Al Sa’fat – Dubai Green Building System-2nd edition, January 2023

Structure of the Regulations

The following categories will be used throughout the regulations:

1. Section 1 (100) : Definitions
2. Section 2 (200) : Regulation Application
3. Section 3 (300) : Ecology & Planning
4. Section 4 (400) : Building Vitality
5. Section 5 (500) : Energy Efficiency
6. Section 6 (600) : Resource Effectiveness - Water
7. Section 7 (700) : Resource Effectiveness - Materials & Waste

The practice guide can exist used for further information on implementation and compliance as required.

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Section 1

Definitions

Certain terms used in these 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 or to 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 liters per second or cubic meters 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 emphasis 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 establishment (government or private) that owns the building and/or the land on which the building works (construction, refurbishing, demolition, or removal of a building) is to be performed or their representative.
Building Works Permit	Permit issued by authorized department from the Dubai Municipality to permit building permits on specific land as per drawings, specifications, and regulations.
Building services	All necessary services required to operate the building such as plumbing, mechanical, electrical and others.
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 as defined on the Land Use and Classification System or any other area classified by Permitting Authorities that has special requirements
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 odorless, colorless, non-flammable non-toxic chemicals. They vaporize 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, particleboard and medium density fiberboard.
Condensation	The process through which a gas or vapor 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 practice 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.
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 the People of Determination 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 term 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	Untreated household wastewater, which has not come into contact with toilet waste. Greywater includes used water from showers, washbasins, 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	The heat load calculations are the process of calculating the total heat generated inside the building by various sources. These calculations 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 Parameter	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.
Hybrid Vehicle	A hybrid vehicle is a vehicle using two different forms of power, such as an electric motor and an internal combustion engine, or an electric motor with a battery and fuel cells for energy storage.
Hydraulic Elevator	An elevator operated using liquid pressure.
Hydro chlorofluorocarbons (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 landform, 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^{o} C and 45^{o} C 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 Reflectance 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 reflectance 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.
Lux	The international system unit of illumination, equal to one lumen/m^2..
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 and having an area of 50 m^2 at a minimum.
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 that 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, exhibitions and festival centers, gymnasium and sports complex and sports and entertainment complexes.
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, and 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 sitting or standing, while working inside of a building or use the building space.
Relative Humidity	Ratio of partial density of water vapor in the air to the saturation density of water vapor at the same temperature and the same total pressure.
Residential / Commercial Building	This building typology includes apartments, labor 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 (Heating/Cooling)	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 mm (⅛ 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 9 m wide, and its area 80 m^2 at a minimum.
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 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 insolation 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 satisfied condition experienced by building occupants with the thermal environment. Level of indoor conditions that occupants experienced and live satisfactorily.
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 meter of a structure divided by the difference in temperature across the structure. It is expressed in 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.
Totalizing Meter	Measures the flow and provides a total of the quantity that 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 an irritant 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 storm water management and aesthetics benefits.
Villa	Private Villa: Separate or semi-detached building with ground entrance and independent parking in addition to independent outdoor spaces. Investment Villa: A complex of separate, connected or semi-connected private villas in which outdoor spaces and recreational services can be shared, and ownership is not allowed to be split unless there are legal repercussions between them.
Volatile Organic Compound (VOC)	Organic chemicals that have a high vapor pressure and easily form vapors 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 color 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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Section 2

Administration

201: Regulation Application

201.01: Building Typologies to which these regulations are applied

a) Villa: There are three types of villas:
   1. Investment villas
   2. Private villa
   3. Arabic House

For the purposes of the Green Buildings Evaluation System, Private, Investment Villas and Arabic house as defined by DM are grouped together as "villas."

b) Residential/Commercial Building: This building typology includes:

Table 201.01 (1): Type of Residential and Commercial Buildings

Building Typologies	
Residential	**Commercial**
▪ Apartments	▪ Hotels, Motels and furnished Apartments
	▪ Laboratories
▪ Labor Accommodation	▪ Offices
	▪ Resorts
▪ Mass Housing	▪ Restaurants / Food Outlets

c) Public Building: This building typology includes:

Table 201.01 (2): Type of Public Buildings

Building Typologies	
Public Buildings	
▪ Banks	▪ Post Offices
▪ Cinema / Theatres	▪ Retail Outlets
▪ Educational Facilities	▪ Shopping Malls
▪ Government Buildings	▪ Masjid and Worship Houses
▪ Health Care Facilities	▪ Exhibitions and Festival Centers
▪ Historical / Heritage Buildings	▪ Gymnasium and Sports complex
▪ Museums	▪ Sports and Entertainment Complexes
▪ Petrol Stations	

Dubai Municipality has the right to apply special standards for historical buildings and Heritage buildings (if required).

d) Industrial Building: This building typology includes:

Table 201.01 (3): Type of Industrial Buildings

Building Typologies		
Industrial		
▪ Factories	▪ Warehouses	▪ Workshops

- In Mixed Use Buildings, when a building combines more than one use, each portion of the building must comply with the relevant regulations for that particular typology.
- The regulations specify the applicability of certain clauses for specific building typologies.
- When there is a change of use for a building (for example, the change from a residential villa to a school), these regulations apply for the new use.

201.02: Referenced Codes and Standards

The codes and standards referenced in these regulations shall be considered part of the requirements of these regulations to the prescribed extent of each such reference, when the requirements of this regulation differ from the requirements of any international references, the requirements of this regulation shall be complied with.

201.03: Energy Compliance Method

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

(a) **Elemental Method:** All buildings must comply with each of these regulations.

(b) **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 101.01 (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 101.01 (1). The reference building must be equal in shape, size and operational patterns to the proposed building. This shall be done as per ASHRAE 90.1 appendix G, except for the minimum requirements for building envelop equipment efficiencies and other parameters and conditions that are already set in Al Sa'fat.

Compliance with Al Sa'fat - Dubai Green Building System 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 201.03 (1) – List of Regulations to be complied with for Energy Compliance

Al Sa'fat - Dubai Green Building System for Elemental Method of Energy Compliance
304.05 Orientation of Glazed Facades
501.01 Minimum Envelope Performance Requirements
502.01 Energy Efficiency– HVAC Equipment and Systems
502.04 Lighting Power Density - Interior

201.04: Water Compliance Method

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

(a) **Elemental Method:** All buildings must comply with each of these regulations.

(b) **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.

Silver Sa'fa Requirements				
Serial	Section	Chapter	Regulation No.	Regulation Title
1	Ecology and Planning (300)	Chapter 01 - 301: Access and Mobility	301.01	Enabled Access
2			301.02	Preferred Parking **
3		Chapter 2 - 302: Ecology and Landscaping	302.01	Local Species
4		Chapter 3 - 303: Neighborhood Pollution	303.01	Exterior Light Pollution and Controls *
5		Chapter 4 -304: Microclimate and Outdoor Comfort	304.01	Urban Heat Island Effect
6			304.02	Heat Rejection Equipment Installation
7			304.04	Colors on the Outside of Buildings
8			304.05	Orientation of Glazed Facades **
9			304.06	Hardscape
10			304.07	Shading of Public Access Areas **
11		Chapter 5 - 305: Environmental Impact Assessment	305.01	Environmental Impact Assessment
12	Building Vitality (400)	Chapter 1 - 401: Ventilation and Air Quality	401.01	Minimum Ventilation Requirements for Adequate Indoor air quality
13			401.02	Indoor Air Quality During Construction, Renovation or Decoration
14			401.03	Air Inlets and Exhausts
15			401.04	Isolation of Pollutant Sources
16			401.05	Openable Windows
17			401.06	Indoor Air Quality Compliance - New Buildings
18			401.07	Indoor Air Quality

				Compliance – Existing Buildings
19			401.08	Sealing Doors and Window Frames
20			401.09	Inspection and Cleaning of HVAC Equipment
21			401.10	Parking Ventilation
22			401.11	Environmental Tobacco Smoke
23		Chapter 2 - 402: Thermal Comfort	402.01	Thermal Comfort
24		Chapter 3 - 403: Acoustic Comfort	403.01	Acoustical Control
25			403.02	Silencers
26			403.03	Expansion joints and vibration prevention
27		Chapter 4 - 404: Hazardous Materials	404.01	Low Emitting Materials: Paints and Coatings
28			404.02	Low Emitting Materials: Adhesives and Sealants
29			404.03	Carpet Systems
30		Chapter 5 - 405: Day lighting and Visual Comfort	405.01	Provision of Natural Daylight
31			405.02	Views
32		Chapter 6 - 406: Water Quality	406.01	Legionella Bacteria and Building Water Systems
33			406.02	Water Quality of Water Features
34		Chapter 7 - 407: Responsible Construction	407.01	Impact of Construction, Demolition and Operational Activities
35	Energy Efficiency: (500)	Chapter 1 - 501: Conservation and Efficiency: Building Fabric	501.01	Minimum Building Envelope Performance Requirements
36			501.02	Thermal Bridges
37			501.03	Air Conditioning Design Parameters

38			501.04	Air Loss from Entrances and Exits **
39			501.05	Air Leakage *
40			501.06	Shade Effect Calculations
41		Chapter 2 - 502: Conservation and Efficiency: Building Systems	502.01	Energy Efficiency – HVAC Equipment and Systems
42			502.02	Demand Controlled Ventilation *
43			502.03	Elevators and Escalators
44			502.04	Lighting Power Density - Interior
45			502.05	Lighting Power Density - Exterior
46			502.06	Lighting Controls
47			502.07	Electronic Ballasts
48			502.08	Control Systems for Heating, Ventilation and Air Conditioning (HVAC) Systems **
49			502.09	Control Systems for Hotel Rooms
50			502.10	Exhaust Air Energy Recovery Systems and Condensation of water
51			502.11	Pipe and Duct Insulation
52			502.12	Thermal Storage for District Cooling
53			502.13	Ductwork Air Leakage
54			502.14	Maintenance of Mechanical Systems
55			502.20	Air Conditioning of Industrial Buildings

56			502.21	Cooling Water Purification to Enhance Cooling Efficiency
57		Chapter 3 - 503: Commissioning and Management	503.01	Commissioning of Building Services – New Buildings **
58			503.02	Re-Commissioning of Building Services – Existing Buildings **
59			503.03	Electricity Metering
60			503.04	Air Conditioning – Metering **
61			503.05	Central Control and Monitoring System (CCMS) *
62		Chapter 4 - 504: Onsite Systems: Generation & Renewable Energy	504.01	On-Site Renewable Energy – Small to Medium Scale Embedded Generators
63			504.02	On-Site Renewable Energy – Sustainable Water Heating System
64		Chapter 1 - 601: Conservation and Efficiency	601.01	Water Efficient Fittings
65			601.02	Condensate Drainage *
66			601.03	Condensate Reuse *
67			601.04	Water Efficient Irrigation *
68		Chapter 2 – 602: Commissioning and Management	602.01	Water Metering
69		Chapter 3 – 603: Onsite Systems: Recovery and Treatment	603.01	Wastewater Reuse *
70			603.02	Water Consumption for Heat Rejection Including Cooling Towers

71	Resource Effectiveness: Materials and Waste (700)	Chapter 1 - 701: Materials and Resources	701.01	Thermal and Acoustical Insulation Materials
72			701.02	Certified / Accredited Timber *
73			701.03	Asbestos Containing Materials
74			701.04	Lead or Heavy Metals Containing Materials
75			701.05	Ozone Depletion Potential (ODP) Material Management
76			701.06	Recycled Content
77			701.07	Regional Materials *
78			701.08	Composite Wood Products *
79		Chapter 2 - 702: Waste Management	702.01	Construction and Demolition Waste *
80			702 .02	Bulk Waste Collection
81			702.03	Waste Storage
82			702.04	Waste Collection *
83			702.05	Recyclable Waste Management Facilities **

(*) Optional requirements for private villas>

(**) Optional requirements for private villas, investment villas.

Note:

- In case of Grey-water use inside the building or Treated Sewage Effluent, all requirements of Article No. 603.01 are mandatory.
- If the green roof provides 30% of the total surface area of the building, it will be exempted from the requirements of Article No. 304.01

Golden Sa'fa Requirements				
Serial	Section	Chapter	Regulation No.	Regulation Title
1	All mandatory and optional Requirements of Silver Sa'fa			
2	Ecology and Planning (300)	Chapter 01 - 301: Access and Mobility	301.03	Charging equipment for electrical vehicles
3			301.04	Bicycle Storage
4	Building Vitality (400)	Chapter 7 - 407: Responsible Construction	407.02	Ensuring Quality and Safety for construction Activities
5			407.03	Sustainable Concrete
6	Energy Efficiency: (500)	Chapter 2 – 502: Conservation and Efficiency: Building Systems	502.15	Control of Air Flow
7			502.16	Control of Chilled Water
8			502.19	Air Conditioning of Parking Areas
9			502.22	Heat Exchangers
10		Chapter 3 – 503: Commissioning and Management	503.06	Cost of the Expected Performance Assessment
11			503.07	Performance and Commissioning Reports
12			503.08	Sustainable Awareness
13		Chapter 4 - 504: Onsite Systems: Generation & Renewable Energy	504.03	On-Site Renewable Energy – Electricity Power Generation
14		Chapter 5 – 505: Energy Demand	505.01	Reduction of Energy Demand
15			505.03	Efficiency of Building Performance

Table no. 101.02 (3) - Platinum Sa'fa Requirements Required in addition to Silver and Golden Sa'fa requirements				
Serial	Section	Chapter	Regulation No.	Regulation Title
1	All Requirements of Golden Sa'fa			
2	Ecology and Planning (300)	Chapter 4 - 304: Microclimate and Outdoor Comfort	304.03	Green Roof
3	Energy Efficiency (500)	Chapter 2 - 502: Conservation and Efficiency: Building Systems	502.17	Control of Air Conditioning Zones
4			502.18	Cooling of Corridors and Public Areas
5		Chapter 5 – 505: Energy Demand	505.02	Smart Building

300

Section 3

Ecology and Planning

301: Access and Mobility

301.01 Enabled Access

All new buildings, must comply with Dubai Municipality Building Regulations with regards to the People of Determination. They must be enabled for their access, internal movement and ability to engage with the building. This must be in accordance to Part C (Accessibility) of Dubai Building Code. For Villas and Townhouses, these requirements are optional as stated in Ref K.6 of Dubai Building Code.

301.02 Preferred Parking

For all new buildings, other than villas, that have more than 20 parking spaces, designated preferred parking must be provided for a combination of hybrid vehicles, electrical vehicles and carpool vehicles.

The number of preferred parking bays shall be calculated based on the total vehicle parking bays required for the building, as defined in part B of Dubai building code. B.7.2.6.1.

The percentages required for preferred parking are as follows:

• 5% for Silver Sa'fa

• 7% for Golden Sa'fa

• 10% for Platinum Sa'fa

The above percentages, does not include the spaces provided for People of Determination.

301.03 Charging Equipment for Electrical Vehicles

For Golden and Platinum Sa'fa and for all new buildings other than villas, where preferred parking spaces were provided according to item 301.02, necessary charging equipment for electrical vehicles must be provided for 30% of the total preferred parking spaces.

301.04 Bicycle Storage

For Golden and Platinum Sa'fa and for all new buildings, other than villas, secured and covered racks or storage areas for bicycles must be provided within the building or within a shaded area located on the ground floor and no more than 30m 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 10% of the number of car parking spaces required for the building, as defined in the Dubai Municipality (DM) Building Regulations.

For Student accommodation and Labor accommodation, secure racks or storage areas must be provided for bicycles, for at least 10% of building occupants, with the same above conditions.

302: Ecology and Landscaping

302.01 Local Species

For all new buildings, a minimum of 25% of the total planted area within the building plot, including green roofs, must utilise plant and tree species indigenous or adapted to Dubai's climate and region.

303: Neighborhood Pollution

303.01 Exterior Light Pollution and Controls

For all new buildings, permanently installed exterior lighting must comply with the requirements stated in Part E of Dubai Building Code, E.5.8 Exterior light power, pollution and controls

304: Microclimate and Outdoor Comfort

304.01 Urban Heat Island Effect

Opaque building envelope surfaces shall have an SRI value not less than that shown in Table (1) 304.01 - Building envelope SRI value requirements and according to Dubai Building Code section E.5.7 and K.7.2.7 Heat island effect reduction , for a minimum of 75% of the roof area and 100% of the external walls.

Table (1) 304.01 - Building envelope SRI value requirement

Element	SRI value
Steep sloped roofs (slopes steeper than 1:6)	≥29
Flat and low sloped roofs (slopes lower than or equal to 1:6)	≥78
External walls	≥29

304.02 Heat Rejection Equipment Installation

For all new buildings, individual heat rejection equipment having a power rating greater than 4.0 kW and which exhausts externally, must be installed not less than 3m above the ground level of the building.

304.03 Green Roofs

For Platinum Sa'fa and for all new buildings, the roof of the building should be provided with vegetated roof (green roof) for at least 30% of the total roof area, or for the remaining area after complying the following conditions:

• The services should be grouped and distributed on each surface so that the space is optimized.

• At least 150 m2 of roof area is available on any roof surface.

304.04 Colors on the Outside of Buildings

For all new buildings, opaque building envelope surfaces shall follow the solar reflectance index (SRI) requirements stated in part E of Dubai Building Code, E.5.7 Heat island effect reduction and part K for villas K.7.2.7 Heat island effect reduction

304.05 Orientation of Glazed Façades

For all new buildings, for silver Sa'fa, the orientation of the glazed elements must comply with the requirements stated in Part E of Dubai Building Code, E.5.2.2 Orientation of glazed facades.
For Golden and Platinum buildings, any glazed elements located between Southeast to Southwest (angles between 112.5° and 247.5°) must be treated environmentally.
In case BIPV is used in the building, the above requirements are exempted.

304.06 Hardscape

For all new buildings, the hardscape of the development must achieve the requirements stated in Part B in Dubai Building Code, B.10.5.3 Heat island effect reduction - surfaces shading.

For Villas, the requirements in Part K, K.5.12.1 Surfaces shading must be met.

304.07 Shading of Public Access Areas

For all new buildings, all pedestrian linkages within the plot area must be shaded using materials having a Solar Reflectance Index (SRI) equal to or greater than those specified in Table 304.01 (1).

305: Environmental Impact Assessment

305.01 Environmental Impact Assessment

For all new buildings, an environmental impact assessment report (EIAR) and/or an environmental impact assessment summary (EIAS) is required as stated in part B of Dubai Building Code, B.10.7 Environmental Impact Assessment.

400

Section 4

Building Vitality

401: Ventilation & Air Quality

401.01 Minimum Ventilation Requirements for Adequate Indoor Air Quality

All new and existing buildings which are air-conditioned must be mechanically or mixed mode ventilated and also must comply with the minimum requirements of latest edition of ASHRAE Standards 62.1, 62.2 and 170.

Occupancy density shall be determined in accordance with part B of dubai building code B.5.1 where possible.

If the occupancy density values are not mentioned then, default occupancy density values stated in the latest edition of ASHRAE Standards 62.1, 62.2 and 170 shall be considered.

401.02 Indoor Air Quality during Construction, Renovation or Decoration

For all the buildings under construction or renovation, building occupants and systems must be protected from airborne contaminants that are generated or spread during construction or renovation works, carried out inside the buildings. These contaminants include toxic substances or substances that are harmful to the human body, such as asbestos, lead, pesticides, heavy metals, mold, dust, fumes, paints, etc.

Unless it is required to provide ventilation during construction, the supply and return heating, ventilation and air conditioning (HVAC) system openings must be closed and protected from contamination. All duct and related air distribution component openings must be covered with tape, plastic, sheet metal or other suitable methods to prevent dust or debris from collecting in the system.

If the HVAC system is used during construction or renovation, temporary return air filters must be installed with at least a Minimum Efficiency Reporting Value of 8 (MERV 8).

Prior to occupancy, all temporary return air filters must be removed and replaced with permanent filters having at least Minimum Efficiency Reporting Value of 8 (MERV 8).

401.03 Air Inlets and Exhausts

For all new buildings, air inlets and exhausts must follow the requirements stated in Part H of Dubai Building Code, H.4.10.4 Air inlets and exhausts.

For Villas, the requirements stated in part K in Dubai Building Code must be met, K.10.1.6.4 Air inlets and exhausts

401.04 Isolation of Pollutant Sources

For all new buildings producing hazardous fumes or chemicals, the requirements stated in part H of Dubai Building Code, H.4.10.5 Isolation of pollutant sources.

401.05 Openable Windows

For all new buildings, openable windows must be provided in accordance with part H of Dubai Building Code, H.4.11 Natural ventilation and part K. For villas, Part K, K.10.1.7 Natural ventilation must be followed.

401.06 Indoor Air Quality Compliance - New Buildings

For all new buildings, suitable ventilation for the building occupants must be ensured and the air quality must be in accordance with Part H of Dubai Building Code, H.4.10.3 Indoor air quality. For Villas, part K, K.10.1.6.3 Indoor air quality must be met.

401.07 Indoor Air Quality Compliance - Existing Buildings

For all existing hotels, shopping malls, educational facilities, government buildings, healthcare facilities, mosques and worship buildings, theatres, cinemas or any other existing buildings as determined by DM in future, suitable ventilation system must to be provided for the building occupants. The provided system must ensure, the air quality provided is in accordance with the technical guidelines issued by Dubai Municipality.

The buildings must apply the following procedures:

A. Indoor air testing for the contaminants listed in Table 401.07 (1) must be carried out, to ensure the air quality in the building, is suitable for occupancy. The maximum limit for the indoor air contaminants provided in Table 401.07 (1), must not be exceeded.

Table (1) 401.07 - Schedule, Duration of Sampling and Maximum Limit for Contaminants

Sampling Schedule	Type of Samples	Maximum Acceptable	Sampling Duration
	Formaldehyde	< 0.08 ppm	8- hour continuous

Testing should be within 5 years of last compliant test	Total Volatile Organic Compound (TVOC)	< 300 micrograms/ m^3	monitoring (8 hour time-weighted average [TWA])
	Respirable Dust (<10 microns)	< 150 micrograms/ m^3	
	Ozone	< 0.06 ppm (120 micrograms/ m^3)	
	Carbon Dioxide	< 800 ppm (1440 microgram/ $m^{3)}$	
	Carbon Monoxide	< 9 ppm (10 micrograms/ $m^{3)}$	
	Bacteria	< 500 CFU/ m^3 (Agar plate)	
	Fungi	< 500 CFU/ m^3 (Agar plate)	

B. Air quality testing must be carried out by specialized companies or laboratories.

C. Air quality testing equipment must have initial and periodical calibration certificate. Calibration certification frequency shall either be annual or as per manufacturer specification and shall be from an external calibration facility, accredited by DM. The initial and periodical calibration certificates must be saved in a special register. The calibration certificate would be checked by DM to validate the accuracy of the readings. This also is a requirement for renewing the indoor air quality certificate of the building.

401.08 Sealing Doors and Window Frames

For all new buildings, doors and window frames on the building exteriors must be sealed from any openings. This must be with a nonflammable materials and with materials that

prevent the transmission of air and sound that may occur as a result of difference in pressure across the exterior of the building.
Sealing materials shall conform to Sections 4 to 7, Ch. 1 of UAE FLSC [Ref. E.1].
They shall also prevent the transmission of air and sound that might occur as a result of pressure differences across the exterior of the building. Air leakage shall be controlled in accordance with part H of Dubai building code.

401.09 Inspection and Cleaning of HVAC Equipment

For all new and existing buildings, the cleanliness of HVAC equipment and systems must be maintained. All its parts must be inspected and cleaned in accordance with the standard specifications approved by Dubai Municipality and in accordance with the technical guidelines issued by Dubai Municipality. Specialized maintenance companies, approved by Dubai Municipality must carry out this inspection and cleaning. This can also be carried out by the building operator, if sufficient evidence can be provided on their qualification for carrying out these tasks.

401.10 Parking Ventilation

For all buildings with enclosed parking, the requirements stated in part H of dubai building code H.4.12.11 Ventilation for vehicle parking areas, must be followed

401.11 Environmental Tobacco Smoke

For all new buildings with smoking areas, the requirements stated in Part B of Dubai building code, B.10.4 Smoking areas must be followed.

402: Thermal Comfort

402.01 Thermal Comfort

For all new building, HVAC systems shall be capable of providing the range of internal conditions in part H of Dubai building code H.4.7 Thermal comfort criteria. For Villas, Part K, K.10.1.4 Thermal comfort criteria must be followed.

403: Acoustic Comfort

403.01 Acoustical Control

For all new buildings, the acoustic performance should be in accordance with part H of Dubai building code, H.4.5 Acoustic requirements and noise criteria, and H.10.3 Acoustic comfort (H.10.3.1 General/ H.10.3.2 Building services noise/ H.10.3.3 Sound insulation)
For villas, part K, K.10.1.2 Acoustic requirements and noise criteria,K.10.6 Acoustics must be met.

403.02 Silencers

For all new buildings, the mechanical systems must be designed, equipped and selected with noise control materials, to reduce the transmission of sound and noise through these systems. Systems include HVAC, air ducts, water pipes and its suspension and installation requirements.
See part H of Dubai building code (H.4.5 Acoustic requirements and noise criteria) and (H.10.3 Acoustic comfort)

403.03 Expansion joints and vibration prevention

For all new buildings:
1. An automatic air vent shall be installed on each vertical water supply riser, addressed with an isolate valve. A drain valve shall be used at the bottom of the risers.
2. The water network pipes shall be installed with sufficient supports and connectors, to prevent any sound and vibration, while allowing thermal expansion of the pipes through the expansion joints.
For more details refer to part H of Dubai building code (H.5.7 Servicing and isolation valves) and (H.5.11 Water services system installation requirements) and part K for villas (K.10.2.7 Servicing and isolation valves and K.10.2.11 Water services installation requirements)

404: Hazardous Materials

404.01 Low Emitting Materials: Paints and Coatings

For all buildings, including new applications in existing buildings, all paints and coatings used in the building should not exceed the allowed limits for Volatile Organic Compound (VOC) specified by Dubai Municipality. The paints and coatings must be accredited / certified from Dubai Central Laboratory or any other laboratory, approved by Dubai Municipality.

For more details refer to part H of Dubai building code (H.4.10.3 Indoor air quality) and part K for villas (K.10.1.6.3 Indoor air quality).

404.02 Low Emitting Materials: Adhesives and Sealants

For all buildings, including new applications in existing buildings, all adhesives, adhesive bonding primers, adhesive primers, sealants and sealant primers used in the building should not exceed the allowed limits for Volatile Organic Compound (VOC) specified by Dubai Municipality. This must be accredited / certified from Dubai Central Laboratory or any other laboratory, approved by Dubai Municipality.

For more details refer to part H of Dubai building code (H.4.10.3 Indoor air quality) and part K for villas (K.10.1.6.3 Indoor air quality)

404.03 Carpet Systems

For all new and existing public and commercial buildings, each new carpet system (Carpets or new permanently installed carpet padding) must be certified / accredited from Dubai Central Laboratory or any other laboratory, approved by Dubai Municipality (DM). Carpets are not allowed to be used in labor accommodation, educational facilities or any other places as determined in part H of Dubai building code (H.4.10.3 Indoor air quality) and part K for villas (K.10.1.6.3 Indoor air quality)

405: Day lighting & Visual Comfort

405.01 Provision of Natural Daylight

For all new buildings, other than industrial buildings, provision for adequate natural daylight must be made in order to reduce the reliance on electrical lighting and to improve conditions for the building occupants. The provided lighting openings must be in accordance with part B of Dubai building code (B.6.5.2.2 Daylighting) and part K for villas (K.5.4.2.2 Habitable room conditions for natural lighting)

405.02 Views

For all new commercial, residential and public buildings, direct line of sight (views) to the outdoor environment must be provided in accordance with part B of Dubai building code (B.6.5.2.3 Access to views) and part K for villas (K.5.4.2.3 Access to views) and part C (C.7.1)

406: Water Quality

406.01 Legionella Bacteria and Building Water Systems

All new and existing buildings must comply with the requirements stated in part H of Dubai building code (H.5.6.1 Treatment against microbiological bacteria growth) and part K for villas, (K.10.2.12 Water treatment against microbiological bacteria growth)

406.02 Water Quality of Water Features

For all new and existing buildings with water features, the requirements stated in part H of Dubai building code (H.5.6.1 Treatment against microbiological bacteria growth) and part K for villas, (K.10.2.12 Water treatment against microbiological bacteria growth)

407: Responsible Construction

407.01 Impact of Construction, Demolition and Operational Activities

All new buildings must comply with all related regulations, local orders and their executive orders, technical guidelines and guides applied in the Emirate. The following is also required:

1. Neither the construction activity nor the operation of the building may cause land disturbances, surface runoff, soil erosion or sedimentation, on any other property beyond the boundary of the plot.
2. Drainage must avoid pollution of watercourses and groundwater. Discharges made directly to ground, storm or marine waters must comply with Local Order (61) issued in 1991.
3. Dust suppression techniques must ensure that dust generated by construction and demolition activities must meet the requirements of Code of Construction Safety Practice issued by Dubai Municipality.
4. Construction waste materials generated on site must be segregated and stored on site, prior to collection. Segregation must, at a minimum, include labelled storage for inert aggregates, metals, timber, dry recyclables and hazardous material.
5. For the disposal of hazardous waste, permit must be prepared and obtained from Dubai Municipality's Waste Management Department. The hazardous waste must be transported in accordance with the requirements of DM Technical Guidelines and DM Code of Construction Safety Practice.
6. Excluding the usage for drinking, toilet activities and concrete works, potable water cannot be used for construction activities on project site.
7. Construction and demolition noise must be no greater than that detailed in DM Technical Guidelines and DM Code of Construction Safety Practice.
8. Chemicals, fuels, solvents or hazardous wastes must be stored in accordance DM Technical Guidelines and DM Code of Construction Safety Practice.
9. Light pollution from the construction site must be minimised by ensuring that light sources are directed inwards and angled down, so that no light is emitted above the horizontal plane. Lux levels should meet the DM Code of Construction Safety Practice.

407.02 Ensuring Quality and Safety for Construction Activities

For Golden and Platinum Sa'fa and for all new buildings other than villas, the main consultant and contractor should be certified by approved utilities from Dubai Municipality. To ensure the quality and safety practices of construction activities, they

must also be certified for ISO 14004 or OSHA or any equivalent as per the approval of authorized department.

407.03 Sustainable Concrete

For Golden and Platinum Sa'fa and for all new buildings, concrete mixes shall have an environmental impact less than that specified in Dubai Sustainable Concrete Baseline. The environmental impact for all mixes used in the project shall be less than the baseline by 7% for Golden Sa'fa and 15% for Platinum Sa'fa.

500

Section 5

Energy Efficiency

501: Conservation & Efficiency: Building Envelope

501.01 Minimum Building Envelope Performance Requirements

For all new air-conditioned buildings, the average thermal transmittance (also referred as u-value) and shading co-efficient (SC) values for the exterior building elements, must not exceed the values indicated in the below tables. The light transmittance values for the glazed elements should be greater than or equal to the values indicated in the below tables.

A. External Walls, Roofs, and Floors:

The average thermal transmittance (U-value) for building elements that includes the external walls, roofs, and floors (where one side of the floor is exposed to ambient conditions) must not exceed the following values:

Table 501.01 (1) – Heat Transfer co-efficient for Roof, External Wall and Exposed Floor

	For Silver Sa'fa (W/m^2K)	For Golden and Platinum Sa'fa (W/m^2K)
Roof	0.3	0.3
External Wall and Exposed Floor	0.57	0.42

For the floor area that is in contact with the ground, the insulation should only be applied for 1m, from the perimeter of the building.

Glazed elements having back-insulated panels must be treated as walls and must meet the performance requirement for walls.

B. Glazed Elements – Fenestration:

1. If window to external wall ratio is less than 40%, then the glazing elements must meet the following performance criteria:

Table 501.01 (2) – Glazing performance criteria for window to external wall ratio less than 40%

	For Silver Sa'fa	For Golden and Platinum Sa'fa
Thermal Transmittance (Summer U-value) in W/m^2K	2.1 (max)	1.9 (max)
Shading Coefficient (SC)	0.4 (max)	0.32 (max)
Light Transmittance	0.4 (min)	0.32 (min)

2. If window to external wall ratio is between 40% and 60%, then the glazing elements must meet the following performance criteria:

Table 501.01 (3) – Glazing performance criteria for window to external wall ratio between 40% and 60%

	For Silver Sa'fa	For Golden and Platinum Sa'fa
Thermal Transmittance (Summer U-value) in	1.9 (max)	1.7 (max)

W/m^2K		
Shading Coefficient (SC)	0.32 (max)	0.25 (max)
Light Transmittance	0.32 (min)	0.25 (min)

3. If window to external wall ratio is greater than 60%, then the glazing elements must meet the following performance criteria:

Table 501.01 (4) – Glazing performance criteria for window to external wall ratio greater than 60%

	For Silver Sa'fa	For Golden and Platinum Sa'fa
Thermal Transmittance (Summer U-value) in W/m^2K	1.7 (max)	1.5 (max)
Shading Coefficient (SC)	0.25 (max)	0.25 (max)
Light Transmittance	0.25 (min)	0.25 (min)

4. For shopfronts and showrooms, other than those at ground floor level, glazing elements must meet the following performance criteria:

Table 501.01 (5) – Glazing performance criteria for shopfronts and showrooms, except ground floor

Thermal Transmittance (Summer U-value) in W/m^2K	1.9 (max)
Shading Coefficient (SC)	0.76 (max)

5. For glazing elements, if the glazing area on the roof is 10% or lower than the total roof area, the following performance criteria must be met:

Table 501.01 (6) – Glazing performance criteria for roof glazing area less than 10% of total roof area

Thermal Transmittance (Summer U-value) in W/m^2K	1.9 (max)
Shading Coefficient (SC)	0.32 (max)
Light Transmittance	0.32 (min)

6. For glazing elements, if the glazing area on the roof is greater than 10% than the total roof area, the following performance criteria must be met:

Table 501.01 (7) – Glazing performance criteria for roof glazing area greater than 10% of total roof area

Thermal Transmittance (Summer U-value) in W/m^2K	1.9 (max)
Shading Coefficient (SC)	0.25 (max)
Light Transmittance	0.25 (min)

7. Maximum Glazed Area

Except for shopfronts, the total WWR of glazed façades for conditioned spaces shall not exceed:

a) 40% of the gross wall area for residential buildings; and

b) 60% of the gross wall area for all other building types.

501.02 Thermal Bridges

1- For all new air-conditioned buildings, thermal bridges must either be eliminated or efficiently insulated to reduce the amount of heat transfer. Thermal bridging may occur at connection points between concrete or steel beams, external walls and columns and around doors and windows.

2-For all villas, thermal bridges can be avoided by increasing the efficiency of building envelope. The average thermal transmittance (U-value) for the building envelope must not exceed 0.40 W/m2K."

501.03 Air Conditioning Design Parameters

For all new buildings, air conditioning design parameters must meet the requirements stated in Dubai Building Code Section H - Indoor Environment (H.4.6.2 Outdoor design conditions), (H.4.6.5 Heat gain and loss calculations) for buildings, and Section K - Villas

(K.10.1.3 Building HVAC energy load), (K.10.1.3.4 Heat gain and loss calculations) for villas.

501.04 Air Loss from Entrance and Exits

All new buildings must follow the requirements stated in Dubai Building Code Section H - Indoor Environment (H.4.9.2 Air loss from entrances/exits).

501.05 Air Leakage

Air-conditioned buildings with a cooling load of 1 MW or greater shall achieve an air leakage that does not exceed 5 m3/h/m2 into or out of the building, at an applied pressure difference of 50 Pa.
Refer to Dubai Building Code Section H - Indoor Environment (H.4.9 Infiltration/air leakage) for buildings

501.06 Shade Effect Calculations

All new buildings must comply with the requirements stated in Part E in Dubai Building Code, E.5.3 Shade effect calculation and Part K, K.7.2.3 Shade effect calculation for villas.

502: Conservation & Efficiency: Building System

502.01 Energy Efficiency - HVAC Equipment and Systems

For all new air-conditioned buildings, heating, ventilating and air conditioning equipment and systems must comply with the minimum energy efficiency requirements and test procedures started in Dubai Building Code: H.4.8.1 Minimum efficiency of HVAC systems for buildings and K.10.1.5.1 Minimum efficiency of HVAC systems for villas.
For Golden Sa'fa, a minimum star rating of 4 must be achieved for household air conditioner and a minimum star rating of 5 for Platinum Sa'fa.
For Golden & Platinum Sa'fa and for commercial and central conditioner, the minimum efficiency shall be at least 10% higher than the efficiencies specified in Dubai Building Code.

502.02 Demand Controlled Ventilation

All new air-conditioned buildings with mechanical ventilation must comply with the requirements stated in Part H in Dubai Building Code, H.4.8.3 Demand controlled Ventilation.

502.03 Elevators and Escalators

For all new buildings, the elevators and escalators must follow the requirements stated in Part D in Dubai Building Code, D.6.1 Elevators, D.6.2 Escalators and moving walks

502.04 Lighting Power Density – Interior

For new buildings, the average Lighting Power Density for the interior connected lighting load must not exceed the values given in Dubai Building Code Section H (H.7.2 Lighting Power densities - interior)

502.05 Lighting Power Density – Exterior

For all new buildings, the average Lighting Power Density for the exterior connected lighting load for specific building types must not exceed the values given in H.7.3 lighting power densities – exterior in Dubai Building Code

502.06 Lighting Controls

For all new buildings, lighting controls requirements should follow Dubai Building Code Part H, H.7.4 Lighting controls and Part K, K.10.4.2 Lighting controls for villas.

502.07 Electronic Ballasts

For all new buildings, Dubai Building Code requirements should be followed as stated in Part H, H.7.5 Electronic ballasts.

502.08 Control Systems for Heating, Ventilation and Air Conditioning Systems

For all new buildings other than villas, HVAC systems shall be equipped with efficient controls to reduce energy consumption. This shall be in accordance with Dubai Building Code Part H, H.4.14.1 Controls for HVAC systems.

502.09 Control Systems for Hotel Rooms

For all new hotels, each guest room must incorporate control systems. This should be in accordance with Dubai Building Code Part H, H.4.14.3 Control systems for hotel rooms.

502.10 Exhaust Air Energy Recovery Systems and Condensation of water

For all new buildings that require treated outdoor air of over 1,000 l/s, energy recovery Systems must be provided in accordance with Dubai Building Code Part H, H.4.8.2 Exhaust air energy recovery. For villas, Part K, K.10.1.5.3 Central air-conditioning units equipped with Energy Recovery Units and regulated air intake system must be met.

For Golden Sa'fa and for all new buildings that require treated outdoor air of over 1,000 l/s, energy recovery systems must be provided for at least 60% of the total exhaust air. The energy recovery systems must have at least 75% sensible load recovery efficiency.

For Platinum Sa'fa and for all new buildings that require treated outdoor air of over 1,000 l/s, energy recovery systems must be provided for at least 70% of the total exhaust air. The energy recovery systems must have at least 80% sensible load recovery efficiency.

For Golden and Platinum Sa'fa and for all new buildings with a cooling load of 1 MW or greater, condensate water must be recollected and used as described in regulation no. 601.03. The thermal energy from the retrieved

condensate water can be restored and can be re-used either in cooling the walking lanes in parking spaces or for public places within plot building limits or for cooling of potable water.

502.11 Pipe and Duct Insulation

For all new buildings, all pipes carrying refrigerant, hot water or chilled water and ducts including prefabricated ducts, supplying conditioned air must be insulated, to minimize

heat loss and to prevent condensation. This shall include pipes and ducts passing through conditioned and unconditioned spaces.

Pipes and ducts shall be encased in thermal insulation in accordance with Dubai Building Code (H.4.8.4 Pipe and duct insulation) for buildings, K.10.1.5.4 Pipe and duct insulation for villas.

502.12 Thermal Storage for District Cooling

All new district cooling plants must incorporate a Thermal Energy Storage (TES) facility. TES shall be designed with a capacity as required in Dubai Building Code Section G (G.3.4)

502.13 Ductwork Air Leakage

For all new buildings, air ductwork must be designed, built and installed to ensure air leakage is minimized. This must be in accordance with Dubai Building Code, Part H, H.4.12.6 Ductwork air leakage and Part K, K.10.1.8.3 Air filters for villas.

502.14 Maintenance of Mechanical Systems

For all new and existing air-conditioned buildings, all mechanical, electrical and plumbing systems in the buildings must be serviced and maintained regularly.

1. Mechanical systems must be installed in a way such that adequate access is available. This would allow for regular inspection, maintenance and cleaning of the equipment, without the need to remove or dismantle any building components.
2. The building operator must ensure that a proper maintenance manual and schedule is developed for the building. This shall be based on the instructions for preventative maintenance or recommendation from equipment manufacturer or supplier or according to the latest edition of ASHRAE Standard 180 or equivalent as approved by DM.
3. The building operator must either have a service contract with a DM approved maintenance company or provide sufficient evidences that the equipment shall be properly maintained by competent members of their own staff.
4. Service records in the form of a service log book including details of both preventative and corrective maintenance must be kept onsite and be readily available for inspection by DM staff.

502.15 Control of Air Flow

For Golden and Platinum Sa'fa and for all new buildings, the fresh air supply to the building shall be controlled to prevent damage due to moisture. This is to ensure that occupant comfort, safety and health conditions are effectively maintained. This shall be achieved with appropriate and adequate use of temperature, humidity and DDC devices as part of a central building management system.

502.16 Control of Chilled Water

For Golden and Platinum Sa'fa and for all new buildings, the HVAC equipment and chilled water control shall be equipped with the hydronic balancing valves including pressure independent control valves for optimum energy usage and occupant comfort. The chilled water control shall be achieved with appropriate use of temperature, humidity and pressure monitoring devices as part of a central building management system.

502.17 Control of Air Conditioning Zones

or Platinum Sa'fa and for all new buildings, mechanical ventilation and temperature control system shall be designed such that it allows the occupants to control the air temperature and air speed in each thermal zone.

In addition to achieving this requirement, there shall also be control of HVAC system in thermal zones using occupancy sensors that automatically modulate temperature and air flow-rate, based on occupancy. The system shall prevent in-efficient use of air-conditioning system, by use of interlocks in window / door / energy saving input contacts to the control devices. This shall be integrated with central building management system which can generate alarms, in case of deficient use.

502.18 Cooling of Corridors and Public Areas

For Platinum Sa'fa and for all new buildings other than villas, all open corridors and open public areas shall be cooled by use of renewable energy systems.

502.19 Air Conditioning of Parking Areas

For Golden and Platinum Sa'fa and for all new buildings other than villas, if air conditioning system is installed for cooling of parking area and in case of shortage in condensation water collected for such purpose, an indirect evaporative cooling system must be used, provided that the design comfort temperature is no less than 28° C.

502.20 Air Conditioning of Industrial Buildings

For all industrial buildings, where air-conditioning is required, air-conditioning shall be achieved by using indirect evaporative cooling system. This system shall be used, provided the design comfort temperature is no less than 28° C. This does not include industrial buildings with special requirements.

502.21 Cooling Water Purification to Enhance Cooling Efficiency

For all new buildings other than villas, chilled water system shall include water purification unit as stated in Dubai Building Code Part H, H.5.2.8 Cooling tower water supply.

502.22 Heat Exchangers

For Golden and Platinum Sa'fa and for all new buildings other than villas:

1. Heat exchangers shall be designed and certified in accordance with the following:

• AHRI Liquid to Liquid heat exchanger certification program.

• The tolerances shall be as per ANSI / AHRI 400.

2. Selection shall consider thermal block load, pressure drop, thermal performance, temperature and provision
for future additional loads.

503: Commissioning & Management

503.01 Commissioning of Building Services - New Buildings

For all new air-conditioned buildings having a cooling load of 1 MW or greater, commissioning of air distribution systems, water distribution systems, lighting, central control and building management systems, refrigeration systems and boilers must be carried out as stated in Part H in Dubai Building Code, H.8 Commissioning.

503.02 Re-Commissioning of Building Services

For all existing buildings having a cooling load of 2 MW or greater, re-commissioning of ventilation, water systems central plant, lighting and control systems must be carried out, at least once in every 5 years. Where possible, the

re-commissioning works should be carried out in accordance with the requirements of Regulation 503.01. At a minimum, systems that required to be re-commissioned should ensure that:

1. The amount of fresh air supplied from each ventilation outlet is within ± 5% of the design volume.
2. The volume of the chilled water supplied to any cooling coil is within ± 5% of the design volume.
3. All mechanical devices, including but not limited to dampers, valves, fans, pumps, motors and actuators, operate freely and as required.
4. Filters and filter housings are sound and secure and that no unfiltered air bypasses the filter assembly.
5. Heat recovery systems are operating as designed.
6. Central plant equipment is tested to ensure that it operates through the full range of its capacity and that all design parameters are achieved.
7. All lighting systems and their controls operate as designed and that required levels of illumination are achieved.
8. Controls are checked and re-calibrated for operation, as designed. And to also ensure that any remote devices respond as required.
9. Pipe and ducts are inspected to ensure there is no air or liquid leakage.

Commissioning results must be recorded and available for inspection by Dubai Municipality.

Where original design requirements are not available, the contractor is to certify that after re-commissioning,

the installed systems are operating correctly.

503.03 Electricity Metering

For all new buildings, meters must be installed to measure and record electricity demand and consumption of the facility as a whole. These meters must meet the requirements of Dubai Building Code, Part G, G.4.3 Incoming supply and metering, G.4.5.2 Multiple consumer premises and for Villas Part K, K.9.1.3 Incoming and metering.

503.04 Air Conditioning Metering

For all new buildings supplied by a central air conditioning source (such as a chiller plant or district cooling) and where cooling energy is delivered individually to several consumers, meters must be installed to measure and record chilled water supply to air conditioning units. These meters must meet the requirements of Dubai Building Code, Part H, H.4.14.4 Air-conditioning metering.

503.05 Central Control and Monitoring System (CCMS)

All new buildings having a cooling load of 1 MW or gross floor area of 5,000 m2 or greater, must have a central control and monitoring system capable of ensuring that the building's systems operate as designed and as required during all operating conditions. The requirements stated in Dubai Building Code, Part H, H.4.14.2 Building management system (BMS) must be met.

503.06 Cost of the Expected Performance Assessment

For Golden and Platinum Sa'fa and for all new buildings other than villas, the consultant must provide a detailed study on the effect of the additional requirements to meet the Sa'fa regulations. The study shall compare the cost of construction and operation of the building for the additional requirements when compared to a building without these additional requirements.

503.07 Performance and Commissioning Reports

For Golden and Platinum Sa'fa and for all new buildings other than villas, a detailed report on the performance of the building based on the design considerations must be submitted.

This should include the actual performance reports for a minimum period of 6 months, of which three months shall be thermal peak months.

503.08 Sustainable Awareness

For Golden and Platinum Sa'fa and for all new buildings other than villas, the building operator must develop and provide a clear mechanism for sustainable awareness for the users of the building. This must include information on the consumption of energy and water in the building.

504: Onsite Systems: Generation & Renewable Energy

504.01 On-Site Renewable Energy - Small to Medium Scale Embedded Generators

For all new buildings, where a building incorporates on-site generation of electricity from a solar photovoltaic system, it can be a solar grid connected system or a solar off-grid system. The requirements stated in Dubai Building Code, Part G, G.6 Renewable energy and Part K, K.9.3 Renewable energy for villas.

504.02 On-Site Renewable Energy - Sustainable Water Heating System

1. Central or decentralized hot water systems shall be configured utilizing a sustainable hot water heating technology, such as solar hot water, except in buildings where:

a) such a hot water system would be impractical due to tenancy, metering, and pipework distribution constraints; or

b) hot water generation utilizing local point-of-use electric water heaters would provide a more energy-efficient design solution.

The percentage heating contribution from the solar hot water heating system depends on the occupancy and estimated hot water usage profile. The system designer shall target 75% of the total hot water daily demand being produced by the solar hot water system. To reduce system standing losses, all hot water storage vessels and distribution pipework shall be insulated.

2. For Golden and Platinum Sa'fa, this regulation is applied for all building typologies.

504.03 On-site Renewable Energy - Electrical Power Generation

For Golden and Platinum Sa'fa and for all new buildings, the electrical power shall be generated on-site using solar panels. The power generation shall be 10% of the electrical load of the building (excluding electrical loads for fire extinguishing system, air conditioning units and air conditioning system pumps).

If sufficient space is not available to achieve the above percentages, then the electrical power shall be generated to cover 30% of the lighting load of the common areas, provided that the capacity of the solar panels shall not be less than 20 kWp.

505: Energy Demand

505.01 Reduction of Energy Demand

For Golden and Platinum Sa'fa and for all new buildings, innovative ideas and new mechanisms shall be provided that would contribute for at least 5% reduction in energy demand. These ideas or new mechanisms shall not be from the requirements listed in the regulations.

505.02 Smart Building

For Platinum Sa'fa and for all new buildings, various building equipment and systems shall be provided with intelligent techniques to control and reduce the energy and water consumption of the building. The intelligent techniques shall also ensure the safety and comfort of the building occupants.

505.03 Efficiency of Building Performance

For Golden and Platinum Sa'fa and for all new buildings, the following requirements can be replaced by using techniques that enhances the building performance. (Table)

The techniques used should increase the energy savings of the building. The energy savings percentage of the building when compared to a building designed with Silver Sa'fa regulations shall be at least 15% for Golden Sa'fa and 20% for Platinum Sa'fa.

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Section 6

Resource Effectiveness - Water

601: Conservation & Efficiency

601.01 Water Efficient Fittings

For all new buildings, the requirements stated in Dubai Building Code, Part H, H.5.2.2 Water-efficient fittings and Part K, K.10.2.2.2 Water efficient fittings for Villas.

601.02 Condensate Drainage

For all buildings including existing buildings, where condensate water is produced by air-conditioning equipment, the condensate water must be collected and disposed appropriately. The requirements stated in Dubai Building Code Part H, H.5.2.3 Condensate drainage must be followed.

601.03 Condensate Reuse

For all new buildings with a cooling load not less than 350 kW, condensate water from all air-conditioning equipment, air handling units or equipment handling a mixture of return air and outside air, where the outside air is not preconditioned, must be recovered and reused. The condensate water can be re-used for irrigation, toilet flushing, cooling towers, or other onsite purposes wherein it will not come into direct contact with the human body.

The condensate water can also be re-used for heat recovery as per the requirements set in regulation 502.10.

For Golden & Platinum Sa'fa, condensate water must be recovered and reused in case of standalone system (minimum of 15% for Golden, 30% for Platinum).

601.04 Water Efficient Irrigation

For all new buildings, 100% water requirement for the total exterior landscaping must be irrigated using non-potable water or by use of drip or subsoil water delivery systems. The requirements stated in Dubai Building Code Part H, H.5.2.5 Water-efficient irrigation must be followed.

602: Commissioning & Water Management

602.01 Water Metering

For all new buildings, meters must be installed to measure and record water demand and consumption of the facility as a whole. It must also provide accurate records of consumption (tariff class meters). All meters should be approved by DEWA and comply with DEWA specifications.

A. For all buildings having a cooling load of at least 1 MW or gross floor area of 5,000 m2 or greater, additional water metering must be installed to record consumption data for major water use of the building and major water uses in and around the building.

B. The building operator shall be responsible for recording water consumption for each individual meter. Records must be kept for 5 years.

C. Each individual tenancy in the building must have a sub-meter installed when a building tariff meter is not present.

D. Where a Building Management System (BMS) or Central Control and Monitoring System (CCMS) is installed, metering must be integrated into the system to allow real time profiling and management of water demand and consumption.

E. Virtual meters using run-hours are not acceptable as sub-meters.

F. The sub-meters should be used for demand management and cost allocation purposes

G. For all buildings using recycled water, sub-meters must be installed to monitor the quantity of water utilized.

Refer to Dubai Building Code Part H, H.5.2.6 Water metering for buildings and Part K, K.9.5.1 Water metering and water conservation for villas.

603: Onsite Systems: Recovery & Treatment

603.01 Wastewater Reuse

For Golden and Platinum Sa'fa and for all new buildings, the building must be provided with a system for the

Collection and reuse of greywater including condensate water regardless if it is connected to the sewage system or standalone system (minimum of 15% for Golden, 30% for Platinum).

For all cases and Sa'fa levels, if a system is installed for the collection and reuse of greywater produced within the building or uses Treated Sewage Effluent (TSE) from an external source, the following must be complied:

A. The building must have dual-plumbing system for the collection and recycled use of drainage water (greywater).

Pipes that transport greywater must be color-coded differently from the pipes that are used for potable (drinking standard) water and must be labelled 'Not Suitable for Drinking.'

B. There must be a minimum air break of 25 mm between any potable water sources and greywater collection systems.

C. Greywater can be re-used for irrigation, toilet flushing, cooling towers, or other onsite purposes wherein it will not come into direct contact with the human body. It must also be treated to the standard set forth by Dubai Municipality.

D. Recycling water system must be clearly identified and labelled with appropriate signages as mentioned in Dubai Building Code

For all new commercial car washing facilities, at least 50% of the wastewater generated must be recovered and re-used.

603.02 Water Consumption for Heat Rejection Including Cooling Towers

For all new buildings, Potable water supplied by Dubai Electricity and Water Authority (DEWA) must not be used for heat rejection purposes. The requirements stated in Dubai Building Code Part H, H.5.2.8 Cooling tower water supply.

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Section 7

Resource Effectiveness - Materials and Waste

701: Materials and Resources

701.01 Thermal and Acoustical Insulation Materials

For all new buildings, insulation materials that are installed in the building must:

1. Be manufactured without the use of Chlorofluorocarbons (CFCs).
2. Be non-toxic and does not release toxic fumes during combustion.
3. Have 0.05 ppm or less of added formaldehyde.
4. Have a Threshold Limit Value (TLV) of 0.1 or less of Individual V olatile Organic Compounds.
5. Be fire resistant as per the requirements set forth by Dubai Civil Defence.
6. Thermal Insulation Materials should be certified by Dubai Central Laboratory.
7. Achieve all the requirements set forth by Dubai Municipality.

All thermal and acoustical insulation must be installed as per the manufacturer's instructions and must be approved by Dubai Municipality.

701.02 Certified / Accredited Timber

All new buildings must follow the requirements stated in part B of Dubai Building Code, B.10.6.6 Certified/accredited timber.

701.03 Asbestos Containing Materials

All new buildings must follow the requirements stated in part B of Dubai Building Code, B.10.6.3 Asbestos-containing materials and part K for villas, K.5.10.1 Asbestos-containing materials.

701.04 Lead or Heavy Metals Containing Materials

All new buildings must follow the requirements stated in part B of Dubai Building Code, B.10.6.4 Lead or heavy metals containing material, and part K for villas, K.5.10.2 Lead or heavy metals containing material.

701.05 Ozone Depletion Potential (ODP) Material Management

For all new buildings:

A. Installations of heating, ventilation, and air conditioning (HVAC) and refrigeration equipment must contain refrigerants with zero ozone depletion potential (ODP) or with global warming potential (GWP) less than 100, unless the equipment contains less than 0.23 kg of refrigerant.

B. Fire suppression systems must not contain any ozone-depleting substances (Chlorofluorocarbons [CFCs], Hydro chlorofluorocarbons [HCFCs] or Halons).

For existing equipment:

A. CFC and halon-based materials are not to be used for any purposes.

B. From 1 January 2030, HCFC based materials or any other material having any ODP are not to be used for any purposes.

C. The venting or direct discharging of any refrigerants during equipment maintenance is strictly prohibited.

D. Recovery, reclamation, recycling and reuse of refrigerants must be practiced at all times.

701.06 Recycled Content

All new buildings must follow the requirements stated in part B of Dubai building code, B.10.6.1 Recycled materials, and part K for villas, K.10.1.6.5 Chlorofluorocarbon (CFC) free and ozone friendly materials. For Golden and Platinum Sa'fa, the percentage of recycled content must be 15%.

701.07 Regional Material

Based on cost, at least (10% for silver Sa'fa • 20% for Golden Sa'fa • 30% for Platinum Sa'fa)of building materials shall have been extracted, harvested or recovered, as well as manufactured, within 800 km of the project site.

If only a fraction of a product or material is extracted, harvested, or recovered and manufactured locally, then only that percentage (by weight) can contribute to the regional value.

Mechanical, electrical and plumbing components as well as furniture and specialty items such as elevators shall not be included in this calculation. Only materials permanently installed in the building shall be included.

701.08 Composite Wood Products

All new buildings must follow the requirements stated in part B of Dubai Building Code B.10.6.5 Composite timber products.

702: Waste Management

702.01 Construction and Demolition Waste

For all new buildings except buildings in CBD area, at least 50% by volume or weight of waste material generated during the construction and/or demolition of buildings must be diverted from disposal in landfills. Diverted materials must be recycled or reused.
This shall be implemented as follows:
1. Concrete waste must be diverted to Construction Waste Treatment Plant.
2. Other recyclable materials such as woods, plastics and metals can be re-used at site.
3. Excavated soil, land-clearing debris and hazardous waste must be diverted to places designated by the concerned departments of Dubai Municipality (these materials are exempt while calculating the percentages for recycling or reuse).

702.02 Bulk Waste Collection

For all new residential apartment buildings, an area must be provided for residents to place items of bulky waste such as furniture, electrical appliances and sanitary ware. The requirements stated in part B of Dubai building code, B.8.5.4 Special and bulky waste.

702.03 Waste Storage

All new buildings must follow the requirements stated in part K of Dubai building code, K.5.9.1 Waste storage/ General.

702.04 Waste Collection

All new buildings must follow the requirements stated in part B of Dubai Building code, B.8.5.7 Refuse chutes.

702.05 Recyclable Waste Management Facilities

For all new buildings other than villas, a sorting and storage facility for recyclable materials must be provided. This facility must follow the requirements stated in Part B of Dubai building code, B.8.5.3 Recycling and segregation and B.8.5.2.1 Waste storage rooms/General.