Urban Design Guidelines

07

7.0 Development Control Regulations – Urban Design Guidelines

7.1 Introduction

This section provides a combination of standards and guidelines that set out the preferred urban design approaches for the new city. Some design proposals are mandatory, some are strongly encouraged and some are optional. The section is sub-divided into the following five topics.

7.1.1 Design Principles and Approach

The over-arching goals and design principles that will influence the standards and guidance are set out.

7.1.2 Shade and Climate Attenuation

Of fundamental importance is the need to respond to the harsh desert climate and to provide a climate sensitive urban design that provides shade, shelter and thermal comfort.

7.1.3 The Courtyard Principle

The traditional Arab town is the result of a dense grouping of courtyard houses. The long-standing, cultural and climatic advantages of the courtyard principle are summarised.

7.1.4 Form-Based Codes for Land Use Types

The approach towards the preparation of urban design guidelines has been influenced by the approach advocated by the Form-Based Codes Institute (FBCI) in the USA. They were first developed by Duany Plater-Zyberk and Company for the Town of Seaside Florida in 1986. Since then they have been successfully adopted by the New Urbanism Movement on a range of projects.

Form-base codes are a method of development regulation, adopted into municipal law, that emphasises the physical character and form of development, especially the relationships between buildings and the street, pedestrians and vehicles, and public and private spaces. Due to this emphasis on urban design, form-based codes provide greater predictability about the visual aspects of development.

The land use boundaries shown on the Detailed Master Plan (DMP) identify where different rules for development apply. This provides an entry point into the code that allow a person interested in the possibilities for development or land use on a specific site to identify the applicable zone so that they can then refer to the text in the code document to determine the rules for design.

The development standards define the critical differences in the form and character of development in each zone, and thereby also determine the configuration of the public realm.

7.1.5 Street-Based Codes

The DMP applies the zones within a framework of streets and blocks. This helps to identify areas that are subject to differing design and development standards. These organising principles include describing and regulating the desired form and character of individual neighbourhoods, districts and corridors; relating differences in Building Form Standards to the type of street fronting a site.

The street-based codes include a section drawing that defines the dimensional requirement for the street design, such as width and number of travel lanes, allocation and width of on-street parking, the width of the pedestrian realm and the location of planting. In addition, the specific way that a building is required to address the street, both in height, frontage type and setback is included in the regulating street section.

7.1.6 Application of Guidelines - Phase 1

The guidelines and standards are applied to the proposed Phase 1 areas of the new development area of the city, this includes all of the Rock Garden District and parts of the Airport District and the Coastal District.

7.2 Design Principles and Approach

7.2.1 Design Principles

The over-arching urban design goals and principles that have helped shape the development codes are summarised below:

- **Climate responsive:** the need to provide shelter, shade and protection to address extreme temperatures and solar exposure during the summer months.
- **Cultural inspiration:** designs that enhance and enforce Diriyah unique cultural identity, emphasise family and hospitality and provide a blend of tradition and modernity.
- **Character:** creating distinct places of character with a strong sense of identity, responding to local environmental factors, such as wadis and topography.
- **Ease of movement:** providing an accessible, well connected, pedestrian friendly environment that prioritises pedestrians, cyclists and transit users before motor vehicle traffic.
- **Liveability:** by ensuring that streets and public spaces are valued places where people enjoy spending time, not just places to be rushed through or avoided, by making them clean, safe and attractive environments.
- **Places of quality:** by helping create places of quality that people will take pride in and enjoy observing and using in their own right.
- **Sustainability:** by making sure that street planning and design promotes 'greener' transport modes, such as walking, cycling and public transport and reduces carbon emissions.
- **Social inclusion:** by ensuring that streets are physically and culturally accessible to all, that the varying needs of different user groups are acknowledged and catered, for example, the safety and security of women and children.
- **Legibility:** the creation of legible sequence of places that are readily understandable and link up in a logical way to form an easily navigable environment defined by landmarks, nodes and gateways.
- **Vitality and viability:** by helping to promote lively and economically successful places through the location, format and design of streets and spaces which encourage local economic activity and attract investment.


The Mouj (The Wave), Muscat


Dar Al Zain, Muscat


The Mouj (The Wave), Muscat


The Chedi Hotel, Muscat


Al Khuwayr South, Muscat


Ras Al Hamra, Muscat


Al Marsa Waterfront, Al Mouj


Muscat Oasis Residence


Zighy Bay, Oman

7.3 Shade and Climate Attenuation

7.3.1 Climate Effects on Outdoor Liveability

The harshest weather conditions in Duqm are between the months of May and August when the predominately southern Khareef desert winds align with the hottest temperatures. The airport on the plateau receives the strongest winds. The harsh desert winds are also funnelled along Wadi Saay. During the Shamal winter months from November to March cooler, gentle easterly winds blow inland from the sea. Rainfall is usually limited to the winter months, particularly December. During the transition months between the Shamal and Khareef there can be fog.

At a macro-level it is proposed to plant shelter belts of trees within the wide rights-of-way of the existing arterial roads to help provide shelter from the harsh desert winds. This form of planting will also extend along the banks of existing wadis. The network of district avenues which provide a loose grid across the city will also have significant tree planting to help provide shade and shelter.

Within districts and neighbourhoods a connected network of greenways and sikkas will provide shaded and comfortable routes for pedestrians and cyclists. At a local level courtyard housing is advocated as the best climatic and cultural response to the desert conditions.

7.3.2 Mitigating the Urban Heat Gain Effect

Urban heat gain caused by direct and reflected sunlight and heat radiating back from warmed surfaces will increase temperatures further, this effect can be mitigated by:

- Undertaking detailed sun angle / shade projection studies to effectively inform the need for streetscape shade.
- Passive shading and ventilation measures that lessen the exposure of pavement and wall surfaces to the sun and increase air circulation.
- Architectural elements and ground surfaces constructed with materials that retain and radiate less heat.
- The use of materials that will minimise and mitigate urban heat gain.
- Provide free-standing shade structures when architecturally integrated or attached shade structures are not feasible.
- Shade structures should be built from materials with low Solar Reflectance Index (SRI) values. Consider integrating efficient radiant cooling and solar photovoltaic systems into the architecture of the shade structure.
- Use of indigenous, native or locally adaptive trees to provide shade and lower ambient temperatures.
- Porous and open grade pavements that permit water and air to pass through to allow cooling by air movement and evaporation.
- Unused surface areas left unpaved and covered with a layer of crushed rock, or stabilised sand.

7.3.3 Shading the Pedestrian Realm

Shade and shelter from the sun, as well as climate attenuation through wind capture, tree planting and selection of suitable materials, will be critical in creating a comfortable pedestrian realm.

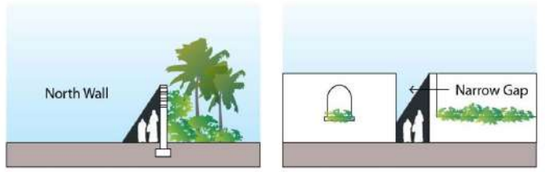
Streetscape elements that attenuate the hot desert climate will be important for encouraging multi-modal travel. Thermal comfort for cyclists and pedestrians is a key factor in mode choice.

In traditional Arabian architecture and urban form, streets and alleys (Sikka) were narrow and shaded by buildings. Where additional or temporary shade was needed, fabric or wooden coverings were constructed to span over areas of the street adjacent to buildings, particularly where pedestrian activity was focused.

Unfortunately, the need to accommodate the car and wide utility corridors has meant that it is difficult to re-create the compact shaded streets of traditional Omani settlements. The introduction of the car has led to buildings being pushed further apart from one another, creating streets that are fully exposed to the sun. The need to accommodate parking within villa plots has further increased the width between buildings.

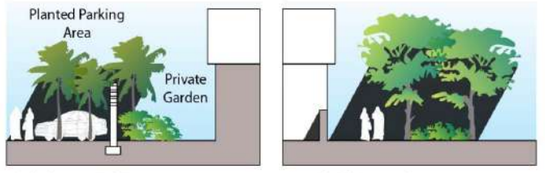
Streets should be oriented and sized to take advantage of shading from adjacent buildings where possible. In developments where buildings are not high enough to provide usable shade within the pedestrian realm, architectural solutions, including canopies and arcades in adjacent buildings, should be incorporated.

Figure 7-1 illustrates and describes various types of overhead shading elements that can be freestanding or attached to buildings.



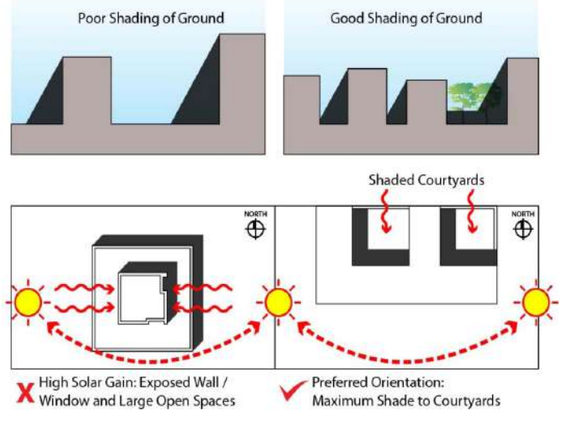
Shaded Footpath by North Walls

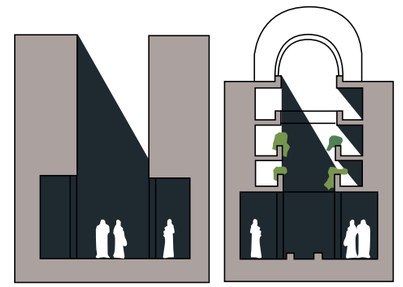
Shaded Footpath between Building



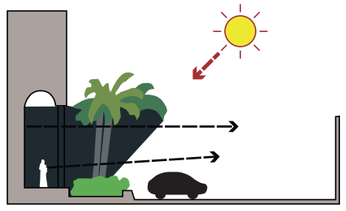
Shaded Street Parking

Trees Shade Footpath

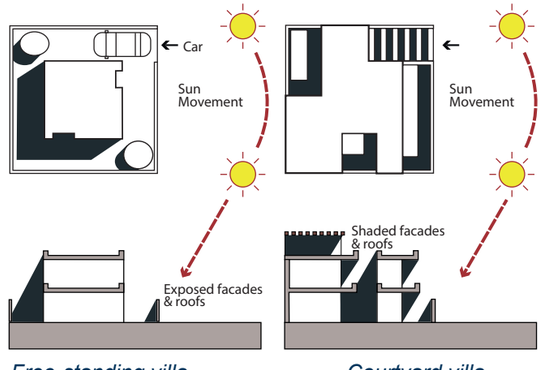




Arcades *Galleria*



Arcade and planting



Free-standing villa *Courtyard villa*

Figure 7-1: Figure 7-1 Overhead shading elements

	Tree Planting	Architectural Colonnades Private Realm	Built-form Design Facade Awning Devices	Framed Landscape Trellis Modular System Freestanding	Bus Shelters	Site-wide Feature or Major Recreational Destination Structures	Freestanding or Suspended Shading Devices	Advertising / Hoarding / Public Art Installations	Proportion of Shading Provided by Built Form
Public Realm									
City Boulevard	✓	✓	✓	✗	✓	✗	✓	✓	✓
District Avenues	✓	✓	✓	✓	✓	✗	✓	✓	✓
Neighbourhood Streets	✓	✗	✗	✓	✓	✗	✗	✗	✓
Access Lanes	✗	✗	✗	✗	✗	✗	✓	✗	✓
Sikkas	✗	✗	✗	✗	✗	✗	✓	✗	✓
Greenways and Wadi Trails	✓	✗	✗	✓	✗	✓	✓	✓	✓

7.4 The Courtyard Principle

Perhaps the most fundamental feature of traditional house and town design in the Middle East is the courtyard. Oman's traditional settlements are typically dense and compact groupings of courtyard houses.

Courtyard houses derive light and air from their own internal open spaces and allow wall-to-wall construction of adjacent buildings. This introverted protected space preserves the privacy of each family and eliminates wasted space between properties. The courtyard provides essential shade and shelter in an unfriendly, harsh environment.

The courtyard house is an ancient Arab form that was previously common in Oman and that works well in this region because it responds to the cultural requirements and the climatic challenges.

The benefits of courtyard houses are:

- The use of passive design techniques that is both sustainable and responsive to the climate by providing shade and shelter from the sun.
- Privacy from overlooking by adjacent plots and the separation of the private family space from the semi-private guest space.
- Optimum use of land with homes built close to the edge of the plot and with flexible internal spaces that can be adapted and expanded over time.
- Development close to the boundary helps to define the public realm and shade small paths (sikkas) which link the neighbourhood together.
- The courtyard creates a sheltered micro-climate in which flowers, shrubs and trees are easily grown.
- Because houses are oriented inwards onto a central court, forming a garden, fountain or pool area, a surrounding garden is not necessary.

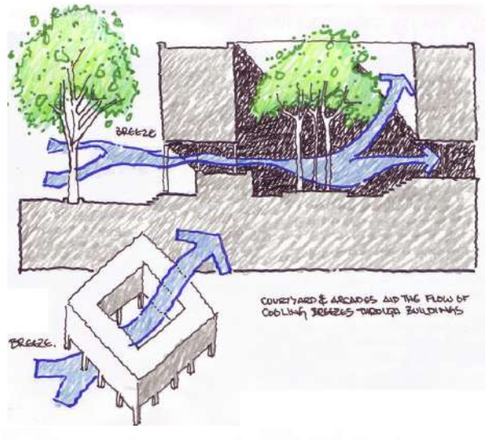
The use of inward-looking courtyard housing creates many possibilities for the contemporary urban design of housing areas which do not exist when open-plan principles are used. Compact grouping of houses around semi- private, communal courtyards promotes domestic security and privacy, and reinforces family ties and relationships. Compact layouts enable the strict requirements of climatic control to be met, whereas open-plan layouts create problems of wind, sand deposition and exposure to sun and glare.

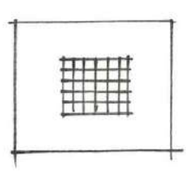
House types in Oman have undergone remarkable changes over the last four decades. The long-standing advantage of compactness, stemming from the courtyard principle, has been largely abandoned since the 1970's in favour of the imported free-standing villa. The size and shape of the building have been transformed from the typically 1-2 storey courtyard houses to 2-3 storey free-standing villas in a walled plot.

The very low density of development that results is not resource efficient and reinforces the need for the private car to travel to school, shopping and work. The research currently being undertaken by Atkins on the Oman National Spatial Strategy (ONSS) is developing new national planning and urban design standards which will promote more sustainable forms of urbanisation including low-rise, high-density neighbourhoods with the courtyard type house as an important building unit.

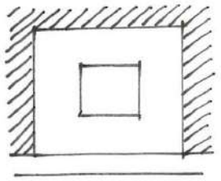
Traditional urban form within Mutrah area in Muscat

Image © *Shehab, Nada & Salama, Ashraf. (2018). Extract from: The Spatiality of Segregation: Narratives from the Everyday Urban Environment of Gothenburg and Glasgow. International Journal of Architectural Research: ArchNet-IJAR. 12. 71-90. 10.26687/archnet-ijar.v12i1.1502.*

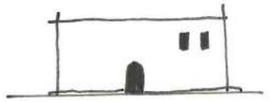




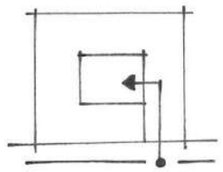
Arrangement of the rooms around a central open space



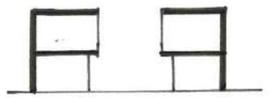
Adjoined by the surrounding houses, generally on three sides



Closed appearance



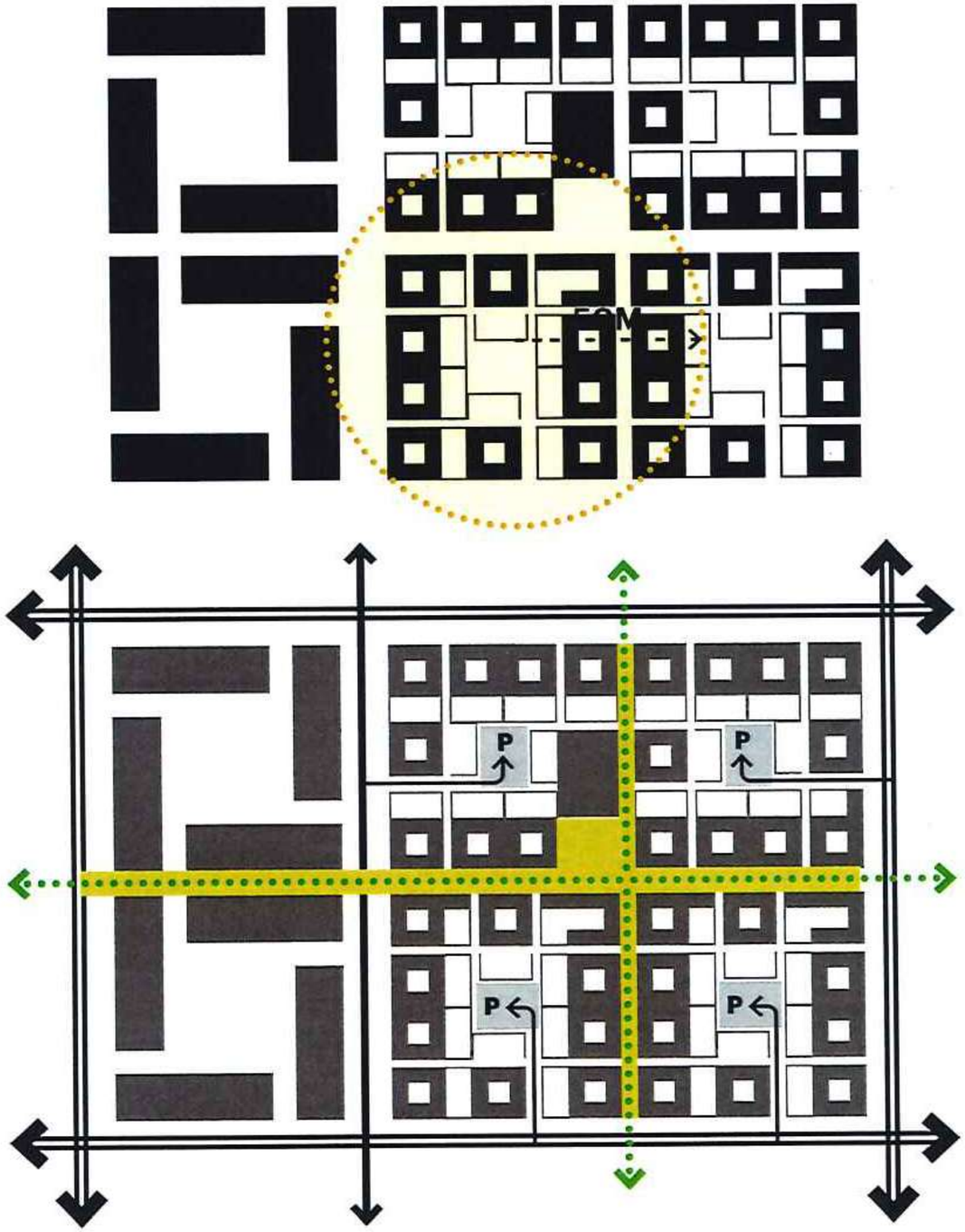
Position of the entrance; angled entrance



Construction of the house with two stories

Using the courtyard for vegetation

Dense and compact urban form of traditional Arab town based on the courtyard, taken from SOM City Form, Al Duqm Urban Design Master Plan



Example of Courtyard Homes in Cluster

7.5 Building Form Standards

7.5.1 Code Components

Building form standards are intended to help prescribe good public spaces as well as good urban form. As the 'walls' of public spaces, building façades are regulated for height to ensure the correct proportions of the public spaces. The maximum size and placement of all buildings is regulated to ensure the buildings are an appropriate size for the intent of the area and will help create the desired urban form.

Building form standards are provided in this section for each of the main land use types defined within the Detailed Master Plan (DMP).

Built form elements such as building typologies and heights, setbacks, parking and the provision of public space are crucial to fostering and maintaining a positive pedestrian experience.

Building Typologies

The definition of building type for this urban design application is different from the typical architectural definition of building type, which is defined solely by use or function. Instead the definition of building type used in these guidelines is primarily the physical form of the building and secondarily by its use or function.

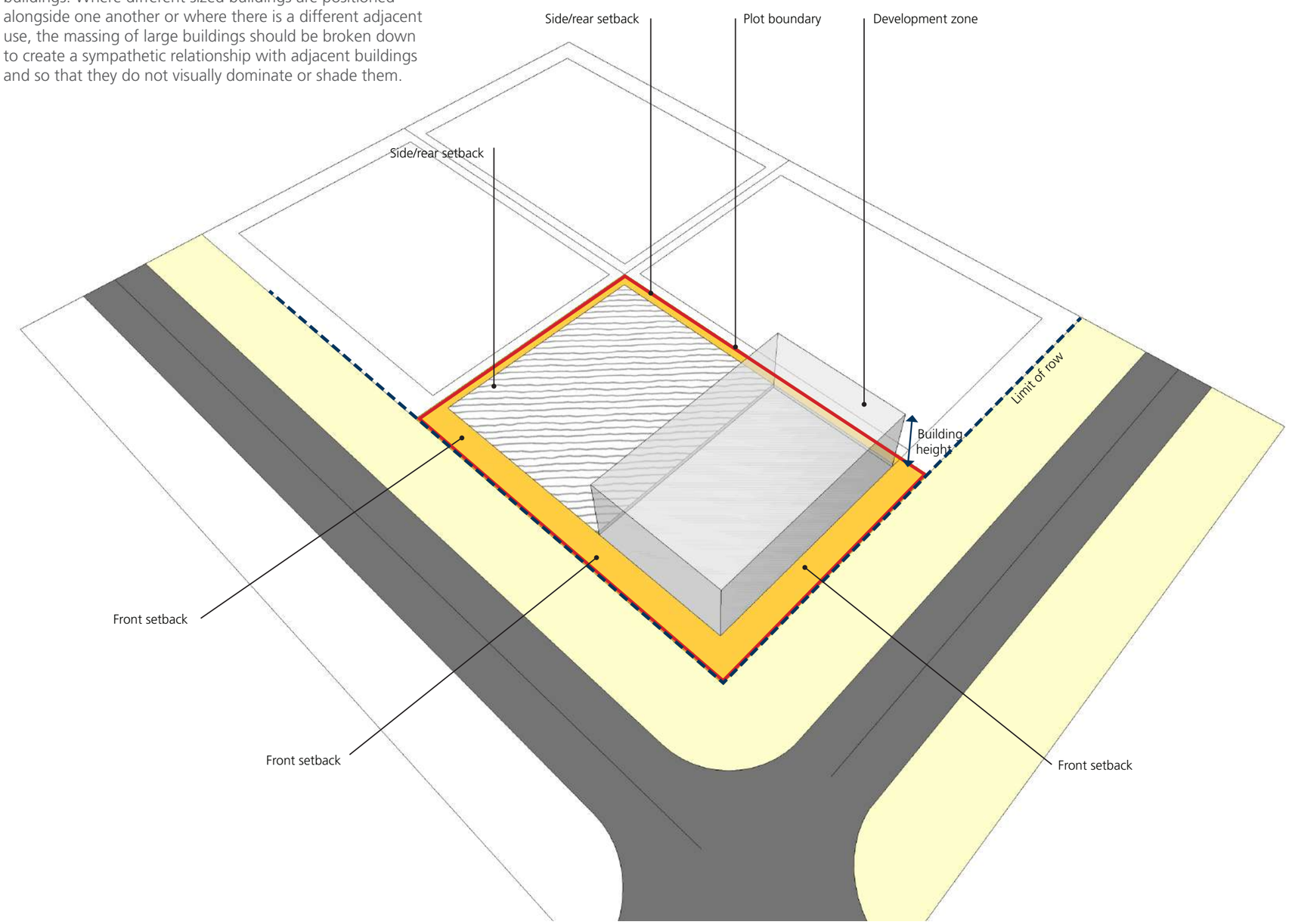
The use of building type regulations as opposed to the conventional regulations Floor-Area Ratio (FAR) and density enables a fine-grain mix of building that is necessary to create a great urban form and high-quality place.

Because of their ability to help ensure diversity in building form, building types are the 'building blocks' of good urbanism.

Building Height

Building height is defined as the largest allowed vertical distance between the side walk and the top of the building. This helps ensure that new buildings will be appropriately scaled to the desired urban form. Maximum building heights are regulated by storeys rather than dimensions. This enables developers to use taller floor-to-ceiling heights, which leads to better buildings, and discourages them from using minimal floor heights.

Building height should be in keeping with adjacent uses and buildings. Where different sized buildings are positioned alongside one another or where there is a different adjacent use, the massing of large buildings should be broken down to create a sympathetic relationship with adjacent buildings and so that they do not visually dominate or shade them.



Plot parameters

Plot Size

Regulating the plot width and depths helps ensure that new buildings will be appropriately scaled to the desired scale and urban form.

Setbacks

Setbacks are the distance by which a building must be separated from the property line or right of way (RoW), typically defined and regulated as a minimum. Setbacks help regulate placement of buildings. Active frontages to have 0m setback. Refer to section 5.4 for permitted structures in setbacks. Refer to section 7.6 for individual typologies for setbacks.

Parking

The impact of car parking on the quality of a place can be mitigated with appropriate requirements and good design. Surface level parking and garages can be unattractive and difficult to integrate successfully into the urban form. Excessive parking takes up space that could be better used for other uses. The design should mitigate visual impact of parking, for example, in more urban areas parking can be accommodated in the centre of blocks, lining them with retail and commercial uses along the perimeter street frontage. In residential areas locating garages behind houses will have a similar effect.

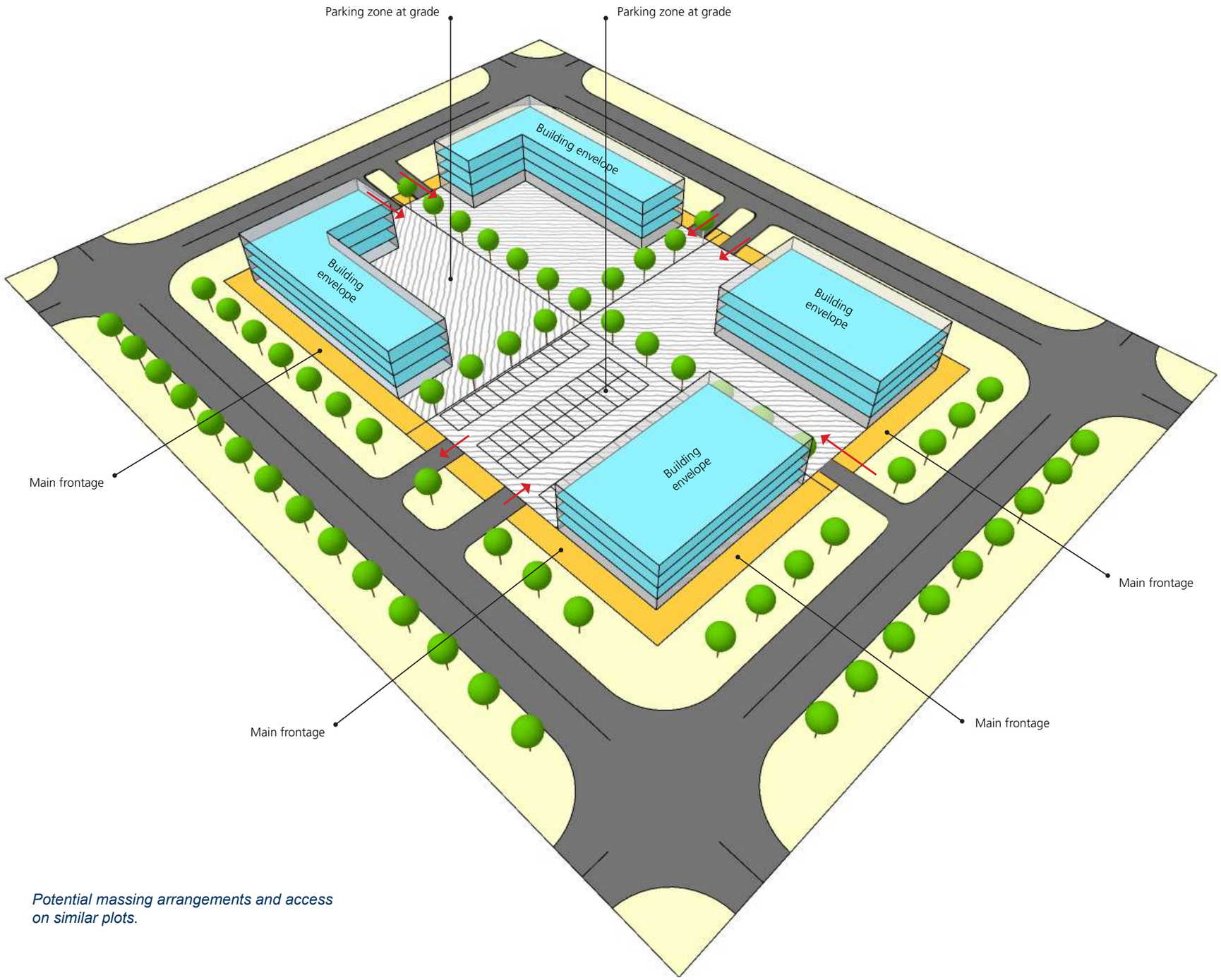
The guidance sets out the required number of spaces for each of the building typologies and main land use types. Parking provision is reduced in more urban places where high quality public transport will exist and where a higher percentage of the people using the commercial and retail uses will be walking.

Public Space

The provision of public open space including parks, plazas and civic spaces for each of the main land use types is identified and cross referenced to the Landscape Guidelines in Chapter 8.

The roof level is used to accomodate service facilities in the building such as the staircase room, water tank, air conditioning equipment, lift engine room, central TV antenna etc. A shaded roof garden can be proposed if desired.

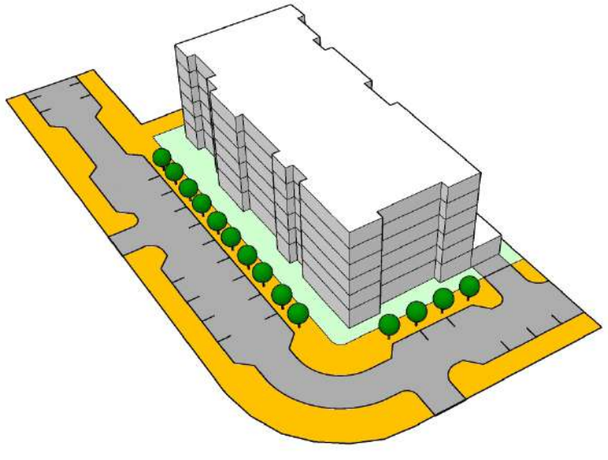
Refer Chapter 9 for architectural detail.

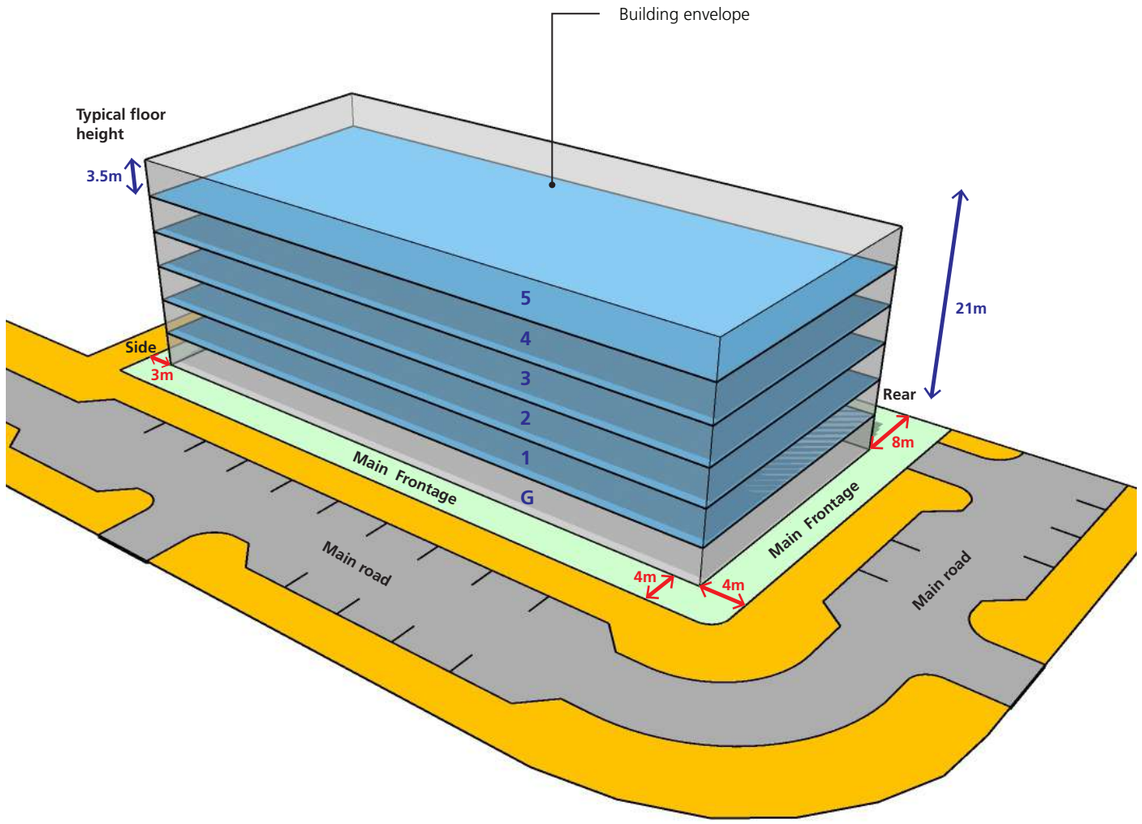


Potential massing arrangements and access on similar plots.

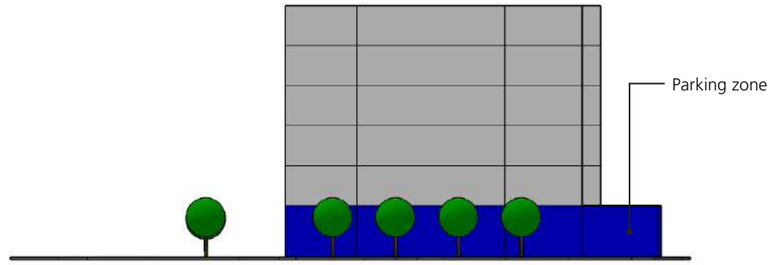
7.6 Residential High Density (HDR)

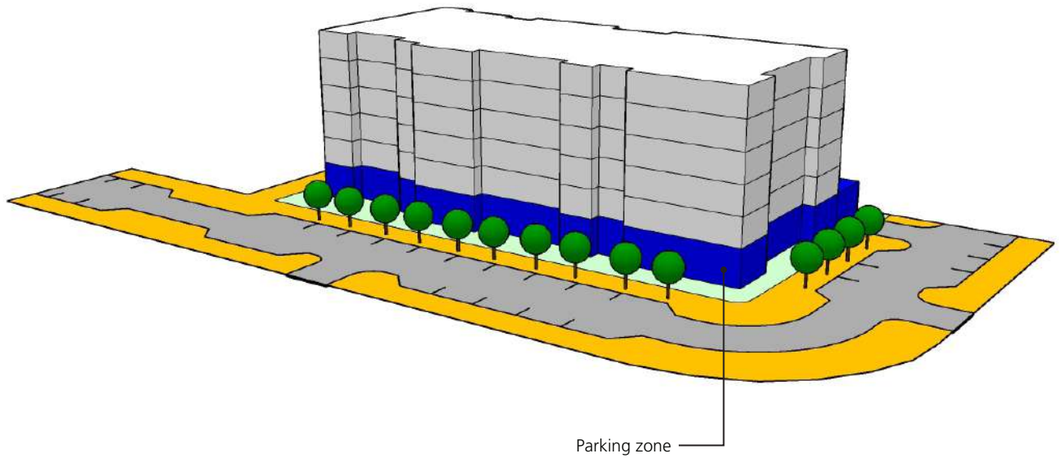
Building Typologies	The High Density Apartment zones identifies areas for multi-family residential apartments, providing accommodation for both Expatriate and Omanis. These are generally located along the edge of development parcels.
Building Height	• A variety of building heights can occur within a block. • Typical heights 5-6 storeys (including penthouses) • Up to 8 storeys in: - City Boulevard and key focal points such as corner plots and gateways • Utilities such as HVAC units or lift rooms on roof may exceed maximum height of building and shall be appropriately screened. • Parapet cannot exceed 1.5m beyond maximum height of the building.
Plot Size	• Minimum 2,800 sqm • Coverage ratio 50%
Setbacks and Entrances	• Each apartment building to have a minimum of 4m setback from main streets • Side - 3m • Rear setback - 8m • Principal pedestrian entrance to face the street Refer to section 5.4 for permitted structures in setbacks.
Parking and Servicing	Parking to be calculated on the basis of the below standards: • Studio/1 bedroom apartment – 1 car parking space per apartment • 2 bedroom apartment – 1.5 car parking spaces per apartment • 3+ bedroom apartment – 2 car parking spaces per apartment If commercial floorspace is to be provided, two (2) parking spaces (minimum) to be provided per 100sqm of commercial floorspace. Servicing for the commercial units is to be from the street. All parking to be provided within the plot.
Public Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. These could be provided at grade, in courtyards, above the podium or on the rooftops.





Massing, setbacks, heights and number of storeys



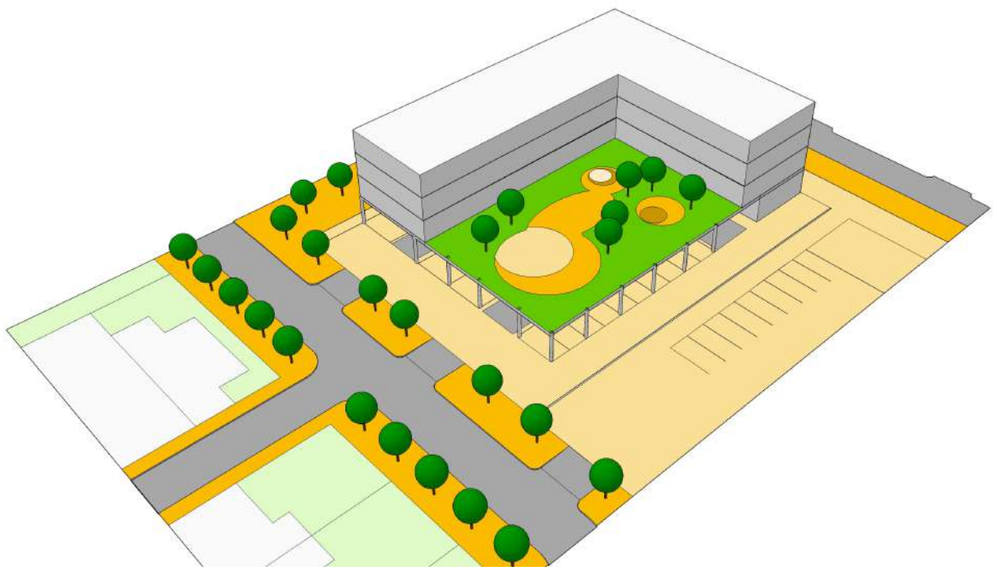


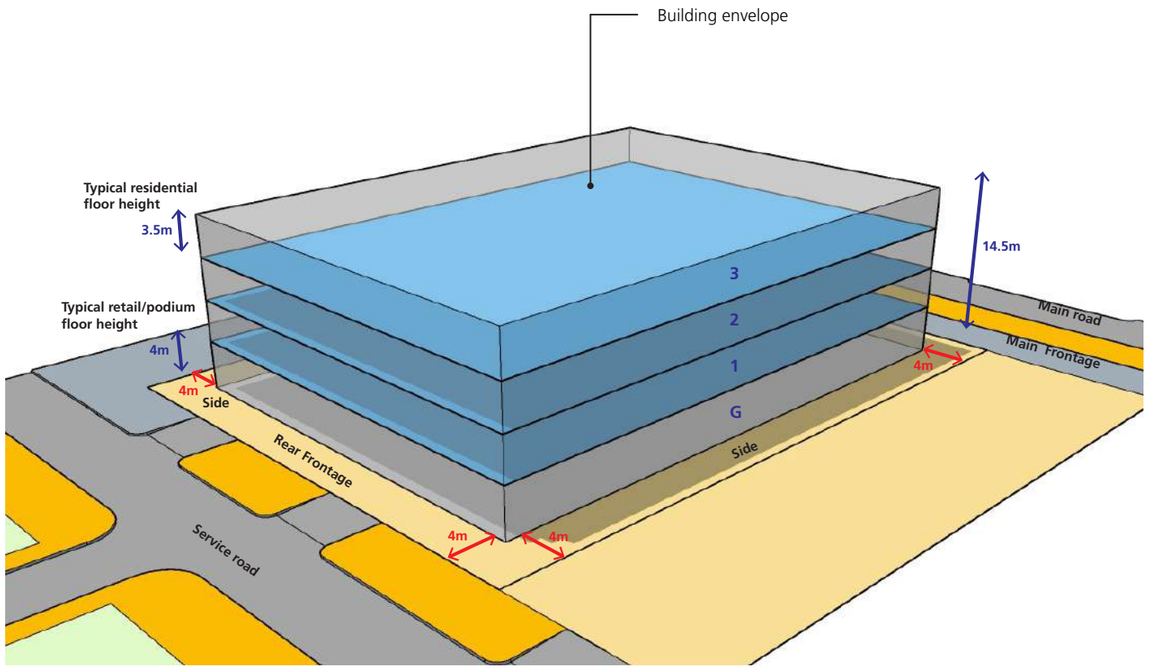
Parking zone

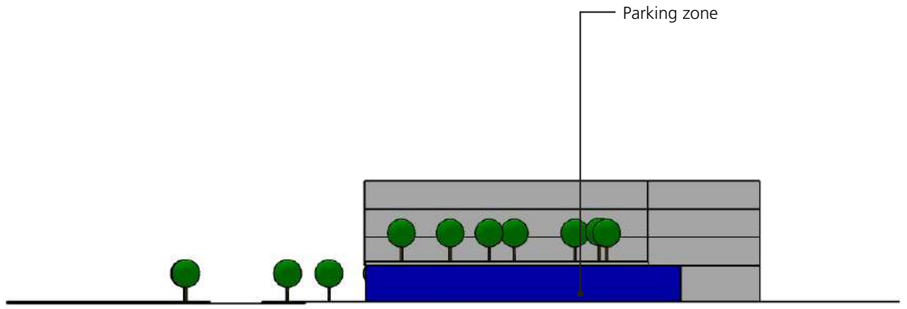
*The diagram does not indicate plot coverage. Please refer to relevant table for % of plot coverage.

7.7 Residential Medium Density - Apartments (MDR-A)

Building Typologies	The Medium Density Apartment zones identifies areas for residential buildings made up of apartments, providing accommodation for both Expatriate and Omanis.
Building Height	• Typical height G+3 storeys (occasionally G+4) • Utilities such as HVAC units or lift rooms on roof may exceed maximum height of building and shall be appropriately screened. • Parapet cannot exceed 1.5m beyond maximum height of the building.
Plot Size	• Minimum 2,200 sq m • Coverage ratio: 50%
Setbacks and Entrances	• Each apartment building to have a minimum of 4m setback from the street • Side setback • Rear setback • Principal pedestrian entrance to face the street
Parking and Servicing	Parking to be calculated on the basis of the below standards: • Studio/1 bedroom apartment – 1 car parking space per apartment • 2 bedroom apartment – 1.5 car parking spaces per apartment • 3+ bedroom apartment – 2 car parking spaces per apartment All parking to be provided within the plot. Refer to section 5.4 for permitted structures in setbacks.
Public Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. These could be provided at grade, in courtyards, above the podium or on the rooftops.





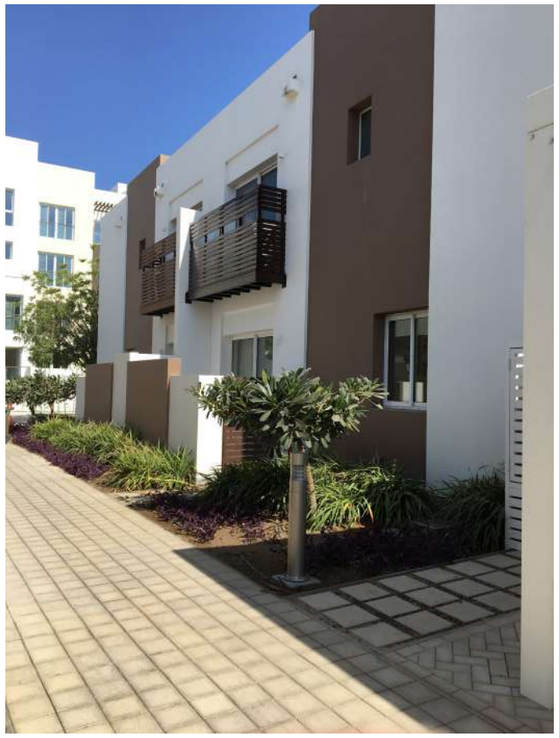


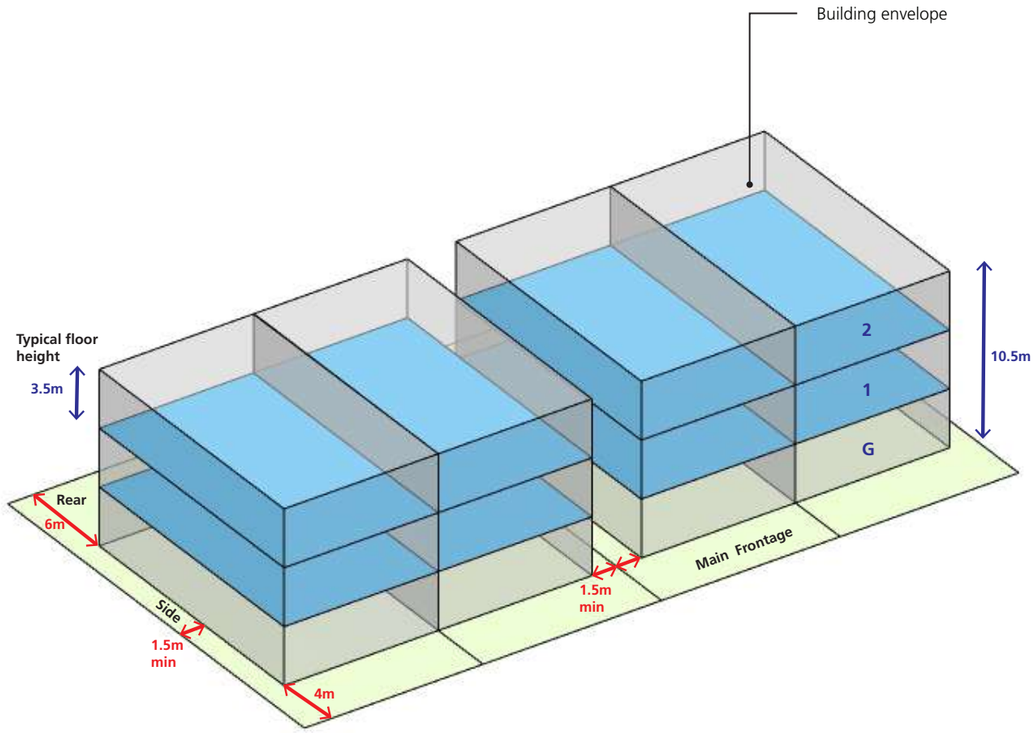
Massing, setbacks, heights and number of storeys

*The diagram does not indicate plot coverage. Please refer to relevant table for % of plot coverage.

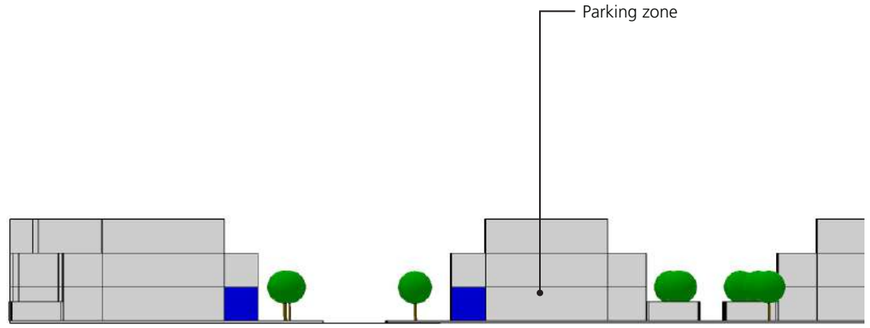
7.8 Residential Medium Density - Town Houses (MDR-T)

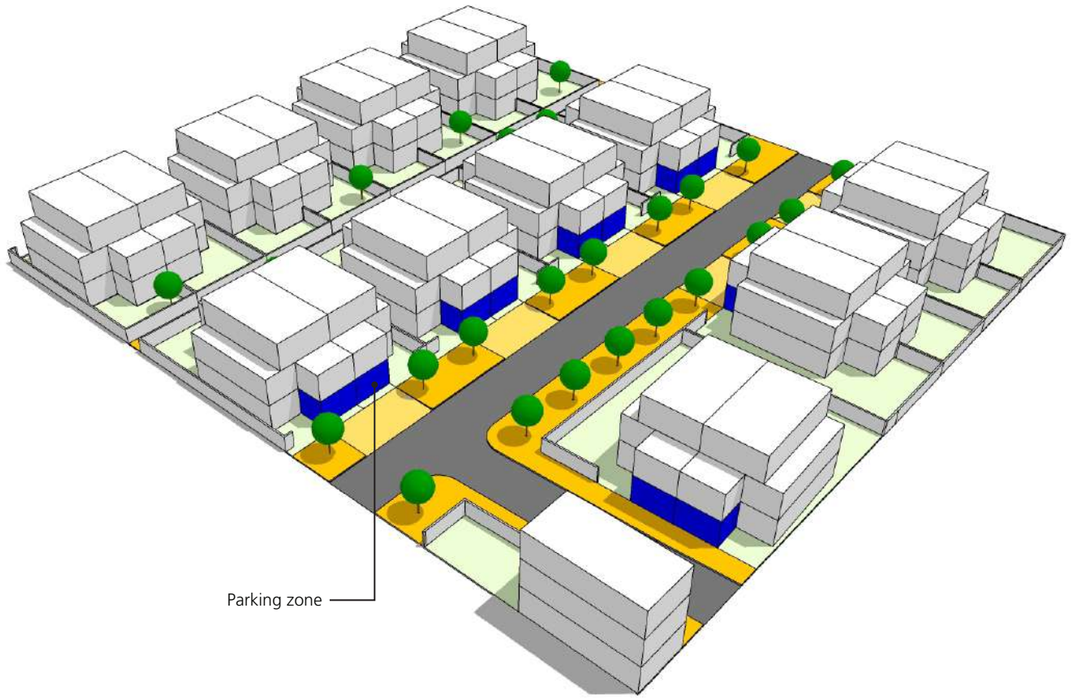
Building Typologies	The Medium Density Residential zones identify areas for single unit detached or attached townhouse accommodation for both Expatriate and Omani family living.
Building Height	• Typically 3 storeys • Typical floor height 3.5m • Parapet cannot exceed 1m -1.5m beyond maximum height of the building.
Plot Size	• Minimum 200 sq m, typically 10m x 35m • Coverage ratio: 40%
Setbacks and Entrances	• 4m Front setback • Side setback – 3m if windows, a minimum of 1.5m in either case. • 6m Rear setback • Privacy can be ensured by the control of fenestration Refer to section 5.4 for permitted structures in setbacks.
Parking and Servicing	Two (2) car parking spaces (minimum) to be provided per villa to be provided within the plot. Visitor parking is provided on the basis of at least one space per plot within the housing cluster or on-street.
Public Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. These could be provided at grade, in courtyards or on the rooftops.





Massing, setbacks, heights and number of storeys



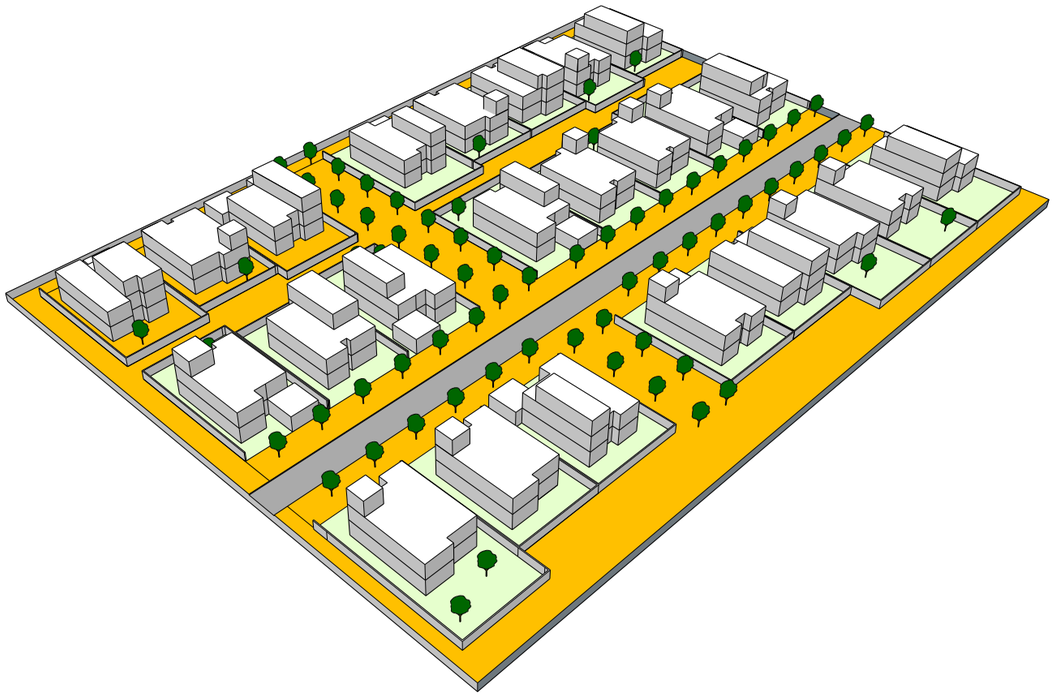


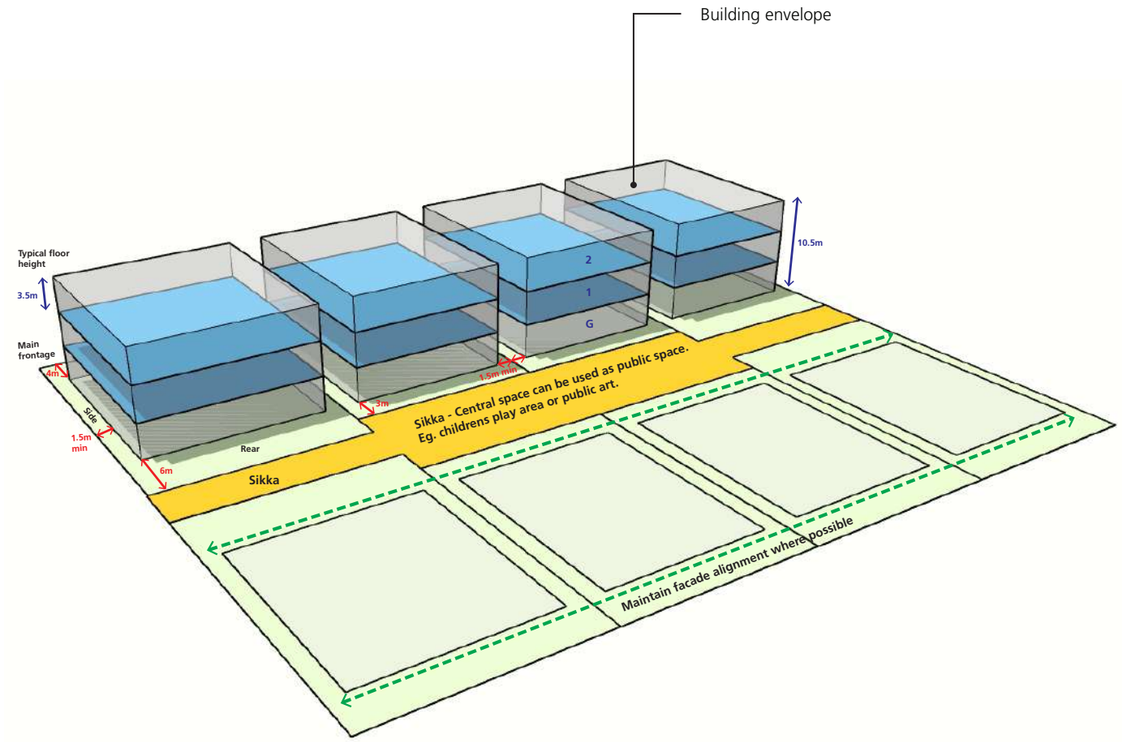
Parking zone

*The diagram does not indicate plot coverage. Please refer to relevant table for % of plot coverage.

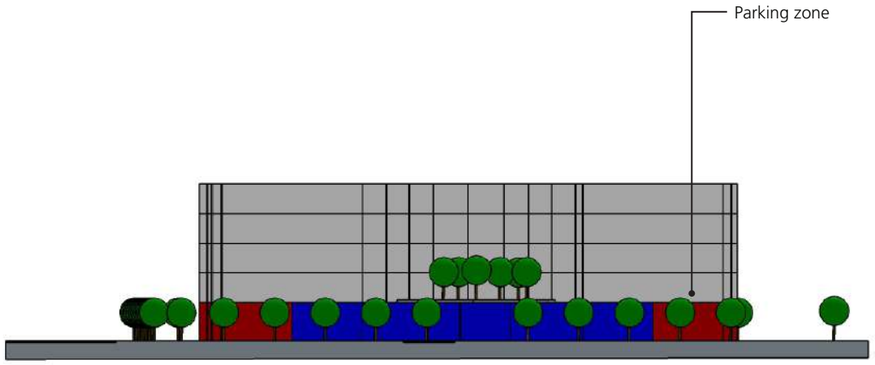
7.9 Residential Low Density (LDR)

Building Typologies	Low Density Residential identifies areas for single unit detached villa accommodation for both Expatriate and Omani family living.
Building Height	• Typically 2-3 storeys • Typical floor height 3.5m • Parapet cannot exceed 1m -1.5m beyond maximum height of the building.
Plot Size	• Range in size from 400-1000 sqm. Average 600 sqm • Coverage ratio: 50%
Setbacks and Entrances	• Front setback – 4m • Side setback – 3m if windows, a minimum of 1.5m in either case. • Rear setback – 6m, 3m if facing a public space along Sikka • Perimeter property walls to be 2m maximum Refer to section 5.4 for permitted structures in setbacks.
Parking and Servicing	Two (2) car parking spaces (minimum) to be provided per villa to be provided within the plot. Visitor parking is provided on the basis of at least one space per plot within the housing cluster or on-street.
Public Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. These could be provided at grade, in courtyards or on the rooftops.





Massing, setbacks, heights and number of storeys



Parking zone

*The diagram does not indicate plot coverage. Please refer to relevant table for % of plot coverage.

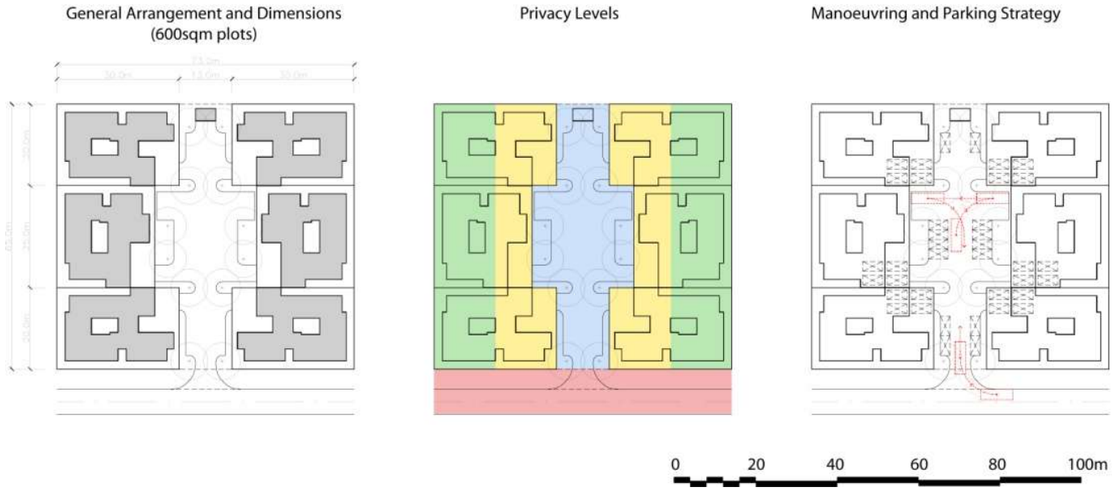
Duqm Heights

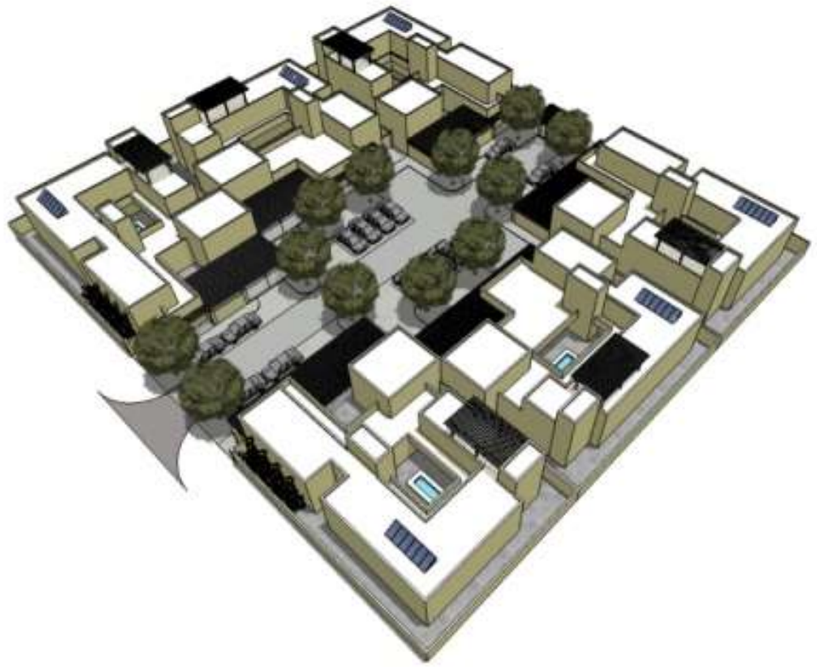
The sketch plan above illustrates the application of urban design principles and the use of low and medium density housing typologies within the Design Heights district

1. Neighbourhood Centre in accessible and visible location at entrance from Highway 3. Facilities also serve northern part of Tourism District.
2. Upper reaches of tertiary wadis used as the basis for linear parks which thread through the district and provide footpath and cycle access to the Coastal Park and the sea.
3. Neighbourhood street connects the district with the sea and acts as the spine, serving short local streets.
4. Local streets provide direct access to linear wadi parks and connect with foot and cycle path network.
5. Slow speed road runs parallel to the wadi, providing frontage access to villas overlooking linear park.
6. Villas overlook Coastal Park with access by traffic calmed scenic drive.
7. Local mosque in accessible and visible location at intersection of neighbourhood streets.
8. Medium density townhouses grouped around pocket parks served by slow speed traffic calmed local streets.
9. Linear park along wadi extends into medium and high density housing in the form of a tree lined greenway.
10. Apartments and townhouses grouped around courtyards with private pool and gardens form entrance to Tourism District.

7.10 Residential MoH Housing (MOH)

Building Typologies	The Ministry of Housing zones identify areas for single unit detached villa accommodation for Omani family living. There are six primary land allocations which have both existing and committed development to a greater or lesser extent, the majority being assigned for citizen housing, where Krookies have been issued for their ownership and development.
Building Height	• Typically 2-3 storeys • Typical floor height 3.5m • Parapet cannot exceed 1m -1.5m beyond maximum height of the building.
Plot Size	• Typically 600 sqm, 20 x 30m • Coverage ratio 50%
Setbacks and Entrances	• Front setback – 2m • Side setback – 2m if windows, a minimum of 1.5m in either case. • Rear setback – 2m • Perimeter property walls to be 2m maximum Refer to section 5.4 for permitted structures in setbacks.
Parking and Servicing	Two (2) car parking spaces (minimum) to be provided per villa to be provided within the plot. Visitor parking is provided on the basis of at least one space per plot within the housing cluster or on-street.
Public Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. These could be provided at grade, in courtyards or on the rooftops.

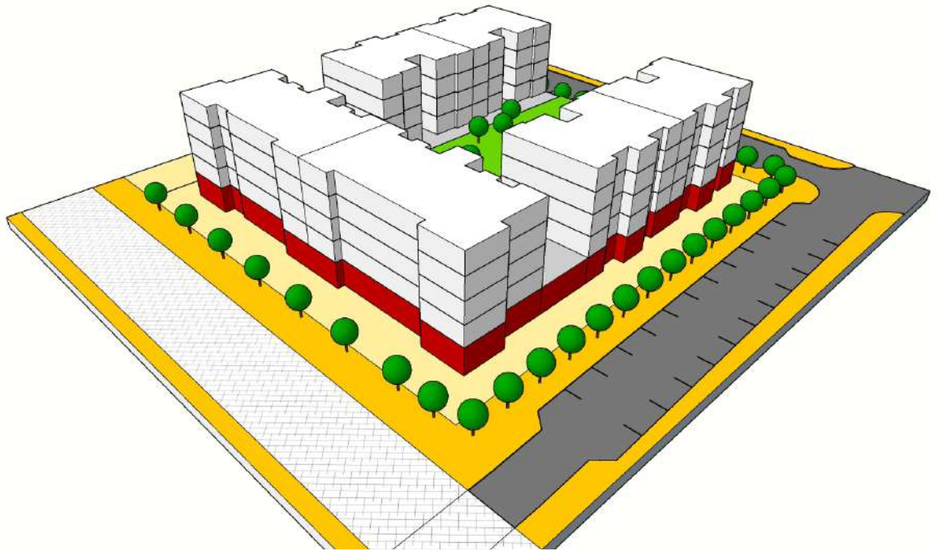


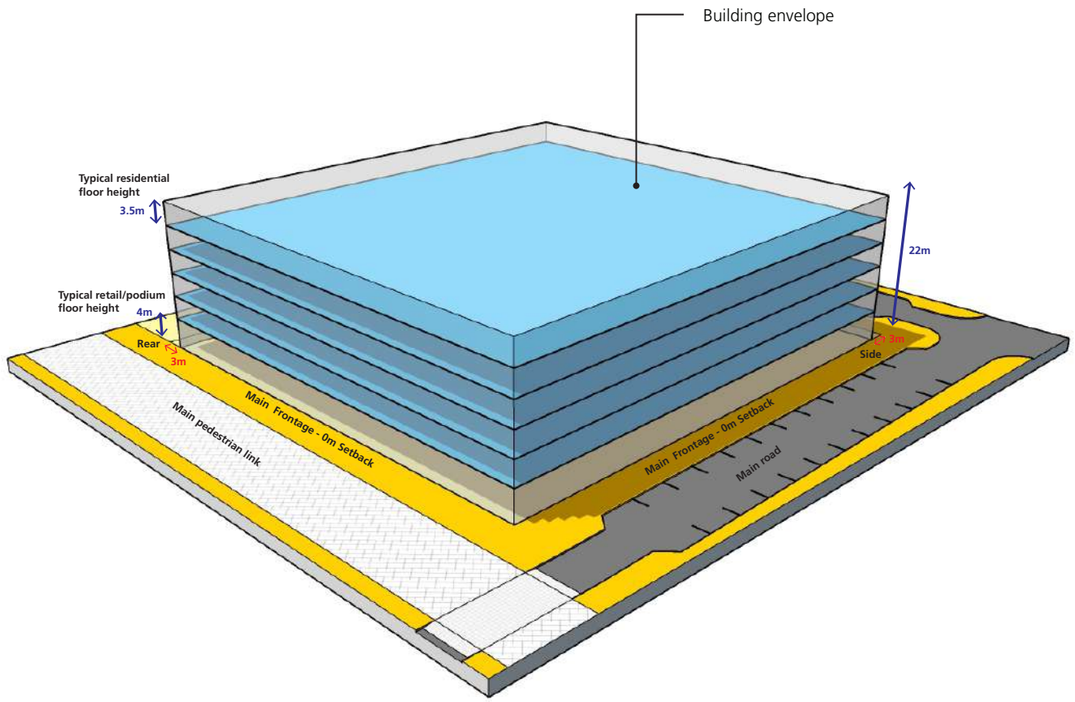


Principles of Large Villa Cluster Development

7.11 Residential Mixed Use (RMU)

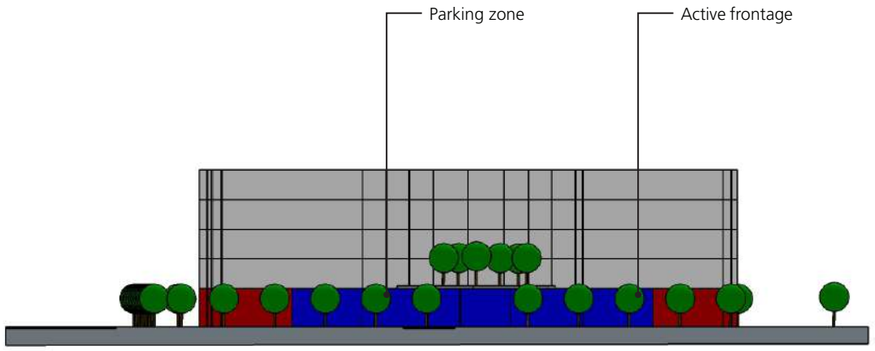
Building Typologies	The Residential Mixed Use typology identifies areas for multi-family residential buildings made up of commercial and retail uses at ground floor/mezzanine level with apartments above, providing accommodation for both Expatriate and Omanis. These are generally located along district avenues and in key areas such as the City Boulevard where the intention is to create active frontages.
Building Height	• Typically 4-6 storeys (G+3) and (G+5), up to 8 storeys (G+7) in high density areas such as the Boulevard District and at gateway points • Utilities such as HVAC units or lift rooms on roof may exceed maximum height of building and shall be appropriately screened. • Parapet cannot exceed 1.5m beyond maximum height of the building.
Plot Size	• Minimum 2,800 sqm • Coverage ratio 40%
Setbacks and Entrances	• Front setback – no setback on the active frontages • Side setback – 3m in all cases • Rear setback – 3m in all cases • Distance from other builodings with windows and habitable rooms minimum 12m • A continuous active frontage is encouraged - this can be arcaded Refer to section 5.4 for permitted structures in setbacks.
Parking and Servicing	Parking to be calculated on the basis of the below standards: • Studio/1 bedroom apartment – 1 car parking space per apartment • 2 bedroom apartment – 1.5 car parking spaces per apartment • 3+ bedroom apartment – 2 car parking spaces per apartment Two (2) parking spaces (minimum) to be provided per 100sqm of commercial floorspace. Servicing for the commercial units is to be from the street. All parking to be provided within the plot to the rear. If viable, this may be decked to provide landscaped courtyards above. Visitor parking to be calculated at 10% of the total parking and should be accommodated on-street or within the cluster.
Public Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. These could be provided at grade, in courtyards, above the podium or on the rooftops.

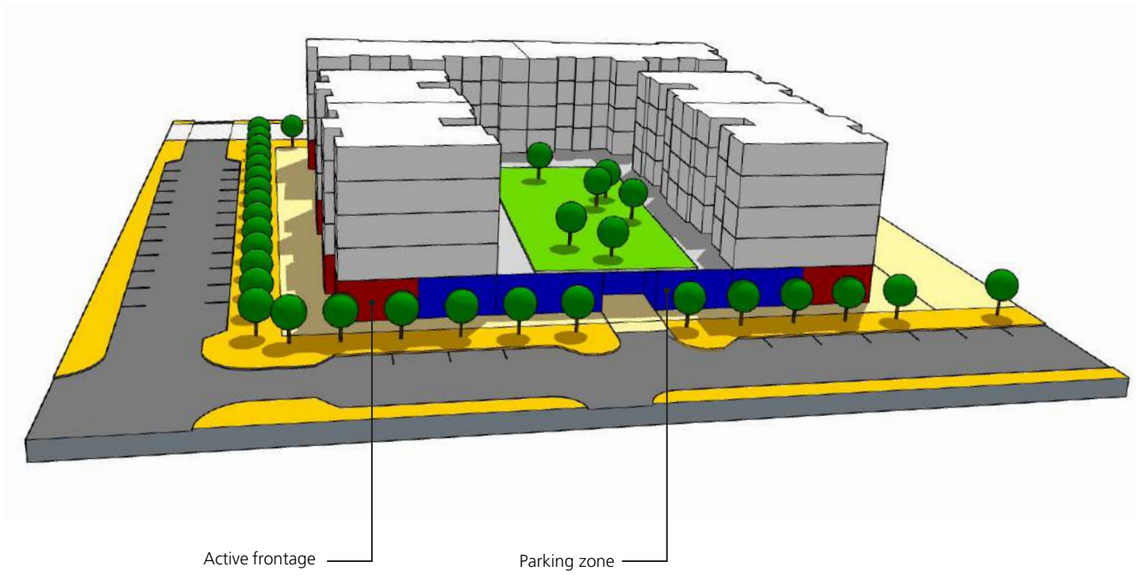




Massing, setbacks, heights and number of storeys

*The diagram does not indicate plot coverage. Please refer to relevant table for % of plot coverage.

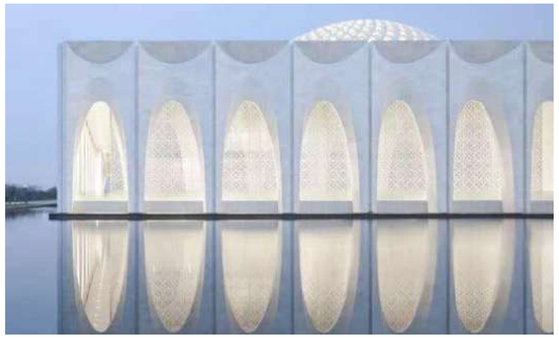




Parking zone

7.12 Civic District – City Level

Building Typologies	The Civic District will be the heart of the new city and situated at the core of the urban area, in a campus setting, to the East of Road 2. Accommodating regional and sub-regional level facilities, it includes the Grand Mosque, Sports Stadium and Regional Hospital and the City Park. The campus is subdivided in three wedges each with its own direct highway access and linked to each other by the City Park. The Grand Mosque is anticipated to extend to approximately 100,000sqm GFA and accommodate a total of around 5,000 worshippers. The Sports stadium, located in the adjacent plot is anticipated to accommodate approximately 15,000 seats and cater for large sporting events. The Regional Hospital is the more comprehensive level of care provision in the Omani Healthcare system (third level) and should cater for the whole city and beyond providing approximately up to 800 beds.
Building Height	• To be determined on a plot by plot basis - these are landmark buildings
Plot Size	• Grand Mosque: 20.5 Ha • Sports stadium: 25.00 Ha • Regional Hospital: 28.00 Ha
Setbacks and Entrances	• Set-backs: to be determined based on location, minimum 5m from all sides • Entrances: from all sides - Vehicular from highways - Pedestrian from City Park Refer to section 5.4 for permitted structures in setbacks.
Parking and Servicing	• Refer to Urban Planning Guidelines, table 6.11.2 Community Facilities/ Parking
Public Space	Minimum 50%. Designated public spaces should be provided, subject to space availability and appropriateness. These could be provided at grade, in courtyards, above the podium or on the rooftops.



7.13 Civic – District Centre

Building Typologies	The DMP adopts the best practice of fully integrating the Community Facilities in the urban fabric. The District Centres should be planned as compact and pedestrian friendly systems which respect the scales of the planned urban form, therefore the policies relating to community facilities will not be so prescriptive that they identify specific facilities but rather identify areas where a comprehensive range of facilities and services will be provided. The District Centres cater for a population of 40-60,000 inhabitants.
Building Height	• To be determined based on location and type of facility • Typically for a commercial and retail landuse, the floor height should be between 4m upto 4.75m and minimum of 6m incase of a mezzanine floor. • Typically for educational landuse a minimum of 3.5m floor height is recommended. • Utilities such as HVAC units or lift rooms on roof may exceed maximum height of building and shall be appropriately screened. • Parapet cannot exceed 1.5m beyond maximum height of the building.
Plot Size	• Up to 23ha
Setbacks and Entrances	• To be determined based on location and type of facility Refer to section 5.4 for permitted structures in setbacks.
Parking and Servicing	• Refer to Urban Planning Guidelines, table 6.11.3 Community Facilities/ Parking
Public Space	Up to 50%. Designated public spaces should be provided, subject to space availability and appropriateness. These could be provided at grade, in courtyards, above the podium or on the rooftops.

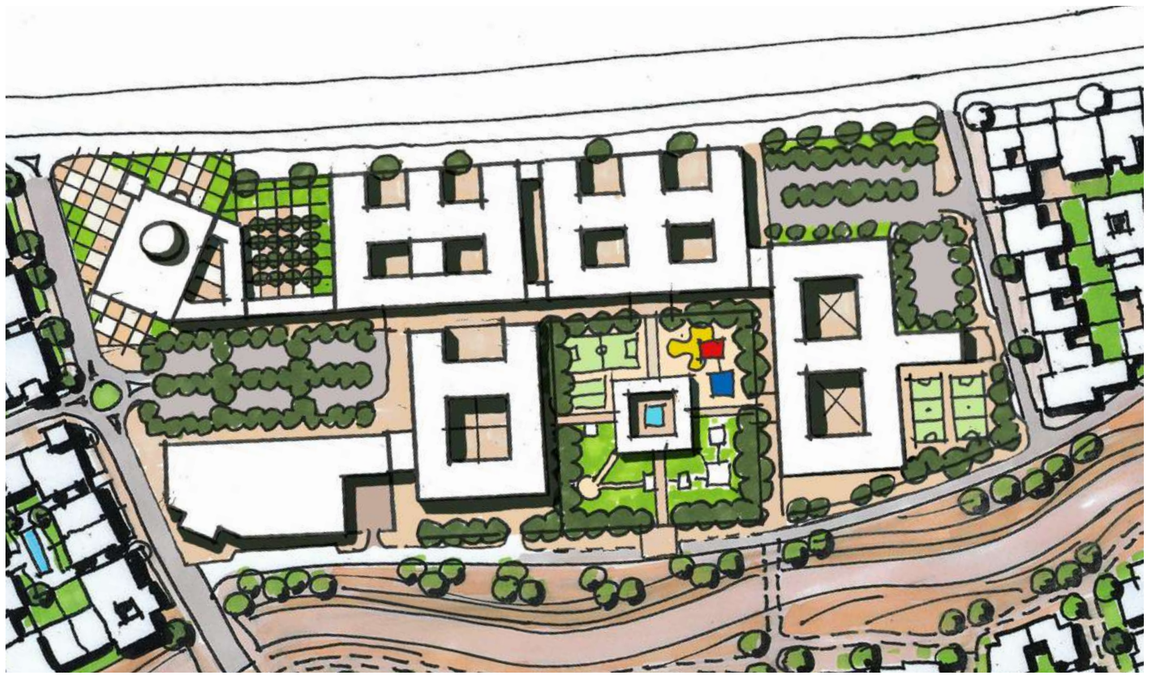
The district centre provides community facilities, public administration, employment, retail and recreational opportunities for multiple neighbourhoods. They fulfil a sub-regional role within the new city serving a population of 40,000 to 60,000 persons. To some extent this is a self-sustaining, fully functional unit within the hierarchy.

The residential typologies in the district centre include higher density townhouses and apartments. These residential units are primarily meant for Omani professionals who choose this lifestyle or professional expatriates.

Figure opposite shows the proposed District Centre in the Rock Garden District. The centre contains a traffic calmed shopping street and civic plaza next to the Friday Mosque. The centre also includes a district park which is overlooked by the hospital. Shaded pedestrian and cycle routes set in greenways connect the park and schools to the surrounding residential neighbourhoods.

7.14 Civic – Neighbourhood Centre

Building Typologies	The DMP adoptes the best practice of fully integrating the Community Facilities in the urban fabric. Neighbourhood Centres are the focal point of neighbourhoods, typically serving 15,000 to 35,000 persons and accessible within 800-1,000m radius. These are planned as compact and pedestrian friendly systems which respect the scales of the planned urban form. Typically Neighbourhood Centres include Retail, Friday Mosque, Cycle 1and 2 schools, Sport and Youth Centre, Health Centre/Clinic, Playing Field, Petrol Filling Station, Public Toilets and Local Post Office.
Building Height	• To be determined based on location and type of facility • Typically for a commercial and retail landuse, the floor height should be between 4m upto 4.75m and minimum of 6m incase of a mezzanine floor. • Utilities such as HVAC units or lift rooms on roof may exceed maximum height of building and shall be appropriately screened. • Parapet cannot exceed 1.5m beyond maximum height of the building.
Plot Size	• Typically up to 10 -13 Ha • Exceptionally up to 20 Ha if Cycle 3 schools need to be included
Setbacks and Entrances	• To be determined based on location and type of facility Refer to section 5.4 for permitted structures in setbacks.
Parking and Servicing	• Refer to Urban Planning Guidelines, table 6.11.4 Community Facilities/ Parking
Public Space	Up to 50%. Designated public spaces should be provided, subject to space availability and appropriateness. These could be provided at grade, in courtyards, above the podium or on the rooftops.

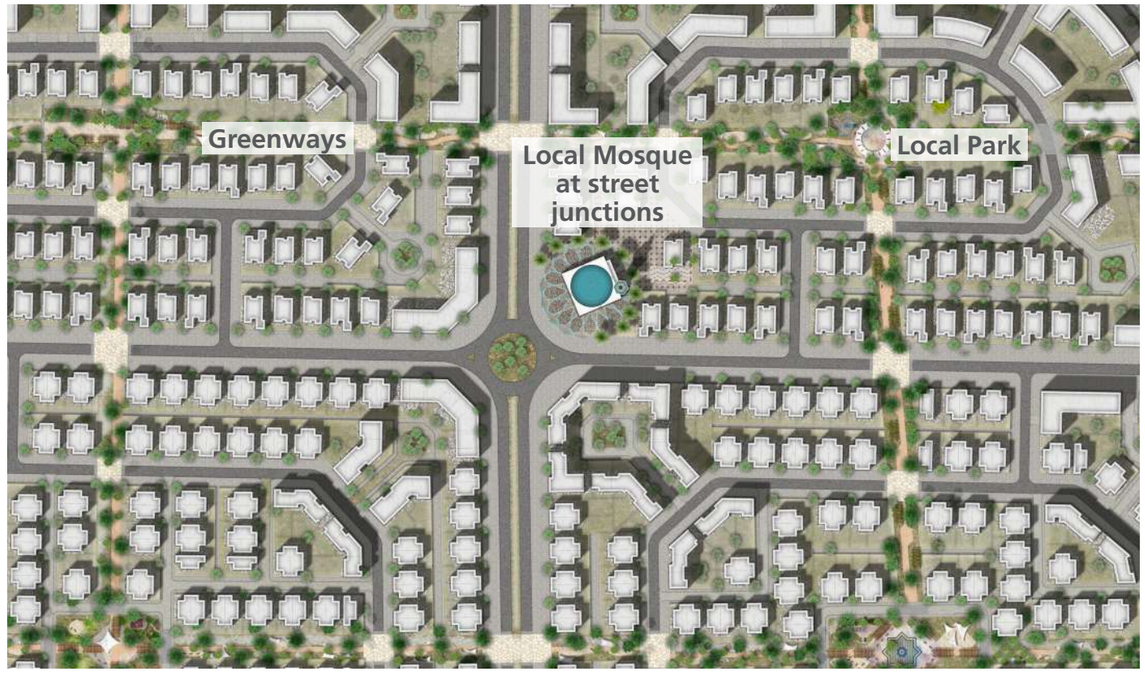


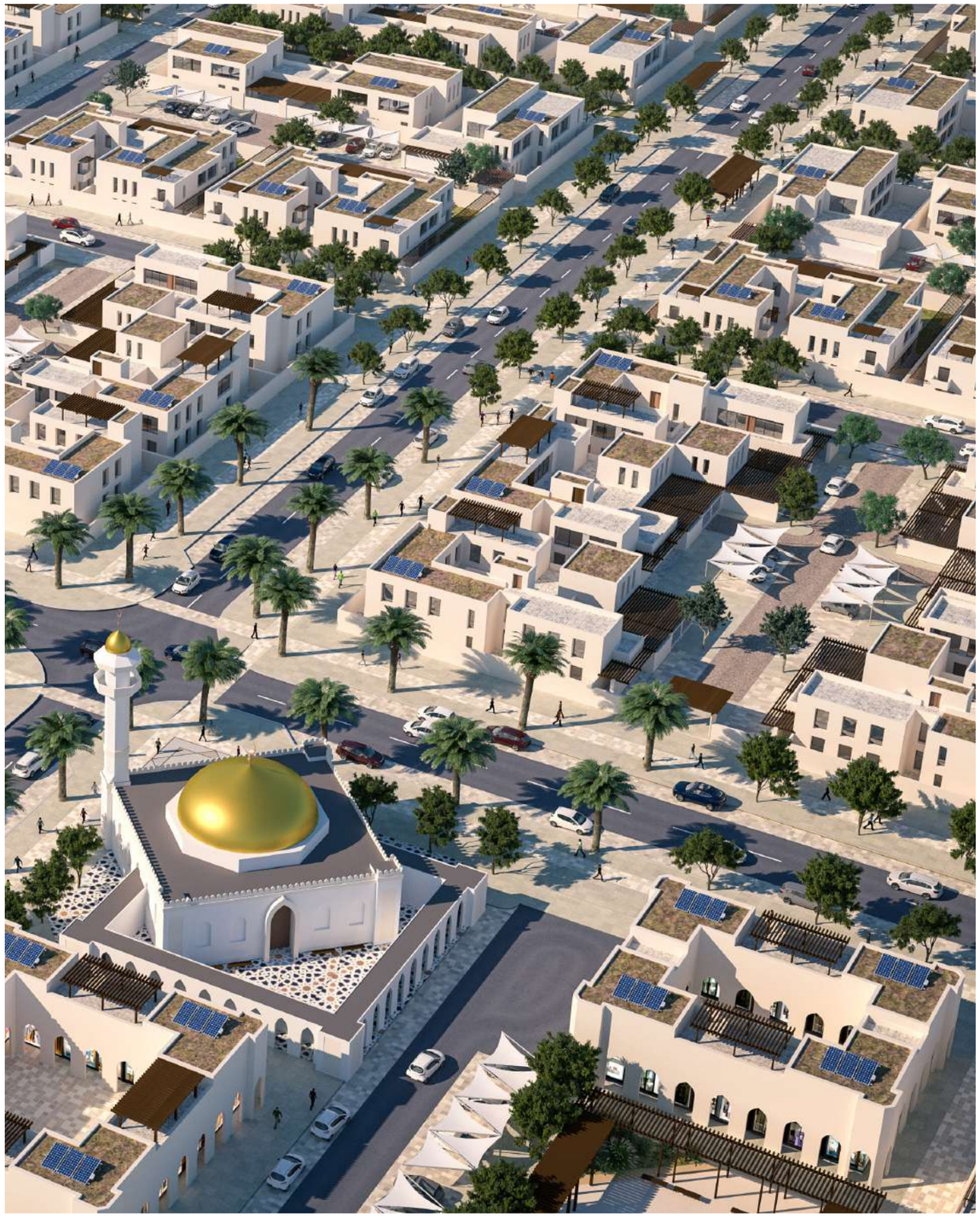
The planning and design of neighbourhoods will be based on the following core principles:

- At the centre of each neighbourhood, at the intersection of routes, will be the 'Neighbourhood Centres' typically providing shops and services for 6-8 Home Zones.
- Higher density areas of shared households are located close to shops and services.
- A safe and shaded pedestrian and cycle network which links the residential areas with local and neighbourhood centres, mosques and public transport stops.
- Elements of Arabic vernacular urban planning such as the Sikka and the Baraha which create shaded routes and meeting or play spaces.
- The neighbourhood module is repeated several times through the district, creating a series of self contained communities, all with the same level of access to shops and facilities, choice of living environment and access to open space.

7.15 Civic – Local Centre

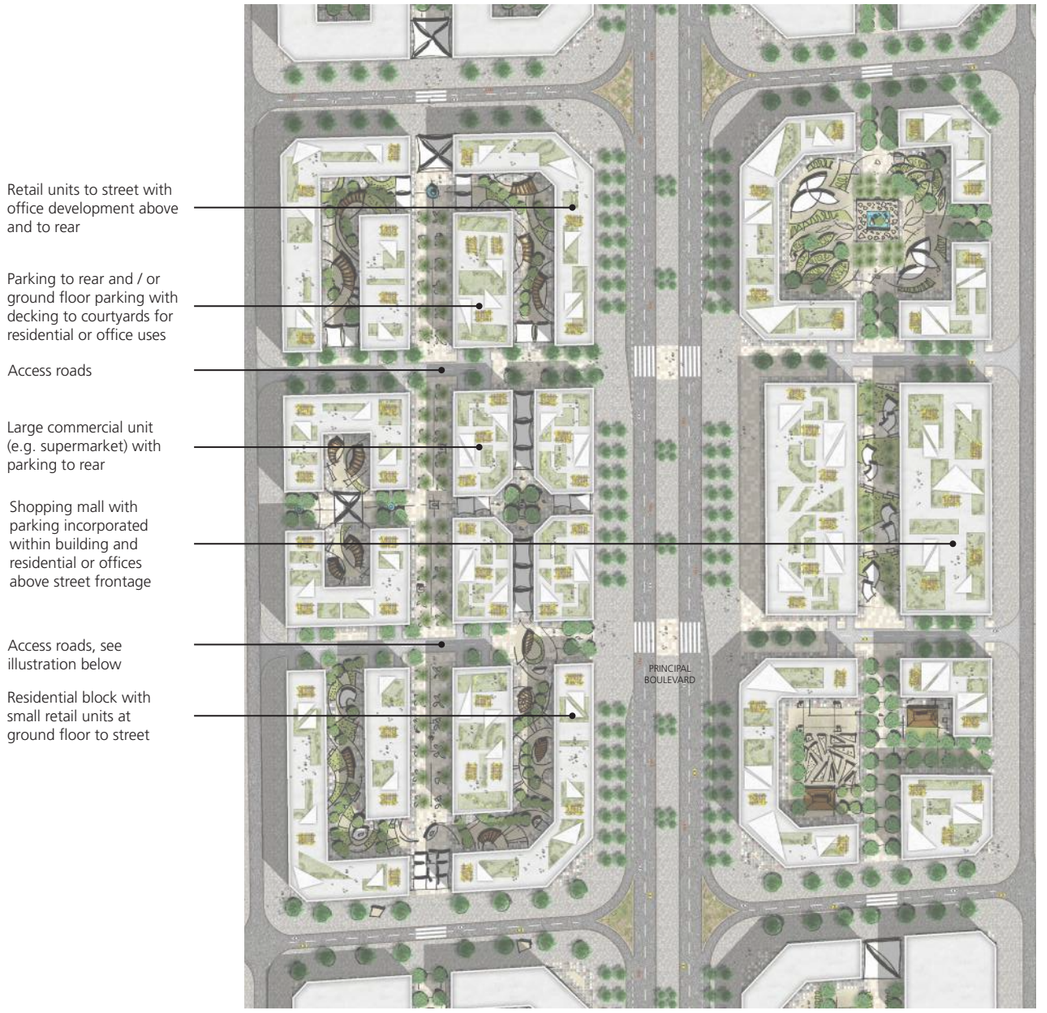
Building Typologies	The DMP adoptes the best practice of fully integrating the Community Facilities in the urban fabric. Local Centres represent the first level of Community Facilities, typically serving communities of 6,000 to 10,000 persons. These are distributed along a finer network of primarily pedestrian links within a radius of 400m (5 mins walk) and act as local landmarks contributing to local identity and distinctiveness. Typically Local Centres include a Local Mosque, Nursery, Local Shops, Community Garden and Playground and the Local Square
Building Height	• To be determined based on location and type of facility
Plot Size	• Typically up to 1.2 Ha
Setbacks and Entrances	• To be determined based on location and type of facility Refer to section 5.4 for permitted structures in setbacks.
Parking and Servicing	• Refer to Urban Planning Guidelines, table 6.11.5 Community Facilities/ Parking
Public Space	Up to 50%. Designated public spaces should be provided, subject to space availability and appropriateness. These could be provided at grade, in courtyards, above the podium or on the rooftops.

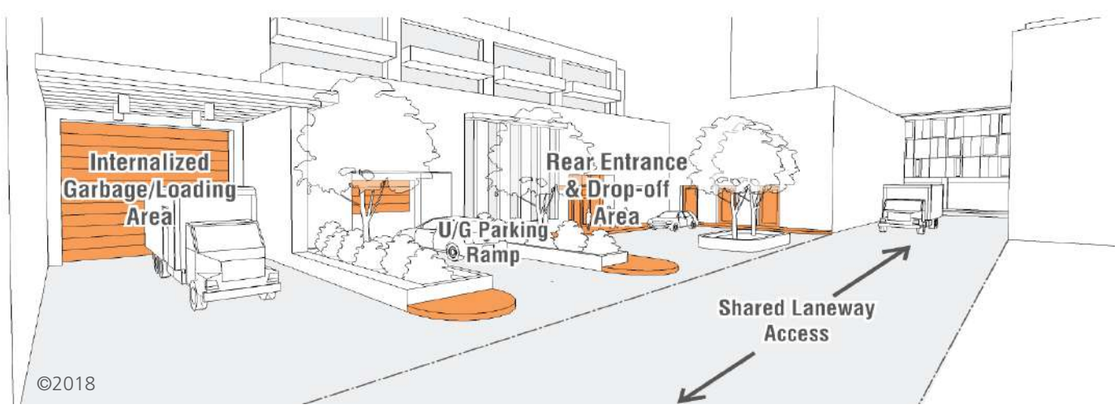




7.16 Commercial Mixed Use – Boulevard (CMU)

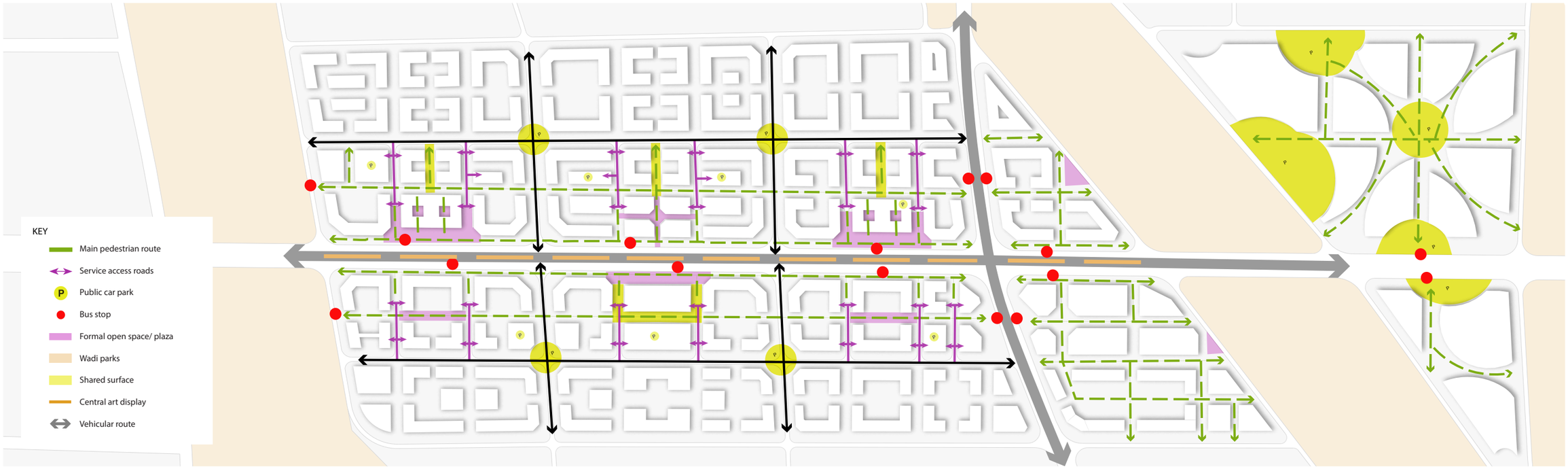
Building Typologies	The Commercial Mixed Use Zones identify land for mixed use commercial development comprising a mix of retail and commercial uses. These uses will be located in areas of high visibility on the primary road network. The 'Primary Shopping Area' (PSA) and the focal point of the city from a retail perspective – is the **City Boulevard**. In the PSA, additional controls and restrictions apply to the retail streets, specifically, the designated 'primary shopping frontage' fronting onto the Civic Boulevard and the supporting 'secondary shopping frontages' which sit behind the main Boulevard.
Building Height	• Buildings will be five or six storeys facing the boulevard. They may be lower behind the front block. • Retail and commercial uses will be located on the ground floor and in some cases the first floor.
Plot Size	Subject to location: average 100 x 60m, minimum plot size is 60 x 40m • Coverage ratio 40%
Setbacks and Entrances	• Buildings will face the street. • Buildings will be built up to the boulevard plot boundary. • The frontage to the street will be as continuous as possible with minimal breaks (see entrances below). • Large areas of blank wall will be avoided, especially to the street which should be animated with windows. • Buildings on corner sites will mark the corner with an architectural feature such as a tower, projecting bay, entrance etc. • The primary pedestrian entrances for all uses will be from the street. These should be clearly identifiable through building design (use of canopies, scale of opening etc.)
Parking and Servicing	• Parking may be located within development blocks at ground floor in an undercroft arrangement; this would be located to the rear of the blocks and not adjacent to the street. • Multi-storey or decked car parks must be located away from the front block in as discreet a location as possible with regard also to rear views from surrounding residential development. • Servicing will be at the rear, behind building mass and accessed by a discreet entrance from the street. • Service yards will be located to the rear of the plot and in an inconspicuous location. • Neighbourhoods shared car parking can complement required provision
Public Space	Various nodal points, landmarks and focal points have been incorporated into the Master Plan for the City Boulevard. The nodes must provide visual interest and landmark quality to orient drivers and pedestrians. The nodes are an opportunity to provide unique places. • Major Nodes: Along the Boulevard spine, five major nodal points have been identified which provide access to public transport and major public open spaces. • Secondary Nodes: In between these major nodes, secondary nodes provide orientation and assist pedestrian movement. These secondary nodes are located along the central boulevard in between the major nodes and along perpendicular roads which form secondary gateways into the Boulevard area. • Pedestrian amenities on sidewalks – transit stops, kiosks, benches, fountains, or food cafés – encourage activity and enhance the vitality and viability of the adjacent shops and businesses.





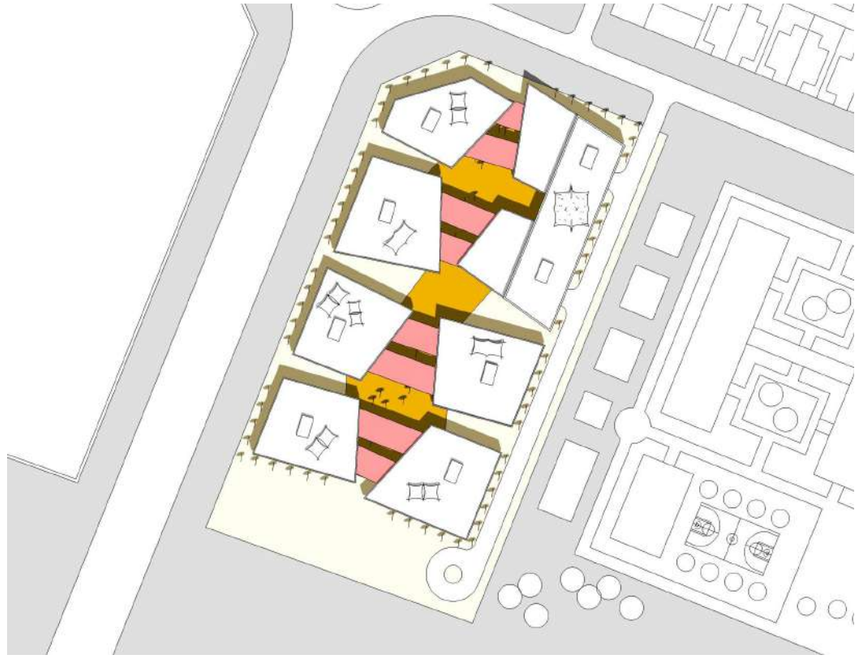
Commercial Frontage in the Civic Boulevard

Circulation and Key Public Spaces



7.17 Retail Mall (CMA)

Building Typologies	The Commercial Mall Zones provide locations for commercial malls to be located around the city. The scale and focus of the malls uses will vary significantly and will include the local or neighbourhood malls and the mall located within the civic boulevard, to serve the retail needs of the City.
Building Height	• 1 storey for local malls • G+1 for district and central malls
Plot Size	• To be determined on a plot by plot basis. Refer to specific District Plans for further detail.
Setbacks and Entrances	• To be determined on a plo t by plot basis Refer to section 5.4 for permitted structures in setbacks.
Parking and Servicing	• Two (2) parking spaces to be provided per 100 sqm of commercial mall GFA. • Appropriate parking must be provided within the site to be reviewed and approved by SEZAD prior to construction. Taxis ranks also to be considered where appropriate.
Public Space	Up to 50%. Designated public spaces should be provided, subject to space availability and appropriateness. These could be provided at grade, in courtyards, above the podium or on the rooftops.



7.18 Commercial Mixed Use – Showrooms (CMU-S)

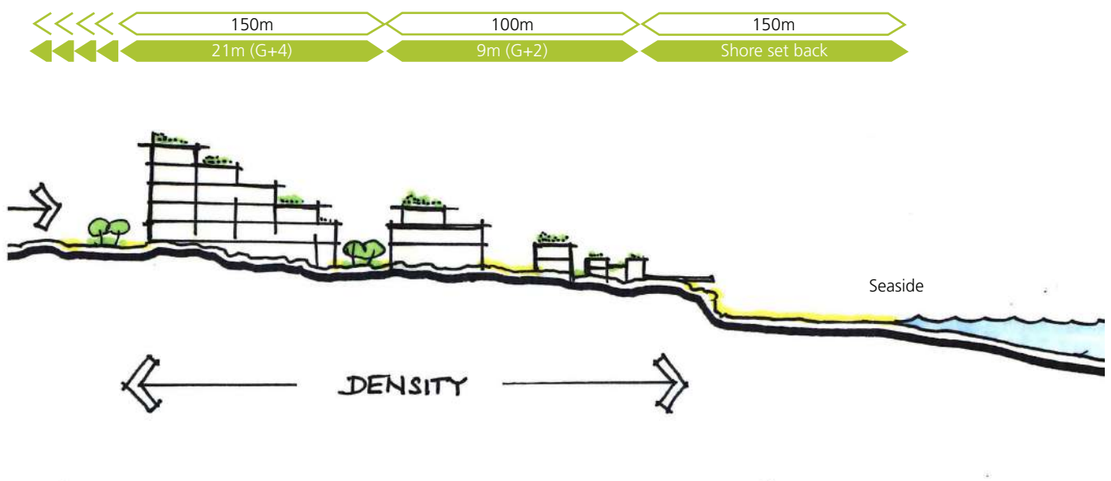
Building Typologies	The Commercial Mixed Use with Showroom Zones are located within the Showroom District to the south of the City. This zone identifies land for mixed use commercial development including showrooms. This zone fronts onto Road 2, and provides an alternative retail offering, with a high percentage of 'big box' retail uses and functions, fulfilling the retail needs of the City.
Building Height	• 2 (G+1) to 6 storeys (G+5)
Plot Size	• To be determined on a plot by plot basis. Refer to specific District Plans for further detail. • Minimum 2,500sqm - 20,000sqm • Coverage ratio 40%
Setbacks and Entrances	• Front: 0-1m • Rear: 8m • Side: 3m • Access driveway can be shaded across two plots Refer to section 5.4 for permitted structures in setbacks.
Parking and Servicing	• Two (2) parking spaces (minimum) to be provided per 100sqm of commercial GFA, except in the Boulevard District which will benefit from the BRT and will therefore require lower levels of parking, to be discussed and agreed with SEZAD on a plot by plot basis. All parking to be provided within the plot, to the rear. • Where appropriate, parking may be located within development blocks at ground floor in an undercroft arrangement; this would be located to the rear of the blocks and not adjacent to the street. • Parking for each use should be separated where possible.

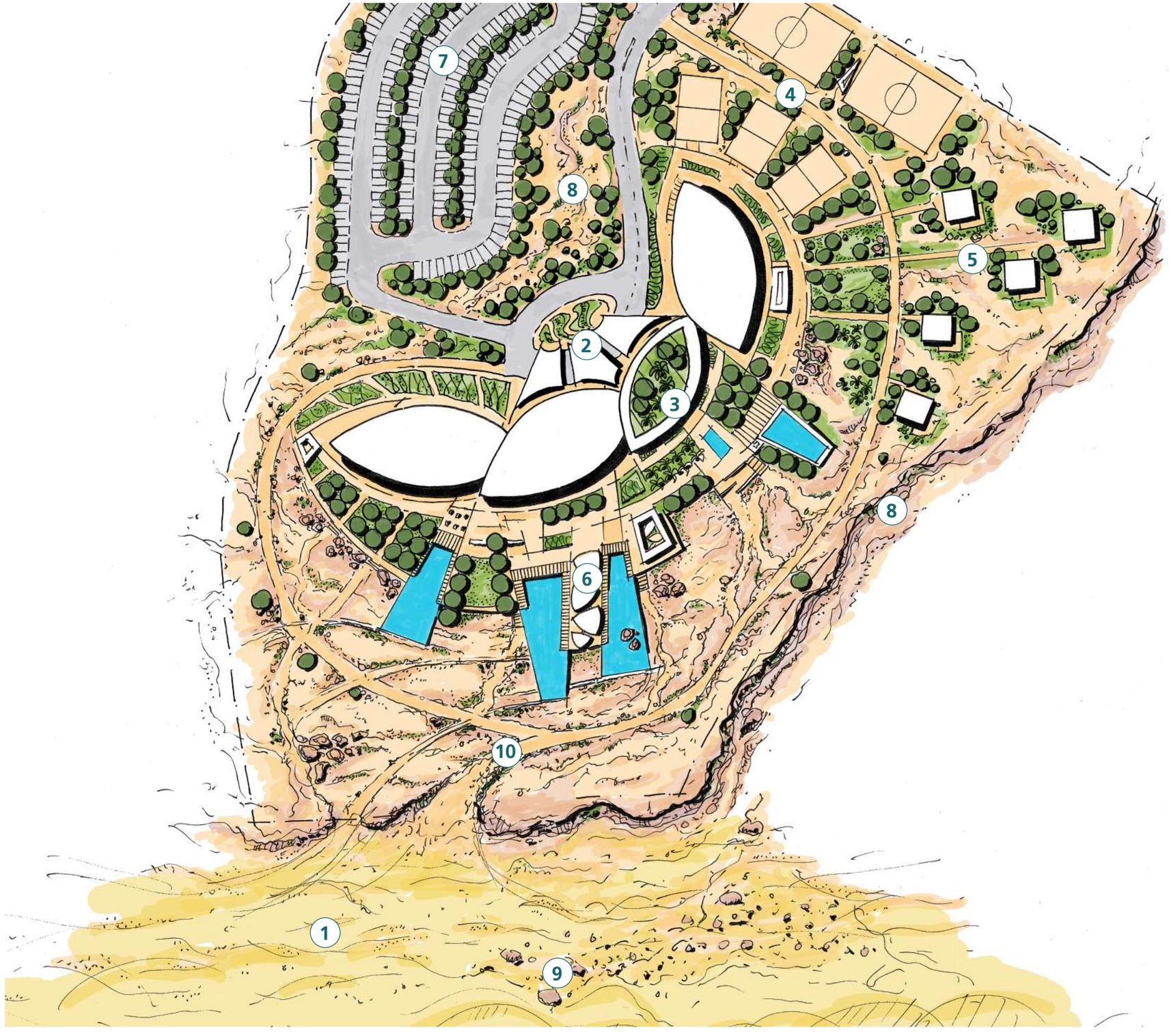
0.25ha site

2ha site

7.19 Tourism – Business and Existing Hotels (TOU-B)

Building Typologies	The identified Tourism – Business land use zone provides plots for the development of business hotels and associated facilities such as conference and meeting centres. They may also include serviced apartments. Restaurants and retail shall be encouraged along the proposed corniche. Building coverage shall in no case exceed 30% of total land area. As a guidance the following can be adopted: **Hotel Rank /Star Classification** — **Footprint (%)** 3 — 20 - 30 4 — 15 5 — 12
Building Height	• Within 100m beyond the setback on the seaside of plot: G+2 • Next 150m and beyond: G+4 • Excluded from the above are the following: Public buildings such as lecture rooms, covered theatres, conference halls and the like according to the technical specifications in force in the Sultanat, Sports halls according to the structural requirements, Staircases, water tanks and air conditioners on top of the buildings provided that they are enclosed and treated architecturally to conceal them. • The parapet shall not be more than (one) meter above the maximum height of the building. Use of screening structures is encouraged.
Plot Size	• Minimum: 8.5 Ha
Setbacks and Entrances	• No built development shall be located within 150m of the high tide line. • No built development is to be located in the wadis or within the 50m buffer zone to the edge of the wadi as illustrated on the Tourism District Plan. • Hotels and built structures set back should not be less then 10m all around the boundary from inside to accommodate an access service street unless one of the boundaries is a beach or waterway, setbacks to be determined by law. • Villas may be bound by fence walls.
Parking and Servicing	• 1 car parking space to be provided for every 3 hotel rooms and • 1 car parking space for every 10 sqm of public area i.e. food & beverage and entertainment uses
Public Space	Minimum 70% of total land area. Designated semi-private spaces should be provided, subject to space availability and appropriateness. These could be provided at grade, in courtyards, above the podium or on the rooftops.





1. Development set back 150m from the sea.
2. Shaded arrival point
3. Atrium garden with café and restaurants
4. Football and tennis pitches
5. Detached hotel apartments
6. Swimming pools with café and restaurants
7. Car park
8. Natural site drainage
9. Public beach
10. Paths to the beach

7.20 Tourism – Family, Leisure and Entertainment (TOU-F)

Building Typologies

The identified Tourism – Family Leisure land use zone provides plots for the development of family hotels and resorts. These zones are located in the Tourism District adjacent to the coast benefitting from uninterrupted views out to sea and direct beach access. Restaurants and retail shall be encouraged along the proposed corniche. As a guidance the following can be adopted:

Hotel Rank /Star Classification	Footprint (%)
3	20 - 30
4	15
5	12

(TOU-F / TOU8) Residential development within the Tourism Zone shall complement the proposed hotel and resort development and may comprise second homes/holiday homes or permanent residential accommodation.
Building coverage shall in no case exceed 30% of total land area.

Building Height

- Within 100m beyond the setback on the seaside of plot: G+2
- Next 150m and beyond: G+4
- Excluded from the above are the following:
  Public buildings such as lecture rooms, covered theatres, conference halls and the like according to the technical specifications in force in the Sultanat, Sports halls according to the structural requirements, Staircases, water tanks and air conditioners on top of the buildings provided that they are enclosed and treated architecturally to conceal them.
- The parapet shall not be more than (one) meter above the maximum height of the building.

Plot Size

Setbacks and Entrances

- No built development shall be located within 150m of the high tide line.
- No built development is to be located in the wadis or within the 50m buffer zone to the edge of the wadi as illustrated on the Tourism District Plan.

Front

- Residential Buildings setback is not less than 6 m.
- Mixed use residential buildings setbacks are not less than 3 m.
- Commercial facilities may be built to the road frontage boundary where outdoor dining, leisure activities or public spaces are proposed.

Side and Rear

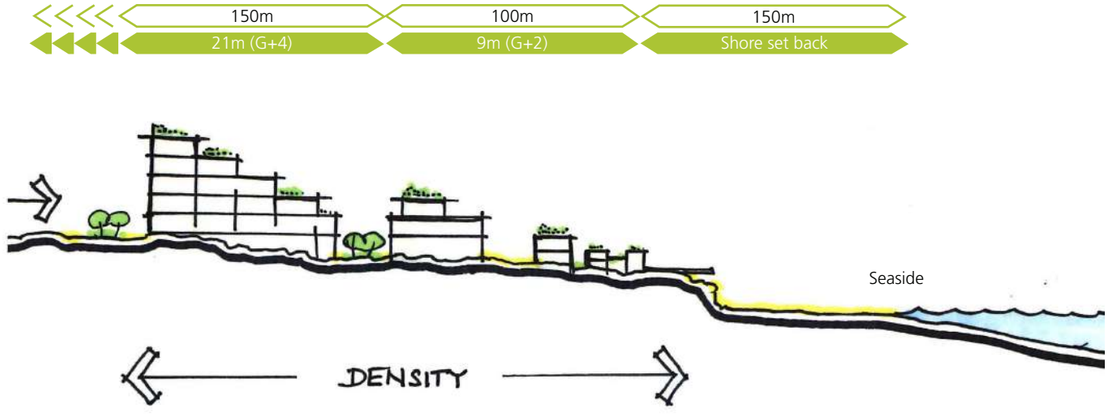
- Hotels and built structures set back should not be less then 10m all around the boundary from inside to accommodate an access service street unless one of the boundaries is a beach or waterway, setbacks to be determined by law.
- As a general guide, where there are openings to rooms in a building, it must be set back to a minimum of 3m from a side or rear boundary of the site.
- If there are no openings, buildings may be built to the boundary, where the next building must be set back 3m, otherwise to be attached.
- Building-to-building setback is not less than 6 m if there are windows in both

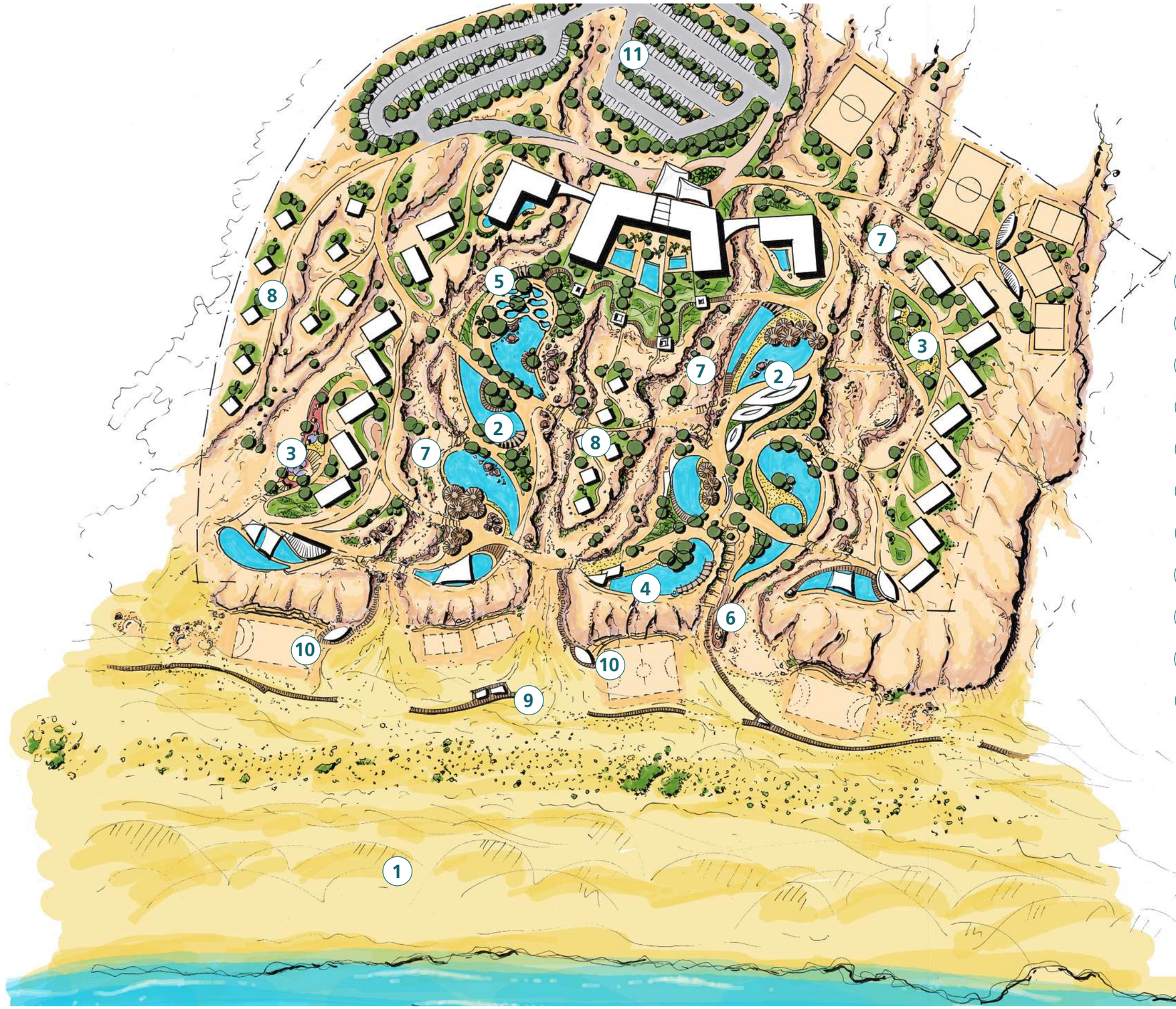
Parking and Servicing

- 1 car parking space to be provided for every 3 hotel rooms and
- 1 car parking space for every 10 sqm of public area i.e. food & beverage and entertainment uses

Public Space

Minimum 70% of total land area. Designated semi-private spaces should be provided, subject to space availability and appropriateness. These could be provided at grade, in courtyards, above the podium or on the rooftops.





1. Development set back 150m from the sea
2. Entertainment pools with cafés and restaurants
3. Hotel gardens with shaded children's play areas
4. Infinity pools
5. Plunge pools
6. Viewing point
7. Where possible wadis retained and protected
8. Family chalets
9. Boardwalks with informal cafés and restaurants overlooking public beach
10. Sports pitches for beach volleyball, soccer and handball with changing rooms and seating facilities
11. Car Park

7.21 Tourism – Eco Tourism, Wellness and Luxury

Building Typologies	The 'Eco Tourism, Wellness and Luxury Zone' will be a calm and peaceful area for tourists and residents to unwind. These zones are located in the Tourism District adjacent to the coast benefiting from uninterrupted views out to sea and on natural wetland to the south of the District. This zone has direct beach access. Building coverage shall in no case exceed 20% of total land area. As a guidance the following can be adopted: **Hotel Rank /Star Classification** — **Footprint (%)** 3 — 20 - 30 4 — 15 5 — 12
Building Height	• Within 100m beyond the setback on the seaside of plot: G+1 • Next 150m and beyond: G+2 • Excluded from the above are the following: staircases, water tanks and air conditioners on top of the buildings provided that they are enclosed and treated architecturally to conceal them. • The parapet shall not be more than (one) meter above the maximum height of the building. Use of screening structures is encouraged.
Plot Size	
Setbacks and Entrances	• No built development shall be located within 150m of the high tide line. In addition • No built development is to be located in the wadis or within the 50m buffer zone to the edge of the wadi as illustrated on the Tourism District Plan. • Hotels and built structures set back should not be less then 10 m all around the boundary from inside to accommodate an access service street unless one of the boundaries is a beach or waterway, setbacks to be determined by law.
Parking and Servicing	• 1 car parking space to be provided for every 3 hotel rooms and • 1 car parking space for every 10 sqm of public area i.e. food & beverage and entertainment uses
Public Space	Minimum 80% of total land area. Designated semi-private spaces should be provided, subject to space availability and appropriateness. These could be provided at grade, in courtyards, above the podium or on the rooftops.

The plans on the following page illustrates the urban design approach for the low density villa villages and the Eco Tourism Hotel in the Family / Residential / Zones, Eco Tourism, Wellness and Luxury Zone.

1. Wadis draining from escarpment protected and retained within linear parks.
2. Development set back 150m from sea, continuous pedestrian and cycle route runs along coast linking new waterfront communities with tourist facilities and hotels.
3. Premium luxury villas front on to the sea, set within plots 600 to 1000 sq metres.
4. Villas and townhouses grouped around shared shaded gardens with children's play area and swimming pool.
5. Local streets provide direct access to wadi parks and connect to recreational footpath and cycleways which run down to the sea.
6. District avenue set within landscaped corridor acts as the main spine road, providing access to new communities. Highway crosses wadis by means of bridges.
7. Local mosque in visible and accessible location at entrance to public beach and sports club.
8. Sports club with tennis courts serving the new residential communities and tourist accommodation.
9. Swimming pool complex on outcrop with dramatic infinity pool.
10. Boardwalk with informal beach cafés and restaurants overlooking public beach with parking clustered in small groups next to picnic and BBQ areas.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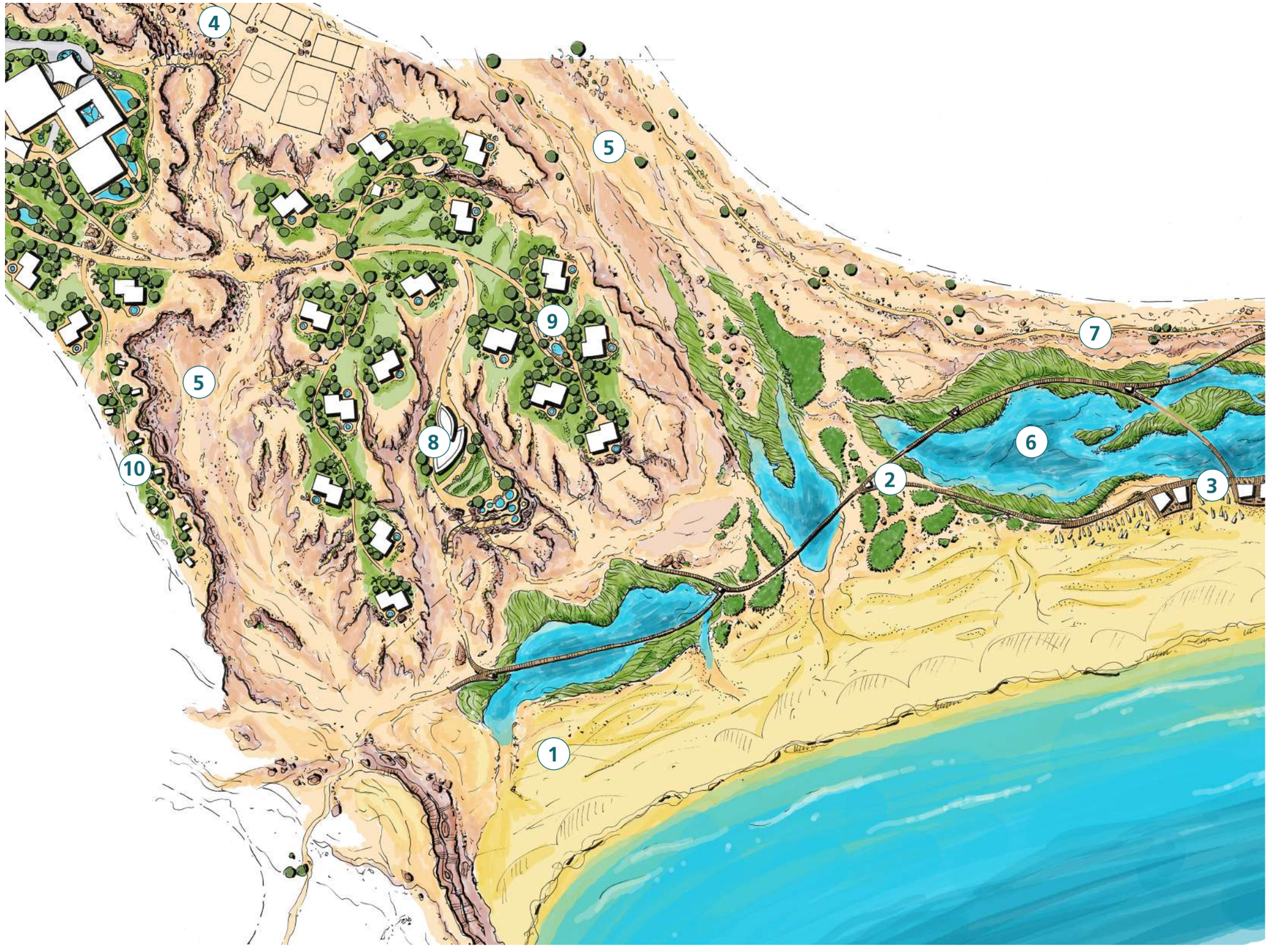
Eco Tourism Hotel



1. Development set back 150m from the sea
2. Boardwalks with birdwatch towers running through sea water lagoons linking Eco hotel and fisherman's village with wadis and public beach
3. Fisherman's village with café and restaurants overlooking sea water lagoons, public beach and the sea
4. Development reflects natural site topography
5. Wadis provide natural drainage
6. Sea water lagoons creating wildlife habitat
7. Pedestrian and cycle route runs along coast linking nature reserve with new developments along the coast
8. Holiday lodge with pools on different levels overlooking the sea
9. Family Chalets where possible grouped around shared, shaded space with children's play area and pools
10. Holiday cabins on wadi edge

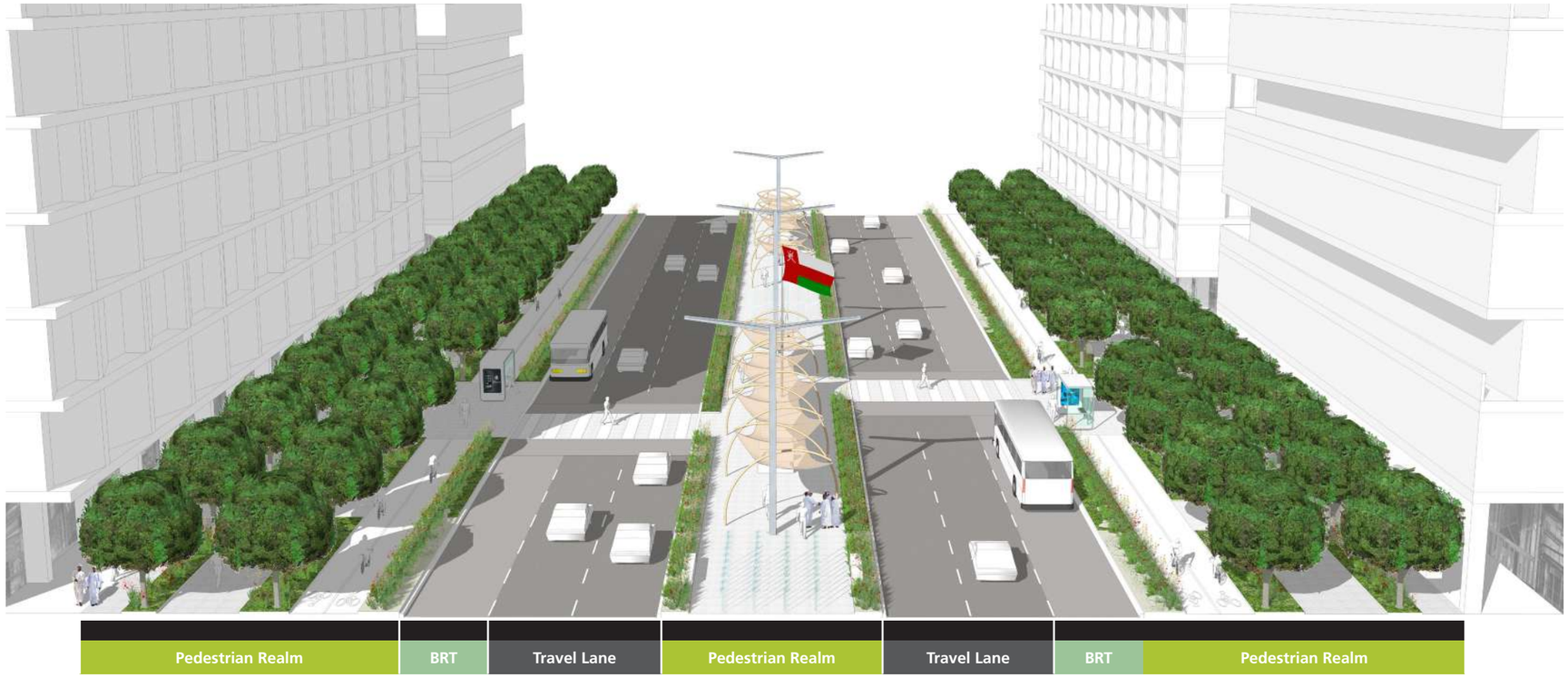
7.22 Street Based Codes

7.22.1 Code Components

Form-Based Codes with streets as their organising principle focus their regulations primarily on the specific design and location of streets. The Standards include a section drawing that defines the dimensional requirement for the street design, such as width and number of travel lanes, allocation and width of on-street parking, the width of the pedestrian realm and the location of planting. In addition, the specific way that a building is required to address the street, both in height, frontage type and setback is included in the regulating street section. The allocation of the different street types and their required locations are directly applied to the Detailed Master Plan and for Phase 1 the Regulating Sub-division Plan.

Right of Way (R.O.W)

The measurement across a thoroughfare of the area the municipality controls or owns. This includes the travel lanes as well as parking and pedestrian realm and together with the building setbacks and the frontage types, effectively defines the width of the public space. Paired with the minimum and maximum height of buildings, this defines the proportion of the public space. All of these should be considered together and regulated accordingly to prescribe the desired place.



Pedestrian Realm

There are five primary zones in the pedestrian realm: Frontage, Through, Furnishings, Cycle Track and Edge. Because interaction occurs between these zones, development of a cohesive design for the pedestrian realm is important. Design must consider the unique conditions associated with each zone as well as how the pedestrian realm interacts with other elements of the street, such as cycle and transit facilities and junctions. Maintaining clear sight lines between pedestrians, cyclists and motorists in these areas of interaction is critical.

Frontage Type

The specific way that a building type addresses the street defines the transition between the public and private realms. Listing the allowable frontage types for each building type helps ensure that the public space is properly addressed and activated based on the form and use of the building.

Managing and integrating parking

Different parking types affect a project in different ways. Based on the location and building type, certain parking types may not be acceptable for creating the urban and building form desired. Possible parking types include:

- Underground garage
- Multi-storey
- Surface parking
- Integrated garage (town houses)
- Detached garage (villas)
- On-street parking

Where parking is provided in courts or squares inside the perimeter street block, it should be designed as a shared surface space, seamlessly connected to building entrances and other public amenities. Smaller pockets of parking (no more than 10-15 spaces) are more easily absorbed into an attractive outdoor space than large, dominating areas of parking. It is also important that the parking areas are well overlooked and that clear and safe pedestrian routes between parking areas and the entrances to homes are provided.

Decking over parking between buildings inside a block has advantages – parking is shaded, the cars do not dominate, and amenity space for residents can be created on the deck The success of this will rely on the design of the parking, ensuring good lighting, security and access to dwellings. It is important to maintain activity on the ground floor of the building especially where it interfaces with the public realm. This activity can be generated by community facilities, or commercial properties.

Basement parking, although expensive clears the space between buildings for residents' amenity. Basement parking often requires the ground floor of buildings to be raised so that the basement can be ventilated. The height could range between 1m-1.5m above ground as appropriate. This can be beneficial for the privacy of ground floor dwellings. Disabled access also needs to be considered if the ground floor dwellings are not level with the street.

Garages that are designed as an integral part of town houses have to be carefully designed so that they do not dominate the façade. This can be achieved by lowering the level of the garage or by placing the garage at the rear of the property accessed by an alley.

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Frontage	Through	Furnishings	Cycle Track	Edge
Space between the building façade, wall or fence and the through zone of the pedestrian realm.	Obstacle-free space for clear pedestrian through travel. This is the primary walking area of the pedestrian realm.	Primary buffer space between the active pedestrian walking area of the through zone and adjacent thoroughfares.	Designated track for bicyclists; may not be required on some streets.	Interface between the on-street parking or travel lane.

7.23 Street Network

A number of significant road network developments have been completed within Duqm City. These road networks have been incorporated within the Detailed Master Plan, to ensure future road network connections respect and incorporate existing networks, to create a highly connected and accessible City.

The key existing road networks include:

Highway 32 - 2 x 2 lane highway connecting Duqm City with Muscat in the north (approximately 550km), and Salalah in the south (approximately 450km). This road is signalled through Saay Village.

Road 2 - 3 x 3 lane road carriageway connecting Duqm Airport in the south with Duqm Port in the north. The highway runs within a 400 metre right of way.

Road 3 - 2 x 2 lane road carriageway connecting Saay Village in the north to Renaissance Village and the Coastal District.

The proposed street network combines a continuous grid of district avenues for city wide connectivity and a secondary grid of neighbourhood streets defining super-blocks. An open space network of greenways, sikkas and shaded footpaths connect all streets within a super-block and create a fully connected pedestrian realm.

This approach balances both the needs of the pedestrian and the motorist and achieves the following objectives:

- Ease of movement for vehicle based transport passing through the city on arterial and district avenues without impacting on residential areas within super-blocks.
- Secure, tranquil and safe residential Home Zones within super-blocks.
- No through traffic in Home Zones, with local streets stopping within, or returning to the perimeter.
- Placing nodes of activity such as local and neighbourhood centres at the intersection of streets and the path system.
- A continuous, open network of shaded pedestrian streets, spaces and paths.
- Encouraging walking while discouraging short-distance driving.

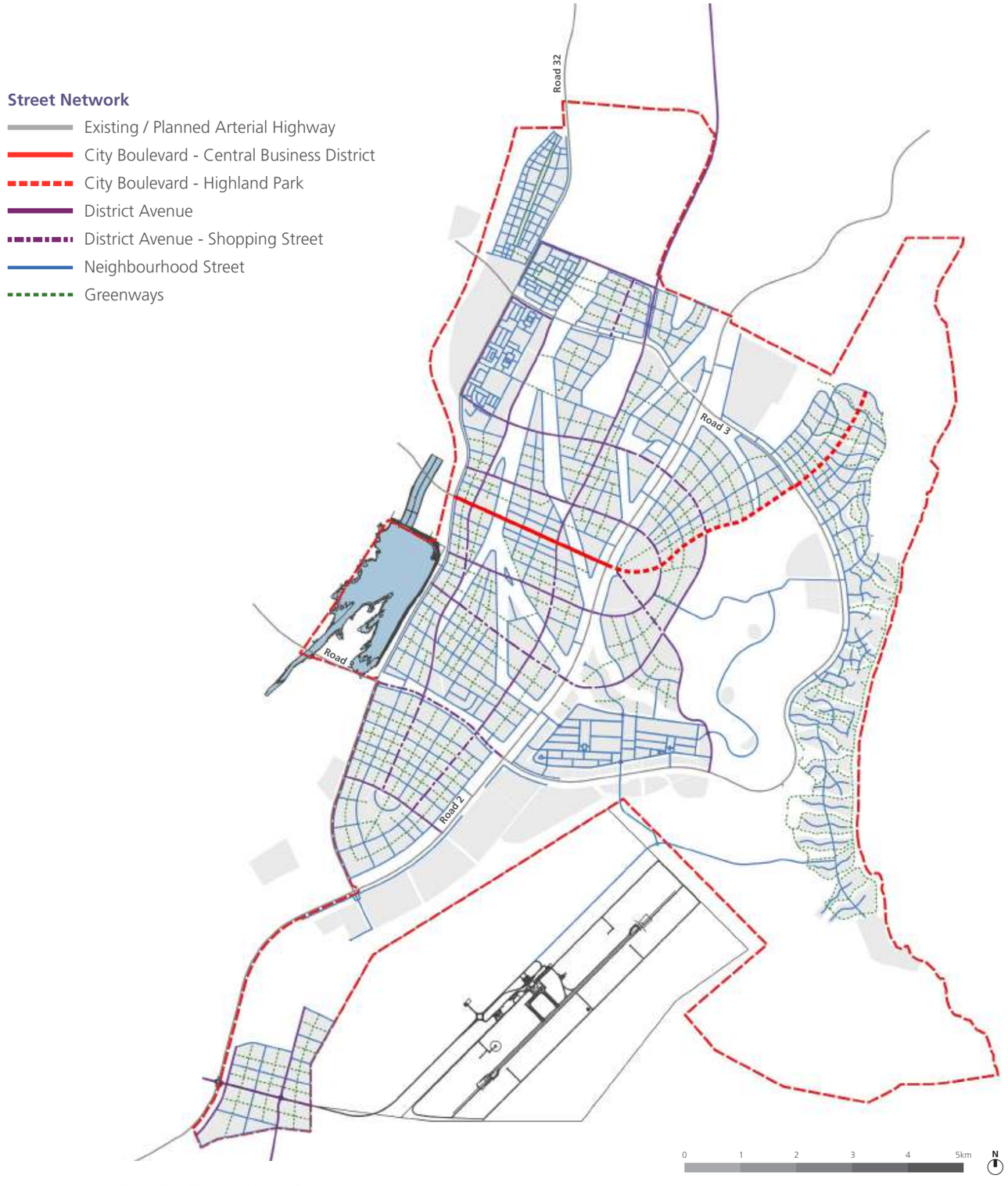

Figure 7-2: City-Wide Mobility Plan

Integrated Street Planning and Design

The UK Publication: Link & Place: A Guide to Street Planning and Design advocates bringing together the perspectives and processes of land use planning and urban design with those of transport planning and traffic engineering to provide an integrated approach to street planning and design. This innovative approach, summarised below, is built around the Link and Place functions of streets.

Link and Place

In order to plan and design for the complex and competing demand characteristics of many urban streets, it is first necessary to understand the role that the street performs. These can be reduced to two distinct independent, often conflicting, primary functions of a street: a Link and a Place.

A street serves two primary functions:

Link – a movement conduit

Place – a destination in its own right

Link Function

As a Link, a street provides a conduit for through movement; it forms an integral part of a wider street network and other, more specialised, urban transport networks.

The Link function seeks to enable users to pass through the street as quickly and conveniently as possible

A Link user's essential need is to follow a continuous, linear path, with minimum disruption and a seamless connection from the beginning to the end of their journey.

Link users may be further subdivided by their mode of movement such as pedestrians, cyclists, car users, bus passengers, goods and vehicle users.

Place Function

As a place, a street is a location where activities take place. It has its own identity and character with particular land uses and activities associated with it. From a Place perspective, the street is an area rather than a movement conduit: a place to shop, access services, socialise, chat, sit or simply stroll. A Place user is someone wishing to make use of some of the features that are on that particular street. For such people the street is an origin or a destination, not simply a movement conduit.

The Place function seeks to encourage users to stay as long as desirable on a street and enjoy the street's surroundings

Most of the activities taking place on the street or in the adjoining frontages are carried out on foot and so the people participating in them are regarded as pedestrians. They are not passing through the area – they are spending time in the area. The character of the Place may be encouraging them to visit and linger in the area.

Link function	Place function
Social sustainability	
• Safety of people in vehicles • Safety of vulnerable road users • Speed of moving traffic	• Personal security • Activities on streets • Presence of people
Economic sustainability	
• Movement and efficiency along the Link • Delays along the Link	• Viability of the Place • Delays moving around the Place
Environmental sustainability	
• Environmental quality inside vehicles • Contribution to global warming • Environmental quality	• Air quality on the footway • Noise level • Vegetation • Street infrastructure

Source: Link & Place: A Guide to Street Planning and Design

Street Character Types

The design of highways, will take into account the Sultanate of Oman, Highway Design Standards 2010. A more collaborative approach to the design of the highway network is proposed which moves away from hierarchies of standard road types based on traffic flows towards developing street character types which achieve a balance between place and movement.

This approach has been adopted in the design, construction, adoption and maintenance of urban streets in the United Kingdom (Manual for Streets) and in Abu Dhabi (Urban Street Design Manual). The principal changes to practice, are set out below:

- Applying a user hierarchy to the design process which considers pedestrians first when designing streets.
- Emphasising a collaborative approach to the delivery of streets. Certain streets, for example, the City Boulevard, may require a 'non-standard' approach to respond to context and this can be achieved by working as a multidisciplinary team and by looking at and researching other similar places that work well.
- Recognising the importance of the community function of streets as spaces for social interaction. Streets should integrate not segregate communities and neighbourhoods.
- Promoting an inclusive environment that recognises the needs of people of all ages and abilities. Designs must recognise the importance of way-finding and legibility, especially with regards to children, older people and disabled people.
- An appropriate balance should be struck between the needs of different user groups. Traffic capacity and utility corridors should **not** always be the primary consideration in designing streets and networks.
- Creating networks of streets that provide permeability and connectivity to main destinations and choice of routes.
- Increased connectivity requires a network of smaller streets and shorter blocks, a 'fine-grained network,' rather than a larger grid of wide, multi-lane streets with large junctions.
- Moving away from hierarchies of standard road types based on traffic flows and / or the number of buildings served.
- Developing street character types on a location-specific basis requiring a balance to be struck between place and movement in many of the busier streets.
- Encouraging innovation with a flexible approach to street layouts and the use of locally distinctive, durable and maintainable materials.

Street Context Names

A two name convention has been adopted for the street hierarchy. The first name is the Context name, based on land use and community character, and the second name is the Street Family name, describing the transport capacity of the street. This approach has been followed in many cities world-wide, for example Abu Dhabi.

Context names and characteristics are summarised below:

City – The Central Business District and high density mixed-use neighbourhoods either side of the City Boulevard are generally characterised by high levels of activity.

District – Mixed-use areas with medium levels of pedestrian activity close to district centres.

Neighbourhood – Areas that provide a variety of housing opportunities, with densities varying from villa to multi-dwelling residential buildings. This category includes very low density Ministry of Housing Subdivision comprising only villas.

Street Family Names

Boulevard: A high vehicle capacity 3+3 street (three lanes in each direction).

Avenue: A medium vehicle capacity 2+2 street (two lanes in each direction). Avenues may have frontage lanes.

Street: A low vehicle capacity 1+1 street (one lane in each direction). Anticipated low traffic volumes and low speeds.

Lane: A very low vehicle capacity 1+1 street (one lane in each direction). Anticipated very low traffic volumes and very low speeds.

Functional Classification

The traditional Functional Classification system makes reference to a hierarchy of street types such as Urban Arterial, Urban Secondary and Urban Distributor, based on the vehicle movement and property access roles in the network. However, this system makes no reference to adjacent land uses, which is the basis for context sensitive street design. The table below shows the relationship between Street Family and Functional Classification systems.

Street Family	Functional Classification			
	Urban Arterial	Urban Secondary	Urban Distributor	Local Street
Boulevard				
Avenue				
Street				
Lane				

Integration of Utilities

The conventional approach to utility corridor design in Oman typically places less emphasis on the direct impact on RoW land take and the resulting land costs. The current approach prevents the placement of utilities beneath travel lanes. This has a significant impact on the width of RoW, resulting in large areas of unused land which do not create inviting public spaces and a comfortable, shaded public realm.

It is recognised that utilities are an integral part of the urban street and well-designed utility networks help create sustainable cities. Cities around the world increasingly focus on creating Complete Streets and treating land for urban RoWs as a limited resource. This requires designing public as three-dimensional corridors.

The street-based codes set out on the following pages are based on the current Oman Highway Standards but it is advocated that narrower RoWs are considered by the highway authorities and utility providers.

Street Hierarchy

City Boulevard: this is the most important street in the city, serving the main commercial, public and institutional buildings. It will need to accommodate high volumes of workers and shoppers particularly at lunchtimes and early evenings. The boulevard has the highest Place and Link status. A dedicated lane for public transit will be provided with a high frequency BRT service connecting across Wadi Saay to the large employment zone. Continuous formal tree planting provides shade and shelter with outdoor cafés.

District Avenues: these city status links form a web of major routes across the urban area. They carry the high frequency bus routes in the city and link residential neighbourhoods with retail and community facilities. Frontage access will generally not be allowed but where they pass through district centres and mixed use areas parallel frontage parking would be provided.

The District Avenues will assume different Link and Place roles depending on the land uses they pass through. For example, where the highway passes through a higher density mixed use area it will have active frontages. Elsewhere, for example in low density villa areas there will be no frontage access. The district avenue that acts as the spine for the Tourism District will have a different character with a more informal landscape treatment.

Neighbourhood Streets: these provide a secondary grid of streets separating super-blocks, the provide links between residential areas and are served by local feeder buses. Local streets connect at frequent intervals. Frontage access allowed with on-street parking in defined bays.

Local Street: these provide direct access to housing within urban blocks and Home Zones. They typically take the form of a loop providing access to villa clusters. They are not served by bus services and are intended to be slow speed with traffic calming features.

Wadi Edge Drive: these run parallel to linear wadi parks and provide limited access to residential properties. They are intended to be slow speed scenic drives with low volumes of traffic. Traffic calming features and surfacing to be informal in character.

Greenway: Greenways provide a green grid of shaded pedestrian and cycle routes extending across a district. They thread through Home Zones, linking together to provide safe routes to school and community facilities.

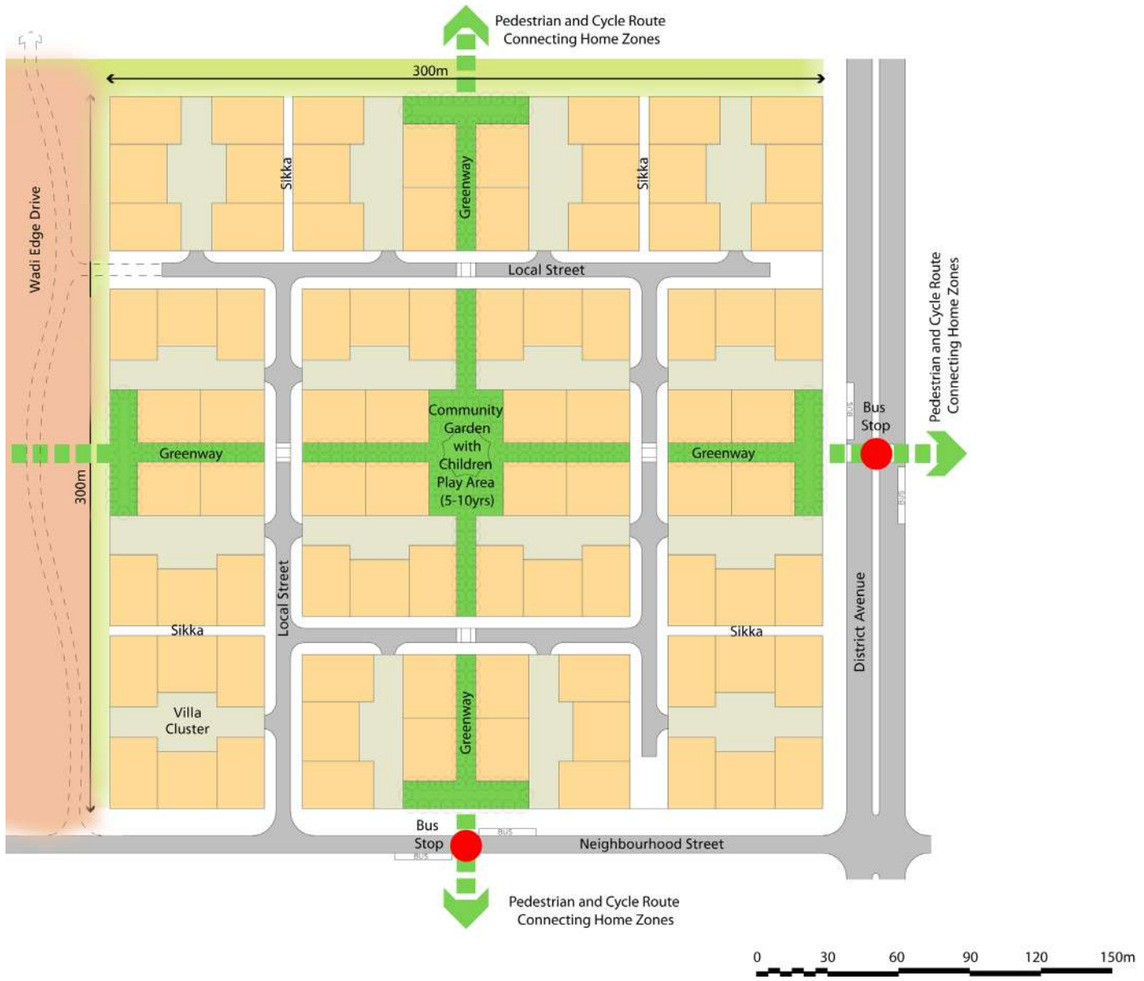

Figure 7-3: Street Hierarchy

City Boulevard – CBD (Urban Arterial)

The City Boulevard will act as the civic, ceremonial and commercial spine of the new city and should attract priority treatment in terms of hard materials and planting. It is characterised by a more generous pedestrian realm that accommodates higher volumes of pedestrians.

Right of Way

- 60m R.O.W

Traffic Lanes

- 3 Lanes in each direction
- High-volume surface transit can be achieved by including dedicated transit lanes. These will help facilitate transit-oriented development (TOD) in the form of high density, mixed use urban corridors.

Bicycle Lanes

- Bicycle lanes for faster-moving commuter bicycles should be incorporated into the sidewalk on a designated path with cycle storage facilities provided at key nodes.

Parking and Servicing

- No frontage parking provided
- Parking and servicing accessed via rear City Street.
- Parking accommodated within development plots or multi-storey public car parks

Pedestrian Realm

- Double row of closely spaced shade trees to be provided on each side of boulevard.
- Pedestrian amenities on sidewalks – transit stops, kiosks, benches, fountains, or food cafés – encourage activity and enhance the vitality and viability of the adjacent shops and businesses.
- Regularly spaced signalised step free crossings should provide safe and accessible pedestrian crossing movements across the Boulevard. They should be provided at every junction and middle of the blocks. Approximately every 50m.
- Public plazas and outdoor activity areas occur along the boulevard at key focal points.
- Transit stops should be local landmarks and could feature sculptural canopies that provide shade.

Frontage Type

- A combination of building colonnades, shade canopy trees and free standing structures should be used to provide shade near key nodes and community facilities.
- Design corner buildings to take into account exposure to multiple street frontages and high public visibility. Incorporate elements such as increased height, fenestration and roof features, and well-articulated entrances.
- Emphasize building entrances and the gateways characteristics of the buildings and/or clusters.
- Front setback to be 0m to maintain urban townscape character.

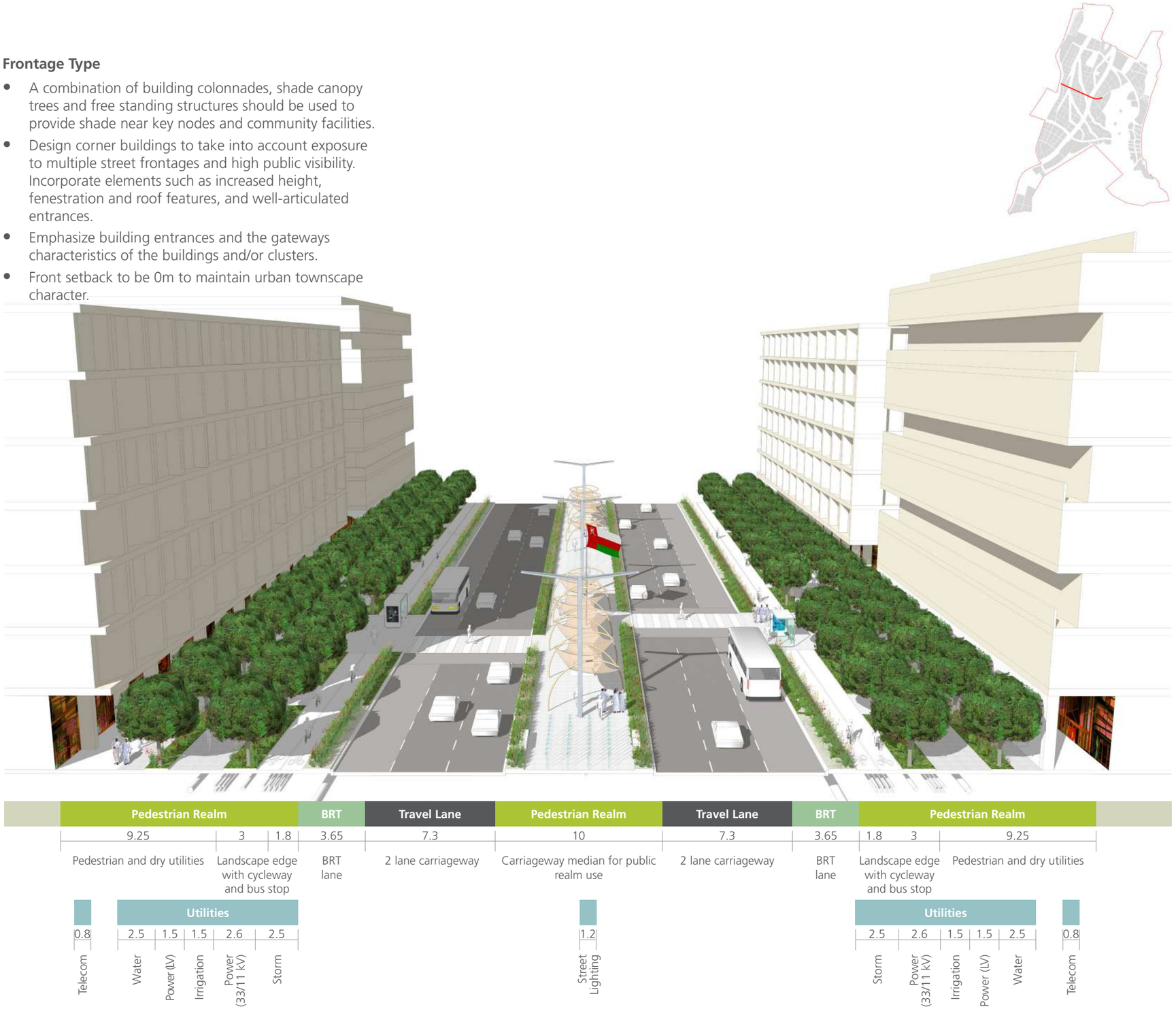

Figure 7-4: City Boulevard (CBD)

City Boulevard - Highland Park (Urban Arterial)

The City Boulevard takes on a different character after it leaves the Civic District and runs in a north-east direction to connect with Duqm Heights. The boulevard will run around the edge of the Highland Park and in places there will be the need for cutting through rock outcrops. The carriageways can be stepped and the surrounding slopes terraced with existing rock formations retained where possible.

Right of Way

- 60m R.O.W

Traffic Lanes

- 3 Lanes in each direction
- Inside lanes dedicated to public transport

Bicycle Lanes

- Cycle track provided on one side.

Parking and Servicing

- No frontage parking provided

Pedestrian Realm

- Shared pedestrian footpath and cycleway provided on one side of route
- Informal grouping of indigenous trees together with extensive landscape features.

Frontage Type

- No district access provided.

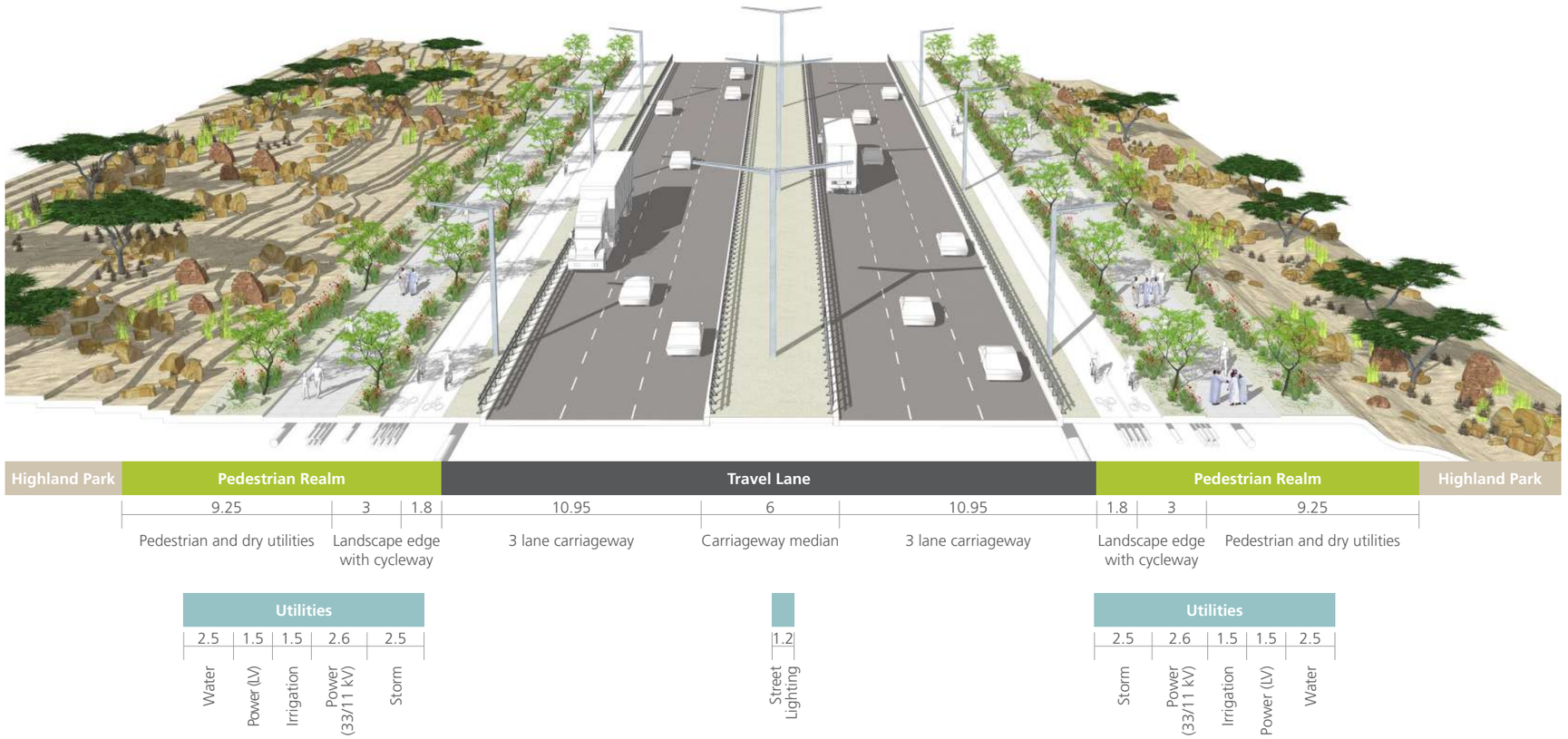

Figure 7-5: City Boulevard (Highland Park)

District Avenue – Residential Areas (Urban Secondary)

These routes provide the spine to the new residential districts and are the main transport corridors. Two 3.65m travel lanes are provided in each direction separated by a 3m central median with a total RoW of 52m.

A loose grid of avenues provides the main circulation within a residential district, linking district and neighbourhood centres to the existing arterial roads. Two 3.65m travel lanes are provided in each direction, with limited on-street parking and a median for left turns. Sidewalks and cycle tracks are also provided on both sides of this roadway.

Right of Way

- 52m

Traffic Lanes

- 2 Lanes in each direction
- Inside lanes dedicated to public transport
- Public transport stops and interchanges should be co-located with the larger centres to encourage access to facilities.

Bicycle Lanes

- A shared pedestrian and cycle zone is appropriate and cycle storage facilities should be provided to coincide with key public facilities.

Parking and Servicing

- No frontage parking provided

Pedestrian Realm

- Allowing safe and accessible pedestrian crossing movements across the District Avenues is a priority and this should be achieved through regular signalised step free crossings.
- An avenue of shade canopy trees should be incorporated to enhance pedestrian comfort.
- Step free access for pedestrians should be provided throughout to cater for people with mobility difficulties.

Frontage Type

- A combination of building colonnades, shade canopy trees and free standing structures should be used to provide shade near key nodes and land uses, particularly at the District centres.

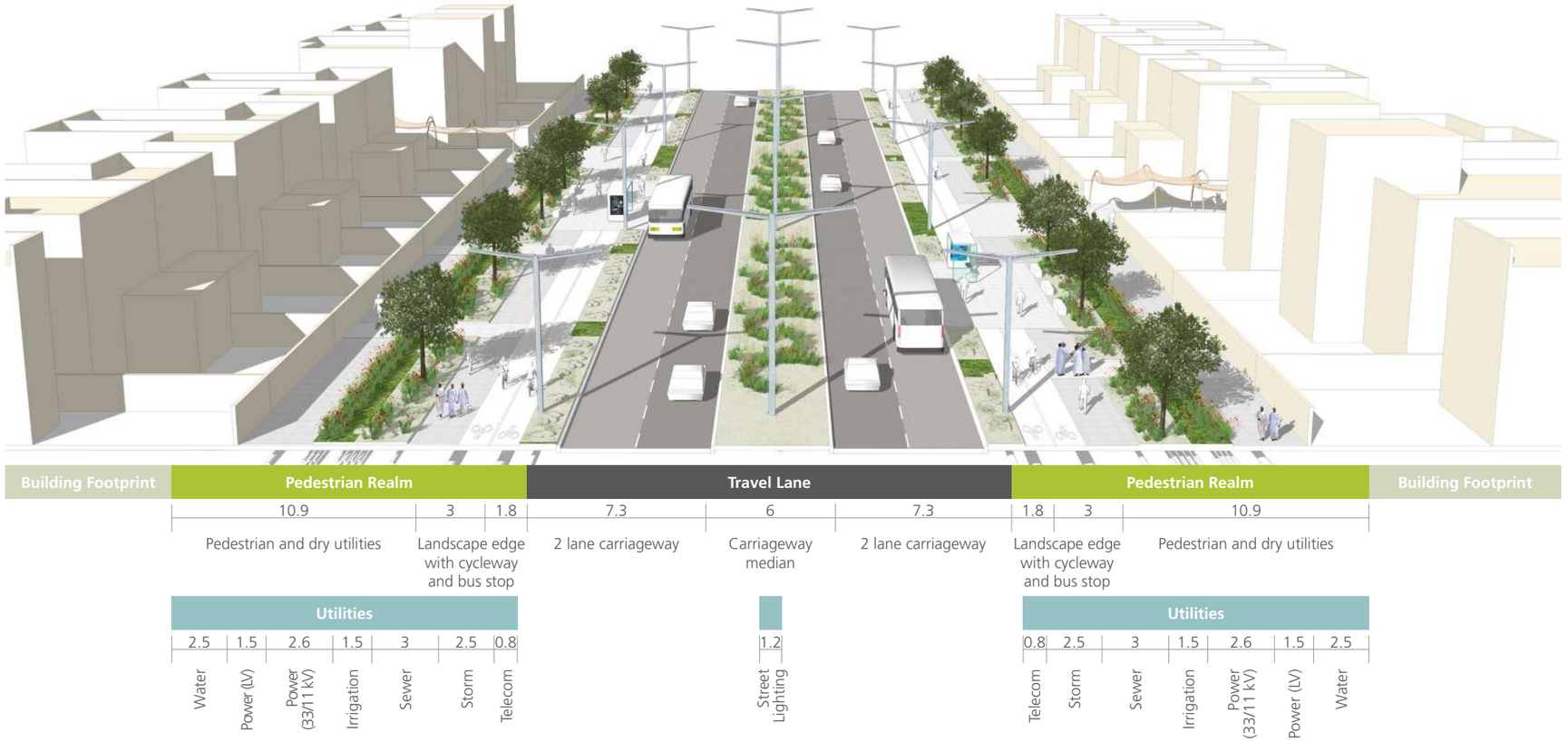

Figure 7-6: District Avenue (Residential Areas

District Avenue – Shopping Areas (Urban Secondary)

Where district avenues pass through centres and mixed use areas, it is important to create an active frontage. This will be achieved by shops and commercial activities on the ground floor of buildings fronting onto the street and a high quality public realm. Shade will be achieved by colonnades and tree planting.

Right of Way

- 52m

Traffic Lanes

- 2 Lanes in each direction
- Inside lanes dedicated to public transport
- Public transport stops and interchanges should be co-located with the larger centres to encourage access to facilities.

Bicycle Lanes

- A shared pedestrian and cycle zone is appropriate and cycle storage facilities should be provided to coincide with key public facilities.

Parking and Servicing

- Parallel frontage parking provided

Pedestrian Realm

- Allowing safe and accessible pedestrian crossing movements across the District Avenues is a priority and this should be achieved through regular signalised step free crossings.
- An avenue of shade canopy trees should be incorporated to enhance pedestrian comfort.
- Step free access for pedestrians should be provided throughout to cater for people with mobility difficulties.
- High quality street furniture, hardscape and softscape, alongside shaded and extended pedestrian walkways should be provided, with good accessibility between both sides of the street.

Frontage Type

- A combination of building colonnades, shade canopy trees and free standing structures should be used to provide shade near key nodes and land uses, particularly at the District centres.
- Retail and commercial activity should be encouraged to spill out into the public realm, creating a diverse and active pedestrian walkway which encourages walking and cycling.

Figure 7-7: District Avenue (Shopping Areas)

District Avenue - Tourism Zone (Urban Secondary)

The main north-south spine road serving the sequence of tourism clusters within t he Tourism Zone will have a narrower right of way then other District Avenues and a more informal character with a greater amount of soft landscape.

Right of Way

- 52m

Traffic Lanes

- 2 Lanes in each direction split by landscaped central median

Bicycle Lanes

- A shared pedestrian and cycle zone is appropriate and cycle storage facilities should be provided to coincide with key public facilities.

Parking and Servicing

- Parallel frontage parking provided at key locations, for example at the intersection of pedestrian and cycle routes connecting to the sea.

Pedestrian Realm

- The Avenue should have attractive hardscape and softscape elements, with traffic calming elements to reduce vehicle speeds to prioritise pedestrian activity.
- Allowing safe and accessible pedestrian crossing movements across the District Avenue is a priority and this should be achieved through regular signalised step free crossings.
- Sensitively designed street lighting should be provided alongside small recreation areas and street furniture to encourage activity and create liveable and attractive communities, day and night.

Frontage Type

- Limited direct access, villas and townhouses fronting onto the avenue to be accessed from within clusters.

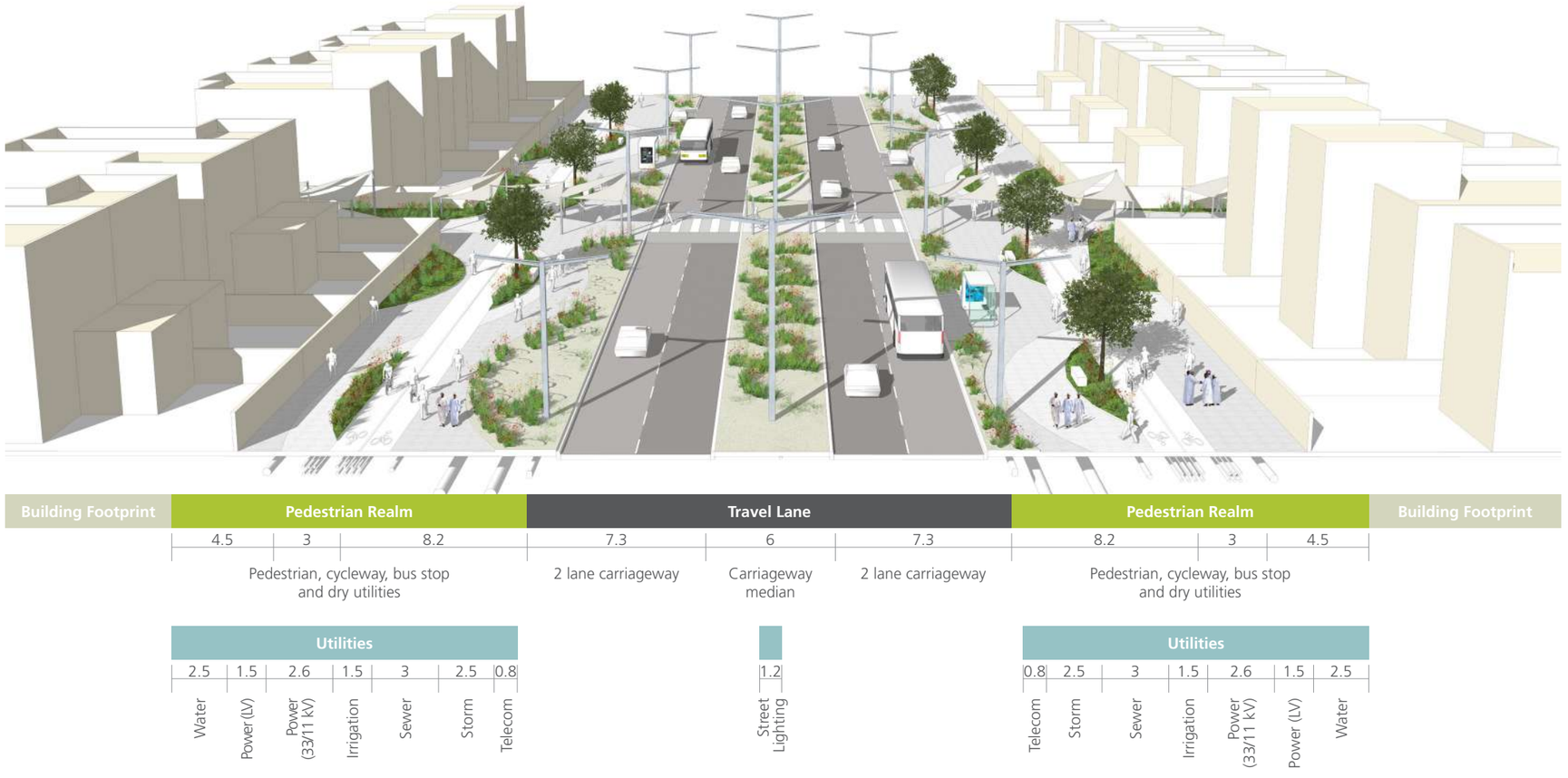

Figure 7-8: District Avenue (Tourism Zone)

Neighbourhood Street (Urban Distributor)

Neighbourhood streets provide the main vehicular circulation within and between residential neighbourhoods. They typically take the form of a secondary grid between district avenues with access points to Home Zones. Pedestrian safety is of paramount importance. They are designed for slower speeds and incorporate traffic calming measures.

Right of Way

- 35m

Traffic Lanes

- Two 3.5m travel lanes are provided in each direction
- Include traffic calming measures to limit traffic speeds and deter through traffic.

Bicycle Lanes

- Sidewalks and shared surface cycle tracks are provided on both sides of this roadway.

Parking and Servicing

- Parallel on-street parking provided at key locations

Pedestrian Realm

- Allowing safe and accessible pedestrian crossing movements across the street is a priority and this should be achieved through regular signalised step free crossings.
- Trees to be located along both sides of the street to offer visual interest and shade.
- Step free access for pedestrians should be provided throughout to cater for people with mobility difficulties.

Frontage Type

- Entrances to Home Zones

Figure 7-9: Neighbourhood Street

Local Street – Medium to High Density (Urban Access)

The primary function of Local Streets is to provide access to residential plots, or cul-de-sac within Home Zones they typically take the form of a loop and are not to be used as through ways. Pedestrian safety is of paramount importance and they are designed for slower speeds and incorporate traffic calming measures.

Right of Way

- 25m

Traffic Lanes

- 1 Lane in each direction
- Traffic calming measures to limit traffic speeds and deter through traffic.

Bicycle Lanes

- Dedicated bicycle lane not provided

Parking and Servicing

- Parking for residents is provided within the large or compact villa plots.
- Areas for visitor parking are defined to prevent driveways being obstructed.
- Parallel parking on one side of the street only.

Pedestrian Realm

- The streets will be in part paved to define pedestrian priority with raised tables and pinch points.
- Connects to greenway and sikkas to provide wider movement through the neighbourhood.
- Trees located along one side of the street only.

Frontage Type

- Typically fronted by villas with boundary walls or townhouses with semi-private setback.
- Plot entrances staggered to ensure privacy.

Figure 7-10: Local Street (Medium to High Density)

Local Street - Medium to Low Density (Urban Access)

The primary function of Local Streets is to provide access to residential plots, or cul-de-sac within Home Zones they typically take the form of a loop and are not to be used as through ways. Pedestrian safety is of paramount importance and they are designed for slower speeds and incorporate traffic calming measures.

Right of Way

- 20m

Traffic Lanes

- 1 Lane in each direction
- Traffic calming measures to limit traffic speeds and deter through traffic.

Bicycle Lanes

- Dedicated bicycle lane not provided

Parking and Servicing

- Parking for residents is provided within the large or compact villa plots.
- Areas for visitor parking are defined to prevent driveways being obstructed.
- Parallel parking on one side of the street only.

Pedestrian Realm

- The streets will be in part paved to define pedestrian priority with raised tables and pinch points.
- Connects to greenway and sikkas to provide wider movement through the neighbourhood.
- Trees located along one side of the street only.

Frontage Type

- Typically fronted by villas with boundary walls or townhouses with semi-private setback.
- Plot entrances staggered to ensure privacy.

Figure 7-11: Local Street (Medium to Low Density)

Shared Street (Mushtarak)

The primary function of this street type is to promote social interaction, whereby through traffic is discouraged. They typically serve a small number of dwellings and are connected to an Access Lane. Features that encourage social interaction include seating, children's play areas, outdoor cafés, etc. All modes share the same paved surface so that there are no grade differences between the travel and pedestrian zones.

Right of Way

- 8-10m

Traffic Lanes

- Typical travel lane dimension is a maximum of 4.2 m in order to allow a motor vehicle and cycle to pass each other when travelling in opposite directions.
- The minimum travel lane width is 3 m.

Bicycle Lanes

- Dedicated bicycle lane not provided

Parking and Servicing

- Parking for residents is provided within the large or compact villa plots.
- Areas for visitor parking are defined to prevent driveways being obstructed.

Pedestrian Realm

- The streets will be paved to define pedestrian priority with raised tables and pinch points.
- Connects to greenway and sikkas to provide wider movement through the neighbourhood.
- Features to encourage social interaction; seating, children's play areas, outdoor cafés, etc.

Frontage Type

- Plot entrances staggered to ensure privacy.

Pedestrian Realm	Parking	Travel Lane	Parking	Pedestrian Realm
2	2	6	2	2
Pedestrian, roadside parking and dry utilities		1 lane carriageway *(accessible to vehicles, pedestrians and cyclists)*		Pedestrian, roadside parking and dry utilities

Figure 7-12: Shared Street (Mushtarak)

Wadi Edge Drive

These run parallel to linear wadi parks and provide direct access to residential properties. They are intended to be slow speed scenic drives with low volumes of traffic. Traffic calming features and surfacing to be informal in character.

Right of Way

- Varies

Traffic Lanes

- Typical travel lane dimension is a maximum of 4.2 m in order to allow a motor vehicle and cycle to pass each other when travelling in opposite directions.
- The minimum travel lane width is 3 m.

Bicycle Lanes

- Dedicated bicycle lane not provided

Parking and Servicing

- Parking for residents is provided within villa plots.
- Visitor parking provided close to picnic and play areas.

Pedestrian Realm

- The drives will be part paved to define pedestrian priority with raised tables and pinch points.
- Connects to greenway and sikkas to provide wider movement through the neighbourhood.
- Features to encourage social interaction; seating, children's play areas, outdoor cafés, etc.
- Surfacing, lighting and furniture to be informal and low-key in character.

Frontage Type

- Small number of villas or townhouses can have direct access. This will assist with passive surveillance.

Figure 7-13: Wadi Edge Drive

Housing Cluster

The grouping of a small number of plots within a housing cluster provides a semi-private space with a strong physical relationship between neighbouring plots. Within the cluster, cars take second place to pedestrians.

Right of Way

- 10-16m

Traffic Lanes

- Typical travel lane dimension is a maximum of 4.2m in order to allow a motor vehicle and cycle to pass each other when travelling in opposite directions.
- The minimum travel lane width is 3m.
- Whilst there is free access for vehicles, the paved area is designed for low speeds

Bicycle Lanes

- Dedicated bicycle lane not provided

Parking and Servicing

- Parking for residents is provided within villa or town house plots.
- Shaded parking for visitors is provided within communal courtyard
- Access geometry is adequate for all services and emergency vehicles.

Pedestrian Realm

- Connects to greenway and sikkas to provide wider movement through the neighbourhood.
- Areas of planting within the enclave provide relief to the boundary walls of plots, shade parking spaces and help create pleasant areas for people to meet and for children to play.
- The floorspace of the courtyard should be imaginatively developed and a surface treatment is recommended which would utilise pre-cast concrete paving of different sizes on a firm bedding with parking and traffic areas defined by inset blocks.

Frontage Type

- The plots themselves are to be enclosed by a 2m boundary wall which may incorporate architectural elements such as grilles, house numbers, copings and limited architectural decoration. Main entrances to the plots will be wide enough to accept a car.

Figure 7-14: Housing Cluster

Greenway

Greenways provide a green grid of shaded pedestrian and cycle routes extending across a district. They thread through Home Zones, linking together to provide safe routes to school and community facilities.

Right of Way

- 10-15m

Traffic Lanes

- Access for emergency vehicles only

Bicycle Lanes

- Dedicated bicycle lane provided

Pedestrian Realm

- Separate footpaths and cycle paths are shaded by evergreen trees and shade structures.
- Sitting areas are provided at regular intervals
- Community Garden with children's play provided at the intersection of greenways within a Home Zone.
- Connects to sikkas to provide wider movement through the neighbourhood.

Frontage Type

- Greenways in low density residential neighbourhoods typically are enclosed by the boundary walls of villas.
- In medium to high density residential neighbourhoods town houses and apartments can front onto the greenway.

Figure 7-15: Greenway

Sikka

These narrow passageways between buildings are traditionally used as a shaded, comfortable way for pedestrians to move within and through a neighbourhood and offer 'shortcuts' and enhanced pedestrian permeability. Sikka should be used to increase connectivity within neighbourhoods, providing passageways between villa plots and through blocks to pocket parks, open spaces, schools or other public amenities.

Right of Way

- 3.5-5m

Traffic Lanes

- Motor vehicles are not accommodated.

Bicycle Lanes

- Dedicated bicycle lane not provided but cyclists may share the space.

Pedestrian Realm

- Sikka should be well-designed spaces with good quality surfaces, furniture and lighting. Avoid clutter and utilities that obstruct pedestrian movement.
- The hardscape treatment should provide the main points of interest through ground patterns and use of colour.
- Potential for climbing plants to walls that form the framework of the sikka.

Frontage Type

- Sikka are defined by the walls of adjacent buildings and should be shaded by these walls as well as by any adjacent built form.

Figure 7-16: Sikka

Duqm
Special Economic Zone Authority

Duqm City, Sultanate of Oman

Stage 4 Report: Final Master Plan and Development Framework, Schematic Engineering Design and Governance Strategy

ATKINS
Member of the SNC-Lavalin Group