حكومة رأس الخيمة
Government of Ras Al Khaimah

دائـــــرة الـبـلـديـــــة
Municipality Department

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دليـل المجتمعـات المستـدامـة لإمـارة رأس الخيمـة
Ras Al Khaimah Sustainable Community Guidelines

Version 1.1
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DIVISION ONE

Abbreviations & Glossary of Terms

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Abbreviations & Glossary of Terms

101 Abbreviations

CEMP	Construction Environmental Management Plan
CO_2	Carbon Dioxide
COP	Coefficient of Performance
CWMP	Construction Waste Management Plan
e. g.	exempli gratia (for example)
EIA	Environmental Impact Assessment
EPDA	Environment Protection and Development Authority
ESMA	Emirates Authority for Standardization and Metrology
EV	Electric Vehicle
FEWA	Federal Electricity and Water Authority
GFA	Gross Floor Area
i. e.	id est (in other words)
km/h	Kilometre per hour
kW	Kilowatt
kWh	Kilowatthour
LED	Light Emitting Diode
lux	Unit of Illuminance
m	Meter

mm	Millimetre
NOC	No Objection Certificate
RAKEZ	Ras Al Khaimah Economic Zone Authority
PV	Photovoltaic
SRI	Solar Reflective Index
STP	Sewage Treatment Plant
TE	Treated Effluents
TR	Tons of Refrigeration capacity

102 Glossary of Terms

Active Cooling	Use of cooling technologies that rely on electricity or any other energy source to enhance heat transfer.
Adaptive Species	A plant species, not originally part of the natural ecosystem, which has evolved to a point where the environmental conditions such as soil, climate and geology allow for healthy growth with no or minimal irrigation requirements.
Arterial Road / Boulevard	A road that serves the centres of activity of an urban area with a high traffic volume.
Coefficient of Performance	Ratio of the net cooling energy exported from the system to the total electric energy used by the system.
Collector Road	A road that collects traffic from local subdivision areas and channels it into the arterial system.
Commissioning Agent	Person or entity who ensures the proper design and installation of energy and water infrastructure so that it can operate in conformity with the design intent of a project.
Community Focal Points	Amenities or other valuable community assets where residents and/or visitors gather and spend time i.e. shopping mall, community pool, main square.
Competent Authority	Any organization that has the jurisdiction and authority to implement the Sustainable Community Guidelines.
Connectivity	A measure of how well streets, sidewalks and/or cycling tracks are connected.
Construction Stage	The execution phase of the project components, such as building a structure and laying infrastructure, as per approved masterplan. Construction activities may vary from earthworks, site grading, excavation, cut and fill, and drainage works to repair, alter or addition to an existing premise.
Construction 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 Waste.
Control Systems	Controls that allow users to change and/or adjust the level of lighting and air conditioning in a space.
Cooling Load	The amount of heat energy that would need to be removed from a space to maintain the temperature of the space in an acceptable range.
Crosswalk	The horizontal portion of roadways, usually at intersections, reserved for pedestrian and/or cycle crossing; it may be marked or unmarked.
Cycle Lane	A cycle lane is a one-way Cycling Facility marked on a road surface which travels with the flow of traffic within the Right of Way which demarcates space on the road reserved for cycling.
Cycle Track	A cycle track is an off-road Cycling Facility reserved exclusively for cycling that can be either one-way or two-way.
Cycling Facility	Physical infrastructure that facilitates, accommodates and encourages cycling.
Detailed Design Stage	The final masterplan stage that incorporates all of the findings of the project initial/concept stage, consolidates project information and provides a clear strategy to develop the project within a timeline and achieve the project masterplan goals. It is a comprehensive planning stage to guide the spatial/physical development based on the identified objectives, strategies and phasing implementation. It includes details of the project policies and principles, through land use plan, social and physical infrastructure provision, distribution and network (community facilities, open space, services, utilities and transportation) and development guidelines and regulations.
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.
Electric Vehicles (EV)	A vehicle which has the capability to be propelled by electrical energy either as its sole form of propulsion, or in combination with other forms of propulsion.
Electric Vehicle (EV) Charging Station	A general term that refers to an operational site used for charge electric vehicle batteries.

Electric Vehicle Infrastructure (EVI)	A general term to describe all of the fixed Items that are required to be installed to create an EV charge point
Electric Vehicle Supply Equipment	The electrical items of EVI equipment that are supplied as products that are connected to the fixed electricity supply (including cable assemblies)
Emissivity	The material's effectiveness in emitting energy as thermal radiation. It is expressed as a parameter with values between 0 and 1.
Environmental Impact Assessment	Detailed study to determine the type and level of impacts an existing or proposed project has or would have on its natural environment.
Environmental Sensitive Areas	Areas which are vital to the long-term maintenance of biological diversity, soil, water or other natural resources both on the site and in a regional context.
Exercise Track	Safe and convenient public realm dedicated for walking, running and jogging with a design that is consistent and appropriate to the character of the area.
Freeway	A highway with at least 2 lanes in each direction, designed for high-speed traffic.
Greywater	Wastewater without human excrement contamination that is generated in residential, public or commercial buildings. Sources of Greywater include sinks, showers, bathtubs, clothes washing machines, dish washing machines and other kitchen appliances.
Habitat	Area in which a particular plant or animal lives. Often used in the wider sense referring to major assemblages of plants and animals found together.
Hardscape	Man-made, non-vegetated features used in landscape architecture in public areas, e.g. paths or walls.
Hazardous Waste	Any waste material that can cause substantial harm to humans, properties or to the environment due to its inherent hazardous characteristics.
Implementation Date	The effective date upon which the Sustainable Community Guidelines enters into force.

Infrastructure Commissioning	A systematic quality assurance process to ensure the energy and water infrastructure systems are designed, installed and tested as per the design intent, contract documents and the owner's operational needs.
Landscape	The planting of trees, ground cover, shrubbery and other plant material (Softscape), as well as the provision of man-made, non-vegetated features (Hardscape) that serve an aesthetic or functional purpose.
Light-Emitting Diode (LED)	A semiconductor device that emits incoherent narrow-spectrum light.
Light Industries	Low impact industries which provide a domestic or community scale service or produce or repair household consumer goods. Examples of Light Industries are local scale car wash facilities, ironing services and car garages.
Local Road / Street	A road that provides direct access to abutting land and serves as access to the higher order system.
Main Development Regulations Committee	Committee that analyses and approves new community developments for projects under the jurisdiction of Ras Al Khaimah Municipality.
Masterplan Stage	The initial planning stage to collect and validate the project data, evolve the project's vision, goals and objectives and formulate the spatial framework.
Microclimate	The climate of a small area and/or confined space such as urban communities, which may be different from that in the general region.
Native Species	A plant species that occurs naturally within a region or ecosystem, with no human intervention.
New Large Scale Community	A planned community or an expansion of an existing community with at least 1,000 residents.
New Small Scale Communities	A new community or an expansion of an existing community with less than 1,000 residents.
No Objection Certificate (NOC)	Legal document, issued by government entities, stating that they do not object to the covenants of the certificate.
Non-Potable Water	Water that is not suitable for human consumption such as Greywater, recovered condensate water or Treated Sewage Effluent.

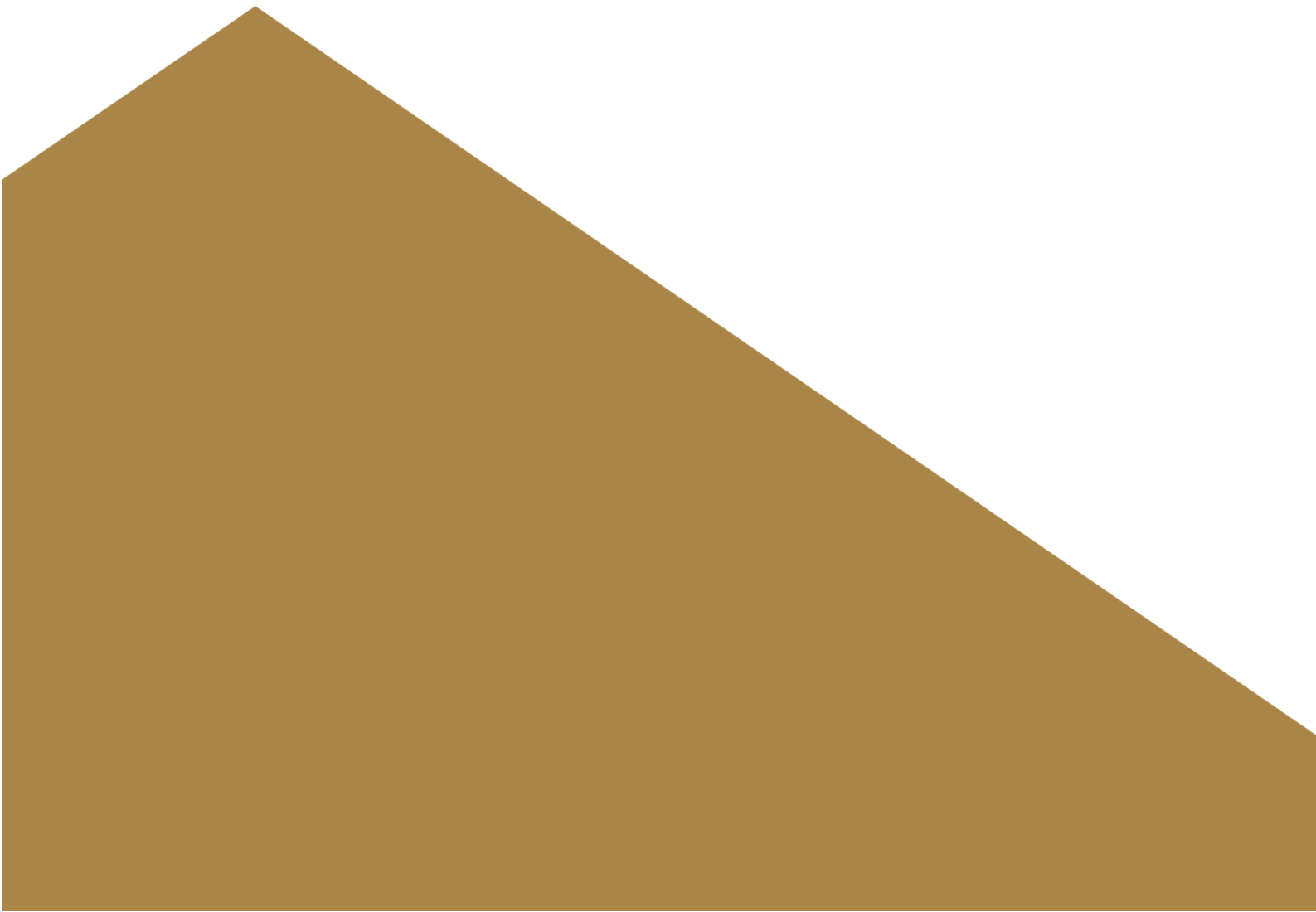
Passive Cooling	Design strategies that minimize the need for mechanical cooling systems.
Paved Areas	Pedestrian sidewalks, Cycle Tracks, Exercise Tracks, parking spaces, plazas, Sikkas and any other hardscape areas, excluding roads.
Pedestrian	Person walking or travelling by means of a wheelchair, electric scooter, crutches or other walking devices or mobility aids.
People of Determination	People who have a physical or mental impairment that has a substantial and long-term adverse effect on his or her ability to carry out normal day to day activities. These impairments can affect different areas such as mobility and physical coordination.
Photovoltaic (PV)	A power system designed to supply usable electric power by means of photovoltaics.
Planning Approval	Approval given by the Competent Authority for the design of a masterplan.
Potable Water	Water that is suitable for human consumption.
Productive Plants	Plants which produce products of nutritional value such as, for example, date palms.
Public Realm	The streets, squares, parks, green spaces and other outdoor places that require no key to access them and are available, without charge for everyone to use.
Recycling	The processing of used materials into new products in order to prevent the waste of potentially useful materials and reduce the need for waste disposal.
Reflectivity	A measure of the ability of a material to reflect solar energy from its surface back into the atmosphere. It is expressed as a parameter with values between 0 and 1.
Reuse	Any activity that extends the life of an item, typically consisting of returning the item to active use in the same or related capacity.
Shared / Public Amenities	Buildings and structures intended to make life more pleasant, convenient or comfortable for residents and visitors such as shopping malls or swimming pools.

Shared Lane / Mixed Traffic Facility	A Shared Lane is an on-road facility with no demarcation between bicycles and other vehicular traffic. Used on local road s with lower traffic speeds and volumes, and which are not wide enough to accommodate cycle lanes.
Sidewalk	Pedestrian realm that enables walking along the streets, and that is connected by Crosswalks. Suitable sidewalks designs are consistent and appropriate to the character of the area.
Sikka	A pedestrian passageway between properties common throughout the Emirate. No motor vehicles are accommodated in a Sikka, however bicyclists may share this space with pedestrians.
Softscape	The planting of trees, ground cover, shrubbery and other plant material as part of landscape architecture in public areas.
Solar Reflectance Index (SRI)	An index that combines Reflectivity and Emissivity, measuring a material's ability to reject solar heat. Materials with higher SRI absorb less heat and can reduce the Urban Heat Island Effect.
Stormwater Management Plan	Action plan to handle or reduce the excess runoff water created during precipitation events.
Subsoil Irrigation	Uniform application of small quantities of water at frequent intervals below the soil surface from discrete emission points or line sources.
Through Zone	The main area within the pedestrian realm, where pedestrians travel. The pedestrian realm is the area between the curb and the boundary of right-of-way that is accessible to pedestrians.
Treated Effluent (TE)	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).
Urban Farming	Growing or producing food in a community for sharing or commercialization within the community.
Urban Heat Island Effect	The phenomenon of warmer temperatures in urban and/or developed areas compared to adjacent undeveloped areas due to the retention of solar energy in constructed surfaces. Examples of surfaces that contribute to the Urban Heat Island

	Effect are paved streets, Sidewalks, parking lots and buildings.
Waste Segregation	Separation of waste according to different categories such as organic, metal, glass, paper.
Wastewater Treatment Plant	A facility used to purify sewage effluents to produce Treated Effluent.

DIVISION TWO

Preambles



DIVISION TWO

Preamble

201 General

The guidelines outlined in this document are applicable to the entire Emirate of Ras Al Khaimah and shall be known and cited as Sustainable Community Guidelines. They are referenced to in this document as ‘the Guidelines’.

201.01 Purpose

The Ras Al Khaimah Vision 2030 aims to create prosperous, happy and cohesive communities, contributing to a sustainable Emirate. The Guidelines intend to support this vision by promoting pedestrian friendly streets and public spaces which bring people together and support local businesses, while reducing energy and water consumption and environmental impact. This is in line with the Ras Al Khaimah Vision 2030, positioning Ras Al Khaimah as a competitive and sustainable destination with distinguished public service standards.

The Guidelines aim to improve the sustainability of urban developments in Ras Al Khaimah by achieving the following objectives:

Reduce demand of energy and water, reduce waste and increase generation from renewables

Support modernization of infrastructure and promote sustainable means of transportation

Create attractive and environment-friendly places to live and work, promoting an increased use of outdoor spaces and strengthening the economic potential of communities

The following underlying principles are to be taken into account when adopting the Guidelines:

- Communities should be designed so that ecosystems are preserved, i. e. able to function properly and are in good health for future generations.
- The design should seek economic, social and environmental outcomes simultaneously. Any significant increase in investment costs should be evaluated against operational savings and indirect benefits. For example, designing efficient and attractive communities, which consider the needs of residents and visitors, might result in increased property values, lower vacancy rates and higher visitor traffic, with positive economic impact, which add to the direct benefits for residents driven by lower utility costs.

- The design solutions should be practical and easy to implement. The supply market should also be considered to ensure products and solutions are available. Preference should be given to sustainable and efficient technologies and products from local and regional suppliers.

201.02 Jurisdiction and Competent Authority

The Guidelines are applicable to the entire Emirate of Ras Al Khaimah and compliance is evaluated by the Competent Authorities. The regulatory effect of the Guidelines will be in accordance with Article 201.07.

Ras Al Khaimah Municipality is the Competent Authority for the application of the Guidelines within the jurisdiction of Ras Al Khaimah Municipality. The economic and free zone authorities, such as RAKEZ and Maritime City are the Competent Authorities for the application of the Guidelines within their jurisdiction.

201.03 Compatibility with Existing Guidelines and Regulations

The Guidelines form part of the urban planning regulations (standards and codes) for the Emirate of Ras Al Khaimah.

The provisions within the Guidelines shall supersede the provisions of any pre-existing guidelines in case of conflict, without any effect on the continuing validity of the remaining non-conflicting provisions of the pre-existing guidelines. When the requirements of the Guidelines differ from the requirements of local and/or with federal laws, the requirements of the local and/or of the federal laws will prevail.

201.04 Community Typology

For the purpose of the Guidelines, communities are classified as follows:

Community Type	New Large Scale Community	New Small Scale Community	Existing Community
Definition	A new community or an expansion of an existing community with at least 1,000 residents	A new community or an expansion of an existing community with less than 1,000 residents	Any existing community
Usage (for all community types)	Residential		
	Commercial		
	Mixed-Use		
	Industrial		

Figure 1 Community Types

201.05 Structure of the Guidelines

The Guidelines are divided into four categories as represented in Figure 2.

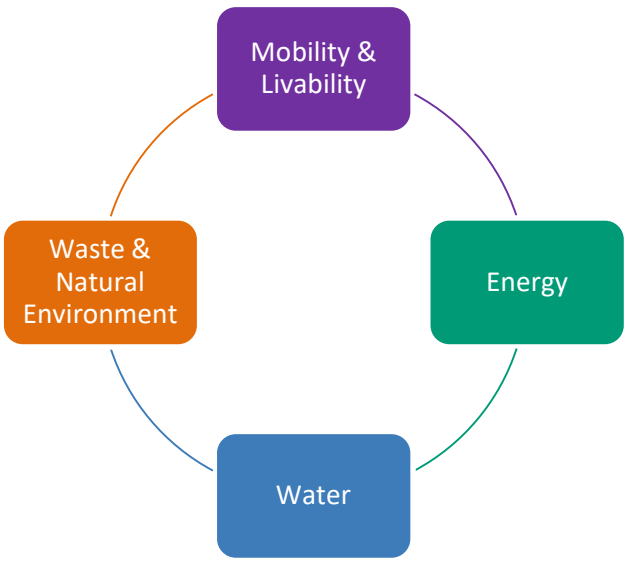


Figure 2 Categories of Provisions within the Guidelines

The categories include several provisions, each provision describing one or more Items.

The description of every provision is structured as follows:

A. **Intent:** This section provides a brief of the intention behind implementing the provision.

B. **Item:** This section lists the number of items covered by the provision. It clarifies their type, the stage in the development process when compliance is assessed, to which community type it applies, and the number of points that can be achieved for each item.

C. **Requirements:** This section describes the requirements which must be fulfilled in order to achieve compliance with the Item(s).

D. **Evidence:** This section details the documentary evidence that is required to prove compliance with the Item(s). The specified evidence shall be submitted to the Competent Authority over the course of the submission process described in Chapter 202 of this document.

201.06 Scope of Application & Approach

The Guidelines are designed for New Large Scale Communities, as some of the requirements may not be applicable for Existing and/or New Small Scale Communities. However, those types of communities may elect to apply the Guidelines or to apply part of the Guidelines on a case-by-case basis.

The Guidelines contain two types of Items: Core and Core Plus Items. Core Items address key aspects which significantly enhance livability and mobility, lower the energy and water consumption, and address key environmental aspects. Core Items are expected to have a low cost impact and are considered the minimum for New Large Scale Communities to be compliant with these Guidelines. Core Plus Items are additional Items which allow for a more holistic approach towards sustainable communities but may also result in a higher cost impact. Therefore, Core Plus Items are intended for communities which aim to excel in sustainability, and those communities are rewarded with points for complying with Core Plus Items.

Application of the Guidelines may be regulated by circulars issued by the Competent Authority, which may mandate some of the Items, may provide benefits for exceeding a certain number of points, and may detail aspects of the submission process. In absence of such circulars, adoption of the Guidelines remains voluntary.

202 Submission Process

Compliance with the Guidelines is to be demonstrated during a) the masterplan stage, b) as part of the detailed design of the transportation and utility infrastructure and public realm and c) during construction stage. Sustainability aspects of the design and construction of buildings are not part of the Guidelines, but are covered by Barjeel, the Green Building Regulations of Ras Al Khaimah.

Figure 3 Submission Process

The design evidence relevant to the Guidelines is to be submitted, along with other documents and drawings as per the requirements of the Competent Authority, at the masterplan and detailed design stage. The relevant sections demonstrating compliance with the Guidelines are to be clearly highlighted in documents, calculations and drawings. The applicant should ensure that the project fulfils all applicable requirements of the Guidelines without any conflict and/or contradiction with other documents and drawings required by the Competent Authority.

The construction stage evidence shall be recorded on a continuous basis during construction. The recorded evidence must be submitted to the Competent Authority upon request. The Competent Authority may conduct site visits at any time to review and verify compliance with the Guidelines.

Compliance with the Guidelines is evaluated for each Item of the Guidelines based on a substantial fulfilment of the requirements in light of the intent of the Item.

DIVISION THREE

Livability & Mobility

DIVISION THREE

Livability & Mobility

301 Cyclist and Pedestrian Supportive Design

Intent

Provision of pedestrian and cycling facilities in communities helps reduce dependency on motorized vehicles, resulting in lower CO_2 emissions. It also promotes health benefits among residents and visitors, reduces traffic congestion and increases the value of leisure amenities.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Pedestrian Networks and Safe Crosswalks	Core	All	Masterplan & Detailed Design	N/A
B. Parking for People of Determination	Core	All	Masterplan & Detailed Design	N/A
C. Cycling Facilities	Core Plus	All	Masterplan & Detailed Design	6
D. Exercise Tracks	Core Plus	Residential and Mixed-Use	Masterplan & Detailed Design	2

Requirements

Masterplan & Detailed Design

A. Pedestrian Networks and Safe Crosswalks

Compliance with this Item is achieved through implementation of the following measures:

(a) Design adequate pedestrian sidewalks, sikkas and safe crosswalks considering the estimated pedestrian movement, the traffic speed and volume, and any corridor restrictions due to the available right-of-way and/or due to infrastructure provision.

(b) At a minimum, pedestrian networks connect to Community Focal Points, such as shopping malls, mosques, schools, parks etc. In Emirati neighbourhoods, pedestrian facilities ensure that mosques are within a 350 m walking distance.

(c) Pedestrian networks adhere to the following design criteria, unless specified otherwise by the Competent Authority:

- Provision of circulation on both sides of the road, wherever possible. It is acceptable to provide a paved sidewalk on one side of the road and an unpaved sidewalk on the other side.
- The pedestrian sidewalks are wide enough to allow accessibility for people with mobility aids on at least one side of the road.
- The surface materials gives a firm, smooth, slip resistant and stable finish. The surface allows the passage of mobility aids on at least one side of the road.
- The through zone of the pedestrian sidewalks are obstacle-free and remain horizontally and vertically clear.
- Provision of suitable ramps where required in order to facilitate travel for people with mobility aids
- Provision of safe crosswalks. Un-signalised zebra or tiger crossings are suitable for Local Roads with a speed limit of up to 40km/h. The zebra or tiger crossings should be elevated or semi-signalled if the speed limit is from 41km/h to 60km/h, or if the Local Road is located in particularly vulnerable areas, such as next to schools, to increase the safety of the crossings. Signalised crossings, pedestrian overpasses and/or underpasses are suitable for roads with higher speed limits, such as Arterial Roads and Collector Roads.
- Provision of adequate streetlights, pedestrian traffic signs, surface markings and/or paving symbols. Avoid uplighting for streetlights, where possible, to limit pollution of the night sky.

Non-walkable roads, such as Freeways and roads designed for goods movement (truck routes) do not require pedestrian sidewalks. However, safe pedestrian overpasses and/or underpasses might be required to connect pedestrian networks of communities located adjacent to the non-walkable roads.

B. Parking for People of Determination

Compliance with this Item is achieved through implementation of the following measures:

(a) Parking spaces for People of Determination are provided for parking within the Public Realm according to Table 1. The parking spaces are clearly labelled with information signs, surface markings and/or paving symbols. Adequate access is provided from the dedicated parking spaces to the pedestrian sidewalks.

Table 1 Parking Spaces for People of Determination

No. of Parking Spaces in the Public Realm	No. of Parking Spaces for People of Determination
≤ 200	1 every 33 parking spaces
200 to 1,000	1 more every 100 parking spaces
> 1,000	1 more every 200 parking spaces

C. Cycling Facilities

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Design adequate cycling facilities considering the estimated cycling demand, which will be influenced by the land use context and the location, the traffic speed and volume, and any corridor restrictions due to the available right-of-way and/or due to infrastructure provisions.

(b) The cycling facilities adhere to the following design criteria, unless specified otherwise by the Competent Authority:

- Shared lanes, i.e. on-road cycling facilities with no demarcation between bicycles and other vehicular traffic, are allowed for Local Roads with a low traffic volume (up to 20,000 vehicles per day) and with a speed limit of no more than 30 km/h. Shared lanes can also be introduced for Local Roads with a higher traffic volume and/or speed limit, if the Competent Authority recognizes that there is not sufficient width to accommodate cycling lanes
- Cycling lanes, i.e. one-way cycling facilities marked on a road surface, are suitable for Local Roads with a low to medium traffic volume (up to 40,000 vehicles per day) and a speed limit of no more than 60km/h.
- Cycling tracks, i.e. off-road cycling facilities reserved for cycling, are suitable for Local Roads, Collector Roads or Arterial Roads. Cycling tracks are physically separated from the motor traffic and a buffer zone is provided between the cycling track and the carriageway.
- The cycling facilities connect to adjacent cycling facilities in neighbouring communities. If there are no adjacent cycling facilities, the design allows for future connections to neighbouring communities.
- The surface materials of cycling facilities give a firm, smooth, slip-resistant and stable finish. The surface allows the passage of bicycles or other wheeled small vehicles such as scooters.
- Safe crosswalks are provided along the cycling facilities (refer to 301 Cyclist and Pedestrian Supportive Design Item A – Pedestrian Networks and Safe Crosswalks). The crosswalks can be shared with pedestrians
- Provision of adequate streetlights, cycling traffic signs, surface markings and/or paving symbols. Avoid uplighting for streetlights, where possible, to limit pollution of the night sky.
- Bicycle parking are provided at Community Focal Points located within the public realm such as parks, playgrounds and plazas.

D. Exercise Tracks

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Design exercise tracks for recreational athletic activities such as running and walking. The surface of the running and walking tracks is made of materials with non-slip qualities and shock absorption in order to promote stability and prevent injuries.

Evidence

Masterplan

A. Pedestrian Networks and Safe Crosswalks

- Site plan indicating Community Focal Points, pedestrian sidewalks, safe crossing facilities and walking distances to mosques
- Technical note analysing the feasibility of pedestrian networks. The technical note includes the estimated traffic speed and volume, and any corridor restrictions by the available right-of-way and/or by infrastructure provisions.

B. Parking for People of Determination

- Site plan indicating parking spaces reserved for People of Determination

C. Cycling Facilities
- Site plan indicating cycling facilities and type, safe crossing facilities and connection to neighbouring cycling networks
- Technical note analysing the feasibility of cycling facilities. The technical note includes the estimated cycling demand, traffic speed and volume, and any corridor restrictions by the available right-of-way and/or by infrastructure provisions.

D. Exercise Tracks
- Site plan indicating the exercise tracks

Detailed Design

A. Pedestrian Networks and Safe Crosswalks
- Cross sections and details of the roads, pedestrian walkways and crosswalks

B. Parking for People of Determination
- Detailed drawings of the parking spaces reserved for People of Determination

C. Cycling Facilities
- Cross sections and details of the roads, pedestrian walkways (if applicable), cycling facilities and crosswalks

D. Exercise Tracks
- Exercise track details

302 Outdoor Thermal Comfort

Intent

Ensuring comfortable outdoor environments during the warmer months helps enhance quality of life for residents and visitors as well as increases the economic potential of commercial activities with outdoor facilities.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Shading Study	Core	Residential, Commercial, Mixed-Use	Masterplan	N/A
B. Outdoor Thermal Comfort Study	Core Plus	Residential, Commercial, Mixed-Use	Masterplan	6
C. Shading of Priority Areas	Core	Residential, Commercial, Mixed-Use	Detailed Design	N/A
D. Urban Heat Island Reduction	Core	Residential, Commercial, Mixed-Use	Detailed Design	N/A
E. Outdoor Thermal Comfort Design	Core Plus	Residential, Commercial, Mixed-Use	Detailed Design	6
F. Shading of Pedestrian and Cycling Facilities	Core Plus	Residential, Commercial, Mixed-Use	Detailed Design	4

Requirements

Masterplan

A. Shading Study

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Conduct a shading study, which identifies priority areas and suitable means for shading. Consider the expected level of pedestrian movement and expected length of stay in the study.

Examples of priority areas are:

- Highly frequented pedestrian sidewalks, cycling facilities and exercise tracks
- Highly frequented crosswalks
- Highly frequented plazas or other gathering areas
- Highly frequented playgrounds
- Benches and gathering areas in parks

The following options are considered suitable means of shading:

- Shading structures and devices for public realm and open space areas such as free standing shading systems or shading umbrellas
- Overhang attachments to building facades
- Recess or setback of frontages on the ground level to create a shaded space for pedestrians
- Vegetation such as trees
- Shading provided by adjacent buildings or structures

B. Outdoor Thermal Comfort Study

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Analyze the outdoor thermal comfort in a detailed study, which includes, at a minimum, the following:

- Microclimate analysis throughout the year
- Analysis of use and function of outdoor spaces
- Recommended microclimatic adaptation measures for improving outdoor comfort such as:
  - Orientation and massing of the buildings
  - Street planning
  - Shading
  - Landscaping
  - Wind funnelling
  - Active cooling
  - Highly reflective surfaces

Detailed Design

C. Shading of Priority Areas

Compliance with this Item is achieved through implementation of the following measures.

(a) Design specific shading measures for the priority areas as identified in the shading study (refer to 302 Outdoor Thermal Comfort Item A – Shading Study). Evaluate the effectiveness of the shading measures for the time of the day when people benefit most from being able to use the outdoor space.

(b) If shading is provided by vegetation, the vegetation does not inhibit sight lines at junctions and driveways and does not pose slip hazards. Tree canopies are at least 2.2 m high if trees are located over the path of travel. Additionally, the water demand and the effectiveness of the provided shade is considered. Therefore, trees with large canopies and a low water demand should be preferred. Shade from trees is measured at five (5) year growth.

(c) Where cover is provided by structures, such as canopies or other architectural elements, the outer surface of the shading element has a minimum Solar Reflectance Index (SRI) as per Table 2.

Table 2 Minimum SRI

Description	Slope	Minimum SRI
Low-sloped roof	≤ 2:12	70
Steep-sloped roof	> 2:12	29

D. Urban Heat Island Reduction

Compliance with this Item is achieved through implementation of the following measures:

(a) Design a minimum of 50% of the Paved Areas within the public realm using a combination of the following:

- Use paving materials with an SRI of at least 29
- Provide shade with vegetated structures
- Provide shade with structures covered by energy generation systems
- Provide shade with architectural devices or structures with an SRI as per Table 2
- Use an open grid paving system or pigmented paving

E. Outdoor Thermal Comfort Design

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Design the infrastructure and public realm as per the recommendations of the outdoor thermal comfort study.

F. Shading of Pedestrian and Cycling Facilities

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Shade at least 50% of all pedestrian sidewalks (2 points) and/or cycling facilities (1 point) and/or exercise tracks (1 point). The shaded pedestrian walkways and/or cycling facilities allow for a continuous route to Community Focal Points. Shade spots are provided at crosswalks which are connecting shaded pedestrian sidewalks and/or cycling facilities.

(b) If shading is provided by vegetation, the vegetation does not inhibit sight lines at junctions and driveways and does not pose slip hazards. Tree canopies are at least 2.2 m high if trees are located over the path of travel. Additionally, the water demand and the effectiveness of the provided shade is considered. Therefore, trees with large canopies and a low water demand should be preferred. Shade from trees is measured at five (5) year growth.

(c) Where cover is provided by structures, such as canopies or other architectural elements, the outer surface of the shading element has a minimum Solar Reflectance Index (SRI) as per Table 2.

Evidence

Masterplan

A. Shading Study
- Site plan highlighting the identified priority areas
- Summary of the shading study:
  - Methodology used to choose the priority areas
  - Shading means to be used

B. Outdoor Thermal Comfort Study
- Copy of the outdoor thermal comfort study

Detailed Design

C. Shading of Priority Areas
- Detailed design of the shading measures for the priority areas

D. Urban Heat Island Reduction
- Detailed design of the selected measures to reduce the urban heat island
- Calculation of the total hardscape area, excluding roads, and the hardscape areas compliant with the heat island reduction measures

E. Outdoor Thermal Comfort Design
- Detailed design of the outdoor thermal comfort measures

F. Shading of Pedestrian and Cycling Facilities
- Detailed design of the shading measures

303 Provision of Amenities

Intent

Providing essential amenities located within a walking distance ensures a high quality of life and decreases motorized vehicle dependency, resulting in lower CO_2 emissions.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Provision of Amenities	Core	All	Masterplan	N/A

Requirements

Masterplan

A. Provision of Amenities

Compliance with this Item is achieved through implementation of the following measures.

(a) Assess the residents' needs for Shared / Public Amenities located within the planned community. The assessment considers the projected demographic data of the planned community, such as population size, age, gender, religion and nationalities.

It also analyses which Shared / Public Amenities, located in neighbouring communities, can serve the future residents and therefore are not required in the planned community. Hereby, the amenity's purpose is being considered to determine whether it should be reachable by walking, cycling or by car. For example, small grocery stores should be reachable on foot in a high-density community. Therefore, small grocery stores in neighbouring communities are not considered in the evaluation if they cannot be reached on foot. The Competent Authority reserves the right to approve the assessment.

(b) Provide Shared / Public Amenity areas according to the outcome of the assessment. Shared / Public Amenity areas may include but are not limited to the following types:

Table 3 Amenity Areas

Shared / Public Amenities Areas	Potential Amenity Types within the Amenity Areas
Public Transportation	• Bus stop • Taxi stop
Education	• Kindergarten • Primary school • Preparatory school or intermediate school • Secondary school
Health	• Pharmacy • General clinic • Medical center • General hospital • Specialty hospital
Religious Service	• Mosque • Mosala Eid
Commercial	• Daily commercial • Neighbourhood commercial center • District commercial center • Specialized commercial center
Social	• Nursery • Majlis • Public plaza • Community service center • Social club • Wedding hall
Recreational	• Residential park • Neighbourhood park • District park • Sector park • Playground
Cultural Service	• Library • Museum • Art gallery
Security	• Local police center
Civil Defence	• Civil defense center
Postal Service	• Sub post office • Main post office
Light Industries	• Car wash facility • Small workshops • Tradesmen depot

Evidence

Masterplan

A. Provision of Amenities

- Summary of the assessment including:
  - An overview of the demographic profile and the resulting needs for amenities
  - List of amenities located in neighbouring communities serving the residents
  - Conclusion on which amenity zones should be provided
- Masterplan illustrating the amenity zones and identifying relevant amenities located in neighbouring communities

304 Noise Abatement

Intent

Limiting traffic and noise impact of light industrial facilities in residential and mixed communities, avoids disturbance to residents and negative impact on their quality of life.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Location of Light Industries	Core	Residential	Masterplan & Detailed Design	N/A
B. Noise Study	Core Plus	Residential and Mixed Use	Masterplan & Detailed Design	2

Requirements

Masterplan & Detailed Design

A. Location of Light Industries

Compliance with this Item is achieved through implementation of the following measures:

(a) Locate light industries, which serve the community's needs as identified in Item 304, in a designated light industrial zone. The light industrial zones are adjacent to non-residential amenity zones wherever possible.

(b) Conduct a noise study if the light industrial zone shares a boundary with any residential zone and implement the recommended noise abatement measures. The noise abatement measures ensure compliance with the maximum allowable noise levels as per the UAE Cabinet Decree No (12) of the year 2006 (listed in Table 4).

Table 4 Maximum Allowable Noise Levels in Different Areas

Area	Allowable Noise Level (dB)	
	Day (7am to 8pm)	Night (8pm to 7am)
Residential area with light traffic	40 - 50	30 - 40
Residential area in downtown	45 – 55	35 - 45
Residential area which includes workshops and commercial business or Residential areas near highways	50 - 60	40 - 50
Commercial areas & downtown	55 - 65	45 - 55
Industrial areas (heavy industry)	60 - 70	50 - 60

B. Noise Study

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Conduct a noise study for the community. The noise study analyses the noise impact and feasible noise abatement measures for current and future roads with a high traffic volume such as Freeways, Arterial Roads and Collector Roads. The noise abatement measures ensure compliance with the maximum allowable noise levels as per the UAE Cabinet Decree No (12) of the year 2006 (listed in Table 4).

(b) Implement the recommended noise abatement measure(s) to ensure compliance with the maximum allowable noise level.

Evidence

Masterplan

A. Location of Light Industries
- Site plan indicating the light industrial zones and the adjacent zones
- Noise study report (if applicable)

B. Noise Study
- Noise study report

Detailed Design

A. Location of Light Industries
- Detailed design of the noise mitigation measures (if applicable)

B. Noise Study
- Detailed design of the noise mitigation measure(s)

305 Communal Public Space

Intent

Providing public use spaces where residents can gather and interact at no cost increases the well-being and encourages a more active citizenship.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Public Use Spaces	Core Plus	Residential and Mixed Use	Masterplan	1-2

Requirements

Masterplan

A. Public Use Spaces

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Provide at least one (1 point), or more (2 points) of the following public use spaces to encourage people to interact and to congregate. Examples of such public use spaces are, but are not limited to:

- Urban farm/community garden which can be accessed by all residents
- Community physical activity spaces
- Park
- Car free street or car free zone with appropriate shading measures and in areas where active frontages exist and where high pedestrian movement is expected. Temporary car free zones, e.g. for street market, can be located in streets with access control to restrict vehicles from entering during a specific time.

Evidence

Masterplan

A. Public Use Space

- Site plan indicating the public use spaces

DIVISION FOUR

Energy

DIVISION FOUR
Energy

401 Optimized Energy Performance

Intent

Reducing energy consumption and adopting renewable energy reduces overall energy costs and dependence on carbon-intensive fossil fuels for power generation. As renewable energy produces little to no greenhouse gases, increasing its supply also contributes to mitigating climate change.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Energy Strategy	Core	All	Masterplan	N/A
B. Renewable Energy Space Allocation	Core Plus	All	Masterplan	2
C. Energy Efficient Community Design	Core Plus	All	Detailed Design	4
D. Renewable Energy Share	Core Plus	All	Detailed Design	1-10

Requirements

Masterplan

A. Energy Strategy

Compliance with this Item is achieved through implementation of the following measures.

(a) Develop an energy strategy for the community. The energy strategy analyses the following aspects:

- The total estimated energy demand for the community and for the public realm. The total estimated energy demand includes all major energy uses. Major energy uses could be, but are not limited to, buildings, street and exterior lighting, pumping systems, district cooling systems and wastewater treatment plants. Consider the energy efficiency measures mandated by Barjeel, the Green Building Regulations of Ras Al Khaimah, when estimating the buildings' energy demand
- Community-level energy efficiency strategies, which aim to reduce the overall energy demand of the community

- Feasibility study for renewable energy systems, to supply part of the community's energy demand. The renewable energy systems serve the community and can be located within the community or in proximity to the community
- For communities with a cooling load density of more than 10,000 refrigeration tons per square kilometre (TR/km^2), conduct a techno-economic feasibility study, comparing centralized cooling systems with various kinds of building level cooling systems in terms of market price and cost for users. To determine the community's cooling load density, assume 1 TR per 35 m^2 of planned GFA. The study considers all capital investments including civil works, equipment, electrical load payments, differences in utility connection infrastructure, and operating costs including maintenance, utilities consumption, and replacement costs for equipment with lifetime less than 15 years
- Payback time calculations for the energy efficiency measures and renewable energy systems

For the purpose of the Guidelines, the following systems are classified as renewable energy systems:

- Community scale renewable energy plant, including, but not limited to, photovoltaic power plant, concentrated solar power plant and biomass power plant
- Integrated renewable energy systems such as photovoltaic street and exterior lighting and solar carports

The feasibility study for renewable energy systems considers the following:

- Estimated energy generated by renewable energy plants
- Share of the annual energy consumption of the public realm that would be supplied by renewable energy plants
- Space requirement for community scale renewable energy plants

B. Renewable Energy Space Allocation

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Provide space for community scale renewable energy plants in line with the recommendations of the energy strategy.

Detailed Design

C. Energy Efficient Community Design

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Incorporate the energy efficiency measures in the detailed design of the community in line with the recommendations of the energy strategy.

D. Renewable Energy Share

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Design the community scale renewable energy plants and/or the integrated renewable energy systems in line with the recommendation of the energy strategy. The number of points depends on the share of the public realm's annual energy consumption covered by renewable energy systems as shown in Table 5.

Table 5 Renewable Energy Share of Public Realm's Annual Energy Consumption

Required Share	Number Points for Item D
1% to ≤ 3%	1
3% to ≤ 5%	2
5% to ≤ 10%	4
10% to ≤ 15%	6
15% to ≤ 20%	8
> 20%	10

Evidence

Masterplan

A. Energy Strategy

- Copy of the energy strategy

B. Renewable Energy Space Allocation

- Site plan indicating the location(s) of community scale renewable energy plant(s)

Detailed Design

C. Energy Efficient Community Design

- Detailed design of the recommended energy saving measures

D. Renewable Energy Share

- Detailed design of community scale renewable energy plant(s) and/or integrated renewable energy system(s)
- Annual generation capability in kWh of each community scale renewable energy plant(s) and/or integrated renewable energy system(s)

402 Electric Vehicles

Intent

Ensuring availability of EV charging stations in public parking spaces encourages adoption of Electric Vehicles (EVs) and plug-in hybrid vehicles.

EVs emit lower greenhouse gases than conventional vehicles. Therefore, EVs improve air quality of urban areas and can contribute to mitigating climate change.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. EV Infrastructure	Core	All	Detailed Design	N/A
B. EV Charging Stations	Core Plus	All	Detailed Design	4

Requirements

Detailed Design

A. EV Infrastructure

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Provide the infrastructure for a future installation of EV charging stations at public parking spaces as per Table 6, by considering the electrical load for future EV charging stations and providing the electrical cabling. The public parking spaces considered for the future installation of EV charging stations are separate from those reserved for People of Determination.

Table 6 EV Infrastructure

No. of Public Parking Spaces	No. of EV Infrastructure Provisions
0 - 49	1
50 - 99	2
100 - 199	4
200 - 400	6
> 400	8 + 1 for each 100 parking spaces above 400 parking spaces

B. EV Charging Stations

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Install EV charging stations at all public parking spaces with an EV infrastructure provision as per Table 6.

Evidence

Detailed Design

A. EV Infrastructure Provision

- Site plan indicating the parking spaces allocated for future EV charging
- Electrical drawings and load calculations

B. EV Charging Stations

- Site plan indicating the locations of EV charging stations
- Specifications of the EV charging stations

403 Efficient Lighting

Intent

Energy-efficient street and exterior lighting consumes less energy and subsequently also reduces operational costs.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Efficient Lighting	Core	All	Detailed Design	N/A
B. Automatic Lighting Control	Core Plus	All	Detailed Design	4

Requirements

Detailed Design

A. Efficient Lighting

Compliance with this Item is achieved through implementation of the following measures:

(a) All street and exterior lights within the public realm are LED, or meet, at a minimum, 4-star rating requirements of ESMA.

B. Automatic Lighting Control

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Provide automatic lighting controls for all street and exterior lights within the public realm, which may be of the following types:

- Daylight sensor(s) that automatically turn exterior lights off if sufficient daylight is present
- Astronomical time switch or programmable schedule control that automatically turns the exterior light off during daytime hours
- Smart lighting systems which adjust the lighting level based on demand

Evidence

Detailed Design

A. Efficient Lighting

- Luminaire schedule indicating the lighting fixture type and ESMA star rating

B. Automatic Lighting Control

- Lighting control schematics and specifications

404 Efficient Cooling

Intent

Efficient cooling systems reduce energy consumption, and thereby reduce CO_2 emissions and operational costs.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. District Cooling Water Provision	Core Plus	All	Detailed Design	3
B. Minimum District Cooling Efficiency	Core	All	Detailed Design	N/A
C. Optimized District Cooling Efficiency	Core Plus	All	Detailed Design	3
D. Thermal Energy Storage System	Core Plus	All	Detailed Design	1

Requirements

Detailed Design

The Items A, B, C and D are only applicable if communities adopt a district cooling system.

A. District Cooling Water Provision

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Use non-potable water sources, such as treated effluent, in the district cooling system.

B. Minimum District Cooling Efficiency

Compliance with this Item is achieved through implementation of the following measures.

(a) Design the district cooling system to be able to achieve a minimum weighted average COP of 4.

C. Optimized District Cooling Efficiency

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Design the district cooling system to be able to achieve a minimum weighted average COP of 4.5 or higher.

D. Thermal Energy Storage System

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Provide a thermal energy storage system for the district cooling plant.

Evidence

Detailed Design

Items A, B, C and D: FEWA NOC and district cooling plant design and specifications indicating:

A. District Cooling Water Provision: The non-potable water sources and non-potable water distribution strategy
B. Minimum District Cooling Efficiency: The system efficiency
C. Optimized District Cooling Efficiency: The system efficiency
D. Thermal Energy Storage: The thermal storage system

405 Infrastructure Commissioning

Intent

Commissioning ensures that infrastructure systems are installed correctly and perform according to community requirements in terms of energy and water efficiency.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Infrastructure Design Commissioning	Core Plus	All	Detailed Design	1
B. Infrastructure Construction Commissioning	Core Plus	All	Construction	2

Requirements

Detailed Design

A. Infrastructure Design Commissioning

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Engage a third-party commissioning agent during the design stage. The commissioning process managed by the commissioning agent includes all major energy and water infrastructure, including but not limited to pumps, lighting controls, energy and water meters, sewage treatment plants (STP), district cooling plants. The developer commits to continuing the commissioning activities during the construction stage.

(b) The commissioning agent develops a commissioning plan and reviews the design and tender specifications of energy and water related infrastructure. The commissioning plan includes the following:

- Overview of the commissioning process
- Roles and responsibilities related to infrastructure commissioning
- Detailed description of the commissioning activities and a schedule of commissioning activities
- List of commissioned systems and description of evaluation procedures
- Format for the commissioning evaluation checklists and testing forms, and issues and resolutions log

Construction

B. Infrastructure Construction Commissioning

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Engage a third-party commissioning agent to commission the energy and water infrastructure during the construction stage.

(b) If the commissioning agent has not been engaged during the design stage, a commissioning plan is developed (as described in the section above) otherwise the existing commissioning plan is updated. The commissioning agent also reviews shop drawings, equipment submittals and installation method statements.

(c) The infrastructure commissioning is executed after obtaining the utility connection, and is managed by the commissioning agent. Testing activity may be executed by the contractor; however, the presence of the commissioning agent is required to oversee the correct execution of each test and to document the testing results. All issues identified during the commissioning are documented in the issues and resolutions log.

(d) The commissioning agent issues a final commissioning report, including at least the following:

- List of the commissioned systems
- Copy of the evaluation checklists and testing forms completed for the commissioned systems
- Copy of the issues and resolutions log, detailing open and closed issues
- Resolution plan for open items

Evidence

Detailed Design

A. Infrastructure Design Commissioning

- Commissioning plan
- Commissioning agent's comments on the energy and water infrastructure design
- Tender specification for construction stage commissioning

Construction

B. Infrastructure Construction Commissioning

- Final commissioning report
- Commissioning agent's comments on the shop drawings, equipment submittals and installation method statement

406 Energy Monitoring

Intent

Monitoring of the energy performance of infrastructure energy systems allows the operator to identify instances of higher than usual energy consumption in real-time. This subsequently enables to detect and mitigate problems early on and results in better energy performance.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Energy Monitoring	Core	All	Detailed Design	N/A

Requirements

Detailed Design

A. Energy Monitoring

Compliance with this Item is achieved through implementation of the following measures:

(a) Develop an energy metering strategy for the community, which outlines the approach to energy metering, the level of metering and sub-metering for the different systems as well as the required monitoring scheme.

(b) Provide energy meters at a minimum for the following major energy infrastructure systems:

- Centralized cooling systems
- Infrastructure lighting such as street lights, traffic lights, signage and exterior lights in the public realm
- Water pumping systems
- Water treatment systems
- On-site energy generation systems
- Any other major energy use

(c) The sub-meters have a data-logging capability and are connected to a central monitoring system. The monitoring system is able to provide hourly, daily, weekly, monthly and annual energy loads for each major energy infrastructure system. It is able to compare consumption of previous days, weeks, months and years to determine out-of-range values and indicate trends.

Evidence

Detailed Design

A. Energy Monitoring

- Energy metering strategy
- Schematics which illustrate the metering strategy
- Design drawings and/or extract of tender specifications indicating the type and location of meters

DIVISION FIVE

Water

DIVISION FIVE
Water

501 Optimized Water Performance

Intent

Using treated effluent reduces the demand and stress on freshwater sources such as groundwater and/or desalinated seawater along with savings in energy consumption for desalination.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Water Strategy	Core	All	Masterplan	N/A
B. Wastewater Treatment Plant Space Allocation	Core Plus	All	Masterplan	3
C. Future Connection to Wastewater Network	Core	All	Detailed Design	N/A
D. Connection to Existing Wastewater Network	Core Plus	All	Detailed Design	10
E. Design of the Wastewater Treatment Plant	Core Plus	All	Detailed Design	7

Requirements

Masterplan Stage

A. Water Strategy

Compliance with this Item is achieved through implementation of the following measures.

(a) Develop a water strategy for the community. The water strategy analyses the following aspects:

- The total estimated potable and non-potable water demand for the community and for all major water uses. Major water uses include, but are not limited to, buildings, irrigation systems and district cooling systems.

Consider the water efficiency measures mandated by Barjeel, the Green Building Regulations of Ras Al Khaimah, when estimating the buildings' water demand.

- Strategies to maximize the softscape areas whilst ensuring that the irrigation demand is 100% covered by treated effluent as per Item 503
- Expected wastewater and storm water quality and volume, including seasonal variations of the volume
- Community-level water efficiency strategies, which aim to reduce the overall water demand of the community
- Feasibility study for wastewater treatment options

The feasibility study for wastewater treatment options analyses the following aspects:

- Available treatment capacity and quality requirements of existing wastewater plants if the community connects to existing wastewater networks
- Options for on-site wastewater treatment if the community cannot connect to existing wastewater networks. This includes the required quality standards and levels of treatment, potential uses and estimated demand for treated effluent, description of the proposed wastewater treatment system(s) including advantages and disadvantages, and possible location(s) for the on-site wastewater treatment plant
- Expected investment and operational costs, simple payback time calculation
- Opportunities for gravity wastewater networks
- Conclusions and final recommendations

B. Wastewater Treatment Plant Space Allocation

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Allocate a space for an on-site wastewater treatment plant in close proximity to future municipal wastewater corridors to allow for future connection.

Detailed Design

C. Future Connection to Wastewater Network

Compliance with this Item is achieved through implementation of the following measures.

(a) For all communities, which are not connected to a municipal wastewater network, allow for the future connection to a municipal wastewater network by providing wastewater and TSE corridors and connection points to the plots.

D. Connection to Existing Wastewater Network

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Connect the community to an existing wastewater network in line with the recommendations of the water strategy.

E. Wastewater Treatment Plant Design

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Design an on-site wastewater treatment plant compliant with Ras Al Khaimah Wastewater Agency's requirements for wastewater treatment plants and in line with the recommendations of the water strategy. The design includes a connection point to connect the wastewater treatment plant to existing or future municipal wastewater networks.

Evidence

Masterplan

A. Water strategy
- Copy of the water strategy

B. Wastewater Treatment Plant Space Allocation
- Site plan indicating the plot allocated for the STP

Detailed Design

C. Future Connection to Wastewater Network
- Infrastructure drawings showing the provision to connect to a future municipal wastewater network

D. Connection to Existing Wastewater Network
- Wastewater network drawings showing the connection to the existing wastewater infrastructure

E. Wastewater Treatment Plant Design
- NOC from the Ras Al Khaimah Wastewater Agency for the on-site wastewater treatment plant

502 Stormwater Management

Intent

Proper management of stormwater minimizes the risk of flooding, watercourse pollution and other environmental damage. In addition, the effective use of rainwater can reduce the demand and stress on freshwater resources such as groundwater and/or desalinated water, with savings on energy consumption for desalination.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Flood Hazard Analysis	Core	All	Masterplan	N/A
B. Quantity of Runoff	Core Plus	All	Masterplan	2
C. Flood Mitigation Measures	Core	All	Detailed Design	N/A
D. Quality of Runoff	Core	All	Detailed Design	N/A
E. Collection and Disposal	Core Plus	All	Detailed Design	1
F. Rainwater Use	Core Plus	All	Detailed Design	1

Requirements

Masterplan

A. Flood Hazard Analysis

Compliance with this Item is achieved through implementation of the following measures:

(a) Conduct a flood hazard analysis, which must at least include the following aspects:

- Description of the assumptions
- Catchment analysis
- Pre- and post-development peak runoff rate and quantity
- Identification of areas prone to flooding
- Analysis of mitigation measures including a high-level cost analysis
- Conclusions and final recommendations

B. Quantity of Runoff

Compliance with this item is achieved through implementation of following measures:

(a) Demonstrating the reduction in runoff through catchment management, such as integrating stormwater with landscape strategy, detention of peak flow, etc.

(b) Design the stormwater drainage within a development to restrict the post-development discharge less than or equal to the pre-development runoff.

Detailed Design

C. Flood Mitigation Measures

Compliance with this Item is achieved through implementation of the following measures:

(a) For areas identified as prone to flooding, implement, at a minimum, safety-related flood mitigation measures in the public realm and infrastructure design.

D. Quality of Runoff

Compliance with this item is achieved through implementation of following measures:

(a) Carry out a risk assessment of stormwater pollution, especially for industrial developments, considering regular operations and accidental spillage.

(b) Design pre-treatment and spillage containment systems to mitigate the risk of stormwater pollution.

E. Collection and Disposal

Compliance with this item is achieved through implementation of following measures:

(a) Design of the stormwater collection system shall follow the natural topography to optimize the pipework and earthworks

(b) Design for disposal to an external system such as positive drainage network, natural water body or wadi system. Carry out an overall assessment of impact on external systems, due to the disposal of development runoff.

F. Rainwater use

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Design a rainwater catchment(s), which allows the usage of rainwater for irrigation purposes. Hereby the rainwater is protected from contamination.

Evidence

Masterplan

A. Flood Hazard Analysis
- Copy of the feasibility study

B. Quantity of Runoff
- Strategy and calculations demonstrating integrated stormwater drainage and reduction in runoff

Detailed Design

C. Flood Mitigation Measures

- Drawings showing the location(s) of flood mitigation measures
- Specifications of the flood mitigation measures

D. Quality of Runoff

- Drawings showing the location of potential risks and mitigation measures
- Specifications of the pre-treatment and containment systems

E. Collection and Disposal

- Analysis and design report for the overall stormwater drainage system
- Drawings showing the topography and designed levels of the collection system
- Specifications of the collection and disposal systems

F. Rainwater use

- Drawings showing the location(s) of rainwater catchment systems
  Specifications of the rainwater catchment systems

503 Landscape Water Reduction

Intent

An efficient public realm landscape allows to reduce water consumption without sacrificing the aesthetic appeal of the community.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Efficient Irrigation	Core	All	Detailed Design	N/A
B. Native and Adaptive Species	Core	All	Detailed Design	N/A
C. Hardscaping	Core Plus	Commercial, Mixed-Use and Industrial	Detailed Design	2
D. Elimination of Lawn	Core Plus	Commercial, Mixed-Use and Industrial	Detailed Design	2
E. Elimination of Softscaping in Medians	Core Plus	All	Detailed Design	3
F. Irrigation Demand	Core Plus	All	Detailed Design	1-8

Requirements

Detailed Design

A. Efficient Irrigation

Compliance with this Item is achieved through implementation of the following measures:

(a) Use treated effluent for irrigation of public realm softscaping. Ensure that the quality of the treated effluent used for irrigation is such as to not affect human health, groundwater, plants and soil, the environment and clog the irrigation system.

(b) Irrigate all softscape areas within the public realm, except lawns, with drip or subsoil irrigation systems. Consider the water source, quality of water, filtration needs, accessories' material, soil characteristics and automation in the irrigation system design. Sprinkler irrigation systems are only allowed for irrigation of lawns.

(c) Implement a centralized irrigation control system.

B. Native and Adaptive Species

Compliance with this Item is achieved through implementation of the following measures:

(a) The share of land area covered by native and adaptive plants, excluding trees, in the total softscape area is at least 50%. The number of native and adaptive trees planted in the total softscape area is at least 50% of the total number of trees.

(b) The share of lawn area in the total softscape area does not exceed 20%.

Recommended plants and trees are described in Appendix A 'Native and Adaptive species'.

C. Hardscaping

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Provide hardscaping for at least 50% of the total public realm landscape area.

D. Elimination of Lawn

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Do not provide lawn in any softscape areas within the public realm, excluding playgrounds and athletic fields.

E. Elimination of Softscaping in Medians

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Eliminate softscaping from medians within the public realm.

F. Irrigation Demand

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Lower the irrigation demand per unit of Softscape Area. Points are provided according to Table 7.

Table 7 Irrigation Demand

Irrigation Water Demand (for Softscape Areas)	Number of Points for Item F
15 L/m^2	2
12 L/m^2	4
7 L/m^2	6
4 L/m^2	8

Evidence

Detailed Design

A. Efficient Irrigation

- Irrigation drawings showing the connection to the treated effluent network
- Site plan indicating softscape areas and lawns
- Specification highlighting the irrigation control requirements

B. Native and Adaptive Species

- Landscape drawings highlighting the different softscape areas and identifying lawn and the species used in each area
- Percentage calculation of native and adaptive plants, trees and lawn

C. Hardscaping

- Calculations of the shares of softscape and hardscape areas (from the total landscape area).
- Site plan indicating hardscape and softscape areas

D. Elimination of Lawn

- Landscape drawings indicating the softscape areas and identifying the softscape types

E. Elimination of Softscaping in Medians

- Detailed design of medians

F. Irrigation Demand

- Irrigation demand calculations

504 Water Monitoring

Intent

Monitoring of water performance of infrastructure water systems allows the operator to identify instances of higher than usual water consumption in real-time. This subsequently enables the detection and mitigation of problems early on and results in better water efficiency.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Water Meters and Leakage Detection	Core	All	Detailed Design	N/A

Requirements

Detailed Design

A. Water Meters and Leakage Detection

Compliance with this Item is achieved through implementation of the following measures:

(a) Develop a water metering strategy for the community, which outlines the approach to water metering, the level of metering and sub-metering for the different systems as well as the required monitoring scheme.

(b) Provide water meters at a minimum for the following major water uses:

- Irrigation of public realm
- District cooling
- Water features within the public realm, such as fountains
- Public swimming pools
- Any other major community water systems

(c) The sub-meters have a data-logging capability and are connected to a central monitoring system. The monitoring system is able to provide hourly, daily, weekly, monthly and annual water consumption data for each major water use. It is able to compare consumption of previous days, weeks, months and years to determine out-of-range values and indicate trends.

Evidence

Detailed Design

A. Water Meters and Leakage Detection

- Metering schematics
- Water metering strategy description

DIVISION SIX

Waste & Natural Environment

DIVISION SIX
Waste & Natural Environment

601 Construction Waste Management

Intent

Segregation and recycling of construction waste reduces the amount of waste sent to landfill, thereby reducing demand for virgin material.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Construction Waste Segregation	Core	All	Detailed Design and Construction	N/A
B. Recycling Rate	Core Plus	All	Construction Stage	1-5

Requirements

Detailed Design and Construction

A. Construction Waste Segregation

Compliance with this Item is achieved through implementation of the following measures.

(a) Segregate and dispose waste streams according to the requirements outlined in Table 8. Develop a Construction Waste Management Plan (CWMP), which outlines the contractor's waste segregation and disposal approach.

Table 8 Waste Streams and Disposal Facilities

Waste Stream	Waste Type	Disposal Facility
Clean Construction Waste	Concrete, excavated soil, grouting mixes etc.	Al Saade reclamation side
Mixed Recyclables	Plastic, cardboard, paper etc.	Material Recovery Facility
Mixed Construction Waste	Contaminated plastics, rubber, foam, carpets etc.	Al Jazeera landfill
Hazardous Waste	Solvent-based paints, pesticides and other garden chemicals, batteries, motor oils, cleaning and polishing chemicals etc.	Contractor to contact Ras Al Khaimah Waste Management Agency to arrange pick up
Metal	Scrap metal, broken metal, furniture, lead pots etc.	Direct sale or Material Recovery Facility
Wood	Mold woods, sawdust, shavings, construction roofs and stakes etc.	Cement Kiln

B. Recycling Rate

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Demonstrate a recycling or reuse rate for construction waste, by weight or volume. Points are provided according to Table 9.

Table 9 Recycling Rates

Recycling Rate	Number of Points for Item B
≥25% and <50%	1
≥50% and <75%	3
≥75%	5

Evidence

Detailed Design

A. Construction Waste Segregation
- Specifications indicating the construction waste segregation requirements

Construction Stage

A. Construction Waste Segregation
- CWMP
- Date-stamped pictures showing the waste segregation

B. Recycling Rate
- Completed construction waste tracker

- Waste hauler receipts and/or weighbridge tickets

602 Community Recycling Hubs

Intent

Recycling hubs, located in centralized areas within the community, encourage residents to recycle and thus reduce the volume of waste sent to landfills.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Recycling Hub Area Allocation	Core Plus	All	Masterplan	2
B. Waste Segregation Bins	Core	All	Construction	N/A

Requirements

Masterplan

A. Recycling Hub Area Allocation

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Allocate an area for a recycling hub in close proximity to a Community Focal Point. The area is sized sufficiently to accommodate all of the following:

- Community level composter
- Recycling station for e-waste
- Clothes donation station

Construction

B. Waste Segregation Bins

Compliance with this Item is achieved through implementation of the following measures:

(a) Provide compartmentalized bins in all public areas to facilitate the segregation of mixed recyclables and general waste.

Evidence

Masterplan Stage

A. Recycling Hub Area Allocation
- Site plan illustrating the area allocated for the recycling hub

Construction

B. Waste Segregation Bins
- Date-stamped pictures

603 Reuse of Materials

Intent

The use of recycled aggregates in road construction reduces demand for virgin materials and the environmental impact of material resource exploitation and processing. By reusing materials, less waste is sent to landfills reducing cost and environmental impact of construction waste collection, transport and disposal.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. Reuse of Materials for Roads	Core Plus	All	Detailed Design and Construction	1-4
B. Reuse of Materials for Refill	Core Plus	All	Detailed Design and Construction	4

Requirements

Detailed Design and Construction

A. Reuse of Materials for Roads

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Use recycled aggregates, tire-rubber and/or recycled plastic for the construction of roads. Points are provided according to Table 10.

Table 10 Reused Materials for Road Construction

Percentage of Reused Materials	Number of Points for the Item A
10%	1
20%	2
30%	3
40%	4

The maximum percentage of using recycled aggregates is 40% as per the Ministerial Resolution No. 21 of 2019 issued by the Ministry of Climate Change and Environment. Quality of recycled aggregates is compliant with the aforementioned resolution.

B. Reuse of Materials for Refill

Compliance with this Item is achieved through implementation of the following measures. Points are awarded following proof of compliance.

(a) Use recycled aggregates for refilling plots. Quality of recycled aggregates is compliant with the Ministerial Resolution No. 21 of 2019 issued by the Ministry of Climate Change and Environment.

Evidence

Detailed Design

A. Reuse Materials for Roads

- Specifications indicating the use of recycled aggregates, tire-rubber and/or recycled plastic for road constructions

B. Reuse Materials for Refill

- Specifications indicating the use of recycled aggregates for refill purposes

Construction

A. Reuse Materials for Roads

- Calculations of the percentage of reused materials

B. Reuse Materials for Refill

- Date-stamped pictures of the refilling activities

604 Protection of Habitat

Intent

Assessing potential environmental impact of the community allows informed decisions to preserve existing natural habitats wherever possible and minimise impact of construction activities on existing habitats.

Items

Item	Item Type	Community Type	Stage of Compliance	Points
A. EIA	Core	All	Masterplan	N/A

Requirements

Masterplan

A. EIA

Compliance with this Item is achieved through implementation of the following measures.

(a) Conduct an Environmental Impact Assessment (EIA) according to the Federal Regulation concerning Environment Protection and Development.

(b) The EIA includes at a minimum the following aspects:

- Description of the project
- Project objectives
- Description of the current environmental situation
- Analysis of the expected environmental impacts resulting from construction activities
- Measures required to be taken for environmental protection, and evaluation of their expected effectiveness
- Description of the consequential results of not executing the project
- Commitments towards continuing the observation and control of environmental pollutants resulting from the project

(c) The EIA is approved by the Environment Protection and Development Authority of Ras Al Khaimah (EPDA). If required by the EPDA, develop a Construction Environmental Management Plan (CEMP).

(d) Every new community located in coastline areas additionally obtains a pre-approval from EPDA at the project start.

Evidence

Masterplan

A. EIA

- EPDA NOC for the EIA
- For new communities located in coastline areas, pre-approval from EPDA