	Modification	6
	1.2.2.7	Occupancy Violations	6
	1.2.2.8	Liability	6
	1.2.3	Appealing Authority	6
	1.2.3.1	General	6

1.2.3.2 Limitations on Authority 7
1.2.4 Violation and Penalties 7
1.2.4.1 Unlawful Acts 7
1.2.4.2 Notice of Violation 7
1.2.4.3 Prosecution of Violation 7
1.2.4.4 Violation Penalties 7
1.2.5 Stop Work Order 7
1.2.5.1 Authority 7
1.2.5.2 Issuance 7
1.2.5.3 Unlawful continuance 7
1.2.6 Miscellaneous 8
1.2.6.1 Power to Make Rules and Regulations 8
1.2.6.2 Power to Prescribe Procedure and Set Standards 8
1.3. PERMIT AND INSPECTION
1.3.1 Development Planning Permit 8
1.3.1.1 Planning Permit Required 8
1.3.1.2 Zoning Requirements 8
1.3.1.3 Urban Aesthetics Control 8
1.3.1.4 Environmental Control and Land Law 9
1.3.1.5 Application for Planning Permission (Works Exempt) 9
1.3.1.6 Submission Requirements 9
1.3.1.7 Fees (Processing fees and Development Charge) 11
1.3.1.8 Decision for Approval/Revision 12
1.3.1.9 Issuance 12
1.3.1.10 Suspension and Revocation 12
1.3.1.11 Responsibilities of the Owners/Developers 12
1.3.1.12 Responsibilities of the Qualified Persons 13
1.3.1.13 Validity of Permit 13
1.3.1.14 Expiration 13
1.3.2 Building Permit 14
1.3.2.1 Building Permit Required 14
1.3.2.2 Application for Permit (Works exempt) 14
1.3.2.3 Submission Requirements 16
1.3.2.4 Fees 17
1.3.2.5 Relevant laws 18
1.3.2.6 Decision for Approval and Revision 18

1.3.2.7	Suspension and Revocation	18
1.3.2.8	Placement of permit & Signage	18
1.3.2.9	Deviations during Construction	19
1.3.2.10	Grant of Permit or Refusal	19
1.3.2.11	Responsibility and Duties of Owners/ Developers	19
1.3.2.12	Responsibility and Duties of Qualified Persons	20
1.3.2.13	Validity of Permit	20
1.3.2.14	Expiration	20
1.3.2.15	Building Demolition	20
1.3.3	Inspections	21
1.3.3.1	General	21
1.3.3.2	Preliminary Inspection	21
1.3.3.3	Required Inspections	21
1.3.3.4	Inspection Agencies	21
1.3.3.5	Inspection Requests	21
1.3.3.6	Approval Required	21
13.3.7	Building Completion Certificate (B.C.C)	21
1.3.4	Service Utilities	22
1.3.4.1	Connection of Service Utilities	22
1.3.4.2	Temporary Connection	22
1.3.4.3	Authority to Disconnect Service Utilities	22
1.3.5	Unsafe Building	22
1.3.5.1	Examination of Unsafe Building	22
1.3.5.2	Special Cases	22
1.3.5.3	Notice to Owner/ Occupier	23
1.3.5.4	Disregard of Notice	23
1.3.5.5	Cases of Emergency	23
1.3.5.6	Costs	23
	APPENDIX	
	ZONING CLASSIFICATION	24-28
	REQUIREMENTS FOR PERMIT APPLICATION	29

PART 1. ADMINISTRATION OF PLANNING, BUILDING AND BUILT ENVIRONMENT

1.1 GENERAL

1.1.1 Title and Scope

1.1.1.1 Title

These regulations shall be known as **the Myanmar National Building Code**, hereinafter referred to as "this code", consist of 7 parts as follow:

1. Administration of Planning, Building and Built Environment
2. Architecture and Urban Design
3. Structural Design
4. Soil and Foundation
5. Building Services
6. Building Materials
7. Constructional Practices, Safety and Building Maintenance

1.1.1.2 Scope

The provisions of this code shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every urban development plan, building or structure or any appurtenances connected or attached to such buildings or structures.

1.1.2 Definitions

The terminology given hereunder concerns only with the Section 1.

Accessory Use — Any use of the premises subordinate to the principal use and customarily incidental to the principal use.

Alteration — A change from one type of occupancy to another, or a structural change, such as an addition to the area or height, or the removal of part of a building, or any change to the structure, such as the construction of, cutting into or removal of any wall, partition, column, beam, joist, floor or other support, or a change to or closing of any required means of ingress or egress or a change to the fixtures or equipment.

Approved — Approved by the Authority having jurisdiction.

Authority Having Jurisdiction — The Authority which has been created by a statute and which, for the purpose of administering the Code/Part, may authorize a committee or an official or an agency to act on its behalf hereinafter called the 'Authority'.

BDS or Back Drain Service *— is a space for drain which locates at the back of the building (see details in Part 5)*

Building — Any structure for whatsoever purpose and of whatsoever materials constructed and every part thereof whether used as human habitation or not and includes foundation, plinth, walls, floors, roofs, chimneys, plumbing and building services, fixed platforms, verandah, balcony, cornice or projection, part of a building or anything affixed thereto or any wall enclosing or intended to enclose any land or space and signs and outdoor display structures. Tents, tarpaulin

shelters etc, erected for temporary and ceremonial occasions with the permission of the Authority shall not be considered as building.

Building Height — The vertical distance measured, in the case of flat roofs from the average level of the ground around, *or from any reference point as determined by the authority* and contiguous to the building or as decided by the Authority to the terrace of last liveable floor of the building adjacent to the external walls; 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 eaves level and the ridge. Architectural features serving no other function except that of decoration shall be excluded for the purpose of measuring heights. (Height of building will be measured to the most extreme height in case of heritage conservation areas.)

Building Line — the line up to which the plinth of a building adjoining a street or an extension of a street or on a future street may lawfully extend. It includes the lines prescribed, if any, in any scheme. The building line may change from time-to-time as decided by the Authority.

Conversion — the change of occupancy or premises to any occupancy or use shall be requiring additional occupancy permit.

Development — 'Development' means the carrying out of building, engineering, mining or other operations in, or over, or under land or water, or in the use *or change of use* of any building or land, and includes redevelopment and layout and subdivision of any land; and 'to develop' shall be construed accordingly.

Drainage — The removal of any liquid by a system constructed for the purpose.

Lanes for bicycles and slow moving vehicles — *like buggies, push carts* *see Part 2*

Occupancy or Use Group — *see Part 2.*

Occupier — Occupier includes any person for the time being, paying or liable to pay rent or any portion of rent of the building in respect of which the ward is used, or compensation or premium on account of the occupation of such building and also a rent-free tenant. An owner living in or otherwise using his own building shall be deemed to be the occupier thereof.

Operational Construction/Installation — A construction/ installation put up *for public services* by *authorised agencies* for operational purposes. (see Part 5**)**

Owner — Person or body having a legal *title* in land and/or building thereon. This includes free holders, leaseholders or those holding a sub-lease which both bestows a legal right to occupation and gives rise to liabilities in respect of safety or building condition. In case of lease or sub-leaseholders, as far as ownership with respect to the structure is concerned.

Pathway — Any way meant covered or uncovered for pedestrian. *see Part 2*

Permit — A permission or authorization in writing by the Authority to carry out work regulated by the Code**.**

Plot — A piece of land enclosed by definite boundaries.

Registered Architect, Engineer, Structural Engineer, Supervisor, Urban Planner, Landscape Architect, Urban Designer — A qualified architect, engineer, structural engineer, supervisor, *urban* planner, landscape architect or urban designer who has been registered by the Authority or by the body governing such profession and constituted under a statute, as may be applicable.

NOTES:

The word 'licensing/ licensed, etc' if used by the Authority in the above context shall be deemed to mean 'registration/ registered', etc.

Right of Way (ROW) *— See Part 2*

Road — *Roads are classified as follows:*

National Highway, Regions/States Collector Road, Districts/Townships Collector Road, Townships/Villages Collector Road etc. in reference to Department of Highways.

Collectors, Feeders, Residential, Service road etc.

SDS or Side Drain Service — is a space for access to the roadside drain.

Set-back Line — A line usually parallel to the **plot boundaries** and laid down in each case by the Authority, beyond which nothing can be constructed towards the **site boundaries**.

Street — Any means of access, namely, highway, street, lane, pathway, alley, stairway, passageway, carriageway, footway, square, place or bridge, whether a thoroughfare or not, over which the public have a right of passage or access or have passed and had access uninterruptedly for a specified period, whether existing or proposed in any scheme and includes all bunds, channels, ditches, storm-water drains, culverts, sidewalks, traffic islands, roadside trees and hedges, retaining walls, fences, barriers and railings within the street lines.

Street Level or Grade — The officially established elevation or grade of the centre line of the street upon which a plot fronts and if there is no officially established grade, the existing grade of the street at its mid-point**.**

To Erect — To erect a building means:

a) to erect a new building on any site whether previously built upon or not

b) to re-erect any building of which portions above the plinth level have been pulled down, burnt or destroyed.

Unsafe Building — Buildings which are structurally and constructionally unsafe or unsanitary or not provided with adequate means of egress or which constitute a fire hazard or are otherwise dangerous to human life or which in relation to existing use constitute a hazard to safety or health or public welfare, by reason of inadequate maintenance, dilapidation, where the building requires either improvement or total removal.

1.1.3 Applicability of the Code

1.1.3.1 All Parts of the Code and their sections shall apply to all buildings described in Part 2, as may be applicable.

1.1.3.2 Where a building is erected, the Code applies to the design and construction of the building.

1.1.3.3 Where the whole or any part of the building is removed, the Code applies to all parts of the building whether removed or not.

1.1.3.4 Where the whole or any part of the building is demolished, the Code applies to any remaining part and to the work involved in demolition.

1.1.3.5 Where a building is altered, the Code applies to the whole building whether existing or new except that the Code applies only to part if that part is completely self-contained with respect to facilities and safety measures required by the Code.

1.1.3.6 Where the occupancy of a building is changed, the Code applies to all parts of the building affected by the change.

1.1.3.7 Where development of land is undertaken the Code applies to the entire development of land.

1.1.3.8 ***Existing Buildings*** The Code shall require the removal, alteration or abandonment, and prevent continuance of the use or occupancy of an existing building, by the opinion of the Authority, and if such building constitutes a hazard to the safety of the adjacent property or the occupants of the building itself.

1.1.4Alternative Materials, Design and Methods of Construction and Equipment

The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

1.1.4.1 ***Research reports*** Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

1.1.4.2 ***Tests*** Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the official shall have the authority to require tests as evidence of compliance to be made at no expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the building official shall approve the testing procedures. Tests shall be performed by an approved agency. Reports of such tests shall be retained by the official for the period required for retention of public records.

1.2. ORGANIZATION AND ENFORCEMENT

1.2.1. Development Planning and Building Authority

1.2.1.1 The *Authority* shall be created by the relevant ***Government Body*** and that authority shall carry out the development planning and building control.

1.2.1.2 ***Appointment of Team of Officials*** The team of officials shall be appointed by the Authority. The team shall comprise officials drawn from concerned disciplines such as engineers, architects, town planners, landscape architects and urban designers as may be decided by the Authority. For scrutiny of buildings and development areas shall be the responsibility of people with relevant expertise who will be appointed by the authority.

1.2.1.3 ***Organization*** In the Organization of the Authority, such number of officers, technical assistants, inspectors and other employees shall be appointed to assist the team of building officials as shall be necessary for the administration of the Code.

1.2.1.4 ***Delegation of Powers*** The Authority may designate one or a group of persons, or agencies who shall exercise all the powers in the name of the authority. The work of the team of building officials may be outsourced to competent professional/ agency group as may be deemed necessary.

1.2.1.5 ***Qualification of The Officials*** The qualification of building officials scrutinizing the plans and carrying out inspection of buildings shall be as prescribed by concerned authority.

1.2.1.6 ***Restriction on Employees*** No official or employee connected with the building authority shall be engaged directly or indirectly in works connected with furnishing of labour, materials or appliances for the construction, alteration, maintenance of a building.

1.2.1.7 ***Records*** Proper records of all applications received, permits and orders issued, inspections made shall be kept properly for future retrieval. The administration of its duties shall be retained and all such records shall be open to public inspection at all appropriate times.

1.2.2 Power and Duties of the Officials

The team of the officials shall enforce all the provisions of the Code and shall act on any question related to the mode or manner of construction and the materials to be used in the erection, addition, alteration, repair, removal, demolition, installation of service equipment and the location, use, occupancy and maintenance of all buildings except as may otherwise be specifically provided.

1.2.2.1 ***Application and Permits*** The team of the officials shall receive all applications and issue permits (see in Permit section) for the erection and alteration of buildings and examine the premises for which such permits have been issued and enforce compliance with the Code.

1.2.2.2 ***Building Notices and Orders*** The team of building officials shall issue all necessary notices or orders to remove or change illegal or unsafe conditions, to require the necessity safeguards during construction, to require adequate exit facilities in existing buildings and to ensure compliance with all the requirements of safety, health and general welfare of the public as included in the Code.

1.2.2.3 ***Right of Entry*** Where it is necessary to make an inspection to enforce provision of this Code, or where the building officials have reasonable cause to believe that there exists in a structure or upon a premises a condition which is contrary to all in violation of this Code which makes the structure or premise unsafe, the building official is authorized to enter the structure or premises at reasonable times to inspect or perform the duties imposed by this Code, provided that if such structure or premises can be occupied that credential be presented to the occupants at entry requested. If such structure or premises unoccupied the building officials shall first make a reasonable effort to locate the owner or other person having charge or control of the structure or premises and request entry. If entry is refused, the building officials shall have recourse to the remedies provided by law to secure entry.

In case of dangerous or hazardous building the building official is authorized to enter immediately to inspect without prior notice.

1.2.2.4 ***Inspection*** The team of the officials shall make all the required inspections or it may accept reports of inspections of authoritative and recognized services or individuals; and all reports of inspections shall be in writing and certified by a responsible officer of such authoritative service, as he may deem necessity to report upon unusual technical issues that may arise.

1.2.2.5 ***Construction not According to Plan*** Should the team of officials determine at any stage that the construction is not proceeding according to the approved plan or is in violation of any of the provisions of the Code, or any other applicable Code Regulation, Act or Bylaw, it shall notify the owner and the qualified person and all further construction shall be withhold until correction has been effected and approved.

Should the owner fail to comply with the requirements at any stage of construction, the officials shall issue a notice to the owner asking explanation for non-compliance. If the owner fails to comply within 14 days from the date of receiving the notice, the officials shall be empowered to cancel the building permit issued and shall cause notice of such cancellation to be securely pasted upon the said construction.

1.2.2.6 ***Modification*** Wherever practical difficulties are involved in carrying out any provision of the Code, the team of the officials may vary or modify such provisions upon application of the owner or his representative provided, the Code shall be observed and public welfare and safety be assured.

1.2.2.7 ***Occupancy Violations*** Wherever any building is being used contrary to provisions of the Code, the team of officials may order such use discontinued and the building or portion thereof, vacated by the notice served on any person, causing such use to be discontinued. Such person shall discontinue the use within 10 days after receipt of such notice or make the building or portion thereof, comply with the requirements of the Code.

1.2.2.8 ***Liability*** The official, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties. Any suit instituted against an officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by legal representative of the jurisdiction until the final termination of the proceedings. The official or any subordinate shall not be liable for cost in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.

1.2.3. Appealing Authority

In order to determine the suitability of alternative materials or methods of design or construction and to provide for reasonable interpretation of the provisions of the Code or in the matter of dispute relating to an ongoing construction vis-à-vis the sanctioned plan, a Authority of Appeals consisting of members who are qualified by experience and training and to pass judgment upon matters pertaining to building construction, shall be appointed by the Authority. A representative of the team of officials shall be an ex-officio member and shall act as secretary to **the Appealing Authority.** The ***authority*** shall adopt reasonable rules and regulations for conducting its investigations and shall render all decisions and findings in writing to the team of building officials with a duplicate copy to the appellant and may recommend such modifications as are necessary.

1.2.3.1 ***General*** In order to hear and decide appeals of orders, decisions or determinations made by the official related to the application and interpretation of this code, there shall be and is hereby created ***the appealing authority***. ***The appealing authority*** shall be appointed by the authority(1.2.1.1) and shall hold office at its decision. ***The authority*** shall adopt rules of procedure for conducting its duties.

1.2.3.2 ***Limitations on authority*** An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted there under have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The appealing authority shall have no authority to waive requirements of this code**.**

1.2.4 Violations and Penalties

1.2.4.1 ***Unlawful acts*** It shall be unlawful for any person, firm or corporation to erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or equipment regulated by this code, or cause same to be done, in conflict with or in violation of any of the provisions of this code.

1.2.4.2 ***Notice of violation*** The official is authorized to serve a notice of violation or order on the person responsible for the erection, construction, alteration, extension, repair, moving, removal, demolition or occupancy of a building or structure in violation of the provisions of this code, or in violation of a permit or certificate issued under the provisions of this code. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.

1.2.4.3 ***Prosecution of violation*** If the notice of violation is not complied, the official is authorized to request the legal counsel of the jurisdiction to institute the appropriate proceeding at law.

1.2.4.4 ***Violation penalties*** Any person who violates a provision of this code or fails to comply with any of the requirements thereof or who erects, constructs, alters or repairs a building or structure in violation of the approved documents or directive of the official, or of a permit or certificate issued under the provisions of this code, shall be subject to penalties as prescribed by the law.

1.2.5 Stop Work Order

1.2.5.1 ***Authority***

Whenever the building official finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the building official is authorized to issue a stop work-order.

1.2.5.2 ***Issuance***

The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work will be permitted to resume.

1.2.5.3 ***Unlawful Continuance***

Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to penalties as prescribed by law.

1.2.6. Miscellaneous

1.2.6.1 *Power to Make Rules and Regulations*

The Authority may make rules and regulations for carrying out the provisions and intentions of the Code provided that any rule shall not be in direct/ indirect conflict or nullify/ dilute any of the provisions of the Code.

1.2.6.2 *Power to Prescribe Procedures & Set Standards*

The authority may, from time to time, issue or amend codes or other documents setting out such standards, designs, requirements, procedures or other details pertaining to the matters under the Act and these Regulations, not inconsistent with the provisions of the Act and these Regulations.

1.3 PERMIT AND INSPECTION

1.3.1 Development Planning Permit

1.3.1.1. *Planning Permit Required*

All major land use developments, which include new construction, extension, retrofitting, increase of floor area, and changes in usage of buildings/land, shall require "Planning Permit". Planning permit shall be granted by "The Development Planning and Building Authority", as in accordance with Section 1.2.1 of this Code.

1.3.1.2 *Zoning Requirements*

All major land use developments, which include new construction, extension, retrofitting, increase of floor area, and changes in usage of buildings/land, shall be in conformity with zoning classification.

1.3.1.3 *Urban Aesthetics Control*

Compliance with the provisions of the Code is adequate for normal buildings. But for major public building complexes or buildings coming up in an important area near historic/monumental buildings and areas of urban conservation, the aesthetics of the whole scheme may also have to be examined, vice-visa existing structures. In addition, any development which may *detract* the general characteristics and built environment of historical, architectural or other monuments should also be subject to the provisions of this clause. This clause is intended to cover very few structures to come up in the vicinity of other declared/historically important structures.

An Urban Arts Committee shall be established at the region/state level on issues related to urban aesthetics, through a statute. ***This Committee*** shall accord approval to all major buildings/important development projects having bearing on the urban aesthetics, depending upon the importance of the area with respect to natural or built heritage or projects. ***The Urban Arts Committee*** shall act as guardian of urban architecture; mainly with regard to building form and envelope, the relationship between the building, and the ambient environment vice-versa other dependant factors. *The Committee* shall be formed with specialists in urban aesthetics, heritage conservation etc.

The Urban Arts Committee should also be charged with advising the regional/state government, on schemes which will beautify the city and add to its cultural vitality.

1.3.1.4 *Environment Control and Land Law*

It is necessary for the developers and the qualified persons to abide by the Myanmar Environmental Conservation Law and Rules and to be in conformity with other land bylaws of the regional authorities.

1.3.1.5 *Application for Planning Permission*

Everyone who intends to do major land use developments, which include new construction, extension, retrofitting, increase of floor area, and changes in usage of buildings/land shall give notice in writing to the Authority of his said intention in the prescribed form and such notice shall be accompanied by plans and documents as required *(soft/hard copy)*.

Works exempt

Notwithstanding above clause, no planning permission shall be necessary:

(a) for the carrying out of such works as are necessary for the maintenance, improvement, or other alteration of a building, being works that affect only the interior of the building and do not_

involve any change in the use of the building or the land to which it is attached;
materially affect the external appearance of the building;
involve any increase in the height or floor area of the building;
involve any addition to or alteration of a building that affects or is likely to affect its drainage, sanitary arrangements, or its soundness; or
contravene or involve or result in inconsistency with any provision in the local plan;

(b) for the carrying out by any authority established by law to provide utilities of any works for the purposes of laying, inspecting, repairing, or renewing any drains, sewers, mains, pipes, cables, or other apparatus, or for the purpose of maintaining or repairing roads, including the breaking open of any road or ground for those purposes;

(c) for any excavation, including excavation of or for wells, made in the ordinary course of agricultural operations in areas zoned for agriculture;

(d) for the use of any land or building for a period not exceeding one month or such further period as the local planning authority may allow for purpose of_

a temporary or mobile cinema, theatre, or show;
a temporary amusement park, fair, or exhibition; or
a temporary ceremony or festivity of a religious, social, or other character,

and for any development necessary to give effect to such use;

(e) for the construction or erection on any land of temporary buildings for the accommodation of workers involved in the construction or erection of a building on the land, for which planning permission has been granted;

(f) for the use of any land or building within the area of a dwelling-house for any purpose incidental to the enjoyment of the dwelling-house as such;

1.3.1.6 *Submission Requirements*

Where the development involves the erection of a building, the planning authority may give written directions to the applicant in respect of any of the following matters:

the level of the site of the building;
the line of frontage with neighbouring buildings;
the elevations of the building;
the class, design, and appearance of the building;
the setting back of the building to a building line;
access to the land on which the building is to be erected; and
any other matter that the planning authority considers necessary for purposes of planning.

In addition to the documents and plans required to be submitted above, the applicant shall submit a development proposal report which shall contain the following:

the development concept and justification;
a location map and a site plan;
particulars of land ownership and restrictions, if any;

(i) a description of the land including its physical environment, topography, landscape, geology, contours, drainage, water bodies and catchments and natural feature thereon;

(ii) a survey of the trees and all forms of vegetation; and

(iii) particulars of a building, which may be affected by the development;

a land use analysis and its effect on the adjoining land;
layout plans, the details of which are specified in *layout plan requirement*; and
such other matters as may be prescribed by the planning authority.

The authority may specify that the development proposal report submitted in respect of certain categories of development shall include an analysis of the social implications of the development for the area which is the subject of the application for planning permission.

The layout plan requirement shall show the proposed development and in particular:

where the development is in respect of any land _
measures for the protection and improvement of its physical environment;
measures for the preservation of its natural topography;
measures for the improvement of its landscape;
measures for the preservation and planting of trees thereon;
the location and species of trees and other vegetation thereon;
the making up of open spaces;
the proposed earthworks, if any; and
description of the works to be carried out; and
where the development is in respect of a building with special architecture of historical interest, particulars to identify the building including its use and condition, and its special character, appearance, make and feature and measures for its protection, preservation and enhancement; and
where the development involves a building operation, particulars of the character and appearance of buildings in the surrounding areas.

Any other matter that the planning authority considers necessary for purposes of planning means other requirements such as:

The application of the Planning Permit shall conform to the "zoning requirements of the respective area" as described in 1.3.1.2 of this Code.

The application of the Planning Permit shall be attached with changes or new requirements of infrastructure.

The requirements in infrastructure, after and during the construction period shall be accompanied by the new concept of infrastructure provision.

The application of the Planning Permit shall be attached with the conceptual design of the planned activities, which shall include:

Plot area ratio/index

Built-up area ratios

Plans of all levels

The building heights

Parking facilities

Three-dimensional presentation in relation with surrounding environment within 300 feet radius.

The application of the Planning Permit shall conform to the requirements of existing heritage conservation bylaws of respective towns / settlements and areas.

The application of the Planning Permit shall conform to corresponding portions of this code.

1.3.1.7 *Fees*

Processing Fees: The current fees payable for the processing of planning applications are prescribed. The fees must be paid at the time of application. Government departments and statutory boards are not exempted from payment. Application fees are payable in respect of the following:

for written permission to develop or subdivided land or buildings;
for written permission with regard to works within conservation area;
for determination of development charge;
for approval on car park plans or proposals;
for inquiry about encumbrances on property;
for search of the record plan or development register;
for plans and certification of notice, order, etc; and
for usage and installation of infrastructure as required by the respective authorities.

Development Charges:

Where a local plan or an alteration of a local plan effects a change of use, density, or floor area in respect of any land so as to enhance the value of the land, a development charge shall be levied in respect of any development of the land commenced, undertaken, or carried out in accordance with the change.

The rate of the development charge or the method of calculating the amount of development charge payable shall be as prescribed by the rules after *the Urban and Regional Development Planning Law* is enacted.

The State/Regional Authorities may, by above rules, exempt any person or class of persons or any development or class, type, or category of development from liability to the development charge, subject to such conditions as the State/Regional Authority may specify in the rules.

NOTE— The fees may be charged as a consolidated fee. In the event of a building/ development permit is not issued, the fees so paid shall not be returned to the owner, but he shall be allowed to re-submit it without any fees after complying with all the objections raised by the Authority within a period of one year from the date of rejection after which fresh fees shall have to be paid.

1.3.1.8 ***Decision for Approval and Revision***

The Authority shall examine the applications for permits and amendments there to within a reasonable time after filing. If the Authority is satisfied that the proposed work conforms to the requirements of this code, the Authority shall issue a permit within reasonable period. If the applications do not conform to the requirements of the Authority, the Authority shall reject such applications in writing, stating the reasons. The applicant has a right to revise and reapply based on the reason given by the authority.

1.3.1.9 ***Issuance***

The application, plans, specifications, computations and other data filed by an applicant for a permit shall be reviewed by the planning authority. Such plans may be reviewed by other departments of this jurisdiction to verify compliance with any applicable laws under their jurisdiction. If the planning authority finds that the work described in an application for a permit and the plans, specifications and other data filed therewith conform to the requirements of this code and other pertinent laws and ordinances, and that the fees specified in 1.3.1.7 have been paid, the planning authority shall issue a permit therefor to the applicant.

When the planning authority issues the permit where plans are required, the planning authority shall endorse in writing or stamp the plans and specifications APPROVED. Such approved plans and specifications shall not be changed, modified or altered without authorizations from the planning authority, and all work regulated by this code shall be done in accordance with the approved plans.

1.3.1.10 ***Suspension and Revocation***

The Authority has the right to keep the application in the suspension or to revoke the permit wherever the permit is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code and in case the activity falls within the area of other planning process. However, the Authority shall give the applicant in writing of the reason for suspension and revocation.

1.3.1.11 ***Responsibilities of the Owners/Developers***

Requirements and Duties:

Neither the granting of the permit nor the approval of the drawings and specifications, nor inspections made by the Authority during erection of the building shall in any way relieve the owner of such building from full responsibility for carrying out the work in accordance with the requirements of the Code (see Violation and Penalties).

Every Owner shall-

a) permit the Authority to enter the building or premises for which the permit has been granted at any reasonable time for the purpose of enforcing the Code;

b) submit required documents of approved planning permit of the site;

c) obtain, where applicable, from the Authority, permits relating to building, zoning, grades, sewers, water mains, plumbing, signs, blasting, street occupancy, electricity, highways, and all other permits required in connection with the proposed work;

d) give notice to the Authority of the intention to start work on the site (see *Form for notice for commencement*);

e) give written notice to the Authority in case of termination of services of a professional engaged by him; and

f) obtain an occupancy permit (see *Form for Occupancy Permit*) from the Authority prior to any:

1) occupancy of the building or part thereof after construction or alteration of that building or part, or

2) change in the class of occupancy of any building or part thereof.

Upon the request of the holder of the permit, the Authority may issue a temporary certificate of occupancy for a building or part thereof, before the entire work covered by permit shall have been completed, provided such portion or portions may be occupied safely prior to full completion of building without endangering life or public welfare.

1.3.1.12 ***Responsibilities of the Qualified Persons***

1.12.1 Architects, engineers, structural engineers, landscape architect, urban designer, supervisors, town planners and Licensed contractors wherever referred in the Code, shall be registered by the respective Authorities, as competent to do the work for which they are employed.

1.12.2 The Registered town planner shall be competent to carry out the work related to the development permit as given below:

a) preparation of plans for land subdivisions/ layout and related information connected with development permit for all areas,

b) issuing of certificate of supervision for development of land of all areas.

1.12.3 In case the registered professional associated with the preparation and signing of plans or for supervision, is being changed during any stage of building/land development process, the professional shall inform the Authority in writing about the further non-association with the project.

1.3.1.13 ***Validity of Permit***

The issuance or granting of a permit shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a permit based on construction documents and other data shall not prevent the building official from requiring the correction of errors in the construction documents and other data. The building official is also authorized to prevent occupancy or use of a structure where in violation of this code or of any other ordinances of this jurisdiction.

1.3.1.14 ***Expiration***

Every permit issued shall become invalid unless the work on the site authorized by such permit is commenced within one year after its issuance, or if the work authorized on the site by such permit is suspended or abandoned for a period of one year after the time the work is commenced. The building official is authorized to grant, in writing, one or more extensions of time, for periods not more than one year each. The extension shall be requested in writing and justifiable cause demonstrated.

1.3.2 Building Permit

1.3.2.1 *Building Permit Required*

Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the building official and obtain the required permit.

1.3.2.2 *Application for Permit*

Application. To obtain a permit, the applicant shall first file an application there for in writing on a form furnished by the building authority safety for that purpose. Such application shall:

1. Identify and describe the work to be covered by the permit for which application is made.
2. Describe the land on which the proposed work is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building or work.
3. Indicate the use and occupancy for which the proposed work is intended.
4. Be accompanied by construction documents and other information as required in *Submission Requirements Section.*
5. Be signed by the applicant, or the applicant's authorized agent.
6. Give such other data and information as required by the building official.

Action on application. The building official shall examine or cause to be examined applications for permits and amendments thereto within a reasonable time after filing. If the application or the construction documents do not conform to the requirements of pertinent laws, the building official shall reject such application in writing, stating the reasons there for. If the building official is satisfied that the proposed work conforms to the requirements of this code and laws and ordinances applicable thereto, the building official shall issue a permit therefor as soon as practicable.

Time limitation of application. The applicant shall be informed whether the application is permitted or not within two months after the date of filing. If there is any requirement in the application, the applicant shall be informed to fill up the requirements. The application will be abandoned unless the requirements have been submitted after three months from the date of informing.

Work exempt from permit. Exemptions from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following:

Building:

One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m^2).
Oil derricks.
Sidewalks and driveways not more than 3 feet above adjacent grade, and not over any basement story below and are not part of an accessible route.
Painting, papering, carpeting, cabinets, counter tops and similar finish works of interior spaces.
Temporary structures as defined in PART 2 of this Code.

Prefabricated swimming pools accessory to a Group R-3 (see Zoning Specification) occupancy that are less than 24 inches deep, do not exceed 5,000 gallons and are installed entirely above ground.
Shade cloth structures constructed for nursery or agricultural purposes, not including service systems.
Swings and other playground equipment accessory to detached one- and two-family dwellings.
Non-fixed and movable fixtures, cases, racks, counters and partitions not over 5 feet 9 inches in height.

Electrical Repairs and maintenance:

Minor repair work, including the replacement of lamps or the connection of approved portable electrical equipment to approved permanently installed receptacles.

Radio and television transmitting stations:

The activities concerning this sector shall be coordinated with **concerned telecommunication authorities**.

Temporary testing systems:

A permit shall not be required for the installation of any temporary system required for the testing or servicing of electrical equipment or apparatus.

Gas:

1. Portable heating appliance.

2. Replacement of any minor part that does not alter approval of equipment or make such equipment unsafe.

Mechanical:

1. Portable heating appliance.

2. Portable ventilation equipment

3. Portable cooling unit.

4. Steam, hot or chilled water piping within any heating or cooling equipment regulated by this code.

5. Replacement of any part that does not alter its approval or make it unsafe.

6. Portable evaporative cooler.

7. Self-contained refrigeration system containing 10 pounds (5 kg) or less of refrigerant and actuated by motors of 1horsepower (746 W) or less.

Plumbing:

1. The stopping of leaks in drains, water, soil, waste or vent pipe, provided, however, that if any concealed trap, drain pipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a permit shall be obtained and inspection made as provided in this code.

2. The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures and the removal and reinstallation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

Emergency repairs. Where equipment replacements and repairs must be performed in an emergency situation, the permit application shall be submitted within the next working business day to the building official.

Repairs. Application or notice to the building official is not required for ordinary repairs to structures, replacement of lamps or the connection of approved portable electrical equipment to approved permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required means of egress, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include addition to, alteration of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

Public service agencies. A permit shall not be required for the installation, alteration or repair of generation, transmission, distribution or metering or other related equipment that is under the ownership and control of public service agencies by established right.

1.3.2.3 *Submission Requirements*

Submittal documents. Construction documents, statement of special inspections and other data shall be submitted in one or more sets with each permit application. The construction documents shall be prepared by a registered design professional, according to respective council laws, required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the building official is authorized to require additional construction documents to be prepared by a registered design professional.

Exceptions: The building official is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that review of construction documents is not necessary to obtain compliance with this code.

Information on construction documents: Construction documents shall be dimensioned and drawn upon suitable materials. Electronic media documents may be required by the building official. Construction documents shall indicate clearly the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, rules and regulations, as determined by the building official.

Fire protection system: The requirements concerning fire protection and other safety systems shall apply the concerned portions of this Code (see Part 5F, Fire Protection Systems).

Means of egress: The construction documents shall show in sufficient detail the location, construction, size and character of the means of egress in compliance with the respective portion of this Code (see Part 2).

Exterior wall envelope and boundary line: Construction documents for all buildings shall describe clearly the exterior wall envelope, the set-back and boundary line in sufficient detail to determine compliance with this code.

Site plan

The construction documents submitted with the application for permit shall be accompanied by the demarcation map and site plan showing to scale the size and location of new construction and

existing structures on the site, distances from lot lines, the established street grades and the proposed finished grades as applicable, flood prone areas, flow directions, and design flood elevations shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the site plan shall show portions to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The building official is authorized to waive or modify the requirement for a site plan when the application for permit is for alteration or repair or when otherwise warranted.

Examination of documents: The building official shall examine or cause to be examined the accompanying construction documents and shall ascertain by such examinations whether the construction indicated and described is in accordance with the requirements of this code and other existing laws.

Approval of construction documents: When the building official issues a permit, the construction documents shall be approved, in writing or by stamp, as "Reviewed for Code Compliance." Required number of set of construction documents so reviewed shall be retained by the building official. The other set shall be returned to the applicant, shall be kept at the site of work and shall be open to inspection by the building official or a duly authorized representative.

Previous approvals: This code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful permit has been issued previously or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

Phased approval: The building official is authorized to issue a permit for the construction of foundations or any other part of a building or structure before the construction documents for the whole building or structure have been submitted, provided that adequate information and detailed statements have been filed complying with the requirements of this code. The holder of such permit for the foundation or other parts of a building or structure shall proceed at the holder's own risk with the building operation and without assurance that a permit for the entire structure will be granted.

1.3.2.4 *Fees*

Payment of fees. A permit shall not be valid until the fees prescribed by law have been paid, nor shall an amendment paid.

Schedule of permit fees. On buildings, structures, electrical, gas, mechanical, and plumbing systems or alterations requiring a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the concerned authority.

Building permits valuations. The applicant for a permit shall provide the permit value at time of application. If, in the opinion of the building official, the valuation is underestimated on the application, the permit shall be denied, unless the applicant can show detailed estimates to meet the approval of the building official. Final building permit valuation shall be set by the building official.

Work commencing before permit issuance. Any person who commences any work on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary permits shall be subject to a fee established by the building official that shall be in addition to the required permit fees.

Related fees. The payment of the fee for the construction, alteration, removal or demolition for work done in connection to or concurrently with the work authorized by a building permit shall

not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

Refunds. The building official is authorized to establish a refund policy.

1.3.2.5 *Relevant Laws*

The building permit shall be processed in the framework of this Code and the Urban and Regional Development Planning Law to be promulgated by the Government of the Republic of the Union of Myanmar and other relevant laws.

The provisions of this code shall not be deemed to nullify any provisions of local, state/region or union law.

1.3.2.6 *Decision for Approval and Revision*

The Authority shall examine the applications for permits and amendments there to within a reasonable time after filing. If the Authority is satisfied that the proposed work conforms to the requirements of this code, complying also the structural, safety of buildings, requirements in public utility services, etc. the Authority shall issue a permit within reasonable period. If the applications do not conform to the requirements of the Authority, the Authority shall reject such applications in writing, stating the reasons. The applicant has a right to revise and reapply based on the reason given by the authority.

1.3.2.7 *Suspension and Revocation*

The Authority has the right to keep the application in the suspension or to revoke the permit wherever the permit is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code and in case the activity falls within the area of other planning process. However, the Authority shall give the applicant in writing of the reason for suspension and revocation.

1.3.2.8 *Placement of Permit & Signage*

The building permit or copy shall be kept on the site of the work until the completion of the project, together with the following documents:

The plans, elevations, sections, structural drawings and other details as required for the construction

The mechanical and electrical drawings and utilities design drawings

The signage shall be of the same format as described by the Authority and shall indicate the consultants and companies in the following order:

Owner/Developer and the name of the project

The Architect or the Architectural firm

The Structural Engineer or Structural Engineering firm

The consultants for building services

The contracting firm or firms

Alteration/revision Notice. When the notice is only for an alteration of the building, only such plans and statements, as may be necessary, shall accompany the notice.

No notice and building permit is necessary for the following alterations, and the like which do not otherwise violate any provisions regarding general building requirements, structural stability and fire and health safety requirements of the Code:

(a) Opening and closing of a window or door or ventilator;

(b) Providing intercommunication doors;

(c) Providing partitions;

(d) Providing false ceiling;

(e) Gardening;

(f) White washing;

(g) Painting of interior spaces;

(h) Re-tiling and reproofing;

(j) Plastering and patch work;

(k) Re-flooring; and

(m) Construction of sunshades on one's own land.

1.3.2.9 ***Deviations during Construction***

If during the construction of a building any departure from the sanctioned plan is intended to be made (see also 1.2.2.5 *Construction not according to plan*), sanction of the Authority shall be obtained before the change is made. The revised plan showing the deviations shall be submitted and the procedure laid down for the original plan heretofore shall apply to all such amended plans except that the time limit shall be ***30 days*** in such cases.

1.3.2.10 ***Grant of Permit or Refusal***

The Authority shall inform the applicant in written form whether the permit has been sanctioned or refused, by giving full reasons in case of refusal.

1.3.2.11 ***Responsibilities and Duties Of Owners/Developers***

Neither the granting of the permit nor the approval of the drawings and specifications nor inspections made by the Authority during erection of the building shall in any way relieve the owner of such building from full responsibility for carrying out the work in accordance with the requirements of the Code.

Every owner shall:

(a) permit the Authority to enter the building or premises for which the permit has been granted at any reasonable time **(**referred to *Right of Entry***)** for the purpose of enforcing the Code;

(b) submit a document of ownership of the site;

(c) obtain, where applicable, from the Authority, permits relating to building, zoning, grades, sewers, water mains, plumbing, signs, blasting, street occupancy, electricity, highways, and all other permits required in connection with the proposed work;

(d) submit the certificate for execution of work as per structural safety requirements (see Form for certificate for execution of work as per structural safety requirements); and give written notice to the Authority regarding completion of work described in the permit (see Form for building completion application)

(e) give written notice to the Authority in case of termination of services of the professionals engaged ;

Documents at Site

a) Where tests of any materials are made to ensure conformity with the requirements of the Code, records of the test data shall be kept available for inspection during the construction of the building and for such a period thereafter as required by the Authority.

b) The person to whom a permit is issued shall during construction keep pasted in a conspicuous place on the property in respect of which the permit was issued:

(a) a copy of the building permit; and

(b) a copy of the approved drawings and specifications .

1.3.2.12 ***Responsibilities and Duties of Qualified Persons***

Architects, engineers, structural engineers, landscape architects, urban designers and town planners wherever referred in the Code, shall be registered by the concerned council/ Authority.

In case the registered professional associated with the preparation and signing of plans or for supervision, is being changed during any stage of building/land development process, the professional shall inform the Authority in writing about the further non-association with the project.

1.3.2.13 ***Validity of Permit***

The issuance or granting of a permit shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a permit based on construction documents and other data shall not prevent the building official from requiring the correction of errors in the construction documents and other data. The building official is also authorized to prevent occupancy or use of a structure where in violation of this code or of any other ordinances of this jurisdiction.

1.3.2.14 ***Expiration***

Every permit issued shall become invalid unless the work on the site authorized by such permit is commenced within one year after its issuance, or if the work authorized on the site by such permit is suspended or abandoned for a period of one year after the time the work is commenced. The building official is authorized to grant, in writing, one or more extensions of time, for periods not more than one year each. The extension shall be requested in writing and justifiable cause demonstrated.

1.3.2.15 ***Building Demolition***

Before a building is demolished, the owner shall notify all utilities having service connections within the building, such as water, electric, gas, sewer and other connections. A permit to demolish a building shall not be issued until a release is obtained from the utilities stating that their respective service connections and appurtenant equipment, such as, meters and regulators have been removed or sealed and plugged in a safe manner.

1.3.3 Inspections

1.3.3.1 *General*

Construction or work for which a permit is required shall be subject to inspection by the team of officials (appointed according to 1.2.1.2) and such construction or work shall remain accessible and exposed for inspection purposes until approved. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the permit applicant to cause the work to remain accessible and exposed for inspection purposes. Neither the building official nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

1.3.3.2 *Preliminary Inspection*

Before issuing a permit, the building official is authorized to examine or cause to be examined buildings, structures and sites for which an application has been filed.

1.3.3.3 *Required Inspections*

The official, upon notification, shall make the inspections set forth in the construction process when and where necessary, i.e., Planning/Development inspection, phase by phase inspections up to final inspection.

1.3.3.4 *Inspection Agencies*

The official is authorized to accept reports of approved inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

1.3.3.5 *Inspection Requests*

It shall be the duty of the holder of the permit or their duly authorized agent to notify the official when work is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such works that are required by this Code.

1.3.3.6 *Approval Required*

Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the official. The official, upon notification, shall make the requested inspections and shall either indicate the portion of the construction that is satisfactory as completed, or notify the permit holder or his or her agent wherein the same fails to comply with this code. Any portions that do not comply shall be corrected and such portion shall not be covered or concealed until authorized by the official.

1.3.3.7 *Building Completion Certificate (B.C.C)*

Use and occupancy. No building or structure shall be used or occupied, and no change in the existing occupancy classification of a building or structure or portion thereof shall be made until the building official has issued a certificate of *Building Completion* there for as provided herein. Issuance of a certificate of *Building Completion* shall not be construed as an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction.

Certificate issued. After the building official inspects the building or structure and finds no violations of the provisions of this code, the Building Construction Industry Development Law to be promulgated by the Government of the Republic of the Union of Myanmar and respective Development Committee Laws, the building official shall issue a certificate of occupancy that contains the following:

1. The building permit number
2. The address of the structure
3. The name and address of the owner
4. A description of the portion of the structure for which the certificate is issued
5. The edition of the code under which the permit was issued
6. The use and occupancy, in accordance with the provisions of 'Use and Occupancy Classification Chapter' (PART 2).
7. The type of construction as defined in 'Types of Construction Chapter' (PART 7).
8. Any special stipulations and conditions of the building permit.

Revocation. The building official is authorized to, in writing, suspend or revoke a certificate of building completion issued under the provisions of this code wherever the certificate is issued in error, or on the basis of incorrect information supplied, or where it is determined that the building or structure or portion thereof is in violation of any regulation or any of the provisions of this code.

1.3.4. Service Utilities

1.3.4.1 *Connection of Service Utilities*

No person shall make connections from utilities, such as source of water, source of energy, fuel or power, etc. to any building or system that is regulated by this code for which a permit is required, until released by the building official.

1.3.4.2 *Temporary Connection*

The concerned authorities shall authorize the temporary connection of the building or system to the utility sources.

1.3.4.3 *Authority to Disconnect Service Utilities*

The concerned authorities shall authorize disconnection of utility service to the building, structure or system regulated by this code and the codes referenced in case of emergency where necessary to eliminate an immediate hazard to life or property. The building official shall notify the serving utility, and wherever possible the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

1.3.5 Unsafe Building

All unsafe building shall be considered to constitute danger to public safety and shall be restored by repairs or demolished or dealt with as otherwise directed by the Authority.

1.3.5.1 *Examination Of Unsafe Building*

The Authority shall examine or cause to be examined every building reported to be unsafe or damaged, and shall make a written record of such examination.

1.3.5.2 *Special Cases*

The Buildings defined as heritage structures can be exempted from immediate demolishing if the concerned authority would take the responsibility for further maintenance and protection from public safety.

1.3.5.3 *Notice to Owner/Occupier*

Whenever the Authority finds any building or portion thereof to be unsafe, it shall, in accordance with established procedure for legal notice, give to the owner/occupier of such building written notices stating the defects thereof. This notice shall require the owner or the occupier within a stated time either to complete specified repairs or improvements or to demolish and remove the building or portion thereof. The Authority may direct in writing that the building which in his opinion is dangerous, or has no provision for exit if caught fire, shall be vacated immediately or within the period specified for the purpose; provided that the Authority concerned shall keep a record of the reasons for such action with him. If any person does not comply with the orders of vacating a building, the Authority shall take legal actions to comply with the orders.

1.3.5.4 *Disregard of Notice*

In case the owner or occupier fails, neglects, or refuses to comply with the notice to repair or to demolish the said building or portion thereof, the Authority shall cause the danger to be removed whether by demolition or repair of the building or portion thereof or otherwise.

1.3.5.5 *Cases of Emergency*

In case of emergency, which, in the opinion of the Authority involves imminent danger to human life or health, the decision of the Authority shall be final. The Authority shall forthwith or with such notice as may be possible promptly cause such building or portion thereof to be rendered safe by retrofitting/strengthening to the same degree of safety or removed. For this purpose, the Authority may at once enter such structure or land on which it stands, or abutting land or structure, with such assistance and at such cost as may be deemed necessary. The Authority may also get the adjacent structures vacated and protect the public by an appropriate fence or such other means as may be necessary.

1.3.5.6 *Costs*

Costs incurred under ‘Disregard of Notice’ and ‘Cases of Emergency’ shall be charged to the owner of the premises involved. Such costs shall be charged on the premises in respect of which.

APPENDIX

Provisions in Part 1 and Part 2 of the Myanmar National Building Code , rules and regulations under the Urban and Regional Development Planning Law to be promulgated and respective City Development Committee Laws shall be applied as Development Control Guideline of this Code.

ZONING CLASSIFICATION

The followings are classified zones. The requirements in the zoning plans shall be described in the Urban and Regional Development Planning Law to be promulgated.

I Residential Use Zone:

Primarily Residential Use Zone

Mixed Residential Use Zone

Use Zone I(a) Primarily Residential Use Zone

All residential building including single and multifamily dwellings, apartment dwellings and tenements together with appurtenances pertaining there to;

Professional consulting offices of the residents and other relevant uses therefore;

Petty shops dealing with daily essentials including retail provisions, soft drinks, cigarettes, newspapers milk Kiosks, cycle repair shops and single person tailoring shops;

Use Zones I(b) Mixed Residential Use Zone

Uses Permitted

All uses permitted under Use Zone (a) i.e. Primarily Residential Use Zone

All buildings belonging to R-6 of (PART2)

Community Halls, and Religious buildings, welfare centres and Gymnasium

Recreation clubs, Libraries and Reading rooms

Clinics (PART-2), Dispensaries and Nursing homes

Government, Municipal and other institutional Sub-Offices

Police Stations, Post & Telegraph Offices, Fire Stations and Electric Sub-station

Banks and Safe Deposit Vaults;

Educational institutions

Restaurants, Hotels and other Boarding and Lodging Houses

Petrol filling and Service station

Departmental stores or super market or wet market, shops for the conduct of retail business

Use Zones 1(c) Informal Residential Use Zone

Uses Permitted

Informal residential zones are the areas that exist in some cities, however, these are to be identified in the development plan as for future improvement and upgrading.

II Commercial Use Zone – Use Zone II

Use permitted

1. All uses permitted in use zone I(a) and I(b) i.e residential use zone.

All commercial and business uses including all shops, stores, markets, and uses connected with the display of merchandise, either wholesale or retail rent excluding exposures, obnoxious products and other materials likely cause health hazards and hazardous to the environment (see PART-2).

2. Business Offices and other commercial and financial institutions.

3. Warehouses, repositories and other uses connected with storage or wholesale trade, but excluding storage of explosives or products which are either obnoxious or likely to cause health hazards.

Cinemas, the theatres and other commercial entertainment centres;

Research experimental and testing laboratories not involving danger of fire, explosions or health hazards;

Transportation terminals including bus stands, railway stations and urbanized parking lots;

Automobiles repair shops and garages;

III. Industrial Use Zone – Use Zone III.

Controlled Industrial use zone	a. Hazardous free
General Industrial use zone	b. Low hazardous
Special Industrial and Hazardous use zone	**c.** Medium hazardous
	d. Hazardous

Use Zone III (a) Controlled Industrial Use Zone

Uses Permitted.

All commercial uses listed under use zone I(a), I(b) and II i.e. residential and commercial use zones;

Industries using electric power not exceeding 130 H.P. (L.T. maximum load) but excluding industries of obnoxious and hazardous nature by reason of odour, liquid effluent, dust, smoke, gas vibration etc. Or otherwise likely to cause danger or nuisance to public health or amenity;

Hotels, Restaurants and Clubs, places for social inter course, recreation and worship and dispensaries and clinics, and

Residential buildings for caretakers, watchman and other essential staff required to be maintained in the premises.

Use Zone III (b) General Industrial Use Zone

Uses Permitted.

All commercial uses listed under use zone I(a), I(b) and II i.e. residential and commercial use zones;

All industries without restrictions on the horse power installed or type of motive power used excluding those of obnoxious or hazardous nature by reason of odour,

liquid effluent, dust, smoke, gas vibration etc. Or otherwise likely to cause danger or nuisance to public health or amenity;
Hotels, Restaurants and Clubs, places for social inter course, recreation and worship and dispensaries and clinics, and
Residential buildings for caretakers, watchman and other essential staff required to be maintained in the premises.

Use Zone III (c) Special Industrial and Hazardous Use Zone

Use Permitted.

All commercial uses listed under Use Zones I and II i.e. residential and commercial use zones,
All industries permissible in the Use Zones III (a) and III (b) i.e. the controlled and general industrial use Zones.
All uses involving storage, handling, manufacture or processing of highly combustible or explosive materials or products which are liable to burn with extreme rapidity and / or which may produce poisonous fumes or explosion.
All uses involving storage, handling, manufacture or processing which involve highly corrosive, toxic or noxious alkalis acids or other liquids or chemicals producing flames, fumes and explosive, poisonous, irritant or corrosive gases.
All uses involving storage, handling or processing of any material producing explosive mixtures of dust, or which result in the division of matter into fine particles subject to a spontaneous ignition.
Processing or manufacturing anything from which offensive or unwholesome smells arise.
Melting or processing tallow or sulphur.
Staring, handling or processing of manure, offal, blend, bones, rags, hides, fish, herms or skin;
Washing or driving wool or hair;
Making fish oil;
Making soap, boiling or pressing oil, burning bricks, tiles, pottery, or lime;
Manufacturing of distilling sago and artificial manual;
Brewery beer, manufacturing by distillation barrack or spirit containing alcohol
In general, any industrial process which is likely to be dangerous to human life or health or amenity and not permissible in the Use Zone III(a) and III (b) i.e. controlled industrial and the general industrial use zones;
Hotels, restaurants and clubs, or places for social intercourse, recreation and worship or dispensaries and clinics, and
Residential buildings for caretakers, watchman and other essential staff required to be maintained in the premises.

IV. Public, Educational and Social Use Zone

Government/Semi-Government/Public Offices (PS- 1)

Government Land (use determined) (PS-2)
Educational and Research (PS-3)
Medical and Health Care Services (PS-4)
Social, Cultural and Religious (PS-5) *(library, museum, galleries)*
Utilities and Services (PS-6) *(Garage/Parking, Gasoline Station)*
Cremation and Burial Grounds (PS-7)
Exhibition Hall, Convention Facilities
Bus, railway and harbour Terminals,

Schools, Colleges and other higher education and Training institutions and the uses connected therewith;
All uses permitted in Use Zone I (a) i.e. primary residential use zone
Hotels and single person apartments
Recreation clubs Libraries and Reading rooms and
Restaurants.

Government and Quasi Government Offices;
Art Galleries, Museums, Aquarium and Public Libraries;
Hospitals, Sanitary and other medical and public health institutions;
Harbour, Airport and Flying Club;

V. Agricultural Use Zone – Use Zone V

Uses permitted.

All agricultural uses;
Farm houses and buildings for agricultural activities;
Rural settlements with allied uses;
Public and Private parks, playfield, gardens, caravan and camping sites and other recreational uses;
Dairy, Poultry, Fishery Farms, etc.
Water tanks bodies and reservoirs;
Sewage farms, Compost and garbage dump yards;
Airports and broadcasting installations;
Forestry;
Cemeteries, Crematoria and Burning and Burial grounds;
Storing and drying of fertilizers;
Fish curing;
Salt manufacturing;
Brick, tile or pottery manufacture;

Stone crushing and quarrying; and
Sand, clay and Gravel quarrying.

VI Special Area Old Built-up (Core) Area (City Centre) (S-1)

Heritage and Conservation Areas (S-2)

Scenic Value Areas (S-3)

Cantonments (S-4)

Village Settlement (S-5)

Other Uses (S-6)

Airport

Quarry

REQUIREMENTS FOR PERMIT APPLICATION

Submittal Documents

Where the development involves the erection of a building, the local planning authority may give written directions to the applicant in respect of any of the following matters, that is to say:

the level of the site of the building;
the line of frontage with neighbouring buildings;
the elevations of the building;
the class, design, and appearance of the building;
the setting back of the building to a building line;
access to the land on which the building is to be erected; and
any other matter that the local planning authority considers necessary for purposes of planning.

In addition to the documents and plans required to be submitted, the applicant shall submit a development proposal report which shall contain the following:

the development concept and justification;
a location map and a site plan;
particulars of land ownership and restrictions, if any;
(i) a description of the land including its physical environment, topography, landscape, geology, contours, drainage, water bodies and catchments and natural feature thereon;
(ii) a survey of the trees and all forms of vegetation; and
(iii) particulars of a building,
which may be affected by the development;
a land use analysis and its effect on the adjoining land;
layout plans, the details of which are specified; and
such other matters as may be prescribed by the local planning authority.

The Authority may specify that the development proposal report submitted in respect of certain categories of development shall include an analysis of the social implications of the development for the area which is the subject of the application for planning permission.

Layout Plans

The layout plans under paragraph shall show the proposed development and in particular:

where the development is in respect of any land _
measures for the protection and improvement of its physical environment;
measures for the preservation of its natural topography;
measures for the improvement of its landscape;
measures for the preservation and planting of trees thereon;
the location and species of trees with a girth exceeding 0.8m and other vegetation thereon;
the making up of open spaces;
the proposed earthworks, if any; and
description of the works to be carried out.

Table(1.1) Control of Building Use By Land Use Zones

Group	No.	Sub. No.	Building Categories	Residential Use Zone			Commercial Use Zone	Industrial Use Zone			Public, Educational & Social Use Zone	Agricultural Use Zone	Special Use Zone
				Primary Residential Use Zone	Mixed Residential Use Zone	Informal Residential Use Zone		Controlled Industrial Use Zone	General Industrial Use Zone	Special Industrial and Hazardous Use Zone			
A			**Assembly (A1 to A5)**										
	I		**A-1**										
		1	Motion picture theatres										
		2	Symphony and concert halls		with spec:								
		3	Television and radio studios admitting an audience										
		4	Theatres, etc.										
	II		**A-2**										
		1	Banquet halls		with spec:								
		2	Night clubs		with spec:								
		3	Restaurants										
		4	Bars, etc.										
	III		**A-3**										
		1	Amusement arcades		with spec:								
		2	Art galleries				Temporary						
		3	Bowling alleys		with spec:								
		4	Community halls										
		5	Courtrooms										
		6	Dharma Halls										
		7	Dance halls										
		8	Exhibition halls										
		9	Funeral parlours										
		10	Gymnasiums										
		11	Indoor swimming pools										
		12	Indoor tennis courts										
		13	Lecture halls										
		14	Libraries										
		15	Museums										
		16	Places of religious worship: Pagodas, Temples, Churches, Mosques, etc.										
		17	Pool and billiard parlours										
		18	Waiting areas in transportation terminals, etc										
	IV		**A-4**										
		1	Arenas				Temporary						
		2	Skating rinks										
		3	Swimming pools										
		4	Tennis courts, etc.										

Table(1.1) Control of Building Use By Land Use Zones (Continued)

Group	No.	Sub. No.	Building Categories	Residential Use Zone			Commercial Use Zone	Industrial Use Zone			Public, Educational & Social Use Zone	Agricultural Use Zone	Special Use Zone
				Primary Residential Use Zone	Mixed Residential Use Zone	Informal Residential Use Zone		Controlled Industrial Use Zone	General Industrial Use Zone	Special Industrial and Hazardous Use Zone			
	V		**A - 5**										
		1	Amusement park structures										
		2	Grandstands										
		3	Stadiums										
B			**Business**										
			Airport traffic control towers										
			Ambulatory health care facilities		with spec:								
			Veterinary										
			Banks		Mini Bank								
			Barber and beauty shops										
			Car wash		with spec:								
			Clinic-outpatient										
			Dry cleaning and laundries: pick-up and delivery stations and self-service	with spec:	with spec:		with spec:						
			Electronic data processing: public internet access centre	with spec:	with spec:								
			Laboratories: testing and research				with spec:						
			Motor vehicle showrooms										
			Post offices										
			Print shops	with spec:	with spec:								
			Professional services (architects, attorneys, dentists, physicians, engineers, etc.)										
			Radio and television stations										
			Telephone exchanges	with spec:	with spec:								
			Training and skill develop- ment not within a school or academic program, etc.		with spec:								
E			**Educational**										
			Basic Education Schools	with spec:									
			Day care	with spec:									
			Universities and Colleges				with spec:						
			Vocational Training Centres, etc.				with spec:						

Table(1.1) Control of Building Use By Land Use Zones (Continued)

Group	No.	Sub. No.	Building Categories	Residential Use Zone			Commercial Use Zone	Industrial Use Zone			Public, Educational & Social Use Zone	Agricultural Use Zone	Special Use Zone
				Primary Residential Use Zone	Mixed Residential Use Zone	Informal Residential Use Zone		Controlled Industrial Use Zone	General Industrial Use Zone	Special Industrial and Hazardous Use Zone			
			Factory and Industrial (Group F)										
			F-1										
			Aircraft (manufacturing, not to include repair)										
			Appliances						with spec:				
			Athletic equipment										
			Automobiles and other motor vehicles										
			Bakeries						with spec:				
			Beverages: over 16-percent alcohol content										
			Bicycles										
			Boats										
			Brooms or brushes										
			Business machines										
			Cameras and photo equipment										
			Canvas or similar fabric						with spec:				
			Carpets and rugs (includes cleaning)						with spec:				
			Clothing						with spec:				
			Construction and agricultural machinery										
			Disinfectants										
			Dry cleaning and dyeing										
			Electric generation plants										
			Electronics										
			Engines (including rebuilding)										
			Food processing										
			Furniture						with spec:				
			Fibrous products										
			Jute products						with spec:				
			Laundries										
			Leather products										
			Machinery										
			Metals										
			Millwork (sash and door)										
			Motion pictures and television filming (without spectators)										
			Musical instruments										
			Optical goods										
			Paper mills or products										
			Photographic film										
			Plastic products										
			Printing or publishing						with spec:				

Table(1.1) Control of Building Use By Land Use Zones (Continued)

Group	No.	Sub. No.	Building Categories	Residential Use Zone			Commercial Use Zone	Industrial Use Zone			Public, Educational & Social Use Zone	Agricultural Use Zone	Special Use Zone
				Primary Residential Use Zone	Mixed Residential Use Zone	Informal Residential Use Zone		Controlled Industrial Use Zone	General Industrial Use Zone	Special Industrial and Hazardous Use Zone			
			Recreational vehicles										
			Refuse incineration										
			Shoes										
			Soaps and detergents										
			Textiles										
			Tobacco										
			Trailers										
			Upholstering										
			Woodworking (cabinet, etc.)						with spec:				
			Wood; distillation, etc.						with spec:				
			F-2										
			Beverages: up to and including 16-percent alcohol content						with spec:				
			Brick and masonry										
			Ceramic products										
			Cottage industries		with spec:				with spec:				
			Foundries						with spec:				
			Glass products						with spec:				
			Gypsum										
			Ice						with spec:				
			Metal products (fabrication and assembly), etc.										
			High Hazardous (Group H)										
			H1 Storage and handling of hazardous and highly flammable material,										
			H2 Storage and handling of flammable material, dry cleaning plants using flammable liquids, paint stores with bulk handling, paint shops and spray painting rooms.										
			H3 Wood working establishments, painting mills and box factories, shops, factories where loose combustible fibers or dust are manufactured ,processed or generated, warehouses where high combustible material is stored										
			H4 Repair garages										
			H5 Aircraft repair hangars.										
			Institutional										
			I-1										
			Alcohol and drug centres										
			Home for Handicapped										
			Old aged Centres										
			Residential board and care facilities										
			Social rehabilitation facilities										

Table(1.1) Control of Building Use By Land Use Zones (Continued)

Group	No.	Sub. No.	Building Categories	Residential Use Zone			Commercial Use Zone	Industrial Use Zone			Public, Educational & Social Use Zone	Agricultural Use Zone	Special Use Zone
				Primary Residential Use Zone	Mixed Residential Use Zone	Informal Residential Use Zone		Controlled Industrial Use Zone	General Industrial Use Zone	Special Industrial and Hazardous Use Zone			
			I-2										
			Child care facilities	with spec:	with spec:								
			Detoxification facilities										
			Hospitals										
			Mental hospitals										
			Nursing homes		with spec:								
			I-3										
			Correctional Centres										
			Detention Centres										
			Jails										
			Prisons,etc.										
			I-4										
			Adult care facility										
			Child care facility										
			I-5										
			Civic administration		with spec:								
			Fire Station		with spec:		with spec:						
			Police Station	with spec:	with spec:		with spec:						
			Mercantile (Group M)										
			Department stores		with spec:								
			Drug stores	with spec:	with spec:								
			Fuel Stations		with spec:		with spec:						
			Markets	with spec:	with spec:								
			Motor fuel-dispensing facilities		with spec:								
			Retail or wholesale stores	retail	retail		whole sale				whole sale		
			Sales rooms										
			Residential (Group R)										
			R-1 Residential occupancies where the occupants are primarily permanent in nature, including: Buildings that do not contain more than two dwelling units, eg. Detached and Duplex houses, Congregate living facilities with 16 or fewer persons.										

Table(1.1) Control of Building Use By Land Use Zones (Continued)

Group	No.	Sub. No.	Building Categories	Residential Use Zone			Commercial Use Zone	Industrial Use Zone			Public, Educational & Social Use Zone	Agricultural Use Zone	Special Use Zone
				Primary Residential Use Zone	Mixed Residential Use Zone	Informal Residential Use Zone		Controlled Industrial Use Zone	General Industrial Use Zone	Special Industrial and Hazardous Use Zone			
			R-2 Residential occupancies where the occupants are primarily permanent in nature, containing more than two dwelling units, including: Apartment houses, Condominiums, Executive, Residences										
			R-3 Residential occupancies containing sleeping units where the occupants are primarily permanent in nature, including:Convents, Dormitories,Hostels, Monasteries										
			R-4 Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living facilities not more than 16 occupants, excluding staff.										
			R-5 Residential occupancies containing sleeping units or more than two dwelling units or care/assisted living facilities where the occupants are primarily permanent in nature, including: Home for the aged, Nursing home, Retirement home,Orphanage										
			R-6 Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:Inns, guest houses, Hotels, Motels, Service Apartments (transient)										

Table(1.1) Control of Building Use By Land Use Zones (Continued)

Group	No.	Sub. No.	Building Categories	Residential Use Zone			Commercial Use Zone	Industrial Use Zone			Public, Educational & Social Use Zone	Agricultural Use Zone	Special Use Zone
				Primary Residential Use Zone	Mixed Residential Use Zone	Informal Residential Use Zone		Controlled Industrial Use Zone	General Industrial Use Zone	Special Industrial and Hazardous Use Zone			
			Storage (Group S)										
			Moderate-hazard storage (S-I)										
			Aerosols, Levels 2 and 3										
			Aircraft hangar (storage and repair) I										
			Bags: cloth, burlap and paper				with spec:						
			Bamboos and rattan				with spec:						
			Baskets				with spec:						
			Belting: canvas and leather					with spec:	with spec:				
			Books and paper in rolls or packs				with spec:						
			Boots and shoes				with spec:						
			Buttons, including cloth covered, pearl or bone				with spec:						
			Cardboard and cardboard boxes				with spec:						
			Clothing, woollen wearing apparel				with spec:						
			Cordage										
			Dry boat storage (indoor)										
			Furniture				with spec:						
			Furs										
			Glues, mucilage, pastes and size										
			Grains										
			Horns and combs, other than celluloid, Ivory										
			Leather										
			Linoleum				with spec:						
			Lumber										
			Motor vehicle repair garages				with spec:						
			Photo engravings				with spec:						
			Resilient flooring				with spec:						
			Silks,Talc and soap, Sugar				with spec:						
			Tires, bulk storage of				with spec:						
			Tobacco, cigars, cigarettes and snuff										
			Upholstery and mattresses										
			Wax candles				with spec:						
			Low-Hazard storage (S-2)										
			Asbestos										
			Beverages up to and including 16-percent alcohol in metal, glass or ceramic containers				with spec:						
			Cement in bags										
			Chalk and crayons				with spec:						
			Dairy products in non waxed coated paper containers										
			Dry cell batteries										
			Electrical coils				with spec:						

Table(1.1) Control of Building Use By Land Use Zones (Continued)

Group	No.	Sub. No.	Building Categories	Residential Use Zone			Commercial Use Zone	Industrial Use Zone			Public, Educational & Social Use Zone	Agricultural Use Zone	Special Use Zone
				Primary Residential Use Zone	Mixed Residential Use Zone	Informal Residential Use Zone		Controlled Industrial Use Zone	General Industrial Use Zone	Special Industrial and Hazardous Use Zone			
			Electrical motors				with spec:						
			Empty cans										
			Food products				with spec:						
			Foods in non-conbustible containers				with spec:						
			Fresh fruits and vegetables in non plastic trays or containers				with spec:						
			Frozen foods, Meats				with spec:						
			Glass, Mirrors				with spec:						
			Glass bottles, empty or filled with non-combustible liquids										
			Gypsum board				with spec:						
			Inert pigments				with spec:						
			Metals, Metal parts, Metal cabinets				with spec:						
			Oil-filled and other types of distribution transformers										
			Parking garages open or enclosed										
			Porcelain and pottery				with spec:						
			Stoves				with spec:						
			Washers and dryers, etc.				with spec:						
			Utility and Miscellaneous (Group U)										
			Agricultural Buildings (U-1)										
			Livestock Shelters or Buildings, including Shade Structures & Milking barns										
			Poultry Buildings or Shelters										
			Barns										
			Storage of equipment & machinery used exclusively in agriculture				with spec:						
			Horticultural Structures including Crop Protection Shelters										
			Sheds										
			Grain Silos										
			Stables										
			Greenhouse										
			Group U-2										
	not defined }		Fences over 6 feet (1829 mm) high										
			Retaining Walls										
			Group U-3										
			Aircraft Hangars										
			Carports										
			Private Garages, Generator Houses										
			Sheds, Telephone Booth, Kiosk, Media Corner										
			Tanks, Towers		with spec:		with spec:						
			Public Bath & WC	with spec:	with spec:								
			Garbage Yards	with spec:	with spec:		with spec:	with spec:	with spec:		with spec:		

Classification of Roads

All roads outside the urban areas are classified as follows:

a) Expressway

Expressway means a highway which has 4 or more lanes with opposing traffic separated by Median strip especially for high speed vehicle. According to the Expressways Law, a highway determined, by notification, as the expressway by the Ministry with the approval of the Union Government. In this expression, the right of way in each side of the expressway and bridges on such expressway are also included.

b) Bypass (or) Special Road

Special Road means a highway which implemented for bypass road (or) special purpose road. According to the Highways law, all roads prescribed by issuing notification as highway by the Ministry. This expression also includes road boundaries in each side of the highway and bridges situated along the highways.

c) International Highway

International Highway is a highway which connects with neighboring countries for the transportation of goods and services. According to the Highways Law, all roads prescribed by using notification as International Highway by the Ministry.

d) National Highway

Roads which connects major cities between different States/Regions within the country. According to the Highways Law, all roads prescribed by using notification as National Highway by the Ministry.

e) Regions/States Collector Road

Roads which connects between different regions/states within the country. According to the Highways Law, all roads prescribed by using notification as Regions/States Collector Road by the Ministry.

f) Districts/Townships Collector Road

Roads which connects between different districts/townships within the country. According to the Highways Law, all roads prescribed by using notification as Districts/Townships Collector Road by the Ministry.

g) Townships/Villages Collector Road

Roads which connects between different townships/villages within the country. According to the Highways Law, all roads prescribed by using notification as Townships/Villages Collector Road by the Ministry.

h) Urban Roads

All urban roads have the following classifications:

1) Urban Avenues/ Boulevard: Urban Avenues are the roads connecting zones in the urban areas and are longer than 5 miles.

2) Urban Main Road: Urban main roads are the roads connecting one zone in the urban areas and which are not longer than 5 miles.

3) Feeder Roads: Feeder roads are the roads connecting collector roads and urban avenues or the urban main roads where several collector roads are connected.

4) Collector Roads: Collector roads are the roads connecting between the feeder roads and residential areas. is a low-to-moderate-capacity road which serves to move traffic from local streets to arterial roads. Unlike arterials, collector roads are designed to provide access to residential properties.

5)Local roads: These roads have the lowest speed limit, and carry low volumes of traffic. In some areas, these roads may be unpaved.

6) Residential roads: Residential roads are the roads in the residential areas.

7) Short residential roads: Residential roads serving less than 4 units can be of one lane unless the roads do not exceed 300 feet in length, and these roads must be consist of two lanes if these served more than 4 units and longer than 300 feet.

8) Cul-de-sacs: All cul-de-sacs longer than 300 feet in length must have the minimum width of 20 feet, such cul-de-sacs must be provided turning circle.

9) One Way roads: One way roads can be planned in the residential areas meant only for one direction.

10) Service roads: Service roads are the roads where the usage is limited only to delivery vehicles.

Table 1.2a ROAD HIERARCHY CLASSIFICATION AND FUNCTIONS OUTSIDE THE URBAN AREA

No.	Type of facility	Functions and Design Features	R.O.W (m)	Speed (km/hr)	Other Features	Remark
1.	Expressway	Expressway means a highway which has 4 or more lanes with opposing traffic separated by Median strip especially for high speed vehicle. According to the Expressways Law, a highway determined, by notification, as the expressway by the Ministry with the approval of the Union Government. In this expression, the right of way in each side of the expressway and bridges on such expressway are also included.	122.00	≥ 100	Require service roads or adequate rear lot building setback lines.	
2.	Bypass (or) Special Road	Special Road means a highway which implemented for bypass road (or) special purpose road. According to the Highways law, all roads prescribed by issuing notification as highway by the Ministry. This expression also includes road boundaries in each side of the highway and bridges situated along the highways.	91.50	60-80	Required detached sidewalks in urban areas, planting strips and adequate building setback line.	Average speed is expressed in km/hr as the roads (Class I, Class II, Class III) are classified according to the width of road.
3.	International Highway	International Highway is a highway which connects with neighboring countries for the transportation of goods and services. According to the Highways Law, all roads prescribed by using notification as International Highway by the Ministry.	70	60-80	Required detached sidewalks in urban areas, planting strips and adequate building setback line.	

No.	Type of facility	Functions and Design Features	R.O.W (m)	Speed (km/hr)	Other Features	Remark
4.	National Highway	Roads which connects major cities between different States/Regions within the country. According to the Highways Law, all roads prescribed by using notification as National Highway by the Ministry.	45.75	60-80	Required detached sidewalks in urban areas, planting strips and adequate building setback line.	Average speed is expressed in km/hr as the roads (Class I, Class II, Class III) are classified according to the width of road.
5.	Regions/States Collector Road	Roads which connects between different regions/states within the country. According to the Highways Law, all roads prescribed by using notification as Regions/States Collector Road by the Ministry.	45.75	60-80	Required detached sidewalks in urban areas, planting strips and adequate building setback line.	
6.	Districts/ Townships Collector Road	Roads which connects between different districts/townships within the country. According to the Highways Law, all roads prescribed by using notification as Districts/Townships Collector Road by the Ministry.	45.75	40-60	Required detached sidewalks in urban areas, planting strips and adequate building setback line.	
7.	Townships/ Villages Collector Road	Roads which connects between different townships/villages within the country. According to the Highways Law, all roads prescribed by using notification as Townships/Villages Collector Road by the Ministry.	30.5	40-60		

Table 1.2b ROAD HIERARCHY CLASSIFICATION AND FUNCTIONS WITHIN THE URBAN AREA

No.	Type of facility	Functions and Design Features	R.O.W (m)	Speed (km/hr)	Other Features	Remark
1.	Major Roads/Urban Avenues/ Boulevard	Provide unity through contiguous urban areas. Usually from boundaries for neighborhoods. Minor access control; parking generally prohibited.	30.5-70.00	72.50	Required detached sidewalks in urban areas, planting strips and adequate building setback line.	
2.	Secondary Roads/ Feeder Roads	Main feeder streets. Signals where needed; stop signs on side streets. Occasionally from boundaries from neighborhoods.	24.00-36.50	48.00	Required detached sidewalks in urban areas, planting strips and adequate building setback line.	
3.	Collector Streets	Main interior streets. Stop sign on side streets.	18.00-36.50	48.00	Required at lease 4ft detached sidewalks, vertical curbs, planting strips are desirable, building setback line.	

No.	Type of facility	Functions and Design Features	R.O.W (m)	Speed (km/hr)	Other Features	Remark
4.	Local Streets Residential Streets Short Residential Streets One Way Streets Service Streets	Local service streets. Non conductive to through traffic. In residential area More than 4 units Road length longer than 300' Less than 4 units, Road length not exceed 300'	9.00-18.00 9.00-18.00 Min-8.5 Min-8.5	32.00	Sidewalks, vertical curbs, planting strips are desirable, building setback line. Platform width- min 4'	
5	Cul-de-sac	Street open at only one end, with provision for a practical turnaround at the other.	9.00 (27 m dia. Turn-around)	32.00	Should not have length greater than 500 ft.	

Table (1.3) Land Use and Building Regulation attached to each Zones

No.	Category of Land Use Zones	Max: Floor Area Ratios (FAR) (%)	Max: Building Coverage Ratios (BCR) (%)
1	Exclusive Low-storey Residential Area	50, 60, 80, 100, 120	30, 40
2	Low-storey Residential Area	50, 60, 80, 100, 120, 150	30, 40, 50
3	Mid-storey Residential Area	50, 60, 80, 100, 120, 150, 200, 300, 400, 450	30, 40, 50, 60
4	Medium-High Rise Residential Area	100, 200, 300, 400, 450	30, 40, 50, 60
5	Informal Residential Area		
6	Mixed Use Area (Residential & Commercial)	100, 200, 300, 400, 500, 600, 700, 800	30, 40, 50, 60
7	Neighbourhood Commercial Zone	100, 200, 300, 400, 500, 600	40,50,60
8	Commercial Zone	100, 200, 300, 400, 500, 600, 700, 800, 1000, 1200	40,50,60,80
9	Controlled Industrial Zone	100, 150, 200, 300, 400, 500	50, 60
10	Industrial Zone/ General Industrial Zone	100, 150, 200, 300, 400	50, 60
11	Exclusive Industrial Zone/ Special Industrial Zone	100, 150, 200, 300, 400	30, 40, 50, 60

FAR = Total Building Floor Area / Plot Area

BCR = Building Footprint Area / Plot Area

List of participators and coordinators in TWG-1

1.	U Win Myint	Group Leader
2.	U Than Moe	Deputy Group Leader
3.	U Nyunt Maung San	Coordinator
4.	Dr. Kyaw Latt	Member
5.	Dr. Zaw Win	Member
6.	Daw Moe Moe Lwin	Member
7.	Daw Mie Mie Tin	Member
8.	Daw Aung May Oo	Member
9.	U Zaw Zaw Aye	Member
10.	Daw Mya Seine Aye	Member
11.	Daw May Htoo Kyaw	Member

MYANMAR NATIONAL BUILDING CODE 2020

PART 2

ARCHITECTURE AND URBAN DESIGN

MYANMAR NATIONAL BUILDING CODE 2020
PART 2 ARCHITECTURE AND URBAN DESIGN
TABLE OF CONTENTS

NO.		TITLE	PAGE
2.1		**USE AND OCCUPANCY CLASSIFICATION**	
	2.1.1	General	1
	2.1.2	Classification of all Building by use and occupancy	1
	2.1.3	Assembly	2
	2.1.4	Business	3
	2.1.5	Educational	4
	2.1.6	Factory and Industrial	5
	2.1.7	High Hazardous	7
	2.1.8	Institutional	7
	2.1.9	Mercantile	9
	2.1.10	Residential	10
	2.1.11	Storage	11
	2.1.12	Utility and Miscellaneous	14
2.2		**ARCHITECTURAL REQUIREMENTS AND SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY**	
	2.2.1	Health Care Buildings	15
	2.2.2	Ambulatory Health Care Facilities	16
	2.2.3	Educational Buildings	17
	2.2.4	Covered Mall and Open Mall Buildings	19
	2.2.5	High-Rise Buildings	23
	2.2.6	Atriums	25
	2.2.7	Special Amusement Buildings	26
2.3		**GENERAL BUILDING HEIGHTS AND AREAS**	
	2.3.1	Definitions	27
	2.3.2	General Height and Area Limitations	27
	2.3.3	Allowable Floor Areas	29
	2.3.4	Maximum Height of Building	29
	2.3.5	Mixed Use and Occupancy	32
	2.3.6	Equipment Platforms	33
	2.3.7	Height Determination for Sky Terrace Floors	33
2.4		**SPECIAL BUILDINGS AND CONSTRUCTION**	
	2.4.1	General	35
	2.4.2	Membrane Structures	35
	2.4.3	Temporary Structures	37

	2.4.4	Pedestrian Walkways or Tunnels	38
	2.4.5	Awnings and Canopies	39
	2.4.6	Marquees	40
	2.4.7	Signs	41
	2.4.8	Telecommunication and Broadcast Towers	51
	2.4.9	Swimming Pool Enclosures	51
	2.4.10	Automatic Vehicular Gates	53
2.5		**INTERIOR ENVIRONMENT**	
	2.5.1	Scope	54
	2.5.2	Definitions	54
	2.5.3	Ventilation	54
	2.5.4	Lighting	55
	2.5.5	Courts or Courtyards	56
	2.5.6	Internal Spaces	57
	2.5.7	Stairs, Steps, Ramps and Lifts	58
	2.5.8	Mechanical vertical transport in buildings	60
	2.5.9	Access to Unoccupied Spaces	60
	2.5.10	Surrounding Materials	61
2.6		**MEANS OF EGRESS**	
	2.6.1	Means of Egress System	62
	2.6.2	General Requirements for Means of Egress	62
	2.6.3	Occupant Load	62
	2.6.4	Exit Access	65
	2.6.5	Exit and Exit Access Doorways from Space	65
	2.6.6	No. of Exit Staircase or Exits per Storey	65
	2.6.7	Exit Access Travel Distance	67
	2.6.8	Egress Width	68
	2.6.9	Exit Stairs	69
	2.6.10	Exits Discharge	72
	2.6.11	Exit Passage Way	72
	2.6.12	Exit Doors	73
	2.6.13	Means of Egress Lighting	74
	2.6.14	Accessible Means of Egress	74
	2.6.15	Smoke Free Approach to Exit Stair	74
	2.6.16	Exit Sign	75
	2.6.17	Emergency escape/ Refuge Area	75
	2.6.18	Special requirements	75
2.7		**ACCESSIBILITY**	
	2.7.1	Scope	76
	2.7.2	Scoping Requirements	76

	2.7.3	Minimum Requirements	77
2.8		**EXTERIOR WALLS**	
	2.8.1	Scope	82
	2.8.2	Definitions	82
	2.8.3	Performance Requirements	83
	2.8.4	Materials	83
	2.8.5	Projections in Brickwork	85
	2.8.6	Recess	85
	2.8.7	Installation of Wall Coverings	85
	2.8.8	Exterior Doors and Windows	85
	2.8.9	Balconies and Similar Projections, Bay and Oriel Windows	86
	2.8.10	Metal Composite Materials	86
2.9		**ROOF CONSTRUCTION, ROOF COVERING AND ROOF TOP STRUCTURES**	
	2.9.1	General	87
	2.9.2	Roof Covering	88
	2.9.3	Roof Trusses	88
	2.9.4	Roof Drainage System	89
	2.9.5	Flashing	89
	2.9.6	Skylights	89
	2.9.7	Penthouses and Roof Top Structures	90
	2.9.8	Chimneys	91
2.10		**REGULATIONS FOR HISTORICAL BUILDINGS**	
	2.10.1	Administration	94
	2.10.2	Definitions	96
	2.10.3	Use and occupancy	100
	2.10.4	Fire protection	101
	2.10.5	Structural regulations	103
	2.10.6	Archaic materials and methods of construction	106
	2.10.7	Mechanical, plumbing and electrical requirements	111
	2.10.8	Qualified historical districts, sites and open spaces	111
	2.10.9	Conservation management plan and heritage impact assessment	112
2.11		**URBAN DESIGN AND ENVIRONMENT**	
	2.11.1	Urban Design and Outside spaces	114
	2.11.2	Environmental Issues	118
	2.11.3	Urban densities	118
	2.11.4	Open Spaces	119
	2.11.5	Building Spacing	120
	2.11.6	Roads and Parking Spaces	122
	2.11.7	Recreation Areas	131

2.12 GREEN BUILDING

2.12.1 Introduction 132
2.12.2 Criteria for green buildings in Myanmar 132
2.12.3 Environmental Sustainability Standard 137
2.12.4 Green Building Grading System 141
2.12.5 Method of Evaluation 141
2.12.6 Clauses of implementation 142

2.1 USE AND OCCUPANCY CLASSIFICATION

2.1.1 General

2.1.1.1 Scope

The provisions of this chapter shall control the classification of all buildings and structures as to use and occupancy. In addition that this chapter contains the requirements to cooperate with allied disciplines in architectural design.

2.1.1.2 Cooperation and Coordination with other Disciplines

2.1.1.2.1 General Architectural Design Process

All design must consider the requirements of building services, structural engineering, building safety, etc. already in the designing process and to coordinate with various concerned disciplines during the conceptual design stage.

2.1.1.2.2 Design of Multi-storeyed Buildings

The architectural design must provide spaces for mechanical and electrical components such as, transformer stations, electrical meter boxes, underground tanks, waste disposal systems, vertical and horizontal shaft etc., which should be coordinated and allocated with the respected specialists already in the process of conceptual planning stage. All these provision must conform to the respective chapter of this building code. For example: the required provision should be complied with Part 5 Building Services.

2.1.2 Classification of all Buildings by Use and Occupancy

2.1.2.1 General

This section defines the scope of this chapter as the provisions to control the classification of all buildings, structures, and spaces as to use and occupancy. Structures or portions of structures shall be classified with respect to occupancy in one or more of the groups listed below. A room or space that is intended to be occupied at different times for different purposes shall comply with all of the requirements that are applicable to each of the purposes for which the room or space will be occupied. Structures with multiple occupancies or uses shall comply with *Chapter 3, General Building Heights and Areas.* Where a structure is proposed for a purpose that is not specifically provided for in this code, such structure shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard involved. It defines ten groups in which structures or portions of structures shall be classified.

a) Group A: Assembly (A1 to A5)
b) Group B: Business
c) Group E: Educational
d) Group F: Factory and Industrial (F1 & F2)
e) Group H: Hazardous
f) Group I: Institutional (I1 to I5)
g) Group M: Mercantile
h) Group R: Residential (R1 to R6)
i) Group S: Storage (S1 & S2)
j) Group U: Utility and Miscellaneous (U1 to U3)

2.1.3 Assembly (Group A*)*

2.1.3.1 General

Assembly occupancy includes, among others, the use of building or portions of building or structure for people gathering for civic, social or religious functions, recreation, entertainment, education or instruction, food or drink consumption or waiting transportation. Assembly occupancies shall include a building or portions of building or tenant space used for assembly purposes with an occupant load of more than 50 persons and/or more than 500 square feet. Otherwise, it shall be classified as Group B occupancy or as part of other occupancy.

Exceptions:

a) Assembly areas that are accessory to Group E occupancies are not considered separate occupancies except when applying the assembly occupancy requirements of *Chapter 7, Accessibility.*

b) Accessory religious educational rooms and religious auditoriums with occupant loads of less than 50 and/or less than 500 square feet. are not considered separate occupancies.

Assembly occupancies shall include the following:

A-1 Assembly uses, usually with fixed seating, intended for the production and viewing of the performing arts or motion pictures including, but not limited to:

Motion picture theatres

Symphony and concert halls

Television and radio studios admitting an audience

Theatres, etc.

A-2 Assembly uses intended for food and/or drink consumption including, but not limited to:

Banquet halls

Clubs

Restaurants

Food courts

Bars

A-3 Assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A including, but not limited to:

Amusement arcades

Art galleries

Bowling alleys

Community halls

Courtrooms

Dharma Halls

Dance halls

Exhibition halls

Funeral parlours

Gymnasiums

Indoor swimming pools

Indoor tennis courts

Lecture halls

Libraries

Museums

Places of religious worship: Pagodas, Temples, Churches, Mosques, etc.

Pool and billiard parlours

Waiting areas in transportation terminals, etc.

A-4 Assembly uses intended for viewing of indoor sporting events and activities with spectator seating including, but not limited to:

Arenas

Skating rinks

Swimming pools

Tennis courts, etc.

A-5 Assembly uses intended for participation in or viewing outdoor activities including, but not limited to:

Amusement park structures

Grandstands

Stadiums

2.1.4 Business (Group B)

2.1.4.1 General

Business occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies including, but not limited to:

Airport traffic control towers

Ambulatory health care facilities

Veterinary

Banks

Barber and beauty shops

Car wash

Clinic-outpatient

Dry cleaning and laundries: pick-up and delivery stations and self-service

Electronic data processing: public internet access centre

Laboratories: testing and research

Motor vehicle showrooms

Post offices

Print shops

Professional services (architects, attorneys, dentists, physicians, engineers, etc.)

Radio and television stations

Telephone exchanges

Training and skill development not within a school or academic program,etc.

2.1.4.1 Definitions

The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

CLINIC, OUTPATIENT. Buildings or portions thereof used to provide medical care on less than a 24-hour basis to individuals who are not rendered incapable of self-preservation by the services provided.

2.1.5 Educational (Group E)

Educational occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any time for educational purposes of the basic education (Group E1) and higher education (Group E2). Assembly areas of Group E occupancy having more than 50 occupant loads are considered as Group A-3 occupancy. Religious educational rooms and religious auditoriums, which are accessory to places of religious worship in accordance with assembly portion and have occupant loads of less than 50, shall be classified as A-3 occupancies.

Educational occupancies including, but not limited to:

Group E1

Basic Education Schools

Day care

Vocational Training Centres,etc.

Group E2

Educational occupancies for students above High School

2.1.5.1 Definitions

The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

DAY CARE: The use of a building or structure, or portion thereof, for educational, supervision or personal care services for more than five children older than 2 1/ 2 years of age shall be classified as Group E occupancy.

2.1.6 Factory and Industrial (Group F)

2.1.6.1 General

Factory and Industrial occupancy includes, among others, the use of a building or structure, or a portion thereof, for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H hazardous or Group S storage occupancy.

2.1.6.2 Factory and industrial F-1 moderate-hazard occupancy

Factory industrial uses which are not classified as Factory Industrial F-2 Low Hazard (which can be small, medium or large industries according to the 1990 Private Industrial Enterprises Law) shall be classified as F-1 Moderate Hazard including, but not limited to:

Aircraft (manufacturing, not to include repair)

Appliances

Athletic equipment

Automobiles and other motor vehicles

Bakeries

Beverages: over 16-percent alcohol content

Bicycles

Boats

Brooms or brushes

Business machines

Cameras and photo equipment

Canvas or similar fabric

Carpets and rugs (includes cleaning)

Clothing

Construction and agricultural machinery

Disinfectants

Dry cleaning and dyeing

Electric generation plants

Electronics

Engines (including rebuilding)

Food processing

Furniture

Fibrous products

Incineration Plant

Jute products

Laundries

Leather products

Land Fill Gas Plant

Machinery

Metals

Millwork (sash and door)

Motion pictures and television filming (without spectators)

Musical instruments

Optical goods

Paper mills or products

Photographic film

Plastic products

Printing or publishing

Recreational vehicles

Refuse incineration

Shoes

Soaps and detergents

Textiles

Tobacco

Trailers

Upholstering

Woodworking (cabinet, etc.)

Wood; distillation, etc.

2.1.6.3 Factory and industrial F-2 low-hazard occupancy

Factory industrial uses that involve the fabrication or manufacturing of non combustible materials which during finishing, packing or processing do not involve a significant fire hazard shall be classified as F-2 occupancies (which can be small, medium or large industries according to the 1990 Private Industrial Enterprises Law) including, but not limited to:

Beverages: up to and including 16-percent alcohol content

Brick and masonry

Ceramic products

Cottage industries

Foundries

Glass products

Gypsum

Ice

Metal products (fabrication and assembly),etc.

2.1.7 High Hazardous (Group H)

H1 Storage and handling of hazardous and highly flammable material,

H2 Storage and handling of flammable material, dry cleaning plants using flammable liquids, paint stores with bulk handling, paint shops and spray painting rooms.

H3 Wood working establishments, painting mills and box factories, shops, factories where loose combustible fibers or dust are manufactured ,processed or generated, warehouses where high combustible material is stored

H4 Repair garages

H5 Aircraft repair hangars.

2.1.8 Institutional (Group I)

2.1.8.1 General

Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which people are provided for public service facilities and cared for or live in a supervised environment, having physical limitations because of health or age are harboured for medical treatment or other care or treatment, or in which people are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

2.1.8.2 Group I-1

This occupancy shall include buildings, structures or parts thereof housing more than 16 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment that provides personal care services. The occupants are capable of responding to an emergency situation without physical assistance from staff. This group shall include, but not limited to:

Alcohol and drug centres

Home for Handicapped

Old aged Centres

Residential board and care facilities

Social rehabilitation facilities

Old Aged Centres, etc.

2.1.8.3 Group I-2

This occupancy shall include buildings and structures used for medical, surgical, psychiatric, nursing or custodial care for persons who are not capable of self-preservation. This group shall include, but not limited to:

Child care facilities

Detoxification facilities

Hospitals

Mental hospitals

Nursing homes (both intermediate care facilities and skilled training), etc.

2.1.8.3.1 Definitions

The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

CHILD CARE FACILITIES. Facilities that provide care on a 24-hour basis to more than five children, 2 1/2 years of age or less.

DETOXIFICATION FACILITIES. Facilities that serve patients who are provided treatment for substance abuse on a 24-hour basis and who are incapable of self-preservation or who are harmful to themselves or others.

HOSPITALS AND MENTAL HOSPITALS. Buildings or portions thereof used on a 24-hour basis for the medical, psychiatric, obstetrical or surgical treatment of inpatients who are incapable of self-preservation.

NURSING HOMES. Nursing homes are long-term care facilities on a 24-hour basis, including both intermediate care facilities and skilled nursing facilities, serving more than five persons and any of the persons are incapable of self-preservation.

2.1.8.4 Group I-3

This occupancy shall include buildings and structures that are inhabited by more than five persons who are under restraint or security. Facility of An I-3 is occupied by persons who are generally incapable of self-preservation due to security measures not under the occupants' control. This group shall include the following:

Correctional Centres

Detention Centres

Jails

Prisons,etc.

Buildings of Group I-3 shall be classified as one of the occupancy conditions indicated as following:

2.1.8.4.1 Condition 1

This occupancy condition shall include buildings in which free movement is allowed from sleeping areas, and other spaces where access or occupancy is permitted, to the exterior via means of egress without restraint. A Condition 1 facility is permitted to be constructed as Group R.

2.1.8.4.2 Condition 2

This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and any other occupied smoke compartment to one or more other smoke compartments. Egress to the exterior is impeded by locked exits.

2.1.8.4.3 Condition 3

This occupancy condition shall include buildings in which free movement is allowed within individual smoke compartments, such as within a residential unit comprised of individual sleeping units and group activity spaces, where egress is impeded by remote-controlled release of means of egress from such a smoke compartment to another smoke compartment.

2.1.8.4.4 Condition 4

This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Remote-controlled release is provided to permit movement from sleeping units, activity spaces and other occupied areas within the smoke compartment to other smoke compartments.

2.1.8.4.5 Condition 5

This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Staff-controlled manual release is provided to permit movement from sleeping units, activity spaces and other occupied areas within the smoke compartment to other smoke compartments.

2.1.8.5 Group I-4 day care facilities under 2 and half years

This group shall include buildings and structures occupied by persons of any age who receive custodial care for less than 24 hours by individuals other than parents or guardians, relatives by blood, marriage or adoption and in a place other than the home of the person cared for.

2.1.8.5.1 Adult care facility

A facility that provides accommodations for less than 24 hours for more than five unrelated adults and provides supervision and personal care services shall be classified as Group I-4.

Exception: A facility where occupants are capable of responding to an emergency situation without physical assistance from the staff shall be classified as *Group R-3.*

2.1.8.5.2 Child care facility

A facility that provides supervision and personal care on less than a 24-hour basis for more than five children 2-1/ 2 years of age or less shall be classified as Group I-4.

Exception: A child day care facility that provides care for more than five but no more than 100 children 2-1/ 2 years of age or less, where the rooms in which the children are cared for are located on a level of exit discharge serving such rooms and each of these child care rooms has an exit door directly to the exterior, shall be classified as Group E.

2.1.8.6 Group I-5

This occupancy shall include buildings, structures or parts thereof in which people are provided for public service facilities. This group shall include the following:

Civic administration

Fire Station

Police Station, etc.

2.1.9. Mercantile (Group M)

2.1.9.1 General

Mercantile Group M occupancy includes, among others, the use of a building or structure or a portion thereof, for the display and sale of merchandise and involves stocks of goods, wares or merchandise incidental to such purposes and accessible to the public. Mercantile occupancies including, but not limited to:

Department stores

Drug stores

Fuel Stations

Markets

Motor fuel-dispensing facilities

Retail or wholesale stores

Sales rooms

2.1.10 Residential (Group R)

R-1 Residential occupancies where the occupants are primarily permanent in nature, including: Buildings that do not contain more than two dwelling units, eg. Detached and Duplex houses, Congregate living facilities with 16 or fewer persons.

R-2 Residential occupancies where the occupants are primarily permanent in nature, containing more than two dwelling units, including:

Apartment houses

Condominiums

Executive Residences

R-3 Residential occupancies containing sleeping units where the occupants are primarily permanent in nature, including:

Convents

Dormitories

Hostels

Monasteries

R-4 Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living facilities not more than 16 occupants, excluding staff.

R-5 Residential occupancies containing sleeping units or more than two dwelling units or care/assisted living facilities where the occupants are primarily permanent in nature, including:

Home for the aged

Nursing home

Retirement home

Orphanage

R-6 Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

Inns, guest houses

Hotels

Motels

Service Apartments (transient)

2.1.10.6 Definitions

The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

APARTMENT. An apartment is a self-contained housing unit (a type of residential real estate) that occupies only part of a building.

BOARDING HOUSE. A building arranged or used for lodging, with or without meals, and not occupied as a single-family unit.

CONDOMINIUM . A condominium, is the form of housing tenure and other real property where a specified part of a piece of real estate (usually of an apartment house) is individually owned, while use of and access to common facilities in the piece such as hallways, heating system, elevators, exterior areas is executed under legal rights associated with the individual ownership and controlled by the association of owners that jointly represent ownership of the whole piece.

CONGREGATE LIVING FACILITIES. A building or part thereof that contains sleeping units where residents share bathroom and/or kitchen facilities.

DORMITORY. A space in a building where group sleeping accommodations are provided in one room, or in a series of closely associated rooms, for persons not members of the same family group, under joint occupancy and single management, as in college dormitories or fraternity houses.

EXECUTIVE RESIDENCE. An executive residence is a type of furnished apartment available for long-term stays, which provides amenities for daily use.

PERSONAL CARE SERVICE. The care of residents who do not require chronic or convalescent medical or nursing care. Personal care involves responsibility for the safety of the resident while inside the building.

RESIDENTIAL CARE/ ASSISTED LIVING FACILITIES. A building or part thereof housing persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment which provides personal care services. The occupants are capable of responding to an emergency situation without physical assistance from staff. This classification shall include, but not be limited to, the following: residential board and care facilities, assisted living facilities, halfway houses, group homes, congregate care facilities, social rehabilitation facilities, alcohol and drug abuse centres and convalescent facilities.

SERVICED APARTMENT. A serviced apartment is a type of furnished apartment available for short-term or long-term stays, which provides amenities for daily use.

TRANSIENT. Occupancy of a dwelling unit or sleeping unit for not more than 30 days.

2.1.11 Storage (Group S)

2.1.11.1 General

Storage Group S occupancy includes, among others, the use of a building or structure, or a portion thereof, for storage that is not classified as a hazardous occupancy.

2.1.11.2 Moderate-hazard storage (Group S-I)

Buildings occupied for storage uses that are not classified as Group S-2, but not limited to:

Aerosols, Levels 2 and 3

Aircraft hangar (storage and repair) I

Bags: cloth, burlap and paper

Bamboos and rattan

Baskets

Belting: canvas and leather

Books and paper in rolls or packs

Boots and shoes

Buttons, including cloth covered, pearl or bone

Cardboard and cardboard boxes

Clothing, woollen wearing apparel

Cordage

Dry boat storage (indoor)

Furniture

Furs

Glues, mucilage, pastes and size

Grains

Horns and combs, other than celluloid

Leather

Linoleum

Lumber

Motor vehicle repair garages

Photo engravings

Resilient flooring

Silks

Soaps

Sugar

Tires, bulk storage of

Tobacco, cigars, cigarettes and snuff

Upholstery and mattresses

Wax candles

2.1.11.3 Low-Hazard storage (Group S-2)

Group S-2 includes, among others, buildings used for the storage of non-combustible materials

such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles or film wrapping. Group S-2 storage uses shall include, but not limited to:

Asbestos

Beverages up to and including 16-percent alcohol in metal, glass or ceramic containers

Cement in bags

Chalk and crayons

Dairy products in non waxed coated paper containers

Dry cell batteries

Electrical coils

Electrical motors

Empty cans

Food products

Foods in non-combustible containers

Fresh fruits and vegetables in non plastic trays or containers

Frozen foods

Glass

Glass bottles, empty or filled with non-combustible liquids

Gypsum board

Inert pigments

Ivory

Meats

Metal cabinets

Metal desks with plastic tops and trim

Metal parts

Metals

Mirrors

Oil-filled and other types of distribution transformers

Parking garages open or enclosed

Porcelain and pottery

Stoves

Talc and soap

Washers and dryers, etc.

2.1.12 Utility and Miscellaneous (Group U)

2.1.12.1 General

Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not limited to:

2.1.12.2 Agricultural Buildings (Group U-1)

Group U-1, Agricultural uses, including, but not limited to:

Livestock Shelters or Buildings, including Shade Structures & Milking barns

Poultry Buildings or Shelters

Barns

Storage of equipment & machinery used exclusively in agriculture

Horticultural Structures including Crop Protection Shelters

Sheds

Grain Silos

Stables

Greenhouse

2.1.12.3 Group U-2

Group U-2 shall include, but not limited to:

Fences over 6 feet (1829 mm) high

Retaining Walls

2.1.12.4 Group U-3

Group U-3 shall include, but not limited to:

Aircraft Hangars

Carports

Private Garages, Generator Houses

Sheds, Telephone Booth, Kiosk, Media Corner

Stables

Tanks, Towers

Public Bath

Garbage Yards

2.2 ARCHITECTURAL REQUIREMENTS AND SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

This section is intended for applying to buildings or structures along with the architecture, occupancy and construction requirements. It contains the Architectural and special detailed requirements for Health Care buildings, Education, Covered Mall Building, High-rise buildings to
cooperate with allied disciplines in architectural design.
This should comply with the related rules, regulations, guidelines and standards issued by concerned Authorities such as Development Committee in respective cities and regions, High-Rise and Public Building Projects Committee (HPBC), Fire Services Department, Health, Education, Hotel, Culture, etc.

2.2.1 Health Care Buildings

2.2.1.1 General

Generally all health care buildings are divided into hospital and clinics.
The buildings belonging to "hospital category" are defined as those where the patients' care require longer than 24 hours and clinics are all where health-care personnel provision time less than 24 hours.
All health care buildings shall have proper garbage disposal system or shall have hygienic arrangements for garbage disposal.
All health care buildings shall be provided with accessibility systems in accordance with Chapter7 of this code.

2.2.1.2 General requirement of hospitals

All hospitals, whether these are rehabilitation hospitals or healing hospitals, the followings rules shall be observed:

a) The maximum height for all hospital buildings shall be according to the functions of the hospitals and the permission of Regional Governments and concerned Municipal Authorities and Health..

b) The maximum number of beds in one patient-room in any hospital is 10.

c) Whether the patients' rooms are provided with air-conditioning systems or not, all patients' rooms are to have windows leading to outside space and with the following rules:

(1) The window areas shall be minimum of 10% of floor area.

(2) The minimum distance of building near that window in any case shall be minimum 10 ft.

d) The floor area of any patient-room shall be minimum 60 sq.ft. per bed.

e) The egress and the escape routes must be in conformity with chapters 6 of this code.

f) There shall be minimum of one toilet for 8 beds and one shower facility for 16 beds.

g) In cases of patients' rooms with more than 2 beds, separate room for the patient's attendants, individual or the nurse, shall be provided separate space. The attendants, living in the patients' rooms is not permissible.

h) All hospitals with more than 20 beds shall have mortuary with proper cooling system.

2.2.1.3 General requirement of clinics

All clinics, whether these are out-patient clinics or clinics combined with operational and other kinds of treatments, the followings rules shall be observed:

a) There shall be not more than 10 doctors in one joined consultation room.

b) There shall be physical separation between the paediatric clinics and the general clinics.

c) There shall be physical separation between the gynecological clinics and the general clinics, however paediatric clinics and the gynecological clinics can be combined.

d) The floor area of waiting room in a consultation unit shall be calculated based on the number of consultants. This shall be minimum of 200 sq.ft. per consultant.

e) The egress and the escape routes must be in conformity with chapters 6 of this code.

f) There shall be minimum of one toilet for 15 waiting chairs.

2.2.2 Ambulatory Health Care Facilities

2.2.2.1 General

Occupancies classified as Group B ambulatory health care facilities shall comply with the provisions of Sections 2.2.2.2 through 2.2.2.6 and other applicable provisions of this code.

2.2.2.2 Smoke barriers

Smoke barriers shall be provided to subdivide every ambulatory care facility greater than 10,000 square feet (929 m2) into a minimum of two smoke compartments per story. The travel distance from any point in a smoke compartment to a smoke barrier door shall not exceed 200 feet (60 960 mm). The smoke barrier shall be installed in accordance with Myanmar Fire Safety Code of Procedures.

2.2.2.3 Refuge area

At least 30 net square feet (2.8 m2) per no ambulatory patient shall be provided within the aggregate area of corridors, patient rooms, treatment rooms, lounge or dining areas and other low-hazard areas on each side of each smoke barrier.

2.2.2.4 Independent egress

A means of egress shall be provided from each smoke compartment created by smoke barriers without having to return through the smoke compartment from which means of egress originated.

2.2.2.5 Automatic sprinkler systems

Automatic sprinkler systems shall be provided for ambulatory care facilities in accordance with Myanmar Fire Safety Code of Procedures.

2.2.2.6 Fire alarm systems

A fire alarm system shall be provided in accordance with Myanmar Fire Safety Code of Procedures.

2.2.3 Educational Buildings

2.2.3.1 Groupings and class rooms

The number of children in each group for respective ages and levels and required minimum floor areas must conform to the following norms, unless otherwise define in the concerned educational authorities.

Table 2.2.3 Groupings and Floor Area Requirements in the Class Rooms for Respective Levels

Levels	No. of children per room	Class room Area (sq-ft per child)
Nursery children below four years	10 children	30 sq-ft per child
Kindergarten children below six years	15 children	30 sq-ft per child
Primary classes, first grade to 4th grade	25 children	25 sq-ft per child
Middle classes, fifth grade to eight grade	40 children	20 sq-ft per child
High school classes	40 children	20 sq-ft per child

All class rooms must have additional storage space for common properties of the class. For nurseries and kindergartens: there should be separate space for play areas and rest/sleeping areas. For all classes: The maximum width of all class rooms should not exceed 35 feet. Class rooms must have window areas which are not less than 15% of the floor areas and window sill heights must be not less than 3ft. And the railing height must be inconformity with section 2.5.7.3. Class rooms' heights must be minimum 9 ft. All class rooms must be connected with covered corridors or passages.

2.2.3.2 General requirements

All education building must have assembly areas which should hold at least 50% of all children with minimum floor areas of 7 sq.ft per child. For urban schools, ample parking space and delivery of children must be considered. There should be rooms for teachers with maximum eight teachers in one room and at least 80 sq-ft per teacher. There should be separate toilet facilities for teachers and children and the toilets for the students must be able to check the misuse of drugs and other illicit activities. All schools must have schools library and computer facilities. All schools must have space for facilities of physical education, handicraft and domestic science education for the children. In addition to the open space requirements of this chapter there should be play ground around 20,000 sq-ft for all schools with more than 500 children.

2.2.3.3 Open space requirements

The requirements for open spaces of respective norms are as the following table 2.2.3.

Table 2.2.3 Open Space Requirements for Respective Levels

Levels	Covered open space (minimum)	Open spaces (minimum)	Open shed (minimum)
Nursery children below four years	10 sq-ft per child	10 sq-ft per child	
Kindergarten children below six years	10 sq-ft per child	10 sq-ft per child	
Primary classes, first grade to 4th grade		15 sq-ft per child	10 sq-ft per child
Middle classes, fifth grade to eight grade		20 sq-ft per child	10 sq-ft per child
High school classes		20 sq-ft per child	10 sq-ft per child

2.2.3.4 General requirements for higher educational institution

The requirements for higher educational institution are as follow:

a) The higher educational institution shall have separate compound with ample land area to provide academic and recreational facilities.

b) The higher educational institution shall provide auxiliary functions and facility such as libraries, multimedia places etc.

c) The higher educational institution shall have sport facility for students.

d) The higher educational institution shall have medical care facility for students and staffs.

2.2.3.5 Requirements for New School design

The following requirements shall be considered:

a) The building should provide for health, safety, and security.

b) The learning environment should enhance teaching and learning and accommodate the needs of all learners.

c) The learning environment should serve as a center for the community.

d) The learning environment should result from a planning/design process that involves all stakeholders.

e) The learning environment should allow for flexibility and adaptability to changing needs.

f) The learning environment should make effective use of all available resources.

2.2.3.6 Current design principles,

1. Current design principles including:
2. Design for protection against natural hazards

3. Design with increased attention to occupant security
4. Design with increased use of day lighting and comfort control
5. Design for durability

2.2.4 Covered Mall and Open Mall Buildings

2.2.4.1 Scope

The provisions of this section shall apply to buildings or structures defined herein as covered mall buildings not exceeding three floor levels at any point nor more than three stories above grade plane. Except as specifically required by this section, covered mall buildings shall meet applicable provisions of this code.

Exceptions:

a) Foyers and lobbies of Business Groups B, and Residential Groups R are not required to comply with this section.

b) Buildings need not comply with the provisions of this section when they totally comply with other applicable provisions of this code.

2.2.4.2 Definitions

The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

ANCHOR BUILDING. An exterior perimeter building of a group other than H having direct access to a covered mall building but having required means of egress independent of the mall.

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 chapter, anchor buildings shall not be considered as a part of the covered mall building. The term" covered mall building" shall include open mall buildings as defined below.

Mall. A roofed or covered common pedestrian area within a covered mall building that serves as access for two or more tenants and not to exceed three levels that are open to each other. The term "mall" shall include open malls as defined below.

Open mall. An unroofed common pedestrian way serving a number of tenants not exceeding three levels. Circulation at levels above grade shall be permitted to include open exterior balconies leading to exits discharging at grade.

Open mall building. Several structures housing a number of tenants, such as retail stores, drinking and dining establishment. entertainment and amusement facilities, offices, and other similar uses, wherein two or more tenants have a main entrance into one or more open malls. Anchor buildings are not considered as a part of the open mall building.

FOOD COURT. A public seating area located in the mall that serves adjacent food preparation tenant spaces.

GROSS LEASABLE AREA. The total floor area designed for tenant occupancy and exclusive use. The area of tenant occupancy is measured from the center lines of joint partitions to the outside of the tenant walls. All tenant areas, including areas used for storage, shall be included in calculating gross leasable area.

2.2.4.4 Lease plan

Each covered mall building owner shall provide both the building and fire departments with a lease plan showing the location of each occupancy and its exits after the certificate of occupancy has been issued. No modifications or changes in occupancy or use shall be made from that shown on the lease plan without prior approval of the building official.

2.2.4.4 Means of egress

Each tenant space and the covered mall building shall be provided with means of egress as required by *Chapter 6, Means of Egress*.

2.2.4.5 Mall width

For the purpose of providing required egress, malls are permitted to be considered as corridors but need not comply with the requirements of *Chapter 6, Means of Egress* of this code where the width of the mall is as specified in this section.

2.2.4.5.1 Minimum width

The minimum width of the mall shall be 20 feet (6096 mm). The mall width shall be sufficient to accommodate the occupant load served. There shall be a minimum of 10 feet (3048 mm) clear exit width to a height of 8 feet (2438 mm) between any projection of a tenant space bordering the mall and the nearest kiosk, vending machine, bench, display opening, food court or other obstruction to means of egress travel.

2.2.4.5.2 Minimum width open mall

The minimum floor and roof opening width above grade shall be 20 feet (6096 mm) in open malls.

2.2.4.6 Fire-resistance-rated separation

Fire-resistance-rated separation is not required between tenant spaces and the mall. Fire-resistance-rated separation is not required between a food court and adjacent tenant spaces or the mall.

2.2.4.6.1 Attached garage

An attached garage for the storage of passenger vehicles having a capacity of not more than nine persons and open parking garages shall be considered as a separate building where it is separated from the covered mall building by not less than 2-hour fire barriers constructed in accordance with Myanmar Fire Safety Code of Procedures.

Exception: Where an open parking garage or enclosed parking garage is separated from the covered mall building or anchor building a distance greater than 10 feet (3048 mm), the provisions of *fire-resistance rating requirements* shall apply.

Pedestrian walkways and tunnels that attach the open parking garage or enclosed parking garage to the covered mall building or anchor building shall be constructed

in accordance with *Pedestrian Walkways and Tunnels, Chapter 4, Special Building and Construction.*

2.2.4.6.2 Tenant separations

Each tenant space shall be separated from other tenant spaces by a fire partition complying with Myanmar Fire Safety Code of Procedures.

A tenant separation wall is not required between any tenant space and the mall.

2.2.4.6.3 Anchor building separation

An anchor building shall be separated from the covered mall building by fire walls complying with Myanmar Fire Safety Code of Procedures.

Exception: Anchor buildings of not more than three stories above grade plane that have an occupancy classification the same as that permitted for tenants of the covered mall building shall be separated by 2-hour fire-resistive fire barriers complying with Myanmar Fire Safety Code of Procedures.

2.2.4.7 Interior finish

Interior wall and ceiling finishes within the mall and exits shall have non-flammable materials and all floors must be of non-slip finishes.

2.2.4.8 Automatic sprinkler system

The covered mall building and buildings connected shall be equipped throughout with an automatic sprinkler system in accordance with Myanmar Fire Safety Code of Procedures, which shall comply with the followings:

a) The automatic sprinkler system shall be complete and operative throughout occupied space in the covered mall building prior to occupancy of any of the tenant spaces. Unoccupied tenant spaces shall be similarly protected unless provided with approved alternative protection.

b) Sprinkler protection for the mall shall be independent from that provided for tenant spaces or anchors. Where tenant spaces are supplied by the same system, they shall be independently controlled.

2.2.4.8.1 Standpipe system

The covered mall building shall be equipped throughout with a standpipe system as required by Myanmar Fire Safety Code of Procedures.

2.2.4.9 Smoke control

Where a covered mall building contains an atrium, a smoke control system shall be provided.

Exception: A smoke control system is not required in covered mall buildings when an atrium connects only two stories.

2.2.4.10 Kiosks

Kiosks and similar structures (temporary or permanent) shall meet the following requirements:

a) Combustible kiosks or other structures shall not be located within the mall unless permitted by the Myanmar Fire Safety Code of Procedures.

b) Kiosks or similar structures located within the mall shall be provided with approved fire suppression detection devices.

c) The minimum horizontal separation between kiosks or groupings thereof and other structures within the mall shall be 20 feet (6096 mm).

d) Each kiosk or similar structure or groupings thereof shall have a maximum area of 300 square feet (28 m2).

e) There shall be no function in the kiosks with open flame.

2.2.4.11 Children's playground structures

Structures intended as children's playgrounds that exceed 10 feet (3048 mm) in height and 150 square feet (14 m2) in area shall comply with Covered mall and Open mall Buildings Sections.

2.2.4.11.1 Materials

Children's playground structures shall be constructed of non-combustible materials.

2.2.4.11.2 Fire protection

Children's playground structures located within the mall shall be provided with the same level of approved fire suppression and detection devices required for kiosks and similar structures.

2.2.4.11.3 Separation

Children's playground structures shall have a minimum horizontal separation from other structures within the mall of 20 feet (6090 mm).

2.2.4.11.4 Area limits

Children's playground structures shall not exceed 300 square feet (28 m2) in area, unless a special investigation has demonstrated adequate fire safety.

2.2.4.12 Security grilles and doors

Horizontal sliding or vertical security grilles or doors that are a part of a required means of egress shall conform to the following:

a) They shall remain in the full open position during the period of occupancy by the general public.

b) Doors or grilles shall not be brought to the closed position when there are 10 or more persons occupying spaces served by a single exit or 50 or more persons occupying spaces served by more than one exit.

c) The doors or grilles shall be openable from within without the use of any special knowledge or effort where the space is occupied.

d) Where two or more exits are required, not more than one-half of the exits shall be permitted to include either a horizontal sliding or vertical rolling grille or door.

2.2.4.13 Standby power

Covered mall buildings exceeding 50,000 square feet (4645 m2) shall be provided with standby power systems that are capable of operating the emergency voice/ alarm communication system and lighting.

2.2.4.14 Emergency voice/ alarm communication system

Covered mall buildings exceeding 50,000 square feet (4645 m2) in total floor area shall be provided with an emergency voice/ alarm communication system. Emergency voice/ alarm communication systems serving a mall required or otherwise, shall be accessible to the concerned authority.

2.2.4.15 Height and width of Signs

Plastic signs shall not exceed a height of 36 inches (914 mm), except that if the sign is vertical, the height shall not exceed 96 inches (2438 mm) and the width shall not exceed 36 inches (914 mm).

2.2.4.16 Fire department access to equipment

Rooms or areas containing controls for air-conditioning systems, automatic fire-extinguishing systems or other detection, suppression or control elements shall be identified for use by the fire services department.

2.2.4.17 Daylight provision for Mall

For the purpose of providing daylight, meant for the time of power failure, there should be minimum of 10% of the floor area of day-light provisions such as windows, etc. The furthest distance of such openings shall be less 80 feet from any point in that mall area.

2.2.5 High-Rise Buildings

2.2.5.1 Applicability

High-rise buildings shall comply with Sections 2.2.5.2 through 2.2.5.6.

Exception: The provisions of *Sections 2.2.5.2 through 2.2.5.6* shall not apply to the following buildings and structures:

a) Concerning the location of high-rise buildings shall be designed to build in the vicinity of historical structures, according to the local Zoning Plan and regulations or, as specified by Regional Governments and concerned Municiplal Authority of the respected towns and regions.

b) Airport traffic control towers in accordance with *Section 2.2.11.*

c) Open parking garages in accordance with *Section 2.2.7.3.*

d) Buildings with a Group A-5 occupancy in accordance with *Assembly Group A, Chapter 1, Use and Occupancy Classification.*

e) Special industrial occupancies in accordance with *Chapter 3, General Building Height and Area.*

2.2.5.2 Automatic sprinkler system

Buildings and structures shall be equipped throughout with an automatic sprinkler system and a secondary water supply in accordance with Myanmar Fire Safety Code of Procedures.

Exception: An automatic sprinkler system shall not be required in spaces or areas of:

a) Open parking garages in accordance with Section 2.2.7.3.

b) Telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces II or areas are equipped throughout with an automatic fire detection system.

2.2.5.2.1 Number of sprinkler risers and system design

Each sprinkler system zone in buildings that are more than 420 feet (128 m) in building height shall be supplied by a minimum of two risers. Each riser shall supply sprinklers on alternate floors. If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.

2.2.5.2.1.1 Riser location

Sprinkler risers shall be placed in exit enclosures that are remotely located in accordance with *Exit and Exit Access Doorways Section, Chapter 6, Means of Egress*.

2.2.5.2.2 Water supply to required fire pumps

Required fire pumps shall be supplied by connections to a minimum of two water mains located in different streets.

Separate supply piping shall be provided between each connection to the water main and the pumps. Each connection and the supply piping between the connection and the pumps shall be sized to supply the flow and pressure required for the pumps to operate.

Exception: Two connections to the same main shall be permitted provided the main is valued such that an interruption can be isolated so that the water supply will continue without interruption through at least one of the connections.

2.2.5.3 Emergency systems

The detection, alarm and emergency systems of high-rise buildings shall comply with Myanmar Fire Safety Code of Procedures.

2.2.5.3.1 Standby power

A standby power system complying with *Part 5, Building Services.*

2.2.5.4 Means of egress and evacuation;

The means of egress in high-rise buildings shall comply with Chapter *6, Means of egress.*

2.2.5.5 Elevators

Elevator installation and operation in high-rise buildings shall comply with *Part 5, Building Services.*

2.2.6 Atriums

2.2.6.1 General

The provisions of this section shall apply to buildings or structures containing vertical openings defined herein as "Atriums."

2.2.6.1.1 Definition

The following word and term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

ATRIUM. An opening connecting two or more stories other than enclosed stairways, elevators, hoist ways, escalators, plumbing, electrical, air-conditioning or other equipment, which is closed at the top and not defined as a mall. Stories, as used in this definition, do not include balconies within assembly groups or mezzanines that comply with *Mezzanines Section, Chapter 3, General Building Heights and Areas.*

2.2.6.2 Use

The floor of the atrium shall not be used for other than low fire hazard uses and only approved materials and decorations in accordance with Myanmar Fire Safety Code of Procedures shall be used in the atrium space.

Exception: The atrium floor area is permitted to be used for any approved use where the individual space is provided with an automatic sprinkler system in accordance with *Automatic Sprinkler Systems*, Myanmar Fire Safety Code of Procedures.

2.2.6.3 Automatic sprinkler protection

An approved automatic sprinkler system shall be installed throughout the entire building.

2.2.6.4 Fire alarm system

A fire alarm system shall be provided in accordance with Myanmar Fire Safety Code of Procedures.

2.2.6.5 Smoke control

A smoke control system shall be installed in accordance with Myanmar Fire Safety Code of Procedures.

Exception: Smoke control is not required for atriums that connect only two stories.

2.2.6.6 Enclosure of atriums

Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier constructed in accordance with Myanmar Fire Safety Code of Procedures.

2.2.6.7 Standby power

Equipment required to provide smoke control shall be connected to a standby power system in accordance with Myanmar Fire Safety Code of Procedures.

2.2.7 Special Amusement Buildings

2.2.7.1 General

Special amusement buildings having an occupant load of 50 or more shall comply with the requirements for the appropriate Group A occupancy and *Sections 2.2.10.1 through 2.2.10.8.* Amusement buildings having an occupant load of less than 50 shall comply with the requirements for a Group B occupancy and *Sections 2.2.10.1 through 2.2.10.8.*

Exception: Amusement buildings or portions thereof those are without walls or a roof and constructed to prevent the accumulation of smoke.

2.2.7.2 Definition

The following word and term shall, for the purpose of this section and as used elsewhere in this code, have the meaning shown herein.

SPECIAL AMUSEMENT BUILDING. A special amusement building is any temporary or permanent building or portion thereof that is occupied for amusement, entertainment or educational purposes and that contains a device or system that conveys passengers or provides a walkway along, around or over a course in any direction so arranged that the means of egress path is not readily apparent due to visual or audio distractions or is intentionally confounded or is not readily available because of the nature of the attraction or mode of conveyance through the building or structure.

2.2.7.3Automatic fire detection

Special amusement buildings shall be equipped with an automatic fire detection system in accordance with *Fire Alarm and Detection Systems Section,* Myanmar Fire Safety Code of Procedures.

2.2.7.4 Automatic sprinkler system

Special amusement buildings shall be equipped throughout with an automatic sprinkler system in accordance with Myanmar Fire Safety Code of Procedures.

Where the special amusement building is temporary, the sprinkler water supply shall be of an approved temporary means.

2.2.7.5 Alarm

Actuation of a single smoke detector, the automatic sprinkler system or other automatic fire detection device shall immediately sound an alarm at the building at a constantly attended location from which emergency action can be initiated including the capability of manual initiation of requirements in Myanmar Fire Safety Code of Procedures.

2.3 GENERAL BUILDING HEIGHTS AND AREAS

2.3.1 Definitions

The following words and definitions applied to this chapter and used in other places in this code have the meanings as described below:

AREA, building: The area included within surrounding exterior walls (or exterior walls and fire walls) exclusive of vent shafts and courts. Areas of the building not provided with surrounding walls must be included in the building area if these areas are included within the horizontal projection of the roof or floor above.

BASEMENT: The portions of buildings that are partly below grade plane. A basement must be considered as a story above grade plane where the finished surface of the floor above the basement is more than 6 feet above grade plane or more than 12 feet above the finished ground level at any point. A basement is a story that is not a story above the grade plane.

EQUIPMENT PLATFORM: An unoccupied, elevated platform used exclusively for mechanical systems or industrial process equipment, including the associated elevated walkways, stairs, and ladders necessary to access the platform.

GRADE PLANE: A reference plane representing the average of finished ground level adjoining the building at exterior walls. Where the finished ground level slopes away from the exterior walls, the reference plane must be established by the lowest points within the area between the building and the lot line or, where the lot line is more than 6 feet from the building, between the building and a point 6 feet from the building.

HEIGHT, building: The vertical distance from grade plane to the average height of the highest roof surface.

HEIGHT, STORY: The vertical distance from top to top of two successive finished floor surfaces; and, to 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.

MEZZANINE: An intermediate level or levels between the floor and ceiling of any story and in accordance with this chapter.

2.3.2 General height and area limitations

The height and area for buildings of different construction types will be ruled by the intended use of the building and cannot go over the limits except as modified from the date of this code coming into force. In Protection and Preserved Zone, Cultural Heritage Regions and Conservation Zones, building heights and locations of new buildings are restricted by the relevant laws concerning the preservation and management of historic views (1998 Law, Chapter IV) and the wider setting of listed buildings, conservation zones and other historic areas and landscapes. Where a new building will affect any of these heritage assets, the developer must set out clearly the potential impact of the new development on those assets. Where there is demonstrable harm to the assets, the development will be refused permission. Each part of a building included within the inside and outside walls and fire walls, where present, will be allowed to be a separate building. Buildings and structures that are designed to accommodate special industrial processes that require large areas and unusual heights to contain cranes or special machinery and equipment are exempt from the height restrictions, such as:

- Rolling mills

- Structural metal fabrication shops and foundries

- The production and distribution of electricity

- The production and distribution of gas or steam power.

There are situations when two or more buildings are on the same building lot. When this happens, they are to be regulated as separate buildings or they will be considered as parts of one building if the height of each building and the total area of the buildings are within the limits of Tables as shown in this code. The requirements of this code that are valid to the total building will be appropriate to each building. Buildings that are Type I construction are allowed to be unlimited level heights and areas are not required to stick to the special requirements that allow unlimited area buildings, unlimited height, or increased height and areas for other types of construction in this chapter.

2.3.2.1 The limitation of area and height of buildings of different occupancy classes

Different occupancy classes (Part 2) and types of construction (Part 3,7) shall be achieved by specifying it in terms of Floor area ratio FAR, which shall take into account the various aspects that govern in specifying FAR by Concerned Zoning Plan and Municipal Authority.

2.3.2.1.1 Height

The height that is allowed by code will be increased in agreement with this section with the exception that the height of one-story aircraft hangars, aircraft paint hangers, and buildings used for the manufacturing of aircraft will not be limited if the building is provided with an automatic fire-extinguishing system and is entirely surrounded by public ways or yards no less in width than one and one-half times the height of the building.

2.3.2.1.2 Mezzanines

Mezzanines that conform to this section can be considered a portion of the story.

The total area of a mezzanine is not allowed to be over 60% of the floor area of the gross floor area that they are in and also cannot include the enclosed part of the room to determine the floor area where the mezzanine is located, and the total area of mezzanines in buildings and structures that are Type IV or V, provided that the clear floor height of the mezzanine cannot be less than 8 feet.

The total area of a mezzanine within a room is not allowed to be over 50% of the floor area of the room or the space that they are in and also cannot include the enclosed part of the room to determine the floor area where the mezzanine is located. The area of the mezzanine must be included in determining the fire area, The clear floor height of the mezzanine cannot be less than 7 feet. When determining the allowable mezzanine area, the area of the mezzanine cannot be included in the floor area except for the following:

a) The total area of mezzanines in buildings and structures that are Type I or II for special industrial occupancies in accordance with this chapter cannot be more than two-thirds of the area in the room.

b) The total area of mezzanines in buildings and structures that are Type I or II cannot be more than one-half of the area of the room in buildings and structures that have an approved sprinkler

system throughout. The sprinkler system has to be in accordance with code requirements and an approved emergency voice/alarm communication system.

c) Mezzanines are no different when talking about exits and exit routes. Each occupant of a mezzanine must have access to at least two exits where the common path of exit travel is over the limits of Chapter (6). If the exit from your mezzanine is a stairway, the maximum travel distance must include the distance traveled on the stairway measured in the plane of the tread nosing.

d) Accessible means of exits must be provided, as well as a single means of exit. If a building or structure has a mezzanine it has to be open and no obstructions are allowed in the room where the mezzanine is located, except for walls that are not more than 42 inches high, columns, and posts.

There are five exceptions to this code, and they are as follows:

a) Mezzanines or portions that are of concern are not required to be open, provided that the occupant load does not go over 10 persons.

b) Mezzanines or portions that are of concern are not required to be open to the room if at least one of the exits provides direct access to an exit from the mezzanine level.

c) Mezzanines are not required to be open to the room, provided that the total floor area of the enclosed space does not go over 10 percent of the area.

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

e) In Groups H and I occupancies that are no more than two stories in height above grade plane and equipped with an automatic sprinkler, a mezzanine having two or more exits is not required to be open to the room in which the mezzanine is located. And required to be complied with travel distance in Chapter 2.6 of this code.

2.3.3 Allowable Floor Areas

The Allowable Floor Area of any proposed building/structure shall only be as allowed based on the Allowed Percentage of Plot Area Ratio (PAR) and floor area ratio (FAR) as specified by concerned Zoning Plan and Municipal Authority.

2.3.4 Maximum Height of Buildings

The maximum height and number of storeys of proposed building shall be dependent upon the character of use or occupancy and the type of construction (see notes), considering end-user population density, light and ventilation, width of streets particularly of its roadway/carriageway component, off-street cum off-site parking requirements, etc. and in relation to local land use plan and zoning regulations as well as other environmental considerations. The height shall be measured from the highest adjoining side walk or ground surface, Provided that the height measured the lowest adjoining surface shall not exceed such maximum height by more than 3.00 meters or 9.84 feet; Except that towers, spires, and steeples, erected as part of a building and not used for habitation or storage are limited as to height only by structural design of combustible

materials or may extend not to exceed 6.00 meters or 20 feet above the height limits for each occupancy group if of combustible materials.

Determination of Building Height

Building Height Limit (BHL) the maximum height to be allowed for building/structures based on their proposed use or occupancy; the BHL is generally determined after the application of other development controls (DC) and certain other parameters, i.e., considerations of site conditions, view, etc. (Table 2.3.4.1). The BHL shall be generally measured from the established grade line to the topmost portion of the proposed building/structure. If applicable, the BHL may be subject to clearance requirements of the Air Transportation Office (ATO) or of the concerned military/security authorities, BHL excludes the height of permitted/allowed projections above the roof of the building/structure, e.g., signage. mast, antenna, telecom tower, beacons and the like.

The Building Height Limit (BHL)of any proposed building/structure shall only be as allowed under this Rule (as shown in table below) or under the duly approved city/municipal (local) zoning ordinance, whichever is more restrictive.

Table 2.3.4.1 Building Height Limit (BHL) by Type of Use or Occupancy

Character of Use or Occupancy	Type of Building/ Structure	Building Height Limit (BHL)	
		Number of allowable Storeys/floors above Established grade	Feet / Meters above highest Grade
Residential	Residential R1 Detached and Duplex houses	Concerned Zoning Plan and Municipal Authority	Concerned Zoning Plan and Municipal Authority
	Residential R2 Apartment houses Condominiums Executive Residences	Concerned Zoning Plan and Municipal Authority	Concerned Zoning Plan and Municipal Authority
	Residential R3 Convents Dormitories Hostels Monasteries	Concerned Zoning Plan and Municipal Authority	Concerned Zoning Plan and Municipal Authority
	Residential R 3-4 Home for the aged Nursing home Retirement home Orphanage	Concerned Zoning Plan and Municipal Authority	Concerned Zoning Plan and Municipal Authority
	Residential R 3-5 Home for the aged Nursing home Retirement home Orphanage	Concerned Zoning Plan and Municipal Authority	Concerned Zoning Plan and Municipal Authority

	Residential R3-6 Inns, guest houses Hotels Motels Service Apartments (transient)	Concerned Zoning Plan and Municipal Authority	Concerned Zoning Plan and Municipal Authority
Commercial	Business (B)	Concerned Zoning Plan and Municipal Authority	Concerned Zoning Plan and Municipal Authority
	Mercantile (M)	Concerned Zoning Plan and Municipal Authority	Concerned Zoning Plan and Municipal Authority
Educational	Schools(E-1)	Concerned Zoning Plan and Municipal Authority	Concerned Zoning Plan and Municipal Authority
	Schools(E-2)	Concerned Zoning Plan and Municipal Authority	Concerned Zoning Plan and Municipal Authority
Industrial	Industrial. 1 (F-1)	Concerned Zoning Plan and Municipal Authority	
	Industrial. 2 (F-2)	Concerned Zoning Plan and Municipal Authority	
	Industrial. 3 (F-3)	Concerned Zoning Plan and Municipal Authority	
Institutional	Institutional (I-1 to 5)	Concerned Zoning Plan and Municipal Authority	
Parks and Open Recreational and Entertainment Spaces		Concerned Zoning Plan and Municipal Authority	
Agricultural/Agro-Industrial/Tourism		Concerned Zoning Plan and Municipal Authority	
Planned Unit Development (PUD)	PUD at a reclamation area close to an operating airport	Concerned Zoning Plan and Municipal Authority	Concerned Zoning Plan and Municipal Authority
	PUD at a reclamation area	Concerned Zoning Plan and Municipal Authority	Concerned Zoning Plan and Municipal Authority
	PUD at a coastal area	Concerned Zoning Plan and Municipal Authority	Concerned Zoning Plan and Municipal Authority
	PUD at an inland area	Concerned Zoning Plan and Municipal Authority	Concerned Zoning Plan and Municipal Authority

Proposed Type of Construction:
For purposes of the Code, all buildings proposed for construction shall be classified according to the following types; and should also link with Part 3, Structure.
Type I - shall be of wood construction. The structural elements may be any of the materials permitted by (AHJ) Authority having Jurisdiction.
Type II - shall be of wood construction with protective fire-resistant materials and one-hour fire-resistive throughout, except, that permanent non-load bearing partitions may use fire- retardant treated wood within the framing assembly with one-hour resistivity.
Type III - shall be of masonry and wood construction. Structural elements may be any of the materials permitted by (AHJ) Authority having Jurisdiction, provided, that the building shall be one-hour fire-resistive throughout. Exterior walls shall be of incombustible fire-resistive construction.
Type IV - shall be steel, iron, concrete, or masonry construction and walls, ceiling and permanent partitions, shall be of Incombustible fire- resistive construction, except, that permanent non-bearing partitions of one-hour fire-resistive construction may use fire- retardant treated wood within the framing assembly.
Type V - shall be fire-resistive. The structural elements shall be of steel, iron, concrete, or masonry construction. Walls, ceilings and permanent partitions shall be of incombustible fire-resistive construction.

Note 2:
Establishing Grade

a) In case of sloping grade where the building footprint running perpendicular to the Road right of way (RROW) has a difference in elevation of less than 3.00 meters, the highest adjoining natural grade (ground surface) or finished grade (sidewalk surface) shall be considered the established grade elevation;
b) In case of sloping grade where the edges of the building footprint turning perpendicular to the RROW has a difference in elevation of more than 3.00 meters, the average grade level of the building footprint shall be considered the established grade elevation .

2.3.5 Mixed use and occupancy

Buildings or parts of buildings that contain two or more occupancies or uses are classified as mixed use. This section applies to mixed use occupancy and the buildings that they occupy. An incidental use area must be classified in accordance with the occupancy of that portion of the building in which it is located or the building must be classified as a mixed occupancy and will comply with this section.
Where the code allows an automatic fire-extinguishing system without a fire barrier, the incidental use area must be separated from the rest of the building by construction that is capable of resisting smoke from passing through the building. The partitions must extend from the floor to the underneath of the fire-resistance-rated floor/ceiling assembly or fire-resistance-rated roof/ceiling assembly above or to the bottom of the floor or roof sheathing or sub deck above. Doors must be self-closing or automatic closing when the detection of smoke is made. Doors also must not have any air transfer openings and cannot be undercut in excess of the clearance that is permitted in *Fire Services Department*. With some exceptions, no separation is required between ancillary occupancies and the main occupancy. Where an automatic fire-extinguishing

system or automatic sprinkler system is provided, only the incidental use areas need to be equipped with this system.

2.3.6 Equipment platforms

Equipment platforms in buildings cannot be considered as a portion of the floor below and must not contribute to either the building area or the number of stories as regulated by this chapter, and may also not use the area of the equipment platform to determine the fire area. Equipment platforms cannot be part of any mezzanine and these platforms and walkways, stairs, and ladders that provide access to an equipment platform cannot be used as an exit from the building either. There are some area limitations that you must be aware of.

The total area of all equipment platforms within a room cannot be larger than two-thirds of the area of the room which they are in. If the equipment platform is located in the same room as a mezzanine, the area of the mezzanine must be determined by this chapter and the combined total area of the room that they are in. If a mezzanine is in a building that is required to have an automatic sprinkler system, equipment platforms must be fully protected by these sprinklers above and below the platform.

Width must be at least 20 feet.

a) The automatic sprinkler system increase cannot apply to buildings with an occupancy in Group H-1.

b) The automatic sprinkler system increase must not apply to the floor area of occupancy in Group H-2 or H-3. For mixed-use buildings containing these occupancies, the allowable area must be calculated in accordance with this book, with the sprinkler increase applying only to the portions of the buildings not classified as Group H-2 or H-3.

2.3.7 Height determination for sky terrace floors

For developments with sky terrace floors, the overall height control will be relaxed, based on the proposed storey height of the development. The additional allowable height over and above the overall aggregate height for the development is tabulated:

Propose story height of development	**Additional height allowable over the overall aggregate height for developments with sky terrace levels**
7- 20	10.0m or 32.8 ft
21- 30	15.0m or 49.2 ft
31- 40	20.0m or 65.6 ft
41- 50	25.0m or 82 ft
50 above	30m or 98.4 ft

NOTE:

a) A sky terrace floor refers to a floor where the sky terrace areas within the 45-degree line occupy at least 60% of the floor plate, and is used for sky terrace and other communal purposes.

b) This additional height can only be distributed to sky terrace floors within the development.

c) Spaces for M&E services located directly beneath the sky terrace floor can also be included under the additional height. Drop-panels are not allowed at the soffit along the perimeter of sky terrace floors, as the intention is to encourage the provision of high volume open communal spaces.

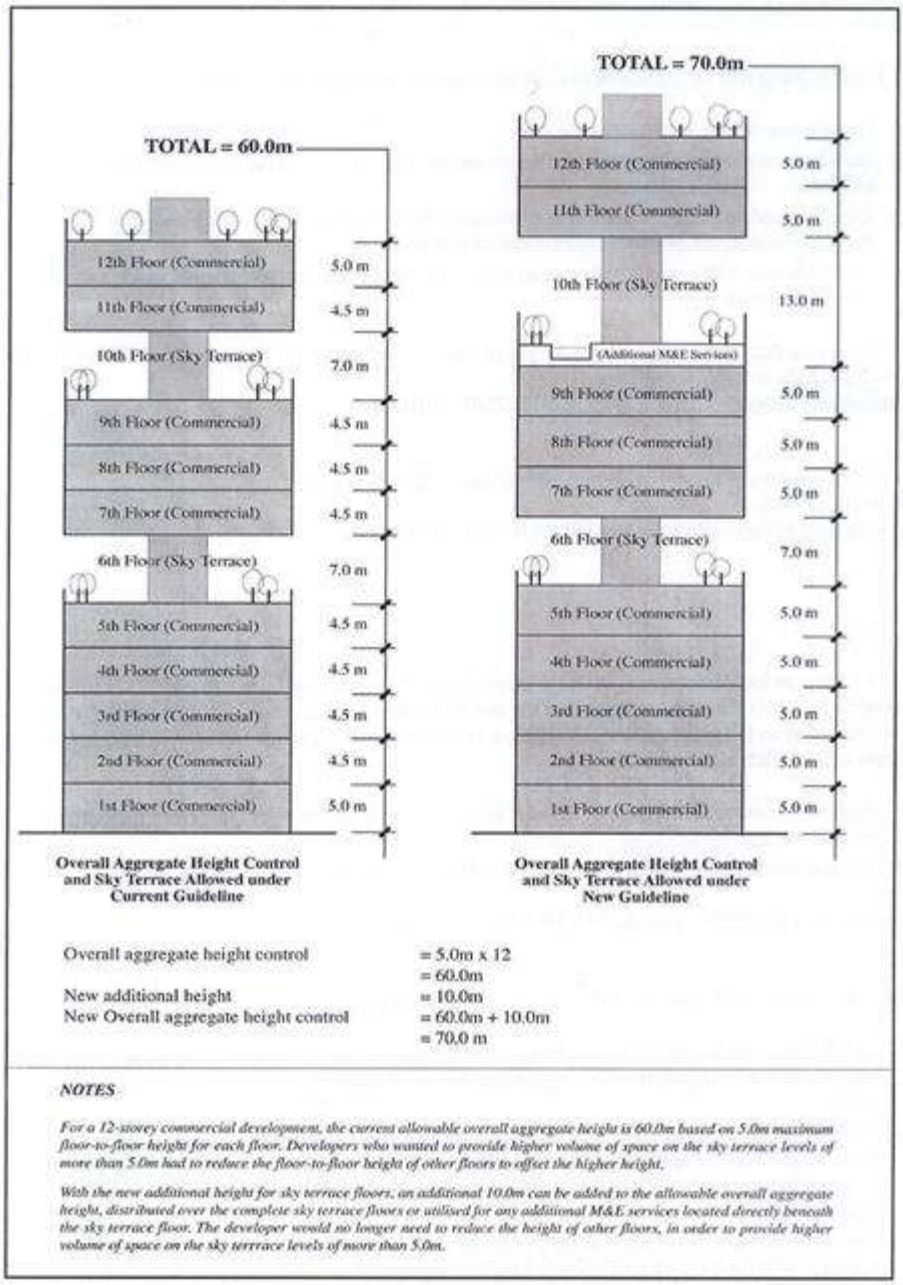


Figure 2.3.7.1 : Illustration On The Relaxation Of The Overall Aggregate Heights For Developments With Sky Terrace Floors

The illustration is shown as a guideline of a typical 12-storey commercial development that has an overall aggregate height of 60.0m based on 5.0m maximum floor-to-floor height for each floor, can enjoy an additional height of 10m, if the development includes at least one sky terrace floor.

2.4 SPECIAL BUILDING AND CONSTRUCTION

2.4.1 General

2.4.1.1 Scope

The provisions of this chapter shall manage special building construction including membrane structures, temporary structures, pedestrian walkways and tunnels, automatic vehicular gates, awnings and canopies, marquees, signs, and towers and antennas.

2.4.2 Membrane Structures

2.4.2.1 General

The provisions of this section shall apply to air-supported, air-inflated, membrane-covered cable and membrane-covered frame structures, collectively known as membrane structures, erected for a period of 180 days or longer. Those erected for a shorter period of time shall comply with the Myanmar Fire Safety Code of Procedures and *Myanmar Fire Services Law*. Membrane structures covering water storage facilities, water clarifiers, water treatment plants, sewage treatment plants, greenhouses and similar facilities not used for human occupancy are required to meet only the requirements of *Part 3, Structural Design*. Membrane structures erected on a building, balcony, deck or other structure for any period oftime shall comply with this section.

2.4.2.2 Definitions

The following words and terms shall, for the purposes ofthis section and as used elsewhere in this code, have the meanings shown herein.

AIR-INFLATED STRUCTURE. A structure that uses air-pressurized membrane beams, arches or other elements to enclose space. Occupants of such a structure do not occupy the pressurized area used to support the structure.

AIR-SUPPORTED STRUCTURE. A building wherein the shape of the structure is attained by air pressure and occupants of the structure are within the elevated pressure area. Air-supported structures are of two basic types:

Double skin. Similar to a single skin, but with an attached liner that is separated from the outer skin and provides an airspace which serves for insulation, acoustic, aesthetic or similar purposes.

Single skin. Where there is only the single outer skin and the air pressure is directly against that skin.

CABLE-RESTRAINED, AIR-SUPPORTED STRUCTURE. A structure in which the uplift is resisted by cables or webbings which are anchored to either foundations or dead men. Reinforcing cable or webbing is attached by various methods to the membrane or is an integral part of the membrane. This is not a cable-supported structure.

MEMBRANE-COVERED CABLE STRUCTURE. A nonpressurized structure in which a mast and cable system provides support and tension to the membrane weather barrier and the membrane imparts stability to the structure.

MEMBRANE-COVERED FRAME STRUCTURE. A non pressurized building wherein the structure is composed ofa rigid framework to support a tensioned membrane which provides the weather barrier.

NONCOMBUSTIBLE MEMBRANE STRUCTURE. A membrane structure in which the membrane and all component parts of the structure are noncombustible.

2.4.2.3 Allowable floor areas

The area of a membrane structure shall not exceed the limitations set forth in *Chapter 3, General Building Heights and Areas.*

2.4.2.4 Maximum height

Membrane structures shall not exceed one story nor shall such structures exceed the height limitations in ft set forth in *Chapter 3, General Building Heights and Areas.*

Exception: Non-combustible membrane structures serving as roofs only.

2.4.2.5 Engineering design

The structure shall be designed and constructed to sustain dead loads, live loads including wind, rain or flood and seismic loads and in accordance with *Part 3, Structural Design*.

2.4.2.6 Inflation systems

Air-supported and air-inflated structures shall be provided with primary and auxiliary inflation systems to meet the minimum requirements of the following.

2.4.2.6.1 Equipment requirements

This inflation system shall consist of one or more blowers and shall include provisions for automatic control to maintain the required inflation pressures. The system shall be so designed as to prevent overpressurization of the system.

2.4.2.6.1.1 Auxiliary inflation system

In addition to the primary inflation system, in buildings exceeding 1,500 sq-ft (140 sq-m) in area, an auxiliary inflation system shall be provided with sufficient capacity to maintain the inflation of the structure in case of primary system failure. The auxiliary inflation system shall operate automatically when there is a loss of internal pressure and when the primary blower system becomes inoperative.

2.4.2.6.1.2 Blower equipment

Blower equipment shall meet all of the following requirements:

a) Blowers shall be powered by continuous-rated motors at the maximum power required for any flow condition as required by the structural design.

b) Blowers shall be provided with inlet screens, belt guards and other protective devices as required by the concerned Authority to provide protection from injury.

c) Blowers shall be housed within a weather-protecting structure.

d) Blowers shall be equipped with backdraft check dampers to minimize air loss when inoperative.

e) Blower inlets shall be located to provide protection from air contamination. The location of inlets shall be approved.

2.4.2.6.2 Standby power

Wherever an auxiliary inflation system is required, an approved standby power-generating system shall be provided. The system shall be equipped with a suitable means for automatically starting the generator set upon failure of the normal electrical service and for automatic transfer and operation of all of the required electrical functions at full power within 60 seconds of such service failure. Standby power shall be capable of operating independently for a minimum of 4 hours.

2.4.2.6.3 Support provisions

A system capable of supporting the membrane in the event of deflation shall be provided for in air-supported and air-inflated structures having an occupant load of 50 or more or where covering a swimming pool regardless of occupant load. The support system shall be capable of maintaining membrane structures used as a roof not less than 20 ft (6096 mm) above floor or seating areas. The support system shall be capable of maintaining other membranes at least 7 ft (2134 mm) above the floor, seating area or surface of the water.

2.4.3 Temporary Structures

2.4.3.1 General

The provisions of this section shall apply to structures erected for a period of less than 180 days. Tents and other membrane structures erected for a period ofless than 180 days shall comply with the Myanmar Fire Safety Code of Procddures and *Mynmar Fire Services Law*. Those erected for a longer period of time shall comply with applicable sections of this code.

2.4.3.1.1 Permit required

Temporary structures that cover an area in excess of 120 sq-ft (11.16 sq-m), including connecting areas or spaces with a common means of egress or entrance which are used or intended to be used for the gathering together of 10 or more persons, shall not be erected, operated or maintained for any purpose without obtaining a permit from the concerned Authority.

2.4.3.2 Construction documents

A permit application and construction documents shall be submitted for each installation of a temporary structure. The construction documents shall include a site plan indicating the location of the temporary structure and information delineating the means of egress and the occupant load.

2.4.3.3 Means of egress

Temporary structures shall conform to the means of egress requirements of *Chapter 6, Means of Egress* and shall have a maximum exit access travel distance of 100 ft (30 480 mm).

2.4.3.4 Design and construction

The structure shall be designed and constructed to sustain dead loads, live loads including wind, rain or flood and seismic loads and in accordance with *Part 3, Structural Design*. Those erected

for a shorter period of time shall comply with the Myanmar Fire Safety Code of Procedures and *Myanmar Fire Services Law*.

2.4.4 Pedestrian Walkways or Tunnels

2.4.4.1 General

This section shall apply to connections between buildings such as pedestrian walkways and/ or tunnels, located at, above or below grade level, that are used as a means of travel by persons. The pedestrian walkway shall not contribute to the building area or the number of stories or height of connected buildings.

2.4.4.2 Separate structures

Connected buildings shall be considered to be separate structures.

Exceptions:

a) Buildings on the same lot. Two or more buildings on the same lot shall be regulated as separate buildings or shall be considered as portions of one building if the building height of each building and the aggregate building area of the buildings are within the limitations of *Chapter 3, General Building Heights and Areas*. The provisions of this code applicable to the aggregate building shall be applicable to each building.

b) Structurally connected buildings and buildings with multiple wings shall be considered one structure.

2.4.4.3 Construction

The pedestrian walkway shall be of noncombustible construction.

Exceptions:

Combustible construction shall be permitted where connected buildings are of combustible construction.

2.4.4.4 Contents

Only materials and decorations approved by the concerned Authority shall be located in the pedestrian walkway.

2.4.4.5 Fire Barriers between pedestrain walkways and buildings

Walkways shall be separated from the interior of the building by not less than 2 hour fire barriers constructed. This protection shall extend vertically from a point 10 ft (3048 mm) above the walkway roof surface or the connected building roof line, whichever is lower, down to a point 10 ft (3048 mm) below the walkway and horizontally 10 ft (3048 mm) from each side of the pedestrian walkway. Openings within the 10 ft (3048 mm) horizontal extension of the protected walls beyond the walkway shall be equipped with devices providing a3/4-hour fire protection rating.

Exception: The walls separating the pedestrian walkway from a connected building and the openings within the 10 ft (3048 mm) horizontal extension of the protected walls beyond the walkway are not required to have a fire-resistance rating by this section where any of the following conditions exist:

a) The distance between the connected buildings is more than 10 ft (3048 mm). The pedestrian walkway and connected buildings, except for open parking garages, are equipped throughout with an automatic sprinkler system. The wall is capable of resisting the passage of smoke or is constructed of a tempered, wired or laminated glass wall and doors subject to the following:

1) The wall or glass separating the interior ofthe building from the pedestrian walkway shall be protected by an automatic sprinkler system and the sprinkler system shall completely wet the entire surface of interior sides of the wall or glass when actuated;

2) The glass shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler operates; and

3) Obstructions shall not be installed between the sprinkler heads and the wall or glass.

b) The distance between the connected buildings is more than 10 ft (3048 mm) and both sidewalls of the pedestrian walkway are at least 50 percent open with the open area uniformly distributed to prevent the accumulation of smoke and toxic gases.

c) Buildings are on the same lot.

d) Where exterior walls of connected buildings are required to have a fire-resistance rating greater than 2 hours, the walkway shall be equipped throughout with an automatic sprinkler system installed.

e) The previous exception shall apply to pedestrian walkways having a maximum height above grade of three stories or 40 ft (12 192 mm), or five stories or 55 ft (16 764 mm) where sprinklered.

2.4.4.6 Public way

The installation of a pedestrian walkway over a public right-of-way shall be subject to the approval of the applicable concerned Authority. The vertical clearance from the public right-of-way to the lowest part of a pedestrian walkway shall be 15 ft (4572mm) minimum.

2.4.4.7 Egress

Access shall be provided at all times to a pedestrian walkway that serves as a required exit.

2.4.4.8 Width

The unobstructed width of pedestrian walkways shall not be less than 36 inches (914 mm). The total width shall not exceed 30 ft (9144 mm).

2.4.4.9 Tunneled walkway

Separation between the tunneled walkway and the building to which it is connected shall not be less than 2 hour fire-resistant construction and openings therein shall be protected.

2.4.5 Awnings and Canopies

2.4.5.1 General

Awnings or canopies shall comply with the requirements of this section and other applicable sections of this code.

2.4.5.2 Definitions

The following term shall, for the purposes of this section and as used elsewhere in this code, have the meaning shown herein.

AWNING. An architectural projection that provides weather protection, identity or decoration and is wholly supported by the building to which it is attached. An awning is comprised of a lightweight frame structure over which a covering is attached.

CANOPY. A permanent structure or architectural projection of rigid construction over which a covering is attached that provides weather protection, identity or decoration, and shall be structurally independent or supported by attachment to a building on one end and by not less than one stanchion on the outer end.

RETRACTABLE AWNING. A retractable awning is a cover with a frame that retracts against a building or other structure to which it is entirely supported.

2.4.5.3 Design and construction

Awnings and canopies shall be designed and constructed to withstand wind or other lateral loads and live loads as required by *Part 3, Structural Design* with due allowance for shape, open construction and similar features that relieve the pressures or loads. Structural members shall be protected to prevent deterioration. Awnings shall have frames of noncombustible material, fire-retardant-treated wood or noncombustible covers and shall be fixed, retractable, folding or collapsible.

2.4.5.4 Public way

There should be temporary awnings which project to the public right-of-way. If it is allowed by the concerned authority, the vertical clearance from the public right-of-way to the lowest part of awning, including valances, shall be 7 ft (2134 mm) minimum and the projection to the public way shall not be more than 3 ft.

2.4.6 Marquees

2.4.6.1 General

Marquees shall comply with this section and other applicable sections of this code.

2.4.6.2 Definitions

The following term shall, for the purposes of this section and as used elsewhere in this code, have the meaning shown herein.

MARQUEE. A permanent roofed structure attached to and supported by the building.

2.4.6.3 Thickness

The maximum height or thickness of marquee measured vertically from its lowest to its highest point shall not exceed 3 ft (914 mm) where the marquee projects more than two-thirds of the distance from the property line to the curb line, and shall not exceed 9 ft (2743 mm) where the marquee is less than two-thirds of the distance from the property line to the curb line.

2.4.6.4 Roof construction

Where the roof or any part thereof is a skylight, the skylight shall comply with the requirements of *Part 3, Structural Design*. Every roof and skylight of a marquee shall be sloped to downspouts that shall conduct any drainage from the marquee in such a manner so as not to spill over the sidewalk.

2.4.6.5 Location prohibited

Every marquee shall be so located as not to interfere with the operation of any exterior standpipe, and such that the marquee does not obstruct the clear passage of stairways or exit discharge from the building or the installation or maintenance of street lighting.

2.4.6.6 Construction

A marquee shall be supported entirely from the building and constructed of noncombustible materials. Marquees shall be designed as required in *Part 3, Structural Design*. Structural members shall be protected to prevent deterioration.

2.4.6.7 Public way

If it is allowed to construct in the public right-of-way by the concerned authority, marquees with less than 15 ft (4572 mm) clearance above the sidewalk shall not extend into or occupy more than two-thirds the width of the sidewalk measured from the building. Stanchions or columns that support awnings, canopies, marquees and signs shall be located not less than 2 ft (610 mm) in from the curb line.

2.4.7 Signs

2.4.7.1 General

A sign shall not be erected in a manner that would confuse or obstruct the view of or interfere with exit signs required by means of egress or with official traffic signs, signals or devices. Within Conservation Zones and designated historic areas, signage and materials must comply with the local planning guidance intended to conserve and enhance the built environment. Commercial, advertising billboards will not be permitted in Conservation Zones, designated historic areas and landscape or sites affecting their broader setting. 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. 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. 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.

Signs which are written in any foreign language shall have a corresponding translation in English or in Myanmar. No sign or signboard shall be constructed as to unduly obstruct the natural view of the landscape, distract or obstruct the view of the public as to constitute a traffic hazard, or otherwise defile, debase or offend aesthetic and cultural values and traditions. The installation of all kinds of signs shall be such that a harmonious and aesthetic relationship of all units therein is presented.

2.4.7.2 Definitions

For the purpose of this Section, the following definitions shall apply.

ADVERTISING SIGN. Any surface or structure with characters, letters or illustrations applied thereto and displayed in any manner whatsoever out of doors for purposes of advertising or to give information regarding or to attract the public to any place, person, public performance, article or merchandise whatsoever, and which surface or structure is attached to, forms part of or is connected with any building, or is fixed to a tree or to the ground or to any pole, screen, fence or hoarding or displayed in space.

BANNER SIGN. A sign utilizing a banner as its display surface.

CANOPY SIGN. A sign affixed to the visible surface(s) of an attached or freestanding canopy.

CLOSED SIGN. An advertising sign in which at least more than fifty percent of the area is solid or tightly enclosed or covered.

COMBINATION SIGN. A sign that is supported partly by a pole and partly by a building structure.

DIRECTION SIGN. Usually included with an arrow and used for indicating a change in route or confirmation to a correct direction.

ELECTRIC SIGN. An advertising sign in which electric fittings, which are an integral part of the signs, are used

FREESTANDING SIGN. A sign principallysupported by a structure affixed to the ground, and not supported by a building, including signs supported by one or more columns, poles or braces placed in or upon the ground.

GROUND SIGN. An advertising sign detached from a building, and erected or painted on the ground or on any pole, screen, fence or hoarding and visible to the public.

IDENTIFICATION SIGN. A sign that gives specific location information, identifies specific items, for example, Parking Lot B, Building No. 5, First Aid, etc.

ILLUMINATED SIGN. An advertising sign, permanent or otherwise, the functioning of which depends upon its being illuminated by director indirect light, and other than an electric sign.

INFORMATIONAL SIGN. Used for overall information for general organization of a series of elements that is, campus plan, bus route, building layout, shopping mall plan, etc.

MARQUEE SIGN. An advertising sign attached to or hung from a marquee canopy or other covered structure projecting from and supported by the building and extending beyond the building wall, building line.

OPEN SIGN. An advertising sign in which at least fifty percent of the enclosed area is uncovered or open to the transmission of wind.

PORTABLE SIGN. Any sign not permanently attached to the ground or to a building or building surface.

PROJECTING SIGN. An advertising sign affixed to any building element and projecting more than 300 mm therefrom.

REGULATORY SIGN. Sign that gives operational requirements, restrictions or gives warnings, usually used for traffic delineation or control, for example ‘stop’, ‘No parking’, ‘one Way’, etc.

ROOF SIGN. An advertising sign erected or placed on or above the parapet or any portion of a roof of a building including signs painted on the roof of a building.

SKY SIGN. An advertising sign displayed in space like:

a) a gas filled balloon anchored to a point on the ground and afloat in the air with or without a streamer of cloth, etc; or

b) sky-writing, that is, a sign or word traced in the atmosphere by smoke discharged from an aeroplane.

SIGN. Any device visible from a public place that displays either commercial or non-commercial messages by means of graphic presentation of alphabetic or pictorial symbols or representations. Noncommercial flags or any flags displayed from flagpoles or staffs shall not be considered as signs

TEMPORARY SIGN. An advertising sign, banner or other advertising device constructed of cloth, canvas, fabric or any other light material, with or without a structural frame, intended for a limited period of display; including decorative displays for holidays or public demonstrations.

VERANDAH SIGN. An advertising sign attached to, posted on or hung from a VERANDAH.

WALL SIGN. An advertising sign, other than a projecting sign, which is directly attached to or painted or pasted on the exterior surface of or structural element of any building.

WINDOW SIGN. A sign affixed to the surface of a window with its message intended to be visible to and readable from the public way or from adjacent property.

2.4.7.3 Permits

No sign shall be erected, altered or maintained without first obtaining a permit for the same from the concerned Authority.

2.4.7.4 Maintenance and inspection

All signs for which a permit is required, together with all their supports, braces, guys and anchors shall be kept in good repair, both structurally and aesthetically, and when not galvanized or constructed of approved corrosion-resistive non-combustible materials, shall be painted when necessary to prevent corrosion. It shall be the duty and responsibility of the owner of every sign to maintain the immediate premises occupied by the sign, in a clean, sanitary and healthy condition. Every sign for which a permit has been issued and every existing sign for which a permit is required shall be inspected by the concerned Authority at least once in every calendar year.

2.4.7.5 General requirements for all signs

2.4.7.5.1 Load

Every advertising sign shall be designed so as to withstand safely the wind, dead, seismic and other loads as set out in *Part 3, Structural Design*.

2.4.7.5.2 Illumination

No sign shall be illuminated by other than electrical means and electrical devices and wiring shall be installed in accordance with the requirements of *Part 5, Building Services (Electrical and Allied Installations)*. In no case, shall any open spark or flame be used for display purposes unless specifically approved by the Authority.

2.4.7.5.3 Design and location of advertising signs

a) Sign should not obstruct any pedestrian movement, fire escape, door or window, opening used as a means for egress or fire fighting purposes.

b) No sign shall in any form or manner interfere with openings required for light and ventilation.

c) When possible signs should be gathered together into unified systems. Sign clutter should be avoided in the landscape.

d) Signs should be combined with lighting fixture to reduce unnecessary posts and for ease of illuminating the signs.

e) Information signs should be placed at natural gathering spots and included in the design of sight furniture.

f) Placement of sign should be avoided where they may conflict with pedestrian traffic.

g) Sign should be placed to allow safe pedestrian clearance vertically and latterly.

h) Braille strips may be placed along sign edges or raised letters may be used for readability for the blind and partially sighted.

i) No sign shall be attached in anyway to a tree or shrub.

j) The signs other than pertaining to building shall not be permitted to come in front of buildings such as hospitals, educational institutions, public offices, museums, buildings devoted to religious worship and buildings of national importance.

2.4.7.5.4 Materials

Materials for construction of signs or sign structures shall be of the quality and grade as specified in *Part 6, Building Materials*. Exceptions will be made in respect of sign in conservation zones, where they will conform to the planning guidance for each zone.

2.4.7.5.4.1 Use of combustibles

Wood or plastic or other ‘materials of combustible characteristics similar to wood may be used for mouldings, cap pings, nailing blocks, letters and latticing where permitted and for other purely ornamental features of signs. Sign facings may be made of approved combustible materials provided the area of each face is not more than 108 sq-ft (10 sq-m) and the wiring for electric lighting is entirely enclosed in metal conduit and installed with a clearance of not less than 2 in (5 cm) from the facing material.

2.4.7.5.4.2 Glass in signs

All glass used in advertising signs, other than glass tubing used in gas discharge or similar signs, shall be of safety glass conforming to accepted standards at least 3 mm thick. Glass panels in advertising signs shall not exceed 64.58 sq-ft (6 sq-m) in area, each panel being securely fixed in the body of the sign independently of all other panels. Glass signs shall be properly protected

from the possibility of damage by falling objects by the provisions of suitable protecting metal canopies, or by other approved means. Use of glass may be discouraged or avoided wherever possible for signs placed overhead.

2.4.7.5.5 Traffic control interference

No advertising sign shall be erected or maintained which interferes with or is likely to interfere with any sign or signal for the control of traffic. No advertising sign shall be placed particularly in bends and curves so as to obstruct the view of traffic at intersecting streets.

2.4.7.5.6 Draining of signs

Adequate provision for drainage shall be made in every advertising sign, where the possibility of collection of moisture exists.

2.4.7.5.7 Animated devices

Signs which contain moving section or ornaments shall have fail-safe provisions to prevent the section or ornaments from releasing and falling or shifting its centre of gravity more than 18 in (450 mm). The fail-safe device shall be in addition to the mechanism and its housing which operate the movable section or ornament. The fail-safe device shall be capable of supporting the full dead weight of the section or ornament when moving mechanism releases.

2.4.7.6 Electric signs and illuminated signs

2.4.7.6.1 Material for electric signs

Every electric sign shall be constructed of non-combustible material except where the sign is purely a flood-lit sign.

2.4.7.6.2 Installation of electric signs and illuminated signs

Every electric sign and illuminated sign shall be installed in accordance with *Part 5, Building Services (Electrical and Allied Installations)*.

2.4.7.6.3 Colour

No illuminated sign in red, amber or green colour shall be erected or maintained within a horizontal distance of 33 ft (10 m) of any illuminated traffic sign.

2.4.7.6.4 Height

All advertising signs illuminated by light other than a white light at height of less than two storeys or 20 ft (6 m) above the ftpath, whichever be the greater height, shall be suitably screened so as to satisfactorily prevent any interference with any sign or signal for the control of traffic.

2.4.7.6.5 Intense illumination

No person shall erect any sign which is of such intense illumination as to disturb the residents in adjacent or nearby residential buildings. Not with standing any permission given for such erection, any such sign which after erection is, in the opinion of the Authority, of such intense illumination as to disturb the occupants of adjacent or nearby buildings shall, on the order of the Authority, be suitably altered or removed by the owner of the site concerned within such reasonable period as the Authority may specify.

2.4.7.6.6 Hours of operation

No electric sign, other than those necessary in the opinion of the Authority in the interest of public amenity, health and safety, shall be operated between midnight and sunrise.

2.4.7.6.7 Flashing, Occulting and Animated

No flashing, occulting or animated advertising signs, the periodicity of which exceeds 30 flashes to the minute, shall be erected so that the lowest point of such signs is less than 30 ft (9 m) above the ground level.

2.4.7.7 Ground signs

2.4.7.7.1 Material

Every ground sign exceeding 20 ft (6 m) in height together with frames, supports and braces shall be constructed of non-combustible material except as in 2.4.7.5.4.1.

2.4.7.7.2 Dimensions

No ground sign shall be erected to a height exceeding 30 ft above the ground. Lighting reflectors may extend beyond the top or face of the sign.

2.4.7.7.3 Supports and anchorage

Every ground sign shall be firmly supported and anchored to the ground. Supports and anchors shall be of treated timber in accordance with good practice, or metal treated for corrosion resistance or masonry or concrete.

2.4.7.7.4 Site cleaning

The owner of any site on which aground sign is erected shall be responsible for keeping such part of the site as is visible from the street, clean, sanitary, un-offensive and free of all obnoxious substances and unsightly conditions to the approval of the Authority.

2.4.7.7.5 Obstruction to traffic

No ground sign shall be erected so as to obstruct free access to or egress from any building.

2.4.7.7.6 Set Back

No ground sign shall be set nearer to the street line than the established building line.

2.4.7.7.7 Bottom clearance

The bottom line of all ground signs shall be at least 2 ft above the ground, but the intervening space may be filled with open lattice work or platform decorative trim.

2.4.7.8 Roof signs

2.4.7.8.1 Material

Every roof sign together with its frames, supports and braces, shall be constructed of non-combustible material, except as in 2.4.7.5.4.1. Provision shall be made for electric grounding of all metallic parts; and where combustible materials are permitted in letters or other ornamental features, all wiring and tubing shall be kept free and insulated there from.

2.4.7.8.2 Dimensions

No roof sign shall exceed the following heights on buildings of heights:

Table 2.4.1 Dimensions for Roof Signs

No.	Height of Building	Height of Sign (Max)
1.	Not exceeding four storeys or 59 ft (18m)	6.56 ft (2 m)
2.	Five to eight storeys or exceeding 59 ft (18m) but not exceeding 118 ft (36m)	9.84 ft (3 m)
3.	Exceeding eight storeys or 118 ft (36m), provided that in calculating the height of such signs, signs placed one above the other, or on planes at different levels of the same building shall be deemed to be one sign, whether or not such signs belong to different owners	16.4 ft (5 m)

2.4.7.8.3 Location

a) No roof sign shall be so placed on the roof of any building as to prevent free passage from one part of the roof to another.

b) No roof sign shall be placed on or over the roof of any building unless the entire roof construction is of non-combustible material.

2.4.7.8.4 Projection

No roof sign shall project beyond the existing building line of the building of which it is erected or shall extend beyond the roof in any direction.

2.4.7.8.5 Supports and anchorage

Every roof sign shall be thoroughly secured and anchored to the building on or over which it is erected. All loads shall be safely distributed to the structural members of the building.

2.4.7.8.6 Clearance

Roof signs shall be so constructed as to leave a clear space of not less than 6 ft (1829 mm) between the roof level and the lowest part of the sign and shall have at least 5 ft (1524 mm) clearance between the vertical supports thereof.

2.4.7.9 Verandah signs

2.4.7.9.1 Material

Every verandah sign shall be constructed entirely of non-combustible material except as in 2.4.7.5.4.1.

2.4.7.9.2 Dimensions

No verandah sign exceed 3.28 ft (1 m) in height. No verandah sign hanging from a verandah shall exceed 8.2 ft (2.5 m) in length and 50 mm in thickness, except that verandah box signs measuring not more than 200 mm in thickness, measured between the principal faces of the sign and constructed entirely of metal wired glass may be erected.

2.4.7.9.3 Alignment

Every verandah sign shall be set parallel to the building line, except that any such sign hanging from a verandah shall be set at right angles to the building line.

2.4.7.9.4 Location

Verandah signs, other than hanging signs only, shall be placed in the following locations:

a) Immediately above the eaves of the VERANDAH roof in such a manner as not to project beyond the rear of the roof gutter;

b) Against but not above or below the VERANDAH parapet or balustrade provided such parapet or balustrade is solid and the sign does not project more than 20 cm from the outside face of such parapet or balustrade; or

c) On the VERANDAH beams or parapets in the case of painted signs.

2.4.7.9.5 Height of hanging VERANDAH signs

Every VERANDAH sign hanging from a VERANDAH shall be fixed in such a manner that the lowest point of such sign is not less than 8 .2 ft (2.5 m) above the pavement.

2.4.7.9.6 Projection

Except as provided for in 2.4.7.9.4, no VERANDAH sign shall extend outside the line of the VERANDAH to which it is attached.

2.4.7.10 Wall signs

2.4.7.10.1 Material

Every wall sign exceeding 43 sq.-t (4 sq-m) in area shall be constructed of non-combustible material except as in 2.4.7.5.4.1.

2.4.7.10.2 Dimensions

a) The total area of any wall sign shall not exceed 215 sq.ft (20 sq.m) for every 49 ft (15 m) of building frontage to the street to which such sign faces; except that in the case of a wall sign, consisting only of the name of a theatre or cinema, the total area of such sign shall not exceed 2153 sq.ft (200 sq.m).

b) No wall sign which exceeds 323 sq.ft (30 sq.m) in area shall be located on any wall not directly facing the road; provided that any such sign or signs shall not exceed 25 percent of the side wall area visible from the street.

2.4.7.10.3 Projection

No wall sign shall extend above the top of the wall or beyond the ends of the wall to which it is attached. At any place where pedestrians may pass along a wall, any wall sign attached thereto shall not project more than 7.5 cm there from within a height of 8.2 ft (2.5 m) measured from the level of such place.

2.4.7.10.4 Supports and attachment

Every wall sign attached to walls shall be securely attached. Wooden blocks or anchorage with wood used in connection with screws, staples or nails shall not be considered proper anchorage, except in the case of wall signs attached to walls of wood.

2.4.7.11 Projecting signs

2.4.7.11.1 Material

Every projecting sign and its support and framework shall be constructed entirely of non-combustible material.

2.4.7.11.2 Projection and height

No projecting sign or any part of its supports or frame work shall project more than 6.56 ft (2 m) beyond the building; however it shall not project beyond the plot line facing the street; when it projects into the street it shall be at clear height of 8.2 ft (2.5 m) from the road.

a) The axes of all projecting signs shall be at right angles to the main face of the building. Where a V-construction is employed for the faces, the base of the sign against the building shall not exceed the amount of the overall projection.

b) No projecting signs shall extend above the eaves of a roof or above the part of the building face to which it is attached.

c) The maximum height of a projecting sign shall be related to the height of the building to which it is attached in the following manners:

Table 2.4.2 Dimensions for Projecting Signs

No.	Height of Building	Height of Sign (Max)
1.	Not exceeding four storeys or 59 ft (18m)	30 ft (9 m)
2.	Five to eight storeys or exceeding 59 ft(18m) but not exceeding 118 ft(36m)	39 ft (12 m)
3.	Exceeding eight storeys or 118 ft (36 m)	49 ft (15 m)

2.4.7.11.3 Supports and attachment

Every projecting sign shall be securely attached to a building so that movement in any direction is prevented by corrosion-resistant metal brackets, rods, anchors, supports, chains or wire ropes so designed and arranged that half the number of such fixing devices may safely support the sign under all circumstances. Staples or nails shall not be used to secure any projecting sign to any building.

2.4.7.12 Marquee signs

2.4.7.12.1 Materials

Marquee signs shall be constructed entirely of metal or other approved non-combustible materials.

2.4.7.12.2 Height

Such sign shall not exceed 6.56 ft (2 m) in height nor shall they project below the fascia of the marquee nor lower than 8.2 ft (2.5 m) above the ftpath.

2.4.7.12.3 Length

Marquee signs may extend the full length but in no case shall they project beyond the ends of the marquee.

2.4.7.13 Sky Signs

In the case of the sky signs, the regulations laid down by the concerned Authority concerned shall apply.

2.4.7.14 Temporary advertising signs, travelling circus signs, fair signs and decorations during public rejoicing

2.4.7.14.1 Types

None of the following advertising signs shall be erected or maintained, other than as temporary signs erected in accordance with 2.4.7.14.2:

a, Any advertising sign which is painted on or fixed on to or between the columns of a VERANDAH,

b, Any advertising sign which projects above or below any fascia, bearer, beam or balustrade of a VERANDAH or balcony,

c, Any advertising sign which is luminous or illuminated and which is fixed to any fascia bearer, beam or balustrade of any splayed or rounded corner of a VERANDAH or balcony,

d, Any streamer sign erected across a road,

e, Any sign not securely fixed so as to prevent the sign swinging from side to side;

f, Any advertising sign made of cloth, paper mache, or similar or like material but excluding licensed paper signs on hoardings or fences,

g, Any advertising sign on a plot used or intended to be used exclusively for residential purposes, other than a brass plate or board preferably not exceeding 600 mm x 450 mm in size, affixed to the fence or entrance door or gate of a dwelling, and in the case of a block of flats, affixed to the wall of the entrance hall or entrance door of any flat and

h, Any sign on trees, rocks, hillsides and similar natural features.

2.4.7.14.2 Requirements for temporary signs

All temporary advertising, travelling circus and fair signs and decorations during public rejoicing shall be subject to the approval of the Authority and shall be subjected to the approval of the Authority and shall be erected so as not to obstruct any opening and to minimize fire risk.

The advertisement contained on any such sign shall pertain only to the business, industry or other pursuit conducted on or within the premises on which such sign is erected or maintained. Temporary advertising signs shall be removed as soon as tom or damaged and in any case within 14 days after erection unless extended.

The Authority shall be empowered to order the immediate removal of any temporary advertising sign or decoration, where, in its opinion such action is necessary in the interests of public amenity and safety.

2.4.7.14.2.1 Pole signs

Pole signs shall be constructed entirely of non-combustible materials and shall conform to the requirements for ground or roof signs as the case may be. Such signs may extend beyond the street line if they comply with the provisions for projecting signs.

2.4.7.14.2.2 Banner and cloth signs

Temporary signs and banners attached to or suspended from a building, constructed of cloth or other combustible material shall be strongly constructed and shall be securely attached to their supports. They shall be removed as soon as torn or damaged, and in no case later than 14 days after erection; except, that permits for temporary signs suspended from or attached to a canopy or marquee shall be limited to a period of 10 days.

2.4.7.14.2.3 Maximum size

Temporary signs shall not exceed 108 sq.ft (10 sq.m) in area.

2.4.7.14.2.4 Projection

Temporary signs of cloth and similar combustible construction shall not extend more than 300 mm over or into a street or other public space except that such signs when constructed without a frame may be supported flat against the face of a canopy or marquee or maybe suspended from the lower fascia thereof but shall not extend closer to the ftpath than 8.2 ft (2.5 m).

2.4.7.14.2.5 Bill boards

Bill boards set up by the Authority shall be used for temporary signs, symbols, bills for entertainment, etc, so that other walls of the city are not defaced.

Bills for entertainment and other functions shall not be affixed on to building walls other than the bill boards. The organization responsible for such bills and posters shall be held responsible for any such defacement and non-removal of signs.

2.4.8 Telecommunication and broadcast towers

2.4.8.1 Location and Access

Towers shall be located such that guy wires and other accessories shall not cross or encroach upon any street or other public space, or over above-ground electric utility lines, or encroach upon any privately owned property without the written consent of the owner of the encroached-upon property, space or above-ground electric utility lines.

2.4.9 Swimming Pool Enclosures

2.4.9.1 General

Swimming pools shall comply with the requirements of this section and other applicable sections of this code.

2.4.9.2 Definition

The following word and term shall, for the purposes of this section and as used elsewhere in this code, have the meaning shown herein.

SWIMMING POOLS. Any structure intended for swimming, recreational bathing or wading that contains water over 24 inches (610 mm) deep. This includes in-ground, above-ground and on-ground pools; hot tubs; spas and fixed-in-place wading pools.

2.4.9.3 Public swimming pools

Public swimming pools shall be provided by some type of barrier with the range of 2 ft to 4 ft in height or a screen enclosure.

2.4.9.4 Residential swimming pools

Residential swimming pools shall comply with the followings.

2.4.9.4.1 Barrier height and clearances

The top of the barrier shall be at least 48 inches (1219 mm) above grade measured on the side of the barrier that faces away from the swimming pool. The maximum vertical clearance between grade and the bottom of the barrier shall be 2 inches (51 mm) measured on the side of the barrier that faces away from the swimming pool. Where the top of the pool structure is above grade, the barrier is authorized to be at ground level or mounted on top of the pool structure, and the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be 4 inches (102 mm).

2.4.9.4.1.1 Openings

Openings in the barrier shall not allow passage of a 4-inch-diameter (102 mm) sphere.

2.4.9.4.1.2 Solid barrier surfaces

Solid barriers which do not have openings shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.

2.4.9.4.1.3 Closely spaced horizontal members

Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the swimming pool side of the fence. Spacing between vertical members shall not exceed $1^3/_4$ inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cut outs shall not exceed $1^3/_4$ inches (44 mm) in width.

2.4.9.4.1.4 Widely spaced horizontal members

Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between vertical members shall not exceed 4 inches (102 mm). Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed $1^3/_4$ inches (44 mm) in width.

2.4.9.4.1.5 Chain link dimensions

Maximum mesh size for chain link fences shall be a $2^1/_4$ inch square (57 mm square) unless the fence is provided with slats fastened at the top or the bottom which reduce the openings to no more than $1^3/_4$ inches (44 mm).

2.4.9.4.1.6 Diagonal members

Where the barrier is composed of diagonal members, the maximum opening formed by the diagonal members shall be no more than $1^3/_4$ inches (44 mm).

2.4.9.4.1.7 Gates

Access doors or gates shall comply with the requirements of Sections 2.4.9.4.1.1 through 2.4.9.4.1.6 and shall be equipped to accommodate a locking device. Pedestrian access doors or

gates shall open outward away from the pool and shall be self-closing and have a self-latching device.

2.4.9.4.1.8 Dwelling wall as a barrier

Where a wall of a dwelling serves as part of the barrier, the following shall apply:

Doors with direct access to the pool through that wall shall be equipped with an alarm that produces an audible warning when the door and/or its screen, if present, are opened. In dwellings not required to be Accessible units, the deactivation switch shall be located 54 inches (1372 mm) or more above the threshold of the door. In dwellings required to be Accessible units, the deactivation switch(es) shall be located at 54 inches (1372 mm) maximum and 48 inches (1219 mm) minimum above the threshold of the door.

2.4.9.4.1.9 Pool structure as barrier

Where an above- ground pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, and the means of access is a ladder or steps, then the ladder or steps either shall be capable of being secured, locked or removed to prevent access, or the ladder or steps shall be surrounded by a barrier which meets the requirements of Sections 3109.4.1.1 through 3109.4.1.8. When the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4-inch-diameter (102 mm) sphere.

2.4.9.4.2 Indoor swimming pools

Walls surrounding indoor swimming pools shall not be required to comply with Section 2.4.9.4.1.8.

2.4.9.4.3 Prohibited locations

Barriers shall be located so as to prohibit permanent structures, equipment or similar objects from being used to climb the barriers.

2.4.10 Automatic Vehicular Gates

2.4.10.1 General

Automatic vehicular gates shall comply with the requirements of this section and other applicable sections of this code.

2.4.10.2 Definition

The following word and term shall, for the purposes of this section and as used elsewhere in this code, have the meaning shown herein.

VEHICULAR GATE. A gate that is intended for use at a vehicular entrance or exit to a facility, building or portion thereof, and that is not intended for use by pedestrian traffic.

2.5 INTERIOR ENVIRONMENT

2.5.1 Scope

The provisions of this chapter shall govern ventilation, lighting, and courtyards, room dimensions and materials associated with the interior spaces of buildings. Exceptions to the provisions of this chapter are permitted for listed and historic buildings (see *Chapter 10*).

2.5.2 General

The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

2.5.2.1 Definitions

ATTIC: It means a room at the top of the house under the roof.

COURTYARD: It is an enclosed area surrounded by a building or parts of a building which is open to the sky.

GRADE: The grade (also called slope, incline, gradient, pitch or rise) of a physical feature, topographic landform or constructed element, refers to the amount of inclination of that surface to the horizontal.

HEADROOM**:** It means the clear vertical distance between the finished floor level or the lowest part of the room and the underside of the ceiling or the lower surface of the cover of that room.

RAMP: It means the sloping part of surface which joins two different levels.

HABITABLE SPACE: It means any inner space meant for human occupation of more than 8 hours per day.

OCCUPIED SPACE: It means any space used by human beings as storage or similar functions but not for living and sleeping.

2.5.3 Ventilation

2.5.3.1 General

All residential buildings, other than detached houses built by owners for their own use, shall be provided with natural ventilation as per 2.5.3.4.

Others shall be provided with natural or mechanical ventilation for its intended occupancy.

Exception: does not apply to the following rooms or spaces

(a) any store room of area not exceeding 6.0 m^2; and

(b) any private lift lobby of area not exceeding 6.0 m^2.

2.5.3.2 Natural ventilation

Natural ventilation of an occupied 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.

2.5.3.2.1 Ventilation required

Natural ventilation shall be provided by means of one or more openable windows or other openings with an aggregate area of not less than – 5% of the floor area of the room or space required to be ventilated.

No part of any room or space (other than a room in a warehouse) that is designed for natural ventilation shall be more than 12.0m from any window/opening ventilating the space.

Except otherwise stated in the following, any openable window or opening may be considered to be unobstructed.

(a) The effective open area of a sliding window is the unobstructed area when the sliding window is opened fully.

(b) The effective open area of any opening installed with fixed louvers shall be assumed to be 50% of the area of the opening.

(c) For any casement windows installed with restrictors and can be opened at least 30 degrees or more, the effective open area of the window shall be assumed to be 50% of the window opening.

The windows or other openings shall be located such that they open to –

(a) the exterior of the building;

(b) courtyards complying with Section 2.5.5.

(c) a recess space,10ft minimum distance between facing walls.

Exception: Any of the following rooms or spaces in any residential development including house built by the owners for their own use is allowed to provide mechanical ventilation.

(i) any fitness room;

(ii) any clubhouse;

(iii) any toilet, bathroom or lavatory; and

(iv) any basement.

2.5.3.3 Artificial or mechanical ventilation

Mechanical ventilation shall be provided in accordance with Part 5 Building Services.

2.5.4 Lighting

2.5.4.1 General

Every space intended for human occupancy shall be provided with natural light by means of exterior glazed openings or artificial light. All residential buildings, other than detached houses built by owners for their own use, shall be provided with natural lighting as per 2.5.4.2.

Exception: does not apply to the following rooms or spaces

(a) any store room of area not exceeding 6.0 m^2; and

(b) any private lift lobby of area not exceeding 6.0 m^2.

2.5.4.2 Natural light

Natural lighting shall be provided by means of one or more windows or other openings with an aggregate light transmitting area of not less than 10% of the floor area of the room or space required to be lighted.

In lieu of natural lighting, artificial lighting may be provided

to the following rooms or spaces within residential units –

(a) bathroom, toilet or lavatory;

(b) store room; or

(c) basement;

2.5.4.2.1 Exterior openings

Exterior openings required for natural light shall open directly onto a public way, or courtyard. Exceptions:

a) Required exterior openings are permitted to open into a roofed porch where the porch:

1) Has a ceiling height of not less than 7 feet (2134 mm).

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

2.5.4.3 Artificial light

The artificial light shall be illuminated in accordance with Part 5 Building Services (Lighting).

2.5.5 Courts or Courtyards

2.5.5.1 General

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

2.5.5.2 Courtyards

Courtyards shall not be less than 10 feet in width and a minimum area open to sky comply with the following Table.

Height	Minimum airwell size FT^2 (M^2)
≤ 100ft (30 m)	108 (10)
Subsequent 10ft (3 m)	10.8 (+1)

2.5.5.3.1 Courtyard access

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

2.5.5.3.2 Air intake

Courtyards more than two stories in height shall be provided with a horizontal air intake at the bottom not less than 10 square feet (0.93 m^2) in area and leading to the exterior of the building unless abutting a public way.

2.5.5.3.3 Courtyard drainage

The bottom of every courtyard shall be properly graded and drained to a public sewer or other approved disposal system.

2.5.6 Internal Spaces

2.5.6.1 Unit sizes and room dimensions

The floor area, not including public stair of smallest residential unit, for one family in the urban areas is 500 square feet or at least 100 square feet per person, allowable to take the lesser figure. The minimum room size meant for human habitation of more than 8 hours daily is 60 clear square feet. The width of such habitable room in a residential building shall be not less than 6 feet.

2.5.6.2 Room height

2.5.6.2.1 Residential buildings

2.5.6.2.1.1 The minimum clear height of room (head room) in residential buildings excluding shop houses shall be:

For living rooms, bedrooms and kitchens, not less than 8 feet;

For bathrooms, water-closets, latrines, , balconies, verandas, and like, not less than 6.5 feet;

2.5.6.2.1.2 The minimum average height of rooms with sloping ceilings in residential buildings excluding shop houses shall be: -

For living rooms, bedrooms and kitchens, not less than 8 feet;

For attic rooms used as bedrooms, the minimum height immediately at roof edges is 4 feet, however the average room height must be 8 feet when used as bedroom;

The minimum headroom of other habitable rooms or space inside any building be 7.5 feet;

The minimum headroom for bathrooms, water-closets, latrines, , balconies, verandas, and the like, not less than 6.5 feet;

2.5.6.2.2 Others

In shop houses and retail shops, the height of areas used as shops shall be not less than 9.5 feet and the height or areas used as residential purposes shall follow the room heights of residential units.

In schools, the clear height of rooms (head room) used for teaching shall not be less than 9.5 feet.

In hospitals, the clear height of rooms (head room) used for the accommodation of patients shall not be less than 9.5 feet.

In hospitals, the height of the rooms used for operation, treatment etc. shall conform to concerned authorities.

The clear height of any room in a factory in which any person works shall not be less than 9.5 feet.

The height of any basement not being used as human habitation shall be 7 feet minimum.

Where the part of the ground floor is left open for use as car park or covered garden or for similar purpose, the height of such ground floor shall not be less than 8 feet.

The headroom of areas meant only for car parking shall not be less than 8 feet.

The headroom at stair cases shall not be less than 7 feet and the height of any covered footway shall not be less than 8 feet.

The height of rooms in public areas shall not be less than 9.5 feet (excluded the areas such as water-closets, lavatories, cloakrooms, corridors and rooms).
Where a balcony is provided in public resort or public places, the heights between the finished floor level and the ceiling over such balcony, shall be not less than 9.5 feet.
The height of non-habitable rooms on public places, such as water-closets, lavatories, corridors, etc, shall not be less than 8 feet.
Exception: When the clear room height is considered, the required height for all electrical and mechanical services such as duct lines, fire extinguishing systems, etc. should be noticed.

2.5.6.3 Inner connecting space widths

All inner connecting space widths in the building shall be complied with 2.6.8 Egress width

2.5.6.4 Doors and openings

All doors width entering any habitable room shall have minimum clear height of 6.5 feet and width of 2.75 feet.

a) All doors entering toilets and kitchens in residential units shall have minimum height of 6.5 feet and width of 2.75 feet.
b) All exit doors shall open outwards and number of doors, door widths and width of openings shall comply with section 2.6 Means of Egress.
c) Where the space beneath a roof is enclosed by a ceiling, access to such space shall be provided for inspection, cleaning and repairs by means of an opening with minimum 2feet width in any direction.

2.5.7 Stairs, Steps, Ramps and Lifts

2.5.7.1 Stairs

Stair in this chapter means only for internal stair whereas, the exit stair is described in *chapter*

2. 6-Means of Egress of this part and emergency stair is in Myanmar Fire Safety Code of Practice.

a) All staircases shall be properly lighted and ventilated.

b) All stairs shall be not more than 16 risers between each such landing.

c) All stairs shall have non-slip surface.

d) In cases where stairs or steps begin after the doors and other openings, the distance between such openings and the beginning of stairs/ steps shall normally be the same as the width of the respective stairs, but minimum of 3 feet shall be required.

2.5.7.1.1 Stair widths

All exit stair widths shall be referred to chapter 6 Egress width.

2.5.7.1.2 Stair ratios

a) The dimensions of the riser and the tread of stairs in a building throughout all storeys or in a staircase shall be uniform and consistent. The tolerance of risers for each storey shall be +/- (5mm)3/16 in.

b) Stair ratios for inner stairs in (R3) detached houses, duplex and terrace houses, which are not more than 3 storeys for single families, or units with less than 10 persons occupancy, must be

calculated with the two given formulas:- 2R + T= between 23 and 26 inches, and R+T=between 16 and 18 inches, and R should not be more than 8 inches and T should not be less than 10 inches. (Where R is the riser in inches; T is the tread in inches)

c) Stair ratios for inner stairs in public buildings, including offices with more than occupancy of 10 persons, must be calculated with the given formulas:- 2R + T= between 23 and 26 inches, and R+T=between 16 and 18 inches, where R shall not be more than 7 inches, T shall not be less than 10 inches. (Where R is the riser in inches; T is the tread in inches)

2.5.7.2 Steps

Dimension of steps shall conform to the formulas given below:-

a) Step in stadiums, cinema halls, theatres and similar buildings where many people use together at the same time, must be calculated with the two given formulas: 2R + T= more than 36 inches, and R+T= more than 30 inches, R should not be more than 7 inches, T should be more than 24 inches, (where R is the riser in inches; T is the tread in inches)

b) Steps in pagodas, parks and in similar places must be calculated with the two given formulas:- 2R + T= more than 30 inches, and R+T= more than 24 inches; R should not be more than 7 inches, (where R is the riser in inches; T is the tread in inches)

2.5.7.3 Railings or Barriers

Where there is a vertical drop in level of 3ft 6in or more, appropriate measures shall be taken to prevent people from falling from a height.

a) All stairs having more than 6 risers or over the stair width of 6.5 feet, must have railings on both sides, where the wall at one side can substitute the railing for stairs with clear width up to 6.5 feet, over the stair width of 6.5 feet, railings shall be constructed on both sides.

b) All handrails shall project not more than 4 inches into the stair width and shall be located not less than 3 inches of the end /beginning of the stairs.

c) Net railing height at stairs (measured from finished surface of stair to the top of railing) shall not be lower than 3 feet and the spacing of balustrades or similar openings below the hand railing level shall not be more than 4 inches.

d) If balconies, terraces, flat roofs and similar structures at buildings are more than 25 feet above the ground level, net railing or barrier height shall not be lower than 3 feet (measured from floor finishing to the top of railing). The spacing of balustrades or similar openings below the hand railing level shall not be more than 4 inches.

e) If balconies, large windows reaching to the floor level, terraces, flat roofs and similar structures at buildings are more than 35 feet above the ground level, net railing or barrier height shall not be lower than 3.5 feet, and the spacing of balustrades or similar openings below the hand railing level should not be more than 4 inches.

f) Net railing height or barrier of stairs, balconies, terraces and similar structures at schools shall not be lower than 3.5 feet (measured from floor finishing to the top of railing) and if there is climbable toehold, it shall not be more than 4 inches from the floor level. The spacing of balustrades or similar openings below the hand railing level shall not be more than 4 inches.

g) All stairs with more than 16 risers shall have an intermediate landing having the same width of the respective stairs but minimum of 3 feet shall be required.

2.5.7.4 Ramps

The design of ramps shall conform to following points:-

a) All ramps meant for wheel chair of handicapped persons must have the slopes less than 10 %, (Rise: run ratio 1:10).

b) All ramps meant for light motor vehicles less than 2 tons net weight must have the slopes, less than 16 %, (Rise: run ratio 1: 6.25).

c) All ramps meant for medium heavy vehicles less than 5 tons net weight must have the slopes less than 14 %, (Rise to run ration 1:7.2).

d) The clear headroom of ramps at the entering points into the buildings, meant for light vehicles less than 2 tons shall not be lower than 7 feet, and meant for entrance of heavy vehicles with less than 5 tons shall not be less than 9 feet.

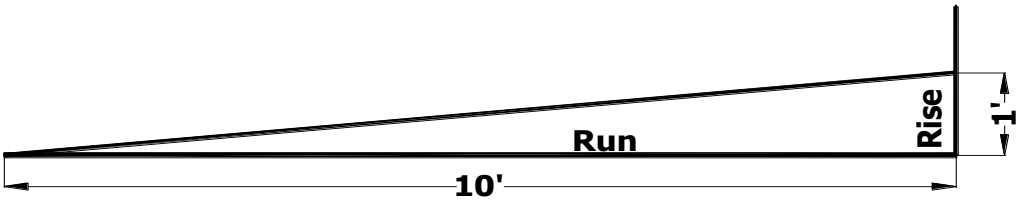


Figure 2.5.2 Schematic figure showing gradient of ramps (rise: run ratio)

2.5.8 Mechanical vertical transport in buildings

2.5.8.1 Lifts and escalators

a) Adequate number of lifts shall be provided in all residential buildings with more than 50 feet from the ground floor level up to the topmost habitable floor level.
b) All office buildings with more than 4 stories or higher than 40 feet from the ground floor level, shall be equipped with adequate number of lifts.
c) All buildings with public dealing functions like banks, shopping centres, hospitals, etc., which have more than 3 storeys and higher than 30 feet from ground level to the topmost floor, shall be equipped with adequate number of lifts or similar facilities.
d) In the shopping centres with more than 3 storeys and more than 5000 square feet shopping area, shall be equipped with adequate number of additional mechanical means of vertical transport, such as lifts, escalators, etc.

e) In places where mechanical means of vertical transportation, such as escalators or lifts are provided, ordinary stairs designed in line with these codes are necessary.

f) The capacity of vertical transportation, size and number of lifts shall follow the norms and standards based on calculations done by qualified engineers of the respective field.

2.5.9 Access to Unoccupied Spaces

2.5.9.1 Crawl spaces

Crawl spaces shall be provided with a minimum of one access opening not less than 18 inches by 24inches (457 mm by 610 mm).

2.5.9.2 Attic spaces

An opening not less than 20 inches by 30inches (559 mm by 762 mm) shall be provided to any attic area having a clear height of over 30 inches (762 mm). A 30-inch(762 mm) minimum clear headroom in the attic space shall be provided at or above the access opening.

2.5.10 Surrounding Materials

2.5.10.1 Floors

In other than dwelling units, toilet and bathing room floors shall have a smooth, hard, non absorbent surface that extends upward onto the walls at least 6 inches (152 mm).

2.5.10.2 Walls

Walls within 2 feet (610 mm) of urinals and water closets shall have a smooth, hard, non absorbent surface, to a height of 4 feet (1219 mm) above the floor, and except for structural elements, the materials used in such walls shall be of a type that is not adversely affected by moisture.

Exceptions: Dwelling units, sleeping units and toilet rooms those are not accessible to the public and which have not more than one water closet.

Accessories such as grab bars, towel bars, paper dispensers and soap dishes, provided on or within walls, shall be installed and sealed to protect structural elements from moisture.

2.5.10.3 Showers

Shower compartments and walls above bathtubs with installed shower heads shall be finished with as mooth, non absorbent surface to a height not less than 70inches (1778 mm) above the drain inlet.

2.6 MEANS OF EGRESS

2.6.1 Means of Egress System

Building or portions of any occupied portions shall be provided with the means of egress systems: the exit access, the exit and the exit discharge in accordance with this chapter. Exemptions from this code are permitted in the case of listed buildings that have been adaptive for alternative use under an agreed Conservation Management Plan. In this case, provision must be made for safe egress with the agreement of the planning authority.

Moreover, as for detail requirements other than this chapter, it must be complied with Myanmar Fire Safety Code of Practice.

2.6.2 General Requirements for Means of Egress

2.6.2.1 Ceiling Heights

Minimum ceiling heights of the exit routes shall not less than 7 feet 6 inches (2286 mm).

2.6.2.2 Protruding objects

Any protruding objects which extend below ceiling shall not be more than 25% of ceiling area of a means of egress and must provide 80 inches minimum headroom.

Exception: Door closer and stops shall not reduce less than 78 inches.

Any horizontal projections from either side shall not be more than 4 inches over any walking surface between the heights of 27 inches and 80 inches.

Any horizontal projections shall not reduce the minimum clear width of accessible routes.

2.6.2.3 Floor surface

Surface of floors of means of egress shall be a slip resistant surface.

2.6.2.4 Level changes

Where elevation changes is less than 12 inches, slopes not greater than 5% slope shall be used. Minimum 2 risers of steps shall be used at locations not required to be accessible by chapter 7 concerning the accessibility of building.

2.6.2.5 Egress continuity

The path along means of egress shall not be interrupted by any building elements, such as walls, furniture, vehicles etc.

2.6.2.6 Elevators, escalators and moving walks

Elevators, escalators and moving walks shall not be used in required means of egress system.

2.6.3 Occupant Load

The number of occupants shall be computed at the rate of one occupant per unit of area as prescribed in Table 2.6.1.

Table 2.6.1 Maximum Floor Area Allowances Per Occupant

Function of Space	Floor area in sq-ft per person
Accessory storage areas, mechanical ,equipment room,	300 gross
Agricultural building	300 gross
Aircraft hangars	500 gross
Airport terminal	
Baggage claim	20 gross
Baggage handling	300 gross
Concourse	100 gross
Waiting areas	15 gross
Assembly, Gaming floors (keno, slots, etc.)	11 gross
Assembly with fixed seats	no. of seats + wheel chair space
Assembly without fixed seats	
Concentrated (chairs only-not fixed)	7 net
Standing space	5 net
Unconcentrated (tables and chairs)	15 net
Bowling centers, allow 5 persons for each lane including 15 feet of runway, and for additional areas	7 net
Business areas	100 gross
Courtrooms-other than fixed seating areas	40 net
Day care	35 net
Dormitories	50 gross
Educational	
Classroom area	20 net
Shops and other vocational room areas	50 net
Exercise rooms	50 gross
H-5 Fabrication and manufacturing areas	200 gross
Industrial areas	100 gross
Institutional areas	
Inpatient treatment areas	240 gross
Outpatient areas	100 gross
Sleeping areas	120 gross
Kitchens, commercial	200 gross
Library	
Reading rooms	50 net

Function of Space	Floor area in sq-ft per person
Stack area	100 gross
Locker rooms	50 gross
Locker rooms	
Areas on other floors	60 gross
Basement and grade floor areas	30 gross
Storage, stock, shipping areas	300 gross
Parking garages	200 gross
Residential	200 gross
Skating rinks, swimming pools	
Rink and pool	50 gross
Decks	15 gross
Stages and platforms	15 net
Warehouses	500 gross

Note : Other function of space not mentioned in above table, it must be calculated based on 100 gross per person.

gross = Gross floor area of a building, means the total floor area calculated based on center of exterior walls, including the circulation area such as stairs , corridors, etc. but excluding the shafts, ducts, lift wells etc.

net = Net floor area of a room or of a units means total floor calculated based on center of the walls of respective room or of unit.

2.6.3.1 Mixed Occupancy

Where building is designed for different types of occupancies or different purposes at the same time, the exit requirements shall meet the more stringent requirements of each building section and function of the respective portions.

2.6.3.2 Multiple occupancy or use

Where a building is designed for multiple purposes involving different activities at different times, the greatest number of occupants shall form the basis for determining the egress requirements.

2.6.3.3 Egress convergence

Where means of egress from floors above and below converge at an intermediate level, the capacity of the means of egress from the point of convergence shall not be less than the sum of the two floors.

2.6.3.4 Fixed seating

For areas having fixed seats and aisles, the occupant load shall be determined by the number of fixed seats installed. The occupant load for areas in which fixed seating is not installed, such as waiting spaces and wheelchair spaces, shall be determined in accordance with Table 2.6.1 and added to the number of fixed seats.

2.6.4 Exit Access

An exit access shall not pass through a room which can be locked and to prevent egress.

Means of egress from dwelling units shall not lead though other sleeping areas or toilet area.

2.6.5 Exit and Exit Access Doorways from Space

Two exits or exit access doorways shall be provided if the occupant load of the space exceeds as per table.

Table 2.6.2 Spaces with One Exit Or Exit Access Doorway

Types of Occupancy	Occupant Load
A, B, E(a), F, M, U	49
H-l, H-2, H-3	3
H-4, H-5, I-1,I-3, I-4, R	10
S	29

(a). Day care maximum occupant load is 10.

Number of exits shall be complying with the following table.

Table 2.6.3 Minimum no. of Exits per occupant load

No of Occupants	Minimum no of Doors	Minimum width of corridors
51-200	2	1000 mm
201-500	2	1250 mm
501-1000	3	1250 mm
exceeding 1000	4	1250 mm

Whenever there are two exit doors or two exit access doorways are required, the distance between the two exits are at least equal to or more than half the furthest distance from one point to another of that particular room and each exit shall be of equal capacity.

2.6.6 No. of Exit Staircase or Exits per Storey

Minimum two independent exit staircases of other exit shall be provided including basements of a building unless otherwise permitted under other provision of this chapter.

2.6.6.1 All Buildings apart from R1 and R2

Only one exit shall be required if it complies with the following table.

Table 2.6.4 No. of Exit staircase or exits per storey

Storey	**Occupancy**	**Maximum occupants per floor and travel distance**
First Floor or basement	A, B(b), E(a), F(b), M, U, S(b)	49 occupants and 50 feet travel distance
	H-2, H-3	3 occupants and 25 feet travel distance
	H-4, H-5, I	10 occupants and 50 feet travel distance
	S	29 occupants and 50 feet travel distance
Second Floor	B, F, M,	29 occupants and 50 feet travel distance

(a) Day care occupancies shall have a maximum occupant load of 10.

(b) Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system and shall have maximum travel distance of 100ft.

2.6.6.2 Residential Group R1 and R2

Means of escape for a building shall comply with the provision of section 2.6.9 Exit stairs and section 2.6.10 Exit discharge. In a block of residential apartments or maisonettes, at least two independent exit staircases or other exits from every storey unless otherwise permitted.

2.6.6.2.1 In a block of residential apartments or maisonettes not exceeding **(7**9 **ft)** 24 m in habitable height, one exit staircase only may be allowed to serve every upper storey, subject to:

a) The exit staircase must be naturally ventilated and shall comply with the requirements of Myanmar Fire Safety Code of Procedures.

b) Provision of exits from each residential apartment or maisonette shall comply with the exits from residential units.

c) Approach to the exit staircase shall be smoke free approach or external corridor or through cross-ventilated lobby. The ventilation openings of corss ventilated lobby having a minimum width of 2000 mm (6ft 6in) and a minimum height of 1200 mm (4ft) shall be unobstructed from parapet wall or balustrade level upwards and be positioned on opposite sides of the lobby such that they provide cross-ventilation throughout the entire space of the lobby. Where multiple ventilation openings are provided on opposite sides of the lobby, the minimum width and height of each opening shall not be less than 1000 mm (3ft 4in) and 1200 mm (4ft) respectively, provided the aggregate width of the openings at each opposite side is not less than 2000 mm (6ft 6in).

The minimum setback of the four-storeyed building shall be 4ft and the distance shall increase with the rate of 1 foot or one tenth of floor to floor height for every increase of a story (or floor to floor height, whichever is greater).

The single exit staircase shall serve not more than four apartments or maisonettes at each level.

d) Travel distance from the most remote exit door to the exit staircase from each apartment or maisonette shall not exceed 15m.

e) Exit staircase shall comply with the requirements of 2.6.9 for exit staircases.

f) Fire lift shall be provided to comply with the requirements from Fire Services Department.

g) Dry rising main shall be provided to comply with the requirements from Fire Services Department.

h) Access to the building for fire fighting appliances being provided for in compliance with the requirements in Fire Services Department.

2.6.7 Exit Access Travel Distance

Exit access travel distances are determined by type of occupancy and shall comply with the table given below in these codes.

Table 2.6.5 Exit Access Travel Distance

Type of Occupancy	Max Travel Distance (ft) (One-way travel)		Max Travel Distance (ft) (Two-way travel)		Max Dead End (ft)	
					Corridor	
	Unsprin-klered	Sprin-klered	Unsprin-klered	Sprin-klered	Unsprin-klered	Sprin-klered
High hazard	35	65	65	115	50	65
Industrial buildings (factories, workshops, godown/ warehouse)	50	80	100	200	50	65
Dormitories, hostels	50	100	145	245	50	65
Shops	50	80	145	200	50	65
Offices	50	100	145	245	50	65
Places of public resort & car parks	50	80	145	200	50	65
School & educational buildings	50	100	145	245	50	65
Hospitals	50	80	100	145	50	65
Hotels, boarding houses (a)	50	65	100	145	50	65
Blocks of flats/ Residents (a)	50b	100b	100	245	50	65
	65c	130c	145c			
Detached, semi-detached & terrace House, including townhouses	NR	NR	NR	NR	NR	NR

a. Need to comply with section 2.6.7.1

b. For travel distance in single stair case.

c. For travel distance to external corridor.

d. Measurement of travel distance is from the most remote point of a guestroom or accommodation unit or suite to the exit door of an exit staircase, exit passageway or exterior open space.

2.6.7.1 Residential Occupancy

Exit from residential unit

a) In each residential apartment or maisonette unit, the exit access door or doors shall be provided such that the travel distances measured from any point within the unit to the entrance door or doors of the unit shall not exceed 20m.

b) In addition, in the case of a maisonette unit comprising not more than two storeys, where a single door is provided,

   i) the door shall not be located on the upper storey of the unit; and

   ii) the floor area of the upper storey shall not exceed 60 m², unless a separate exit is provided on this upper storey.

c) All exits from residential or maisonette units shall have direct access to exit staircase, exit passageway or exterior open space.

2.6.8 Egress Width

The total width of means of egress shall not be less than the total occupant load serves by means of egress multiply by defined width per occupant load as per table and the minimum width must conform to the following table.

Table 2.6.6 Egress Width

Type of Occupancy	Egress Width per person (inch)				Min width (ft)	
	To outdoors at ground level (Door opening) (inches)	Other exit & corridor doors	Stair-cases	Ramps Corridors Exits Passageways	Stairs	Corridor
High hazard	0.4	0.5	0.65	0.4	3.5	3.5
Industrial buildings (factories, workshops, godown/ warehouse)	0.2	0.25	0.35	0.2	3.5	3.5
Dormitories, hotels	0.4	0.5	0.65	0.4	3.5	3.5
Shops	0.2	0.25	0.35	0.2	3.5	3.5
Offices	0.2	0.25	0.35	0.2	3.5	3.5
Places of public resort & car parks	0.2	0.25	0.35	0.2	3.5	3.5
School & educational buildings	0.2	0.25	0.35	0.2	3.5	5(a)
Hospitals	0.65	0.65	1.25	0.65	3.5	6.5(b)
Hotels, boarding houses	0.4	0.5	0.65	0.4	3.5	3.5
Blocks of flats/ residents	0.4	0.5	0.65	0.4	3.5(c)	3.5
Detached, semi-detached & terrace House, including townhouses	NR	NR	NR	NR	3	3

(a) Applies to corridors serving classrooms. Other corridors shall have a minimum width of 3ft 6 inches.

(b) Applies to corridors serving patients. Other corridors shall have a minimum 3ft 6 inches.

(c) Staircase within maisonette serving as an internal access to be at least 3ft width.

The maximum width of exit staircase shall be not more than 6 feet 6 inches. Where staircase exceeds 6 feet 6 inches in width, handrails shall be used to divide the staircase into sections of not less than 3 feet 6 inches of width or more than 6 feet 6 inches of width.

2.6.9 Exit Stairs

All exit stairs shall be constructed minimum 1 hour rated construction.

All exit stairs (except for R1) riser heights shall be 7 inches maximum and 4 inches minimum, tread shall be minimum 10 inches.

All exits stairs shall be not more than 16 risers between each such landing.

Stair treads and risers shall be of uniform size and shape. The tolerance between the largest and smallest riser heights or between the largest and smallest tread depth shall not exceed 3/16 inch in any flight of stairs.

The width of landings shall not be less than the width of stairways they serve.

Winder stairs are not permitted in means of egress stairways except within a dwelling unit. Where circular/geometric staircases are used as exit staircases, the width of treads measured at the narrower end shall be not less than 4 inches in residential buildings and at a distance of 2ft from the narrower end shall be not less than 9 inches in residential buildings.

Spiral stair cases as exit stair with non-combustible material and minimum tread length 2 ft 6 in) can be used at residential buildings (R1 and R2) which are not more than 33ft in height.

2.6.9.1 Internal exit stair

An internal exit stair which serves as an exit shall be enclosed.

Where an internal exit staircase is directly approached from an external exit passageway or external corridor, it shall not be necessary to provide such enclosure between the staircase and the external exit passageway or external corridor.

All services such as pipe/duct installation shall not be located inside protected staircase and no wash room is allowed to be located inside staircase.

There shall be no unprotected openings of occupancy area within 5ft horizontally and 10 ft vertically below any part of the ventilation opening in the external wall of internal exit staircase. Exceptional cases are public and commercial buildings like hotels and offices etc. which are properly provided and maintained with mechanical ventilation and lighting facilities as per Building services chapter.

There shall be no unprotected openings within 10 ft horizontally or within 10ft vertically below, or adjacent or facing.

If the stair except the buildings defined as R1 and R2 serves more than 4 storeys, smoke free approach shall be added comply with 2.6.14.

2.6.9.1.1 R1 and R2 (Up to 8 storey)

Internal exit stair of the buildings (R-maximum 24 m height) must be naturally ventilated and opening of the ventilation must be 8ft (up to 24m habitable floor height) and 10ft (habitable floor height above 24m) away from the boundary line. If the ventilation opening is faced to BDS or street, the above distance shall not be considered.

2.6.9.2 External exit stair

a) An exit stair which serves as an exit must be located outside of the building or at least 50% of it, must be protruded outside the building or locate on external wall. The external exit staircase shall be located so as to lead directly to a street or open space with direct access to street.

An exit staircase which serves as a required exit shall be located outside the building and open to the outdoor air, and enclosed by parapet walls or railing only.

External exit staircase may be used as required exit in lieu of internal exit staircase provided it complies with the requirements of exit staircase, except for enclosure of an internal staircase.

An external staircase shall qualify as an external exit staircase if it is located within or abutting an air-well (which is open to sky and is required to provide lighting and ventilation to the occupancy areas) having the minimum size in relation to the habitable height of the building as given in the Table 2.6.7.

Table 2.6.7 Minimum Air-well size

Max. Habitable Height of Building	Min. Clear width of Air-well
60	33
78	36
118	40
158	43
196	46

b) The stair must be naturally ventilated with a minimum unobstructed opening area, larger or equal to 10% (fixed opening) and 15% (if louvre) of floor area per floor of the staircase.

c) There shall be no unprotected openings within 10 ft horizontally or within 10ft vertically below, or adjacent or facing.

Exception: R1 and R2 (Up to 8 story) which are located in CBD, having back lane and can't comply with 2.6.8.2.c, the building can be accessible by fire engine and it shall have one stair at the back of flat.

2.6.9.3 Scissor Staircase

a) Where two separate internal exit staircases are contained within the same enclosure, each exit staircase shall be separated from the other by non- combustible construction having fire resistance for a minimum period equal to that required for the enclosure, and

b) Such scissor exit staircases shall comply with all applicable provisions for exit staircase, and

c) Door opening into scissor exit staircases shall be at least 7m measured as travel distance between the two closer edges of the staircase doors, and

d) Where there is only one pair of scissor exit staircases, the door opening into scissor exit staircases shall be spaced at least ⅓ the diagonal dimension of the area to be served in a sprinkler protected building and ½ the diagonal dimension in a non-sprinkler protected building and

e) The ventilation openings of each staircase shall be located on alternate storeys if such openings or windows are serving both staircases on the same wall.

2.6.9.4 Basement Exit Staircase

(a) Any exit staircase which serves a basement storey of a building shall comply with all the applicable provisions for exit staircase, and

(b) Such exit staircase shall not be made continuous with any other exit staircase which serves a non basement storey of the building,

(c) Basement exit staircases which are vertically aligned with the exit staircases of non basement storeys shall be separated from such other exit staircases by construction having fire resistance for a minimum period equal to that required for the enclosure.

2.6.9.5 Upper storey staircase continues into basement

Where upper storey staircase is allowed by the Relevant Authority to be continuous with that serving the basement which is naturally ventilated, the following shall be complied with:

i) Entry at basement

the entry into the basement staircase shall be through a protected lobby, or directly from the basement occupancy area provided the door to the basement staircase is minimum 1-hour fire rated;

ii) Barrier

to prevent occupants exiting continuously from upper storeys into the basement storey during an emergency, a physical barrier in the form of a door or gate (self-closing type) could be provided across the staircase landing at ground level to separate the discharge route of upper storeys from the basement staircase;

iii) Smoke-stop lobby

smoke stop lobby shall be provided for entry into the staircase at all storeys, including basement if the staircase serves more than 4 storeys , including basement;

iv) Signages

Appropriate signages shall be provided inside the staircase enclosure to direct occupants out of the building at ground level.

2.6.10 Exits Discharge

All exits shall be discharged at ground level directly into a safe open exterior space within its own property or public space.

Exception: In sprinkler protected building, maximum 50% of the total building exits are allowed to discharge directly to the ground level circulation space subject to the following:

a) The discharge point shall be at a location in the circulation space at ground level with direct access and within sight of a safe exterior open space.

b) The maximum distance of the discharge point to exterior open space is 30ft.

The sprinkler system shall conform to the Myanmar Fire Safety Code of Procedures.

2.6.11 Exit Passage Way

Exit passage way can be used as a horizontal extension of a vertical exit of exit staircase or a passage leading from a courtyard to an open exterior space, complying with the requirements of travel distance, exit discharge and requisite fire resistance.

2.6.11.1 Internal Exit Passage way

a) Exit passageways that serve as a means of escape shall be minimum 1 hour rated construction.

b) The enclosure walls of an exit passageway shall have not more than two exit doors opening into the exit passageway

c) Exit doors opening into an exit passageway shall have fire resistance rating as required for exit doors opening into exit staircases, fitted with automatic self-closing device.

d) The minimum width and capacity of exit passageway shall comply with 2.6.8 Egress Width

e) Changes in level along an exit passageway requiring less than two risers shall be by a ramp complying with the provisions under 2.6.2

f) If the exit staircase which connects to the internal exit passageway is pressurised, the internal exit passageway shall not be naturally ventilated but shall be mechanically ventilated.

2.6.11.2 External exit passageway

a) An external exit passageway can be used as a required exit in lieu of an internal exit passageway. The external wall between the exit passageway and the rest of the floor space can have ventilation openings of non-combustible construction, fixed at or above a level 1.8m (6 ft), measured from the finished floor level of the passageway to the sill level of the openings and such ventilation openings shall be located not less than 3.0 m (10ft) from any opening of an exit staircase, and

b) An external exit passageway may not be subjected to the limitations of a maximum of two exit doors opening into the exit passageway, and

c) An external exit passageway may be roofed over provided the depth of the roofed over portion shall not exceed 3m (10ft) to avoid smoke logging, and

d) An external exit passageway may be enclosed on the open side by only a parapet wall of not less than 1.0 m (3 ft 4 in) or more than 1.1m (3 ft 7 in) in height and the vertical height of the unobstructed ventilation opening measured from the parapet wall up to the top edge of the opening or eaves of overhang shall not be less than 1.2m (4 ft), Exception: if external passage way is used on ground between building and fence, the farthest edge of roof or slab above the exit passage shall be 3ft apart from fence and the passage shall have minimum width of 4 ft.

e) Exit doors opening into an external exit passageway shall have fire resistance for at least half an hour and fitted with automatic self-closing device.

2.6.11.2.1 Residential Occupancy

In a block of residential apartments or maisonettes, smoke free approach to an exit staircase is permitted by means of an external corridor subject to compliance with the following:

(a) Such external corridors conform to the requirements of external exit passageways for minimum width, headroom clearance, changes in floor level. The provision of parapet wall or balustrade which shall not exceed 4ft or lower than 1m in height along the outer side of the corridor. The corridor may be roofed over, provided the depth of the roofed over portion shall not exceed 10ft. The vertical height of the unobstructed ventilation opening measured from the parapet wall or balustrade up to the top edge of the opening or eaves of overhang shall not be less than 4ft.

(b) The residential apartment or maisonette shall be separated from the external corridor by an external wall with fire resistance rating of at least 1 hour, except that ventilation openings of non-combustible construction may be fixed at or above a level of 4ft, measured from the finished floor level of the external corridor to the sill level of the opening.

2.6.12 Exit Doors

2.6.12.1 Exit doors opening

Exit doors opening into exit staircases and exit passageways shall not impede the egress of occupants when such doors are swung open, and all doors which open into the corridor, shall not hinder movement of occupants. The corridor's clear width shall at least remain to be half of the required clear width as stipulated under Table 2.6.6 when such door (s) is swung open.

Exit doors and exit access doors shall open in the direction of exit travel:

a) When leading to an exit access way

b) When used in exit enclosure, including smoke stop and fire fighting lobbies in a building. It shall not apply to doors of individual residential units that open directly into an exit enclosure, or

c) When serving a high hazard area, or

d) When serving a room or space with more than 50 persons

2.6.12.2 Locking of staircase and smoke stop/ fire lift lobby doors

One way locking device is allowed to be protected to doors of exit staircase, smoke stop/ fire lift lobby in the following situations, provided only one-way locking device is used, e g .panic bolt or thumb turn locking device:

a) Exit door between staircase shaft and occupancy area; and

b) Exit access door between smoke/ fire fighting lobby and occupancy area; and

c) Exit door between staircase shaft and smoke stop lobby; and

d) Exit door between staircase shaft and circulation area; and exit access door between smoke stop/ fire fighting lobby and circulation area.

2.6.13 Means of Egress Lighting

Emergency lighting system must be provided along Exit Access and Exits, Exits discharge.

2.6.14 Accessible Means of Egress

Accessible egress must be provided if there is "accessible place". Refer to Chapter 2.7

2.6.15 Smoke Free Approach to Exit Stair

Entry at every storey level (including Ground floor) to an exit staircase of any building or part of a building of more than four storeys above ground level shall be through: an external exit passageway or external corridor comply with 2.6.10 or through a lobby comply with the followings:

a) A lobby that is separated from the adjoining areas of the building by a wall having a fire resistance of 1 hour. The exit access door shall have fire resistance of half an hour fitted with automatic self-closing device conforming to the requirements of Myanmar Fire Safety Code of Procedures. The design of a smoke-stop lobby must be such as not to impede movement of occupants through the escape route. The floor area of a smoke-stop lobby shall be not less than 32 sq-ft and if a smoke-stop lobby also serves as a fire fighting lobby, the floor area shall be not smaller than 64 sq-ft and with no dimension smaller than 6ft 6 inches. The floor shall be graded from the lift door towards the lobby door with a fall not exceeding 1 in 200.

A smoke-stop lobby shall be ventilated by:

(i) permanent fixed ventilation openings in the external wall of the lobby; such ventilation openings shall have an area of not less than 15 per cent of the floor area of the lobby and located not more than 30ft from an air-well or external recessed space of minimum clear area 1000sq-ft and minimum width of 20ft. The air-well or external recessed space shall have no obstruction vertically throughout the air space for ventilation;

(ii) mechanical ventilation, except for purpose Residential Apartment, complying with the requirements

(iii) cross-ventilated corridor having fixed ventilation openings in at least two external walls. The openings to each part of the external walls shall not be less than 50 per cent of the superficial area of the opposing external wall. No part of the floor area of the corridor shall be at a distance of more than 43ft from any ventilation openings.

(iv) minimum 5ft horizontally and 10 ft vertically below any part unprotected openings of occupancy area.

2.6.16 Exit Sign

All signage showing the emergency exit route must be visible from distance of 100 ft and they shall not be covered by other elements.

2.6.17 Emergency escape/ Refuge Area

In the next edition, the details of this section will be described depending on the resources' availability.

2.6.18 Special requirements

2.6.18.1 Hospitals

a) All multi-storey hospitals with patients care of more than 24 hours must have all vertical transportation system (fire escape bed lift) only for the patients if the hospital is more than 4 storeys and

b) Every storey shall have fire escape lobby or balcony that is designed for 2 hour fire rating.

2.6.18.2 Definitions

FIREMAN STAIR: The stairs generally meant for usage of fireman in case of emergency. The fireman stairs must be able to stand minimum 1000 pounds.

FIRE ESCAPE BED LIFT: Lift is to be used for the evacuation of patients in beds including wheelchairs or physically disabled, in a fire emergency, although it can be use as a passenger lift during normal time.

2.7 ACCESSIBILITY

2.7.1 Scope

The provisions of this chapter shall control the design and construction of facilities for accessibility to physically disabled persons.

2.7.2 Scoping Requirements

All public buildings shall be accessible for the disabled persons and must have minimum one accessible toilet comply with this chapter. Minimum provision for disabled persons based on building types shall be as per following table.

Table 2.7.1 Scoping requirements

Type of Building	Minimum provision
All public transportation building	At least one space shall be accessible to use public transport.
Banks Post offices, banks and financial service institutions	At least one accessible service desk shall be provided for every 10 service desk.
Hotels	At least one guest room shall be provided for every 250 guestrooms or part and thereof. Rooms designated for wheelchair users should, where possible, be placed at ground level so as to have a direct means of escape in case of fire.
Concert halls, Stadium, Cinema and theatres, sport buildings and other places of public assembly.	Accessible entrances, exists, aisles and main community or public gathering areas. Accessible toilet facilities should be nearby. At least one wheel chair space shall be provided for every 100 seats or part thereof.
Religious Building (If occupancy load is more than 1000)	The main worship shall be made accessible in accordance with this chapter.
Hostels and Halls	At least one level, preferably access level, shall be provided with facilities in accordance with 2.7.3.
Shopping Mall (if ground floor area is more than 10,000sq-ft)	At least ground floor shall be accessible in accordance with 2.7.3.
School/Educational buildings	At least ground floor shall be accessible in accordance with 2.7.3. All teaching, administrative and common areas should be accessible to a wheelchair user. Suitable arrangements should be made for stepped lecture halls or auditoriums.
Hospitals and health facilities	All entrances should be accessible to a wheelchair user. All rooms and administrative departments should be accessible for the benefit of patients, disabled visitors and disabled staff members.

Type of Building	Minimum provision
Libraries	All open book stack, library facilities and equipment should be accessible. A special room should be provided for sightless and for hearing-impaired people who need assistance while reading.
Food Centres, Cafeterias and restaurants	Accessible entrance. A minimum of 1 table without stools or seats attached to the floor for every 10 tables. Stools and high tables are not suitable for wheelchair users. Low tables should be provided as well. In self-service restaurants tray slides and counters should be mounted approximately 0.90 m from the floor.
Car parks	At least one car parking stall shall be reserved for first 100 parking stall and at least stalls shall be provided if the parking lots is more than 100.

2.7.3 Minimum Requirements

2.7.3.1 Parking Lot

a) Minimum size of 16ft long and 11 ft wide parking lot shall be provided in accordance with 2.7.2.

b)Accessible parking lots shall be located as close as possible to accessible entrance.

Entrances and doors

Entrance doors can be either the sliding type or the swinging type.Revolving doors are not suitable for the use of disabled people or people with prams.

a) For double-leaf doors, at least one leaf should have a minimum clear width of 2ft 10 inches.

b) At least one accessible entrance shall be provided near to parking lot reserved for disable persons.

c) Clear opening of doors for the wheelchair shall be minimum3 ft.

d) Door handles shall be easily handled and lever handles are preferred to door knobs.

e)Door handles and other hard ware shall be located not more than 3ft6in from finished floor and not less than 3ft.

f) Minimum clear space of 4ft 6in x 4ft 6in shall be provided where a door opens against the direction of approach.

2.7.3.2 Public Areas

All public areas shall be accessible for the disabled persons with barrier free access.

2.7.3.3 Corridors and Walk ways

a)Minimum width of corridor and walkway shall be 4ft and waiting area

b)Turnabout,minimum space of 4ft 6in x 4ft 6in shall be provided at or within 12ft of dead end and in front of accessible doors along corridor.

c)Recesses or turn about shall be spaced at a maximum of 40ft interval.

2.7.3.4. Guiding/warning floor material

The floor material to guide or to warn the visually impaired persons with a change of colour or material with conspicuously different texture and easily distinguishable from the rest of the surrounding floor materials is called **guiding or warning floor material.**This floor material shall be provided in the following areas:

a) The access path to the building and to the parking area.

b) The landing lobby towards the information board, reception, lifts, stair-cases and toilets.

c) Immediately at the beginning/end of walkway where there is a vehicular traffic.

d) At the location abruptly changing in level or beginning/end of a ramp.

e) Immediately in front of an entrance/exit and the landing.

f) The marking strip width should not be less than 0.60 m.

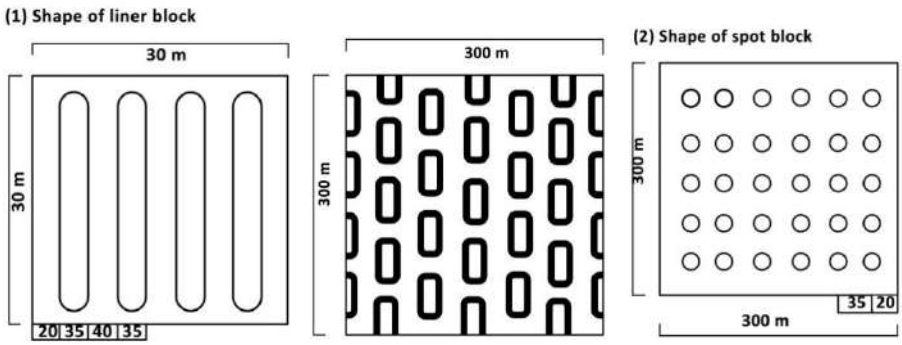


Fig: 2.7.3.4 Shapes of guiding blocks for persons with impaired vision

2.7.3.5 Handrail

a) All grip rails and handrail shall be not less than 1 in diameter and not more than 2 in. and it shall have minimum 1.75 in. spacing from the surface of doors and walls.

b) Handrails must be provided on both sides of the ramp and should not be installed beyond the width of any crossing not to obstruct pedestrian flow.

2.7.3.6 Buttons and switches

All buttons for the wheelchair bound such as switches, controls and lift buttons shall be located at not more than 4ft 9 in and not less than 3ft 3 in.

2.7.3.7.Signage

All types of signs should be visible, clear, simple, easy to read and understand at night.

Signs should not be placed behind glass because of possible reflection.
Accessible spaces and facilities should be identified by the international symbol of accessiblity(seefig :)

Fig : 2.7.3.7b. Information boards in concourse

The symbol is composed of a wheelchair figure with either a square background or a square border (see fig.).

Fig : 2.7.3.7c. The international symbol of accessibility
The information board should be made easily readable by using sufficiently large text size, distinct contrast and illumination.

For hearing impaired persons, an electronic sign board of appropriate size & height should be displayed on each platform at conspicuous location for all announcements.
Visually impaired persons make use of other senses such as hearing and touch to compensate for the lack of vision.
International symbol mark for wheel chair as shown below be installed at the lift, toilet, staircase, parking areas etc., that have been provided for the handicapped.

2.7.3.8 Ramps

a) All ramps meant for the wheelchairs must be the slopes less than 1:10 (rise: run ratio) and the minimum 4 ft. clear width of ramp shall be provided.

b) The maximum horizontal run of ramp is 30 ft. and minimum 6 ft. wide of landing shall be provided at every 30 ft. horizontal run.

c) If horizontal run is less than 1 ft. the ramp gradient can be steeper till up to 1:8.

d) The ramp surface should be hard and non-slip.

2.7.3.9.Stairs

Circular stairs and stepped landings should be avoided.

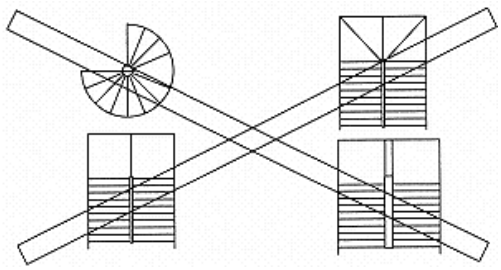
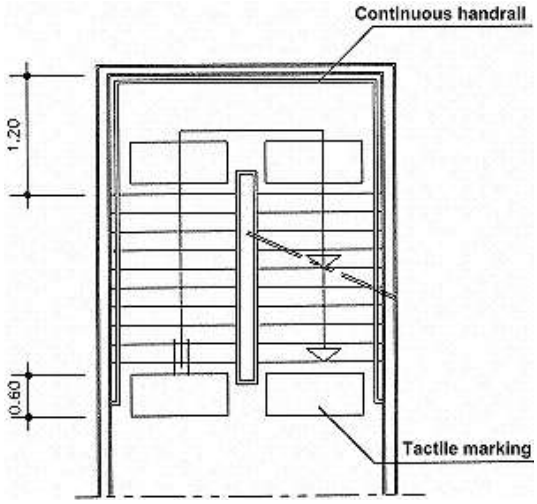


Fig :2.7.3.9a. Circular stairs and stepped landings

The edges of stairs should be painted in a contrasting color for the benefit of poor- sighted users.



Height of the riser shall not be more than 150 mm and width of the tread 300 mm. The steps shall not have abrupt (square) nosing.

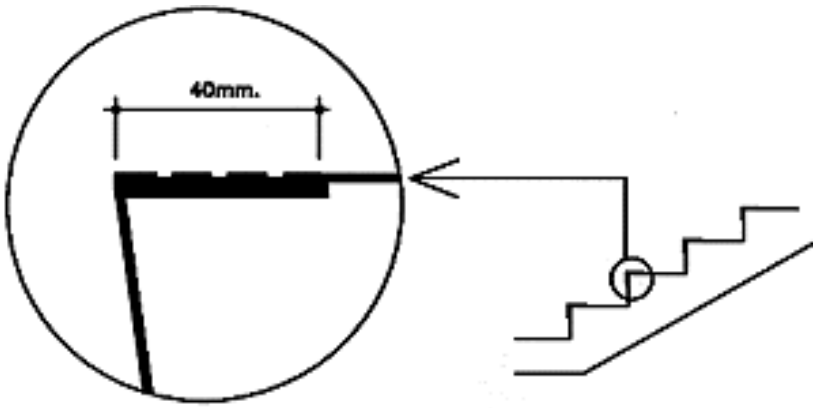


Fig : 2.7.3.9d. Slip-resistant nosing

2.7.3.10 Counter and desk

Writing or service counters for disabled person shall be not more than 2ft. 5 in. high and clear space below counter shall have minimum dimensions of 3 ft. wide x 1 ft. 9 in. deep x 2 ft.5 in. high.

2.7.3.11 Restrooms and Toilets

The dimensions of water closet compartment for wheelchair bound shall be accordance with the dimensions as shown in fig. 2.7.1.Rest rooms should be equipped with an alarm system.
Toilet floor shall have a non-slip surface without any level.
Mirrors should be suitable for use by both standing and seated persons. Low mirrors or downward tilted mirrors can be used. The bottom edge of mirrors should be located at a maximum height of 1.00 m from the finished floor level.
Toilet seats, bidets, shower seats and bath-tub seats are required to be mounted at the same height of the wheelchair seat, i.e. between 0.45m and 0.50 m above floor level.
Grab bars should be installed in water-closets, bath-tubs and showers to assist disabled persons to use the facilities safely and easily. Grab bars should have a diameter of 30 mm to 40 mm. Wall-mounted grab bars should extent between 35 mm and 45 mm from the wall.

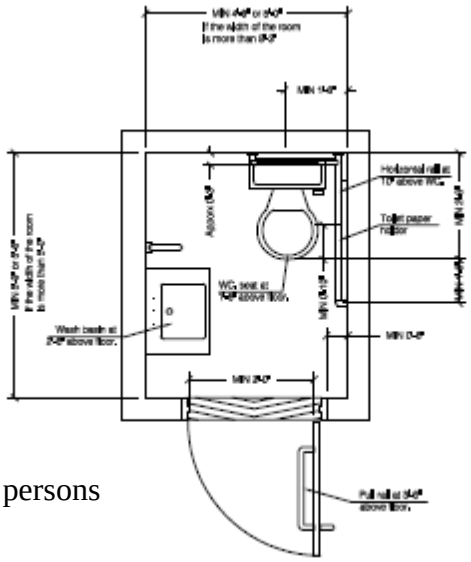


Fig. 2.7.1 Spacing in toilets for disabled persons

2.8 EXTERIOR WALLS

2.8.1 Scope

The provisions of this chapter shall establish the minimum requirements for exterior walls; exterior wall coverings; exterior wall openings; exterior windows and doors; architectural trim; balconies and similar projections; and bay and oriel windows.

2.8.2 Definitions

ADHERED MASONRY VENEER. Veneer secured and supported through the adhesion of an approved bonding material applied to an approved backing.

ANCHORED MASONRY VENEER. Veneer secured with approved mechanical fasteners to an approved backing.

BACKING. The wall or surface to which the veneer is secured.

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS). EIFS are nonstructural, nonload-bearing, exterior wall cladding systems that consist of an insulation board attached either adhesively or mechanically, or both, to the substrate; an integrally reinforced base coat and a textured protective finish coat.

EXTERIOR INSULTATION AND FINISH SYSTEMS (EIFS) WITH DRAINAGE. An EIFS that incorporates a means of drainage applied over a water- resistive barrier.

EXTERIOR WALL. A wall, bearing or nonbearing, that is used as an enclosing wall for a building, other than a fire wall, and that has a slope of 60 degrees(1.05 rad) or greater with the horizontal plane.

EXTERIOR WALL COVERING. A material or assembly of materials applied on the exterior side of exterior walls for the purpose of providing a weather- resisting barrier, insulation or for aesthetics, including but not limited to, veneers, siding, exterior insulation and finish systems, architectural trim and embellishments such as cornices, soffits, facias, gutters and leaders.

EXTERIOR WALL ENVELOPE.A system or assembly of exterior wall components, including exterior wall finish materials, that provides protection of the building structural members, including framing and sheathing materials, and conditioned interior space, from the detrimental effects of the exterior environment.

METAL COMPOSITE MATERIAL (MCM). A factory-manufactured panel consisting of metal skins bonded to both faces of a plastic core.

METAL COMPOSITE MATERIAL (MCM) SYSTEM. An exterior wall covering fabricated using MCM in a specific assembly including joints, seams, attachments, substrate, framing and other details as appropriate to a particular design.

VENEER. A facing attached to a wall for the purpose of providing ornamentation, protection or insulation, but not counted as adding strength to the wall.

WATER- RESISTIVE BARRIER. A material behind an exterior wall covering that is intended to resist liquid water that has penetrated behind the exterior covering from further intruding into the exterior wall assembly.

2.8.3 Performance Requirements

The provisions of this section shall apply to exterior walls, wall coverings and components thereof.

2.8.3.1 Weather protection

Exterior walls shall provide the building with a weather-resistance exterior wall envelope. The exterior wall envelope 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. 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.

2.8.3.2 Prevention of dampness

Damp rising from the ground up into the superstructure not only damages the masonry units, but also accelerates the decaying of timber and bamboo elements. Damp-Proof Course (dpc) shall be installed according to the manual of the manufacturers to prevent the penetration of dampness and moisture into the building. Where any part of the walls of a building is subject to water pressure, that portion of the floor or wall below ground level shall be waterproof.

2.8.3.3 Structural

Exterior walls, and the associated openings, shall be designed and constructed to resist safely the superimposed loads required by *Part 3- Structural Design*.

2.8.3.4 Fire resistance

Exterior wall shall be fire-resistance rated as required by Myanmar Fire Safety Code of Procedures.

2.8.3.5 Flood resistance

Exterior walls extending below the design flood elevation shall be resistant to water damage in flood hazard areas. The electrical mechanical and plumbing system components shall not be mounted on or penetrate through exterior walls that are designed to break away under flood loads.

2.8.4 Materials

Materials used for the construction of exterior walls shall comply with the provisions of this section. Materials not prescribed herein shall be permitted, provided that any such alternative has been approved. All wall cladding over 10 feet from the floor must have safety arrangement to protect falling of these material on the occupant.

2.8.4.1 Water-resistive barrier

A minimum of one layer of approved materials, shall be attached to the studs or sheathing, with flashing as described in Section 2.8.3.1, in such a manner as to provide a continuous water-resistive barrier behind the exterior wall venner.

2.8.4.2 Bamboo

Bamboo which is used for special and temporary shelter in public usage shall be mature and free from damage. It is preferable to use treated bamboo be used. The treatment may be carried out in a traditional manner. One of the simplest ways is to soak the bamboo in running water continuously for two to three weeks.

2.8.4.3 Wood

Exterior walls of wood construction shall be designed and constructed in accordance with *Part 3- Structural Design*.. Wood shall be performed according to the Wood Based Materials Section in Part 6, Building Materials. Locally available timber can be used. Treated timber is preferable to untreated timber. The treatment may be done in a traditional manner.

2.8.4.4 Masonry

Exterior walls of masonry construction shall be designed and constructed in accordance with Masonry Section in *Part 3- Structural Design*.. Masonry units, mortar and metal accessories used in anchored and adhered veneer shall meet the physical requirements of Blocks, Bricks, Tiles and Masonry Section in Part 6, Building Materials. The backing of anchored and adhered veneer shall be of concrete, masonry, steel framing or wood framing.

2.8.4.5 Metal

Exterior walls of formed steel construction, structural steel or lightweight metal alloys shall be designed and constructed in accordance with *Part 3- Structural Design* and shall be performed according to Aluminium and Other Light Metals and Their Alloys Section in Part 6, Building Materials.

2.8.4.6 Concrete

Exterior walls of concrete construction shall be designed and constructed in accordance with Concrete Section in *Part 3- Structural Design* and Concrete shall be performed according to Cement and Concrete Section in Part 6, Building Materials.

2.8.4.7 Glass-unit masonry

Exterior walls of glass-unit masonry construction shall be designed and constructed in accordance with Glass-unit masonry Section in *Part 3- Structural Design*.

2.8.4.8 Stone Venner

Exterior walls of stone venner construction shall be designed and constructed in accordance with *Part 3- Structural Design*. Stone shall be performed according to Stones Section in Part 6, Building Materials.

2.8.4.9 Exterior insulation and finish systems

Exterior insulation and finish systems (EIFS) with or without drainage shall govern the materials, construction and quality for use as exterior wall coverings.

2.8.5 Projections in Brickwork

All projections in brickwork shall be corbelled gradually and no projection shall extend more than 9 inches from the face of any wall.

2.8.6 Recess

Where a recess in the load-bearing building is made in an external wall or a division wall (party wall):-

a) The wall at the back of the recess shall not be less than 4.5 inches thick at an external wall and 9 inches thick at a division wall;

b) A sufficiently strong members like lintel or arch of noncombustible material shall be built over the recess area;

c) If a recess or opening is made at the edge of a division wall or of an external wall, there shall be a space of not less than 1.5 feet between the beginning of opening and the extreme end of the wall.

2.8.7 Installation of Wall Coverings

2.8.7.1 Exterior covering materials in brick walls

In all cases where 4.5 inches brick walls or non-load-bearing walls of other materials should be attached to reinforced concrete frames, or other structural members, such walls shall be properly secured to the structural members.

2.8.7.2 Cement plaster

Cement plaster applied to exterior walls shall conform to the requirements specified in Cement and Concrete Section in Part 6, Building Materials.

2.8.7.3 Fastening

Weather boarding and wall coverings shall be securely fastened with aluminum, copper, zinc, zinc-coated or other approved corrosion-resistant fasteners or the approved manufacturer's installation instructions.

2.8.8 Exterior Doors and Windows

The openings of exterior walls shall be provided the overhead sun shade and similar projections for weather protection. Exterior doors and windows shall be installed in accordance with approved manufacturer's instructions and shall be performed according to Part 6, Building Materials. Fastener size and spacing shall be provided in such instructions and shall be calculated based on maximum loads and spacing. Any parts of the exterior doors and windows shall be water-proof. The protective bars and safety glazing are required for any fixed or operable opening extended to floor finished level. The protective bars or sill height of operable openings shall be 3 feet above adjacent floor finished level that is more than 30 inches above

exterior ground level. The insulating glass shall be installed if required to give weather protection.

2.8.8.1 Curtain Walls

Any parts or members of curtain walls shall be water-proof and installed in accordance with approved manufacturer's instructions. The approved flexible fire barrier material that provides an effective firestop and smoke seal for perimeter voids and accommodates dynamic movement between the curtain wall and the floor shall be provided.

2.8.9 Balconies and Similar Projections, Bay and Oriel Windows

Balconies and similar projections, bay and oriel windows shall conform to the type of construction required for the building to which they are attached. Exterior balconies attached to or supported by wall required to be of masonry, shall have brackets or beams constructed of incombustible materials. 3 feet height railings shall be provided for balconies, landings, or porches which are more than 30 inches above exterior ground level.

2.8.10 Metal Composite Materials (MCM)

The provisions of this section shall govern the materials, construction and quality of metal composite materials (MCM) for use as exterior wall coverings.

2.8.10.1 Exterior wall finish

MCM used as exterior wall finish or as elements of balconies and similar projections and bay and oriel windows to provide cladding or weather resistance.

2.8.10.2 Architectural trim and embellishments

MCM used as architectural trim or embellishment shall comply with durability and fire resistance rating.

2.8.10.3 Structural design

MCM systems shall be designed and constructed to resist wind loads as required by Structural Design Chapter for components and cladding.

2.8.10.4 Weather resistance

MCM systems shall comply with Section 2.8.3 and shall be designed and constructed to resist wind and rain in accordance with this section and the manufacturer's installation instructions.

2.8.10.5 Durability

MCM systems shall be constructed of approved materials that maintain the performance characteristics required in Section 2.8.10 for the duration of use.

2.8.10.6 Fire-resistance rating

Where MCM systems are used on exterior walls required to have a fire-resistance rating in accordance with Section 2.8 evidence shall be submitted to the building official that the required fire-resistance rating is maintained.

2.9 ROOF CONSTRUCTION, ROOF COVERING AND ROOF TOP STRUCTURES

2.9.1 General

2.9.1.1 Scope

Roofing construction, roof coverings and rooftop structures shall be as specified in this code and as otherwise required by this chapter.

2.9.1.2 Definitions

ATTIC STOREY: Any storey situated wholly or partly in a roof, so designed, arranged, or built as to be used for business, storage, or habitation.

CHHIMNEY CLASSIFICATIONS:

(a)RESIDENTIAL APPLIANCE TYPE

A factory-built or masonry chimney suitable for removing products of combustion from residential type appliance producing combustion gases not in excess of 538°C measured at the appliance flue outlet.

(b) LOW-HEAT APPLIANCE TYPE

A factory-built masonry or metal chimney suitable for removing-the product of combustion from fuel-burning low-heat appliances producing combustor gases not in excess of 538°C under normal operating conditions but capable of Producing, combustible gases of 760°C during intermittent forced firing for periods up to one hour. All temperatures are measured at the appliance flue outlet.

(c) MEDIUM-HEAT APPLIANCE TYPE

A factory built masonry or metal chimney suitable for removing -the products of combustion from fuel-burning medium-heat appliances producing combustion gases not in excess of 1093°C measured at the appliance flue outlet.

CHIMNEY CONNECTOR: The pipe which connects a flue-burning appliance to a chimney.

CHIMNEY LINER: The lining materials of fire clay or other approved material.

CHIMNEY, MASONRY: The chimney of solid masonry units bricks, stones, listed hollow unit masonry units, or reinforced concrete.

INCOMBUSTIBLE MATERIAL: When referred to as structural material, means brick, stone, terracotta, concrete, iron, steel, sheet metal, or tiles, used either singly or in combination.

INCOMBUSTIBLE ROOFING: A covering of not less than two thicknesses of roofing' felt and a good coat of tar and gravel or tin, corrugated iron or other approved fire-resisting material with standing seam on lap joint.

INTERLAYMENT is a layer of felt or no bituminous saturated felt not less than 18 inches (457 mm) wide, shingled between each course of roofing material.

METAL ROOF COVERING is metal shingles or sheets for application on solid roof surfaces, and corrugated or otherwise shaped metal streets or sections for application on roof frameworks or on solid roof surfaces.

PENT HOUSE: An enclosed, unoccupied structure above the roof of a building, other than a tank, tower, spire, dome cupola or bulkhead.

POSITIVE ROOF DRAINAGE**:** The drainage condition in which consideration has been made for all loading deflections of the roof deck, and additional slope has been provided to ensure drainage of the roof within 48 hours of precipitation.

ROOF COVERING**:** Roof covering is a durable exterior surface material that provides weather protection for the building at the roof.

ROOFING ASSEMBLY: Roofing assembly includes the roof deck, substrate or thermal barrier, insulation, vapour retarder, underlayment, inter-laymen, base plies, roofing plies, and roof covering that is assigned a roofing classification.

ROOF VENTILATION**:** The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, attics, cathedral ceilings or other enclosed spaces over which a roof assembly is installed.

SCUPPER**:** An opening in a wall or parapet that allows water to drain from a roof.

UNDERLAYMENT is one or more layers of felt, sheathing paper, no bituminous saturated felt or other approved material over which a roofing system is applied.

2.9.2 Roof Covering

Roof covering for all buildings shall be either fire-retardant or ordinary depending upon the fire-resistive requirements: of the particular type of construction. The use of combustible roof insulation shall be permitted in all type of construction provided it is covered with approved roof covering applied directly thereto.

2.9.3 Roof Trusses

All roofs shall be so framed and tied into the framework and supporting walls so as to form an integral part of the whole building. Roof trusses shall have all joints well fitted and shall have all tension members well tightened before any load is placed in the truss. Diagonal and sway bracing shall be used to brace all roof trusses. The allowable working stresses of materials in trusses shall conform to this Code. Camber shall be provided to prevent sagging.

2.9.3.1 Attics

2.9.3.1.1 Access

An attic access opening shall be provided in the ceiling of the top floor of buildings with a combustible ceiling or roof construction. The opening shall be located in a corridor or hallway of buildings of three (3) or more stories in height and readily, accessible in buildings of any height. An opening shall not be less than 600 mm x 600 mm (2 ft x 2 ft). The minimum clear headroom of 800 millimeters (31.2") shall be provided above the access opening.

2.9.3.1.2 Area separation

Enclosed attic spaces of combustible construction shall be divided into horizontal areas not exceeding 250 sq. meters (2691 sq.ft) by fire-resistive partitions extending from the ceiling to

the roof. Except, that where the entire attic is equipped with approved automatic fire-extinguishing system, the attic space may be divided into areas not to exceed 750 sq. meters (8073 sq.ft). Openings in the partitions shall be protected by self-closing doors.

2.9.3.1.3 Draft stops

Regardless of the type of construction, draft stops shall be installed in trusses roofs, between roof and bottom chords or trusses, in all buildings exceeding 2000 sq.meter (21528 sq.ft). Draft stops shall be constructed as for attic area separations.

2.9.3.1.4 Ventilation

Enclosed attics including rafter spaces formed where ceilings are applied direct to the underside or roof rafters shall be provided with adequate ventilation protected against the entrance of rain.

2.9.4 Roof Drainage System

2.9.4.1 Roof drains

Roof drains shall be installed at low points of the roof and shall be adequate in size to discharge all tributary waters.

2.9.4.2 Overflow drains and scuppers

Where roof drains are required adequate overflow drains shall be provided.

2.9.4.3 Concealed piping

Roof drains and overflows drains, when concealed within the construction of the building, shall be installed in accordance with the provisions of this Code.

2.9.4.4 over public property

Roof drainage water from a building shall not be permitted to flow over public property except for Group “R” and “U_1” Occupancies.

2.9.5 Flashing

Flashing and counter flashing shall be provided at the juncture of the roof and vertical surfaces.

2.9.6 Skylights

All skylights shall be constructed with metal frames except those for Groups “R” and “U_1” Occupancies, Frame's of skylights shall be designed to carry loads required for roofs. All skylights the glass of which is set at an angle of less than 45° from the horizontal, if located above the first storey, shall be set at least 100 millimeters (4") above the roof. Curbs on which the skylights rest shall be constructed of incombustible materials except for Types I or II Construction.

Spacing between supports in one direction for flat wired glass in skylights shall not exceed 625 millimeters (24"). laminated glass may have supports 1.50 meters (5 ft) apart in the direction of the corrugation, All glass in skylights shall be laminated glass; Except, that skylights over vertical shafts extending through two (2) or more storey shall be glazed with plain glass as

specified in the Code. Provided, that wired glass may be used in ventilation equal to not less than one-eight (1/8) the cross-sectional area of the shaft but never less than 1.20 meters (4 ft) provided at the top of such shaft. Any glass not wired glass shall be protected above and below with a screen constructed of wire not smaller than 2.5 millimeters (0.098") in diameter with a mesh not larger than 25 millimeters (0.98"). The screen shall be substantially supported below the glass.

Ordinary glass may be used in the roof and skylights for greenhouses. Provided that height of the greenhouses at the ridge does not exceed 6.00 meters (19.6 ft) above the grade. The use of wood in the frames of skylights will be permitted in greenhouses outside of highly restrictive Fire Zones if the height of the skylight does not exceed 6.00 meters (19.6 ft) above the grade, but in other cases metal frames and metal sash bars shall be used.

Glass used for the transmission of light, if placed in floors or sidewalks, shall be supported by metal or reinforced concrete frames, and such glass shall not be less than 12.5 millimeters (0.5") in thickness. Any such glass over 100 sq. centimeters (15.5 sq.inches) in area shall have wire mesh embedded in the same or shall be provided with, a wire screen underneath as specified for skylights in the Code. All portions of the floor lights or sidewalk lights shall be of the same strength as required for floor or sidewalk construction, except in cases where the floor is surrounded by a railing not less 1.10 meters (3.6 ft) in height, in which case the construction shall be calculated for not less than roof loads.

2.9.7 Penthouses and Roof top structures

2.9.7.1 Height

No penthouse or other projection above the roof in structures of other than Type V construction shall exceed 8.40 meters (28 ft) above the roof when used as an enclosure for tanks or for elevators which run to the roof and in all other cases shall not extend more than 3.60 meters (12 ft) in height with the roof.

2.9.7.2 Area

The aggregate area of all penthouses and other roof structures shall not exceed 50% of the area of the supporting roof.

2.9.7.3 Prohibited uses

No penthouse, bulkhead, or any other similar projection above the roof shall be used for purposes other than shelter of mechanical equipment or shelter of vertical shaft openings in the roof. A penthouse or bulkhead used for purposes other than that allowed by this Section shall conform to the requirements of the Code for an additional storey.

2.9.7.4 Construction

Roof structures shall be constructed with walls, floors, and roof as required for the main portion of the building except in the following cases:

On Types III and IV constructions, the exterior walls and roofs of penthouses which are 1.50 meters (4.5 ft) or more from an adjacent property line may be of one-hour fire-resistive incombustible construction.

Walls not less than 1.50 meters (4.5 ft) from an exterior wall of a Type IV construction may be of one-hour fire-resistive incombustible construction. The above restrictions shall not prohibit the placing of wood flagpoles or similar structures on the roof of any building.

2.9.8 Chimneys

2.9.8.1 Structural design

Chimneys shall be designed, anchored, supported, reinforced constructed, and installed in accordance with generally accepted principles of engineering. Every chimney shall be capable of producing a draft at the appliance not less than that required for the safe operation of the appliance connected thereto. No chimney shall support any structural load other than its own weight unless it is designed to act as a supporting member. Chimneys in a wood-framed building shall be anchored laterally at the ceiling line and at each floor line which is more than 1.80 meters (6 ft) above grade, except when entirely within the framework or when designed to be free standing.

2.9.8.2 Walls

Every masonry chimney shall have walls of masonry units, bricks, stones, listed masonry chimney units, reinforced concrete or equivalent solid thickness of hollow masonry and lined with suitable liners in accordance with the following requirements.

2.9.8.2.1 Masonry chimneys for residential type appliances

Masonry Chimneys shall be constructed of Masonry units or reinforced concrete with walls not less than 100 millimeters (4 in) thick: or rubble stone masonry not less than 300 millimeters (12 in) thick. The chimney liner shall be in accordance with the code.

2.9.8.2.2 Masonry chimneys for low heat appliances

Masonry Chimneys shall be constructed of Masonry units or reinforced concrete with walls not less than 200 millimeters (8 in) thick. Expect that rubble stone masonry not less than 300 millimeters (12 in) thick. The chimney liner shall be in accordance with the code.

2.9.8.2.3 Masonry chimneys for medium-heat appliances

Masonry chimneys for medium-heat appliances shall be constructed of solid masonry units of reinforced concrete not less than 200 millimeters (8 in) thick. Except, that stone masonry shall be not less than 300 millimeters (12 in) thick and, in addition shall be lined with not less than 100 millimeters (4 in) of firebrick laid in a solid bed of fire clay mortar with solidly filled head, bed, and wall joints, starting not less than 600 millimeters (24 in) below the chimney connector entrance, Chimneys extending 7.50 meters (25 ft) or less above the chimney connector shall be lined to the tap.

2.9.8.2.4 Masonry chimneys for high-heat appliances

Masonry chimneys for high-heat appliances shall be constructed with double walls of solid masonry units or reinforced concrete not less than 200 millimeters (8 in) in thickness, with an air space of not less than 50 millimeters (2 in) between walls. The inside of this Interior walls shall be of firebrick not less than 100 millimeters (4 in) in thickness laid in a solid bed of fire clay mortar with solidly filled head, bed, and Wall joints.

2.9.8.2.5 Masonry chimneys for incinerators installed in multi-storey buildings (apartment-type incinerators)

Chimneys for incinerators installed in multi-storey buildings using the chimney passageway as a refuse chute where the horizontal grate area of combustion chamber does not exceed 0.80 sq. Meters shall have walls of solid masonry or reinforced concrete, not less than 100 millimeters thick with, a chimney lining as specified in the Code. If the grate area of such an incinerator exceeds 0.80 sq. meters, the walls shall not be less than 100 millimeters of firebrick except that higher than 9.00 meters (30 ft) above the roof of the combustion chamber, common brick alone 200 millimeters in thickness may be used.

2.9.8.2.6 Masonry chimneys for commercial and industrial type incinerators

Masonry chimneys for commercial and industrial type Incinerators of a size designed for not more than 110 kilograms of refuse per hour and having a horizontal grate area not exceeding 0.50 sq. meter shall have walls of solid masonry or reinforced concrete not less than 100 millimeters thick with lining of not less than 100 millimeters (4 in) of firebrick, which lining shall extend for not less than 12.00 meters (36 ft) above the roof of the combustion chamber If the design capacity of grate area of such an inclneratorexceeds110 kilograms per hour and 0.80 sq. meter (80 sq ft) respectively, walls shall not be less than 200 millimeters (8 in) thick, lined with not less than 1 00 millimeters (4 in) of firebrick extending the full height of the chimney.

2.9.8.3 Linings

Fire clay chimney lining shall not be less than 15 millimeters (1/2 in) thick. The lining shall extend from 200 millimeters (8 in) below the lowest inlet or, in the case of fireplace, from the throat of the fireplace to a point above enclosing masonry walls, Fire clay chimney linings shall be installed ahead of the construction of the chimney as it Is carried up, carefully bedded one on the other in the fire clay mortar, with close-fitting joints left smooth on the inside. Firebrick not less than 500 millimeter thick maybe used in place of fireclay chimney.

2.9.8.4 Area

No chimney passageway shall be smaller in area, than the vent connection of the appliance attached thereto.

2.9.8.5 Height

Every masonry chimney shall extend at least 600 millimeters (24 in) above the part of the roof through which it passes and at least 600 millimeters (24 in) above the highest elevation of any part of a building within 3.00 meters (10 ft) to the chimney.

2.9.8.6 Corbelling

No masonry chimney shall be corbelled from a wall more than 150 millimeters, (6 in) nor shall a masonry chimney is corbelled from a wall which is less than300 millimeters (12 in) in thickness unless it projects equally on each side of the wall. In the second storey of a two-storey building of Group “R” Occupancy, corbelling of masonry chimneys on the exterior of the enclosing walls may equal the wall thickness. In every case the corbelling shall not exceed 25 millimeters (1 in) projection for each course of brick.

2.9.8.7 Change in size or shape

No change in the size or shape of a masonry chimney shall be made within a distance of 150 millimeters (6 in) above or below the roof joints or rafters where the chimney passes through the roof.

2.9.8.8 Separation

When more than one passageway is contained in the same chimney, masonry separation at least 100 millimeters (4 in) thick bonded into the masonry wall of the chimney shall be provided to separate passageways.

2.9.8.9 Inlets

Every inlet to any masonry chimney shall enter the side thereof and shall be of not less than millimeters thick metal or 16 millimeters refractory material.

2.9.8.10 Clearance

Combustible materials shall not be placed within 50 millimeters of smoke chamber or masonry chimney walls when built within a structure or within 25 millimeters (1 in) when the chimney is built entirely outside the structure.

2.9.8.11 Termination

All incinerator chimneys shall terminate in a substantially constructed spark arrester having a mesh not exceeding 20 millimeters.

2.9.8.12 Cleanout

Cleanout openings shall be provided at the base of every masonry chimney.

2.10 REGULATIONS FOR HISTORICAL BUILDINGS

Note: The *Historical Building Chapter,* Part 2, Architecture and Urban Design, governs for all heritage places or properties or areas in the Republic of the Union of Myanmar.

2.10.1 Administration

2.10.1.1 Title, purpose and Intent

2.10.1.1.1 Title. These regulations shall be known as the *Historical Building Chapter of Part 2, Architecture and Urban Design, Myanmar National Building Code* and will be referred to herein as "the HBC."

2.10.1.1.2 Purpose. The purpose of the HBC is to provide regulation to guide works affecting heritage places during conservation, restoration, rehabilitation, relocation, reconstruction, adaptation, or new works to buildings or properties designated as heritage places or properties within heritage conservation areas (Chapter 2.10.2). The HBC is intended to provide solutions for the proper conservation of heritage places or properties, to promote sustainability, to provide access for persons with disabilities, to provide a cost-effective approach to conservation, and to provide for the reasonable safety of the occupants or users. The HBC requires enforcing agencies to accept solutions that are reasonably equivalent to the regular rules and regulations (as defined in Chapter 2.10.2) when dealing with heritage places or properties.

2.10.1.1.3 Intent. The intent of the HBC is to facilitate the proper conservation and continuing use of heritage places or properties while providing reasonable safety for the building occupants and access for persons with disabilities.

2.10.1.2 Application

2.10.1.2.1 Application. The HBC is applicable to all issues regarding code compliance for heritage places or properties. The HBC may be used in conjunction with the regular rules and regulations to provide solutions to facilitate the conservation of registered heritage places or properties. The HBC shall be used by any agency with jurisdiction and whenever compliance with the code is required for registered heritage places or properties.

1. The relevant Union or Regional government department shall apply the provisions of the HBC in permitting repairs, alterations and additions necessary for the conservation, restoration, reconstruction, rehabilitation, relocation, adaptation or continued use of a registered heritage place or property when so elected by the private property owner.

2. All relevant government departments shall apply the provisions of the HBC in permitting repairs, alterations and additions necessary for the conservation, restoration, rehabilitation, safety, relocation, reconstruction or continued use of registered heritage places or properties.

2.10.1.2.2 Additions, alterations and repairs. It is the intent of the HBC to allow new expansion or addition to a registered heritage place or property, provide new additions shall conform to the requirements of the regular rules and regulations and relevant heritage guidelines and requirements. See Chapter 2.10.2.

2.10.1.2.3 Relocation. Relocated registered heritage places or properties shall be sited to comply with the regular code or with the solutions listed in the HBC. New construction related to relocation shall comply with the regular rules and regulations. Reconstruction and restoration related to relocation is permitted to comply with the provisions in the HBC.

2.10.1.2.4 Change of occupancy. For change of use or occupancy, see Chapter 2.10.3, Use and Occupancy.

2.10.1.2.5 Continued use. Registered heritage places or properties may have their existing use or occupancy continued if such use or occupancy conformed to the code or to the standards of construction in effect at the time of construction, and such use or occupancy does not constitute a distinct hazard to life safety as defined in the HBC.

2.10.1.2.6 Unsafe buildings or properties. When a registered heritage place or property is determined to be unsafe as defined in the regular rules and regulations, the requirements of the HBC are applicable to the work necessary to correct the unsafe conditions. Work to remediate the buildings or properties need only address the correction of the unsafe conditions, and it shall not be required to bring the entire registered heritage place or property into compliance with regular code.

2.10.1.2.7 Additional work. Registered heritage places or properties shall not be subject to additional work required by the regular code, regulations or bylaws beyond that required to complete the work undertaken. Certain exceptions for accessibility and for distinct hazards exist by mandate and may require specific action, within the parameters of the HBC.

2.10.1.3 Organization and enforcement

2.10.1.3.1 Authority. The relevant Union or Regional or Local government department shall administer and enforce the provisions of the HBC in permitting repairs, alterations and additions necessary for the conservation, restoration, reconstruction, rehabilitation, relocation, adaptation or continued use of a registered heritage place or property.

2.10.1.3.2 Enforcement. All relevant government departments shall administer and enforce theHBC with respect to registered heritage places or properties under their respective jurisdiction.

2.10.1.3.3 Liability. Prevailing law regarding immunity of the relevant government departments is unaffected by the use and enforcement of the HBC.

2.10.1.4 Review and appeals

2.10.1.4.1 An appeal and review body. Building Department of Local Governing Authority shall review preliminary appeal and the City Committee shall act as an appeal and review body to state and local agencies or any affected party.

2.10.1.4.2 Union and Regional-level agencies. All Union and Regional-level agencies with ownership of, or that act on behalf of state agency owners of, heritage places and properties, shall consult and obtain review prior to taking action or making decisions or appeals that affect registered heritage places or properties.

2.10.1.4.2.1 Imminent threat. Where an emergency is declared and a registered heritage place or property is declared an imminent threat to life and safety, the state agency assessing such a threat shall consult with the City Committee before any demolition is undertaken.

2.10.1.4.3 Local agency fees. Local agencies, when actively involved in the appeal, may also charge affected persons reasonable fees not to exceed the cost of obtaining reviews and appeals from the Board.

2.10.1.5 Construction methods and materials

2.10.1.5.1 Repairs. Repairs to any portion of a registered heritage place or property may be made in-kind with historical materials and the use of original or existing historical methods of construction, subject to conditions of the HBC. (See Chapter 2.10.8.)

2.10.1.5.2 Solutions to the HBC. Solutions provided in the HBC, or any other acceptable regulation or methodology of design or construction and used in whole or in part, with the regular code, or with any combination of the regular rules and regulations and the HBC, shall be allowed. The HBC does not preclude the use of any proposed alternative or method of design or construction not specifically prescribed or otherwise allowed by these regulations. Any alternative may be submitted for evaluation to the appropriate enforcing agency for review and acceptance. The enforcing agency may request that sufficient evidence or proof be submitted to substantiate any claims that may be made regarding such solutions. Any alternative offered in lieu of that prescribed or allowed in the HBC shall be reasonably equivalent in quality, strength, effectiveness, durability and safety to that of the HBC.

2.10.1.6 Rulings

2.10.1.6.1 General. Rulings of the Local government or Committee (i.e., formal appeals, case decisions, code interpretations and administrative resolutions, etc.) that are issues of State-wide and Region-wide application are required to be recorded in printed form and be made available to the public. These rulings may be used to provide guidance for similar cases or issues.

2.10.2 Definitions

2.10.2.1 Definitions

For the purpose of the HBC, certain terms and phrases, words and their derivatives shall be construed as specified in this chapter. Additional definitions and/or terms may appear in the various other chapters relative to terms or phrases primarily applicable thereto.

ADDITION. A nonhistorical extension or increase in floor area or height of a building or property.

ALTERATION. A modification to a registered heritage place or property that affects the usability of the building or property, or part thereof. Alterations include, but are not limited to, remodeling, renovation, rehabilitation, reconstruction, historical restoration, changes or rearrangement of the structural parts or elements, and changes or rearrangements in the plan configuration of walls and full-height partitions.

ANCIENT MONUMENT. Ancient monument is a monument which has been determined as cultural heritage that have existed since 100 years before the date on which the Department of Archaeology, National Museum and Library, Ministry of Religious Affairs and Culture made inquiries.

BUILDING STANDARD. Any guideline, regulation or code that may be applied to a registered heritage place or property.

CHARACTER-DEFINING FEATURE. Those visual aspects and physical elements that comprise the appearance of a historical building or property, and that are significant to its historical, architectural and cultural values, including the overall shape of the historical building or property, its materials, craftsmanship, decorative details, interior spaces and features, as well as the various aspects of its site and environment.

CONSERVATION. The act or process of applying measures necessary to sustain the existing form, integrity and materials of a registered heritage place or property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-related work to make properties functional is appropriate within a conservation project.

CONSERVATION MANAGEMENT PLAN (CMP). A conservation management plan is a document that explains what the building or site is, why it is culturally significant and how the significance is vulnerable or sensitive to change. It sets out the policies for managing and protecting the significance in any future use or development. The CMP includes detailed information concerning the most significant elements of a building or site and suggests measures to conserve them. It may also suggest options of adaptive reuse of buildings and sites, so that the inherent significance is retained while permitting continued use and thus maintaining the building and site for future generations.

CONSERVATION AREAS/ZONES. Areas of significant historical, social, cultural, architectural and scientific values as designated by the relevant planning authority, and/or a committee formed by the relevant planning authority and/or the commission formed by Union, Regional and/or Local authorities in which by-laws and zoning regulations require projects to follow specific guidelines including but not limited to height, color, character, views, materials and scale to protect the nature and character of the areas.

CULTURAL RESOURCE. Building, site, property, object or district evaluated as having significance in prehistory or history.

DISASTER MANAGEMENT PLAN (DMP). A Disaster Management Plan is a document that access hazards/risks from severe weather, earthquake, flood, etc. The plan shall clearly lay out prevention/mitigation strategies, response and recovery strategies, fire prevention plans, disaster preparation plan such as before and aftermath of cyclones, earthquakes, etc. so that the loss of heritage places and properties may be mitigated and prevented.

DISTINCT HAZARD. Any clear and evident condition that exists as an immediate danger to the safety of the occupants or public right of way. Conditions that do not meet the requirements of current regular codes and ordinances do *not,* of themselves, constitute a distinct hazard.

ENFORCING AGENCY. Authority having Jurisdiction, Local Agency with Jurisdiction in consultation with the relevant planning authority, and/or a committee formed by the relevant planning authority and/or the commission formed by Union, Regional and/or Local authorities. An entity with the responsibility for regulating, enforcing, reviewing or otherwise that exerts

control of or administration over the process of gaining permits, approvals, decisions, variances, appeals for heritage places and properties.

EXIT LADDER DEVICE. An exit ladder device is a permanently installed, fixed, folding, retractable or hinged ladder intended for use as a means of emergency egress from areas of the second or third stories. Unless approved specifically for a longer length, the ladder shall be limited to 25 feet (7620 mm) in length. Exit ladders are permitted where the area served by the ladder has an occupant load less than 10 persons.

FIRE HAZARD. Any condition which increases or may contribute to an increase in the hazard or menace of fire to a greater degree than customarily recognized by the authority having jurisdiction, or any condition or act which could obstruct, delay, hinder or interfere with the operations of firefighting personnel or the egress of occupants in the event of fire.

HERITAGE IMPACT ASSESSMENT (HIA). Heritage Impact Assessment is a document that investigates and analyses the impact of new development, redevelopment, and adaptive-reuse development on and/or in the vicinity of the heritage place or property or in conservation zones or ancient monuments and regions designated or deemed eligible under the Protection and Preservation of Cultural Heritage Regions Law. Its investigation shall encompass historical, social, cultural, environmental and architectural impact on the registered heritage place or property. The document shall clearly state the impacts on the registered heritage place or property or conservation zone and shall provide resolution to avoid, minimize, and mitigate the adverse effects on the registered heritage place or property.

HERITAGE PLACE OR PROPERTY. Any habitable building, site, place, location, district or collection of structures, and their associated sites, deemed of importance to the history, architecture or cultural landscape of an area either listed by an appropriate local, regional or union level jurisdiction or with cultural significance. This shall include habitable historical buildings or properties on, or determined by city or county historical buildings lists, inventories or surveys of historical or architecturally significant sites, places or landmarks, identified and determined by the relevant local authorities, communities and concerned organizations to be included.

HISTORIC BUILDING STRUCTURE REPORT (HBSR). A historic building structural report is a document that reports on the structural conditions of a historical building to understand the scope of work for structural repairs and that provides recommendation for remedial solutions by a licensed structure engineer or a licensed architect. Structural conditions to survey includes all major load-bearing structures including but not limited to columns, beams, walls, floors, roofs, windows, doors, protruding members of a structure, cornice, pediments, etc.

HISTORICAL FABRIC OR MATERIALS. Original and later-added historically significant construction materials, architectural finishes or elements in a particular pattern or configuration which form a qualified historical property, as determined by the authority having jurisdiction.

HISTORICAL SIGNIFICANCE. Importance for which a property has been evaluated and found to be historical, as determined by the authority having jurisdiction.

IMMINENT THREAT. Any condition within or affecting a registered heritage place or property which, in the opinion of the authority having jurisdiction, would qualify a building or property as dangerous to the extent that the life, health, property or safety of the public, its occupants or those performing necessary repair, stabilization or shoring work are in immediate peril due to conditions affecting the building or property. Potential hazards to persons using, or improvements within, the right-of-way may not be construed to be "imminent threats" solely for that reason if the hazard can be mitigated by shoring, stabilization, barricades or temporary fences.

INTEGRITY. Authenticity of a building or property's historical identity, evidenced by the survival of physical characteristics that existed during the property's historical or prehistorical period of significance.

LIFE·SAFETY EVALUATION. An evaluation of the life-safety hazards of a registered heritage place or property based on procedures laid out by the local authorities

LIFE SAFETY HAZARD. See Distinct Hazard.

PERIOD OF SIGNIFICANCE. The period of time when a qualified historical building or property was associated with important events, activities or persons, or attained the characteristics for its listing or registration.

RECONSTRUCTION. The act or process of depicting, by means of new construction, the form, features and detailing of a non-surviving site, landscape, building, property or object for the purpose of replicating its appearance at a specific period of time.

REGULAR RULES AND REGULATIONS. The adopted regulations that govern the design and construction or alteration of nonhistorical buildings and properties within the jurisdiction of the enforcing agency.

REHABILITATION. The act or process of making possible a compatible use for heritage place or property through repair, alterations and additions while preserving those portions or features which convey its qualified historical, cultural or architectural values.

RELOCATION. The act or process of moving any qualified historical building or property or a portion of a qualified historical building or property to a new site, or a different location on the same site.

REPAIR. Renewal, reconstruction or renovation of any portion of an existing property, site or building for the purpose of its continued use.

RESTORATION. The act or process of accurately depicting the form, features and character of a qualified building or property as it appeared at a particular period of time by the means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.

STRUCTURE. That which is built or constructed, an edifice or a building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

TREATMENT. An act of work to carry out conservation, restoration, stabilization, rehabilitation or reconstruction.

2.10.3 Use and occupancy

2.10.3.1 Purpose and scope

2.10.3.1.1 Purpose. The purpose of the HBC is to provide regulations for the determination of occupancy classifications and conditions of use for heritage places or properties.

2.10.3.1.2 Scope. Every heritage place or property for which a permit or approval has been requested shall be classified prior to permit issuance according to its use or the character of its occupancy in accordance with the regular rules and regulations and applicable provisions of this chapter.

2.10.3.2 General

2.10.3.2.1 Existing use. The use or character of occupancy of a heritage place or property, or portion thereof, shall be permitted to continue in use regardless of any period of time in which it may have remained unoccupied or in other uses, provided such building or property otherwise conforms to all applicable requirements of the HBC.

2.10.3.2.2 Change in occupancy. The use or character of the occupancy of a heritage place or property may be changed from or returned to its historical use or character, provided the heritage place or property conforms to the requirements applicable to the new use or character of occupancy as set forth in the HBC. Such in occupancy shall not mandate conformance with new construction requirements as set forth in regular rules and regulations.

2.10.3.2.3 Light and ventilation. Existing provisions for light and ventilation which do not, in the opinion of the enforcing agency, constitute a safety hazard may remain.

2.10.3.2.4. Means of Egress. Heritage places and properties shall be granted reasonable exceptions to regular chapter and fire code in consultation with the relevant planning authority, and/or a committee formed by the relevant planning authority and/or the commission formed by Union, Regional and/or Local authorities.

2.10.3.2.5. Means of Accessibility. Heritage places and properties shall be granted reasonable exceptions to regular chapter in consultation with the relevant planning authority, and/or a committee formed by the relevant planning authority and/or the commission formed by Union, Regional and/or Local authorities.

2.10.4 Fire protection

2.10.4.1 Purpose, Intent and Scope

2.10.4.1.1 Purpose. The purpose of this chapter is to provide for fire protection of heritage places or properties. The HBC requires enforcing agencies to accept any reasonably equivalent to the regular rules and regulations when dealing with heritage places and properties.

2.10.4.1.2 Intent. The intent of the HBC is to preserve the integrity of heritage places or properties while maintaining a reasonable degree of fire protection based primarily on the life safety of the occupants and firefighting personnel.

2.10.4.1.3 Scope. This chapter shall apply when required by the provisions of Section 2.10.2.

2.10.4.2 fire-resistive construction

2.10.4.2.1 Fire-resistive construction. Heritage places and properties shall be granted reasonable exceptions or restrictions to regular fire code. in consultation with the relevant planning authority, and/or a committee formed by the relevant planning authority and/or the commission formed by Union, Regional and/or Local authorities.

2.10.4.2.2 Exterior wall construction. In case of highly significant heritage places or properties, the fire-resistance requirement for existing exterior walls and existing opening protection shall be satisfied.

2.10.4.2.3 One-hour construction. Upgrading an existing qualified historical building or property to one-hour fire-resistive construction and one-hour fire-resistive corridors shall not be required regardless of construction or occupancy when one of the following is provided:

1. An automatic sprinkler system throughout.
2. An approved life-safety evaluation.
3. Other alternative measures as approved by the enforcing agency.

2.10.4.2.4 Openings in fire-rated systems. Historical glazing materials and solid wood unrated doors in interior walls required to have one-hour fire rating may be approved when operable windows and doors are provided with appropriate smoke seals and when the area affected is provided with an automatic sprinkler system.

2.10.4.3 Interior finish materials

New nonhistorical interior wall and ceiling finish shall conform to the provisions of the regular rules and regulations. Existing nonconforming materials used for wood lath and plaster walls, see Section 2.10.4.4.

Exception: When an automatic sprinkler system is provided throughout the building, existing finishes shall be approved.

2.10.4.4 Wood lath and plaster

Wood lath and plaster walls which consist of a wood stud wall assembly with gypsum or lime plaster on hand split or sawn wooden lath shall obtain a one-half-hour fire-resistive rating. This rating may be increased for interior walls to as much as one hour by filling the wall with mineral fiber or glass fiber.

2.10.4.5 Vertical shafts

Vertical shafts need not be enclosed when such shafts are blocked at every floor level by the installation of not less than 2 full inches (51 mm) of solid wood or equivalent construction installed so as to prevent the initial passage of smoke and flame. Automatic sprinkler systems or other solutions may be considered on a case-by-case basis, in lieu of enclosure of vertical shafts and stairwells.

2.10.4.6 Roof covering

Existing or original roofing materials may be repaired or reconstructed subject to the following requirements:

1. The Original or historical roofing system shall be detailed or modified as necessary in order to be capable of providing shelter while preserving the historical materials and appearance of the roof.
2. Wooden roof materials may be utilized where fire resistance is required, provided they are treated with fire-retardant treatments to achieve a Class "B" roof covering rating.

2.10.4.7 Fire alarm systems

Every heritage place or property shall be provided with fire alarm systems as required for the use or occupancy by the regular code or other approved alternative.

2.10.4.8 Automatic sprinkler systems

2.10.4.8.1 Every heritage place or property which cannot be made to conform to the construction requirements specified in the regular rules and regulations for the occupancy or use, and which constitutes a distinct fire hazard (for definition of "distinct hazard," see Chapter 2.10.2), shall be deemed to be in compliance if provided with an automatic sprinkler system or a life-safety system or other technologies as approved by the enforcing agency. ("Automatic" is defined in the regular code. Sprinkler System is defined in this section.)

2.10.4.8.2 Automatic sprinkler systems shall not be used to substitute for or act as an alternate to the required number of exits from any facility. (See Chapter 2.10.5 for exiting requirements.)

2.10.4.8.3 An automatic sprinkler system shall be provided in all detention facilities.

2.10.4.9 Other technologies

Fire alarm systems, smoke and heat detection systems, occupant notification and annunciation systems, smoke control systems and fire modeling, times egress analysis and modeling, as well

as other engineering methods and technologies may be accepted by the enforcing agency to address areas of nonconformance.

2.10.5 Structural regulations

2.10.5.1 Purpose, intent and scope

2.10.5.1.1 Purpose. The purpose of the HBC is to provide alternative regulations to the regular rules and regulations for the structural safety of buildings designated as heritage places or properties. The HBC requires enforcing agencies to accept any reasonably equivalent alternatives to the regular rules and regulations when dealing with heritage places or properties.

2.10.5.1.2 Intent. The intent of this section is to encourage the conservation of heritage places or structures while providing standards for a minimum level of building performance with the objective of preventing partial or total structural collapse such that the overall risk of life-threatening injury as a result of structural collapse is low.

2.10.5.1.3 Application. The alternative structural regulations provided by Section 2.10.705 are to be applied in conjunction with the regular rules and regulations whenever a structural upgrade or reconstruction is undertaken for heritage places or properties.

2.10.5.2 General

2.10.5.2.1 The HBC shall not be construed to allow the enforcing agency to approve or permit a lower level of safety of structural design and construction than that which is reasonably equivalent to the regular code provisions in occupancies which are critical to the safety and welfare of the public at large, including, but not limited to, public and private schools, hospitals, municipal police and fire stations and essential services facilities.

2.10.5.2.2 Nothing in these regulations shall prevent voluntary and partial seismic upgrades when it is demonstrated that such upgrades wil1 improve life safety and when a full upgrade would not otherwise be required.

2.10.5.3 Structural survey

2.10.5.3.1 Scope. When a structure or portion of a structure is to be evaluated for structural capacity under the HBC, it shall be surveyed for structural conditions by an architect or engineer knowledgeable in historical structures. The survey shall evaluate deterioration or of distress. The survey shall determine the details of the structural framing and the system for resistance of gravity and lateral loads. Details, reinforcement and anchorage of structural systems and veneers shall be determined and documented where these members are relied on for seismic lateral resistance.

2.10.5.3.2 The results of the survey shall be utilized for evaluating the structural capacity and for designing modifications to the structural system to reach compliance with this code.

2.10.5.3.3 Historical records. Past historical records of the structure or similar structures may be used in the evaluation, including the effects of subsequent alterations.

2.10.5.4 Nonhistorical additions and nonhistorical alterations

2.10.5.4.1 New nonhistorical additions and nonhistorical alterations which are structurally separated from an existing historical building or structure shall comply with regular code requirements.

2.10.5.4.2 New nonhistorical additions which impose vertical or lateral loads on an existing structure shall not be permitted unless the affected part of the supporting structure is evaluated and strengthened, if necessary, to meet regular code requirements.
Note: For use of archaic materials, see Chapter 2.10.6.

2.10.5.5 Structural regulations

2.10.5.5.1 Gravity loads. The capacity of the structure to resist gravity loads shall be evaluated and the structure strengthened as necessary. The evaluation shall include all parts of the load path. Where no distress is evident, and a complete load path is present, the structure may be assumed adequate by having withstood the test of time if anticipated dead and live loads will not exceed those historically present.

2.10.5.5.2 Wind and seismic loads. The ability of the structure to resist wind and seismic loads shall be evaluated. Wind loads shall be considered when appropriate, but need not exceed 75% of the wind loads prescribed for structural design required of new building construction. The evaluation shall be based on the requirements of Section 2.10.7.6.

2.10.5.5.2.1 Any unsafe conditions in the lateral-load-resisting system shall be corrected, or alternative resistance shall be provided. When strengthening is required, additional resistance shall be provided to meet the minimum requirements of the HBC. The strengthening measures shall be selected with the intent of meeting the performance objectives set forth in Section 2.10.5.1.2. The evaluation of structural members and structural systems for seismic loads shall consider the inelastic performance of structural members and their ability to maintain load-carrying capacity during the seismic loadings prescribed by the regular rules and regulations.

2.10.5.5.2.2 The architect or engineer shall consider additional measures with minimal loss and impact to, historical materials which will reduce damage and needed repairs in future earthquakes to better preserve the historical structure in perpetuity. These additional measures shall be presented to the owner for consideration as part of the rehabilitation or restoration.

2.10.5.6 Lateral load regulations

2.10.5.6.1 Seismic forces. Strength-level seismic forces used to evaluate the structure for resistance to seismic loads shall be based on the R-values tabulated in the regular code for similar lateral-force-resisting systems including consideration of the structural detailing of the members where such R-values exist. Where such R-values do not exist, an appropriate R-value shall be rationally assigned considering the structural detailing of the members.

Exceptions:

1. The forces need not exceed 0.75 times the seismic forces prescribed for structural design required of new building construction.

2. For Occupancy Category I, II or III structures, near-fault increases in ground motion (maximum considered earthquake ground motion of 0.2 second spectral response greater than 150 percent at 5 percent damping) need not be considered when the fundamental period of the building is 0.5 seconds in the direction under consideration.

3. For Occupancy Category I or II structures, the seismic base shear need not exceed 0.30W.

4. For Occupancy Category III or IV structures, the seismic base shear need not exceed 0.40W.

2.10.5.6.1.1 When a building is to be strengthened with the addition of a new lateral force resisting system, the *R* value of the new system can be used when the new lateral force resisting system resists at least 75 percent of the building's base shear regardless of its relative rigidity.

2.10.5.6.1.2 Unreinforced masonry bearing wall buildings shall comply with MNBC, and as modified by the HBC. Alternative standards may be used on a case-by-case basis when approved by the authority having jurisdiction. It shall be permitted to exceed the strength limitation of 100 psi in MNBC when test data and building configuration supports higher values subject to the approval of the authority having jurisdiction.

2.10.5.6.1.3 All deviations from the detailing provisions of the lateral-force-resisting systems shall be evaluated for stability and the ability to maintain load-carrying capacity at the expected inelastic deformations.

2.10.5.6.2 Existing building performance. The seismic resistance may be based upon the ultimate capacity of the structure to perform, giving due consideration to ductility and reserve strength of the lateral-force-resisting system and materials while maintaining a reasonable factor of safety. Broad judgment may be exercised regarding the strength and performance of materials not recognized by regular code requirements. (See Chapter 2.10.6, Archaic Materials and Methods of Construction.)

2.10.5.6.2.1 All structural materials or members that do not comply with detailing and proportioning requirements of the regular rules and regulations and provisions for new building construction shall be evaluated for potential seismic performance and the consequence of non-compliance. All members that would be reasonably expected to fail and lead to collapse or life threatening injury when subjected to seismic demands shall be judged unacceptable, and appropriate structural strengthening shall be developed.

2.10.5.6.3 Load path. A complete and continuous load path, including connections, from every part or portion of the structure to the ground shall be provided for the required forces. It shall be verified that the structure is adequately tied together to perform as a unit when subjected to earthquake forces.

2.10.5.6.4 Parapets. Parapets and exterior decoration shall be investigated for conformance with regular code requirements for anchorage and ability to resist prescribed seismic forces.
An exception to regular code requirements shall be permitted for those parapets and decorations which are judged not to be a hazard to life safety.

2.10.5.6.5 Nonstructural features. Nonstructural features of historical structure, such as exterior veneer, cornices and decorations, which might fall and create a life-safety hazard in an earthquake, shall be evaluated. Their ability to resist seismic forces shall be verified, or the feature shall be strengthened with improved anchorage when appropriate.

> **2.10.5.6.5.1** Partitions and ceilings of corridors and stairways serving an occupant load of 30 or more shall be investigated to determine their ability to remain in place when the building is subjected to earthquake forces.

2.10.6 Archaic materials and methods of construction
2.10.6.1 Purpose, intent and scope

2.10.6.1.1 Purpose. The purpose of the HBC is to provide regulations for the use of historical methods and materials of construction that are at variance with the requirement of regular rules and regulations or are not otherwise codified, in buildings or structures designated as registered heritage places or properties. The HBC require enforcing agencies to accept any reasonably equivalent alternatives to the regular rules and regulations when dealing with heritage places and properties.

2.10.6.1.2 Intent. It is the intent of the HBC to provide for the use of historical methods and materials of construction that are at variance with specific code requirements or are not otherwise codified.

2.10.6.1.3 Scope. Any construction type or material that is, or was, part of the historical fabric of a structure is covered by this chapter. Archaic materials and methods of construction present in a historical structure may remain or be reinstalled or be installed with new materials of the same class to match existing conditions.

2.10.6.2 General engineering approaches
Strength values for archaic materials shall be assigned based upon similar conventional codified materials, or on tests as hereinafter indicated. The archaic materials and methods of construction shall be thoroughly investigated for their details of construction in accordance with Section 2.10.5.3. Testing shall be performed when applicable to evaluate existing conditions. The architect or structural engineer in responsible charge of the project shall assign allowable stresses or strength levels to archaic materials. Such assigned strength values shall not be greater than those provided for in the following sections without adequate testing, and shall be subject to the concurrence of the enforcing agency.

2.10.6.3 Nonstructural archaic materials

Where nonstructural historical materials exist in uses which do not meet the requirements of the regular rules and regulations, their continued use is allowed by this rules and regulations, provided that any public health and life-safety hazards are mitigated subject to the concurrence of the enforcing agency.

2.10.6.4 Allowable conditions for specific materials

Archaic materials which exist and are to remain in qualified historical buildings or structures shall be evaluated for their condition and for loads required by this code. The structural survey required in Section 2.10.5.3 of the HBC shall document existing conditions, reinforcement, anchorage, deterioration and other factors pertinent to establishing allowable stresses, strength levels and adequacy of the archaic materials. The remaining portion of this section provides additional specific requirements for commonly encountered archaic materials.

2.10.6.5 Masonry

2.10.6.5.1 Existing solid masonry. Existing solid masonry walls of any type, except adobe, may be allowed, without testing, a maximum ultimate strength of nine pounds per square inch (62.1 kPa) in shear where there is a qualifying statement by the architect or engineer that an inspection has been made, that mortar joints are filled and that both brick and mortar are reasonably good. The shear stress above applies to unreinforced masonry, except adobe, where the maximum ratio of unsupported height or length to thickness does not exceed 13, and where minimum quality mortar is used or exists. Wall height or length is measured to supporting or resisting elements that are at least twice as stiff as the tributary wall. Stiffness is based on the gross section. Shear stress may be increased by the addition of 10 percent of the axial direct stress due to the weight of the wall directly above.

2.10.6.5.2 Stone masonry.

2.10.6.5.2.1 Solid-backed stone masonry. Stone masonry solidly backed with brick masonry shall be treated as solid brick masonry as described in Section 2.10.6.5.1, provided representative testing and inspection verifies solid collar joints between stone and brick and that a reasonable number of stones lap with the brick wythes as headers or that steel anchors are present. Solid stone masonry where the wythes of stone effectively overlap to provide the equivalent header courses may also be treated as solid brick masonry.

2.10.6.5.2.2 Independent wythe stone masonry. Stone masonry with independent face wythes may be treated as solid brick masonry as described in Section 2.10.6.5.1, provided representative testing and inspection verify that the core is essentially solid in the masonry wall and that steel ties are epoxied in drilled holes between outer stone wythes at floors, roof and not to exceed 4 feet (1219 mm) on center in each direction, between floors and roof. A reinforcing element shall exist or be provided at or near the top of all stone masonry walls.

2.10.6.5.3 Reconstructed walls. Totally reconstructed walls utilizing original brick or masonry, constructed similar to original, shall be constructed in accordance with the rules and regulations. Repairs or infills may be constructed in a similar manner to the original walls without conforming to the regular rules and regulations.

2.10.6.6 Wood 2.10.6.6.1 Existing wood diaphragms or walls. Existing wood diaphragms or walls of straight or diagonal sheathing shall be assigned shear resistance values appropriate with the fasteners and materials functioning in conjunction with the sheathing. The structural survey shall determine fastener details and spacings and verify a load path through floor construction. Shear values of Tables 2.10.6-A and 2.10.6-B.

2.10.6.6.2 Wood lath and plaster. Wood lath and plaster walls and ceilings may be utilized using the shear values referenced in Section 2.10.6.7.1.

2.10.6.6.3 Existing wood framing. Existing wood framing members may be assigned allowable stresses consistent with codes in effect at the time of construction. Existing or new replacement wood framing may be of archaic types originally used if properly researched, such as balloon and single wall. Wood joints such as dovetail and mortise and tendon types may be used structurally, provided they are well made. Lumber selected for use and type need not bear grade marks, and greater or lesser species such as low-level pine and fir, boxwood and indigenous hardwoods and other variations may be used for specific conditions where they were or would have been used. Wood fasteners such as square or cut nails may be used with a maximum increase of 50 percent over wire nails for shear.

2.10.6.7 Concrete

2.10.6.7.1 Materials. Natural cement concrete, unreinforced rubble concrete and similar materials may be utilized wherever that material is used historically. Concrete of low strength and with less reinforcement than required by the regular code may remain in place. The architect or engineer shall assign appropriate values of strength based on testing of samples of the materials. Bond and development lengths shall be determined based on historical information or tests.

2.10.6.7.2 Detailing. The architect or engineer shall carefully evaluate all detailing provisions of the regular rules and regulations which are not met and shall consider the implications of these variations on the ultimate performance of the structure, giving due consideration to ductility and reserve strength.

2.10.6.8 Steel and iron

The hand-built, untested use of wrought or black iron, the use of cast iron or grey iron, and the myriad of joining methods that are not specifically allowed by code may be used wherever applicable and wherever they have proven their worth under the considerable span of years involved with most qualified historical buildings or structures. Uplift capacity should be evaluated and strengthened where necessary. Fixed conditions or mid height lateral loads on cast iron columns that could cause failure should be taken into account. Existing structural wrought, forged steel or grey iron may be assigned the maximum working stress prevalent at the time of original construction.

2.10.6.9 Hollow clay tile

The historical performance of hollow clay tile in past earthquakes shall be carefully considered in evaluating walls of hollow clay tile construction. Hollow clay tile bearing walls shall be evaluated and strengthened as appropriate for lateral loads and their ability to maintain support

of gravity loads. Suitable protective measures shall be provided to prevent blockage of exit stairways, stairway enclosures, exit ways and public ways as a result of an earthquake.

2.10.6.10 Veneers

2.10.6.10.1 Terra cotta and stone. Terra cotta, cast stone and natural stone veneers shall be investigated for the presence of suitable anchorage. Steel anchors shall be investigated for deterioration or corrosion. New or supplemental anchorage shall be provided as appropriate.

2.10.6.10.2 Anchorage. Brick veneer with mechanical anchorage at spacings greater than required by the regular rules and regulations may remain, provided the anchorages have not corroded. Nail strength in withdrawal in wood sheathing may be utilized to its capacity in accordance with code values.

2.10.6.11 Glass and glazing

2.10.6.11.1 Glazing subject to human impact. Historical glazing material located in areas subject to human impact may be approved subject to the concurrence of the enforcing agency when alternative protective measures are provided. These measures may include, but not be limited to, additional glazing panels, protective film, protective guards or systems, and devices or signs which would provide adequate public safety.

2.10.6.11.2 Glazing in fire-rated systems. See Section 2.10.4.2.3.

TABLE2.10.6

STRENGTH VALUES FOR EXISTING MATERIALS

EXISTING MATERIALS OR CONFIGURATIONS OF MATERIALS[1]	STRENGTH LEVEL CAPACITY x14.594 for N/m
1. Horizontal diaphragms[2]	
1.1 Roofs with straight sheathing and roofing applied directly to the sheathing	300 lbs per foot for seismic shear
1.2 Roofs with diagonal sheathing and roofing applied directly to the sheathing	750 lbs per foot for seismic shear
1.3 Floors with straight tongue-and-groove sheathing	300 lbs per foot for seismic shear
1.4 Floors with straight sheathing and finished wood flooring with board edges offset or perpendicular	1,500 lbs per foot for seismic shear
1.5 Floors with diagonal sheathing and finished	1,800 lbs per foot for seismic shear
2. Crosswalls[2,3]	
2.1 Plaster on wood or metal lath	Per side: 600 lbs per foot for seismic shear
2.2 Plaster on gypsum lath	550 lbs per foot for seismic shear
2.3 Gypsum wallboard, unblocked edges	200 lbs per foot for seismic shear
2.4 Gypsum wallboard, blocked edges	400 lbs per foot for seismic shear
3. Existing footings, wood framing, structural steel and reinforcing steel	
3.1 Plain concrete footings	f'_c = 1,500 psi (10.34 MPa) unless otherwise shown by tests[3]
3.2 Douglas fir wood	Allowable stress same as D.F. No. 1[3]
3.3 Reinforcing steel	f_s = 40,000 lbs per square inch (124.1 N/mm^2) maximum
3.4 Structural steel	f_s = 33,000 lbs per square inch (137.9 N/mm^2) maximum

[1]Material must be sound and in good condition.
[2]Shear values of these materials may be combined, except the total combined value shall not exceed 900 pounds per foot (13,140 N/m).
[3]Stresses given may be increased for combinations of loads as specified in the regular code.

TABLE2.10.6B

STRENGTH VALUES OF NEW MATERIALS USED IN CONNECTION WITH EXISTING CONSTRUCTION

NEW MATERIALS OR CONFIGURATIONS OF MATERIALS	STRENGTH LEVEL CAPACITY[1]
1. Horizontal diaphragms[2]	
1.1 $^{15}/_{32}$ inch minimum plywood sheathing fastened directly over existing straight sheathing with edges of plywood located on center of individual sheathing boards and fastened with minimum #8x $1^{1}/_{4}$ inch wood screws or nails with helical threads 0.13 inch min. diameter and $1^{1}/_{4}$ inch min. length at 4 inch centers all panel edges and 12 inch centers each way in field.	1,500 lbs per foot
1.2 Same plywood and attachments as 1.1 fastened directly over existing diagonal sheathing.	1,800 lbs per foot
1.3 $^{1}/_{8}$ inch plywood sheathing fastened directly over existing straight or diagonal sheathing with ends and edges on centers of individual sheathing boards and fastened with #6 wood screws or nails with helical threads 0.13 inch minimum diameter and $1^{1}/_{4}$ inch min. length at 6 inch centers tall panel edges and 12 inch centers each way in field.	900 lbs per foot
2. Shear walls: Plywood sheathing applied directly over wood studs. No value shall be given to plywood applied over existing plaster or wood sheathing	100 percent of the value specified in the regular code for shear walls
3. Crosswalls: (special procedure only)	
3.1 Plywood sheathing applied directly over wood studs. No value shall be given to plywood applied over existing plaster or wood sheathing	133 percent of the value specified in the regular code for shear walls
3.2 Drywall or plaster applied directly over wood studs	100 percent of the values in the regular code
3.3 Drywall or plaster applied to sheathing over existing wood studs	50 percent of the values specified in the regular code
4. Tension bolts	
a. Bolts extending entirely through unreinforced masonry walls secured with bearing plates on far side of a three-wythe-minimum wall with at least 30 square inches (19 350 mm^2) of area[4,5]	5,400 lbs (24,010 N) per bolt[6] 2,700 lbs (12,009 N) per bolt for two-wythe walls[6]
b. All thread rod extending to the exterior face of the wall installed in adhesive[9]	3,600 lbs (16,014 N) per bolt
5. Shear bolts Bolts embedded a minimum of 8 inches (203 mm) into unreinforced masonry walls and centered in a $2^{1}/_{2}$-inch-diameter (63.5 mm) hole filled with dry-pack or nonshrink grout. Through bolts with first 8 inches (203 mm) as noted above and embedded all thread rod as noted in Item 4.b[3,7,9]	$^{1}/_{2}$ inch (12.7 mm) diameter = 1050 lbs (4671 N)[6] $^{5}/_{8}$ inch (15.9 mm) diameter = 1500 lbs (6672 N)[6] $^{3}/_{4}$ inch (19 mm) diameter = 2250 lbs (10,008 N)[6]
6. Infilled walls Reinforced masonry infilled openings in existing unreinforced masonry walls. Provide keys or dowels to match reinforcing.	Same as values specified for unreinforced masonry walls
7. Reinforced masonry Masonry piers and walls reinforced per the regular code	Same as values specified in the regular code[8]
8. Reinforced concrete Concrete footings, walls and piers reinforced as specified in the regular code and designed for tributary loads	Same values as specified in the regular code[8]

[1]Values are for strength level loads as defined in regular code standards.
[2]Values may be adjusted for other fasteners when approved by the enforcing authority.
[3]In addition to existing sheathing value.
[4]Bolts to be $^{1}/_{2}$-inch (12.7 mm) minimum diameter.
[5]Other bolt sizes, values and installation methods may be used provided a testing program is conducted in accordance with regular code standards. Bolt spacing shall not exceed 6 feet. (1830 mm) on center and shall not be less than 12 inches (305) mm) on center.
[6]Other masonry based on tests or other substantiated data.
[7]Embedded bolts to be tested as specified in regular code standards.
[8]Stresses given may be increased for combinations of loads as specified in the regular code.
[9]Adhesives shall be approved by the enforcing agency and installed in accordance with the manufacturer's recommendations. All drilling dust shall be removed from drilled holes prior to installation.

2.10.7 Mechanical, plumbing and electrical requirements

2.10.7.1 Purpose, intent and scope

Heritage places and properties shall be complied with the regular chapter in consultation with the relevant planning authority, and/or a committee formed by the relevant planning authority and/or the commission formed by Union, Regional and/or Local authorities.

2.10.8 Qualified historical districts, sites and open spaces

2.10.8.1 Purpose and scope

2.10.8.1.1 Purpose. The purpose of this section is to provide regulations for the conservation, rehabilitation, restoration and reconstruction of associated historical features of qualified historical buildings, properties or districts (as defined in Chapter 2.10.2), and for which Chapters 2.10.3 through 2.10.7 of the HBC may not apply.

2.10.8.1.2 Scope. This section applies to the associated historical features of heritage places or properties such as historical districts that are beyond the buildings themselves which include, but are not limited to, natural features and designed site and landscape plans with natural and man-made landscape elements that support their function and aesthetics. This may include, but will not be limited to:

1. Site plan layout configurations and relationships (pedestrian, equestrian and vehicular site circulation, topographical grades and drainage, and use areas).
2. Landscape elements (plant materials, site structures other than the heritage place, bridges and their associated structures, lighting, water features, art ornamentation, and pedestrian, equestrian and vehicular surfaces).
3. Functional elements (utility placement, erosion control and environmental mitigation measures).

2.10.8.2 Application

2.10.8.2.1 The HBC shall apply to all sites and districts and their features associated with heritage places or qualified historical districts as outlined in 2.10.10.1.2 Scope.

2.10.8.2.2 Where the application of regular rules and regulations may impact the associated features of qualified historical properties beyond their footprints, by work performed secondarily, those impacts shall also be covered by the HBC.

2.10.8.2.3 This section shall be applied for all issues regarding code compliance or other standard or regulation as they affect the purpose of this chapter.

2.10.8.2.4 The application of any rules and regulations or building standard shall not unduly restrict the use of a heritage place or property that is otherwise permitted pursuant to Chapter 2.10.3.

2.10.8.3 Site relations

The relationship between a building or property and its site, or the associated features of a district (including qualified historical landscape), site, objects and their features are critical components

that may be one of the criteria for these buildings and properties to be qualified under the HBC. The HBC recognizes the importance of these relationships. This section shall be used to provide context sensitive solutions for treatment of heritage places, properties, district or their associated historical features, or when work to be performed secondarily impacts the associated historical features of a heritage place or property.

2.10.9 Conservation management plan and heritage impact assessment

2.10.9.1 Purpose and scope

2.10.9.1.1 Purpose. The purpose of this section is to provide regulations for the conservation, rehabilitation, restoration and reconstruction of associated historical features of heritage places and buildings (as defined in Chapter 2.10.2), and to make sure building conservation follows proper investigations, guidelines and planning procedures for historic buildings.

2.10.9.1.2 Scope. Every listed heritage place or property for which a permit or approval has been requested shall be classified prior to permit issuance according to conservation management plan and heritage impact assessment as required. In addition, the process shall be complied to any other heritage places or properties if required by the relevant planning authority, and/or a committee formed by the relevant planning authority and/or the commission formed by Union, Regional and/or Local authorities.

2.10.9.2 Application

2.10.9.2.1 The requirement shall apply to all heritage place or property and conservation zones as defined in Chapter 2.10.2.

2.10.9.2.2 When a historical building is to be adaptively reused or propose an adaptive reuse plan, Conservation Management Plan (defined in Chapter 2.1-2) is required before any planning or building permission for development is given.

2.10.9.2.2.1 Historic Building Structure Report (HBSR) can be required as part of the CMP for surveying extensive structural conditions of a historical building.

2.10.9.2.2.2 Disaster Management Plan (DMP) is required as part of CMP to access hazards/risks, to clearly lay out prevention/mitigation strategies, response and recovery strategies, fire prevention plans, disaster preparation plan such as before and aftermath of cyclones, earthquakes, etc. so that the loss of heritage places and properties may be mitigated and prevented.

2.10.9.2.2.3 Conservation Management Plan, as defined in Chapter 2.10.2, shall be undertaken by independent team of experts, commissioned and shall be reported to the relevant planning authority and/or committee or commission formed by relevant planning authority.

2.10.9.2.2.4 Any cost relating to Conservation Management Plan must be paid for by the developer or the project proponent.

2.10.9.2.2.5 Conservation Management Plan shall be made available to the public as public record.

2.10.9.2.3 Any project, regardless of its status, falling in the conservation zone or adjacent to or in the vicinity of heritage places and properties shall require to undertake Heritage Impact Assessment before any planning or building permission for development is given.

2.10.9.2.3.1 Heritage Impact Assessment, as defined in Chapter 2.10.2, shall be undertaken by independent team of experts, commissioned and shall be reported to the relevant planning authority and/or committee or commission formed by relevant planning authority.

2.10.9.2.3.2 Any cost relating to Heritage Impact Assessment must be paid for by the developer or the project proponent.

2.10.9.2.3.3 Heritage Impact Assessment shall be made available to the public as public record.

2.10.9.2.4 HIA and CMP must clearly explain, with facts, drawings with scale, and/or any other medium, how the proposed project shall avoid the adverse effects on the heritage place or property and/or conservation zones.

2.10.9.2.4.1 When avoidance of adverse effects become reasonably unfeasible, HIA and CMP shall provide resolutions to minimize and/or mitigate the adverse effects on the heritage place or property and/or conservation zone, satisfactory to the relevant local and planning authority before approval.

2.11 URBAN DESIGN AND ENVIRONMENT

2.11.1 Urban Design and Outside spaces

2.11.1.1 Zoning Regulations

The regulations regarding the "Urban Design Portion" of this code are to follow in addition to the regulations written in Part 1 of "Myanmar National Building Code", and the Zoning Regulations of the respective towns and urban areas, where available, and are to apply in all areas of the Republic of the Union of Myanmar.

2.11.1.2 Definitions

Unless otherwise specifically defined, the meanings are to be interpreted as the followings:

ACCESS WAY: It means driveway that provides access to the parking stalls. Accessways do not have adjacent parking stalls.

BOUNDARY OR BOUNDARY LINE: It means the official line that divides one area of land from another.

BUILDING LINE: It means the line prescribed by either the competent authority beyond which no part of a building may project, except as otherwise permitted by the relevant respective laws or these codes.

BUILDING SPACING: It means the space between buildings to maintain in order to provide ventilation, light, etc., to avoid disturbances in noise and view, and to leave space for infrastructural systems.

BUILT ENVIRONMENT: It means areas of the environment, where human beings reside or occupy to practice their activities; contrary to natural environment, to which forests, woods, etc. belong, which are not directly or rarely intervened by human beings.

BUILT-UP AREA: It means the area occupied by a building on the land or on the premises.

BUILDING COVERAGE RATIO: It means the ratio between the building coverage area and the total land area.

CLEARWAY RAMPS: It means inclined floors that provide access between two levels. Clearway ramps do not have parking stalls adjacent to them.

CUL-DE-SAC: It means a street or lane closed at one end with turning circle and can be also called dead-end street.

CBD OR CENTRAL BUSINESS DISTRICT: It means area or locality in a city or town having business, cultural and other functions concentrated in that district or locality.

DEPTH: In respect of a building, means the measured distance between the front line of the building and the back line of the rear main wall which separates the main building from the open space or in case of row blocks, the side shorter than the longer side.

DETACHED BUILDING: It means any building not attached to any other buildings. Normally, single family houses are detached building.

DIVISION WALL OR (PARTY WALL) It means a wall forming part of a building and used or constructed for separation of adjoining buildings belonging to different owners or occupants or constructed to be occupied by different persons constructed at the abutting common boundary.

DUPLEX HOUSE: It means any building with two residential units designed to be abutting to each other separated by a division wall. Each unit has its own separate entrance and each unit shall have one or more storeys used only by the same people.

EXTERNAL WALL: It means an outer wall of a building and not immediately adjoining a wall of another building.

FIRE WALL: It means any wall of materials having the fire resistance as required under Part 9 and 10 of these codes and constructed to be used for the separation of adjoining buildings or premises or separation of parts of building to prevent or reduce the spreading of fire from one building to another or from one part of a building to another part of that building.

FLOOR AREA IN SHOPPING FACILITIES: It means total floor area of shops, shopping centres and other shopping facilities; this include storage areas, staff area and circulation area

FLOOR AREA RATIO (FAR) or PLOT AREA RATIO: Floor area ratio means the total gross floor area (GFA) excluding basements divided by the land area belonging to the particular building. There are zonal FAI indicating the floor area densities of zones and estates FAI which indicates the floor area densities of estates.

For the purpose of urban planning, the floors which are only covered but not within the walls, such as terraces, verandahs, balconies are calculated as 50 % of the floors.

FIRST CLASS AREA: Area which is defined by authorities of the respective towns and cities which have basically residential characters with larger plot sizes.

GRADIENT: It means to the ratio of the inclination of the ramp (height: length). The gradient of ramp measured along the centre line of the ramp.

GREEN AREA: It means not occupied by any structures including the traffic and parking areas and covered only by grass and trees or bear land covered by vegetations.

GROUND STOREY: It means the storey at the ground level of a building to which there is an entrance from outside on or above the level of the ground.

GROSS FLOOR AREA (GFA): It means the total floor area calculated based on centre of exterior walls, including the circulation area such as stairs, corridors, etc. but excluding the technical area without floors shafts, ducts, lift wells etc.

HUMAN HABITATION: It means usage of people as living, sleeping, studying or other functions where the people stay more than 6 hours per day.

HUMAN SETTLEMENT: It means areas where human beings reside or occupy to practice their activities.

INFRASTRUCTURE: It means the systems or part of systems like roads, water supply, electricity, waste disposal, etc. that are essential for proper functioning of human settlements, group of buildings or separate buildings.

INSIDE LANE: Inside lane of curved is the innermost lane, nearest to the centre point of curve.

INSIDE RADIUS: Inside radius of lane of curved accessway and driveway is the distance measured from the innermost curve edge to the center point of the curve.

LANES FOR CYCLES: It shall be provided at the side of pedestrian footways, where it is possible and are required at motor vehicle free zones such as parks and green areas.

LANES FOR SLOW-MOVING VEHICLES: Lanes such as bicycles and tricycles shall be provided at the side of roads where it is possible and are required at motor roads planned besides the busy streets or as required in the detailed plans of respective settlements.

MULTI-LANE: It means where more than one vehicle can pass through at any given time and there is no physical separations/ divider between the lanes. Divider refers to the form of kerbs, railings, parapet and walls.

OUTSIDE LANE: Outside lane of curved refers to any lane positioned after the innermost lane.

PARKING AISLE: It means an access lane or driveway with adjacent parking stalls.

PARKING ANGLE: It means the angle measured between the longer side of the parking stall and the line of traffic flow of the aisle.

PARKING STALL: It means space for a parking of motor vehicle, a car or a motor cycle parking lot.

PLOT: It means land area defined by the concerned authority with measurements.

POINT BLOCK: It means a building with the lengths less than two times the widths of respective buildings.

ROW BLOCK: It means buildings with the lengths more than two times the widths of respective buildings

SETBACK DISTANCE: It means the distance, a building or any part of a building has to maintain from other buildings, boundary line or any other element.

SHOPPING AREA: It means areas in shops and shopping centres, where people have direct access and where items for sales are placed or displayed. The areas like stores, offices, etc. belonging to the staff areas are not included.

SINGLE-LANE: It means a lane where only one vehicle can pass through at any given time.

STOREY: It means the space between the upper surface of every floor and the surface of the floor next above it, or if there be no such floor, then the underside of the ceiling or roof or other covering above the respective floor.

TERRACE HOUSE: It means any building with more than three residential units designed to be in a row. Each unit has its own separate entrance and each unit may have more than one storey but used only by the same family and the units are separated by division wall.

TRAFFIC FLOW: It means the direction of vehicle movement.

TURNING RADIUS: It is the turning radius of the smallest circle inside of which the entire vehicle can turn.

2.11.1.3 Classification of Roads

All roads outside the urban areas are classified as follows:

a) Union highway roads or Inter-Region roads:

These are roads planned to connect from one region to others and are free of all vehicles which are not motorized and which maximum speed 50 miles per hours. These are roads planned to connect from one region to others must have minimum of two lanes in one direction in addition to one side

lane meant for emergency stopping or for police and lifesaving vehicles. The lane widths must have minimum 14 feet each and the side lane width shall be minimum 8 feet.

b) Township roads:

Township roads are the roads connecting between the rural settlements or between the rural settlements or connecting between small urban centres.

Such roads must have the minimum of two lanes and shoulders on each side where each lane having minimum 12 feet and shoulders minimum 4 feet. For such rural roads, there shall be pedestrian path at least at one side with minimum of 6 feet width.

c) Rural roads:

Rural roads are the roads connecting between the rural settlements or between the rural settlements and their urban centres.

Such roads must have the minimum of two lanes and shoulders on each side where each lane having minimum 10 feet and shoulders minimum 3 feet. For such rural roads, there shall be pedestrian path at least at one side with minimum of 5 feet width.

d) Urban roads:

All urban roads have the following classifications:

1) Urban Avenues/ Boulevard: Urban Avenues are the roads connecting zones in the urban areas and are longer than 5 miles. These are roads must have minimum of two lanes in one direction in addition to paved platforms on each side. The urban avenues must have a green dividing strip minimum in the middle and the lane widths must have minimum 14 feet each and the platform width shall be minimum 6 feet.

2) Urban Main Road: Urban main roads are the roads connecting one the zone in the urban areas and which are not longer than 5 miles. These are roads must have minimum of two lanes in one direction in addition to paved platforms on each side. The lane widths must have minimum 12 feet each and the platform width shall be minimum 5 feet1

3) Feeder Roads: Feeder roads are the roads connecting collector roads and urban avenues or the urban main roads where several collector roads are connected. These are roads which have minimum two lanes in addition to paved platforms on each side. The lane widths must have minimum 12 feet each and the platform width shall be minimum 4 feet.

4) Collector Roads: Collector roads are the roads connecting between the feeder roads and residential areas. These are roads which have minimum two lanes in addition to paved platforms on each side. The lane widths shall have minimum 12 feet each and the platform width shall be minimum 4 feet.

5) Residential roads: Residential roads are the roads in the residential areas. These are roads which have minimum two lanes in addition to paved platforms on each side. The lane widths shall have minimum 10 feet each and the platform width shall be minimum 4 feet.

6) Short residential roads: Residential roads serving less than 4 units can be of one lane unless the roads do not exceed 300 feet in length, and these roads must be consist of two lanes if these served more than 4 units and longer than 300 feet.

7) Cul-de-sacs: All cul-de-sacs longer than 300 feet in length must have the minimum width of 20 feet, such cul-de-sacs must be provided turning circle.

8) One Way roads: One way roads can be planned in the residential areas meant only for one direction. These have minimum lane widths of 14 feet.

9) Service roads: Service roads are the roads where the usage is limited only to delivery vehicles. These roads shall have minimum road width of 10 feet.

10) All gradient roads longer than 300 feet must have maximum gradient for 10%.

11) The gradients of minor roads adjoining the major roads must have the maximum gradient of 12%.

2.11.2 Environmental Issues

a) Every building to be erected shall generally be considered as non-disturbing and non-polluting to the environment, for that reason the first and foremost consideration of all architects is the "Environmental Issue".

b) Whenever any building is planned, the architect should first make the environmental assessments, these include:-

1) The role and position of the planned building in the environment, whether or not the building to be constructed is disturbing to environment visually or physically.

2) The building to be constructed shall consider the laws concerning the conservation of heritage in Myanmar.

c) The concepts on sources of infrastructure and waste disposal of the building, during the construction process and after the completion of building.

d) The expected traffic generated during and after the building completion.

e) The concept of facilities for entering, parking and departing the building

f) The concept for public facilities such as green areas, schools, shopping, social amenities, etc.

2.11.3 Urban Densities

a) In registered urban heritage places and zones and the CBD areas of cities and towns, or in the areas defined as high density zones, the densities should be in line with by-laws and zoning plans of respective towns where available.

b) Outside registered urban heritage places and zones and CBD areas or outside quasi such areas, the following estate densities should be maintained:

1) In multi-storeyed residential estates, the building coverage ratios (BCR) shall be 0.4 to 0.6 according to concerned Zoning Plan and Municipal Authority; site locations and road building ratio of the respective areas. [open area including traffic area should not be less than 0.25, and pervious and green area not less than 0.15 (see also Section 2.12.3.3 for Greenery)]

c) Outside registered urban heritage places and zones and CBD areas or outside quasi CBD areas, the open space for buildings abutting a street shall be:-

1) In respect of other buildings used for non-residential purposes, not less than one-tenth of the built-up area of the building lot;

2) In respect of a building with mixed residential and commercial buildings, not less than one-third of the built-up area of the building lot;

d) The plot sizes in the urban settlements are defined in Part 1 of this code, and these are to be followed accordingly.

2.11.4 Open Spaces

a) There shall be not less than 10 square feet per child of play area for educational buildings meant for children younger than 6 years.

b) There shall be not less than 15 square feet per child of play area for educational buildings meant for children between 7 to 16 years.

c) There shall be not less than 20 square feet per child of play area for educational buildings meant for students of age above 16 years.

d) In the residential areas with multi-storeyed units, there shall be minimum of 200 square feet per family as play and recreation areas, additional to parking and road areas.

2.11.4.1 For the purpose of counting the open space

a) Half the width of the backline abutting a building can be counted as open space;

b) Balconies, passage-ways and sun-shades may project over any open space provided these do not project more than 5 feet and have 10 feet clear height from the ground level, such projection can be counted as open space and not as built-up area;

c) The open space provided between the street and the setback for a property line and legally not belonging to the lot where the building is constructed, shall not be counted as open space;

d) The structures such as septic tanks, drains covers, and other elements meant for building services, can be counted as open spaces, provided that people can step on these for purpose using these areas

e) In the residential areas, the parking spaces and road areas can be counted as open spaces but not as play and recreation areas.

f) Where open space not abutting a backline is provided for, such open space shall have a minimum clear width of not less than 8 feet.

2.11.4.2 Alteration of open spaces

Whenever any open space has been provided in connection with any building, no person shall, without the approval in writing of the local authority:-

a) Make any alteration in such open spaces; or

b) Construct a roof over any portion thereof so as to diminish the area of such open space, provided that the local authority in its discretion may issue such a permit if the authority is satisfied that the free movement of air is not impeded or hindered and environmental quality of the area under consideration is not reduced by such alteration.

c) The local authority may, by notice in writing, the owner or any person acting in contravention of this part, instruct to remove any such alteration or roof or otherwise to do such works as will restore such open spaces.

2.11.5 Building Spacing

Building setback shall be specified by city or town authority based on land use zoning plans, conservation guidelines and its' planning control.

2.11.5.1 Spaces between buildings and setback distances

a) For detached buildings in the areas defined as first class areas or quasi equivalent to such areas, which are not more than 36 feet height, there shall be minimum of 6 feet clear space measured between external walls of the building and the boundary of the plot; and 3 feet clear space between the extreme projections of the buildings such as roof edges, gutters, etc. In cases where the buildings exceed 36 feet height, the space mentioned here shall increase with the rate of 1 foot or one tenth of floor to floor height for every increase of a story (or floor to floor height, whichever is greater).

b) For areas outside registered urban heritage places and zones and Central Business District which are not defined as first class areas there shall be minimum of 3 feet clear space between external walls of the building or any elements of the building and one side of the plot shall have the minimum space of 6 feet clear space, and the boundary of the plot, for the buildings up to 8 storeys. There shall be 9 feet clear space between external walls of the building or any elements of the building and the boundary of the plot for the buildings up to 12 stories. There shall be 12 feet clear space between external walls of the building or any elements of the building and the boundary of the plot for the buildings up to 18 stories. If the buildings exceed 18 storeys, there shall be 15 feet clear space between external walls of the building or any elements of the building and the boundary of the plot.

c) For duplex houses and terrace houses, clear space of 3 feet must be maintained between the extreme projections of the buildings (roof edges, balconies, etc.) and the boundary of the plot.

d) For multi-storeyed residential buildings, in the estates outside CBD areas or quasi equivalent to such areas, unless otherwise mentioned in the specific bye-laws of some cities:-

1) For multi-storeyed row blocks with several units parallel and in front to front position, the wall to wall distance shall be not less than the height of the higher building, in the cases where the building heights are different, and minimum 50 feet must be maintained for driveway, parking, aprons and platforms

2) For multi-storeyed row blocks with several units parallel to each other and having back to back position, the wall to wall distance shall be not less than half the height of the higher building, in the cases where the building heights are different and minimum of 30 feet must be maintained as service back lane meant for septic tanks, other infrastructural requirements and as free spaces.

3) For buildings where the gable side abuts the longitudinal side of the building, the space between the buildings shall be not less than half the height of the higher building; in the cases the building heights are different and minimum of 30 feet shall be provided for free flow of air and for other infrastructural requirements. (the different cases are shown in Figure 1 and 2)

4) For multi-storeyed point blocks with several units facing each other, the spacing shall be not less than half the height of the higher building, and that distance shall be minimum 40 feet for residential road and for other infrastructural requirements.

(Multi-storeyed point blocks in these codes are defined in part I of these codes)

e) For buildings in the CBD areas or quasi equivalent to such areas, the building spacing rules are to follow the local codes wherever available.

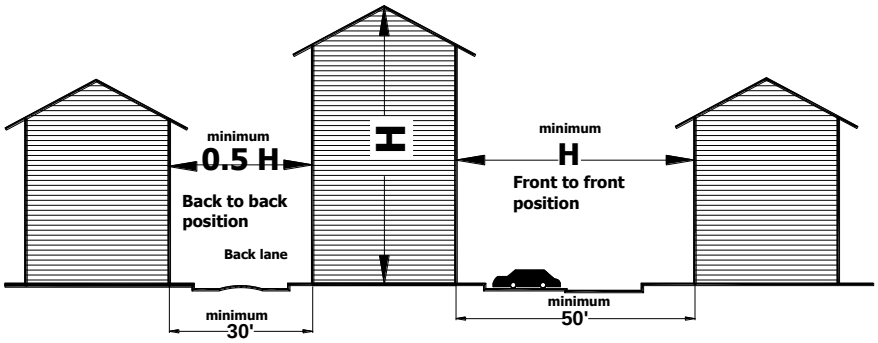


Fig. 2.11.1 Schematic figure showing spacing of row blocks,
front to front and back to back positions and distances

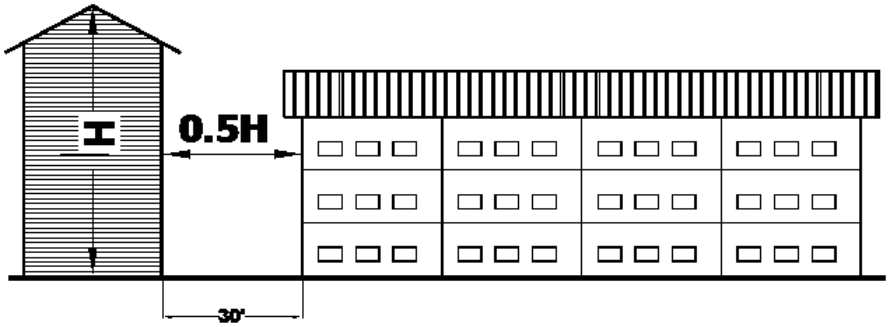


Fig. 2.11.2 Schematic figure showing spacing of row blocks,
gable to longitudinal side and distance

2.11.5.2 Fences or walls

Fences or walls to the boundaries of detached properties other than the boundary which abuts the street or backline shall be constructed to a maximum height of 6 feet in the case of solid fences or walls and to a maximum height of 9 feet in the case of fences which are so constructed as to permit the passage of light and air.

2.11.5.3 Spaces on the street network

a) Where a building is erected at the junction of two streets and in cases where the degree of splay or rounding off is not shown on the layout plan or any statutory maps, modification or replacement thereof maintained by the competent planning authority, the corner of such building shall be splayed or rounded off to a height of not less than 15 feet above the street level at the point of intersection of the street lines so that no part of the building below this height shall project beyond the straight line drawn across the corner of the building plot joining each street line at a point 10 feet from the point of intersection of the street lines.

b) Where buildings abut on a street, there shall not be permanent structures like verandahs, balconies, sun-shades, canopies, etc. built beyond the property line of respective buildings.

2.11.5.4 Walkways and covered walkways

a) The width of any covered or uncovered walkway shall not be less than 7 feet if the walkway is in a confined walls and not less than 4 feet in the open space.

b) Where there is a change in levels along the walkway there shall be steps with risers not exceeding 7 inches and treads not less than 16 inches or a pedestrian ramp of gradient not exceeding 10 % or rise: run ratio of 1:10. (see also part 2.5 of these codes)

c) Where a service road is designed in the residential areas, the walkway is required to be provided along the street

2.11.6 Roads and Parking Spaces

a) The width of one lane of the road for motor vehicles is minimum 12 feet, in the residential areas; the paved area of the road meant for both ways must be at least be 16 feet with 2 feet shoulder at both sides.

b) The internal turning radius of roads in the residential areas shall be 12 feet minimum and the internal turning radius of parking access way shall be 10 feet minimum.

c) Parking (A parking stall means a space for a parking of motor car and a parking aisle means an access lane or driveway with adjacent parking stalls.) The general requirement for parking spaces for cars shall be:

1) Minimum dimensions of parking stalls are 8 feet width and 16 feet in length when stalls are perpendicular to or with angle to the aisles.

2) Minimum dimensions of parking stalls are 8 feet width and 18 feet in length when stalls are parallel to the aisles.

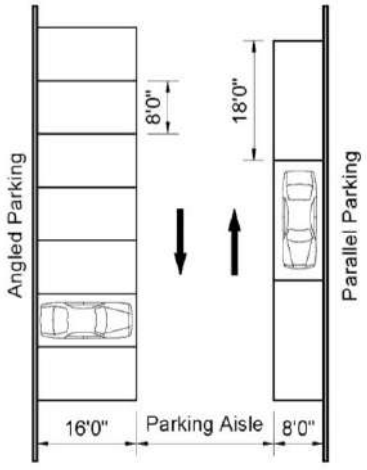


Fig. 2.11.3 Position of parking stalls and required dimensions (Above figure)

3) Parking stalls with adjacent obstructions

Where the obstructions (any large element above 7 inch) located within the middle 9 feet of the parking length, the parking stall shall be widened. If the obstruction is on one side, the minimum stall width shall be 9 feet. If the obstruction is on both sides, then the minimum stall width shall be 10 feet. For parallel parking, the minimum stall length shall be 24 feet where there are obstructions at the stall ends.

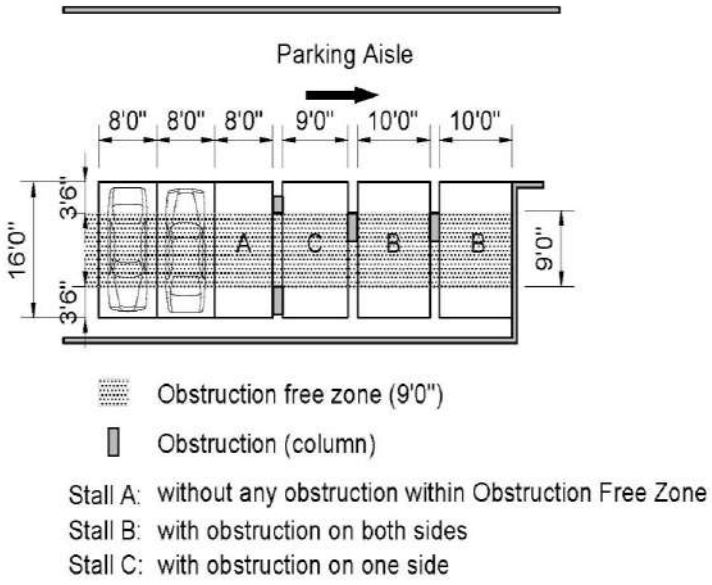


Fig. 2.11.4 Places to maintain obstruction free zones and parking stalls with adjacent obstructions

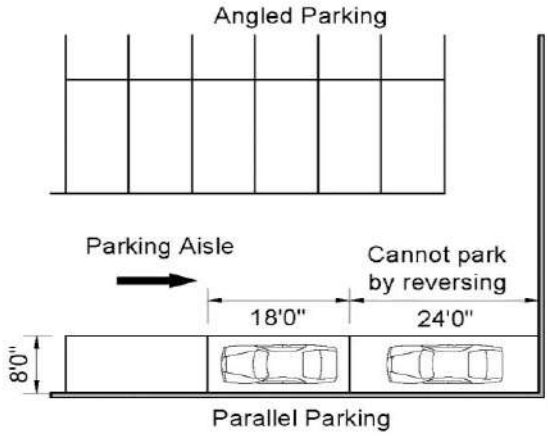


Fig. 2.11.5 Parking stalls which cannot park by reversing

(For parallel parking, where a car cannot be parked by reversing, the length of stall shall be 24'.)

2.11.6.1 The minimum width of parking aisle

The minimum width of parking aisle shall be as follows:

Table 2.11.1 Minimum widths of parking aisles

Parking Angle	One-way traffic flow		Two-way traffic flow
	Stalls on 1 side	Stalls on 2 sides	Stalls on 1 or 2 sides
Parallel	12′	12′	20′
30	12′	14′	21′
45	14′	16′	21′
60	16′	16′	22′
90	20′	20′	20′

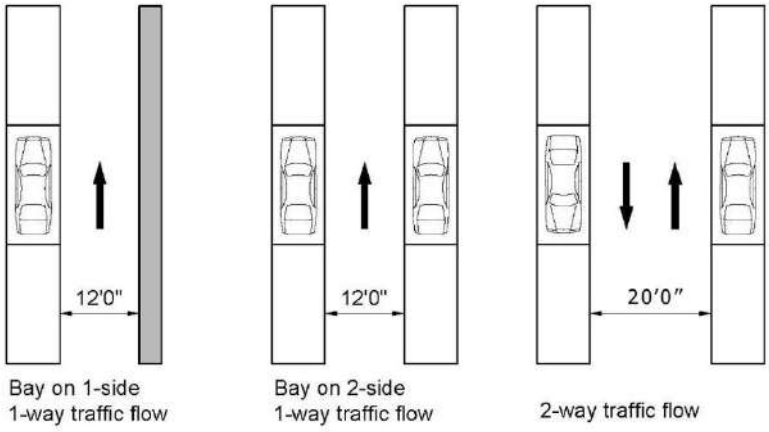


Fig: Parallel Parking Aisle

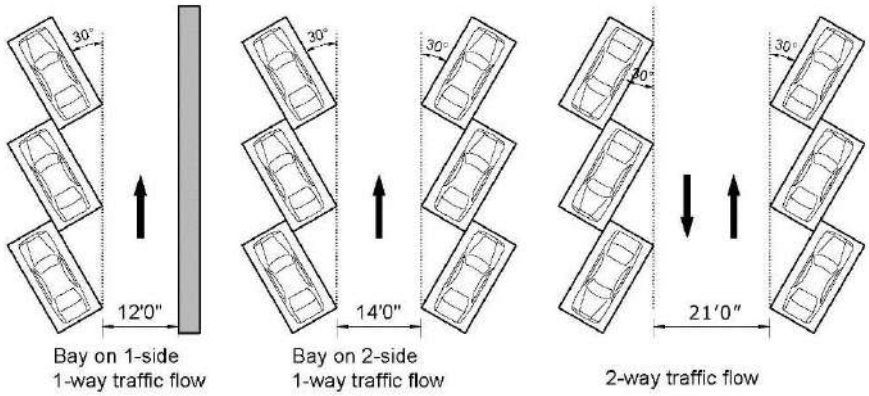


Fig: 30° Angled Parking Aisle

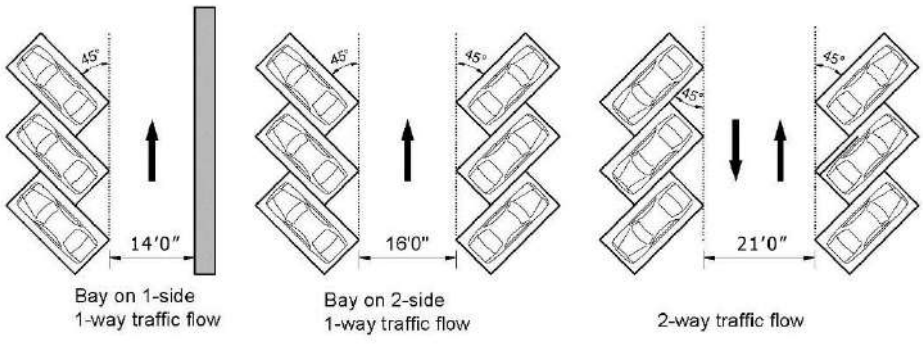


Fig: 45° Angled Parking Aisle

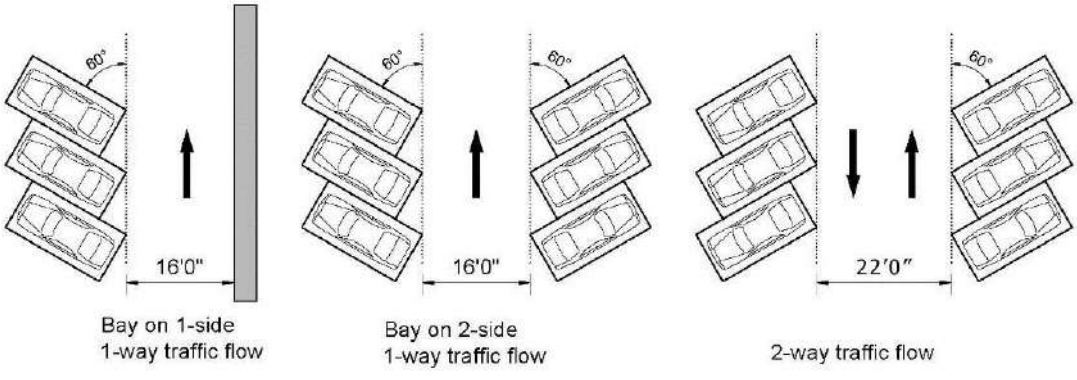


Fig: 60° Angled Parking Aisle

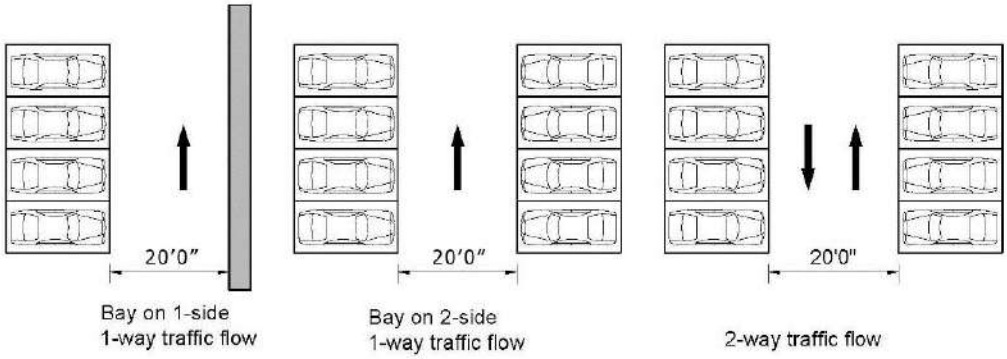


Fig: 90° Angled Parking Aisle

2.11.6.2 Clearway Ramps and Access-Ways

Design and dimensions of Clearway Ramps and Access-Ways are to conform to table 2.11.2, presented below. (Clearway Ramps are inclined floors that provide access between two levels; they do not have parking stalls adjacent to them. Access-Ways are driveways that provide access to the parking stalls.)

a) The slope of curved ramp shall be that of the centre line of its path.

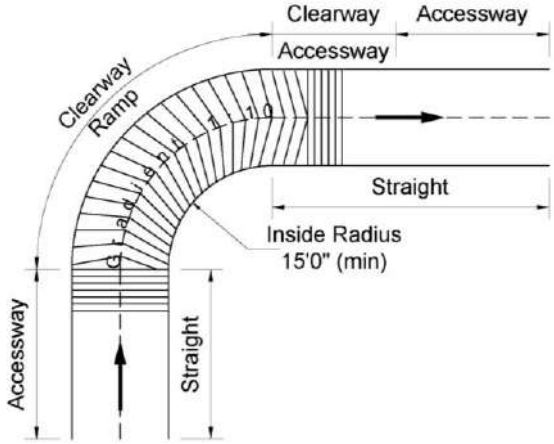


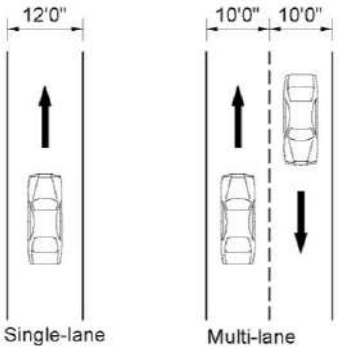
Fig: Example of Clearway ramp and Accessway

Table 2.11.2 Dimensions of Clearway ramps and Accessways

	Single-lane	Multi-lane
Width of straight clearway ramp and access-way	12'0"	10'0"
Width of inside lane of curved clearway ramp and accessway	14'0"	12'0"
Width of Outside lane of curved clearway ramp and accessway	14'0"	11'0"

	Single-lane	Multi-lane
Inside radius of curved clearway ramp and accessway	15’0”	
Gradient of clearway ramp and accessway for straight ramp	1:6.25 (16%) for light vehicles less than 2 tons where accessway level difference is not more than 5’0” which serve not more single level car parking (Max. 10 nos. car lots) 1:7.2 (14%) for medium vehicles less than 5 tons	
Gradient of clearway ramp and accessway for curved ramp	1:10 (10%) preferred 1:8.3 (12%) maximum	

Continuous spiral ramps shall be limited to 4 stories.



1) More than one lane is considered Multi-lane.
2) Number of Lane does not depend on the direction of traffic flow and has no physical divider.

Fig: Example of straight, single and Multi-lane

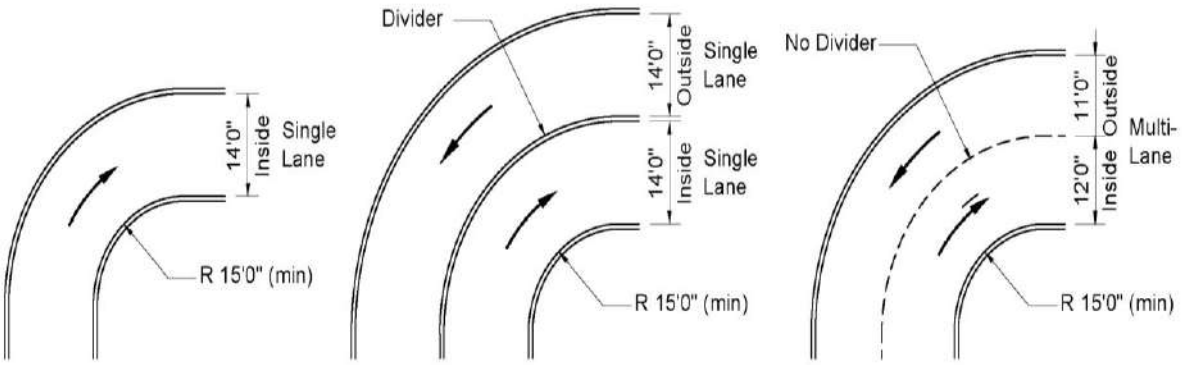


Fig: Example of Curved, single-lane separated by physical divider and Multi-lane

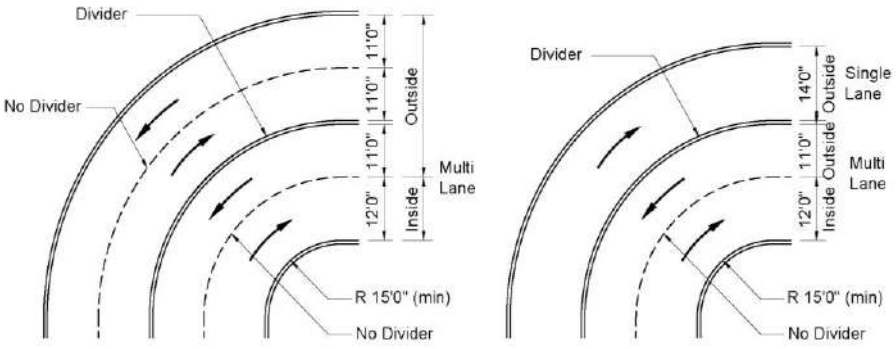


Fig: Example of Curved, Multi-lanes separated by Divider

b) Adequate blending of ramp grades at floor levels shall be provided where a straight / curved ramp meets a straight ramp/ driveway, this can be achieved by the provision of straight slope 9 ft. to 12 ft. long at half the grade of the ramps.

c) If the clear ramps and access-ways have physical divider (with raised brickwork, concrete blocks, etc.) for two directions at one level, physical divider, minimum height of 9 inches above the driveway level, shall be provided as shown in above figures.

d) There shall be a straight landing of minimum 30 feet in length every after 160 feet of ramps with gradients given in the table 2.11.2.

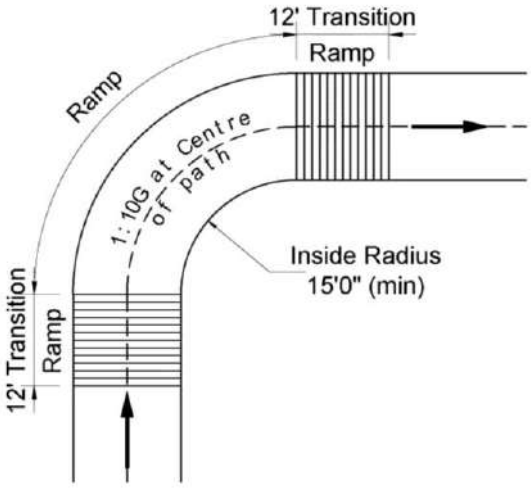


Fig: Transition at the start & end of curved ramp

2.11.6.3 Minimum headroom

The clear headroom or height clearance for car parking shall not be less than 7′-3″. The clear headroom measured from floor level to the underside of any projections including beams, directional signs, sprinkler heads, electrical fittings, etc. The clear headroom of ramps at the entering points to the buildings shall not be less than 7ft 6in.

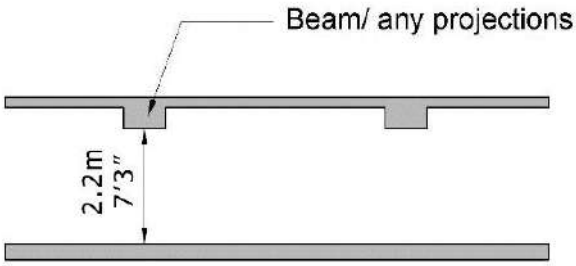


Fig: Minimum headroom clearance

2.11.6.4 Heavy vehicle parking spaces

Heavy vehicles include Lorries, trailers, containers, coaches and other similar commercial vehicles. These are categorized into three groups.

a) Rigid-framed vehicles of length <25’-0"

b) Rigid-framed vehicles of length >=25’-0"

c) Articulated vehicles such as prime movers,20’,40’ and 45’

Table 2.11.3 Minimum dimensions required for heavy vehicles parking

Items	Rigid-framed vehicles of length <25'		Rigid-framed vehicles of length <= 25'		Articulated vehicles, eg. Prime movers, 20'40' and 45' trailers	
Dimensions of parking stall:						
-Parallel parking	30'-6"x10'-0"		46'-0"x11'-0"		63'-0"x11'-0"	
-Angled parking	25'-0"x10'-0"		40'-0"x11'-0"		46'-0"x11'-0"	
Width of parking aisle:	1-Way flow	2-Way flow	1-Way flow	2-Way flow	1-Way flow	2-Way flow
-Parallel parking	12'-0"	24'-0"	15'-0"	24'-0"	15'-0"	24'-0"
-30 parking	12'-0"	24'-0"	15'-0"	24'-0"	22'-0"	24'-0"
-45 parking	16'-0"	24'-0"	18'-0"	24'-0"	32'-0"	32'-0"
-60 parking	21'-0"	24'-0"	22'-0"	24'-0"	36'-0"	36'-0"
-90 parking	30'-0"	30'-0"	36'-0"	36'-0"	40'-0"	40'-0"
Width of clear Access way: per lane	1-Way flow	2-Way flow	1-Way flow	2-Way flow	1-Way flow	2-Way flow
-On straight	15'-0"	24'-0"	15'-0"	24'-0"	15'-0"	24'-0"
-On Curve	15'-0"	25'-0"	15'-0"	25'-0"	15'-0"	30'-0" 6.0m for 20'
Inside turning radius of curve	20'-0"		20'-0"		20'-0"	
Maximum gradient of ramp:						
-Straight ramp	1:12 or 8.3%		1:12 or 8.3%		1:15 or 6.7%	
-Curved ramp	1:15 or 6.7%		1:15 or 6.7%		1:20 or 5%	
Headroom Clearance	14'-0"		14'-0" exclude double-decker		15'-0", 16'-0"at ramp	

2.11.6.5 Motor cycle parking

Motor cycle parking stall can be provided in any available space within parking, the stalls should not obstruct movement of other vehicles and pedestrians. Minimum dimensions of motor-cycle parking stall 3 ft. x 8 ft. If provided next to car parking lots, it is recommended that a gap of 1‟6” to 3‟0” be provided between the car and motor-cycle lots.

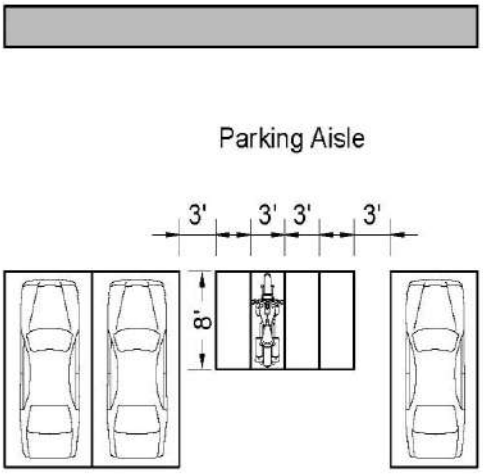


Fig: Example of motor-cycle stalls

2.11.6.6.Parking Ramp

Parking Ramp is a sloping aisles with parking stalls adjacent to them. The gradient of parking ramps shall be 1:25 (4%) (preferred) and 1:20 (5%) (maximum).

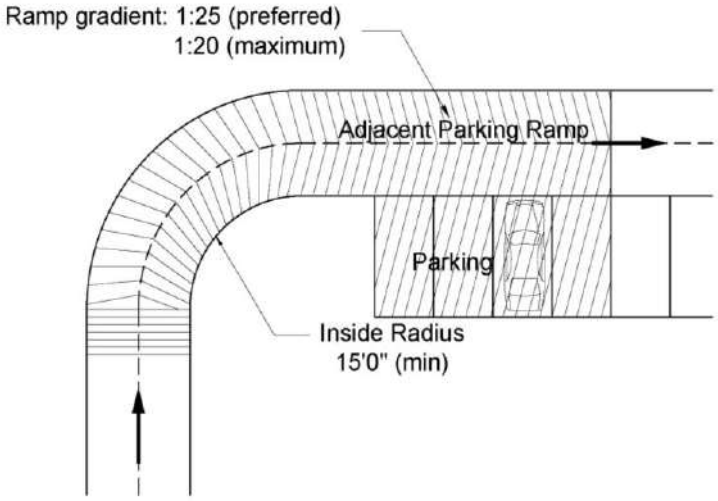


Fig: Example of parking ramp

2.11.6.7.Good Practice

Provision of Adequate sight distance

Adequate sight distance or splay corners for exiting driveways should be provided in order to allow sufficient line of sight for motorists to see approaching pedestrians crossing or another traffic lane.

No sign, wall or other obstruction shall be erected within this clear sight distance triangles.

Convex mirrors should be located appropriately at sharp building edges and blind spot areas.

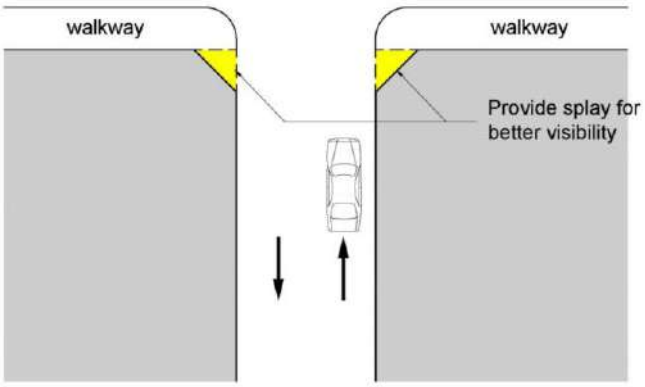


Fig: Improve visibility at car-park exit

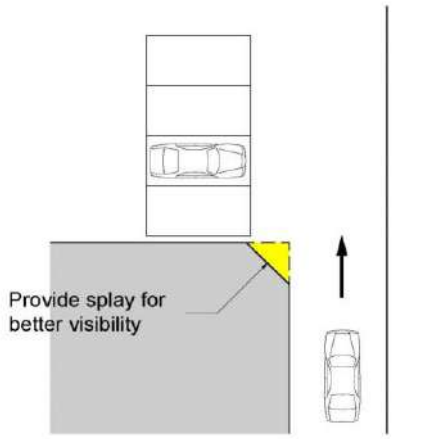


Fig: Improve visibility where there are walls

1) Reduce Visual Intrusion / Effect

To reduce visual intrusion at the carpark building entrance, circular access ramps and along circular ramps, care consideration of contrast color painting or material.

2) Mechanised Parking Provision

3) Minimum Parking Provision Standards

2.11.6.8 Type of Building

Parking provision shall be specified by city or town authority.

Parking provision may vary depends on town's public transportation system and its' own planning control.

Note: Following parking provision is recommended for 2012 Yangon situation.

a) In the urban residential areas for multi-storeyed units (R), there should be minimum one parking space for one residential unit, and for service apartments units (R6), there should be minimum one parking space for two residential units, planned separately as parking lots or in the garages or as specified by Regional Governments, and concerned authorities of respected towns and regions. The road and parking areas cannot be counted as play and green areas as required in part 2, paragraph 6 of these codes.

b) For shopping centres, there shall be minimum one parking space for 1000 square feet sales floor area, planned separately as parking lots or as parking spaces; or as specified by Regional Governments, and concerned authorities of respected towns and regions.

c) For offices in the urban areas, there should be minimum one parking space for 10 employees, planned separately as parking lots or as parking space; or as specified by Regional Governments, and concerned authorities of respected towns and regions.

d) For other commercial establishments like banks, restaurants, clubs, hotels, etc. the additional calculation for parking requirements must be submitted together with planning and building permit.

2.11.7 Recreation Areas

This sub-section will be added in next edition.

2.12 GREEN BUILDING

2.12 Green Building

2.12.1 Introduction

Green building and sustainable building both refer to the design and construction of buildings that have minimal impact on the environment. The purpose of Chapter 12 is to provide minimum design requirements that will promote all phases of design, materials selection, and construction, efficient utilization of energy and water resources in buildings. The requirements are directed toward the design of building envelopes with adequate thermal resistance and low air leakage, and toward the design and selection of mechanical, water heating, electrical and illumination systems that promote effective use of finite energy resources. A green building is designed and constructed to reduce the overall impact of the built environment on human health and the natural environment for the following criteria.

2.12.2 Criteria for Green Buildings in Myanmar

As an art of creating and shaping living environment for the community in general and each person in particular, architecture is currently largely influenced by urbanization, industrialization and also global climate change.

In order to design a sustainable built environment for the people, this chapter would like to highlight the community and especially the architects and engineers to strive for the future development of green buildings and as a tool for the implementation process, this chapter would like to promulgate its own Criteria for Green Buildings in Myanmar.

2.12.2.1. Aims

2.12.2.1.2. Criteria for Green Buildings in Myanmar specify the contents and requirements for architecture and planning in order to shape and promote sustainable built environment and landscape, to ensure living quality for indoor environment, to use energy and natural resources towards efficiency and to develop social sustainability towards communities and modern architecture based on identity with a futuristic vision.

2.12.2.1.3. The criteria to be established aim to:

- conduct research and development/design activities in principles of green building;
- offer training courses on green building for architects, engineers and the community;
- promote and introduce green building;
- offer consultancy and social critiques in principles of green building;
- evaluate green building designs and honour architects, engineers and developers who design and develop green building respectively.

2.12.2.2. Objectives, Scope and Requirement for Application

2.12.2.2.1. Criteria for green buildings shall apply to:

- Buildings and urban areas which can be constructed, renovated, upgraded or redeveloped/rehabilitated.
- Architectural design and urban/rural planning projects that have been approved by competent organizations, already completed or still under construction.
- The code will later include the compliance method for determining the level of environmental performance of a building development.

2.12.2.3. Five Criteria

(1) Sustainable Site

(2) Efficient Consumption of Energy, Water and Natural Resources Management

(3) Indoor Environment and Materials

(4) Innovative Architecture and Identity

(5) Social Sustainability and Humanities for Community

2.12.2.3.1. Criterion One: Sustainable Site

Objectives: to shape a harmonious and sustainable landscape, to minimize the negative impacts of a building on the surrounding area and to make full use of all favourable conditions of the nature for the living environment of human beings.

2.12.2.3.1.1. Construction Site Should Be in Accordance with the Current Planning

- The site should be located within an area where the spatial planning has been approved, and the land area for building purpose needs to be appropriate to the existing building(s) in terms of function and also in consideration of the future development.
- The site should be convenient for transport and access, power and water supply, as well as communication.
- The site should comply with the regulations in planning management, protection and buffer zones applicable to buildings as required in Myanmar National Building Code and relevant planning management policies.

2.12.2.3.1.2 Protection of Environment and Natural Landscape

- Protection and conservation of eco-systems and natural landscape:

  (a) The building(s) will not cause pollution to the environment and neighbouring buildings.

  (b) The building(s) will not change so much to the typology of the site, the terrain, eco-systems and natural landscape.
- During the construction of the building(s), the monitoring and control of pollution or contamination caused by the construction work to the surrounding area are strongly recommended.

2.12.2.3.1.3 Prevention and mitigation of natural disasters and adaptation to climate change

Solutions in planning, architecture and technology should be developed in response to climate change and help minimize the devastation/damage of natural disasters (such as flood, land slide, storm, earthquake and whirlwind).

2.12.2.3.1.4 Harmony with natural landscape

Solutions in spatial planning and architectural design should not only be in harmony with natural landscape, but also enhance the quality of such natural landscape.

2.12.2.3.1.5 Restoration and Improvement of Environment and Landscape

Landscape design solutions applicable to green areas, water bodies, architecture and building technology will help restore and improve microclimatic conditions and enhance the beauty of the local natural landscape.

2.12.2.3.2. Criterion Two: Efficient Consumption of Energy, Water and Natural Resources Management

Objectives: To enhance the efficiency and help save both energy and natural resources; to reduce negative impacts on the natural environment and minimize the greenhouse effect in using natural resources, such as land, water, energy, materials, etc. for green building.

2.12.2.3.2.1 Land saving in building

- Building density and land use ratio should be in accordance with the properties and purposes of use of building(s), as well as the landscape requirements for the area.
- Use uncultivated or uninhabited land, not agricultural land, for building purpose and try to conserve eco-systems.
- Develop solutions to create green areas and underground spaces, and economize land use for building purpose.

2.12.2.3.2.2Energy Saving and Efficient Energy Use

- Solutions in planning, architecture, use of building materials, application of technology and installation of equipment should ensure efficient energy use and save as much energy as possible. It is strongly advised to exploit energy sources locally available, particularly renewable energy, in compliance with the relevant standards currently applied.
- Controlling, monitoring and/or managing systems should be properly used towards the minimization of energy consumption of building service systems.

2.12.2.3.2.3 Utilization and Efficient Use of Air Circulation and Daylight

Solutions in planning, architecture, use of building materials, application of technology and installation of equipment should ensure efficient use of air circulation and daylight which are of course good for building occupants' health. By doing so it is possible to minimize air-conditioning and artificial lighting.

2.12.2.3.2.4 Efficient use of water

- Save clean water as a valuable natural resource and comply with relevant standards currently applied.
- Develop water-saving solutions and minimize water leakage.
- Rain water and wastewater should be collected, treated and reused.
- Ensure that water sources are safe and will not have any harmful effects on human health and living environment.

2.12.2.3.2.5 Use of environment-friendly materials

- Materials to be used for the building(s) must be free of hazardous substances and emissions (radioactive materials, chemicals, volatile organic compounds, etc.).
- Use of local materials should be encouraged, so that the natural resources will not become exhausted, and can even be reused or recycled.

2.12.2.3.2.6 Application of green technologies

Application of innovative and intelligent solutions in engineering, technology and equipment for design and construction of buildings and/ or on a larger scale, a whole urban area will help minimize loss of energy, costs and environmental pollution.

2.12.2.3.2.7 Efficient Management in use of buildings as well as urban areas

- Application of waste sorting and treatment without causing pollution.
- Application of reuse and recycling solutions to deal with building waste and try to minimize the amount of waste transported to waste disposal sites and recycle the amount of waste arising throughout the life cycle of a building.
- Management of use of energy, water and materials must meet the requirements towards saving and efficiency according to relevant standards of competent organization.
- Management and operation of building(s) and urban area(s) must ensure that CO2 emissions and waste substances will not exceed the amounts required in standards.

2.12.2.3.3 Criterion Three: Indoor Environment and Materials

Objective: To create safe, hygiene and comfortable to building occupants while the building(s) can still be effectively used.

2.12.2.3.3.1 Room Design

- Rooms should be designed in accordance with specific purposes of use and the needs of building occupants, physio-psychologically considered.
- Rooms specially reserved for and used by disabled people must be designed as required.
- Room design must meet the needs of building occupants for social communication and welfare.

2.12.2.3.3.2 Building Envelope

- Building design, including built forms, spatial planning, structural design and selection of building envelope, must meet the requirements for the prevention and mitigation of the negative impacts of both natural and artificial factors, such as solar radiation, light and lighting, wind and rain.

Other requirements include: thermal insulation, sun shading, ventilation, reflection, illumination, noise control, elimination of the condensation of humidity as well as the diffusion of toxins.

- Use of materials for the building envelope must take the advantage of the natural environment towards energy saving and efficiency.

2.12.2.3.3.3 Materials for Interior Design

Use of materials for interior design, such as paints, gypsum, wood and plastic, must be free of emissions of greenhouse gases or hazardous substances that have negative effects on the health and physio-psychological state of building occupants.

2.12.2.3.3.4 Indoor Air Quality

- Indoor air must satisfy the hygiene conditions and ensure good health for building occupants and the air quality meet the standards of competent organizations.
- Natural ventilation:

  Make full use of cool wind in terms of providing fresh air for building occupants;

  Minimize and avoid, if possible, cold/hot wind that may have negative effects on human health.
- Mechanical ventilation:

  (a) Ensure that air quality, room temperature; humidity, indoor wind speed, etc. are adequate to meet the requirements for comfort and well-being of building occupants;

  (b) Minimize the use of energy-intensive equipment and appliances for heating and cooling in residential buildings
- Air pollution must be controlled and should not exceed the maximum level allowed in the standards.

2.12.2.3.3.5 Noise

Noise must be controlled and should not exceed the maximum level allowed in the standards.

2.12.2.3.3.6 Lighting

Ensure the following factors/conditions: illuminance, lighting indicator, visual effect and minimization of energy consumption. Solutions to control and manage lighting/illumination towards energy saving and efficiency should be applied and easy/convenient to use.

2.12.2.3.4. Criterion 4: Innovative Architecture and Identity

Objective: To develop innovative architecture on the basis of the continuity and respect of traditional values and an emphasis on vernacular or local architecture.

2.12.2.3.4.1 Planning and Architecture

Solutions should be compatible/ appropriate to the needs of people living and working in a modern society and help them understand much better as well as respect/appreciate the cultural values of a society.

2.12.2.3.4.2 Conservation, Continuation and Promotion of Cultural Values and Traditional Architectural Styles; which are highly characteristic for each region, nation and ethnic group.

2.12.2.3.4.3 Application of Advanced Science and Innovative/Climate Responsive Technology; which is expected to bring socio-economic benefits to the community.

2.12.2.3.5 Criterion 5: Social Sustainability and Humanities for Community

Objective: To connect architectural development with the goals in establishing, protecting and nurturing social environment and humanities towards stability and sustainability.

2.12.2.3.5.1 Ensure Harmony with Social Environment and Humanities for Community

The harmony with humanities for the communities, such as cultural tradition, history, religion, lifestyle, etc. should be emphasized and highlighted.

2.12.2.3.5.2 Meet the Material, Cultural and Spiritual Needs of Individuals, Communities and Nations

It is important to respect the rights and needs of communities in order to avoid conflicts of interest and to ensure the integration of disabled people into the society as well as to help marginalized groups (low-income residents).

2.12.2.3.5.3 Respect, Conserve and Promote the Values of Cultural Heritage

- Respect, conserve and promote all the values of cultural heritage, both tangible and intangible one.
- Explore and discover new heritage and propose solutions to conserve the heritage and put it into a closer relationship with the local socio-economic activities.

2.12.2.3.5.4 Ensure a Stable Socio-Economic Context

- Ensure a harmony of interests among different groups of the local community without causing any negative problems, hereby it is possible to establish and secure a stable and sustainable socio-economic development for the local community.
- Ensure an efficient management concept by respecting and encouraging the public participation in the design process, investment in construction, use and operation of building(s) as well as urban area(s)

2.12.3 Environmental Sustainability Standard

2.12.3.1 Energy Efficiency and Renewable Energy

- **Building Envelope**

Heat gain or loss in buildings is due to heat transfer through walls, roof, ceiling, floor, and glass etc., i.e., the building fabric or envelope. The load due to such heat transfer is often referred to as the envelope heat gain or loss. In this connection, it is to be considered whether a particular wall or roof is exposed (normal or severe exposure) to the sun or not. In the case of a sunlit wall or roof, the heat gain of the room will be more in comparison to a shaded one, as the outside surface temperature of the wall or roof will increase above the outside air temperature due to the incident solar radiation. (Ref: shodhganga.inflibnet.ac.in)
The control of the overall thermal performance of building envelope will contribute to minimize heat gain thus reducing the overall cooling load requirement.

- **Natural Ventilation in Common Area**

A building's natural ventilation can be based on a variety of different ventilation principles. A ventilation principle shows how natural ventilation works based on the design of the building, internal thermal loads and the positioning of openings (typically windows).
All natural ventilation principles are based on the principle of ensuring healthy and comfortable indoor climate through minimal energy consumption and at minimal cost. (Ref: https://www.windowmaster.com)
Common area such as stairs, toilets, lifts, lobby, walkways, passage ways are advised to be naturally ventilated as much as possible rather than using air-conditioning system readily.

- **Lighting**

Daylight is the combination of all direct and indirect sunlight during the daytime. This includes direct sunlight, diffuse sky radiation, and (often) both of these reflected by the Earth and terrestrial objects, like landforms and buildings. Sunlight scattered or reflected by objects in outer space (that is, beyond the Earth's atmosphere) is generally not considered daylight. Thus, daylight excludes moonlight, despite it being indirect sunlight. Daytime is the period of time each day when daylight occurs. Daylight happens as Earth rotates, and either side on which the Sun shines is considered daylight. (Ref: https://en.wikipedia.org)

Building works must be designed to integrate natural lighting wherever applicable to reduce the need of the electrical energy.

- **Energy Efficient Features**

In the near future, energy efficiency is potentially the most important and cost-effective means for mitigating greenhouse gas emissions from industry. (ref: https://link.springer.com)
Energy efficient features in place of conventional fixtures should be applied in building projects

- **Renewable Energy**

Renewable energy is energy that is collected from renewable resources, which are naturally replenished on a human timescale, such as sunlight, wind, rain, tides, waves, and geothermal heat. Renewable energy often provides energy in four important areas: electricity generation, air and water heating/cooling, transportation, and rural (off-grid) energy services. (Ref: https://en.wikipedia.org) Some of the examples are solar energy, wind energy, biomass,

2.12.3.2 Safeguarding Water, Water Efficiency and Pollution Control

Water efficiency is reducing water wastage by measuring the amount of water required for a particular purpose and the amount of water used or delivered. Water efficiency differs from water conservation in that it focuses on reducing waste, not restricting use. (Ref: https://en.wikipedia.org)
Important factors to be considered for safeguarding water are:

- Water efficient fittings
- Water usage monitoring
- Water discharge system
- Rain water harvesting system
- Irrigation system

2.12.3.3 Environmental Protection

- **Greenery**

  Green spaces are a great benefit to our environment. They filter pollutants and dust from the air, they provide shade and lower temperatures in urban areas, and they even reduce erosion of soil into our waterways.
  (Ref: http://projectevergreen.org)

Green space (land that is partly or completely covered with grass, trees, shrubs, or other vegetation). Provision of open space/green area and pervious area in Urban areas shall comply to "Section 2.11.3 Urban Densities" of this code.

Objectives

Encourage greater use of greenery and restoration of existing trees to reduce heat island effect.

Applicability

Applicable to building developments with landscaping areas.

Greenery Provision (GnP) is calculated by considering the 3D volume covered by plants using the following Green Area Index (GAI):

Grass GAI = 1 ; Shrubs GAI = 3; Palms Trees GAI = 4; Trees GAI = 6
Greenery Provision (GnP) = total green area / site area
(Ref: htpps://www.farminguk.com)

- **Solid Waste Management System**

  Solid waste management is a term that is used to refer to the process of collecting and treating solid wastes. It also offers solutions for recycling items that do not belong to garbage or trash. As long as people have been living in settlements and residential areas, garbage or solid waste has been an issue. Waste management is all about how solid waste can be changed and used as a valuable resource. Solid waste management should be embraced by each and every household including the business owners across the world. Industrialization has brought a lot of good things and bad things as well. One of the negative effects of industrialization is the creation of solid waste.
  (Ref: https://www.conserve-energy-future.com)

- **Environmental Management System**

  Environmental management system (EMS) refers to the management of an organization's environmental programs in a comprehensive, systematic, planned and documented manner. It includes the organizational structure, planning and resources for developing, implementing and maintaining policy for environmental protection.

  Operational Controls, Procedures, and Practices. To implement an effective environmental management system, an organization must identify those operations and activities that are associated with the identified significant environmental aspects in line with its policy, objectives and targets.

2.12.3.4 Indoor Environmental Quality

Indoor environmental quality (IEQ) refers to the quality of a building's environment in relation to the health and wellbeing of those who occupy space within it. IEQ is determined by many factors, including lighting, air quality, and damp conditions. (Ref:www.cdc.gov/niosh/topics/indoorenv/ default.html)

- **Thermal Comfort**

Thermal comfort is the condition of mind that expresses satisfaction with the thermal environment. The temperature is an indication of the physical environment. Good indoor thermal comfort improves productivity at workplace.
Thermal comfort results from a combination of environmental factors and personal factors. Environmental factors influencing thermal comfort are:

Air temperature

• The temperature of the air that a person is in contact with, measured by the dry bulb temperature (DBT).

Air velocity

• The velocity of the air that a person is in contact with (measured in m/s). The faster the air is moving, the greater the exchange of heat between the person and the air (for example, draughts generally make us feel colder).

Radiant temperature

• The temperature of a persons surroundings (including surfaces, heat generating equipment, the sun and the sky). This is generally expressed as mean radiant temperature (MRT, a weighted average of the temperature of the surfaces surrounding a person, which can be approximated by globe thermometer) and any strong mono-directional radiation such as radiation from the sun.

Relative humidity (RH)

• The ratio between the actual amount of water vapour in the air and the maximum amount of water vapour that the air can hold at that air temperature, expressed as a percentage. The higher the relative humidity, the more difficult it is to lose heat through the evaporation of sweat.
(Ref: https://www.designingbuildings.com)

- **Noise Pollution Control**

A form and level of environmental sound that is generally considered likely to annoy, distract or even harm other people. Most industrial plants operated by a business located near a residential area will need to be respectful of others residing within earshot regarding their production of noise pollution. (Ref:https://www.merriam-webster.com)
Any sound which is unnecessary, excessive, unnatural, annoying, prolonged, or unusually loud in relation to its time, place and use effect.

- **Indoor Air Quality (IAQ)**

Indoor air quality (IAQ) is the purity of the air in a specified area. It is determined by the level of dust, suspended particles and pollutants that are present. The quality of indoor air can affect the health and wellness of those who are breathing it. (Ref: www.safeopedia.com)

- **Air Change Rate**

  Air changes per hour, or air change rate, abbreviated ACH or ac/h, is a measure of the air volume added to or removed from a space (normally a room or house) divided by the volume of the space. If the air in the space is either uniform or perfectly mixed, air changes per hour is a measure of how many times the air within a defined space is replaced. (Ref: https://en.wikipedia.org)

2.12.4 Green Building Grading System

For new constructions or major retrofitted buildings, green building grading system shall be practiced by Myanmar Green Building Society: **JADE – Myanmar**.

JADE is a set of Green Building to develop by the Myanmar Green Building Society (MGBS) specifically for the Myanmar built environment. JADE rating tools are based on various international green building rating systems (LEED, Green Star, BREEAM, GBI, Green Mark, and have the following goals:

- To establish standards and bench marks specific to Myanmar
- To guide the local construction industry towards efficient use of natural resources
- To introduce and promote environmentally friendly practices JADE rating tools have been developed to long term research, with the expert advices of specialist giving particular consideration to Myanmar's cultural and natural characteristics and to existing Myanmar standards and policy. MGBS has developed three grades; Grade A, B and C.
- To award Green Building certificate for Non-Residential and Residential buildings in operation.

2.12.5 Method of Evaluation

2.12.5.1. One building to be recognized "green building" must be evaluated on the basis of all five criteria of green building categorized by Myanmar Green Building Society (MGBS)

2.12.5.1.1. The satisfaction of criteria is categorized in different grades:
• Grade A (Excellent): The performance of a building is well above the criteria of green building.
• Grade B (Good): The performance of a building meets the criteria of green building.
• Grade C (Satisfactory)

2.12.5.1.2. Scoring percentage

- A building will be recognized as Green Building JADE – Myanmar - Grade A, if it scores above 80%.
- A building will be recognized as Green Building JADE – Myanmar - Grade B, if it scores between 60% - 80%.

- A building will be recognized as Green Building JADE – Myanmar - Grade C, if it scores between 40% - 60%.

2.12.6 Clauses of implementation

2.12.6.1. The criteria of green building in Myanmar is proposed and issued by the Green Building Society (MGBS). The criteria will be frequently developed and completed in the course of implementation in order to correspond to the socio-economic development and meet the requirements for sustainable development of the country as well as of each state and region.

2.12.6.2. The application of the criteria of green building in Myanmar shall be complied with all the regulations, relevant norms and standards, promulgated by competent organizations.

2.12.6.3. The principles, objectives and contents of the criteria of green building in Myanmar as stated above can be reviewed and revised in accordance with the framework of time, space and technology.

Table 2.12.6.1 - Measures to Expand the Myanmar Green Building Market

Beneficiary	Building Owner/ Provider
Incentives	Record of green building certification level in Building Register in MGBS
	Reduction of Property Registration Tax
	Reduction of Property Tax
	Reduction of Environment Improvement Tax
	Low interest loans
	Relaxation of Building Regulations
	Additional point in Project Quality of Public Procurement

List of participators and coordinators for TWG-2

1.	Dr. Swe Swe Aye	Group Leader
2.	Daw San San Moe	Deputy Group Leader
3.	Dr. Theingi Shwe	Secretary
4.	Dr. Kyaw Latt	Member
5.	U Khin Maung Than	Member
6.	U Aung Myint	Member
7.	Daw Hla Su Myat	Member
8.	U Htin Kyaw Myint	Member
9.	Dr. Aung Sea Sar	Member
10.	Daw Su Yee Aung	Member
11.	Dr. Su Su	Member
12.	Dr. Khine Minn Mon	Member
13.	Dr. Hnin Wint Yi	Member
14.	Dr. Kay Khine Ye Myint	Member
15.	Daw L.Nang Ing	Member
16.	Daw Chaw Myat Lin	Member
17.	Daw Yuzana Lwin	Member
18.	U Zaw Lin Myat	Member
19.	Daw Tin Tin Kyi	Member
20.	Dr. Khin Ni Ni Thein	Member
21.	Daw Chaw Kalyar	Member
22.	Daw Nilar Kyaw	Member
23.	Daw Hlaing Maw Oo	Member
24.	Daw Htoo Htoo Ngwe	Member
25.	U Thant Zin	Member
26.	U Sai Ohn Kyaw	Member
27.	U Win Htoo	Member
28.	U Khin Maung Maung	Coordinator