



Green Building Regulations and Specifications

Practice Guide

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FORWORD

Sustainable Development is about achieving the dual goal of striking a balance between economic growth and environmental protection. Through its strategic planning, legislation and projects, Dubai has always been a leader in this area - despite its limited natural resources and difficult climatic conditions.

Dubai's Strategic Plan is aligned to the historic resolution of His Highness Sheikh Mohammed bin Rashid Al Maktoum - Vice President, Prime Minister and Ruler of Dubai - on the implementation of green building specifications in all buildings and projects in the Emirate of Dubai. This culminated in the Green Building Project which is considered one the most important legislations adopted by the government to protect the environment and its natural resources as well as to preserve public health and people's welfare without adversely affecting the potential of our future generations.

We seek in Dubai to build an excellent city, clean and free of contaminants that provides the essence of success and comfort of living, for that it is imperative to continue and maintain what has been built with high quality and fulfill our duties to the international community through an active role in the global efforts to reduce the risk of climate change, global warming and greenhouse gases emissions.

All concerned authorities in our beloved Emirate have come together in unison to accomplish this Green Building Practice Guide as a real contribution to sustainable development. We, therefore, request all official bodies, the community and the private sector to adopt and implement practical methods and effective solutions in applying these regulations without harming the national economy. In so doing, we will be playing our part in following the best international practices as it pertains to sustainable development.

Finally, I wish to thank everyone at the Green Building Committee who contributed their expertise, time and efforts to bring this Guide into existence.

We, at Dubai Municipality, will continue to strive and work hard to make Dubai a fullfledged Green City, thereby achieving the wise vision of our leader, His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President, Prime Minister and Ruler of Dubai in making Dubai "the hub of global finance, business, and tourism."

Eng. Husain Nasser Lootah
Director General of Dubai Municipality



PREFACE

It is with great pleasure that we present to you the first edition of the Dubai Green Buildings Regulations and Specifications Practice Guide - Dubai 2011. This achievement was the result of the combined efforts of Dubai Municipality in collaboration with Dubai Electricity and Water Authority through the Green Building Committee and intensive follow up of the Executive Council of the Government of Dubai.

The Green Building Committee has set the strategic objectives and developed the operational and future plans for the Green Building Project. After which the committee has identified the targets of Dubai Green Building Project after studying most of the recognized international practices in this field. It has selected the most appropriate items from them to be applied in Dubai through dialogue sessions and exchange of views and experiences and benchmarking with partnership of all concern authorities and stakeholders including the external customers. The selected items were studied in-depth to reach up to determine the most appropriate items to be applied in Emirate of Dubai. These items came after an extensive evaluation in terms of environmental impact, cost, market readiness, ease of application and availability of materials and the possibility of testing, inspection and accreditation. For this, this issue of the Green Buildings Regulations and Specifications Practice Guide attached with Green Building Materials Guide came in order to ensure the safety and ease of application and adoption of the mechanism of application of these standards.

The Practice Guide is divided into 8 main sections. The first two sections are introductory sections cover the Administration and Definitions. Section three covers mainly the environmental building planning & design in a way that caters for the end users' needs whilst being environmentally friendly. Section four addresses the issue of building livability to improve the internal building environment as well as the health and welfare of the occupants. The remaining three sections focus on the adequacy of resources as relating to energy, water, building materials, and waste management.

The first edition of this guide requires the participation of all concern parties and all segments of society to develop it after it has been tested in practice on the ground to ensure the effective implementation in the future and to promote the integration of the concept of Green City which we hope Dubai will be in the level of best Green cities in the world as inspired by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister and Ruler of Dubai.

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Administration

100 : A Practice Guide for Building a Sustainable Dubai

101 : Introduction

Sustainable Development

On 24 October 2007, His Highness Sheikh Mohammed bin Rashid Al Maktoum UAE Vice President, Prime Minister and Ruler of Dubai, stated:

All owners of residential and commercial buildings and properties in the Emirate of Dubai must comply with the internationally recognised environmental-friendly specifications to turn Dubai into a healthy city that meets the demands of best practice and the benchmarks of a pollution-free sustainable development.

This statement set Dubai on a “greener” and more sustainable development path. Many Governments around the world are now seeking the best ways through which a low carbon and more sustainable future can be achieved. Dubai has taken a bold step forward with these new building regulations which address the Emirate’s most urgent sustainability issues of energy and water demand, carbon emissions and public health.

Dubai has chosen a Regulatory Framework instead of a Rating System through which to achieve the edict of His Highness. A rating system reviews various aspects in the building process and gives “credits” or “points” towards an award for a certain level of achievement – rating systems are valuable however rating is a voluntary system which engages only those who choose to use it. A mandatory system of regulation focuses on all buildings. Figure 1 illustrates some major differences between a Regulatory Framework and Rating Systems.

Figure 1: Regulatory Framework Compared to Rating Systems

REGULATORY FRAMEWORK	RATING SYSTEM
Mandatory Measures	Voluntary Measures
Directed and Focused	Developer/Builder’s Choice
Strategic and Predictable	Selection Varies
All Buildings will have a Measure of “Greenness”	“Greenness” per Builder’s Choice
Will Drive the Market	May Encourage Market

By implementing a Regulatory Framework, ALL buildings in Dubai will be required to implement sustainable practices, instead of just a few buildings which might choose a voluntary commercial system.

Dubai’s Green Buildings Regulations are an addition to the current Codes & Standards, which set out mandatory minimum performance standards for buildings.

Dubai Municipality issued administrative order no. (344/2011) which indicate the implementation dates for the government, public and private buildings. Dubai’s Green Building Regulations are applied voluntary to the public and private buildings in order to allow adequate time for the developers, construction professionals and the community to prepare for compliance. While Dubai’s Green Building Regulations are applied mandatory to all new government buildings.

Dubai’s Green Building Regulations create a link between Dubai’s building regulations and the wider picture of Sustainability. The regulations have been developed to be Dubai-specific, closely related to Dubai’s climate and conditions.

This document is the Practice Guide which provides guidance for each of the regulations that have been promulgated.



Overview of the Practice Guide

The Practice Guide has seven sections and one appendix. The first section of this Guide is the Administration, which provides details on the Green Building Regulations' link to sustainability and Dubai's definition of a Green Building. The Administration also includes the link to Dubai's Strategic Vision and the Focus of the Regulations. The purpose of the Practice Guide is described, along with details of how each of the guides expands on each of the regulations.

The second section of this Guide contains a Glossary of Terms used in all the Practice Guides. While the sections from third to seven contain all the Practice Guides. Each Guide includes a re-statement of each of the regulations, as well as sufficient information to provide some understanding of the reason for the regulations, their benefit and some guidance towards compliance. The Practice Guides are not intended to provide detailed design information or to be a substitute for the experience and expertise of the building designers and contractors.

The appendix is included at the end of this document which offers some energy and water conservation tips.

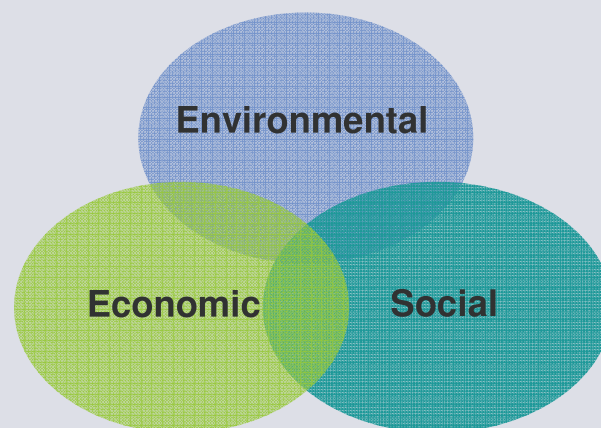
102 : Link to Sustainability

Sustainability is a complex concept which has rapidly developed in the past few years. Founded in the Brundtland Report 'Our Common Future' the concept of Sustainable Development has served two decades of renewed effort in addressing environmental and social issues in the context of economic growth. In the context of the built environment and Climate Change, In the last 5 years, *Sustainability* has become the benchmark terminology for the response required in human-influenced activities. Dubai examined the traditional definition of Sustainable Development as defined by the Brundtland Commission in 1987, which states that:

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Dubai also reviewed the common principles of Sustainability which are often referred to as the "Triple Bottom Line". This is a concept that began development in 1994 as a way of going beyond just the economic aspects of any product, project or programme. It includes three aspects: Social, Environment, and Economic and is often viewed as interlocking circles as depicted in Figure 2.

Figure 2: The Three Pillars of Sustainability



It was the intent of Dubai that in developing these Green Building Regulations that they were linked to the higher principles of Sustainability. With the regulations, Dubai wishes to balance the opportunities and challenges of each aspect in the "triple bottom line" ensuring a positive outcome for all. In practice this means that the Regulations aim to deliver a built environment that delivers environmental improvement and a better quality of life for the people and visitors of Dubai at a cost that is not unacceptable and in fact supports future economic growth.

The goal is to apply sustainable principles to the tasks of building design, construction, operation, maintenance, change of use and deconstruction in Dubai. The examples described below relate to the existing Green Building Regulations that have been put in place within the environmental, economic and social context of buildings.

Environmental

Buildings have many impacts on the environment. From the materials manufactured, to the multiple facets of construction, to the longer term operational and maintenance period to the final disassembly and disposition of components, buildings have an impact on the environment.

To achieve a more sustainable built environment, Dubai has identified the following important considerations regarding these new Regulations:

- **Reduce Energy, water and carbon emissions** – Perhaps the primary focus for the Green Building Regulations is to address issues of energy and water demand to conserve limited resources, increase energy security, reduce infrastructure costs and mitigate carbon emissions.
- **Responsiveness to Dubai's climate** – This single factor is a significant issue for building construction in such areas as a building's core and shell, its mechanical components, its need for air conditioning, the materials used and even a building's orientation. As an example, sustainable buildings in Dubai should seek to reduce the heat impact with Heat Island strategies, light colours and heat rejection approaches.
- **Pollution reduction or elimination** – A building and activities related to the building should attempt to minimise or eliminate pollution and seek to protect the environment within the building site and around it. As an example, light pollution and even condensate drainage should be controlled. Pollution also affects people and the quality of indoor environments or the 'vitality' of the buildings is particularly important.
- **Minimising and conserving resources** – Natural resources create the basic needs for life and form the basis for all man-made materials. Minimising and effectively using these resources forms the principles of good stewardship in sustainability. Thus, sustainable buildings in Dubai should include programs to recycle materials, use green products, and reduce demolition and construction waste, among others.

Economic

Throughout the years of the life of a building, many economic impacts are associated with the construction and operation of a building.

An evaluation of costs and benefits is necessary to examine efficiency for the life cycle of the building's development. The ability to quantify costs helps to maximise the benefits in developing sustainable cities. These impacts are not only related to buildings, but also to the site and the surrounding environment. Economic impacts occur not only during the construction, but also before and after construction. Each building has the potential to have an economic impact on its neighbours, the local community, as well as the larger Emirate of Dubai. To achieve sustainability, Dubai has identified the following considerations to assess the economic impacts of buildings.

- **Efficiency** – Efficiency can be defined as the optimum use or productivity of any mechanical, structural or building component when no further improvements can be made. Efficiency seeks to maximize the value of materials or systems. As an example, this can lead to more efficient elevators, better control systems, and water efficient fixtures in Dubai.
- **Cost/Benefit throughout a building's lifecycle** – The entire spectrum of a building and everything related to that building must take into account both the costs and the benefits of any single item. This includes costs and benefits during the phases of: design, construction, operations, maintenance, deconstruction/demolition and disposing of a building and all component parts. In addition, sustainable buildings in Dubai are not always more expensive than other buildings. Using water efficient techniques, or maintaining mechanical systems, or ensuring that commissioning is accomplished can have positive economic impacts.
- **Balancing performance** – This economic principle applies to balancing performance with the most cost effective response based on the conditions and context of Dubai. Thus, a specified energy performance of glazing, the prevention of cooling air loss, and condensate recovery are all methods to balance performance in a building.



Social

Buildings are built for people. The health, well being and liveability of a building are important aspects to be addressed in a sustainable strategy to strive towards the goal of ensuring a positive quality of life now, and for the future generations. Furthermore, buildings impact the social fabric of any city. While the structures may vary in complexity and use, the goal of each building is to provide a positive human interaction within that building. Each user must accomplish their goals in using the building, and the users' health, safety and welfare during that period must be ensured. To achieve sustainability, Dubai has identified the following aspects as important social considerations.

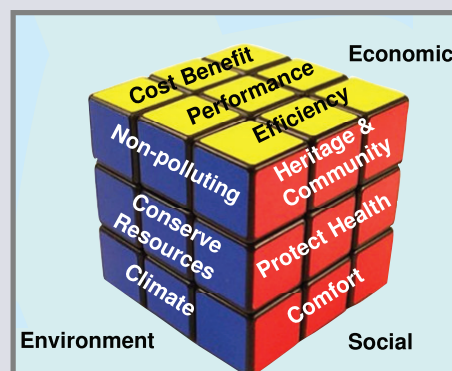
- **Protect Health** – Sustainable buildings in Dubai protect the health and well being of the building's users, as well as the health and well being of the building's neighbours. Ultimately, the goal of sustainable buildings is to ensure the health of its occupants and neighbours. This level of sustainability can be achieved in Dubai through the implementation of measures such as the use of low emitting paints and coatings, ensuring adequate parking ventilation and restricting the use of asbestos containing materials.
- **Ensure Comfort and Liveability** – A positive quality of life in and around a building is important for sustainable buildings in Dubai. Buildings must be liveable and promote comfortable surroundings with both active and passive systems. Thus, in Dubai, this aspect of sustainability should include measures such as light and thermal controls, views from a building, and good acoustical control.
- **Heritage and Community** – The social aspect includes sensitivity to the Dubai-specific culture and heritage. It also ensures that buildings are accessible to the community and that information about that building is also available. For Dubai this includes such aspects as: incorporating indigenous plants that are less water consuming and ensuring enabled access. The social aspect also includes encouraging responsible use of resources by the community and instilling conservation ideals.

Sustainability Aspects are Interrelated

As shown in Figure 3, all aspects of sustainability are interrelated. The interdependence of these principles reflects the interdependence of the building, the systems within the building, and the site on which the building is located. Each of the regulations impacts all three areas of the triple bottom line, as well as all the various aspects described above.

Impacts occur during every phase of a building's life cycle from site development to deconstruction. The Practice Guide identifies impacts as they relate to sustainability (within the "Benefits" section of each Guide) and therefore recognises the cross-correlation of these principles and aspects. Sustainability is the pathway on which the regulations are built and they seek continuous improvement in building development for the building's entire life cycle.

Figure 3: Interrelated Sustainability Aspects



103 : Definition of a Green Building

For Dubai, Green Building is the practice of creating a built environment that is resource efficient in terms of energy, water, and materials whilst reducing building-related impacts on human health and the environment throughout the building's lifecycle, through better siting, design, construction, operation, maintenance, change of use and deconstruction.

Figure 4: Life Cycle of Buildings



A standard for Green Buildings can be set at any time but will always be progressive towards a building of zero net or positive impact on the environment, society and the economy.

104 : Links to Strategic Vision

How the Regulations Link to Dubai's Strategic Vision

The Green Building Regulations form part of a wider initiative from His Highness Sheikh Mohammed bin Rashid Al Maktoum, UAE Vice President, Prime Minister and Ruler of Dubai, steer Dubai's development towards a more sustainable growth trajectory. The Green Building Regulations should be understood within the context of Dubai's Strategic Plan, as well as other initiatives on building performance standards within the UAE.

The following are the key areas of contribution from the Green Building Regulations to the vision for Dubai.

Leadership

Dubai's objective is to become the leading Arab city in the region, which is a global hub. Leadership in building performance will increase Dubai's long term sustainability goals. The Green Building Regulations demonstrate global leadership by creating a forward looking and comprehensive *mandatory* system for all buildings in Dubai. Leadership, in the context of Dubai, allows comparison with global best practice while reflecting on the uniqueness of Dubai.



Competitiveness

The Green Building Regulations enhance Dubai's competitiveness in the following areas:

- Brand and reputation, which allows benchmarking against international standards.
- Efficiency, which ensures peak and base loads of energy can be reduced. It promotes recovery and re-use of water. It ensures there are reductions in waste. Efficiency will optimise a better use of land and capital.
- Resilience, which can help anticipate and mitigate likely climate change impacts on Dubai and reduce Dubai's dependence on imported energy and resources.

Liveability

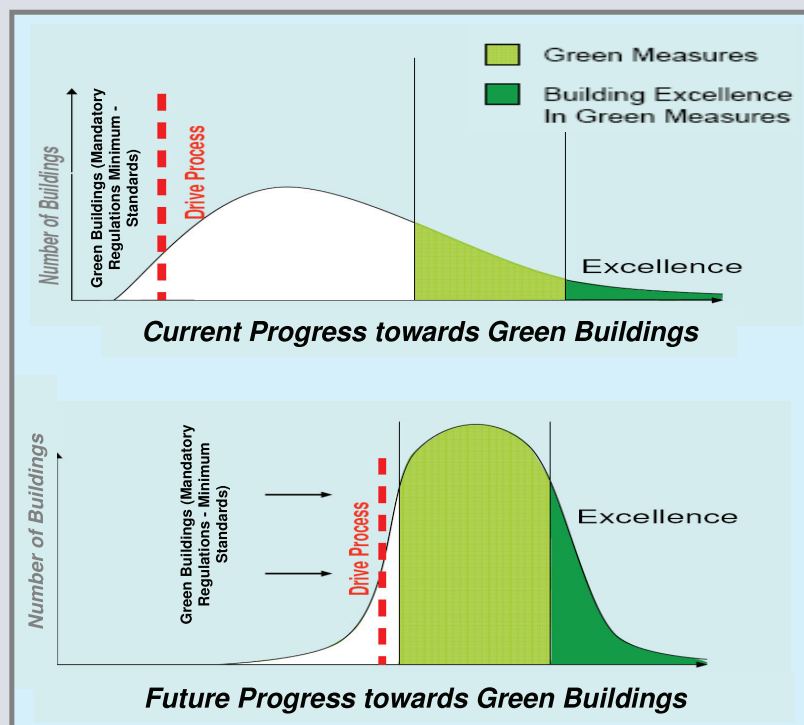
Improved outdoor and indoor environments will promote good quality of life for visitors and residents, and therefore to a high level of liveability. The quality of the urban environment is a key factor in making this achievable.

105 : Focus of the Regulations

A Regulatory Minimum Focus

The intent of the Dubai Green Building Regulations is to provide assurance that all buildings in Dubai will meet minimum sustainability standards. A variety of rating systems will continue to be used, which will increase the overall standards. In addition, there will be developers and building owners who will seek an exemplary level of building performance. However, the Green Building Regulations will be a key driver within this process, as shown in Figure 5. The "Current Progress" diagram shows the implementation of a certain level of green measures and green building excellence measures largely due to the use of rating systems. With the mandatory regulations (illustrated in the "Future Progress" diagram), both levels will increase.

Figure 5: Green Building Regulations Driving the Implementation of Green Building Measures



Focus on Design Phase

It is important to also acknowledge the importance of the design phase of the building process, which is the focus of a majority of the Dubai Green Building Regulations. The MacLeamy Curve, introduced in 2004 at the Construction Users' Roundtable, illustrates the impact of "effort" that is introduced early in the building process. There are typically two possible track lines of effort.

One of the track lines is a traditional approach with the following phases:

- Pre Design
- Schematic Design
- Design Development
- Construction Documents
- Agency Permit or Bid
- Construction and Post Construction

The second track line is an Integrated Design Process approach, with the following phases:

- Conceptualisation
- Criteria Design
- Detailed Design
- Implementation Documents
- Agency Coordination / Final Buyout
- Construction and Post Construction

A majority of the Dubai Green Building regulations will be primarily applied to the Design phase. This is especially important as the ability to alter the building's performance is greatest early in any project's lifecycle. Furthermore, the greater insights on methods to achieve the effects desired and produce maximum outcome come from the Design Phase. This is demonstrated in the "MacLeamy Curve" created by Patrick MacLeamy, CEO, Hellmuth, Obata + Kassabaum. The MacLeamy Curve demonstrates that the "effort and effect" through either the Traditional or Preferred method comes in the design phase, well before the bid and construction phase. Additionally, as the phases and time move forward, the ability to impact cost and functional capabilities decreases while the cost of design change increases.

Regulations during the Construction and Maintenance phases will also have an impact, especially on long term operational issues. Thus, it is necessary to maintain the effort necessary to enhance the entire lifecycle of a building with a "green" focus.

106 : Modelling Information

A significant amount of modelling work has been done relating to these regulations. The main purpose for undertaking a dedicated energy modelling study is to ensure that the Green Building Regulations have specific benefits quantifiable in the context of Dubai. The energy use of buildings is closely related to their size, use, the way they are operated, their construction characteristics, shape and of course the climate. The dynamic thermal modelling approach used allows the detailed consideration of all these factors to understand their sensitivity to the energy use of buildings.

107 : Use of Practice Guide

Overview

The Practice Guide is intended to provide general information on each regulation that is part of the Green Building Regulation. The guide is intended to inform professionals associated with the building industry, architects, engineers, general contractors, planners, landscapers, owners, facility managers, financial organisations related to the building industry, product manufacturers, developers, specifiers, and staff at government agencies. The guidance identified is intended to provide some understanding of the reason for the regulations, their benefit and some guidance towards compliance.

The Practice Guides are not intended to provide detailed design information or to be a substitute for the experience and expertise of the building designers and contractors. The guidelines do not relieve any professionals from ensuring that the regulations are met to their fullest extent. The Practice Guidelines included in this document are expected to be supplemented with the knowledge and professional experience of each of the users. The Practice Guidelines are organised as follows.

- Chapter 300: Ecology & Planning
- Chapter 400: Building Vitality
- Chapter 500: Resource Effectiveness: Energy
- Chapter 600: Resource Effectiveness: Water
- Chapter 700: Resource Effectiveness: Materials & Waste



Each Guideline is divided into sections, as follows.

Background

This section provides information on the overall context regarding the issue that is addressed by the regulation.

Applicability

This section identifies the building types to which the regulation applies, whether the regulation is a mandatory or voluntary requirement for each building type.

Benefit

This section reviews the impact of the regulation as it relates to sustainability principles (environmental, economic and social).

Guidance

This section provides information to guide the building team towards compliance. As the scope of the regulations is extremely varied, the guidance provided also varies depending on complexity of the issue addressed in the regulation. Depending on the topic, this section can include aspects such as:

- Expansion on regulation requirements
- Discussion on referred documents
- Examples or illustrative applications
- Descriptive approaches to achieve compliance

For most topics there are many other guidance documents from a wide variety of countries around the world. Many of these documents have significant amounts of material, diagrams, approaches, pictures and details.

To aid the building team in achieving compliance, the Practice Guide refers to various documents in the regulation and/or in the Practice Guide. Any referred documents are detailed in this section.

Compliance

This section provides information on submission requirements to confirm compliance with the regulation, as well as the timing of submission (during permit application, construction, completion/commissioning, or operation).

Common Practices

This gives examples of actions being taken in other building regulations or rating systems.

References

Full details are given of any documents referred to in the Regulation or Practice Guide.

108 : Implementation System

Dubai will become a world leader by setting out the first Integrated Green Building Regulations which represent progress beyond voluntary requirements such as rating systems. By implementing these mandatory requirements Dubai's Government is establishing an international position of leadership in demonstrating a strong commitment to creating a sustainable built environment. However, a world class Green Building System is of little use if it is not enforced effectively.

Successful implementation requires that the changes to the current building permitting and approvals system be kept at a minimum and that new processes are phased and streamlined to complement that which is already in place. The intention would then be to build additional capacity over time to develop the support services and the research base from which to expand and improve the regulations at future dates.

Whilst additional requests for information and inspection criteria will be expanded, there should be no fundamental changes in the way in which building permits and completion certificates will be obtained.



New elements to be added to the current building approval and control process include:

- **Additional building regulations** that require demonstration of compliance at various stages in the building lifecycle
- **Additional inspections** both in terms of scope and frequency will take place at construction, completion and operational stages
- **New documentation** will be required as evidence of compliance much of which will be held in a *Green Building Site File*.
- The preparation of the **Green Building Declaration** to ensure strict liability of Green Issues

109 : Energy and Water Compliance Methods

In addition to the guidance provided in the Practice Guides, the following compliance methods may be used for energy and water.

Energy Compliance Method

There are two compliance routes for energy performance in buildings. The standard method is referred to as the Elemental Method; the alternative method is referred to as the Performance Method.

- (i) **Elemental Method:** All buildings must comply with each of these regulations.
- (ii) **Performance Method:** Alternatively, a calculation method may be employed for a building which may not comply with all the elemental requirements of those Articles listed in Table (1).

The Performance Method, using a calculation tool such as dynamic thermal modelling, must compare the annual energy consumption of the proposed building with that of a reference building which meets all the elemental requirements listed in Table (1). The reference building must be equal in shape, size and operational patterns to the proposed building.

Compliance with the Green Building regulations will be demonstrated if the annual energy consumption of the proposed building is equal to or lower than the annual energy consumption of the reference building

Table (1)
Green Buildings Regulations for Elemental Method of Energy Compliance
304.04 Orientation of Glazed Facades
501.01 Minimum Envelope Performance Requirements
502.01 Energy Efficiency– HVAC Equipment & Systems
502.04 Lighting Power Density - Interior

Water Compliance Method

There are two compliance routes for water performance in buildings. The standard method is referred to as the Elemental Method; the alternative method is referred to as the Performance Method. .

- (i) **Elemental Method:** All buildings must comply with each of these regulations.
- (ii) **Performance Method:** Alternatively, a calculation method may be employed for a building which may not comply with the elemental requirements for water efficient fixtures detailed in Article 601.01.

The Performance Method, using a calculation tool, must compare the annual water consumption of the proposed building with that of a reference building which meets all the elemental requirements detailed in Article 601.01. The reference building must be equal in shape, size and operational patterns to the proposed building.

Compliance with the Green Building regulations will be demonstrated if the annual water consumption of the proposed building is equal to or lower than the annual water consumption of reference building





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Definitions

Certain terms used in the Dubai Green Building Regulations are defined in this section. Terms that are not defined shall have their ordinary accepted meaning within the context in which they are used.

Acoustical control	Controlling noise sources, transmission path, and/or receiver in order to reach an acceptable noise environment for a particular space.
Addition	An extension or increase in floor area or height of a building outside of the existing building envelope (walls and roofs).
Adequate	Sufficient to satisfy a specific requirement or meet a specific need.
Adhesive	Material used to bond one surface to another by attachment.
Air break	A piping arrangement where a drain from an appliance or fixture discharges into an airspace and then into another fixture, receptacle, or interceptor; used to prevent back siphonage or backflow.
Air contaminants	Unwanted airborne constituent that may reduce acceptability or adequacy of the air quality
Air leakage	Air that escapes from a building through a joint, coupling, junction, or the surfaces which enclose the building. The flow of uncontrolled air within a building through cracks or openings.
Air tightness (of a building)	The property of an enclosure or barrier that precludes the passage of air.
Air volume	The amount (volume) of air delivered to a space through ventilation, typically specified in litres per second or cubic metres per minute.



Air, ventilation	The share of supply air that is outdoor air, plus any recirculated air that has been filtered or otherwise treated to maintain acceptable indoor air quality.
Airborne sound insulation	Insulation against noise originating in air, such as voices, music, motor traffic and wind.
Architecture Accent Lighting	Lighting that highlights an area or object of a building to emphasise that area or object.
Asbestos	A group of impure magnesium silicate minerals which occur in fibrous form. Asbestos has been used in a variety of building construction materials for insulation and as a fire-retardant. However, long-term exposure or big amounts of asbestos can have severe health impacts, such as chest and abdominal cancers and lung diseases. Therefore the use of asbestos products has been restricted in many countries.
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers.
Balancing (air system)	To ensure that correct volumes of air are supplied by adjusting airflow rates through air distribution system devices (such as fans and diffusers) by manually adjusting the position of dampers, splitter vanes, extractors, etc. or by using automatic control devices, such as constant air volume or variable air volume boxes.
Brightness contrast ratio	The ratio of illuminance between the highest and lowest illuminance value in a room.



Building commissioning	The process of ensuring that all building systems are designed, installed, tested, and operated in conformity with design intent.
Building completion certificate	Certificate issued by Dubai Municipality, as soon as the entire construction work has been carried out, inspected and approved by Dubai Municipality.
Building envelope	The exterior elements of a building which form a barrier between the internal and exterior spaces. For an air conditioned building, the building envelope is defined as the elements of a building that separate conditioned spaces from the exterior.
Building fabric	Refers to the ceiling, walls, windows, floors and doors of a building, which play a major role in the energy efficiency of a structure.
Building Management System (BMS)	A computer-based control system installed in buildings that controls and monitors the building's mechanical and electrical equipment, such as ventilation, lighting, power systems, fire systems, and security systems.
Building metering	The use of meters to track the use of utilities (such as water and electricity) per building unit.
Building occupants (also building users)	Persons using the building. Full-time occupants use the building for at least 8 hours most days. Part-time occupants use the building for less than 8 hours most days. Transient occupants, such as visitors, customers, students, use the building at irregular times.
Building operator	The person who has full operational control of the place (the land or building or any part thereof), whether owner or tenant or holder or any other capacity by which he is authorized to occupy the place



Building owner	The person or institution (government or private) that owns the building and/or the land on which the building work (construction, refurbishing, demolition, or removal of a building) is to be performed or their representative.
Building permit	Permit issued by the Dubai Municipality.
Building services	All necessary services required to operate the building such as plumbing, mechanical, electrical and others
Built Up Area (Total Floor Area)	The grand total of the covered area in a building or structure measured between the outer sides of the building borders, including terraces, balconies, protrusions and any other covered parts like car parking circulation passages, air wells, unloading bays, service floors, swimming pools and any other structure on the plot.
Carpet	A fixed floor covering of natural or synthetic material that is woven onto a batting. This excludes rugs and other non-permanent woven coverings
Carpool vehicles	Shared vehicle used especially for commuting to work and often by people who each have a car but travel together to save cost, to reduce driving stress and to promote other socio-environmental benefits. Vehicles must be registered with the Dubai Road and Transport Authority (RTA).
Central Business District (CBD)	The old area of Dubai defined in Building Specifications and Regulations.



Central Control and Monitoring System (CCMS)	A computer-based control system that controls and monitors the mechanical and electrical equipment, such as ventilation, lighting, power systems, fire systems, and security systems in a building or controlling and monitoring a number of buildings.
Central plant	The main equipment within a building or series of buildings which provides cooling, ventilation, heating, water, and other services to the whole building or buildings. The central plant is typically in a central location.
Certified timber	Timber certification is a process that results in a certificate (written statement) attesting to the origin of wood raw material and its status and/or qualifications, often following validation by an independent third party. Certification is intended to allow participants to measure their forest management practices against standards and to demonstrate compliance with those standards. Timber certification generally includes two main components: certification of sustainability of forest management (which occurs in the country of origin) and product certification (which covers the supply chain of domestic and export markets).
Chlorofluorocarbons (CFCs)	CFCs are odourless, colourless, non-flammable non-toxic chemicals. They vaporise easily at low temperatures making them ideal coolants in refrigerators and air conditioners. CFCs are also used in foam for seat padding and insulation. Until recently, they were used extensively in aerosol spray cans. CFCs cause stratospheric ozone depletion.
Composite wood products	Products such as plywood, panel substrates, door cores, particle board, and medium density fibreboard.

Condensation	The process through which a gas or vapour changes to liquid form. Also defined as the water which is produced in this process.
Construction activity	Includes all activities that are part of new construction, alteration, repair, maintenance, refurbishing, and any other physical changes to a building.
Construction and demolition waste	Waste generated from construction, renovation, and demolition or deconstruction of structures. Land clearing debris including soil, vegetation and rocks are typically not considered construction and demolition waste.
Contractor	Natural or considerable person registered and licensed to practise contracting profession in the Emirate of Dubai.
Control systems	Controls that allow users to change/adjust the level of lighting and air conditioning in a space.
Control zone (HVAC)	A space or group of spaces with heating or cooling requirements that is sufficiently similar so that desired conditions (e.g. temperature) can be maintained throughout by using a single controller. The zone may be part of a larger space, an individual office or a small dwelling.
Cooling coil	A coiled arrangement of tubing or pipe for the transfer of heat between a cold fluid and air.
Cooling load	The amount of cooling that a building will require to meet the conditions specified by Dubai Municipality. The cooling load will be determined by the output of the Heat Load Calculation required by Dubai Municipality.



Cooling tower	Heat removal devices used to transfer process waste heat to the atmosphere. Cooling towers may either use the evaporation of water or rely solely on air to cool the working fluid. Common applications include removing heat from the water used to cool refrigeration chillers.
Corrective maintenance	Maintenance service or procedures intended to fix equipment failure or damage. This service is carried out in response to a fault and not planned in advance.
Cycles of concentration	The level of solids in the re-circulating cooling tower water in comparison to the level of solids of the original raw make up water. If the circulating water has three times the solids concentration of the make up water, then the cycles of concentration are three (3).
Daylighting	The use of natural light from the sun or sky to provide illumination in interior spaces.
Demand Controlled Ventilation (DCV)	A ventilation system that provides for the automatic reduction of outdoor air intake below design rates, when the actual occupancy of spaces served by the system is less than design occupancy. Demand is often assessed by using the measure of the amount of carbon dioxide (CO ₂) in a space to reflect occupancy levels.
Designated preferred parking spaces	Parking spaces that are closest to the main entrance of a building exclusive of spaces designated for disabled parking. Alternatively, these can be parking spaces closest to the pedestrian exit leading from the parking area.



District cooling	A district cooling system distributes thermal energy, in the form of chilled water or other media, from a central source to multiple buildings or facilities through a network of underground pipes for use in space and process cooling. The cooling (or heat rejection) is usually provided from a central, dedicated cooling plant, which eliminates the need for separate systems in individual buildings. A district cooling system consists of three primary components: the central plant (which may include the cooling equipment, power generation and thermal storage), the distribution network, and the consumer system (typically comprising of air handling units and chilled water piping in the building).
Diversity factor	Relates to the thermal characteristics of the building envelope, temperature swings and occupancy load.
Drip water delivery system (drip irrigation)	A high-efficiency irrigation method where water is delivered at low pressure through buried pipes and sub-pipes, which in turn distribute water to the soil from a network of perforated tubes or emitters.
Dual plumbed	A building or structure with two sets of pipes: one for drinking water and one for recycled or greywater.
Ductwork	Air-tight devices that carry conditioned air throughout the building. This includes terminal fixtures to distribute air.
Ductwork leakage	The outcome of air conditioning ductwork that is leaking, and therefore lets air out through cracks and gaps. Ductwork leakage will result in an increase in energy consumption of supply and return air fans.
Electrical system	Permanently installed wiring, switchgear, distribution boards, transformers, controls and other devices used in distributing electricity into and through a building.

Electrical sub-metering	The installation of separate meters to allow the measurement of electricity used in specific areas or individual items of equipment.
Electronic ballast	A piece of equipment required to control the starting and operating voltages of fluorescent lights. Electronic lighting ballasts use solid state circuitry and can greatly reduce or eliminate any flicker in the lamps.
Enabled access	Project design that incorporates accessibility for disabled people to and within a building.
Environmental tobacco smoke (ETS) (second hand smoke)	Airborne particles emitted from the burning of cigarettes, pipes, cigars, or shishas and from smoker's exhaled air.
Entrance lobby	Space immediately between the entrance-door and the interior of a building which acts as a transition area into the building.
Equivalent	Measure, standard, or reference material that has been deemed to be equal or better by Dubai Municipality.
Exhaust air	Air removed from a building space and discharged to the outside of the building through a mechanical or natural ventilation system.
Facilities operator	Party responsible for the maintenance and operation of a building or facility.
Fan systems	A system of fans used to supply or exhaust air from a building space.

Fenestration	Another name for 'glazed elements'.
Fresh air	Outside air supplied to a building space through mechanical or natural ventilation to replace air in the building that has been exhausted.
Glazed Elements	All areas in the building envelope that let in light, including windows, plastic panels, clerestories, skylights, doors that are more than one half glass, and glass block walls.
Glazing area	The area of glazed elements in the exterior walls of a building.
Global Warming Potential (GWP)	Expresses contribution of greenhouse gases released to the atmosphere in the global warming phenomenon.
Green roofs	See vegetated roofs.
Greywater (grey water, graywater)	Untreated household wastewater which has not come into contact with toilet waste. Greywater includes used water from showers, wash basins, bathtubs, laundry sinks and clothes washers.
Halons	Substances used in fire suppression systems and fire extinguishers. These substances deplete the stratospheric ozone layer.



Hardscape	The area of a project site, excluding buildings, made with hard materials, including roads, car parks, patios, courtyards and walkways.
Hazardous fumes or chemicals	Fumes/gases or chemicals that can adversely impact human health when inhaled or when they come into contact with a person's skin; also includes fumes/gases and chemicals that can create a hazardous condition (such as explosive or flammable substances).
Hazardous waste	Any waste material that can cause substantial harm to humans, properties or to the environment due to its inherent hazardous characteristics. Hazardous waste takes the form of solid, liquid, sludge, gas or any combination thereof.
Heat Island Effect (HIE)	Heat Island Effect occurs when warmer temperatures are experienced in urban/developed areas compared to adjacent undeveloped areas due to solar energy retention on constructed surfaces. Some of the surfaces that contribute to the Heat Island Effect are paved streets, sidewalks, parking lots and buildings.
Heat load calculation	Calculations which must be submitted to Dubai Municipality for approval. These calculations must be based on the design of the building to be constructed and follow the form and use the parameters required by Dubai Municipality.
Heat load calculation parameters	The design parameters used in Heat Load calculation according to Dubai Municipality requirements.
Heating, ventilation, and air conditioning (HVAC) system	The equipment, distribution systems, and terminals that provide either individually or collectively, the processes of heating, ventilating, or air conditioning to a building or a portion of a building.

Heat Rejection Equipment	Equipment which is used to disperse the heat produced in the air conditioning process. Heat rejection equipment, such as cooling towers, may be located outside of the building envelope; however it may also be a component of the air conditioning equipment, such as with window or split systems.
Heavy metals	Heavy metals include: cadmium, chromium, mercury, and arsenic.
Heritage building	A building having historical architectural elements, situated inside a Dubai historical area. No demolition or variation works shall be carried out on a Heritage building except after obtaining approval from the Competent Authority.
Hydraulic elevator	An elevator operated using liquid pressure.
Hydrochlorofluorocarbons (HCFC)	Refrigerants used in building equipment that deplete the stratospheric ozone layer, but to a lesser extent than CFCs.
Hydrofluorocarbons (HFCs)	Refrigerants that do not deplete the stratospheric ozone layer. However, some HFCs have a high Global Warming Potential.
Industrial building	An industrial building is any building directly used in manufacturing, processing, technically productive enterprises or storage. This includes workshops, factories and warehouses.
Land clearing debris	Solid waste generated solely from land-clearing activities, including brush, stumps, soil material and rocks.

Land disturbance	Any project that changes the physical conditions of land form, vegetation and hydrology, creates bare soil, or otherwise may cause erosion or sedimentation. The activities include, but are not limited to, clearing of land, removal of vegetation, stripping, grading, excavating, filling and storing of materials.
Legionella bacteria	Legionella bacteria are the causative agent of Legionnaires' disease and its lesser form, Pontiac fever. The bacteria grow in water between 20 and 45 degrees Celsius and can be spread by water droplets.
Light fixture	The component of a luminaire that houses the lamp(s), positions the lamp, shields it from view, and distributes the light. The fixture also provides for connection to the power supply, which may require the use of ballast.
Lighting Power Density (LPD)	The maximum lighting power per unit area.
Light Reflective Value (LRV)	A measure of the total quantity of useable and visible light reflected by a surface in all directions on a scale from 0% to 100%. Zero percent is assumed to be an absolute black and 100% represents an assumed perfectly reflective white. The blackest achievable wall finish has a LRV of approximately 5% and the whitest available finish approximately 85%.
Light Transmittance	The percentage of incident light that passes through the glazing elements. When this percentage increases the day light amount into the building will increase.
Line of sight	An imaginary line from the eye to a perceived object or view.

Local Species	Local plants and adapted plants to the local environment.
Low emitting and fuel efficient vehicle	A vehicle approved by Dubai Road Transport Authority (RTA) as being low emitting or fuel efficient.
Lux	The international system unit of illumination, equal to one lumen per square metre.
Mechanical system	Those systems within a building which include components of mechanical plant or machinery. These systems include, but are not limited to, the HVAC system of a building.
Mechanical ventilation (active ventilation)	Ventilation provided by mechanically powered equipment, such as fans.
Minimum Efficiency Reporting Value (MERV)	Air Filter Minimum Efficiency Reporting Value (MERV) is an expression of the filtering efficiency of an air filter that has been evaluated using the ASHRAE Standard 52.2 Test Procedure. An air filter's performance is determined by comparing airborne particle counts upstream and downstream of the air filter (or other air cleaning device) under test conditions. A higher MERV rating equates to higher air filtration efficiency.
Mixed mode ventilation	A combination of mechanical and natural ventilation.



Monitoring equipment	Equipment used to measure and record status or conditions related to a building or to verify pre-set conditions and provide control or alarm functions if conditions vary.
Natural ventilation (passive ventilation)	Ventilation provided by thermal, wind or diffusion effects through windows, doors, or other openings in the building.
Negative pressure	Pressure less than that in adjoining spaces.
Occupancy sensor	A device that detects the presence or absence of people within an area and causes lighting, equipment, or appliances to be regulated accordingly.
Occupant Lighting Controls	A means of controlling the level of lighting which is easily accessible to a building occupant. Includes on/off switches.
Office	A building in which business, clerical, or professional activities are conducted.
Opaque	All areas of a building envelope which do not transmit light. Fenestration and building service openings, such as vents and grilles, are not opaque.
Open grid pavement	Pavement surfaces composed of structural units with void areas that are filled with pervious materials, such as sand or grass turf.
Outdoor environment	The environment outside of buildings, not enclosed by walls.
Ozone Depletion Potential (ODP)	Expresses contribution to the deterioration of the stratospheric ozone layer.

Parking area – Enclosed	Area of a building which is used for parking of motor vehicles but is not an open parking area. As it does not meet the criteria for open parking areas and is considered enclosed, mechanical ventilation is required to compensate for the lack of natural ventilation.
Parking area – Open	Area of a building which is used for parking of motor vehicles and which requires uniformly distributed openings on two or more sides for natural ventilation on every level of parking. The total area of openings to the atmosphere must be at least 20% of the total perimeter wall areas for each level of parking. Although openings on a third side are not required, openings on opposing sides are preferred for cross ventilation.
Parking ventilation	Ventilation which is required to maintain a satisfactory level of air quality within a vehicle parking facility.
Perimeter zone	The interior space adjacent to the perimeter walls of a building.
Plumbing system	Permanently installed piping, pumps, valves, tanks, taps, controls and other devices used in distributing water into, within and away from a building.
Positive pressure	Pressure greater than that in adjoining spaces.
Potable water	Water that is suitable for human consumption.
Pressure differential	The difference in pressure between two points of a system, or two different spaces of a building.
Preventative maintenance	Maintenance service or procedures intended to prevent or reduce equipment failure or damage.



Primer	Material applied to a surface to improve adhesion of a subsequently applied paint or adhesive.
Public building	A building which provides access to the general public. This building typology includes healthcare facilities, educational facilities, governmental buildings, worship houses, petrol stations, shopping malls, retail outlets, post offices, banks, museums, cinema/theatres, and historical/heritage buildings.
Radiant heat/temperature	Thermal radiation is the heat that radiates from a warm object. Radiant heat may be present if there are heat sources in an environment. Examples of radiant heat sources include: the sun, fire, ovens, driers, hot surfaces and machinery, etc.
Recycling	Processing used materials into new products in order to prevent the waste of potentially useful materials, reduce the consumption of fresh raw materials, reduce energy usage, reduce air pollution and water pollution by reducing the need for "conventional" waste disposal.
Reflectivity (solar reflectance)	Reflectivity measures how well a material bounces back solar radiation.
Refrigerants	Working fluids of refrigeration cycles, which absorb heat at low temperatures and reject heat at higher temperatures.
Refurbish (Retrofit)	The substantial alteration of a building or building services to replace or improve the quality of the building. This may occur when a new tenant occupies the building or part of the building.
Regional materials	Materials that were extracted, processed, and/or manufactured within the Gulf Cooperation Council (GCC) area. GCC member countries are: United Arab Emirates, the Kingdom of Bahrain, the Kingdom of Saudi Arabia, the Sultanate of Oman, Qatar, and Kuwait.



Regularly occupied areas (non-residential buildings)	Those areas within non-residential buildings where building users are seating or standing, as they work inside of a building or use the building space.
Relative humidity	Ratio of partial density of water vapour in the air to the saturation density of water vapour at the same temperature and the same total pressure.
Residential/ Commercial Building	This building typology includes: apartments, labour accommodations, student accommodations, offices, hotels, resorts, restaurants/ food outlets and laboratories.
Retail	Business dedicated to the sale of goods or commodities in small quantities directly to consumers.
Reuse	Any activity that lengthens the life of an item, typically consisting of returning the item to active use in the same or related capacity.
Safety factor	An allowance to cover any heating or cooling load greater than the design conditions.
Sealants	Material with adhesive properties that is used for the general purpose of filling, sealing, or waterproofing gaps or joints between two surfaces.
Secure bicycle racks or storage areas	Structures where individual bicycles can be locked and/or stored. Such structures should be inside or shaded if outdoors.
Service log book	A book where all maintenance works for a specific site or piece of equipment is recorded in detail (including dates and specific information regarding what service was performed and who carried out the work).



Shading Coefficient (SC)	A measure of the amount of heat passing through glazing compared with the heat passing through a single clear glass. It is the ratio of solar heat gain at normal incidence through glazing to that occurring through an approximately 3 millimetre (1/8th inch) thick clear, double-strength glass.
Showroom	Any space allocated for conducting a commercial business such as displaying commodities for purpose of wholesale or retail sale, and has a road front façade not less than nine (9) metres wide.
Solar Reflectance Index (SRI)	The SRI is an index that combines reflectivity and emissivity, measuring a material's ability to reject solar heat. SRI is defined so that a standard black (reflectance 0.05 and emittance 0.90) is 0 and a standard white (reflectance 0.80 and emittance 0.90) is 100. Materials with higher SRI absorb less heat and can reduce the heat island effect.
Substrate	The base material to which a process, such as painting, is applied to produce new films or layers of a different material.
Thermal bridges	Component, or assembly of components, in a building envelope, where the insulation is not continuous and through which heat is transferred at a substantially higher rate than through the surrounding envelope area; such as a metal fastener, concrete beam, slab or column.
Thermal comfort	A condition experienced by building occupants which is satisfied with the thermal environment.
Thermal insulation	Materials, or the methods and processes used to reduce heat transfer. Heat energy can be transferred by conduction, convection or radiation. The flow of heat can be delayed by addressing one or more of these mechanisms and is dependent on the physical properties of the material employed to do this.

Thermal transmittance	Also known as U-value is the rate of transfer of heat (in watts) through one square metre of a structure divided by the difference in temperature across the structure. It is expressed in watts per square metre per degree kelvin, or W/m^2K . Well-insulated parts of a building have a low thermal transmittance whereas poorly-insulated parts of a building have a high thermal transmittance.
Total planted area	The total external landscaped area of a building plot, including landscaped areas on roofs (vegetated roofs).
Total vehicle parking capacity	Total number of parking spaces within the site as specified by Dubai Municipality.
Totalising meter	Measures the flow and provides a total of the quantity which has passed through the meter. This is indicated in the form of a numeric readout.
Toxic waste	Waste containing poisonous substances. These substances may have acute effects (causing death or violent illness) or chronic effects (slowly causing irreparable harm) even in very small or trace amounts.
Treated sewage effluent (TSE)	The product of the process of removing physical, chemical and biological contaminants from wastewater. The process produces treated effluent suitable for reuse or discharge into the environment and solid waste (or sludge).
U-value	Refer to Thermal transmittance.
Urea formaldehyde	Combination of urea and formaldehyde, used in some glues. Formaldehyde is a naturally occurring VOC that is irritating to most people when found in high concentrations, and is also carcinogenic. Urea-formaldehyde may emit formaldehyde at room temperature.



Variable air volume system	An air handling system that conditions the air to a constant temperature and varies the outside airflow to ensure thermal comfort.
Vegetated roof (green roof)	A vegetated roof consists of vegetation and soil or a growing medium, planted over a waterproofing membrane on rooftops. Vegetated roofs may also include additional layers, such as a root barrier and drainage and irrigation systems. The use of vegetated roofs may have different purposes, from energy savings to stormwater management and aesthetics benefits.
Ventilation	The process of supplying air to or removing air from a space in order to control air contaminant levels, humidity, or temperature within the space.
Villa	Refer to Building Specifications and Regulations issued by Dubai Municipality
Volatile Organic Compound (VOC)	Organic chemicals that have a high vapour pressure and easily form vapours at normal temperature and pressure. The term is generally applied to organic solvents, certain paint additives, aerosol spray can propellants, fuels (such as gasoline, and kerosene), petroleum distillates, dry cleaning products and many other industrial and consumer products ranging from office supplies to building materials.
Wall Washing Light	Light fixture used for architectural or aesthetic purposes transmitting variable colour light or flash (with the possibility of modifying the speed of movement) and be programmed to operate automatically and can work to direct the light down for long distances and can be used inside or outside the building
Warehouse	A place in which goods or merchandise are stored; a storehouse.
Water feature	Features within a range of man-made fountains, ponds, cascades, waterfalls, and streams, not intended for human contact with the water. Therefore, for these regulations, the definition of water features excludes swimming pools and spas.



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Ecology and Planning

- Access and Mobility
- Ecology and Landscaping
- Neighbourhood Pollution
- Microclimate and Outdoor Comfort
- Responsible Construction
- Environmental Impact Assessment

1.0	Preferred Parking	301.01
	For all new buildings, other than villas, which have more than 20 parking spaces, designated preferred parking must be provided for a combination of low-emitting, fuel-efficient and carpool vehicles for at least five percent (5%) of the total vehicle parking spaces required for the building by Dubai Municipality (DM) Building Regulations, Administrative Resolution No.125-2001. Preferred parking must be included in addition to any spaces designated for parking for people with special needs as required by DM Building Regulations.	Residential/ Commercial
		Public Buildings
		Industrial
2.0	Intent/Goal <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Ecology and Planning – Access and Mobility <input type="checkbox"/> Building Vitality <input type="checkbox"/> Resource Effectiveness: Energy <input type="checkbox"/> Resource Effectiveness: Water <input type="checkbox"/> Resource Effectiveness: Materials and Waste 	
3.0	Background <p>High numbers of private cars and the low usage of public transport (currently only 7% of journeys) are resulting in extreme traffic congestion in Dubai. The present scale of private car ownership in Dubai is over 540 cars for every 1,000 persons and the average number of passengers in each car is only 1.3 people. Current projections of population growth indicate that the expected number of private cars in Dubai may increase to 1,500,000 cars by 2020. The large numbers and the types of vehicles used in Dubai are major contributors to the levels of air pollution in the city. Encouraging the use of fuel-efficient, low-emission and carpool vehicles will assist in reducing both air pollution levels and traffic volumes. Whilst these types of vehicles are not presently common in Dubai, providing designated parking for these vehicles will help to encourage their use.</p> <p>In 2008 the Dubai Roads and Transport Authority (RTA) announced their carpooling scheme called 'Sharekni'. The scheme promotes ride sharing to reduce the number of cars on the road at a given time, aiming to decrease traffic congestion. Further information on the Sharekni Scheme may be found at http://www.sharekni.ae/.</p>	



4.0

Applicability

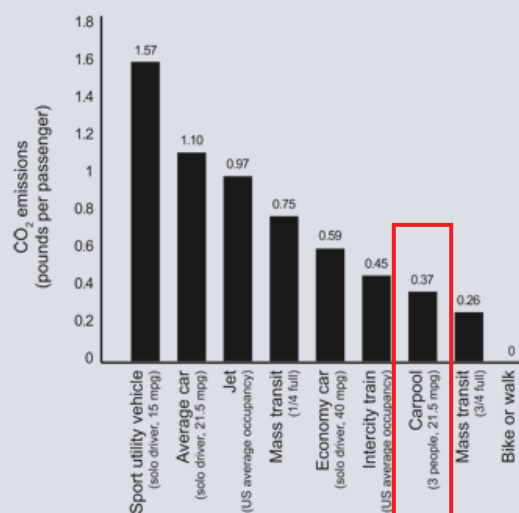
Main Typology Criteria	Typology Subdivisions	New	Existing	Typology Subdivisions	New	Existing
Villa						
Residential/ Commercial	Residential	✓		Commercial	✓	
	Apartment	✓		Hotels	✓	
	Offices	✓		Resorts	✓	
	Labour Accommodation	✓		Restaurants/Food Outlets	✓	
	Student Accommodation	✓		Laboratories	✓	
Public Buildings	Healthcare Facilities	✓		Retail Outlets	✓	
	Educational Facilities	✓		Post Offices	✓	
	Government Buildings	✓		Banks	✓	
	Worship Houses	✓		Museums	✓	
	Petrol Stations	✓		Cinema/theatres	✓	
	Shopping Mall	✓		Historical/heritage Buildings*	✓	
Industrial	Workshops	✓				
	Factories	✓				
	Warehouses	✓				

5.0

Outcome/ Benefit

This regulation promotes the use of low-emitting, fuel efficient vehicles and shared transportation such as carpooling by providing designated preferential parking for these vehicles. An increase in the use of such vehicles will potentially reduce pollution from motor vehicle sources and reduce traffic volumes, congestion and demand for additional roads infrastructure.

The regulation supports the implementation of Dubai RTA's 'Sharekni' car-share initiative.



Reduced CO₂ emissions from carpooling



6.0

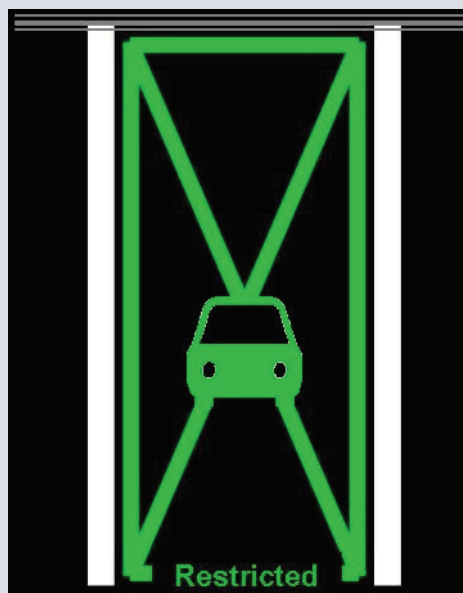
Guidance

6.1 General

The number of parking spaces required for a building is specified by Dubai Municipality Building Regulations, Administrative Resolution No.125-2001, Articles 24 and 25. If a minimum of 20 spaces is required, designated parking must be provided for a combination of low-emitting, fuel-efficient and carpool vehicles for at least 5% of the total vehicle parking capacity for the site, exclusive of spaces designated for disabled parking. When calculating the number of designated parking spaces required, if the calculated number includes a fraction, it must be rounded up to the next higher whole number.

Dubai RTA will be introducing a system for the definition and identification of low-emitting, fuel-efficient and carpool vehicles to make use of these parking spaces and will issue stickers that can be applied to identify compliant vehicles that qualify for the benefit of preferential parking. The developer is required to identify and construct designated parking in accordance with this regulation.

Parking spaces designated for the use of low-emitting, fuel-efficient and carpool vehicles must be clearly identified. A possible means of identification is shown below:



Possible means of identification

Designated preferred parking refers to parking areas that are closest to the main entrance of the building or to internal access points such as lifts or stairs. The reservation of preferred parking spaces for low-emission, fuel-efficient, and carpool vehicles must not conflict with the parking requirements for disabled people. Preference in location shall be given to disabled parking places.

It is recommended that incentive or facilitated programs for carpooling be implemented whenever possible.

6.2 Technical Data and Specifications

Permanent pavement paint signage is required to clearly identify reserved parking spaces, in addition to signage to enable drivers to locate the preferred parking spaces.

The number of parking spaces required for a building is specified by Dubai Municipality Building Regulations, Administrative Resolution No.125-2001, Articles 24 and 25.

The definition and identification of vehicles that are eligible to use these reserved parking spaces is being established by the Dubai RTA.

7.0 Compliance

7.1 Responsibilities Matrix

	Consultant or Contractor	User / Operator	DM	DEWA	Other Government Department	3 rd party
Design/permit application	✓		✓			
Construction	✓		✓			
Commissioning/Completion	✓		✓			
Operation						
Refurbishment	✓		✓			
Demolition						

7.2 Consultant Document Requirements

Lifecycle Stage	Document Requirements
Design/permit application	Green Building Declaration Completed Self Assessment Parking schedule including 'green parking allocation'
Construction	n/a
Commissioning/Completion	Completed Green Building Site File
Operation	n/a
Refurbishment	Any works requiring a building permit from DM are required to comply with the Green Buildings Regulations for Dubai.
Demolition	n/a


8. Common Practices / Solutions

Some international building ratings provide credits to encourage the provision of preferred parking spaces. For example LEED provides credits for the provision of 5% preferred parking spaces and Green Star (Australia) for 10%.

9. References.

Dubai Municipality Building Regulations, Administrative Resolution No.125-2001, Articles 24 and 25.



1.0	Enabled Access	301.02
	All new buildings, other than villas, must comply with Dubai Municipality Building Regulations, Administrative Resolution No.125-2001 with regard to Special Needs users. They must be enabled in their access, internal movement and ability to engage with the building functions.	Residential/ Commercial
		Public Buildings
		Industrial
2.0	Intent/Goal <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Ecology and Planning – Access and Mobility <input type="checkbox"/> Building Vitality <input type="checkbox"/> Resource Effectiveness: Energy <input type="checkbox"/> Resource Effectiveness: Water <input type="checkbox"/> Resource Effectiveness: Materials and Waste 	
3.0	Background <p>There are significant numbers of people with disabilities currently living in Dubai. 'Special Needs users' may have disabilities that restrict mobility and create obstacles to them being able to access buildings. No exact numbers on the people or their disabilities are available for Dubai, however reports from 2005 estimate that about 5,500 people with Special Needs live in the UAE.</p> <p>Further, the Dubai Department of Tourism and Commerce Marketing (DTCM) has called for increased efforts from public and private sector organisations to focus on creating and promoting a barrier-free environment for the disabled and elderly tourism market segment.</p> <p>The importance of the issue has been recognised within the UAE for some time. UAE Federal Law No. 25, 1999 is based on the principles of the United Nations Convention on the Rights of Persons with Disabilities. It states:</p> <p>Article 22 Special Needs persons should be provided with a tailored environment to ease their access to different places.</p> <p>There are many international Codes of Practice available to provide guidance and technical details related to this regulation. Examples of guidance include:</p> <p>Access Code: A Code of Practice on Access and Mobility (United Kingdom)</p> <p>29 CFR Part 36—ADA Standards for Accessible Design (United States)</p> <p>Although this is an existing UAE Federal Law and a Dubai Municipality Building Regulation addressing enabled access, this Regulation has been developed to reinforce the importance of buildings in Dubai complying with these requirements. The ability for all users to enter a building and engage in building functions without problem is an aspect of sustainable design which must be applied in Dubai. The need for suitable toilet facilities to cater for people with Special Needs is also covered by this regulation.</p> 	

4.0 Applicability

Main Typology Criteria	Typology Subdivisions	New	Existing	Typology Subdivisions	New	Existing
Villa						
Residential/ Commercial	Residential	✓		Commercial	✓	
	Apartments	✓		Hotels	✓	
	Offices	✓		Resorts	✓	
	Labour Accommodation	✓		Restaurants/Food Outlets	✓	
	Student Accommodation	✓		Laboratories	✓	
Public Buildings	Healthcare Facilities	✓		Retail Outlets	✓	
	Educational Facilities	✓		Post Offices	✓	
	Government Buildings	✓		Banks	✓	
	Worship Houses	✓		Museums	✓	
	Petrol Stations	✓		Cinema/theatres	✓	
	Shopping Mall	✓		Historical/heritage Buildings*	✓	
Industrial	Workshops	✓				
	Factories	✓				
	Warehouses	✓				

5.0 Outcome/ Benefit

The provision of enabled access to buildings for people with disabilities allows them to have access to the building's facilities or services, such as in offices, retail, or other purposes. This regulation ensures that buildings may be used by people with disabilities and that there are no obstacles to accessing and using buildings.

6.0 Guidance

6.1 General

In order to comply with this Regulation, it is recommended that at least one accessible route be provided from the exterior of a building, through the building or facility entrance and within all accessible spaces and elements within the building. Objects that overhang or protrude into the circulation path of the accessible route should be removed. A range of measures, such as ramps, railings, painting, etc, can be used to help accommodate people with disabilities.



6.2 Technical Data and Specifications

Building Design must comply with UAE Federal Law No. 25, 1999, Article 22 and DM Building Regulations Administrative Resolution No. 125-2001, Article 27; which details specific requirements for Public Buildings, Commercial Buildings and Hotels. This regulation requires that the provisions of Article 27 must be applied to all new buildings in Dubai other than Villas.

The provisions for toilet rooms must be in compliance with Articles 4.16 Water Closets, 4.17 Toilet Stalls, 4.18 Urinals and 4.19 Lavatories and Mirrors of US 28 Code of Federal Regulations (CFR), Part 36 - ADA Standards for Accessible Design or equivalent standard approved by Dubai Municipality.

A useful resource to obtain information on the requirements for Enabled Access is the 'Accesscode' website set up as an advisory code of practice reflecting current statutory requirements and best practice within the UK for the design of buildings, structures, highways and transportation.

7.0 Compliance

7.1 Responsibilities Matrix

	Consultant or Contractor	User / Operator	DM	DEWA	Other Government Department	3 rd party
Design/permit application	✓		✓			
Construction	✓		✓			
Commissioning/Completion	✓		✓			
Operation		✓				
Refurbishment	✓		✓			
Demolition						

7.2 Consultant Document Requirements

Lifecycle Stage	Document Requirements
Design/permit application	Green Building Declaration Completed Self Assessment
Construction	Green Building Site File with orders and delivery notes for the correctly specified materials
Commissioning/Completion	Completed Green Building Site File
Operation	n/a
Refurbishment	Any works requiring a building permit from DM are required to comply with the Green Buildings Regulations for Dubai.
Demolition	n/a

8. References.

UAE Federal Law No. 25, 1999

Dubai Municipality Building Regulation, Administrative Resolution No. 125-2001, Article 27

Access Code: A Code of Practice on Access and Mobility (UK) - An advisory code of practice reflecting current statutory requirements and best practice within the UK for the design of buildings, structures, highways and transportation. <http://www.accesscode.info>. (Accesscode is a joint project between five English City Councils in conjunction with the University of Salford.)

Part 36—ADA Standards for Accessible Design (USA) This document sets guidelines for accessibility to places of public accommodation and commercial facilities by individuals with disabilities. These guidelines are to be applied during the design, construction, and alteration of buildings and facilities. The guidelines are published by the U.S. Department of Justice to support the Americans with Disabilities Act and are available free of charge from their website <http://www.ada.gov/stdspdf.htm>



1.0	Bicycle Storage and Changing Rooms	301.03
	<p>For all new buildings, other than villas, secure and covered racks or storage areas for bicycles must be provided within the building or within a shaded area located no more than thirty (30) meters from a building entrance within the plot limit. Secure racks or storage areas must be provided for a number of bicycles equal to at least fifteen percent (15%) of the number of car parking spaces required for the building as per the Dubai Municipality (DM) Building Regulations, Administrative Resolution No.125-2001.</p> <p>For Student accommodation and Labor accommodation, secure racks or storage areas must be provided for bicycles for at least 15% of building occupants with the same above conditions.</p>	Residential/ Commercial Public Buildings Industrial
2.0	Intent/Goal <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Ecology and Planning – Access and Mobility <input type="checkbox"/> Building Vitality <input type="checkbox"/> Resource Effectiveness: Energy <input type="checkbox"/> Resource Effectiveness: Water <input type="checkbox"/> Resource Effectiveness: Materials and Waste 	
3.0	Background <p>There is increasing use of bicycles in Dubai for recreation and as a means of transportation to work. The development of new residential areas close to work places in Dubai will allow some workers to consider bicycles as a viable means of transportation. Most new major developments in Dubai are being promoted as being pedestrian and bicycle-friendly.</p> <p>The successful implementation of a strategy to increase the use of bicycles in Dubai depends in part on adequate infrastructure. Dubai Roads and Transport Authority (RTA) has developed the Dubai Bicycle Master Plan to provide 1300 kilometres of bicycle lanes by 2020, as part of their strategic approach to ease traffic congestion and increase road safety. The provision of bicycle storage and showers/changing rooms at destinations is important in ensuring the success of such a strategy.</p>	

4.0

Applicability

Main Typology Criteria	Typology Subdivisions	New	Existing	Typology Subdivisions	New	Existing
Villa						
Residential/Commercial	Residential	✓	✓	Commercial	✓	✓
	Apartments	✓	✓	Hotels		
	Offices	✓	✓	Resorts		
	Labour Accommodation	✓	✓	Restaurants/Food Outlets		
	Student Accommodation	✓	✓	Laboratories		
Public Buildings	Healthcare Facilities	✓	✓	Retail Outlets		
	Educational Facilities	✓	✓	Post Offices	✓	✓
	Government Buildings	✓	✓	Banks	✓	✓
	Worship	✓	✓	Museums	✓	✓
	Houses					
	Petrol Stations			Cinema/theatres	✓	✓
	Shopping Mall			Historical/heritage Buildings*	✓	✓
Industrial	Workshops	✓	✓			
	Factories	✓	✓			
	Warehouses	✓	✓			

5.0

Outcome/ Benefit

The use of bicycles as an alternative mode of transportation is an important part of long-term sustainable transportation and energy strategies. Cycling produces no emissions and does not require the use of fossil fuels. Bicycle commuting contributes to relieving traffic congestion and reducing noise pollution. Reduced traffic volumes will in turn result in reduced air pollution, reduced demand for increased infrastructure for roadways and parking lots as well as promoting an active lifestyle, and associated health benefits, amongst the population.



6.0 Guidance

6.1 General

Secure bicycle racks or storage areas must be available for individual bicycles to be locked and stored. Storage should protect bicycles from theft.



Multi-use building: For the purpose of this regulation each portion of the building which has a different usage shall use the compliance calculation for that usage type.

For residential buildings, requirements are based on either the number of apartments or number of occupants. The number of occupants shall be used for buildings such as labour accommodation, which may not have specific apartments.

The number of building users (or occupants) shall be the number declared in documentation submitted to Dubai Municipality at the permit application stage.

The exact location and design of the racks or storage will be different for each building; however it is important that the bicycles can be secured. Because of the Dubai climate, all bicycle storage areas should be under cover or shaded.

The number of bicycle storage spaces required has been selected as the minimum that are needed to encourage increased usage of bicycles. To allow for initial compliance with this regulation, the numbers are less than those required in some other countries. Wherever feasible, it is recommended that the site design link the building with existing or proposed cycle paths. Below are some recommendations regarding bicycle storage capacity from Chapter 16 of the RTA's Dubai Bicycle Master Plan (January, 2008). Note that these figures are recommendations only and cover many facilities for which bicycle storage is not regulated. It is recommended that bicycle parking be provided at all buildings listed below.



Table 15 - Recommended Non-Residential Bicycle Parking Requirements by Land Use

Land Use	Employee/Resident Bike Spaces as Percent of Auto Parking		Class	Visitor/Shopper/Student Bike Spaces as Percent of Auto Parking		Class
	Non-TOD	TOD		Non-TOD	TOD	
Art Gallery	10%	20%	2	15%	30%	3
Bank	10%	20%	2	15%	30%	3
Cafe	10%	20%	2	15%	30%	3
Hospital	10%	20%	1	10%	20%	3
Industrial	10%	20%	1 or 2	5%	10%	3
Hotel	10%	20%	1	5%	10%	3
Light Industrial	10%	20%	1 or 2	5%	10%	3
Sports Stadium	10%	20%	1	20%	40%	3
Market Place	10%	20%	2	20%	40%	3
Museum	10%	20%	1	20%	40%	3
Nursing home	10%	20%	1	10%	20%	3
Office	15%	30%	1 or 2	10%	20%	3
Restaurant	10%	20%	1 or 2	15%	30%	3
Retail show room	10%	20%	2	15%	30%	3
School	15%	30%	2	40%	80%	3
Shop	10%	20%	1	15%	30%	3
Take-away food	10%	20%	1	15%	30%	3
College/University	15%	30%	2	60%	120%	3
Park / Recreation	15%	20%	2	30%	40%	3

Showers and changing facilities are required for non-residential buildings as cyclists are less likely to make journeys by bicycle unless if there are no facilities to shower and change clothing on arrival at their destination.

There is no requirement for additional shower and changing facilities for residential buildings, as the tenants will have their own facilities.

Table 16 - Recommended Shower Requirements by Land Use

Type of Land Use	Number of Showers Required for Specified Building Floor Area	
	1 Shower for Each Gender	1 Additional Shower for Each Gender
Office Uses (business, professional)	5,000 to 15,000 sq. meters	Each 10,000 sq. m over 15,000
Retail Trade, Service Uses	10,000 to 30,000 sq. meters	Each 20,000 sq. m over 30,000
Manufacturing and Industrial Uses	5,000 sq. meters or more	N.A.

6.2 Technical Data and Specifications

Secure bicycle racks or storage areas must be available for individual bicycles to be locked and protected bicycles from theft.

In order to provide protections from the sun and dust racks or storage areas should be indoors or be shaded.

7.0 Compliance

7.1 Responsibilities Matrix

	Consultant or Contractor	User / Operator	DM	DEWA	Other Government Department	3 rd party
Design/permit application	✓		✓			
Construction	✓		✓			
Commissioning/Completion	✓		✓			
Operation		✓				
Refurbishment	✓		✓			
Demolition						

7.2 Consultant Document Requirements

Lifecycle Stage	Document Requirements
Design/permit application	Green Building Declaration Completed Self Assessment
Construction	Green Building Site File with orders and delivery notes for the correctly specified materials
Commissioning/Completion	Completed Green Building Site File
Operation	n/a
Refurbishment	Any works requiring a building permit from DM are required to comply with the Green Buildings Regulations for Dubai.
Demolition	n/a

8. Common Practices / Solutions

A number of building rating schemes worldwide seek to encourage cycling as realistic transport option through the provision of bicycle storage and changing rooms. LEED awards credits for the provision of bicycle storage for 15% of residents and for 5% for occupants of non-residential buildings, plus shower facilities for 0.25% of occupants of non-residential buildings. Green Star credits bike storage for 5% of building staff and one shower for each 10 bike parks.

9. References

Dubai Bicycle Master Plan (January, 2008), Dubai Roads & Transport Authority (RTA)

