

لجنة تطوير المساجد  
mosque development committee



Abu Dhabi Mosque Development Regulations  
Volume 2  
**Design**





## Summary of Mandate

In 2008, His Highness General Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi, Deputy Supreme Commander of the UAE Armed Forces and Chairman of the Abu Dhabi Executive Council, mandated the formation of the Abu Dhabi Mosque Development Committee. Its purpose is to deliver upon the vision of His Highness Sheikh Khalifa bin Zayed Al Nahyan, President of the United Arab Emirates and Ruler of Abu Dhabi, for the continued fulfilment of the grand design envisaged by the late Sheikh Zayed bin Sultan Al Nahyan, Father of the Nation, and the ongoing evolution of the Emirate of Abu Dhabi.

The Mosque Development Committee (MDC) is responsible for preparing a strategy to direct the development of mosques in the Emirate. Its objectives include optimising the distribution of mosques and enhancing their role within communities, encouraging design innovation while preserving Emirati architectural heritage and ensuring that mosques are built, operated and maintained to the highest international standards.

Accordingly, the MDC has completed the following:

- A comprehensive Emirate-wide survey and conditions assessment of all existing mosques to identify which may be replaced to regulate distribution and capacity based on population density;
- A web enabled application processing tool that identifies gaps in supply and demand to determine the optimum location of future mosques;
- An Emirate-wide cleaning and maintenance programme that ensures all mosques are serviced to the highest international standards for public buildings;
- An Emirate-wide programme that enables all mosques, including those that are privately owned, to be managed and operated by the General Authority of Islamic Affairs and Endowments (Awqaf);
- An Emirate-wide programme that enables all temporary mosques to be replaced with new permanent ones where required; and
- An Emirate-wide regulatory framework that addresses the planning, design, construction, operations and maintenance of each mosque to ensure best practice standards are applied during its complete life cycle.

As such, the MDC is pleased to issue the Abu Dhabi Mosque Development Regulations, a regulatory framework that will safeguard the development of mosques well into the future.



# Abu Dhabi Mosque Development Regulations

## Volume 2: Design

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## I. Introduction

The Abu Dhabi Mosque Development Regulations (ADMDR), referred to here onwards as the Regulations, establish standards for the distribution, design and operational management of permanent mosques in the Emirate of Abu Dhabi. All proposals for mosques in the Emirate will be prepared and assessed using these Regulations.

The Regulations comprise of the following documents, as referenced in Figure 2:

### 1. User Guide

### 2. Regulatory Volumes

- Volume 1 - Planning
- Volume 2 - Design
- Volume 3 - Operations

### 3. Appendices

- Appendix 1 - Estidama
- Appendix 2 - Architectural Prototypes
- Appendix 3 - Vernacular Study

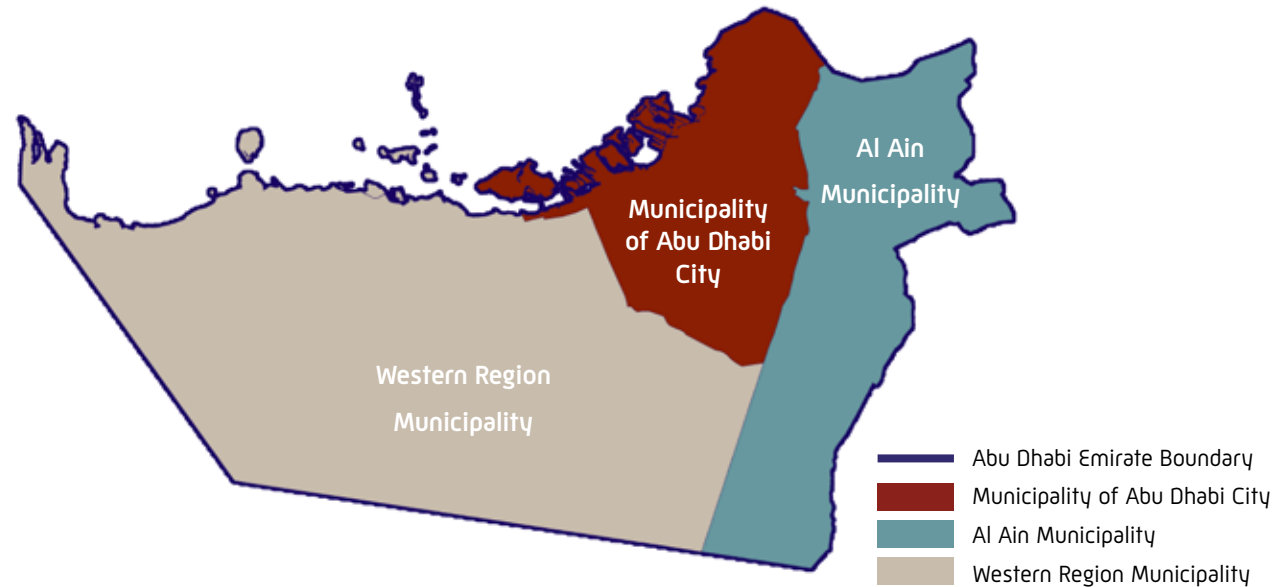


Figure 1: Geographical jurisdiction of Abu Dhabi Emirate.

## Estidama



'Estidama', which means sustainability in Arabic, is Abu Dhabi Government's programme of sustainability. As part of Estidama, the Abu Dhabi Urban Planning Council has developed the Pearl Rating System (PRS).

The PRS is a comprehensive framework for the sustainable design, construction and operation of communities and buildings that supports the social and cultural traditions and values of the Emirate.

The Abu Dhabi Mosque Development Regulations specify that all mosques shall achieve a minimum 2 Pearl Rating. In order to do this, the design of a mosque must:

- meet all 20 mandatory Pearl Building Rating System (PBRS) required Credits; and
- meet a combination of PBRS Credits that will achieve a minimum of an additional 60 Credit Points.

A PBRS Credit is a specific sustainability item or set of items from which Credit Points are obtained. The number of Credit Points obtained can vary from Credit to Credit. For example, SM-10 is a Credit relating to recycled material that offers 6 Credit Points, whereas SM-12 is a Credit relating to re-used or certified timber that offers 2 Credit Points.

In this volume, the Estidama logo appears next to the relevant policies, standards and guidelines to inform the user of Credit requirements and opportunities. For more information, refer to Attachment A of this document and Appendix 1 - Estidama.

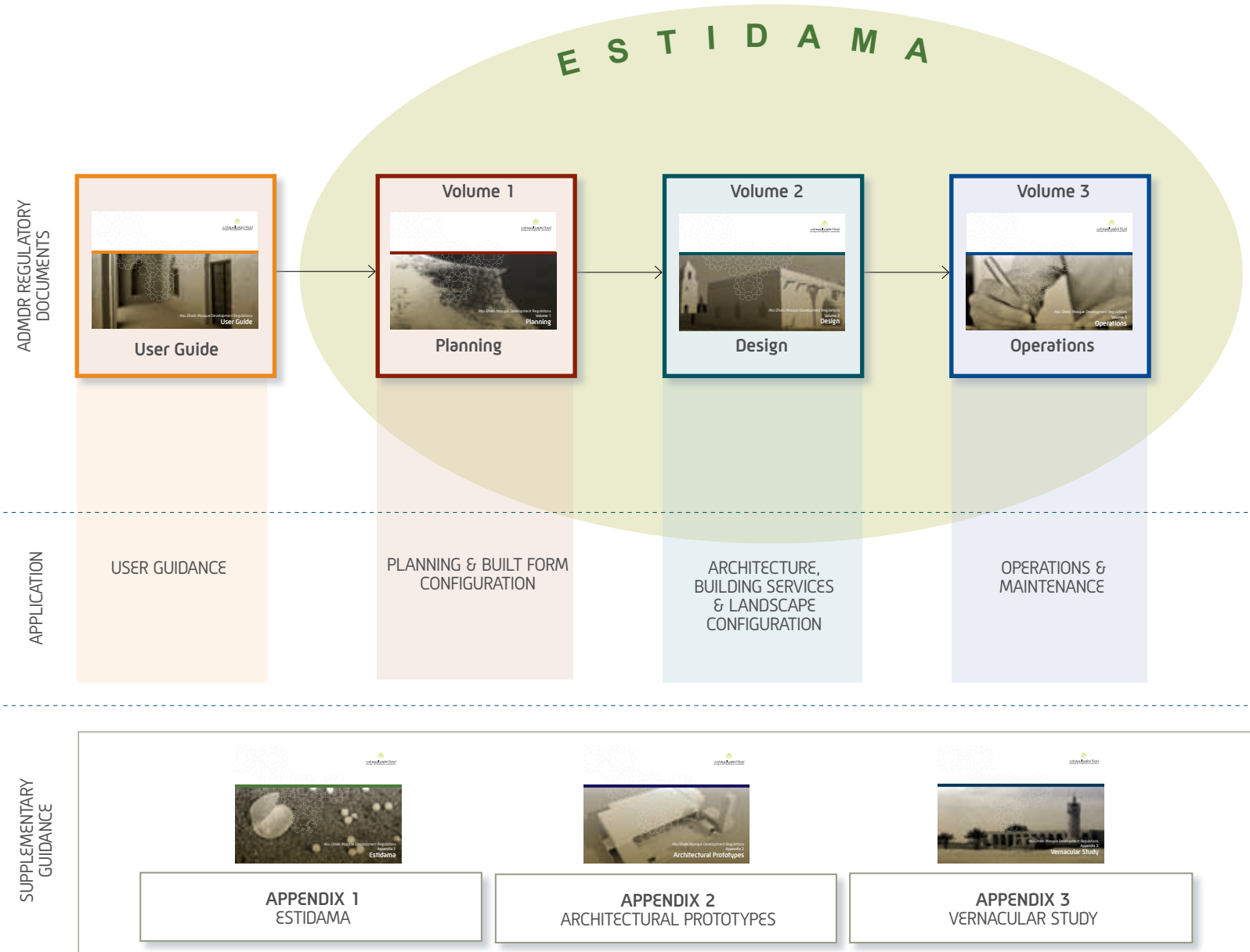


Figure 2: Abu Dhabi Mosque Development Regulations documents and application.

## II. Targeted Users

The Regulations in this volume, Volume 2 - Design, have been designed for the following user groups:

- Consultants (architects, engineers and other specialists)
- Municipalities;
- Estidama Assessors; and
- Estidama Pearl Qualified Professionals (PQPs)

## III. Regulatory Language

Throughout this volume there are methodologies, design standards (referred to as DS1, DS2, DS3, etc.) and design guidelines (referred to as DG1, DG2, DG3, etc.) that have been established to ensure the architectural, building services and landscape designs for mosques meets both the regulatory and aesthetic design requirements of the Emirate of Abu Dhabi.

The methodologies are mandatory and must be used to ensure consistency across the Emirate when developing and assessing mosque designs.

The prescriptive elements in the standards and guidelines in this volume are defined using the following language:

- SHALL and SHALL NOT are mandatory statements;
- SHOULD and SHOULD NOT are recommended statements; and
- MAY is a permitted statement.

## IV. Document Structure

This volume sets out the standards and guidelines for the development of architectural, building services and landscape elements of mosques within the Emirate of Abu Dhabi. The standards and guidelines provide recommendations which are in line with local regulations in order to determine the optimal design for mosques within individual plots. This volume includes:

### Architecture Standards

Sets out the architectural standards and guidelines for effective design of a mosque building, including:

- functional and spatial provision;
- site development; and
- architectural design.

### Building Services Standards

Provides guidance and specifications for the engineering elements of a mosque including:

- building systems - plant acoustic;
- building management systems;
- fire protection;
- mechanical systems;
- plumbing systems;
- electrical systems;
- telecommunications systems; and
- sound systems.

### Landscape Standards

Sets out the treatment options for the landscaped areas of mosques and provide guidance and specifications for how they should be integrated into the surroundings, including:

- layout;
- surface treatments; and
- accessories.



## V. Application

All mosques within the Emirate of Abu Dhabi must comply with the Design Standards and Guidelines in this volume as follows:

**New Mosques:** All new mosques will be designed to integrate the Emirati vernacular design principles as presented in this volume. Only under exceptional circumstances will an alternative style of mosque be approved. If an alternative style of mosque is considered, the proponent must prepare an evidence based study of the proposed architectural concept that reflects the chosen historic Islamic period or a contemporary alternative.

**Existing Mosques:** If an existing mosque is to be demolished, the new mosque will be designed to integrate the Emirati vernacular design principles as presented in this volume. If an existing mosque is being renovated, an evidence based architectural study must be prepared demonstrating that the proposed renovations are consistent with the period and style of the mosque being renovated.

## VI. Emirati Vernacular Architecture

The type of mosque design being promoted in the Emirate of Abu Dhabi by the Mosque Development Committee reflects the Emirati vernacular, as presented in the Regulations.

It draws inspiration from the historical design of mosques in the Emirate, while allowing for the use of modern building materials and construction techniques. This encourages a variety of design outcomes, from traditional to contemporary, that equally represent Emirati vernacular design, yet allow for creativity and innovation.

3 key factors make up an Emirati vernacular mosque design:

1. A simple and clear identity.
2. A specific sequence of components.
3. A distinctive character.

### Vernacular Identity

Design elements, which promote an overarching level of simplicity, so as not to detract from the primary use of the mosque for prayer, include:

- Using subtle, non-obtrusive colour, texture and pattern;
- Creating a place of quiet contemplation, as a result of appropriate lighting and minimal ornamentation;
- Ensuring the ambience generated as a result of the design evokes a sense of moving from everyday life to a peaceful, spiritual environment;

- Promoting the mosque's primary use as a place of worship through suitably designed internal and external spaces;
- Appropriately designing the areas immediately surrounding the mosque to instil a sense of respect for the mosque as a place of worship and reflection; and
- Designing the mosque as a focal point for the community, predominantly as a place of worship.

### Vernacular Components

The flow of 'spatial progression' within the mosque, which is principally based on functionality and efficient use of space, follows a specific sequence:

1. Portal
2. Sahān
3. Riwaq
4. Prayer hall
5. Mihrāb

This flow is integral to Emirati vernacular design and an essential component in creating the spiritual, peaceful environment found in traditional Emirati mosques.


### Vernacular Character

The Emirati vernacular mosque has the following distinctive characteristics:

- a defined sahan and portal;
- a riwaq along the entrance façade of the prayer hall;
- a flat roofed prayer hall;
- a bold expression of the mihrab on the façade; and
- a stout minaret, if present.

### Vernacular



The ADMDR promotes Emirati vernacular designed mosques throughout the Emirate of Abu Dhabi. To easily identify the elements of vernacular design, a  logo has been placed next to all policies, standards and guidelines that represent Emirati vernacular design characteristics.

When integrated into the design of a mosque, these characteristics achieve the design of a mosque that intrinsically follows Emirati vernacular design, as per the vision set by the Mosque Development Committee.

## VII. Outline of the Design Process

The mosque design process guides the user through the design objectives for the individual elements of the mosque design process (architecture, building services and landscape) and identifies the requirements for mosques that provide the most efficient and effective design within the mosque plot.

The process identified in this volume is structured into 4 stages:

1. Review of Design Policies and Principles.
2. Direction on the requirements of the Architecture Standards and Guidelines.
3. Direction on the requirements of the Building Services Standards and Guidelines.
4. Direction on the requirements of the Landscape Standards and Guidelines.

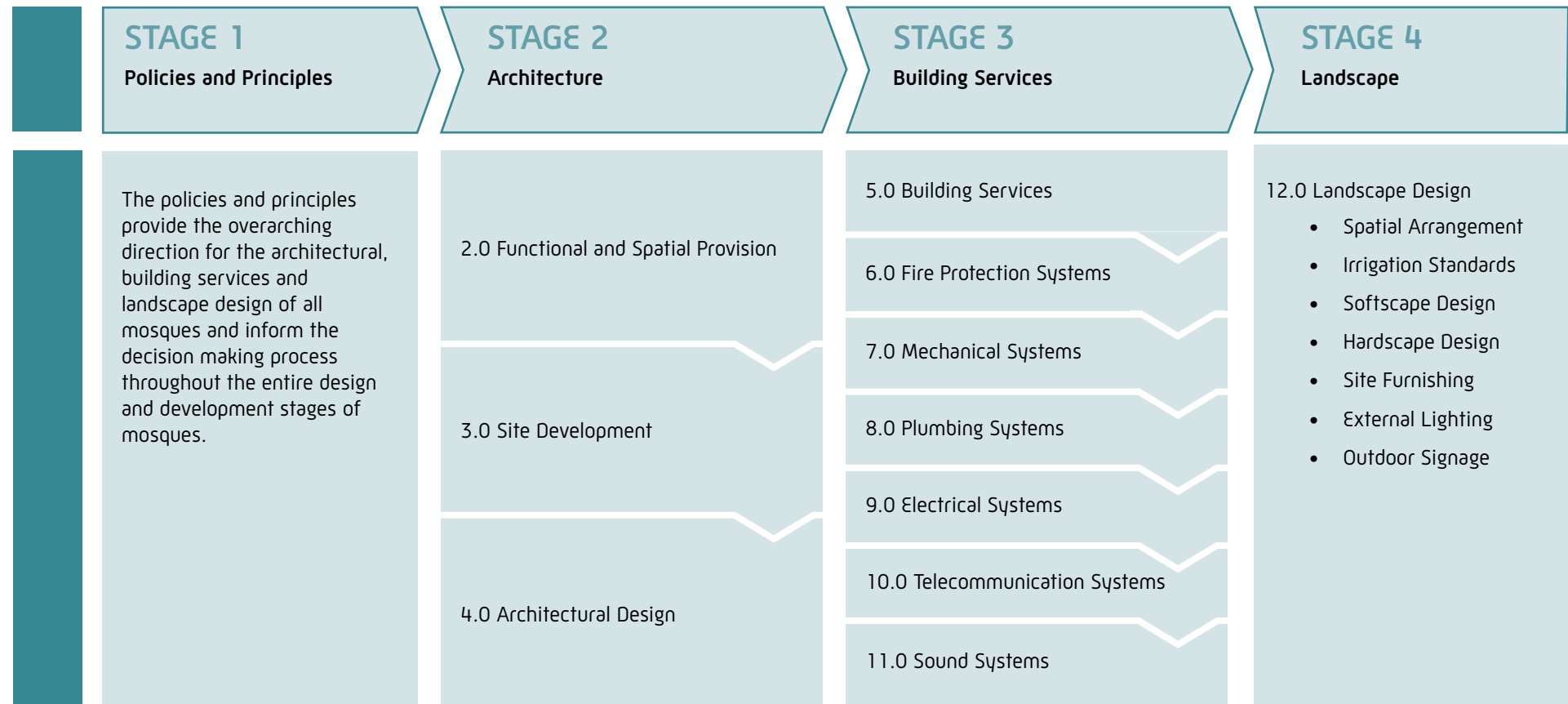


Figure 3: Mosque design process.





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# Stage 1 Policies and Principles

# 1.0 Policies and Principles

These Policies and Principles provide the overarching policy guidance for the design of mosques and their systems. This guidance should be used to inform the decision making process in the assessment of development proposals from initial concept to implementation.

## Methodology

At project inception, review the design policies and principles to ensure that the intent is considered throughout the design process and reflected in the final outcome.

## 1.1 Design Intent Policy

**Policy 1 – Mosques in the Emirate are to be designed based on Emirati vernacular design, as outlined in the Abu Dhabi Mosque Development Regulations.**

Principle 1.1a	An Emirati vernacular mosque, as outlined in the ADMDR, comprises specific factors that, when combined, represent a specific style of mosque that is synonymous with the United Arab Emirates.
Principle 1.1b	The treatment of a mosque may vary, from traditional to modern, provided the design remains consistent with the Emirati vernacular as outlined in the ADMDR.
Principle 1.1c	The location and community that a mosque is within will influence the design, resulting in each mosque having unique characteristics.

## 1.2 Safe Access and Secure Environment Policy

**Policy 2 – Mosques are to be designed and operated so that there is an appropriate balance between accessibility and safety.**

Principle 1.2a	All spaces in and around mosques are to be designed to maximise natural surveillance and avoid the need for intrusive physical security.
Principle 1.2b	All mosques are to be designed to provide well-defined and convenient access and movement that does not compromise safety, security or emergency response.

## 1.3 MEPF Integration Policy

**Policy 3 – Mechanical, Electrical, Plumbing and Fire (MEPF) equipment is to be integrated into the design of the building and surrounding landscaped areas to maintain the quality of presentation and appearance of a mosque.**

Principle 1.3a	All mosques are designed to ensure MEPF systems are considered as a core component of the design process.
Principle 1.3b	The MEPF equipment is to be integrated early on in the design stage to ensure it does not detract from the appearance of the mosque.
Principle 1.3c	All MEPF systems are to be designed as an integrated solution that complement each other.

## 1.4 MEPF Equipment Policy

**Policy 4 – MEPF equipment is to be selected on the basis of ensuring the effective and efficient operation of a mosque.**

Principle 1.4a	MEPF equipment is to be sized according to the space and capacity of a mosque to ensure energy efficiency and a pleasant environment for worshippers.
Principle 1.4b	The maintenance and servicing requirements should be considered in association with the placement, access and integration of equipment into the building and landscaped areas.

## 1.5 Landscaping Policy

**Policy 5 – Outdoor spaces are to be appropriate and consistent with the use of a mosque as a place of worship and integrated seamlessly with the public realm.**

Principle 1.5a	Sustainable, practical and functional designs and treatments are appropriate responses for landscaping.
Principle 1.5b	The landscaping elements and treatments are to be compatible with the size and type of mosque.
Principle 1.5c	Minimising the use of water and providing shaded areas are important considerations when designing the landscaped areas.
Principle 1.5d	Landscape plant species and furnishing are to be non-intrusive e.g. without thorns, allergic influence and sharp hazardous edges.







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## Stage 2 Architecture

## 2.0 Functional and Spatial Provision

The Functional and Spatial Provision Standards inform the mosque designer of the functional and spatial requirements for each mosque typology within the Emirate of Abu Dhabi. Fundamentally, the design of the mosque shall be based on the separation of, and transition between the shoe zone (where shoes are worn) and the no shoe zone (where shoes are not worn).

### Methodology

- i. Review the completed 'Mosque Planning Summary Sheet', as per Volume 1 - Planning.
- ii. Identify the functional components required for the mosque, as per the Functional and Spatial Provision Standards (refer to Table 1).
- iii. Estimate the net space requirements for the functional components, as per the Functional and Spatial Provision Standards (refer to Table 1).
- iv. Prepare a specific Mosque Circulation Diagram for the mosque based on the guidance provided in Section 2.4 (see Figure 5).
- v. Meet all minimum standards for interstitial space (refer to Section 2.2), as per the requirements of the relevant authorities.

### Outcome

- i. Functional provisions of the mosque are defined.
- ii. Minimum spatial requirements are defined.
- iii. A specific mosque circulation diagram is created.
- iv. Minimum GFA requirements, as per the Mosque Planning Summary Sheet, are met or exceeded.

## 2.1 Mosque Planning Summary Sheet

A Mosque Planning Summary Sheet, as completed through the use of Volume 1 – Planning (refer to Attachment B in Volume 1 – Planning), contains the following parameters on which to base the mosque design:

- settlement context;
- capacity;
- plot area;
- minimum Gross Floor Area (GFA) (excluding residential);
- residential GFA;
- maximum plot coverage;
- minimum open space and parking coverage;
- height; and
- bicycle and vehicular parking capacity.

## 2.2 Spatial Parameters

Spatial requirements for each of the mosque functions are defined within Table 1 and are based on 'Minimum Net Space Standards'. Furthermore, Table 1 provides the requirements for parking within the mosque plot, which is excluded from GFA calculations.

The net space also excludes circulation paths, stairways, elevator shafts, lobbies and corridors.

Space requirements for these elements will be determined by the mosque designer as per the Abu Dhabi International Building Code (ADIBC) requirements for assembly buildings.

The mosque designer will use the following formula to ensure that the minimum GFA is achieved:

Minimum Gross Floor Area (GFA) = (net space area - residential area) + areas excluded from the net space

Note: The minimum GFA provided in the Mosque Planning Summary Sheet does not include the GFA of the Imam's and Mu'athen's residences.

## 2.3 Functional and Spatial Standards


Table 1: Functional Components and Minimum Net Space (See Figure 4)

Item Nos.	Components	Zone Location	Provision and Minimum Net Space			
			District Jame'e	Jame'e	Masjid	Musalla
<b>Worshipper Capacity</b>						
i	Total worshippers		As per 'Mosque Planning Summary Sheet'			Refer to Volume 1 - Planning
ii	Total male worshippers		85% of total worshippers			
iii	Total female worshippers		15% of total worshippers			
<b>Primary Functional Components</b>						
1	Prayer area per worshipper	NS	0.75 m (w) x 1.2 m (d) = 0.9 sqm			0.6 m (w) x 1.2 m (d) = 0.72 sqm
2 (V)	Mihrab		6 sqm			
3 (V)	Main prayer hall sub-division		25% for daily prayer and 75% for Friday prayer		Not required	
4	Female prayer hall		15% of total worshippers			
5 (V)	Ablution (mosque in non-industrial area)		1 abluion unit per 40 worshippers at 0.85 m (w) x 1.4 m (d) per abluion unit (centre line between units)			
	Ablution (mosque in industrial area)	-	1 abluion unit per 10 worshippers at 0.85 m (w) x 1.4 m (d) per abluion unit (centre line between units)			
6 (V)	Riwaq	NS/S	To be determined during the architectural design stage (Refer to Section 4)			Not required
7 (V)	Portal and sahan					
8 (V)	Minaret					
<b>Secondary Functional Components</b>						
9	Shoe racks	NS/S	70% of total worshippers with 0.25 m (w) x 0.35 m (d) x 0.17 m (h) for each pair of shoes			
10	Shower cubicles		1 cubicle per 500 worshippers at 1.2 m (w) x 1.65 m (d) per cubicle	1 cubicle per mosque at 1.2 m (w) x 1.65 m (d) per cubicle		
11	Toilets	S	1 toilet cubicle per 3 abluion units at 1.2 m (w) x 1.5 m (d) per cubicle			Not required
12	Washbasins		1 washbasin unit per 2 toilet cubicles at 0.6 m (w) x 0.35 m (d) per abluion unit (centre line between units)			
13	Imam's residence		3 bedrooms, 2 bathrooms, hall and kitchen (refer to ADIBC requirements for habitable spaces)			
14	Mu'athen's residence		2 bedrooms, 1 bathroom, hall and kitchen (refer to ADIBC requirements for habitable spaces)		Not required	

NS = no shoe zone

S = shoe zone. (Refer to Section 2.4.)

Table 1 (Continued): Functional Components and Minimum Net Space (See Figure 4)

Item Nos.	Components	Zone Location	Provision and Minimum Net Space				
			District Jame'e	Jame'e	Masjid	Musalla	
15	Imam's office	S	9 sqm			Not required	
16	MEP utility room(s)		Size is variable (refer to Building Services Section 5 to 11)				
17	Storage for mosque equipment		0.025 sqm per worshipper				
<b>Ancillary Functional Components</b>							
18	Multi-purpose hall (non-prayer usage)	NS/S	30% of total worshippers at 1 sqm per worshipper	Not required	Not required	Not required	
19	Library		To accommodate 1% of total worshippers at 3 sqm per worshipper				
20	Crèche		To accommodate 5% of female worshipper population or minimum 5 children at 1.5 sqm per child				
21	Qur'anic classes: Highly Urban and Urban settlement contexts		To be accommodated in prayer areas during non-prayer times.				
22	Qur'anic classes: Suburban and Rural settlement contexts		To accommodate 5% of worshipper population at 1.5 sqm per student or a minimum 15 sqm				
<b>Parking</b>							
23	On-site parking: Highly Urban and Urban settlement contexts	S	1 parking space each for the Imam and Mu'athen; Civil Defence parking as per ADCD requirements; and Disabled parking as per ADIBC requirements for accessibility		Not applicable	Not applicable	
24	On-site car parking: Suburban and Rural settlement contexts				1 parking space for the Imam; Civil Defence parking as per ADCD requirements; Disabled parking as per ADIBC requirements for accessibility		
25	Total parking				(Refer to Volume 1 - Planning for total parking requirements)		
26	 Bicycle parking				(Refer to Volume 1 - Planning for total parking requirements)		

NS = no shoe zone

S = shoe zone (Refer to Section 2.4.)



Figure 4: Example of space planning programme provisions.

## 2.4 Mosque Circulation Diagram

The mosque circulation diagram (see Figure 5) represents the ideal movement of people through a mosque. This has been used as the basis to inform the layout and design of the Emirati vernacular mosque prototypes presented in this document.

The diagram identifies the uses and functions that should be contained within both the no shoe zone and the shoe zone. This provides designers with a basis upon which to determine the distribution and layout of spaces within a mosque. The application of this will ensure the appropriate clustering of functions within the no shoe and shoe zones and minimise the number of times people are required to move between them.

Incorporated into the design of a mosque should be a clear visual and material line of separation between the no shoe and shoe zones so that users can easily recognise where they have to take off (and later put on) their shoes. This line of separation (shown in Figure 5 as an abstract red line) should be as long as possible to avoid crowding, which typically occurs after group prayers.

The diagram breaks these zones down into the following spaces:

- prayer halls, ablution facilities and annexed facilities, such as a library and the Imam's office, should be within the no shoe zone;
- shoe racks are preferred to be within the no shoe zone;
- toilets will be within the shoe zone;
- other functions (e.g Imam's residence) will be in the shoe zone;

- seats for worshippers to take off and put on their shoes are recommended to be in the shoe zone and to be very close to the separation line; and
- an area where circulation (shown by the dotted green box in Figure 5) occurs in the shoe zone, e.g. a sahan in vernacular mosques.

The diagram also shows that an important aspect in the design of prayer areas is the ability to divide them into a smaller daily prayer hall and a larger group prayer hall. These halls need to be physically separated by a wall or a glass partition. This enables air conditioning and lighting to be switched off in the large group prayer area when only the daily prayer hall is in use. This division can significantly reduce the energy consumption of the overall prayer area.

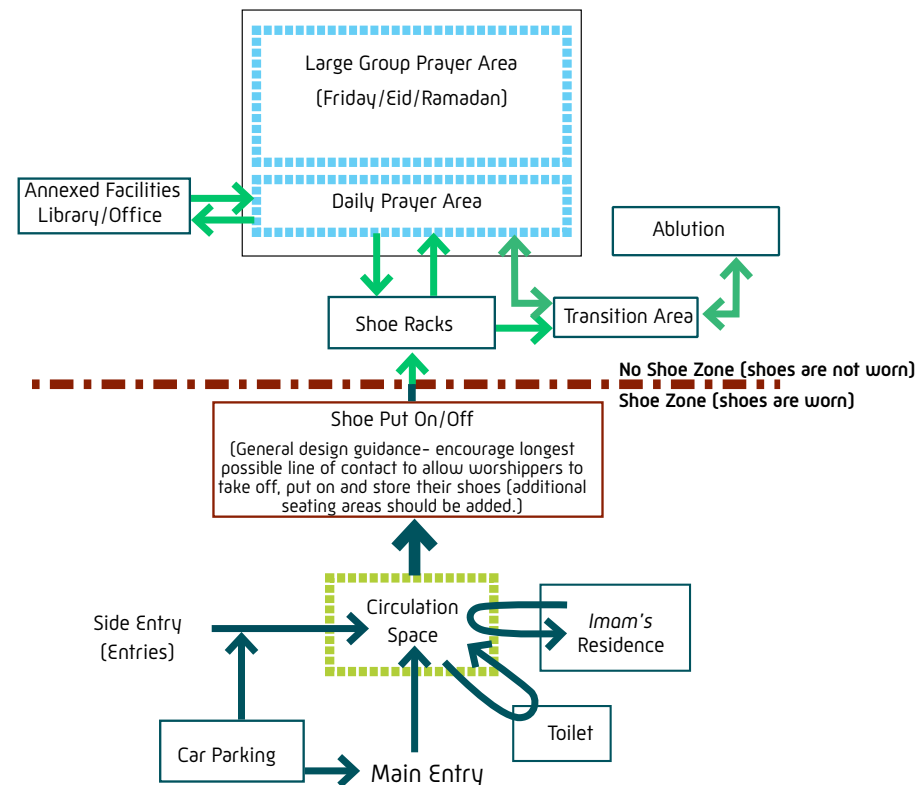


Figure 5: Circulation and relationship pattern among functions within the no shoe and shoe zones.

## 3.0 Site Development

The Site Development Standards relate to the spatial layout of all functional components within the mosque plot. They ensure the mosque is prominent, visible and encourages safety through design by considering the following:

- the relationship of a mosque to its context;
- access to and from the mosque plot; and
- the placement and arrangement of functional components to each other.

### Methodology

- i. Use the built form parameters from the Mosque Planning Summary Sheet, as completed through the use of Volume 1 - Planning.
- ii. Utilise the opportunities and mitigate the constraints of the site and its surroundings with respect to the following (but not limited to):
  - existing natural systems;
  - microclimate;
  - pedestrian and vehicular connectivity;
  - linkages to community facilities; and
  - surrounding built form.
- iii. Adapt the specific Mosque Circulation Diagram, prepared in Section 2.4, to create a spatial layout that relates to the site and its surrounding context, based on the Site Development standards.
- iv. Ensure the vernacular components are identifiable and prominently placed in the spatial layout.
- v. Meet all minimum standards as per the requirements of the relevant authorities.

### Outcome

- i. A spatial layout is created that identifies public, private and restricted areas that relates to its site and context.
- ii. The progressional relationship of vernacular components are clearly identified.
- iii. Safety considerations are integrated in the spatial layout.
- iv. On-site parking considerations are integrated in the spatial layout.

### Vernacular Components



Further to the guidance on Emirati mosque vernacular architecture provided in Section VI, the vernacular mosque has a specific spatial sequence. The worshipper enters the mosque plot via the portal. Entering through the portal represents the transition between everyday life into a spiritual environment. The portal leads to a defined sahan, followed by the riwaq, into the prayer hall and finally, the worshipper faces the mihrab.

These architectural elements, forming the spine of spatial progression, are the 'vernacular components' of Emirati mosques.



### 3.1 Visual Appreciation

Standards	Guidelines
3.1.1 Mosque Visibility	
<p>AS1 The mosque design SHALL ensure the vernacular components are prominent and well-articulated.</p> <p>Ⓟ</p>	<p>AG1 The secondary functional components SHOULD NOT obstruct the primary functional components. (Refer to Table 1.)</p>
	<p>AG2 The ancillary functions SHOULD be integrated with the design of the primary functional components. (Refer to Table 1.)</p>
	<p>AG3 Views to the mosque from adjacent streets and road junctions SHOULD be maximised in the design. (See to Figure 6.)</p>
	<p>AG4 The minaret SHOULD be a prominent landmark within its surrounding context.</p>

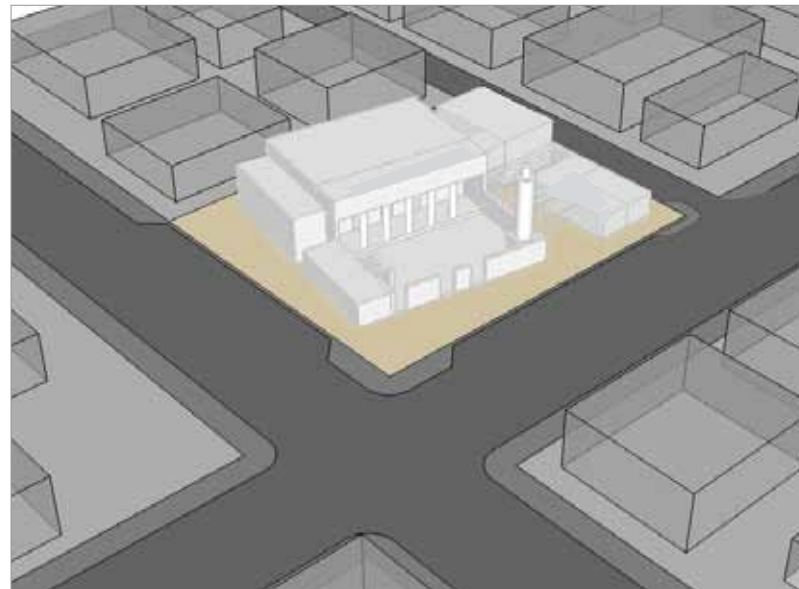




Figure 6: Visibility of the mosque from at least 2 sides.

## 3.2 Site Layout

Standards	Guidelines
<b>3.2.1 Orientation</b>	
AS2 All prayer areas SHALL be oriented towards qibla, as determined by each Municipality.	AG5 Areas other than those designated for prayer MAY be orientated away from the direction of qibla. [See Figure 7.] AG6 Orientation of the spatial layout and the built form SHOULD consider its alignment to the city grid.
<b>3.2.2 Plot Access</b>	
AS3 Plot access to the public spaces of the mosque SHALL be clearly differentiated from independent access to its private spaces.	AG7 Multiple access points SHOULD be provided to aid circulation and mitigate congestion within the mosque plot. [See Figure 8.]
AS4  Safe and independent access SHALL be provided for female worshippers.	AG8 The female access point SHOULD be located along a street edge. [See Figure 8.]
AS5 Plot access and linkages to adjacent or off-site parking areas SHALL be provided.	
AS6 The spatial layout of the mosque SHALL enhance and reinforce linkages to existing sikkak.	
AS7 Universal access into and within the mosque plot SHALL comply with ADIBC requirements for accessibility.	
<b>3.2.3 Spatial Layout</b>	
AS8 Public and private spaces SHALL be clearly delineated using paving treatments, landscaping and gateway elements.	AG9 An access and circulation management strategy for the mosque SHOULD be devised by the mosque designer. This will identify the spaces within the plot and the level of accessibility using the following categories: <ul style="list-style-type: none"> <li>• public space;</li> <li>• private space; and</li> <li>• restricted space.</li> </ul>
AS9  The spatial layout SHALL minimise areas of concealment or entrapment to foster natural surveillance.	AG10 Approaches to all entrances into the mosque SHOULD be visible to enhance natural surveillance from within the plot and from the public realm. [See Figure 10.]
	AG11 Views from habitable spaces SHOULD overlook secluded areas to enhance natural surveillance.
	AG12 Semi-transparent architectural elements, such as frosted glass and mashrabiya panels, SHOULD be used in partially enclosed areas to improve natural surveillance.
	AG13 In 'female only' areas where visibility is not possible from all other areas, the design treatment SHOULD ensure that occupants can be heard to enhance natural surveillance.
AS10 A minimum 3 m setback SHALL be maintained from the external surface of the qibla wall. All other separation of buildings on the plot will be governed by Abu Dhabi Civil Defence (ADCD) requirements. [See Figure 9.]	
AS11 'Female only' areas SHALL be physically separate from other areas of the mosque.	
AS12 Physical or visual connections SHALL be maintained between compatible functions to optimise circulation.	
AS13 The crèche SHALL be located adjacent to the female prayer area.	AG14 The crèche MAY be used for Qur'anic classes outside of prayer times.

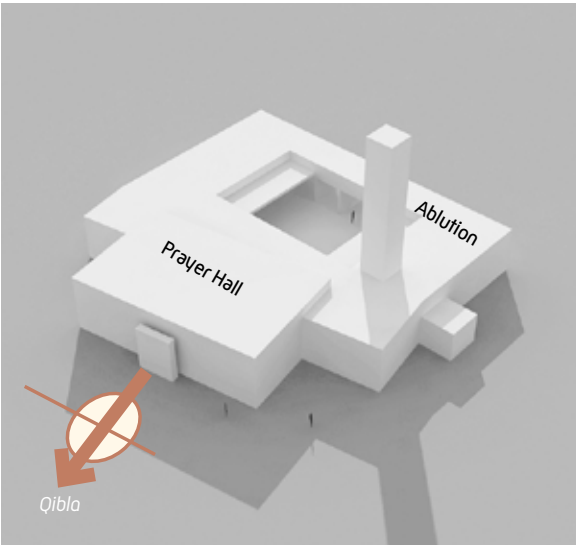


Figure 7: Change in direction of prayer hall towards qibla.

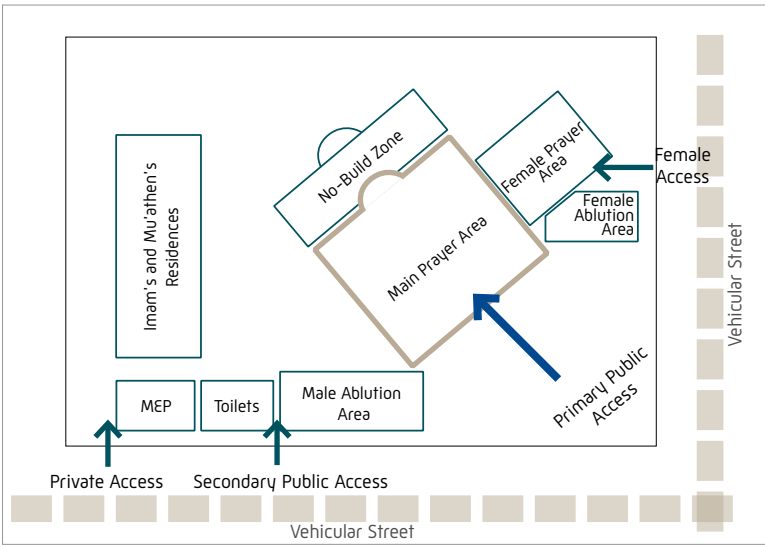


Figure 8: Access and spatial layout.

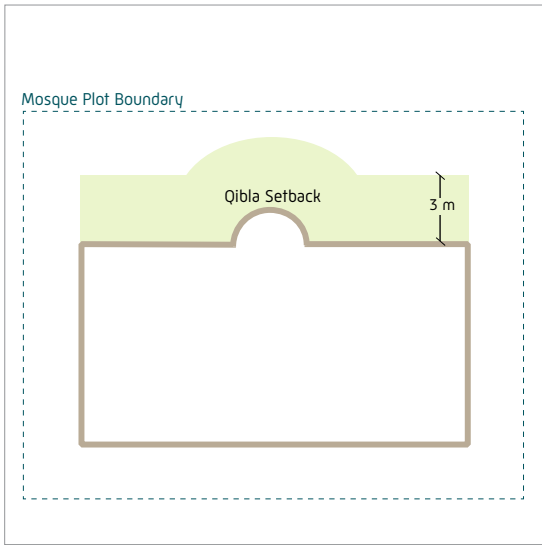


Figure 9: 3 m qibla setback.



Figure 10: Entrances to the mosque should have a visual linkage from the public realm.

Standards		Guidelines	
AS14	The multi-purpose hall of a district jame'e SHALL be located to maximise efficiency of access to surrounding community facilities. (See Figure 11.)	AG15	The multi-purpose hall SHOULD open onto a courtyard or plaza. (See Figure 11.)
AS15	Toilet facilities SHALL be separated from ablution facilities to enable the segregation of shoe and no shoe zones. (Refer to Section 2.4.)	AG16	The Imam's and Mu'athen's residences SHOULD be located near the most compatible adjacent land use.
AS16	Wind direction SHALL be considered while locating toilets, in order to prevent the spread of odours to the prayer areas.		
AS17	Toilets, ablution areas and the Imam's and Mu'athen's residences SHALL NOT be located beyond the qibla wall.	AG17	Parking areas, MEP storerooms, and emergency assembly areas (Refer to Section 3.2.6) MAY be located beyond the qibla wall.
AS18	The architectural design SHALL clearly define the threshold between the shoe and no shoe zones.	AG18	Definition of the threshold SHOULD be achieved through a change in floor materials and/or change in level.
AS19	Open spaces within the mosque plot SHALL be provided to accommodate gathering before and after prayer.		
<b>3.2.4 Existing Natural Systems</b>			
AS20	Existing trees and groundcover of preservation value SHALL be integrated into the overall spatial layout.	AG19	Existing topography, ground cover and vegetation MAY be integrated into the mosque design.
<b>3.2.5 Community and Emergency Support (Designated District Jame'e)</b>			
AS21	A district jame'e designated for Community and Emergency Support (refer to Volume 1 - Planning), SHALL make provisions based on the requirements of the local emergency planning authority.	AG20	The multi-purpose hall SHOULD be designed to facilitate emergency support.
AS22	All provisions for Community and Emergency Support SHALL be incorporated in the mosque design.		
<b>3.2.6 Fire and Safety Evacuation Space</b>			
AS23	Exits from the mosque SHALL be sized appropriately, as per ADCD requirements.	AG21	Where applicable, a Fire and Life Safety Strategy SHOULD be prepared.
AS24	A fire assembly point for the total worshipper population of the mosque SHALL be provided, as per ADCD requirements.	AG22	If the fire assembly point is not within the mosque plot, it SHOULD be directly accessible and clearly signposted from it. (See Figure 12.)
<b>3.2.7 On Site Parking Provision</b>			
AS25	Parking areas SHALL be a minimum of 3 m away from any building on the mosque plot.		
AS26	Parking spaces for the Imam and Mu'athen SHALL be designated with a visible 'Reserved' sign.	AG23	Parking spaces for the Imam and Mu'athen SHOULD be located at the side or rear of the mosque plot.
		AG24	At least 1 disabled parking space SHOULD be provided within 10 m of the mosque entrance.
		AG25	At least 1 parking space SHOULD be reserved near the fire pump room of the mosque for ADCD.

Standards		Guidelines	
AS27	The visual impact of parking areas SHALL be minimised by dividing on-site parking areas into smaller areas and distributing them across the mosque plot.	AG26	Parking areas of 5 parking spaces or more SHOULD be divided by a landscaped area equal to half the size of a parking space.
AS28	Bicycle parking stands SHALL be located within a 30 m walking distance of the mosque entrance.	AG27	Bicycle parking stands SHOULD be provided at the side of the mosque building, without obstructing pedestrian and vehicular access.

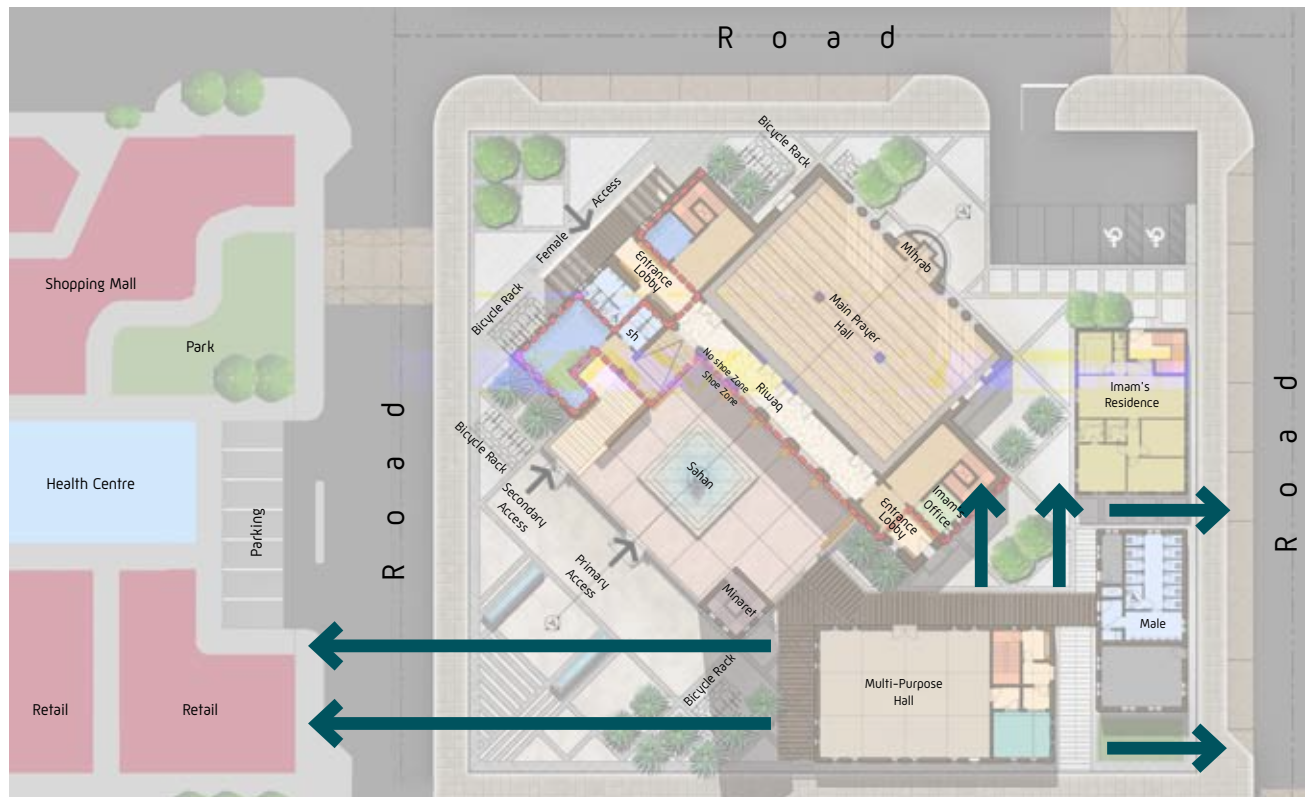


Figure 11: Multi-purpose hall and its linkages to surrounding community facilities.



Figure 12: Images of typical emergency evacuation areas/signs.

### 3.3 Edge Condition

Standards	Guidelines
<b>3.3.1 Setbacks</b>	
<p>All buildings SHALL be set back a minimum of 3 m from any adjacent plot line (see Figure 13), except when;</p> <p>AS29</p> <ul style="list-style-type: none"> <li>co-located with, or adjacent to, a community facility plot; where ADCD setback requirements will govern; and/or</li> <li>adjacent to a public open space, street or sikkak, where no setback is required.</li> </ul>	
<b>3.3.2 Boundary Treatment</b>	
<p>AS30 The threshold design at the plot boundary SHALL be integrated appropriately with the surrounding context.</p>	<p>The design of the plot boundary threshold MAY be treated with the following:</p> <ul style="list-style-type: none"> <li>low walls (see Figure 15);</li> <li>fencing;</li> <li>planting (see Figure 14);</li> <li>site furnishing;</li> <li>landform; and/or</li> <li>a change in paving material or colour.</li> </ul> <p>AG28</p>
	<p>Where noise or environmental mitigation measures are required, the threshold design of the plot boundary SHOULD consider the provision of the following:</p> <ul style="list-style-type: none"> <li>sculpted landforms; and/or</li> <li>dense landscape planting.</li> </ul> <p>AG29</p>
<p>AS31 The plot boundary SHALL be clearly identifiable and visible during the day and night.</p>	<p>AG30 Mosque entrances SHOULD be accentuated using architectural elements, lighting and landscaping.</p>
<p>AS32 Plot boundary walls and fences, if used, SHALL NOT exceed 1.2 m in height.</p>	<p>AG31 Plot boundary walls and fences SHOULD be used in a Rural settlement context where plot edges are undefined. (See Figure 15.)</p>
	<p>AG32 Plot boundary walls and fences SHOULD NOT be used in an Urban and/or Suburban settlement context, unless it relates to the surrounding context.</p>
<p>AS33 If a plot boundary wall or fence is used, its appearance and texture SHALL complement the mosque design.</p>	
<p>AS34 Where applicable within a Rural settlement context, boundary treatments SHALL be designed to prevent animal intrusion.</p>	

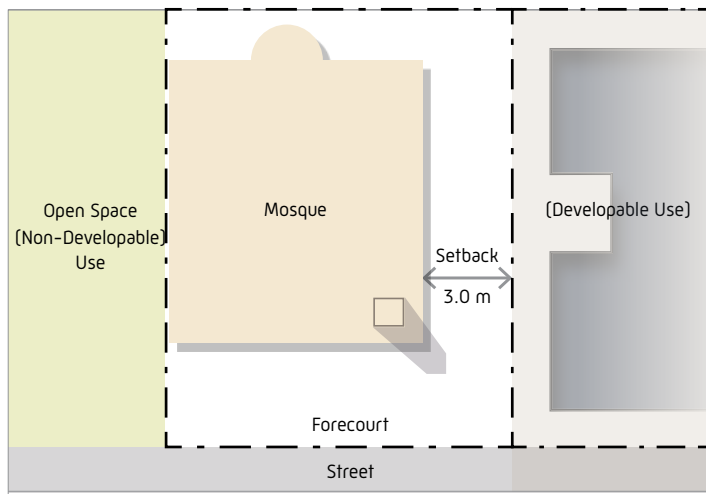


Figure 13: Setback based on the edge condition (no setback required to non-developable uses).



Figure 14: Landscape boundary treatment.



Figure 15: Low boundary wall to define plot edge.

## 4.0 Architectural Design

The Architectural Design Standards have been developed to create an architectural language for the design of Emirati vernacular mosques. The standards encourage a level of creative flexibility to yield a variety of mosque designs, while maintaining the Emirati 'vernacular character'.

As a result of the construction methods and materials traditionally used, Emirati vernacular mosques have specific proportional relationships between the architectural components, thus creating a module for design (refer to Appendix 3 - Vernacular Study). To ensure future mosques maintain the vernacular character, all vernacular components should be based on a Design Module (refer to Section 4.1).

### Methodology:

- i. Use the developed layout and design composition standards to create a built form which celebrates the vernacular components.
- ii. Establish a Design Module to define proportional relationships between the architectural elements of the mosque relating to its size and context (refer to AS41, AS42, AG35 and AG 36, and Appendix 3 - Vernacular Study, Section 4.4.1).
- iii. Apply standards outlined in Table 1 for all functional components.
- iv. Ensure the requirements of the Building Services and Landscape Sections are integrated with the Architectural Design section.
- v. Meet all minimum standards, as per the requirements of the relevant authorities.

### Outcome:

- i. Simplicity of built form.
- ii. Proportional relationship between the vernacular components and the remaining built form.
- iii. Use of passive cooling and natural lighting.
- iv. Minimal architectural detailing.
- v. Homogeneity of colour, texture, materials and finishes.
- vi. Functional and safe design.
- vii. Integration of multi-disciplinary aspects of mosque design.

### Vernacular Character



Further to the guidance on Emirati mosque vernacular architecture provided in Section VI, the vernacular mosque has distinctive characteristics.

The defined portal, sahan, riwaq and prominent mihrab distinguish it from the surrounding context, while the flat roofed prayer hall and stout minaret reflect the minimalist style of the mosque.

Together these form the vernacular character of Emirati mosques



## 4.1 Design Composition

Standards		Guidelines
<b>4.1.1 Built Form</b>		
AS35 Ⓟ	The massing and scale of the mosque SHALL relate to its capacity and context. (See Figure 16.)	AG33 Mosques in Highly Urban and Urban settlement contexts SHOULD be multi-storey, to complement the context. (See Figure 16.)
AS36 Ⓟ	All massing components SHALL be pure geometric forms to reflect the minimalist character of Emirati vernacular.	
AS37 Ⓟ	Vernacular components SHALL be prominent, bold, and of simple massing to reflect Emirati vernacular character. (See Figure 17.)	



Figure 16: Transformation of scale and proportion in different settlement contexts.



Figure 17: Simplicity in the massing composition of a jame'e.

Standards		Guidelines	
AS38	Non-vernacular components SHALL NOT overshadow or detract from the vernacular components.	AG34	All utility plant and equipment SHOULD be located at the side or in an extreme corner of the mosque built form, away or detached from the prayer areas. (See Figure 18.)
AS39	The massing and architectural style of the Imam's and Mu'athen's residences SHALL complement the mosque design.		
AS40	Massing components SHALL be clustered to create shadeways and courtyards. (See Figure 19.)		
AS41	The Design Grid of the mosque SHALL be determined by a Design Module with a width to depth proportion of 1:1.	AG35	The Design Module SHOULD be 4 m (w) x 4 m (d).
AS42	Vernacular components SHALL be based on the Design Module.	AG36	All other functional components SHOULD be based on the Design Module.
<b>4.1.2 Height</b>			
AS43	For a single storey mosque, the proportion of the Design Module width to height of the main prayer hall SHALL be 1:1.5. (See Figure 20.)	AG37	The floor to ceiling height of the main prayer hall in a single storey mosque SHOULD be 6 m.
AS44	The height of a multi-storey mosque SHALL comply with ADIBC building height requirements for assembly buildings.		
AS45	The external height of the main prayer hall SHALL exceed the external height of all other functional components, excluding the minaret. (See Figure 21.)		
AS46	The proportion of the external height of the minaret to the prayer hall SHALL be a maximum of 2.5:1. (See Figure 42.)		



Figure 18: Integrated plant design; Grand Mosque Bur Dubai, Dubai, UAE.



Figure 19: Shadeways between building mass.

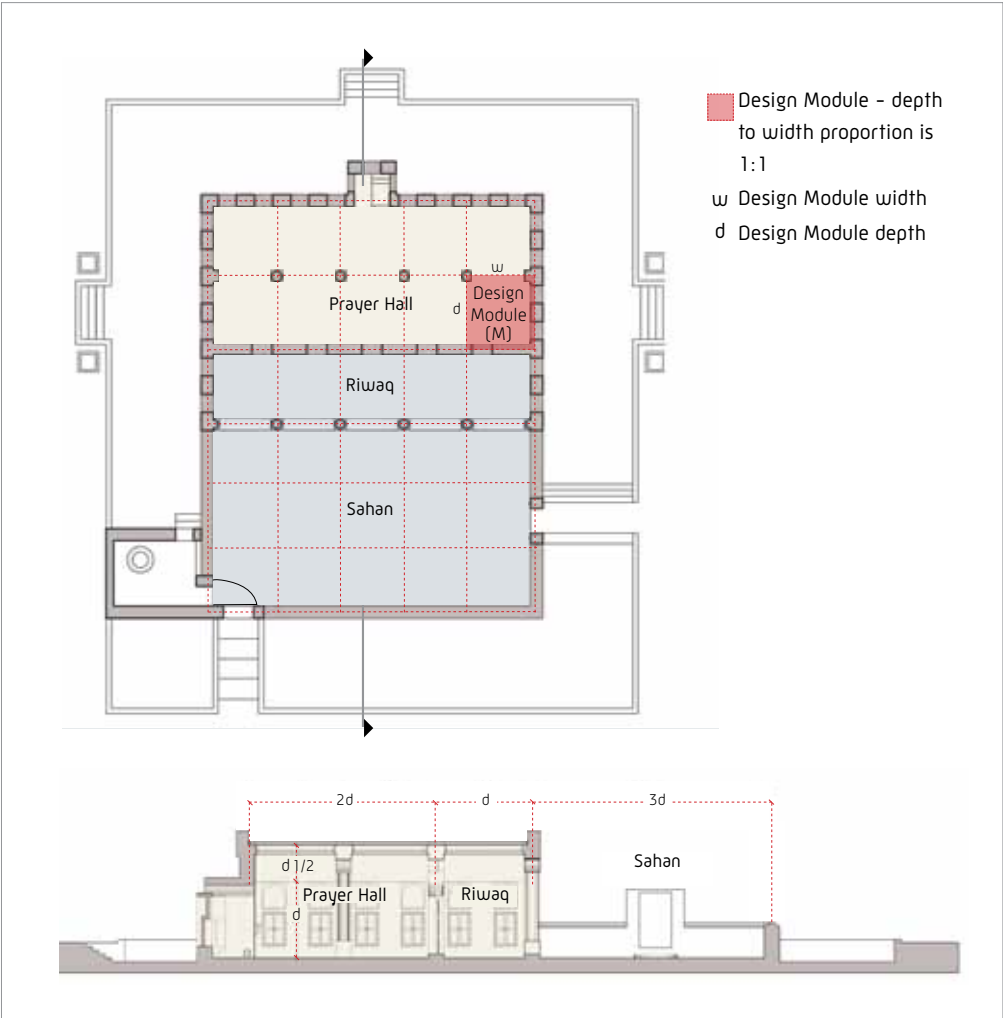


Figure 20: Proportions of the sahan, riwaq and prayer hall.

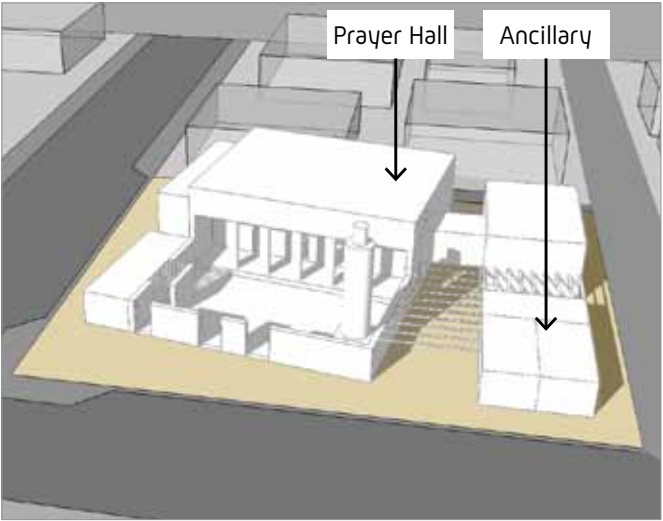










Figure 21: The height of the ancillary building is proportionate to the prayer hall.

Standards		Guidelines	
<b>4.1.3 Façade</b>			
AS47  Articulation of the base, middle and top SHALL be minimal. (See Figure 22.)		AG38	Each level of a multi-storey mosque MAY be defined on its façade.
AS48	The base of the vernacular components SHALL be defined by a single raised plinth.	AG39	The base of the entire mosque building MAY be raised on a single plinth.
AS49 	Voids, including recessed panels and mashrabiya panels, SHALL NOT exceed 30% of the total façade. (See Figure 24.)	AG40	A façade SHOULD appear solid, with glazed doors and/or windows not exceeding 16% of the façade. (See Figure 25.)
AS50 	Vertical rhythm on a façade SHALL be formed by solids and voids. (See Figure 26.)	AG41	Vertical rhythm on a façade SHOULD reflect the Design Grid.
AS51 	Voids SHALL be recessed to express the solidity of the façade. (See Figure 26.)	AG42	Recesses for voids SHOULD have a depth of least 0.3 m from the external façade.
AS52 	Utility and safety equipment on a building façade SHALL be concealed, to blend in with the overall façade treatment.		
AS53 	The air leakage of the mosque envelope SHALL be in accordance with Estidama requirements.		
AS54 	The average thermal transmittance (U Value) and Solar Heat Gain Co-efficient (SHGC) of the mosque envelope SHALL be in accordance with Estidama requirements.		
<b>4.1.4 Roof</b>			
AS55 	A flat roof with a defined parapet SHALL be incorporated in the design.	AG43	Articulation of the parapet SHOULD be minimal. (See Figure 23.)
AS56	Mosques with a capacity below 300 worshippers SHALL NOT have domes.	AG44	Large mosques MAY use domes to complement the internal spatial experience, provided they are not designed with the intent of being visible as external architectural features. (See Figure 27.)
AS57	Domes SHALL be set back from the parapet and be low and hemispherical so that they are not prominent from the public realm. (See Figure 28.)		

Standards		Guidelines	
AS58	Domes SHALL NOT be more than 2 times the parapet height.		
AS59	MEP equipment on the roof SHALL be screened and set back by a minimum of 3 m.	AG45	Access to the roof SHOULD be via staircases, access hatches, lifts, cat ladders or fixed ladders.
AS60	The Solar Reflective Index (SRI) level, in relation to the roof, SHALL be in accordance with Estidama requirements.		



Figure 22: Subtle articulation of base, middle and top of Al Jähili Mosque, Al Ain, UAE.



Figure 23: Minimal articulation of the parapet, Hamad Bin Sultan Mosque, Al Ain, UAE.



Figure 24: Façade solid-void relationship with less than 30% void.



Figure 25: Rhythmic solid-void relationship with 16% operable openings.

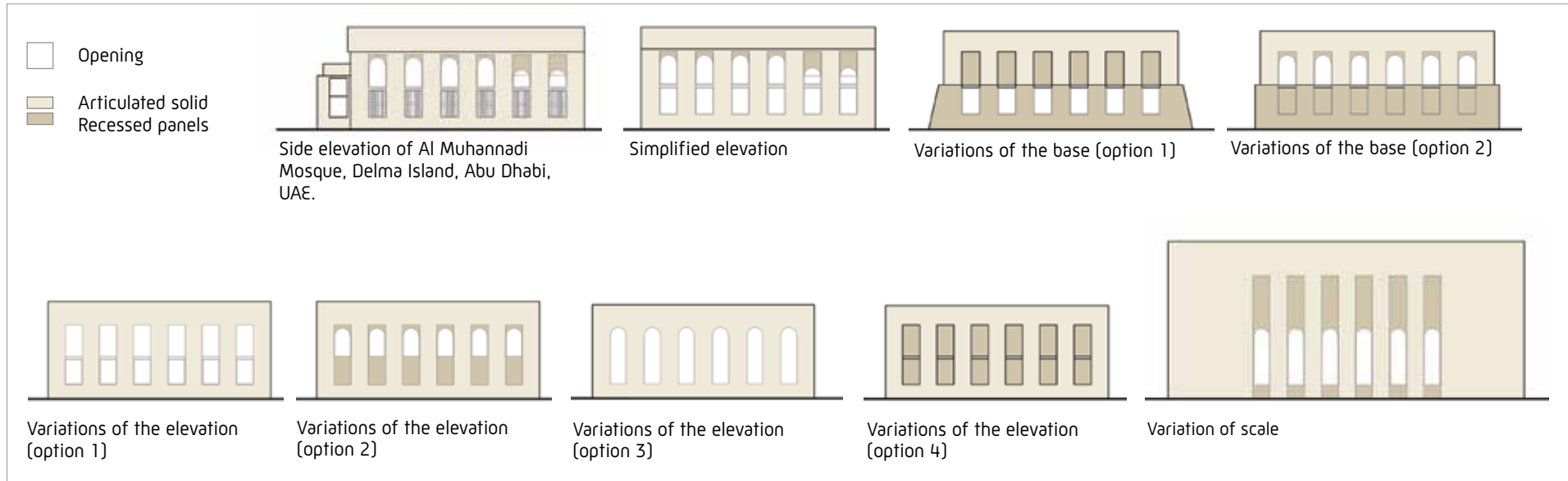


Figure 26: Façade alternatives illustrating recessed windows, diffused light, proportion and composition.



Figure 27: Unobtrusive domes to create an internal ambience, Grand Mosque, Dubai, UAE.

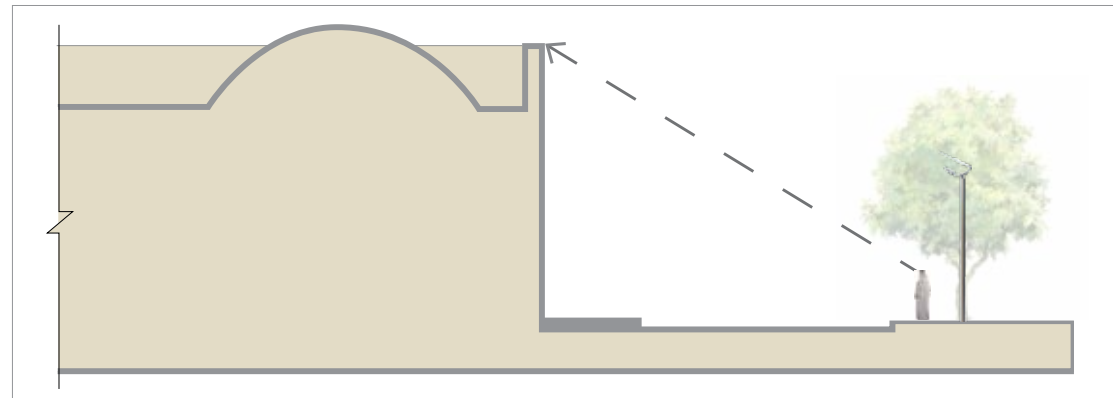








Figure 28: Dome designed to integrate into the vernacular form.

## 4.2 Passive Thermal Control

Standards		Guidelines
4.2.1 Thermal Comfort		
<p>AS61</p> <p> Methods of passive thermal comfort SHALL be integrated into the mosque design.</p> <p></p>	AG46	Traditional concepts of passive cooling SHOULD be adapted to the mosque design. (See Figure 29.)
	AG47	 Smaller courtyards and shadeways SHOULD be integrated to create a microclimate for natural air movement.
	AG48	Water features and planting SHOULD be used to promote a comfortable microclimate.
	AG49	 Cross-ventilation SHOULD be used as the primary mode of ventilation during wintertime. (See Figure 30.)
	AG50	The minaret MAY be used for ventilation and/or passive cooling.
	AG51	 Mixed-mode ventilation SHOULD be integrated in the mosque design and be in accordance with Estidama requirements.
	AG52	Double wall façades MAY be used to reduce solar heat gain for thermal comfort, while retaining a solid character.
	AG53	Where double wall façades are used, air MAY be filtered through wall ducts that incorporate methods of moisture control to reduce humidity.
<p>AS62</p> <p> A shading strategy SHALL create a transition for worshippers between the indoor and outdoor functional areas of the mosque.</p>	AG54	Shading treatment(s), such as pergolas, arcades, tensile fabric and automatic umbrellas, MAY be included.

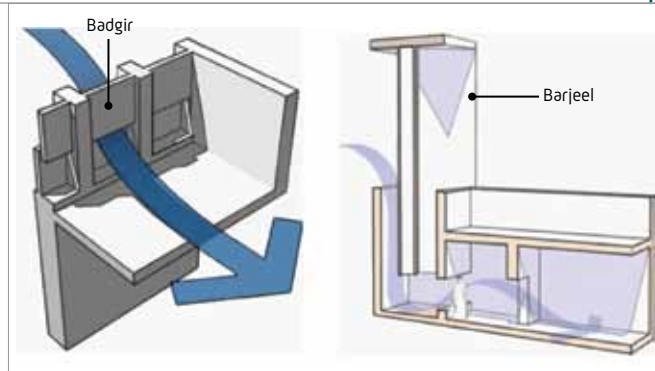


Figure 29: Passive cooling through traditional badgir and barjeel.



Figure 30: Windows along all façades at Al Mulla Mosque facilitate cross-ventilation, Dubai, UAE.

## 4.3 Architectural Elements

Standards		Guidelines	
<b>4.3.1 Main Prayer Hall</b>			
AS63 Ⓟ	Based on the Design Grid, the main prayer hall SHALL be rectangular, such that the long edge (width) is along the qibla wall.	AG55 Ⓟ	The main prayer hall SHOULD have a depth to width proportion of 1:2.5. (See Figure 31.)
AS64	The main prayer hall SHALL be designed to minimise the number of columns, facilitating continuous prayer rows.		
AS65	The main prayer hall SHALL provide a dedicated perimeter walkway, allowing circulation of worshippers. Minimum widths are as follows (see Figure 31): <ul style="list-style-type: none"> <li>• 0.75 m for a prayer hall capacity of less than 1,000 worshippers;</li> <li>• 1.5 m for a prayer hall capacity of 1,000 to 2,000 worshippers; or</li> <li>• 2.25 m for a prayer hall capacity of 2,000 worshippers or more.</li> </ul>	AG56	The perimeter walkway SHOULD be defined through a change of pattern, colour, material or structural feature.
AS66	Main prayer hall design SHALL integrate the needs of the elderly and mobility impaired worshippers, as per ADIBC requirements for accessibility.	AG57	Seating for the elderly and the mobility impaired SHOULD be integrated into the interior architecture of the mosque.
AS67	Bookshelves and storage space SHALL be integrated into the interior architecture of the mosque. (See Figure 32.)		
AS68	Storage for copies of the Holy Qur'an SHALL accommodate 1 copy per 5 worshippers.		
AS69 Ⓟ	Daily and Friday prayer halls SHALL be physically separated to enable the isolation of lighting and cooling systems, resulting in the reduction of energy consumption.	AG58	In an Urban and Highly Urban settlement context, the main prayer hall size MAY be reduced provided that the required worshipper capacity is distributed between the prayer hall and an integrated shaded sahan to optimise space.
AS70	The floor finishing in main prayer halls SHALL clearly define the prayer rows. (See Figure 33.)	AG59 Ⓟ	The floor finishing in prayer halls SHOULD be constructed from modular carpet systems and have low Volatile Organic Compounds (VOCs) emissions.
AS71	The depth of each prayer row SHALL be a minimum of 1.2 m to allow a comfortable prostration position.	AG60	Gaps between prayer rows MAY be integrated into floor finishing.
AS72	The floor finishing SHALL be made of soft materials to allow a comfortable prostration position.	AG61	The prayer hall SHOULD be carpeted using carpet that consists of a minimum 80% wool.
		AG62	Traditional textile patterns MAY be used in prayer areas. (See Figure 34.)
AS73	Main prayer hall wall finishes below 1.8 m SHALL NOT use excessive ornamentation or high contrast colours. (See Figure 35.)	AG63	Prayer hall wall finishes below 1.8 m MAY include panelling or cladding.
AS74	Finishes to the prayer areas SHALL NOT distract worshippers from their prayers.		



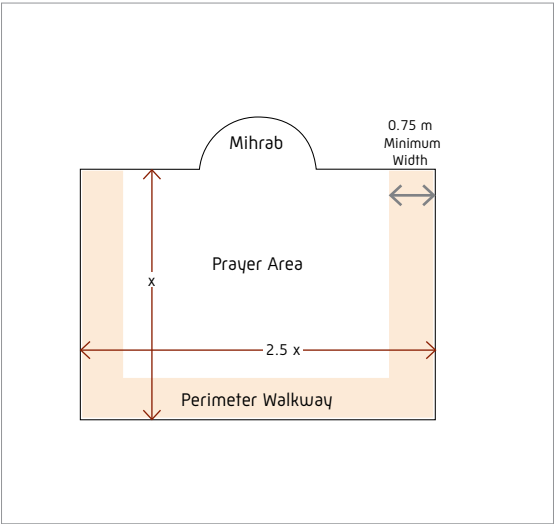


Figure 31: Prayer hall perimeter walkway and its width to depth proportion.



Figure 32: Shelves for storing copies of the Holy Qur'an.



Figure 33: Clearly defined prayer rows.



Figure 34: Traditional textile patterns.

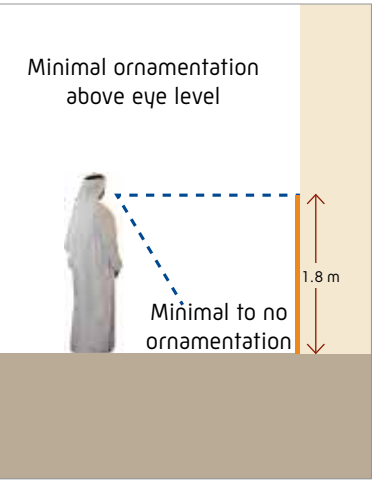


Figure 35: Minimal ornamentation above eye level.



Figure 36: AC vents integrated into the interior design.

Standards		Guidelines	
AS75	All building systems SHALL be integrated into the interior architecture of the prayer hall. (See Figure 36.)	AG64	Placement of any building systems equipment SHOULD be away from the worshippers' line of sight during prayers.
AS76	Pendant lights and chandeliers SHALL be incorporated into the structural design.	AG65	Fire equipment SHOULD NOT be located on the qibla wall.
AS77	The placement of Visual Display Unit(s) (VDUs) SHALL be integrated into the interior architecture of the prayer hall to enhance the Imam's communication with worshippers.	AG66	Pendant lights and chandeliers SHOULD NOT incorporate incandescent lamps.
<b>4.3.2 Mihrab and Minber</b>			
AS78 Ⓟ	The mihrab of the main prayer hall SHALL be visible externally. (See Figure 37.)	AG67	Within all prayer halls other than the main prayer hall, the mihrab SHOULD be indicative, for orientation only.
AS79 Ⓟ	A minber SHALL be integrated into the mihrab design within the main prayer hall and be located on the right hand side when facing qibla.		
AS80	Jame'e and district jame'e mosques SHALL have an external door integrated into the mihrab design. (See Figure 37.)		
<b>4.3.3 Female Prayer Hall</b>			
AS81	All regulations for the main prayer hall SHALL apply to the female prayer hall, apart from those referring to proportions where site constraints impact the design.		
AS82	The female prayer hall SHALL not be placed beyond the mihrab.	AG68	The female prayer hall MAY be located on a mezzanine, with the use of mashrabiya panels to ensure privacy.
AS83	Female worshippers SHALL be able to view and hear the Imam.	AG69	Audio visual equipment SHOULD be integrated into the interior architecture to transmit live footage of the Imam from the main male prayer hall to the female prayer hall.
<b>4.3.4 Riwaq</b>			
AS84 Ⓟ	The mosque design SHALL incorporate a riwaq.	AG70	More than 1 riwaq MAY be incorporated, if justified functionally.
AS85 Ⓟ	The distance between the centre line of the riwaq columns SHALL be the length of 1 Design Module.		
AS86	A riwaq Module SHALL be the same as the prayer hall Design Module, and SHALL have a depth of 1 row of Design Modules, except for jame'e and district jame'e mosques where extended space is required, when 1 row of Design Modules or more can be added. (See Figure 38.)		



Figure 37: Prominent mihrab on the main prayer hall with entry for Imam, Dubai Grand Mosque, Dubai, UAE.

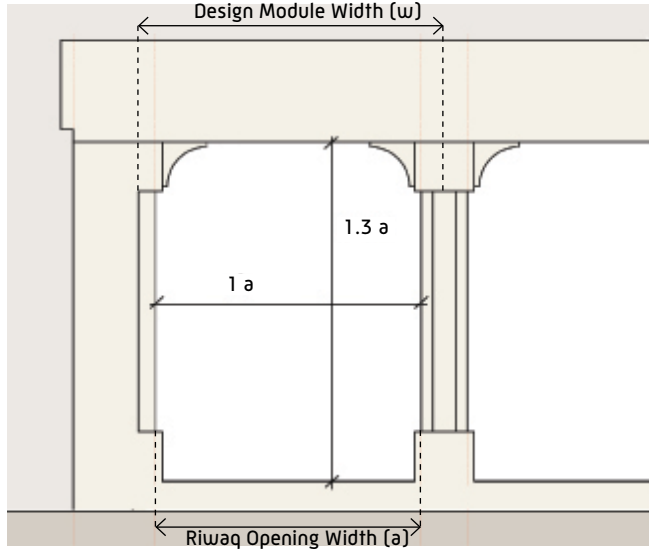
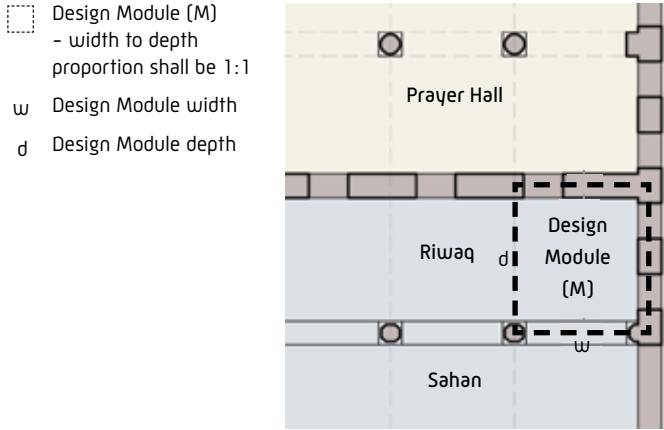


Figure 38: Proportion of riwaq opening width to height.

Standards		Guidelines	
AS87 Ⓟ	The riwaq opening SHALL have a width to height proportion of no more than 1:1.3. (See Figure 38.)	AG71	The design of the riwaq façade SHOULD express the structural rhythm of the module.
AS88	The riwaq SHALL be designed to be used as an extended prayer space.	AG72	The floor finishing of the riwaq SHOULD indicate prayer rows for worshippers.
<b>4.3.5 Sahan and Portal</b>			
AS89 Ⓟ	The sahan SHALL be proportional to the main prayer hall, and is determined by the design intent and scale of the mosque.	AG73	The proportion of the sahan depth to the prayer hall depth SHOULD range from 1:1 to 2:1 (See Figure 20.)
AS90 Ⓟ	A physical threshold SHALL clearly define the sahan boundary.	AG74	The width of the sahan MAY be greater than the width of the prayer hall.
		AG75	A sahan MAY be used as an extended prayer space, accommodating worshippers over the prayer hall capacity.
AS91	The sahan design SHALL NOT include any trees.	AG76 Ⓟ	Shading SHOULD be provided for when the sahan is used for prayer. (See Figure 39.)
AS92 Ⓟ	The entrance to the sahan SHALL be defined by a portal. (See Figure 41).	AG77	Sahan paving pattern and colour SHOULD indicate prayer rows for worshippers. (See Figure 40.)
		AG78	The portal MAY be indicative, using a structure and/or landscaping.
AS93	The sahan SHALL be hardscaped with homogeneous colours, materials and textures.	AG79	The number and size of portals SHOULD be determined by the design intent and scale of the mosque.
		AG80	The sahan SHOULD incorporate permeable paving material(s).
<b>4.3.6 Minaret</b>			
AS94 Ⓟ	The mosque SHALL have 1 minaret.		
AS95 Ⓟ	The minaret SHALL be of a stout appearance.	AG81	The proportion of the minaret height to its base width SHOULD be 3.7:1. (See Figure 42.)
AS96	The minaret SHALL be placed at the opposite end of the plot, away from the qibla direction.	AG82	The minaret SHOULD be freestanding and located on the right hand side, while facing qibla.
AS97	The internal space of the minaret SHALL have a functional use.	AG83	The internal use of the minaret SHOULD be integrated with the functional uses of the mosque.
AS98	Public address, telecoms and other equipment SHALL be integrated into the minaret design.		



Figure 39: Example of sahan shading, The Prophet's Mosque, Medina, the Kingdom of Saudi Arabia (KSA).



Figure 40: Sahan with defined prayer rows.



Figure 41: Defined portal of Al Muhannadi Mosque, Delma Island, Abu Dhabi, UAE.

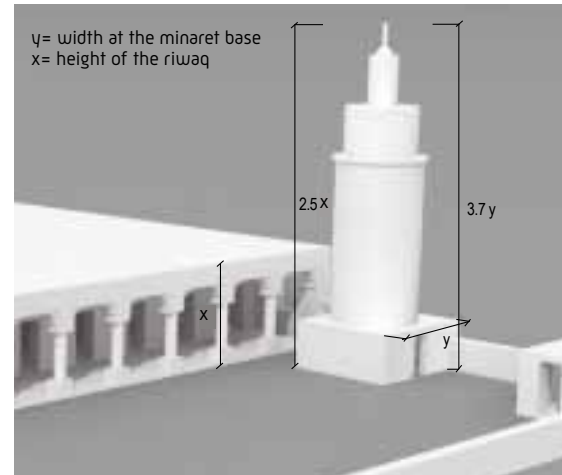
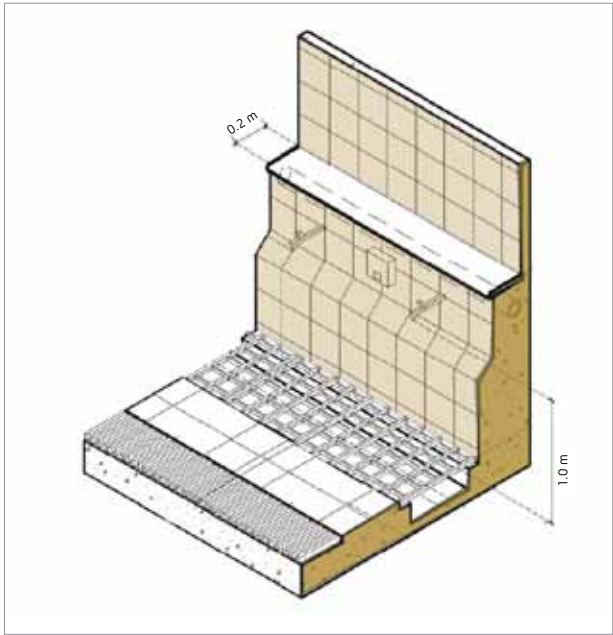


Figure 42: Proportion of the minaret height to prayer hall height and proportion of minaret height to its base width.

## 4.4 Wet Area Design

Standards		Guidelines	
<b>4.4.1 Ablution Areas and Shower Cubicles</b>			
AS99	Transition areas between ablution areas and prayer halls SHALL be covered with anti-fungal/antibacterial material.	AG84	Ablution areas MAY be divided for daily and Friday prayers to minimise usage and operational costs.
AS100	A minimum of 5% of ablution units, or at least 1 ablution unit, SHALL be provided that meets universal access principles.		
AS101	The design of ablution units SHALL be integrated with the interior architecture to ensure they are: <ul style="list-style-type: none"> <li>• safe and secure;</li> <li>• easy to maintain; and</li> <li>• comfortable to use.</li> </ul>	AG85	Standing ablution units MAY be installed at a minimum of 1 standing unit per 3 seated units, with the faucet set at 1.0 m from the floor finish. (See Figure 43.)
			For seated ablution units, the dimensions SHOULD be (See Figure 43.):
		AG86	<ul style="list-style-type: none"> <li>• 0.38 m from the seat to the floor finish;</li> <li>• 0.75 m from the faucet to the floor finish;</li> <li>• 0.4 m between the faucet and ablution seat; and</li> <li>• 0.8 m between centre-line of the ablution seats.</li> </ul>
AS102	Shelves of 0.2 m depth SHALL be integrated into each ablution unit design. (See Figure 43.)	AG87	The height of the shelf for seated ablution units SHOULD be 0.95 m from the floor finish.
AS103	The design of the ablution units SHALL prevent splashing. (See Figure 44.)		
AS104	Faucets for ablutions SHALL: <ul style="list-style-type: none"> <li>• be durable;</li> <li>• be water efficient;</li> <li>• use aerators; and</li> <li>• have metering controls or infrared sensors.</li> </ul>		
AS105	At least 1 shower cubicle SHALL be designed to meet universal access standards, as per ADIBC requirements for accessibility.		
AS106	Shower cubicles SHALL have both wet and dry areas.	AG88	Each shower cubicle MAY have its own operable window 1.8 m or above from the floor finish.
AS107	Water efficient showerheads SHALL be installed within all shower cubicles.		

Standing abluion unit



Seated abluion unit

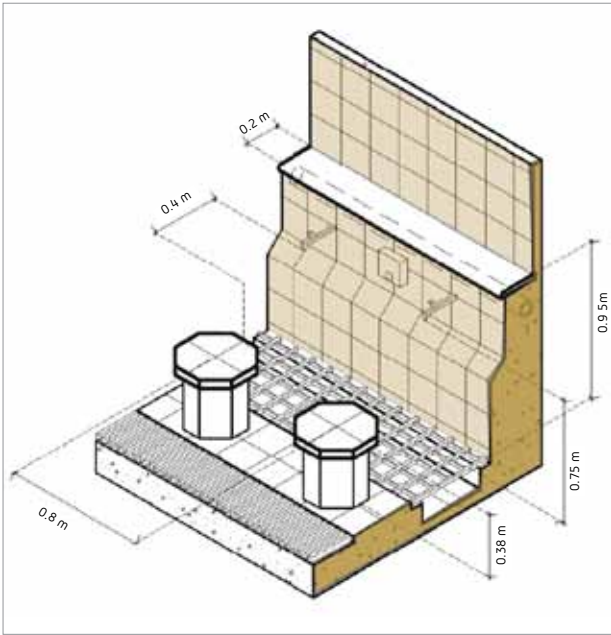


Figure 43: Abluion design alternatives.



Figure 44: Abluion design with splash-free grating and without a step.

Standards		Guidelines	
<b>4.4.2 Toilet Facilities</b>			
AS108	The design of toilet fittings SHALL meet the Universal Plumbing Code of Abu Dhabi Emirate (UPC-AD) requirements.		
AS109	Toilet facilities SHALL NOT be located above or below any prayer hall.	AG89	Toilet facilities SHOULD be located on the edges of the mosque plot.
AS110	1 baby changing facility, at a minimum, SHALL be provided per 5 toilet units in the women's toilet facilities.		
AS111	The orientation of toilet cubicles SHALL be a minimum of 30 degrees away from the qibla direction.	AG90	The orientation of toilet cubicles SHOULD be perpendicular to the qibla direction.
AS112	All toilets SHALL have well-ventilated cubicles, whether partitioned or built-in units.	AG91	Partitioned toilet cubicles SHOULD have a vertical gap of 0.45 m from the ceiling to encourage air movement.
		AG92	Built-in toilet cubicles SHOULD have individual ventilation units.
		AG93	Each toilet cubicle MAY have its own operable window 1.8 m or above from the floor finish.
AS113	An equal number of Eastern type and wall-mounted European type toilets SHALL be provided.		
AS114	All toilets SHALL be water efficient and all flush tanks SHALL be concealed.		
AS115	Bidet shower fixtures SHALL be located on the right side of the user.		
AS116	Washbasins SHALL NOT be floor mounted.		
AS117	Washbasins SHALL be provided with integrated soap dispensers and faucets that have metering controls or infrared sensors.		
<b>4.4.3 Wet Area Fixtures and Finishes</b>			
AS118	All floor finishes SHALL be comprised of slip and water resistant material(s).		
AS119	Steps SHALL NOT be used in the design of wet areas.		
AS120	Floor drains in all wet areas SHALL be configured to maximise drainage efficiency.		
AS121	Water-resistant materials SHALL be used on the walls to a minimum height of 1.2 m from the floor finish.		
AS122	Glazed ceramic tiles SHALL be used in wet areas only.		
AS123	Ventilation in all wet areas SHALL be configured to maximise drying efficiency.		
AS124	1 integrated disposable towel dispenser, dryer and dustbin, at a minimum, SHALL be provided per 5 ablution or toilet units.		
AS125	1 clothes hook, at a minimum, SHALL be provided per shower and toilet unit.		



## 4.5 Other Requirements

Standards		Guidelines	
<b>4.5.1 Shoe Racks and Seating</b>			
AS126	Shoe racks SHALL be designed to allow worshippers to comfortably store, find and collect their shoes.	AG94	Shoe racks SHOULD be integrated with the architectural design. (See Figure 45.)
AS127	Shoe racks SHALL be distributed along the no shoe/shoe zone threshold to avoid overcrowding and accommodate worshippers exiting the mosque after group prayer.	AG95	Shoe racks MAY be located in the no shoe zone and/or near the no shoe/shoe zone threshold.
		AG96	Lockable shoe racks MAY be provided.
AS128	The maximum height of a shoe rack SHALL be 1.8 m.		
AS129	Seating SHALL be dispersed and integrated in the shoe zone, near the no shoe/shoe zone threshold, to accommodate 0.5% of the mosque worshipper capacity.		
<b>4.5.2 Restricted Access and Secure Storage</b>			
AS130	Access to the roof, minaret, utility rooms and storage areas SHALL be restricted.		
AS131	Secure storage for furniture and cleaning and maintenance equipment SHALL be provided.		
AS132	The following SHALL be lockable with high-grade, tamper resistant locking hardware: <ul style="list-style-type: none"> <li>restricted areas;</li> <li>maintenance areas;</li> <li>utility rooms or panels; and</li> <li>audio equipment.</li> </ul>		
AS133	All entrance doors of the mosque SHALL be lockable to restrict access during non-prayer times, except for any doors designated for emergency exit, which will be operable from inside.		



Figure 45: Integrated shoe rack design.

## 4.6 Architectural Detailing



Standards		Guidelines	
<b>4.6.1 Windows, Doors and Screens</b>			
AS134	The design of windows, doors and screens SHALL complement the architectural design of the mosque.		
AS135	Fenestration SHALL be designed to promote the use of natural daylight within the mosque.		
AS136	All fenestration design(s) SHALL be responsive to the internal function and orientation of the façade.	AG97	Windows on the qibla wall SHOULD only allow diffused light.
		AG98	Windows in the prayer hall SHOULD reduce potential glare and restrict external views. (See Figure 46.)
AS137 	Pivot and sliding windows SHALL NOT be used in the mosque design, except for wet areas.	AG99	Casement or fixed glass windows SHOULD be used in the mosque design.
		AG100	Pivot and sliding windows MAY be used in wet areas, provided they are screened with mashrabiya panels.
AS138 	Fully glazed doors SHALL NOT be used externally.		
AS139	Required emergency exits and fire rated doors SHALL comply with ADCD requirements.		
AS140	Mashrabiya panels or screens SHALL be used to control light, provide privacy and restrict external views. (See Figure 47.)	AG101	Mashrabiya panels or screens MAY be of a contemporary style to reflect the design intent.
<b>4.6.2 Signage</b>			
AS141	All signage SHALL be integrated and compatible with the mosque design, prominently located to direct worshippers to each mosque function and meet ADIBC requirements for signage.	AG102	Signage size, shape and style SHOULD NOT detract from the architectural design of the mosque.
AS142	Exterior wayfinding signage to the mosque SHALL comply with the Abu Dhabi Public Realm Design Manual (PRDM) requirements.		
AS143	Signage SHALL provide clear direction between the parking areas(s) and the mosque building.	AG103	Exterior signs SHOULD be provided to direct worshippers to adjacent community facilities.
AS144	Disabled parking spaces SHALL display the relevant signs and markings, as per DoT Standards.		



Figure 46: Recessed windows reduce glare, Al Jahili Fort, Al Ain, Abu Dhabi, UAE.

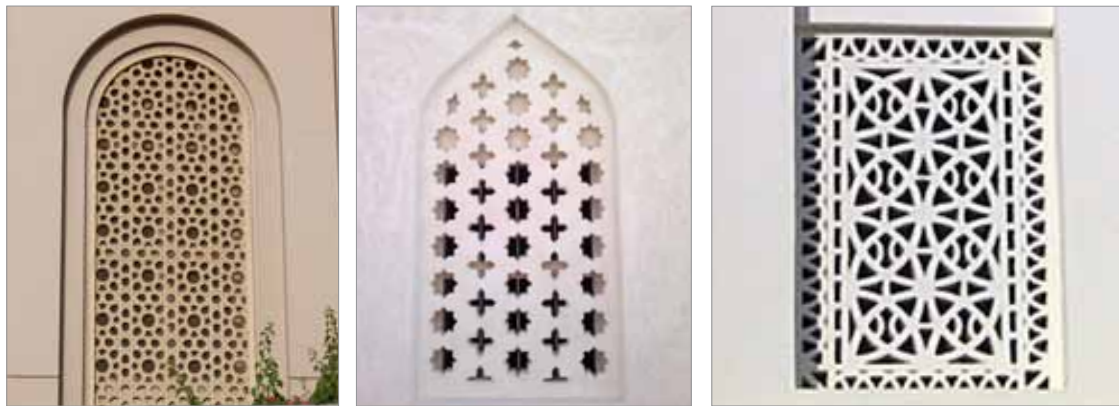


Figure 47: Geometric pattern-based mashrabiya panels.

Standards		Guidelines	
AS145	Interior and exterior signage SHALL use a clear and legible font size, with text in both Arabic and English.	AG104	Symbols and diagrams MAY be used on signage.
AS146	Emergency escape signage shall meet ADCD requirements.		
AS147	Signage SHALL clearly identify the segregation of male and female worshippers for all functional components.		
AS148	Signage for the no shoe/shoe zone threshold SHALL be integrated in the design.		
AS149	A permanent sign indicating the mosque layout SHALL be placed adjacent to all noticeboards and show all fire assembly points.	AG105	The layout plan SHOULD orient the worshipper and indicate the location of exit points, first aid equipment, Imam's office, Imam's residence and emergency communications.
AS150	First aid signs SHALL be located next to first aid equipment. (Refer to Volume 3 - Operations) [See Figures 48-49.]		
<b>4.6.3 Noticeboards</b>			
AS151	All mosques SHALL include a minimum of 2 noticeboards; 1 for male worshippers and 1 for female worshippers.	AG106	Noticeboards SHOULD be made from materials that complement the interior architecture of the mosque.
AS152	Noticeboards SHALL be a minimum size of 1.2 m (w) x 1.0 m (h) per board.	AG107	Noticeboards SHOULD be placed within public spaces on the mosque plot.
		AG108	Each mosque SHOULD incorporate a digital feedback system and display to communicate mosque energy and water consumption to worshippers.
<b>4.6.4 Lighting</b>			
AS153	A lighting strategy SHALL be developed to complement the design intent, scale and context of the mosque.		
AS154	The lighting strategy SHALL ensure easy and efficient operation and maintenance of all lighting within the mosque plot.		
AS155	The lighting strategy SHALL specify energy saving, low maintenance and readily available fixtures.		
AS156	Interior and exterior lighting SHALL accentuate architectural elements and ensure safe circulation within the mosque plot and the adjacent public realm.	AG109	Architectural lighting SHOULD be used modestly to enhance the minimalist ambience.



Figure 48: Red Crescent Sign.



Figure 49: Suggested First Aid Sign.

## 4.7 Materials

Standards		Guidelines	
4.7.1 Surface Treatment and Finishes			
AS157 Ⓟ The building materials, surface treatment(s) and finishes SHALL complement the design intent, scale and context of the mosque and meet ADIBC requirements for exterior surfaces and means of egress.	AG110	Materials such as form-faced concrete, compressed earth blocks and unpolished composite stone SHOULD be used to enhance the solidity and homogenous character of the built form. (See Figures 51-52.)	
	AG111	External finishes, such as textured paint, gypsum plaster and stucco, SHOULD be used.	
	AG112 Ⓟ Ⓢ	Traditional and locally sourced building materials, such as compressed earth blocks and those derived from date palm trees, MAY be considered, provided they are in accordance with ADIBC requirements for performance of alternative materials. (See Figures 51-53.)	
AS158	Highly reflective materials, such as aluminium cladding and mirrored glass, SHALL NOT be used for any external façades.		AG113 Ⓢ
		Materials and finishes selected for use in the mosque design SHOULD be in accordance with Estidama requirements.	



Figure 50: Materials with homogeneous colours and textures that enhance solid massing.



Figure 51: Rubble and gypsum texture, The National Museum of Ras Al Khaimah, UAE.



Figure 52: Contrasting texture and homogenous colour palette.

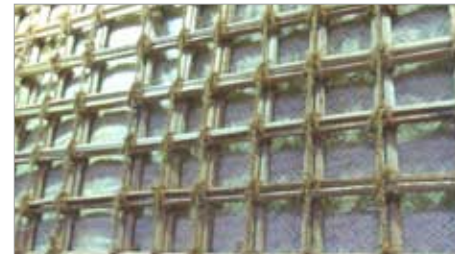


Figure 53: Examples of date palm materials used in traditional buildings.

Standards		Guidelines	
<b>4.7.2 Colour</b>			
AS161	Bright, glossy and/or reflective colours SHALL NOT be used.		
(V) AS162	The colour palette used for façades SHALL be derived from the existing natural landscape, ranging from white to muted earth tones. (See Figures 54-55.)	AG114	Architectural detailing, such as mullions and trims, MAY utilise contrasting colours, for example 'Heritage Red' (RGB 137,32,4) and 'Oasis' (RGB 129,127,84) (Source: The General Secretariat of the Executive Council (GSEC).)
		AG115	A mosque in a desert context SHOULD use a complementary colour palette such as 'Sand Dune' (RGB 247,237,211), 'Desert Sun' (RGB 223,139,26) and 'Glittering Sand' (RGB 151,147,129) (Source: GSEC.)
		AG116	A mosque in a coastal context SHOULD use a complementary colour palette which reflects traditional coral stone colours, such as 'Sandstone' (RGB 209,201,181) and 'Coral White' (RGB 249,238,222) (Source: GSEC.)
(V) AS163	The internal colour palette SHALL complement the external colour palette.	AG117	Internal wall finishes MAY use a muted colour palette, with contrasting colours used to accent elements such as the mihrab.
<b>4.7.3 Decorative Features and Ornamentation</b>			
(V) AS164	Decorative features and ornamentation SHALL be minimal, as per Emirati vernacular design. (See Figure 57.)	AG118	Ornamentation MAY be more complex for larger mosques to reflect the scale.
(V) AS165	All ornamentation SHALL be based on geometry, calligraphy, materials and textures only, to comply with the Islamic principle of 'non-imagery'.	AG119	Geometric patterns used in the architectural detailing SHOULD be simple and repetitive.
		AG120	Use of floral patterns SHOULD be limited.
		AG121	Use of ornamentally glazed tiles SHOULD be limited.
		(V) AG122	Decorative patterns SHOULD be used to define doorways and portals.
		AG123	Columns with architectural detailing SHOULD have a base-middle-capital height proportion of 0.2:1:0.2. (See Figure 58.)
		AG124	Continuous decorative patterns MAY be used along architectural expression lines, sill level trims, traditional brackets and column capitals. (See Figure 58.)
		AG125	Traditional projecting rain spouts SHOULD be integrated with a functional purpose, such as lighting, if used in the mosque design. (See Figure 59.)



Figure 54: Desert colour palette.



Figure 55: Homogenous colour palette.



Figure 56: Muted interiors, Abu Dhabi Cultural Museum, Abu Dhabi, UAE.



Figure 57: Decorative elements and arch treatments for openings.

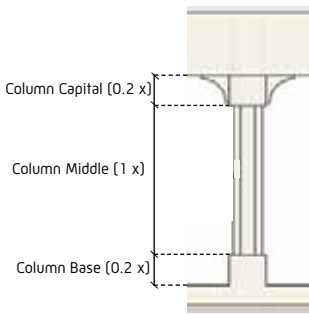


Figure 58: Column base-middle-capital height proportion. (x = column middle height.)



Figure 59: Rain spouts, Al Darmaki Mosque, Al Ain, UAE.

## 4.8 Musalla

Standards		Guidelines	
AS166	The location and orientation of the musalla SHALL be considered during the concept stage of the building design.	AG126	The musalla SHOULD be located conveniently in the podium or lower levels of a building.
AS167	The design of a musalla SHALL ensure that no shoe and shoe zones are maintained.		
AS168	The mihrab SHALL be clearly indicated.		
AS169	All standards required for a prayer hall SHALL apply to the musalla, with the exception of the proportions.		
AS170	Musalla ablution area design SHALL comply with the standards for ablution areas. (Refer to Sections 4.4.1 and 4.4.3.)		
AS171	Ablution areas SHALL be located adjacent to the prayer hall to allow direct access for worshippers.		
AS172	Shoe racks SHALL be located adjacent to the ablution area.	AG127	Seats SHOULD be provided adjacent to the shoe racks.





Figure 60: A musalla within an office block, Abu Dhabi City, Abu Dhabi, UAE.





لجنة تطوير المساجد  
mosque development committee

Stage 3  
**Building Services**

## 5.0 Building Services Overview

The Building Services sections provide the standards for the mechanical, electrical, plumbing, fire fighting, telecommunications and sound systems for the mosque. The design will ensure integration of the building services with the architecture and landscaping of the mosque.

### Methodology:

- i. Consider the built form parameters of the mosque based on the architectural design.
- ii. In accordance with the Regulation & Supervision Bureau (RSB) Water Supply Regulations, load assessments shall be undertaken for the water supply utilities and design service intakes.
- iii. In accordance with the Abu Dhabi Sewerage Services Company (ADSSC) design guidelines, load assessments shall be undertaken for the drainage utilities and design service.
- iv. In accordance with the RSB Electricity Wiring Regulations and The Electricity Supply Regulations, load assessments shall be undertaken for the electrical utilities and service intakes.
- v. Each building services discipline shall comply with the requirements of the following regulations:
  - **mechanical services:**
    - Abu Dhabi International Mechanical Code (AD IMC).
  - **plumbing services:**
    - Uniform Plumbing Code of Abu Dhabi Emirate (UPC-AD).
  - **drainage services:**
    - ADSSC design guidelines.
  - **electrical services:**
    - The Electricity Wiring Regulations and The Electricity Supply Regulations of the RSB.

- vi. Ensure compliance with the requirements of Appendix 1 - Estidama in relation to energy performance by using either the prescriptive method parameters or the performance methodology.
- vii. Ensure energy and water metering is integrated into the design of the mosque.
- viii. Ensure all documentation, including as built drawings, and Operations and Maintenance Manuals are provided for the future operation of the mosque (refer to Volume 3 - Operations).

### Outcome:

- i. An integrated and sustainable design for the building services of the mosque.

## 6.0 Fire Protection Systems

### 6.1 Fire Protection Systems Overview

The objectives for Fire Protection Systems are to:

- warn of a fire;
- evacuate people safely;
- contain the fire;
- mitigate and reduce losses; and
- extinguish the fire.

7

### 6.2 Fire Protection Systems – Types



The types of fire protection systems are:

- automatic sprinkler systems (covered in this section);
- alternative fire extinguishment systems, including portable fire extinguishers (covered in this section);
- automatic fire detection and alarm systems (refer to section 9.0 Electrical Systems);
- emergency lighting (refer to section 9.0 Electrical Systems); and
- fire hydrants and stand pipe systems (covered in this section).

### 6.3 Fire Protection Codes and Standards

Fire protection systems are one part of a Fire and Life Safety Strategy. The Strategy for a mosque should meet ADCD requirements. For larger or more complex projects, it may be necessary to appoint a specialist consultant.

### 6.4 Fire Protection Systems

Standards		Guidelines	
BS1	Automatic sprinkler systems SHALL be installed, where required, to meet ADCD requirements.	BG1	Where sprinkler coverage is required in tall spaces (high ceilings) or under domes, the sprinkler system designer SHOULD consider side wall sprinklers to meet ADCD requirements.
BS2	Access, circulation and parking facilities for ADCD SHALL be coordinated with the placement of sprinkler pump rooms and breaching inlets.		
BS3	The use of alternative fire extinguishing systems SHALL comply with ADCD requirements.		
BS4	 All gaseous agents used in alternative fire extinguishing systems SHALL have an Ozone Depletion Potential (ODP) of zero.	BG2	 All gaseous agents used in alternative fire extinguishing systems SHOULD have a Global Warming Potential (GWP) of 1 or less.
BS5	All fire protection systems SHALL be integrated with the architectural design.		
BS6	Commissioning of fire protection systems SHALL be carried out prior to building completion.		

## 7.0 Mechanical Services

### 7.1 Mechanical Services Overview








The objectives for mechanical services are to:

- provide conditioned air at a temperature and humidity to maintain design room conditions;
- meet the minimum ventilation requirements,
- minimise energy usage through the use of efficient HVAC equipment;
- select appropriate cooling and distribution systems based on the cooling load assessment; and
- facilitate safe access for maintenance and replacement of equipment.

### 7.2 Mechanical Codes and Standards

Mechanical provisions for the mosque shall comply with AD IMC requirements.

### 7.3 Mechanical Services

Standards		Guidelines	
7.3.1 Ventilation Systems			
BS7 	The minimum thresholds for ventilation rates SHALL be in accordance with Estidama requirements.		
BS8	Mechanical ventilation systems in the form of Air Handling Units (AHUs) SHALL supply conditioned and filtered air to maintain occupant comfort.	BG3	The mechanical ventilation system SHOULD maintain a positive pressure to prevent the ingress of heat, humidity and dust into the mosque.
BS9 	Where a mixed-mode mechanical ventilation system is utilised, the ventilation design SHALL consider the integration of all openings.	BG4	The mechanical ventilation system SHOULD be interlocked with any operable windows in order to shut down the AHU plant, when required.
BS10 	All air intakes, including doors and operable windows, SHALL be designed to ensure minimum separation distances from sources of pollution are met in accordance with Estidama requirements.		
BS11	All AHUs providing fresh air SHALL have sand-trap type air intake louvres.		
BS12 	All exhaust air discharges SHALL be located away from the public realm.		
BS13 	All mechanical ventilation systems SHALL be assessed by the designer in relation to achieving the minimum energy performance requirements for the mosque.	BG5 	All spaces within the mosque SHOULD be designed according to a thermal zoning strategy and have independent temperature control.
BS14 	Commissioning of all air/chilled water/automatic control/refrigeration systems and all associated controls SHALL be carried out prior to building completion, as per Estidama requirements.		

Standards		Guidelines	
BS15	The designer SHALL consider the accessibility of all mechanical ventilation system components in relation to maintenance and replacement requirements.	BG6	The designer SHOULD incorporate drum, jet or swirl diffusers in areas of the mosque that have high ceilings.
<b>7.3.2 Extraction Systems</b>			
BS16	Smoke extraction systems SHALL be designed as per ADCD requirements.		
BS17	Exhaust air from toilets and ablution areas SHALL NOT be re-circulated.		
BS18	Areas that are intended to contain hazardous chemicals such as janitorial rooms SHALL be provided with separate air extraction systems which discharge directly to atmosphere.		
<b>7.3.3 Cooling Systems</b>			
BS19	The cooling system design SHALL be based on a summer design condition of 46°C dry bulb temperature and 29°C wet bulb temperature.		
BS20	Externally located cooling plant(s) SHALL withstand a peak summer temperature of 50°C.		
BS21	Air cooled refrigeration systems SHALL be used where district cooling is not available. (Refer to Table 3.)	BG7	Where available, district cooling SHOULD be utilised as the primary method of cooling.
BS22	Mechanical plant SHALL be located in restricted spaces, with safe access for the maintenance of equipment.		
BS23	Mechanical plant(s) SHALL be suitably positioned to allow sufficient space to safely remove, replace, clean and maintain the equipment.		
BS24	All jame'e mosques SHALL incorporate partitioning between the daily and Friday prayer areas and each area SHALL be evaluated as part of a thermal zoning strategy.	BG8	The use of partitioning SHOULD enable the setback of any cooling systems located in unoccupied spaces.
BS25	All mechanical and refrigeration equipment SHALL contain refrigerants with zero ODP.	BG9	All mechanical refrigeration equipment SHOULD use refrigerants with a Global Warming Potential (GWP) of 10 or less.
BS26	The designer SHALL consider the accessibility of all cooling systems in relation to maintenance and replacement requirements.		



Standards	Guidelines
7.3.4 Plant Acoustics	
<p><b>BS27</b>  The mosque design SHALL ensure that any noise and/or vibration from mechanical systems does not disturb worshippers during prayers.</p>	<p><b>BG10</b>  The mechanical systems should be designed in accordance with the Estidama background noise requirements.</p>

Table 3: Cooling Options Summary

Mosque Type	Cooling System Type*		
	District Cooling	Direct Expansion/Variable Refrigerant Flow (VRF)	Air Cooled Liquid Chillers (ACLC)
Masjid	1st Option	2nd Option	3rd Option
Jame'e	1st Option	2nd Option	3rd Option
District Jame'e	1st Option	N/A	2nd Option
Notes	District cooling should be the first option for cooling available.	Where there is no district cooling, VRF and/or direct expansion, AHUs should be utilised if the cooling load is below 150 kW.	Where district cooling is not available, ACLC should be considered for cooling loads above 150 kW.

\*The cooling system selected in the above figure is dependent on cooling load.



## 8.0 Plumbing Systems

### 8.1 Plumbing Systems Overview

The objectives for plumbing systems are:








- meet the potable hot and cold water demand required to meet drinking, cleaning and irrigation requirements;
- reduce water consumption by using water-saving fixtures and recycling water for non-potable uses;
- provide means of drainage for sewage to meet the mosque requirements; and
- reduce water wastage by implementing metering and leak detection systems.

### 8.2 Plumbing Codes and Standards

All codes and standards, as listed below, are mandatory and shall be met within the design of the mosque:

- Uniform Plumbing Code of Abu Dhabi Emirate (UPC-AD);
- RSB Water Supply Regulations;
- RSB Water Quality Regulations; and
- ADSSC Regulations.

### 8.3 Plumbing Systems

Standards		Guidelines	
<b>8.3.1 Optimal Interior Water Consumption</b>			
BS28 	The rate of water consumption from all water fixtures, fittings and appliances SHALL NOT exceed the baseline flow rates, as per Estidama requirements.		
BS29 	Water metering SHALL be in accordance with Estidama requirements.	BG11 	All meters and sub-meters SHOULD be connected to a central monitoring system to monitor and record water consumption within the mosque.
BS30 	Commissioning of plumbing systems, including any chemical treatments and chlorination, SHALL be carried out prior to building completion.		
BS31 	A Legionella Management Plan SHALL be prepared in relation to all water systems.		
BS32 	Tap sensors SHALL be implemented within the toilet and ablution facilities to reduce water consumption.	BG12 	Water consuming appliances SHOULD meet or exceed Estidama requirements.

Standards	Guidelines
<b>8.3.2 Potable Water Storage</b>	
<b>BS33</b> The mosque SHALL be designed as per ADDC, AADC and RSB requirements for potable water storage.	<b>BG13</b> Condensed water from HVAC systems MAY be recycled and reused for irrigation. (See Figure 61.)
	<b>BG14</b> Where the fire and potable water storage tanks are not integrated, the fire water storage tank SHOULD be connected to an irrigation draw-off and condensation feed to mitigate stagnation issues.
<b>8.3.3 Hot Water Systems</b>	
<b>BS34</b> Hot water storage requirements SHALL be designed as per UPC-AD requirements.	<b>BG15</b> Solar hot water systems SHOULD be used wherever possible.
	<b>BG16</b> The installation of solar panels SHOULD consider the roof profile and not be seen from ground level. (See Figure 62.)
<b>8.3.4 Drainage Systems</b>	
<b>BS35</b> The wastewater drainage system SHALL be designed as per UPC-AD requirements.	<b>BG17</b> A 3-pipe drainage system SHOULD be used wherever possible. If it is not appropriate, a 2-pipe system MAY be used subject to authority approval.
	<b>BG18</b> Stormwater systems SHOULD be designed as per Estidama requirements.

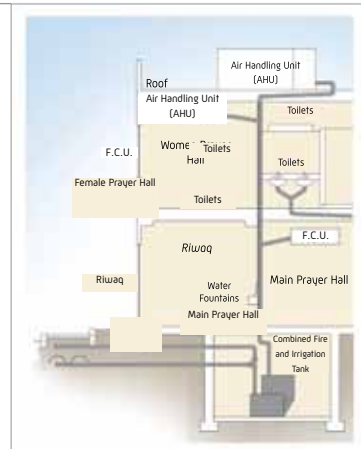


Figure 61: Illustration of a typical condensate recycling system within the mosque.

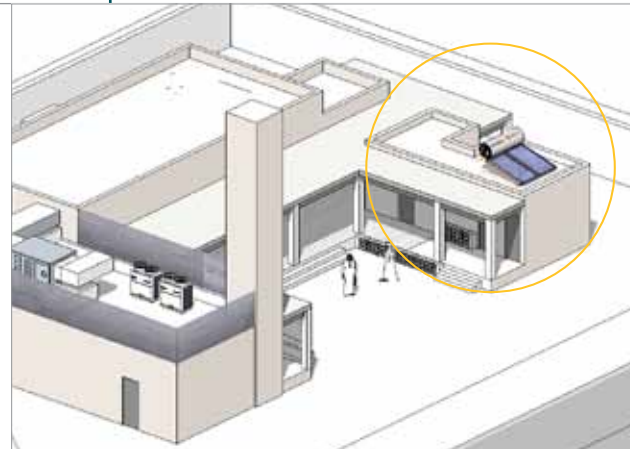


Figure 62: Illustration of possible locations for solar panels. While solar panels should be screened from mosque worshippers, the visual screens have been removed in this illustration to show the typical location.

## 9.0 Electrical Systems

### 9.1 Electrical Systems Overview

The objectives for electrical systems are:

- provide an adequate electrical supply to cater for all cooling, heating, lighting and general power requirements;
- locate an area for main incoming electrical services and plant that is free of obstructions, and is lockable yet accessible to authorised personnel;
- distribute electrical power throughout the mosque for building operation and general use;
- provide adequate functional and architectural lighting, with sufficient controls to minimise electrical wastage;
- ensure emergency systems are operable for fire and life safety situations, and emergency lighting is sufficient to enable evacuation; and
- ensure electrical systems can be maintained throughout the life cycle of the mosque.

### 9.2 Electrical, Fire and Lighting Codes and Standards

All codes and standards listed below are mandatory and shall be met within the design of the mosque.

#### Electrical

The following codes and standards are applicable:

- RSB - Electricity Wiring Regulations;
- ADDC/AADC Regulations; and
- ADWEA Standards.

#### Automatic Fire Detection and Alarm Systems

The design shall comply with ADCD requirements.

#### General Lighting

The following Lighting Codes and Standards are applicable:

- CIBSE/SLL (Society of Lighting), Technical Memoranda (TMs), Lighting Guides (LGs) and Code for Lighting; and
- Illuminating Engineering Society (IES), Lighting Handbook.










#### Emergency Lighting and Power Systems

The design shall comply with ADCD requirements.

## 9.3 Electrical Systems

Standards		Guidelines	
<b>9.3.1 Electrical Distribution Systems</b>			
BS36	All electrical systems SHALL meet the minimum energy performance requirements.		
BS37	All designs SHALL consider the local environmental conditions, including ambient temperature, humidity, air quality and soil resistivity (both electrical and thermal), when sizing cables and equipment.		
BS38	The electrical load requirements for mosques SHALL be assessed in accordance with ADDC/AADC requirements.		
BS39	Substation quantities and location SHALL be confirmed with ADDC/AADC as part of the approvals process.		
BS40	The design of the mosque SHALL incorporate electrical utility room(s), where the minimum size is as per ADDC/AADC requirements.		
BS41	Electrical distribution boards SHALL be located to optimally meet the electrical power requirements of the mosque.	BG19	The electrical distribution boards SHOULD be located within electrical closets and mechanical plant rooms that have restricted access.
BS42	Electrical sub-meters SHALL be provided for all major high power equipment items in order to monitor and record energy consumption.		
BS43	Commissioning of electrical systems SHALL be carried out prior to building completion.		
<b>9.3.2 Cable Management Systems</b>			
BS44	Power and data cables SHALL be adequately protected using cable containment systems, and SHALL NOT be fixed/clipped to the mosque building.	BG20	Cable trays, baskets or ladders SHOULD be utilised for the distribution of large sub-mains cables from the main switchboard to distribution boards.
BS45	Cable support systems, including recessed and surfaced mounted conduits, SHALL be made from rigid steel.	BG21	Cable trunking and conduits SHOULD be utilised for small power sub-circuits, supplying lighting and socket outlets.
		BG22	All cable trays, baskets, ladders and trunking systems SHOULD be routed through areas that are easily accessible for maintenance purposes.
		BS23	Conduits, trunking and cable trays for the electrical network SHOULD be designed and sized to allow for future capacity increases, system upgrades or alternative technologies.

Standards		Guidelines
<b>9.3.3 Standby Power Systems</b>		
BS46	Standby power SHALL be provided for all Fire and Life Safety Systems, as determined in the Fire and Life Safety Strategy where applicable.	
BS47	<p>If the mosque is used for Community and Emergency Support, the following building systems SHALL be <b>designed</b> with standby power and an Uninterruptible Power Supply (UPS) or alternative battery systems:</p> <ul style="list-style-type: none"> <li>• Emergency lighting systems;</li> <li>• Security systems;</li> <li>• Fire detection and fire fighting systems;</li> <li>• Public address systems; and</li> <li>• Telecommunication systems.</li> </ul>	
BS48	Where fuel is stored on-site, the bulk fuel tank(s) and fuel fill point(s) SHALL be integrated in the building design to minimise any interruption during the refilling of the tanks.	BG24 Fuel tanks SHOULD be located in ventilated tank chambers. These SHOULD have suitable fire ratings and bund walls to provide secondary containment in the event of a tank rupture, and must be accessible for filling and draining down.
<b>9.3.4 Earthing and Lightning Protection Systems</b>		
BS49	Earthing systems SHALL be <b>designed</b> as per RSB Electricity Wiring Regulations and ADDC/AADC requirements.	
BS50	Where lightning protection systems are to be installed, these SHALL follow the recommendations of BS EN 62305 (Series) 'Protection Against Lightning'.	BG25 The requirement for a lightning protection system SHOULD be based on the completion of a relevant risk analysis.
<b>9.3.5 Small Power Systems</b>		
BS51	<p>Small power provisions SHALL be made throughout the mosque based on the requirements of the building. This SHALL consist of:</p> <ul style="list-style-type: none"> <li>• socket outlets or receptacles;</li> <li>• fused connection units (spur units) for direct connection to low power equipment; and</li> <li>• isolators or switches for direct connection to high power equipment (above 13A).</li> </ul>	<p>BG26 The locations and mounting heights of all small power devices SHOULD be coordinated with the operational requirements of the devices, users and other building systems.</p> <p>BG27 All small power devices SHOULD be accessible for maintenance purposes.</p>
BS52	Coordinated design SHALL be provided for the electrical supply to secondary equipment for building systems, e.g. Heating, Ventilation, and Air Conditioning (HVAC), pumps, water heaters and Public Address (PA) systems.	BG28 Small power devices SHOULD incorporate Ingress Protection (IP) ratings to suit the location, mounting height and environmental conditions.

Standards		Guidelines	
<b>9.3.6 Lighting and Lighting Controls</b>			
BS53 	Lighting designs SHALL be in accordance with the maximum lighting power densities outlined in the ASHRAE 90.1-2007 Standards.	BG29 	High frequency electronic control gear SHOULD be utilised for all fluorescent lamps.
BS54 	Lighting designs SHALL employ energy efficient lamp types, e.g. fluorescent and LED.	BG30 	Incandescent lamps SHOULD be avoided.
		BG31	Lighting designs SHOULD ensure that light pollution is avoided.
BS55 	Commissioning of lighting and lighting control systems SHALL be carried out prior to building completion.	BG32 	The following automated lighting controls and occupancy sensors SHOULD be considered in the lighting design: <ul style="list-style-type: none"> <li>• movement sensors, which enable lights to be switched off or dimmed when the space is empty;</li> <li>• automatic timed operation of the internal and external lighting scheme; and</li> <li>• daylight sensors with automatic switching, or dimming of individual lighting zones for when sufficient natural lighting is available.</li> </ul>
			BG33 
BS56 	Where these sensors are provided, manual control of the lighting SHALL be incorporated.	BG34 	Occupancy Passive Infrared (PIR) sensors SHOULD be considered for all areas.

Standards	Guidelines
<b>9.3.7 Emergency Lighting Systems</b>	
<p>BS57      Emergency lighting SHALL be provided, as per-ADCD requirements</p>	<p>The lighting design SHOULD include emergency lighting to:</p> <ul style="list-style-type: none"> <li>• illuminate escape routes and any intersections and changes in direction;</li> <li>• provide indication of all escape routes;</li> <li>• Identify the exit doors of the mosque;</li> <li>• illuminate fire alarm devices and fire fighting provisions; and</li> <li>• highlight changes in floor level or stairways.</li> </ul> <p>BG35</p>
<b>9.3.8 Automatic Fire Detection and Alarm Systems</b>	
<p>BS58      The automatic fire detection and alarm system SHALL be designed as per ADCD requirements.</p>	<p>The automatic fire detection and alarm system SHOULD control, monitor and/or interface with the following systems:</p> <ul style="list-style-type: none"> <li>• sprinkler flow switches;</li> <li>• smoke curtains;</li> <li>• smoke vents;</li> <li>• fire/smoke dampers;</li> <li>• intake/make up air vents;</li> <li>• smoke extract fans;</li> <li>• ventilation plant;</li> <li>• lifts;</li> <li>• BMS;</li> <li>• sound system; and</li> <li>• fire doors.</li> </ul> <p>BG36</p> <p>BG37      An external monitoring dial-up facility SHOULD be provided for the fire alarm system to enable monitoring by an external station and/or ADCD.</p>

# 10.0 Telecommunication Systems

## 10.1 Telecommunication Systems Overview

The objectives for telecommunications (telecoms) systems are to:

- select an appropriate Telecoms System that is compliant with the relevant authority requirements;
- provide an area for incoming telecoms services and plant location, with consideration for maintenance and accessibility;
- ensure connectivity between the telecoms system and Sound System.

## 10.2 Telecommunications Codes and Standards

The relevant codes and standards listed below shall be adhered to for the telecoms design of the mosque:

- Etisalat/Du Design Guide; and
- UTT Telecommunication Design Guidelines.

## 10.3 Telecommunications Systems

Standards		Guidelines	
BS59	The incoming connection to the mosque and location for any telecommunication rack/equipment SHALL be in accordance with the regulations and requirements of the service provider (Etisalat/UTT/Du).	BG38	The Telecoms System design of the mosque SHOULD incorporate dedicated rack space in an Extra Low Voltage/Low Voltage room and locate it in an accessible position to allow access by the service provider.
BS60	The incoming telecoms connection for the Imam's and Mu'athen's residences SHALL have a wall-mounted rack space for incoming fibre connections and router placement, as per service provider guidelines.	BG39	The incoming telecoms connection for the Imam's and Mu'athen's residences SHOULD follow the service provider requirements for residential buildings.
BS61	The mosque telecoms design SHALL accommodate an adequate distribution of data outlets, with a spare capacity of 20% for future demands.	BG40	The distribution of data outlets SHOULD be in accordance with Etisalat/UTT/Du requirements and associated standards.
BS62	Horizontal SFTP cable runs to the incoming locations of services SHALL NOT exceed 90 m.	BG41	The mosque design SHOULD locate the Main Distribution Frame (MDF) to allow a 90 m LAN cable length, with sufficient rack space to accommodate a VPN firewall and LAN switch device.
BS63	Commissioning of telecommunication systems SHALL be carried out prior to building completion.		
BS64	Mosques SHALL have secure VPN data connectivity.		



Standards		Guidelines
BS65	The design of the telecoms system SHALL allow remote access connectivity for real time data monitoring.	
BS66	The design of the mosque SHALL incorporate an adequate back-up power supply for the telecoms system equipment.	
BS67	The mosque SHALL have a satellite dish and receiver (with redundant device availability), in accordance with Awqaf, to receive the radio channel broadcast from a central location, and have controlled and secured access.	BG42 At a secure location within the mosque, for example within the Imam's residence or other emergency system interface such as adjacent to the fire alarm panel, an emergency communications system SHOULD be connected via a direct link to the appropriate emergency services as referred to in the emergency services authorities standards.
BS68	The district jame'e design SHALL include an emergency communication system to facilitate emergency support. (Refer to Section 3.2.5.)	
BS69	All MEP conduits, trunking and cable trays SHALL be designed and sized to allow for future capacity increases, system upgrades or alternative technologies for the Telecoms System.	

Table 6: Telecommunications Systems Summary Table

Mosque Type	Telecommunication Type	
	Direct Line to Police and Civil Defence	Dedicated Main Telecommunication Room (Etisalat, Du and/or UTT)
Masjid	Required	Not required
Jame'e	Required	Required
District Jame'e	Required	Required

# 11.0 Sound Systems

## 11.1 Sound Systems Overview

The key factor in delivering any form of speech (khutba)/call to prayer is the clarity of sound. Speech should be audible and with a high degree of sound quality within all areas of the mosque.

The objectives for the Sound System are:

- develop a building-specific sound system design;
- integrate the Sound System into the building design;
- optimise the sound and sound equipment through acoustic modelling;
- ensure the Sound System equipment is appropriate to the operating environment; and
- enable the use of the Sound System for community support.

## 11.2 Sound System Codes and Standards

### Electrical and Life Safety

The standards listed below are based on electrical codes:

- [ADCDC requirements](#); and
- [RSB Electricity Wiring Regulations](#)

### Sound/Audio Systems

The standards listed below are based on sound/audio system standards:

- IEC 60065 - Audio, video and similar electronic apparatus;
- IEC 60268 - Sound systems equipment; and
- IEC 60574 - Audio-visual, video and television equipment and systems.

## 11.3 Sound Systems

Standards		Guidelines	
BS70	The location of loudspeakers SHALL be designed to provide optimum sound quality with consideration of the architecture.	BG43	The sound system SHOULD provide sonority for the main prayer hall, female prayer hall and minaret. The System SHOULD be free from echo, hissing and other sound disturbances.
BS71	The components of the sound system SHALL be sized appropriately to the mosque size, while still achieving the objectives for the System.	BG44	The sound system SHOULD be adequately zoned to facilitate flexibility for the operational needs of the mosque.
BS72	The sound system SHALL include sufficient booster amplifiers for the calculated connected load at rated power with a minimum 15% spare capacity built into the system.	BG45	The sound system SHOULD have an acoustic feedback suppressor, based on digital signal processing. The Sound System SHOULD include filters to cancel sound from speakers that could provide feedback.
		BG46	The sound system SHOULD include a digital signal processor ADC/DAC, RS 232 data interface and 19" rack mounted.
		BG47	The amplifiers SHOULD be a 19" rack mounting type and the booster amplifier power be 120 W, 240 W and 480 W, with constant voltage outputs typically being 70 V and 100 V.
BS73	The commissioning of sound systems SHALL be carried out prior to building completion.		

Standards		Guidelines	
BS74	2 separate sound systems SHALL be designed for the main prayer hall and female prayer hall.		
BS75	Sound systems SHALL have the flexibility to ensure they can be combined or act individually, as required.		
BS76	The sound system SHALL be used in the event of a fire to enable the following: <ul style="list-style-type: none"> <li>shutdown of normal communications upon receipt of a fire alarm signal;</li> <li>allow the fire alarm sound signal (voice or tone dependent upon fire alarm design and ADCD requirements) to override the audio messages; and</li> <li>ensure the emergency alarm signals are clearly received.</li> </ul>		
BS77	The sound system SHALL have an audio mixer to facilitate adjustment of the sound quality to suit the building and its materials.	BG48	The sound system SHOULD have a muting function for group control, to allow the muting of set channels and switch between bands.
BS78	The sound system SHALL have a multi-channel diversity receiver.	BG49	The multi-channel diversity receiver SHOULD include pre-programmed frequency channels. The volume control SHOULD be a 19" rack mounting type with balanced output terminals and microphone or line level outputs.
BS79	The sound system SHALL use Digital Signal Processing (DSP) speakers, line array speakers and outdoor cabinet speakers. (See Figure 76.)	BG50	The loudspeaker array SHOULD have input selection or mixing capabilities.
BS80	The indoor loudspeaker array SHALL have the following capabilities: <ul style="list-style-type: none"> <li>audio delay with parametric equalisation per input/output;</li> <li>automatic volume control; and</li> <li>built-in ambient noise sensing microphone(s).</li> </ul>	BG51	The sound system SHOULD use a vari-directional loudspeaker array and include wall-mounted swivel brackets with the ability to rotate horizontally by more than 90° on either side.
		BG52	The main prayer hall SHOULD be equipped with line array speakers to offer a high level of audio directivity with highly suppressed side lobes and provide adequate and uniform sound distribution throughout the targeted spaces.
		BG53	The loudspeakers SHOULD comply with IEC/EN 60065 or equivalent and ADCD requirements for voice evacuation.
		BG54	Outdoor loudspeaker mountings SHOULD allow the loudspeakers to be turned in all directions to allow sound to be easily directed.
		BG55	The outdoor sound system equipment cabinet SHOULD be a robust enclosure and resistant to the outdoor environment.
BS81	The sound system SHALL have external loudspeakers.	BG56	The external loud speaker SHOULD be of a minimum power capability of 50W and connected to a separate booster amplifier with an IP65 rating for water and dust protection. The booster amplifier SHOULD be able to mount different driver units for different power levels. (See Figure 77.)
		BG57	The external loudspeaker SHOULD be able to operate within a temperature range of 0°C to 55°C.

Standards		Guidelines	
BS82	The sound system SHALL have wired and wireless microphones, amplifiers and accessories.	BG58	The microphone SHOULD be mounted on a floor-standing adjustable stand with an adjustable boom.
		BG59	The hand-held microphone SHOULD be a cardioid condenser microphone.
		BG60	The multi-channel tile clip wireless microphone transmission/receiving system SHOULD be based on PLL synthesised and true diversity technology, be operational in the UHF band of 710 to 865 MHz and free from any noise or interference.
BS83	All MEP conduits, trunking and cable trays for the sound system SHALL be designed to allow for future capacity increases, system upgrades or alternative technologies.		



Figure 63: Example of an internal speaker.



Figure 64: Example of an external speaker.







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## Stage 4 Landscape

## 12.0 Landscape Design

The Landscape Standards ensure that landscape design is appropriate to the specific environmental conditions of the context, and the mosque function and its architectural design. The standards are applicable to all open spaces within the mosque plot (excluding the sahan), in addition to the parking areas.

### Methodology:

- i. Establish a spatial layout of landscape elements on the mosque plot.
- ii. Create a softscape and hardscape design strategy that is responsive to local climatic conditions with an emphasis on reducing water demand.
- iii. Integrate street furniture, outdoor lighting and signage, which complements the mosque's architectural design.
- iv. Meet all minimum standards, as per the requirements of the relevant authorities.

### Outcome:

A landscape design that:

- i. responds to the mosque and its context.
- ii. Complies with Estidama and PRDM requirements.
- iii. Meets or exceeds the requirements provided in the PRDM.

### 12.1 Spatial Arrangement

Standards		Guidelines	
<b>12.1.1 Spatial Layout</b>			
LS1	The scale and arrangement of open spaces across the mosque plot SHALL be appropriate to their function and context, and provide linkages to the surrounding public realm.	LG1	The landscape spatial layout SHOULD include (see Figure 78): <ul style="list-style-type: none"> <li>• primary and secondary access areas;</li> <li>• transition areas; and</li> <li>• open spaces.</li> </ul>
LS2	The design of open spaces across the mosque plot SHALL include shaded areas to comply with Estidama requirements.	LG2	Shading SHOULD be strategically placed along circulation routes and seating areas.
LS3	The design of open spaces across the mosque plot SHALL incorporate areas of softscape.	LG3	The landscape design SHOULD provide 40% softscape within the open space across the mosque plot.
LS4	The softscape extent, selection, layout and design SHALL be in accordance with Estidama and PRDM requirements.		
LS5	The design SHALL use well-defined edge treatments to indicate the transition between softscape and hardscape.		



Standards		Guidelines
LS6	<p>The use of bollards and pedestrian guardrails SHALL be minimised by:</p> <ul style="list-style-type: none"> <li>designing spaces which are open and safe to use;</li> <li>creating open spaces and thresholds with no 'trip hazards';</li> <li>the placing of site furnishings around the edge, or grouped together to create islands of relief (see Figure 79); and</li> <li>guiding worshippers through the site by prescribing preferred routeways which are integrated into the landscape design.</li> </ul>	
LS7	<p>External mechanical equipment, chambers and inspection covers SHALL be seamlessly integrated in the landscape design.</p>	<p>LG4 External mechanical equipment, chambers and inspection covers SHOULD be screened using planting and/or sculpted landforms.</p>

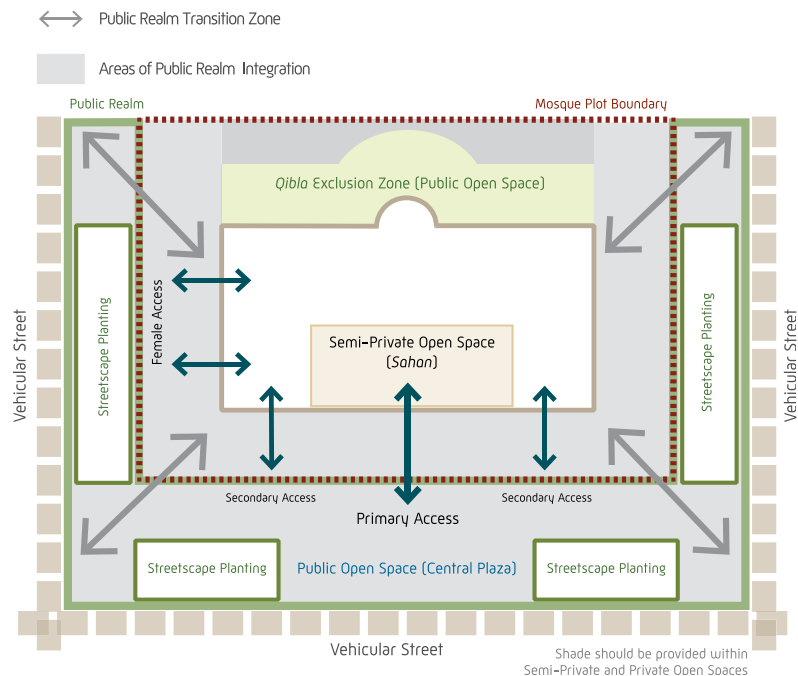


Figure 65: Landscape zoning diagram with linkage to public realm.



Figure 66: Site furnishing around an urban jame'ah in Abu Dhabi City, UAE.

Standards		Guidelines	
<b>12.1.2 Water features</b>			
LS8	Drinking fountains SHALL be provided in open spaces across the mosque plot.	LG5	Drinking fountains SHOULD be placed adjacent to circulation routes and seating areas.
<b>12.1.3 Parking Areas</b>			
LS9	Landscape design SHALL minimise the visual impact of parking area(s). (See Figure 67.)	LG6	Parking areas SHOULD consist of a combination of shading devices, hardscape and softscape, as per PRDM requirements.
LS10	Designated walkways SHALL be provided from the parking area(s) to the mosque.	LG7	Walkways between the parking area(s) and the mosque SHOULD be shaded.
LS11	Permeable paving SHALL be used in parking area(s).	LG8	Drainage of car parking area(s) into planting zones SHOULD NOT be permitted, unless the softscape design is programmed to accommodate it.

## 12.2 Irrigation Standards


Standards		Guidelines	
LS12 	Irrigation design SHALL conform to Estidama requirements.	LG9	The arrangement and distribution of softscape throughout the development SHOULD be grouped so as to reduce the water demand for irrigation.
		LG10	The irrigation design SHOULD reduce water demand, as per PRDM requirements.
LS13	The 'Mosque Specific Plant List' SHALL be used to determine 'hydrozones' related to the water demand requirements of individual plant species. (Refer to Attachment B.)	LG11	Softscape design SHOULD use plants with either a low or medium-low irrigation demand,, as per PRDM requirements.
LS14	The irrigation infrastructure SHALL be designed to accommodate peak flows in order to respond to the seasonal variation in water demand.	LG12	The irrigation infrastructure SHOULD supply appropriate flow rates for each plant species.
		LG13	All trees and turf areas SHOULD be designed with separate irrigation valves.



Figure 67: Landscape relief and shading in parking areas.

### 12.3 Softscape Design

Standards		Guidelines	
LS15	The Mosque Specific Plant List SHALL be used in the selection of the planting palette for the mosque landscape design. (Refer to Attachment B.)	LG14	The variety of species included in the planting palette SHOULD be minimised to convey clarity in the softscape design.
		LG15	The selected species SHOULD be planted at natural densities to allow for a self-maintaining landscape.
		LG16	The softscape SHOULD be used to help differentiate areas of open space and enhance views, which accentuate the unique character of the mosque.
		LG17	The proposed planting schedule SHOULD include strategically placed specimen plants to provide a variety of colour, texture and form.
LS16	Perennial bedding plants SHALL be used and timed to flower during significant occasions in the Islamic calendar. (Refer to Attachment B.)		
LS17	Annual bedding plants SHALL NOT be used in permanent planting beds. (Refer to Attachment B.)	LG18	Annual bedding plants MAY be used in temporary planters and timed to flower during significant occasions in the Islamic calendar. (Refer to Attachment B.)
		LG19	In Highly Urban and Urban settlement contexts, plant materials MAY be used to buffer the visual impact of the surroundings.
LS18	All trees and palms SHALL have a height clearance of 2 m between the ground level and the bottom of the canopy. (See Figure 69.)	LG20	Trees, palms and shrubs SHOULD be used to define pathways and the mosque plot boundary. (See Figure 68.)
		LG21	Trees and palms SHOULD NOT be planted within areas of turf grass or any other area where water stagnates around the base of the trunk.
LS19	All other planting, such as shrubs, hedges, groundcover and grasses, SHALL be below 1.2 m. (See Figure 69.)		



Figure 68: Softscape elements are used to define pathways and the mosque plot boundary.

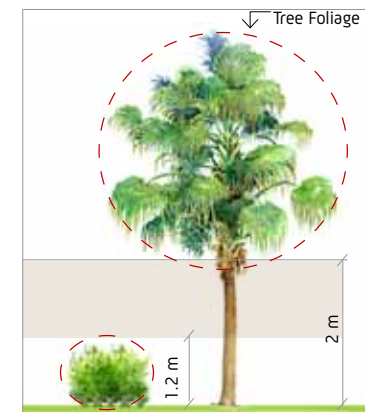




Figure 69: Planting height restriction.

## 12.4 Hardscape Design

Standards		Guidelines	
LS20	The hardscape design SHALL ensure all materials complement the mosque architecture and surrounding context.	LG22	The hardscape design SHOULD utilise permeable unit paving materials that match the scale and context of the mosque.
LS21	The hardscape design SHALL alternate materials, textures and colour to indicate space transition.	LG23	Hardscape design SHOULD use a consistent palette of materials which reflects the scale and context of the mosque. (See Figure 70.)
LS22	All finishes SHALL be slip-resistant, as per PRDM requirements.	LG24	Honed, brushed, sandblasted and polished finishes SHOULD be specified for all concrete and natural stone materials.
LS23	 Low impact and durable hardscape materials SHALL be specified.	LG25	Replacement hardscape materials SHOULD be readily available.
LS24	 All hardscape materials SHALL be easily cleaned, maintained and replaced.		
LS25	Longitudinal and cross falls SHALL be integrated within all hardscape areas to aid drainage and achieve level changes.	LG26	Longitudinal falls of 5% and above SHOULD be considered as ramps for the level change.
		LG27	Cross falls SHOULD be between 1% and 3% to aid drainage and must be appropriate to the selected material and finish.
		LG28	Areas of hard paving MAY be drained into areas of planting, provided that: <ul style="list-style-type: none"> <li>the adjacent landscape is designed to accommodate drainage discharge; and</li> <li>the paved surface is no more than 2 m in width.</li> </ul>
LS26	All planted areas SHALL include a top dressing of mulch material to a minimum depth of 0.075 m.	LG29	Mulch products MAY include bark chippings, crushed stone or tumbled glass.



Precast concrete paver: honed finish



Limestone: natural finish



Limestone: honed finish



Sandstone: brushed finish



Slate: honed finish



Limestone: honed finish



Sandstone: polished finish



Sandstone: brushed finish

Figure 70: Hardscape materials palette for mosques.

## 12.5 Site Furnishing

Standards		Guidelines	
LS27	The mosque landscape strategy SHALL use coordinated furniture designs that are appropriate to the mosque architecture and its context, and can withstand climatic conditions and heavy use.	LG30	Landscape design SHOULD provide a variety of seating options arranged in clusters.
		LG31	Furnishing elements SHOULD be light coloured and non-reflective.
		LG32	Site furnishing elements, such as seating and planters, MAY be integrated into the architectural elements of the mosque. (See Figures 72-73.)
		LG33	Fixed site furnishings SHOULD be mounted into below-ground concrete foundations.
LS28	External seating areas SHALL be provided.	LG34	A hard paved area of 1.2 m x 1.2 m SHOULD be provided at the end of each row of seating to accommodate a wheelchair or pushchair.
		LG35	Portable seating MAY be considered to encourage flexibility in the use of the internal courtyard spaces.
LS29	Site furnishings SHALL NOT be located within the pedestrian through zone.		
LS30	All furnishing elements SHALL be easily cleaned, maintained and replaced.		
LS31	Shading devices SHALL be provided along main pedestrian thoroughfares and seating nodes, as per PRDM requirements. (See Figure 71.)	LG36	Tree cover, shade structures or architectural elements SHOULD be used to provide shade.
LS32	Trees and plants SHALL use containers or planters where soil conditions, and underground infrastructure, do not allow below grade planting.	LG37	The use of High Density Polymers (HDP) and/or Wood-Plastic Composite (WPC) for site furnishings SHOULD be considered.
LS33	The design of all entrances and seating areas SHALL include refuse and recycling containers.		



Figure 71: Integrated site furnishing, including seating, planters and shading.



Figure 72: Examples of mosque site furnishings.

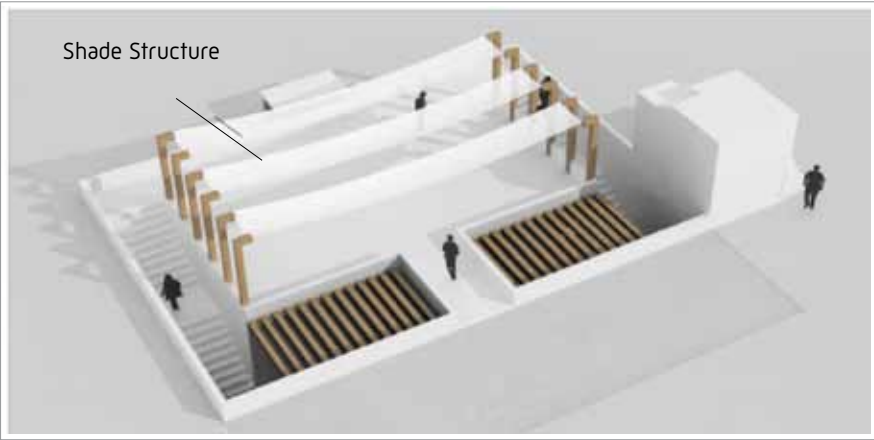
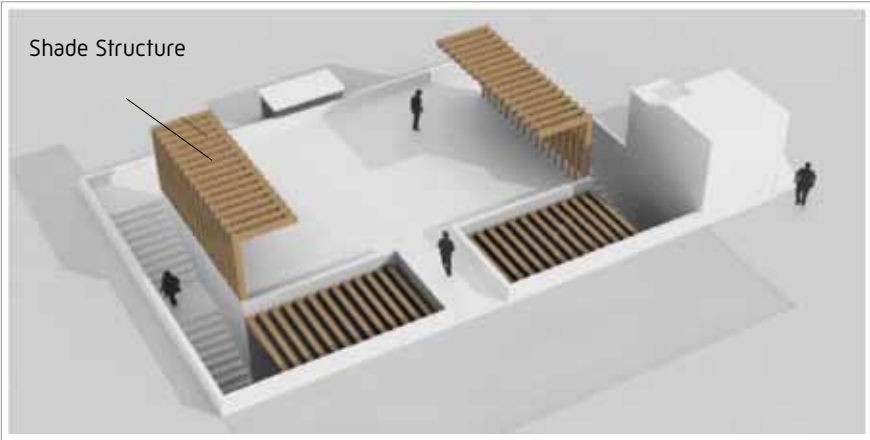


Figure 73: Examples of shading options.

## 12.6 External Lighting

Standards		Guidelines	
LS34	All external pedestrian areas SHALL be lit to ensure safe night-time use. (Refer to Section 4.6.4.)		
LS35	External lighting SHALL NOT cause nuisance or glare to neighbouring plots or street users.		
LS36	The lighting strategy SHALL use low-level or pedestrian lighting, such as in-ground lights, and step and wall lights. (See Figure 74.)	LG38	The lighting strategy SHOULD provide appropriate lighting along parking areas and the plot boundary.
		LG39	External lighting design SHOULD NOT use lit bollards or other freestanding lighting facilities.
LS37	The lighting strategy SHALL prioritise solar powered and LED pedestrian lighting.	LG40	Up-lighting MAY be used for specimen trees, palms and shrubs.
LS38	The lighting strategy SHALL clearly illuminate treads, risers and other level differences along primary and secondary walkways. (See Figure 74.)		
LS39	Feature lighting, such as reflected or diffused lighting, SHALL be used to highlight significant architectural elements. (See Figure 74.)		



Figure 74: Integrated mosque lighting options.



## 12.7 Outdoor Signage

Standards		Guidelines	
LS40	Outdoor signage SHALL be provided across the mosque plot for wayfinding, mosque information and universal access.	LG41	The material, colour and character of the signage SHOULD complement the mosque architecture and ensure a unified visual language. (See Figure 75.)
LS41	Signage SHALL be prominently located and easily visible by worshippers, without causing obstruction.	LG42	Outdoor signage SHOULD be placed to reinforce mosque entrances and entry nodes.
LS42	Outdoor signage SHALL NOT be placed in locations that interfere with pedestrian through zones or sight lines.		
LS43	Outdoor signage SHALL integrate the use of lighting in areas of high night-time use.		



Figure 75: Example of wayfinding signage.





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## Attachment A: Estidama Compliance Checklist

## Attachment A: Estidama Compliance Checklist

Section Number	Standards/ Guidelines Number	Volume 2 Page No.	Standards and Guidelines	Estidama PBRs Credit	Appendix 1 - Estidama - Section Reference	Appendix 3 Page No.
<b>Architecture</b>						
2.3	Functional and Spatial Standards	16	Bicycle parking	LBo-7	3.3 Accessibility and Provision of Community Facilities	18
3.2.2	AS4	21	Safe and independent access SHALL be provided for female worshippers.	LBi-10	3.4 Safe, Secure and Healthy Environments	19
3.2.3	AS9	21	The spatial layout SHALL minimise areas of concealment or entrapment to foster natural surveillance.	LBi-10	3.4 Safe, Secure and Healthy Environments	19
3.2.3	AS14	23	The multi-purpose hall of a district jame'e SHALL be located to maximise efficiency of access to surrounding community facilities.	LBo-R2 LBo-3	2.0 Site Context	10
					2.1 Natural and Urban Systems Assessment	11
					3.0 Design of Outdoor Spaces	15
					3.3 Accessibility and Provision of Community Facilities	18
3.2.3	AS16	23	Wind direction SHALL be considered when locating toilets, in order to prevent the spread of odours to the prayer areas.	LBi-R1	4.1 Ventilation Strategy	28
3.2.4	AS20	23	Existing trees and groundcover of preservation value SHALL be integrated into the overall spatial layout.	NS-R1 NS-R2	2.0 Site Context	10
					2.1 Natural and Urban Systems Assessment	11
					2.2 Natural Systems Protection	13
3.2.4	AG19	23	Existing topography, groundcover and vegetation MAY be integrated into the mosque design.	NS-R1 NS-R2	2.0 Site Context	10
					2.1 Natural and Urban Systems Assessment	11
					2.2 Natural Systems Protection	13
3.2.5	AS21	23	A district jame'e designated for Community and Emergency Support SHALL make provisions based on the requirements of the local emergency planning authority.	LBi-10	3.4 Safe, Secure and Healthy Environments	19
3.2.6	AS23	23	Exits from the mosque SHALL be sized appropriately, as per ADCD requirements.	LBi-10	3.4 Safe, Secure and Healthy Environments	19

Section Number	Standards/Guidelines Number	Volume 2 Page No.	Standards and Guidelines	Estidama PBRS Credit	Appendix 1 - Estidama - Section Reference	Appendix 3 Page No.
3.2.6	AS24	23	A fire assembly point for the total worshipper population of the mosque SHALL be provided, as per ADCD requirements.	LBi-10	3.4 Safe, Secure and Healthy Environments	19
3.3.2	AG29	25	Where noise or environmental mitigation measures are required, the threshold design of the plot boundary SHOULD consider the provision of the following: <ul style="list-style-type: none"> <li>sculpted landforms; and/or</li> <li>dense landscape planting.</li> </ul>	LBi-9	8.2 Acoustic Verification	65
3.2.7	AS28	24	Bicycle parking stands SHALL be located within a 30 m walking distance of the mosque entrance.	LBo-7	3.3 Accessibility and Provision of Community Facilities	18
4.1.1	AS40	29	Massing components SHALL be clustered to create shadeways and courtyards.	LBo-R3 LBo-1	3.0 Design of Outdoor Spaces	15
					3.2 Outdoor Thermal Comfort	17
4.1.3	AS53	31	The air leakage of the mosque envelope SHALL be in accordance with Estidama requirements.	RE-R1	6.0 Design of Building Systems	46
					6.1 Energy Systems	47
4.1.3	AS49	31	Voids, including recessed panels and mashrabiya panels SHALL NOT exceed 30% of the total façade.	RE-R1	6.0 Design of Building Systems	46
					6.1 Energy Systems	47
4.1.3	AS54	31	The average thermal transmittance (U Value) and Solar Heat Gain Co-efficient (SHGC) of the mosque envelope SHALL be in accordance with Estidama requirements.	RE-R1	6.0 Design of Building Systems	46
					6.1 Energy Systems	47
4.1.4	AS60	32	The Solar Reflective Index (SRI) level, in relation to the roof, SHALL be in accordance with Estidama requirements.	LBo-R3 LBo-1	3.0 Design of Outdoor Spaces	15
					3.2 Outdoor Thermal Comfort	17
4.2.1	AS61	34	Methods of passive thermal comfort SHALL be integrated into the mosque design.	RE-R1	6.0 Design of Building Systems	46
					6.1 Energy Systems	47

Section Number	Standards/ Guidelines Number	Volume 2 Page No.	Standards and Guidelines	Estidama PBRs Credit	Appendix 1 - Estidama - Section Reference	Appendix 3 Page No.
4.2.1	AG51	34	Mixed-mode ventilation SHOULD be integrated in the mosque design and be in accordance with Estidama requirements.	LBI-R1 RE-R1	4.0 Design of Indoor Spaces	27
					4.1 Ventilation Strategy	28
					6.0 Design of Building Systems	46
					6.1 Energy Systems	47
4.2.1	AS62	34	A shading strategy SHALL create a transition for worshippers between the indoor and outdoor functional areas of the mosque.	LBo-R3 LBo-1	3.0 Design of Outdoor Spaces	15
					3.2 Outdoor Thermal Comfort	17
4.3.1	AS69	35	Daily and Friday prayer halls SHALL be physically separated to enable the isolation of lighting and cooling systems, resulting in the reduction of energy consumption.	LBI-5.1	4.0 Design of Indoor Spaces	27
					4.2 Thermal Zoning	30
4.3.1	AG59	35	The floor finishing in prayer halls SHOULD be constructed from modular carpeting systems and have low Volatile Organic Compound (VOCs) emissions.		5.1 Modular Flooring Systems	33
4.3.1	AG66	37	Pendant lights and chandeliers SHOULD NOT incorporate incandescent lamps.	LBI-6	6.4 Lighting Fixtures	50
4.3.5	AG76	39	Shading SHOULD be provided for when the sahan is used for prayer.	LBo-1	3.2 Outdoor Thermal Comfort	17
4.4.1	AS104	41	Faucets for ablutions SHALL: <ul style="list-style-type: none"> <li>• be durable;</li> <li>• be water efficient;</li> <li>• use aerators; and</li> <li>• have metering controls or infrared sensors.</li> </ul>	PW-R1	6.0 Design of Building Systems	46
					6.6 Water Fixtures and Appliances	52
4.4.1	AS107	41	Water efficient showerheads SHALL be installed within all shower cubicles.	PW-R1	6.0 Design of Building Systems	46
					6.6 Water Fixtures and Appliances	52
4.4.2	AS114	43	All toilets SHALL be water efficient and all flush tanks SHALL be concealed.	PW-R1	6.0 Design of Building Systems	46
					6.6 Water Fixtures and Appliances	52

Section Number	Standards/ Guidelines Number	Volume 2 Page No.	Standards and Guidelines	Estidama PBRS Credit	Appendix 1 - Estidama - Section Reference	Appendix 3 Page No.
4.4.2	AS117	43	Washbasins SHALL be provided with integrated soap dispensers and faucets that have metering controls or infrared sensors.	PW-R1 PW-1	6.0 Design of Building Systems	46
					6.6 Water Fixtures and Appliances	52
4.6.3	AG108	47	Each mosque SHOULD incorporate a digital feedback system and display to communicate mosque energy and water consumption to worshippers.	IDP-6	9.1 Sustainable Communication	68
4.6.4	AS156	47	The lighting strategy SHALL specify energy saving, low maintenance and readily available fixtures.	RE-R1	6.0 Design of Building Systems	46
					6.1 Energy Systems	47
4.7.1	AG112	48	Traditional and locally sourced building materials, such as compressed earth blocks and those derived from date palm trees, MAY be considered, provided they are in accordance with ADIBC requirements for performance of alternative materials.	SM-9	5.3 Regional Materials	35
4.7.1	AG113	48	Materials and finishes selected for use in the mosque design SHOULD be in accordance with Estidama requirements.	LBi-2.1	5.1 Modular Flooring Systems 5.3 Regional Materials 5.4 Recycled Materials 5.5 Reused or Certified Timber 5.6 Hazardous Materials 5.7 Low Emissions	33 35 36 42 43 44 45
				LBi-2.2		
				LBi-2.3		
				LBi-2.4		
				LBi-2.5		
				SM-R1		
				SM-5		
				SM-9		
				SM-10		
SM-12						
<b>Building Systems</b>						
6.4	BS4	56	All gaseous agents used in alternative fire extinguishing systems SHALL have an Ozone Depletion Potential (ODP) of zero.	RE-R3	6.5 Refrigerants and Fire Suppression	51

Section Number	Standards/ Guidelines Number	Volume 2 Page No.	Standards and Guidelines	Estidama PBRs Credit	Appendix 1 - Estidama - Section Reference	Appendix 3 Page No.
6.4	BG2	56	All gaseous agents used in alternative fire extinguishing systems SHOULD have a Global Warming Potential (GWP) of 1 or less.	RE-7	6.5 Refrigerants and Fire Suppression	51
7.3.1	BS7	57	The minimum thresholds for ventilation rates SHALL be in accordance with Estidama requirements.	LBI-R1	4.0 Design of Indoor Spaces	27
					4.1 Ventilation Strategy	28
7.3.1	BS10	57	All air intakes, including doors and operable windows, SHALL be designed to ensure minimum separation distances from sources of pollution are met in accordance with Estidama requirements.	LBI-R1	4.0 Design of Indoor Spaces	27
					4.1 Ventilation Strategy	28
7.3.1	BS12	57	All exhaust air discharges SHALL be located away from the public realm.	LBI-R1	4.0 Design of Indoor Spaces	27
					4.1 Ventilation Strategy	28
7.3.1	BS13	57	All mechanical systems SHALL be assessed by the designer in relation to achieving the minimum energy performance requirements for the mosque.	RE-R1	6.0 Design of Building Systems	46
					6.1 Energy Systems	47
7.3.1	BG5	57	All spaces within the mosque SHOULD be designed according to a thermal zoning strategy and provide independent temperature control.	LBI-5.1	4.0 Design of Indoor Spaces	27
					4.2 Thermal Zoning	30
7.3.1	BS14	57	Commissioning of air/chilled water/automatic control/refrigeration systems and all associated controls SHALL be carried out prior to building completion, as per Estidama requirements.	IDP-R3	8.1 Commissioning	65
7.3.3	BS24	58	All Jame' mosque SHALL incorporate partitioning between the daily and Friday prayer areas and each area SHALL be evaluated as part of a thermal zoning strategy.	LBI-5.1	4.0 Design of Indoor Spaces	27
					4.2 Thermal Zoning	30
7.3.3	BS25	58	All mechanical and refrigeration equipment SHALL contain refrigerants with zero ODP.	RE-R3	6.5 Refrigerants and Fire Suppression	51
7.3.3	BG9	58	All mechanical and refrigeration equipment SHOULD use refrigerants with a GWP of 10 or less.	RE-7	6.5 Refrigerants and Fire Suppression	51



Section Number	Standards/ Guidelines Number	Volume 2 Page No.	Standards and Guidelines	Estidama PBRs Credit	Appendix 1 - Estidama - Section Reference	Appendix 3 Page No.
7.3.4	BS27	59	The mosque design SHALL ensure that any noise and/or vibration from mechanical systems does not disturb worshippers during prayers.	LBI-9	4.0 Design of Indoor Spaces	27
					4.3 Acoustic Design	31
7.3.4	BG10		The mechanical systems should be designed in accordance with the Estidama background noise requirements.		3.4 Safe, Secure and Healthy Environments	
8.3.1	BS28	60	The water consumption from all water fixtures, fittings and appliances SHALL NOT exceed the baseline flow rates, as per Estidama requirements.	PW-R1 PW-1	6.6 Water Fixtures and Appliances	52
8.3.1	BS29	60	Water metering SHALL be in accordance with Estidama requirements.	PW-R2 PW-3	6.7 Water Metering	56
8.3.1	BS30	60	Commissioning of plumbing systems, including any chemical treatments and chlorination, SHALL be carried out prior to building completion.	IDP-R3	8.1 Commissioning	65
8.3.1	BS31	60	A Legionella Management Plan SHALL be prepared in relation to all water systems.	LBI-R1	9.3 Legionella Management	70
8.3.1	BS32	60	Tap sensors SHALL be implemented within the toilet and ablution facilities to reduce water consumption.	PW-R1 PW-1	6.6 Water Fixtures and Appliances	52
8.3.1	BG12	60	Water consuming appliances SHOULD meet or exceed Estidama requirements.	PW-R1	6.6 Water Fixtures and Appliances	52
8.3.2	BG13	61	Condensed water from HVAC systems MAY be recycled and reused for irrigation.	PW-2.1	3.7 Landscaping and Irrigation	23
8.3.2	BG14	61	Where the fire and potable water storage tanks are not integrated, the fire water storage tank SHOULD be connected to an irrigation draw off and condensation feed to mitigate stagnation issues.	PW-2.1	3.7 Landscaping and Irrigation	23
8.3.3	BG15	61	Solar hot water systems SHOULD be used wherever possible.	RE-R1	6.0 Design of Building Systems	46
					6.1 Energy Systems	47
8.3.4	BG18	61	Stormwater systems SHOULD be designed as per Estidama requirements.	PW-4	3.8 Stormwater Management	25

Section Number	Standards/ Guidelines Number	Volume 2 Page No.	Standards and Guidelines	Estidama PBRs Credit	Appendix 1 - Estidama - Section Reference	Appendix 3 Page No.
9.3.1	BS36	63	All electrical systems SHALL meet the minimum energy performance requirements	RE-R1	6.0 Design of Building Systems	46
					6.1 Energy Systems	47
9.3.1	BS42	63	Electrical sub-meters SHALL be provided for all major high power equipment items in order to monitor and record the energy consumption.	RE-R2	6.2 Energy Metering	48
9.3.1	BS43	63	Commissioning of electrical systems SHALL be carried out prior to building completion.	IDP-R3	8.1 Commissioning	65
9.3.6	BS53	65	Lighting designs SHALL be in accordance with the maximum lighting power densities outlined in the ASHRAE 90.1-2007 Standards.	RE-R1	6.0 Design of Building Systems	46
					6.1 Energy Systems	47
9.3.6	BG29	65	High frequency electronic control gear SHOULD be utilised for all fluorescent lamps.	LBi-6	6.4 Lighting Fixtures	50
9.3.6	BS54	65	Lighting designs SHALL employ energy efficient lamp types, e.g. fluorescent and LED.	LBo-10	3.4 Safe, Secure and Healthy Environments	19
				LBi-6	6.4 Lighting Fixtures	50
9.3.6	BG30	65	Incandescent lamps SHOULD be avoided.	LBi-7	6.4 Lighting Fixtures	50
9.3.6	BS55	65	Commissioning of lighting and lighting control systems SHALL be carried out prior to building completion.	IDP-R3	8.1 Commissioning	65
9.3.6	BS56	65	Where these sensors are provided, manual control of the lighting SHALL be incorporated.	LBi-6	6.4 Lighting Fixtures	50
9.3.6	BG33	65	Photocell sensors capable of adjusting the level of internal light SHOULD be considered for all spaces that receive sufficient daylight.	LBi-6	6.4 Lighting Fixtures	50
9.3.6	BG34	65	Occupancy Passive Infrared (PIR) sensors SHOULD be considered for all areas.	LBi-6	6.4 Lighting Fixtures	50
Landscape						
12.1.1	LS2	75	The design of open spaces across the mosque plot SHALL include shaded areas to comply with Estidama requirements.	LBo-R3	3.0 Design of Outdoor Spaces	15
				LBo-1	3.2 Outdoor Thermal Comfort	17

Section Number	Standards/ Guidelines Number	Volume 2 Page No.	Standards and Guidelines	Estidama PBRS Credit	Appendix 1 - Estidama - Section Reference	Appendix 3 Page No.
12.1.1	LS4	75	The softscape extent, selection, layout and design SHALL be in accordance with Estidama and PPDM requirements. 2.2 Natural Systems Protection	NS-R1 NS-R2 NS-R3 NS-3 PW-R2 PW-2.1	2.0 Site Context	10
					2.1 Natural and Urban Systems Assessment	11
					2.2 Natural Systems Protection	13
					3.0 Design of Outdoor Spaces	15
					3.7 Landscaping and Irrigation	23
					6.7 Water Metering	56
12.1.3	LG6	77	Parking areas SHOULD consist of a combination of shading devices, hardscape and softscape.	LBo-R3	3.0 Design of Outdoor Spaces	15
				LBo- 1	3.2 Outdoor Thermal Comfort	17
12.1.3	LG7	77	Walkways between the parking area(s) and the mosque SHOULD be shaded.	LBo-R3	3.0 Design of Outdoor Spaces	15
				LBo-1	3.2 Outdoor Thermal Comfort	17
12.2	LS12	77	Irrigation design SHALL conform to Estidama requirements.	PW-R2 PW-2.1	2.0 Site Context	10
					2.1 Natural and Urban Systems Assessment	11
					2.2 Natural Systems Protection	13
					3.0 Design of Outdoor Spaces	15
					3.7 Landscaping and Irrigation	23
					6.0 Design of Building Systems	46
6.7 Water Metering	56					
12.4	LS23	79	Low impact and durable hardscape materials SHALL be specified.	SM-6	5.0 Material Selection	32
12.4	LS24	79	All hardscape materials SHALL be easily cleaned, maintained and replaced.		5.2 Design for Durability	34
12.5	LS30	81	All furnishing elements SHALL be easily cleaned, maintained and replaced.			

Section Number	Standards/ Guidelines Number	Volume 2 Page No.	Standards and Guidelines	Estidama PBRS Credit	Appendix 1 - Estidama - Section Reference	Appendix 3 Page No.
12.5	LS31	81	Shading devices SHALL be provided along main pedestrian thoroughfares and seating nodes, as per PRDM requirements.	LBo-R3 LBo-1	3.0 Design of Outdoor Spaces	15
					3.2 Outdoor Thermal Comfort	17
12.5	LS33	81	The design of all entrances and seating areas SHALL include refuse and recycling containers.	SM-R3	9.2 Indoor Waste and Recycling Storage	69
12.6	LS34	83	All external pedestrian areas SHALL be lit to ensure safe night-time use. (Refer to Section 4.6.4.)	LBi-10	3.4 Safe, Secure and Healthy Environments	19







لجنة تطوير المساجد  
mosque development committee

## Attachment B: Mosque Specific Plant List

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Botanical Name	Common Name	Plant Type	Softscape Palette A = Desertscape # B = Waterfront ## C = Suburban D = Urban	Mosque Typologies 1 = Masjid 2 = Jame'e 3 = District Jame'e	Bloom Colour	Bloom Time	Leaf Texture	Fragrant	Cautionary User Notes	Irrigation Demand
Acacia arabica	Babul	Trees	A,D	1	Yellow	Winter/Early Summer				**
Acacia nilotica	Arabian Gum	Trees	C	1, 2	Yellow	Early Summer				**
Acacia tortilis	Samar	Trees	A,C,D	1	Green	Early Summer/Summer			Thorns	*
Aerva javanica	Al Ara	Shrubs	A,C	1, 2, 3	White	Early Summer/Summer				*
Agave americana angustifolia	Century Plant	Succulent & Perennials	A,C,D	1, 2, 3	Green	Mid Summer			Leaf Spines	**
Agave americana 'Green'	Century Plant	Succulent & Perennials	A,C	1, 2, 3	Green	Mid Summer			Leaf Spines	**
Agave attenuata	Swan's Neck, Fox Tails	Succulent & Perennials	A,C	1, 2, 3	Green	Mid Summer			Leaf Spines	**
Agave 'Blue Agave'	Blue Agave, Tequila Agave	Succulent & Perennials	A,D	1, 2, 3	Blue	All Year			Leaf Spines	**
Allamanda cathartica	Golden Trumpet	Climbers	D	2	Yellow	Summer				***
Albizia lebbeck	Women's Tongue	Trees	B,D	1, 2	Yellow	Early Summer/Summer		Yes		***
Aloe arborescens	Krantz Aloe	Succulent & Perennials	C,D	1, 2, 3	Red	Early Summer			Leaf Spines	**
Aloe striata	Coral Aloe	Succulent & Perennials	C,D	1, 2, 3	Red	Mid - Late Winter/Early Summer			Leaf Spines	**
Aloe vera	Aloe Vera	Succulent & Perennials	A,C,D	1, 2, 3	Green	Early Summer			Leaf Spines	**
Alternanthera bettzickiana	Joyweed	Groundcover & Grasses	B,C,D	1, 2, 3	Inconspicuous	N/A				***
Alternanthera versicolor	Rose Bush	Groundcover & Grasses	D	2, 3	Inconspicuous	N/A				***
Antigonon leptopus	Coral Vine	Climbers	C,D	2, 3	Pink/White	Early Summer/Summer				***
Atriplex canescens	Four-wing Saltbush	Shrubs	B,C,D	1, 2	Yellow	Early Summer	Coarse			**
Atriplex glauca	Waxy Saltbush, Grey Saltbush	Shrubs	B,C,D	1, 2	Inconspicuous	N/A				**
Atriplex halimus	Sea Orach	Shrubs	A,B,D	1, 2	Inconspicuous	N/A				**
Atriplex nummularia	Giant or Old Man Saltbush	Shrubs	B,C,D	1, 2	Inconspicuous	N/A				**

The bespoke plant list for mosques has been sourced from the PRDM.

Note: # A desertscape is a scenic view of a desert composed of desert landscape features such as sand dunes, desert plantation, etc.

## Waterfront is the area of a town or city alongside a body of water, such as a harbour or dockyard or corniche.

Irrigation Demand

\* -Low

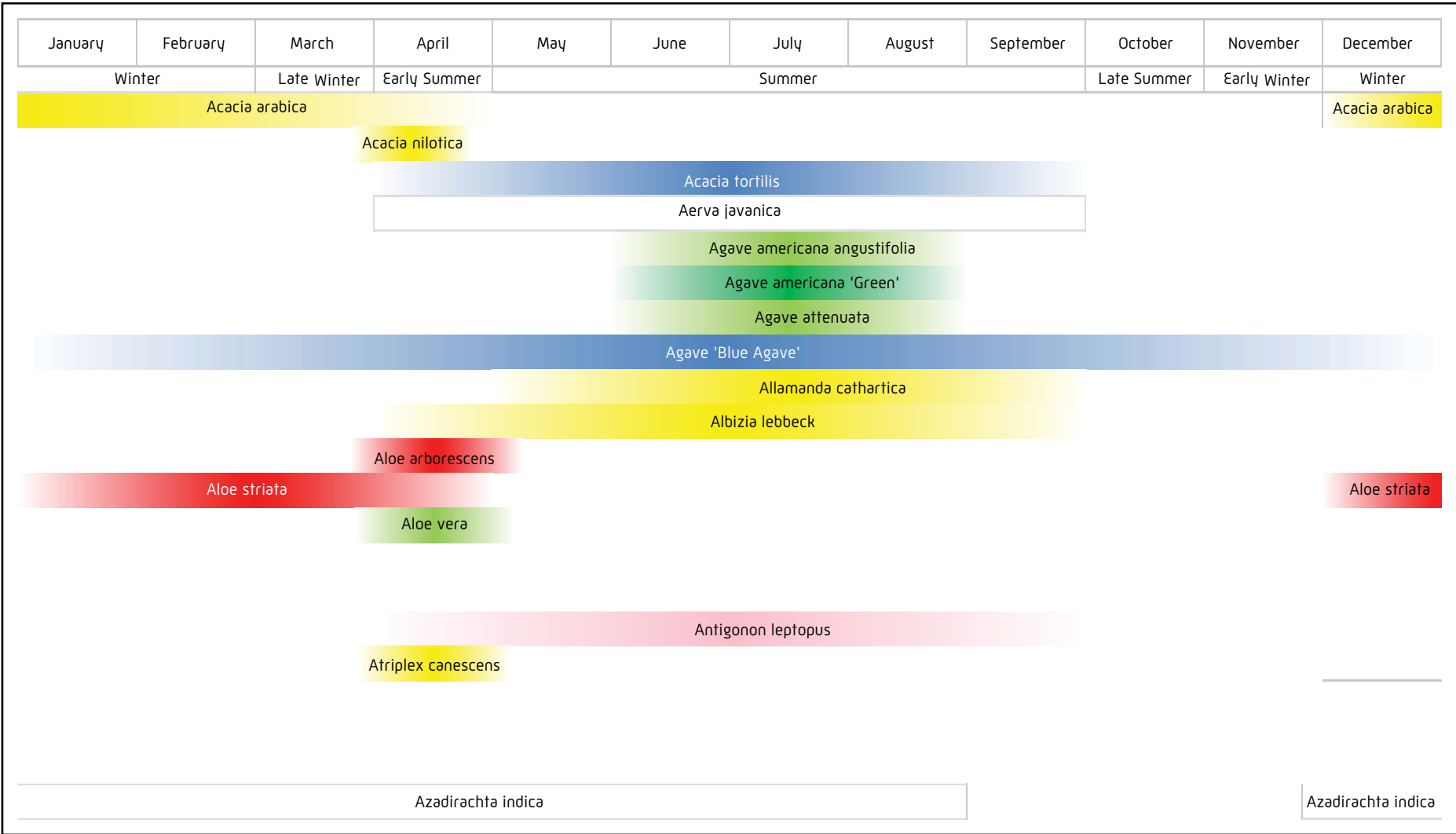
\*\* -Medium-Low

\*\*\* -Medium

Refer to the latest PRDM Appendix C for the most up to date irrigation rates and requirements.

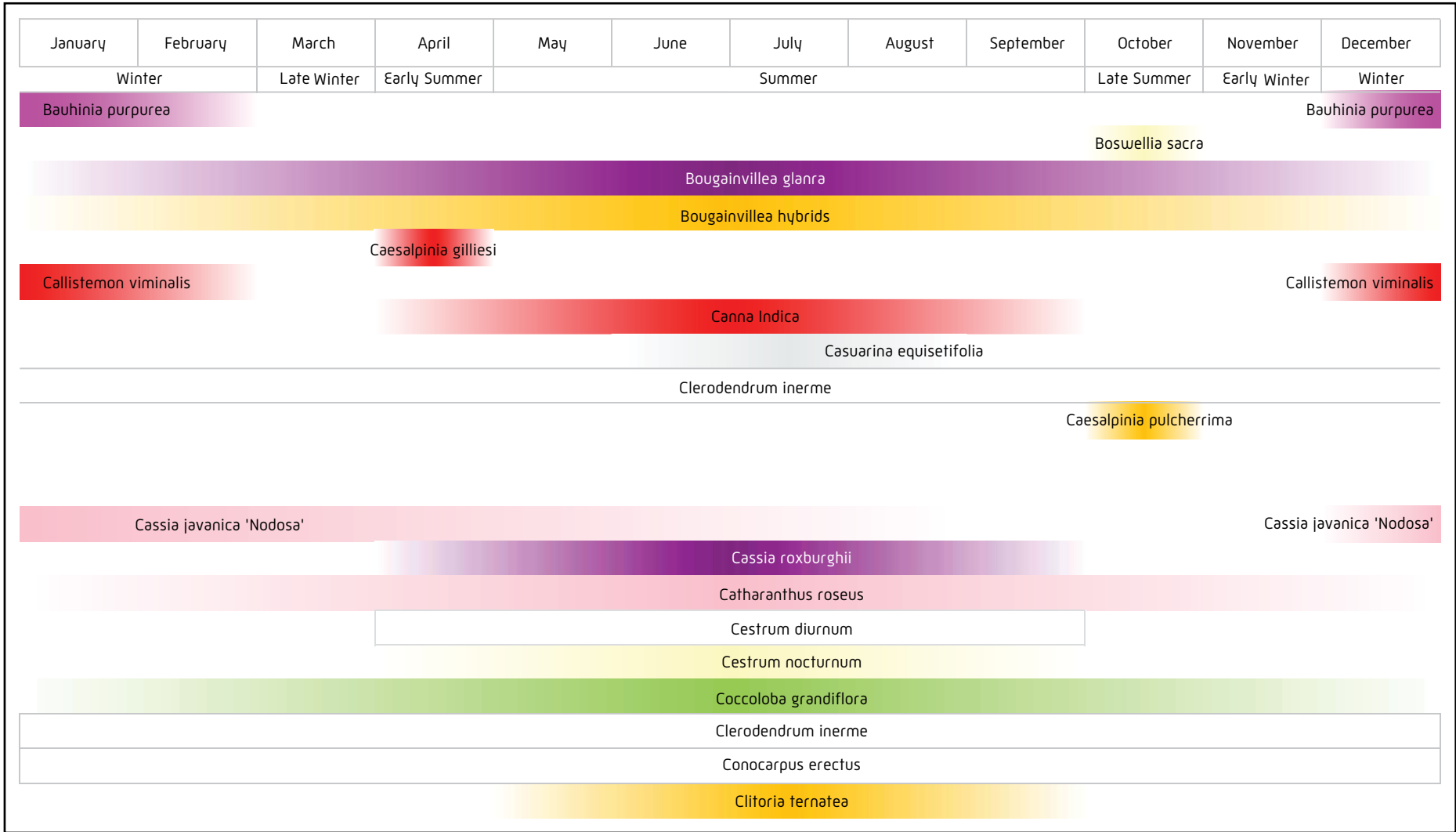


Phenology Chart



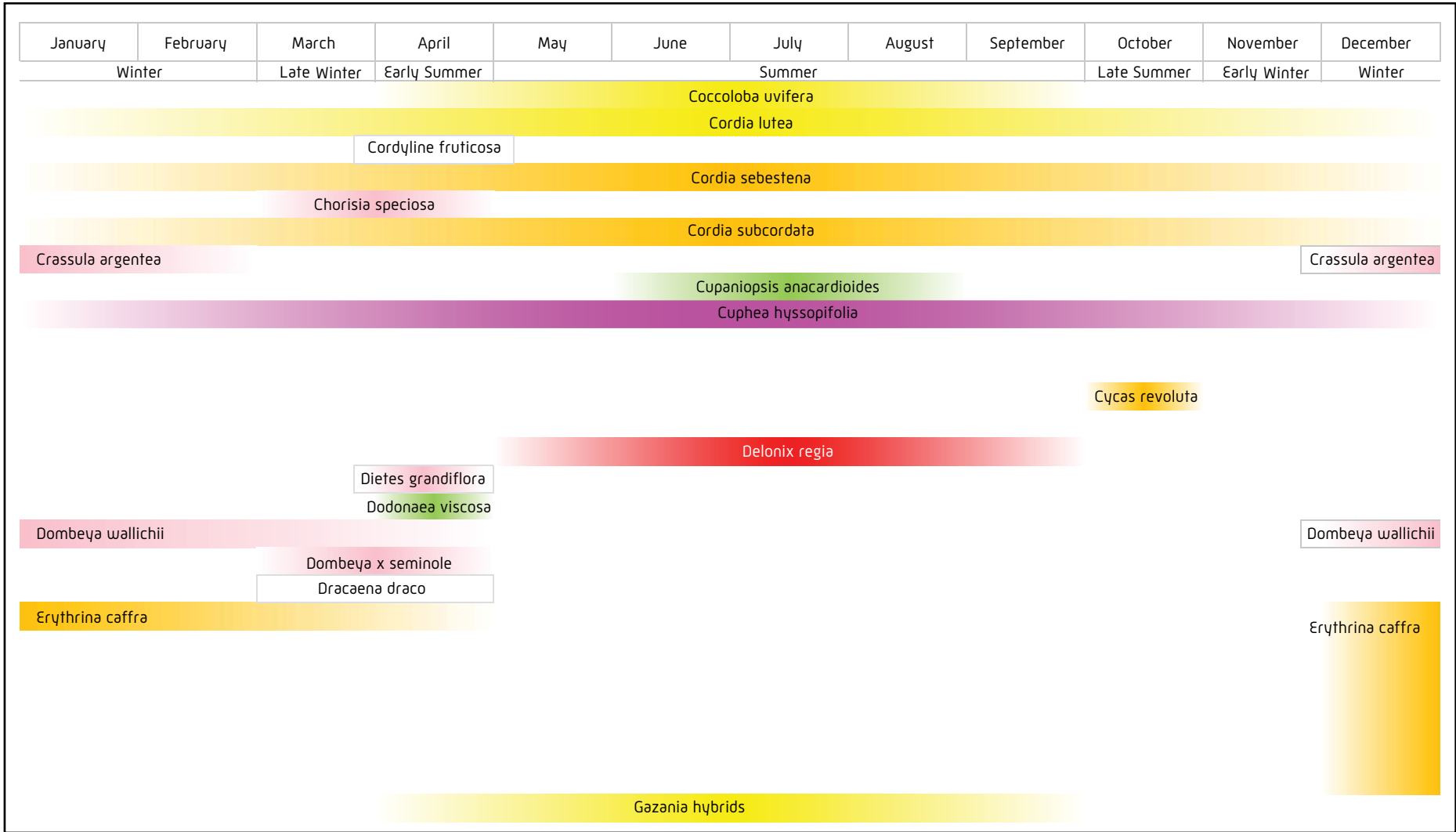
Botanical Name	Common Name	Plant Type	Softscape Palette A = Desertscap # B = Waterfront # C = Suburban D = Urban	Mosque Typologies 1 = Masjid 2 = Jame'e 3 = District Jame'e	Bloom Colour	Bloom Time	Leaf Texture	Fragrant	Cautionary User Notes	Irrigation Demand
<i>Azadirachta indica</i>	Neem Tree	Trees	A,B,C,D	1, 2	White	Winter/Early -Mid Summer		Yes		***
<i>Alternanthera versicolor</i>	Rose Bush	Groundcover & Grasses	D	2	Inconspicuous	N/A				***
<i>Bauhinia purpurea</i>	Purple Orchid Tree	Trees	B,D	2, 3	Magenta/White	Winter		Yes		***
<i>Boswellia sacra</i>	Frankincense Tree	Trees	A,C	1, 2	Yellow/White/ Cream	Late Summer				***
<i>Bougainvillea glabra</i>	Bougainvillea, Paper Flower	Climbers	A,D,C	1, 2, 3	Magenta/ Fuschia/Purple	All Year			Thorns	**
<i>Bougainvillea hybrids</i>	Bougainvillea hybrids	Climbers	C,D	1, 2, 3	White/Orange/ Pink	All Year			Thorns	**
<i>Caesalpinia gilliesi</i>	Bird of Paradise, Paradise Poinciana	Shrubs	C,D	3	Yellow	Early Summer				***
<i>Callistemon viminalis</i>	Weeping Bottlebrush	Trees	A,C	1, 2	Red	Winter				***
<i>Canna indica</i>	Indian Shot	Succulent & Perennials	D	1, 2, 3	Red/Yellow	Early Summer/Summer				***
<i>Casuarina equisetifolia</i>	Ironwood, Coastal She-oak	Trees	A,B,C,D	1	Silvery	Mid Summer	Needle-like			**
<i>Clerodendrum inerme</i>	Seaside Glory-Bower	Groundcover & Grasses	C,D	1	White	All Year		Yes		***
<i>Caesalpinia pulcherrima</i>	Red bird of paradise, Pride of Barbados	Shrubs	C,D	2, 3	Orange	Late Summer				***
<i>Callistemon viminalis</i>	Weeping Bottlebrush	Trees	A,C	2	Red	Winter				***
<i>Carex hachijoensis</i>	Japanese Sedge	Groundcover & Grasses	C,D	2, 3	Inconspicuous	N/A				***
<i>Cassia javanica 'Nodosa'</i>	Pink Shower, Pink Cassia	Trees	D	2, 3	Pink	Winter/Early - Mid Summer				***
<i>Cassia roxburghii</i>	Ceylon Senna, Red Cassia	Trees	D	2, 3	Pink/Purple/ Orange	Early Summer/Summer				***
<i>Catharanthus roseus</i>	Madagascar Periwinkle	Groundcover & Grasses	D	3	Pink/White	All Year				***
<i>Cestrum diurnum</i>	Inkberry, Day Jasmine	Shrubs	B,C,D	2, 3	White	Early Summer/Summer		Yes		***
<i>Cestrum nocturnum</i>	Night Jasmine	Shrubs	B,C,D	2, 3	Cream	Early Summer/Summer		Yes		***
<i>Coccoloba grandiflora</i>	Seagrape	Shrubs	B,C,D	1, 2	Green	All Year				***
<i>Clerodendrum inerme</i>	Seaside Glory-Bower	Groundcover & Grasses	C,D	2	White	All Year		Yes		***
<i>Conocarpus erectus</i>	Buttonwood, Button Mangrove	Trees	A,B,C,D	1, 2	White	All Year			Pollen Allergy Source	***
<i>Clitoria ternatea</i>	Butterfly Pea, Blue Pea Vine	Climbers	C,D	2, 3	White/Orange/ Pink	Summer				***

Phenology Chart



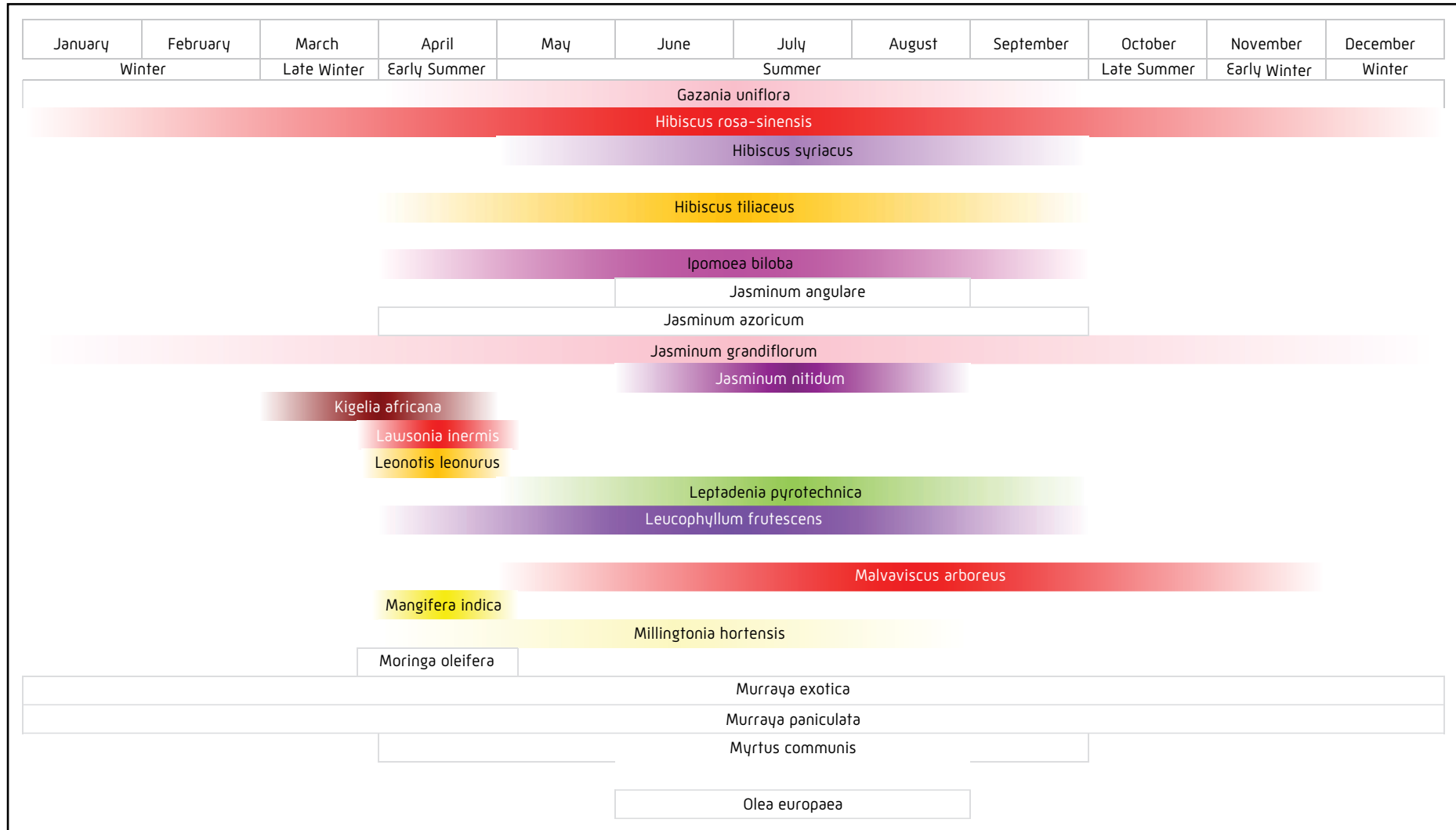
Botanical Name	Common Name	Plant Type	Softscape Palette A = Desertscap # B = Waterfront ## C = Suburban D = Urban	Mosque Typologies 1 = Masjid 2 = Jame'e 3 = District Jame'e	Bloom Colour	Bloom Time	Leaf Texture	Fragrant	Cautionary User Notes	Irrigation Demand
Coccoloba uvifera	Seagrape	Trees	B,C,D	2, 3	Yellow-White	Early Summer/Summer				***
Cordia lutea	Yellow Geiger, Muqayyo	Trees	D	3	Yellow	All Year				***
Cordyline fruticosa	Ti Plant, Good Luck Plant	Shrubs	D	3	White	Early Summer	Coarse			***
Cordia sebestena	Geiger Tree, Geranium Tree	Trees	B,D	1	Orange	All Year				***
Chorisia speciosa	Silk Floss Tree	Trees	C,D	3	Pink	Late Winter/Early Summer			Thorns	***
Cordia subcordata	Kou, Sea Trumpet	Trees	D	1, 2	Orange	All Year				***
Crassula argentea	Jade Plant	Succulent & Perennials	C,D	1,3	Pink/White	Winter				**
Cupaniopsis anacardioides	Carrotwood, Tuckeroo Tree	Trees	B,C,D	2	Green	Mid Summer				***
Cuphea hyssopifolia	Mexican Heather, False Heather	Groundcover & Grasses	C,D	2, 3	Magenta/Purple	All Year				***
Cupaniopsis anacardioides	Carrotwood, Tuckeroo Tree	Trees	B,C,D	1, 2	Green	Mid Summer				***
Cycas circinalis	Queen Sago Palm	Palms	C,D	1, 2, 3	Inconspicuous	N/A				***
Cycas revoluta	King Sago Palm	Palms	C,D	1	Orange	Late Summer				***
Crassula argentea	Jade Plant	Succulent & Perennials	C,D	2	Pink/White	Winter				**
Delonix regia	Royal Poinciana, Flamboyant	Trees	B,D	2, 3	Red	Summer				***
Dietes grandiflora	Wild Iris, Fairy Iris	Groundcover & Grasses	C,D	2, 3	Yellow/White	Early Summer				***
Dodonaea viscosa	Shahus	Shrubs	A,C,D	1, 2	Green	Early Summer	Medium			**
Dombeaya wallichii	Pinkball, Tropical Hydrangea	Shrubs	D	2, 3	Pink	Winter/Early Summer				***
Dombeaya x seminole	Pink Cloud	Shrubs	D	2, 3	Pink	Late Winter/Early Summer				***
Dracaena draco	Dragon or Dragon's Blood Tree	Trees	C,D	2, 3	White	Late Winter/Early Summer				***
Erythrina caffra	Kaffir Coral, Kaffirboom Tree	Trees	C,D	1, 2	Orange	Winter/Early Summer			Thorns	***
Ficus altissima	Lofty Fig, False Banyan, Council Tree	Trees	C,D	1, 2	Inconspicuous	N/A				***
Ficus benghalensis	Indian Banyan Tree	Trees	B,D	1, 2	Inconspicuous	N/A				***
Ficus infectoria	Bo Tree	Trees	C,D	1, 2	Inconspicuous	N/A				***
Ficus microcarpa	Malayan Banyan	Trees	B,C,D	1, 2	Inconspicuous	N/A				***
Ficus microcarpa 'Benjamina'	Weeping Fig	Trees	B,C,D	2, 3	Inconspicuous	N/A				***
Ficus religiosa	Bodhi	Trees	B,D	2, 3	Inconspicuous	N/A				***
Gazania hybrids	Treasure Flower	Groundcover & Grasses	D	3	Yellow/Orange	Early Summer/Summer				**

Phenology Chart



Botanical Name	Common Name	Plant Type	Softscape Palette A = Desertscap # B = Waterfront ## C = Suburban D = Urban	Mosque Typologies 1 = Masjid 2 = Jame'e 3 = District Jame'e	Bloom Colour	Bloom Time	Leaf Texture	Fragrant	Cautionary User Notes	Irrigation Demand
Gazania uniflora	Treasure Flower	Shrubs	A,D	1, 2	Orange/Pink/ Yellow	Early Summer/Summer				**
Hibiscus rosa-sinensis	Tropical Hibiscus, Rose of China	Shrubs	B,C,D	1, 2, 3	Red/Pink	All Year	Medium			***
Hibiscus syriacus	Rose of Sharon	Shrubs	D	1, 2, 3	White/Pink/ Red/Lavender/ Purple	Summer	Medium			***
Hibiscus tiliaceus	Beach, Sea or Linden Hibiscus	Trees	A,B,C,D	1, 2	Red/Orange/ Yellow	Early Summer/Summer				***
Iresine herbstii	Beefsteak Plant, Bloodleaf	Groundcover & Grasses	D	3	Inconspicuous	N/A				***
Ipomoea biloba	Morning Glory	Climbers	B	1, 2	Pink/Magenta/ Lavender	Early Summer/Summer				***
Jasminum angulare	South African Jasmine	Climbers	B,C,D	1, 2, 3	White	Mid Summer		Yes		***
Jasminum azoricum	Azores Jasmine	Climbers	B,C,D	1, 2, 3	White	Early Summer/Summer		Yes		***
Jasminum grandiflorum	Spanish or Royal Jasmine	Climbers	B,C,D	1, 2, 3	White/Pink	All Year				***
Jasminum nitidum	Angelwing or Shining Jasmine	Climbers	C,D	1, 2, 3	Purple/White	Mid Summer		Yes		***
Kigelia africana	Sausage Tree	Trees	A,C	2	Maroon	Late Winter/Early Summer				***
Lawsonia inermis	Henna Plant, Mignonette Tree	Shrubs	C,D	1, 2	Red/Pink/White	Early Summer				***
Leonotis leonurus	Lion's Tail, Lion's Ear, Wild Dagga	Groundcover & Grasses	C,D	1, 2	Red/Orange	Early Summer				***
Leptadenia pyrotechnica	Fire Plant, Merekh	Shrubs	A,B,C	1	Green	Summer		Yes		*
Leucophyllum frutescens	Texas Ranger, Texas Sage	Shrubs	A,C,D	1, 2	Violet	Early Summer/Summer				**
Livistona chinensis	Chinese Fan Palm	Palms	C,D	1, 2	Inconspicuous	N/A				***
Malvaviscus arboreus	Turk's Cap	Shrubs	C,D	1	Red	Summer/Early Winter		Yes		***
Mangifera indica	Mango Tree	Trees	B,C,D	1, 2	Yellow	Early Summer				***
Millingtonia hortensis	Indian Cork Tree, Tree Jasmine	Trees	C,D	1, 2	Yellow/White/ Cream	Early Summer/Mid Summer				***
Moringa oleifera	Horseradish, Drumstick, Ben-oil tree	Trees	A,C,D	2, 3	White	Early Summer		Yes		***
Murraya exotica	Orange Jasmine, Honey Bush, Chinese Box	Shrubs	C,D	1, 2	White	All Year		Yes		***
Murraya paniculata	Orange Jasmine, Chalcas	Shrubs	C,D	2, 3	White	All Year		Yes		***
Myrtus communis	True Myrtle	Shrubs	B,C,D	1, 2	White	Early Summer/Summer	Coarse	Yes		***
Nanorrhops ritchieana	Zerbet	Palms	C,D	2, 3	Inconspicuous	N/A			Leaf Spikes	**
Olea europaea	Olive	Trees	A,C,D	1, 2, 3	White	Mid Summer				**

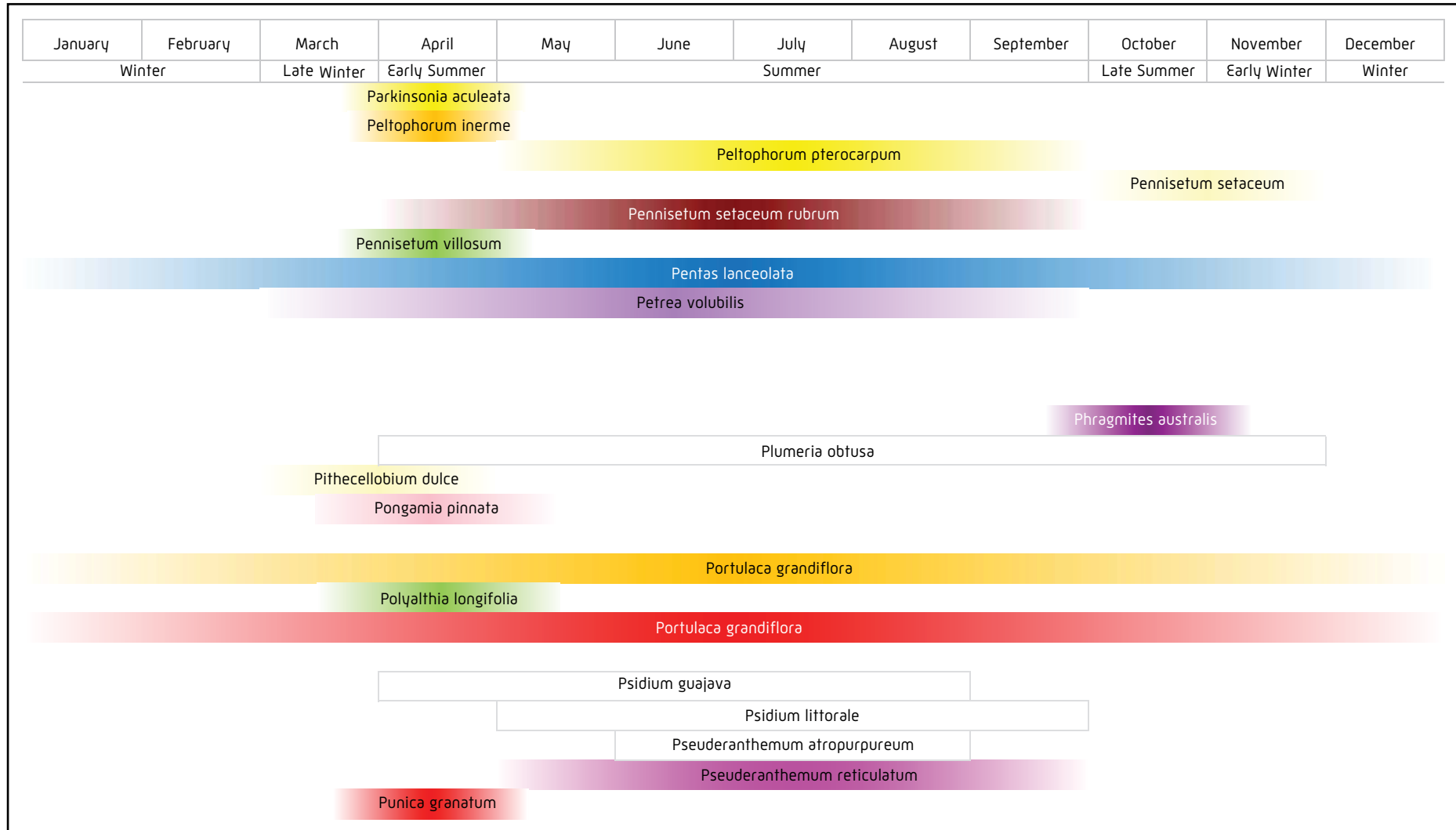
### Phenology Chart



Botanical Name	Common Name	Plant Type	Softscape Palette A = Desertscapes # B = Waterfront ## C = Suburban D = Urban	Mosque Typologies 1 = Masjid 2 = Jame'e 3 = District Jame'e	Bloom Colour	Bloom Time	Leaf Texture	Fragrant	Cautionary User Notes	Irrigation Demand
Parkinsonia aculeata	Jerusalem Thorn	Trees	A,B,C	1, 2	Yellow	Early Summer			Thorns	**
Peltophorum inerme	Yellow Poinciana	Trees	B,D	1, 2	Orange-Yellow	Early Summer		Yes		**
Peltophorum pterocarpum	Copper Pod	Shrubs	D	1, 2	Yellow	Summer				***
Pennisetum setaceum	Crimson or African Fountain Grass	Groundcover & Grasses	A,D	1, 2, 3	Cream	Late Summer/Early Winter				**
Pennisetum setaceum rubrum	Purple or Red Fountain Grass	Groundcover & Grasses	A,B,C,D	1, 2, 3	Red/Purple/ Maroon	Early Summer/Summer				**
Pennisetum villosum	Feathertop, White Fountain Grass	Groundcover & Grasses	C,D	1, 2, 3	Green	Early Summer				**
Pentas lanceolata	Egyptian Star Cluster	Succulent & Perennials	D	1, 2, 3	Pink/Red/Blue/ Violet/White	All Year				***
Petrea volubilis	Queen's Wreath	Climbers	D	1	Blue/Lavender/ White	Late Winter/Early Summer/ Summer				***
Phoenix dactylifera	Date Palm	Palms	A,B,C,D	1, 2, 3	Inconspicuous	N/A			Leaf Spikes	****
Phoenix reclinata	Senegal Date Palm	Palms	A,B,C,D	1, 2, 3	Inconspicuous	N/A			Leaf Spikes	***
Phoenix roebelinii	Pigmy Date Palm	Palms	A,B,C,D	1, 2	Inconspicuous	N/A			Leaf Spikes	***
Phragmites australis	Common Reed	Groundcover & Grasses	B,C	1, 2	Purple	Late Summer				
Plumeria obtusa	Singapore or White Frangipani	Trees	C,D	2, 3	White	Early Summer/Summer/ Early Winter		Yes	Sap Allergy	***
Pithecellobium dulce	Madras Thorn, Manila Tamarind	Trees	A,C	1	White/Cream	Late Winter/Early Summer			Thorns	***
Pongamia pinnata	Pongam Tree	Trees	D	1, 2	Pink/Lavender/ White	Early Summer		Yes		***
Portulaca grandiflora	Moss Rose	Groundcover & Grasses	A,C,D	1, 2	Pink/Red/ Orange/Yellow/ White	All Year				**
Polyalthia longifolia	Mast Tree	Trees	C,D	2, 3	Green	Early Summer				***
Portulaca grandiflora	Moss Rose	Groundcover & Grasses	A,C,D	3	Pink/Red/ Orange/Yellow/ White	All Year				**
Prosopis cineraria	Ghaf Tree	Trees	A,B,C	1	Inconspicuous	N/A			Thorns	**
Psidium guajava	Tropical Guava	Trees	C,D	1, 2	White	Early - Mid Summer				***
Psidium littorale	Cattley Guava	Trees	C,D	1, 2	White	Summer				***
Pseuderanthemum atropurpureum	Purple False Eranthemum	Shrubs	C,D	2, 3	White	Mid Summer				***
Pseuderanthemum reticulatum	Yellow-Vein Eranthemum	Shrubs	C,D	2, 3	Magenta/White	Summer				***
Punica granatum	Pomegranate	Shrubs	C	1, 2	Red-Orange	Early Summer			Thorns	***

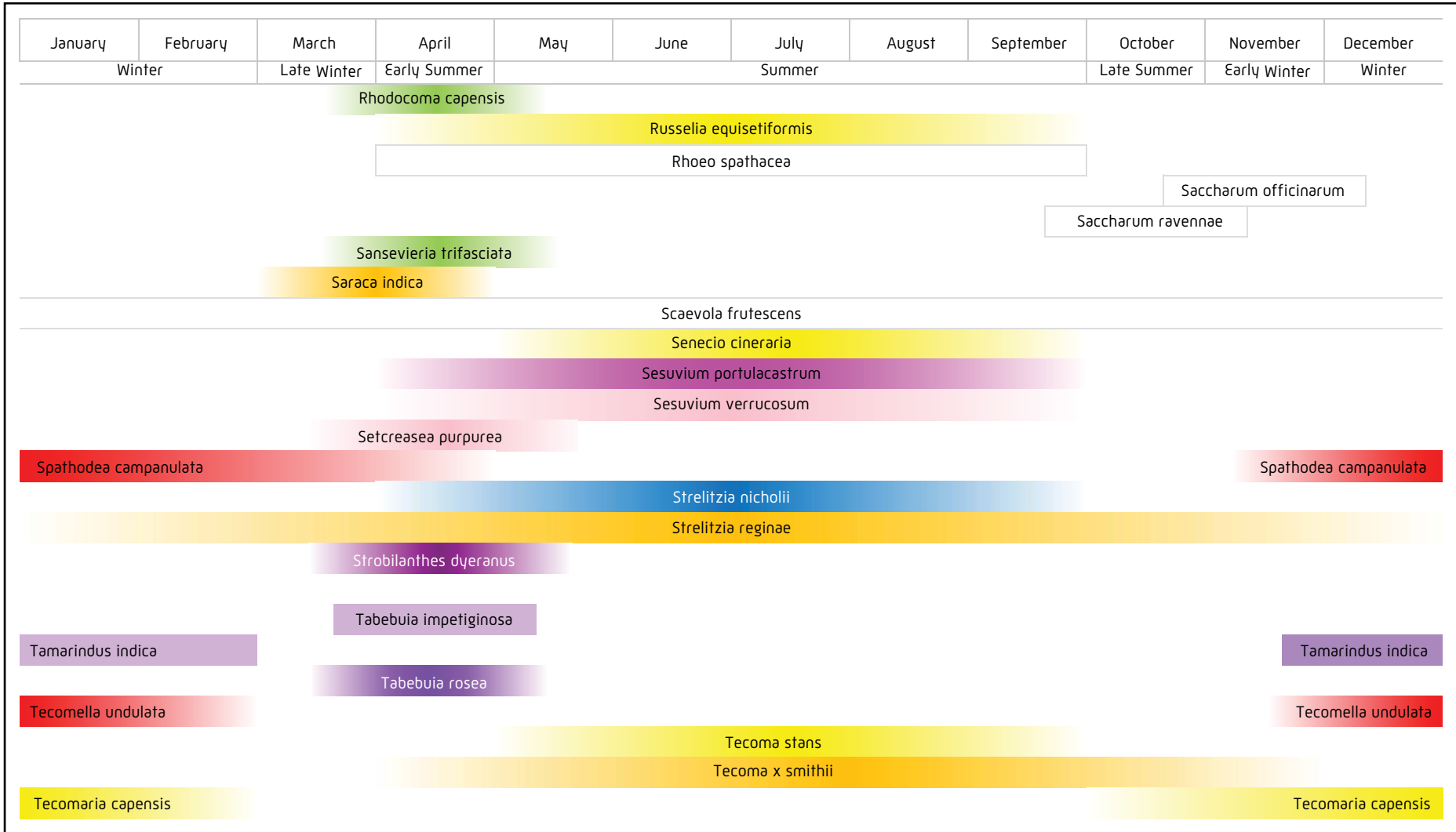


Phenology Chart



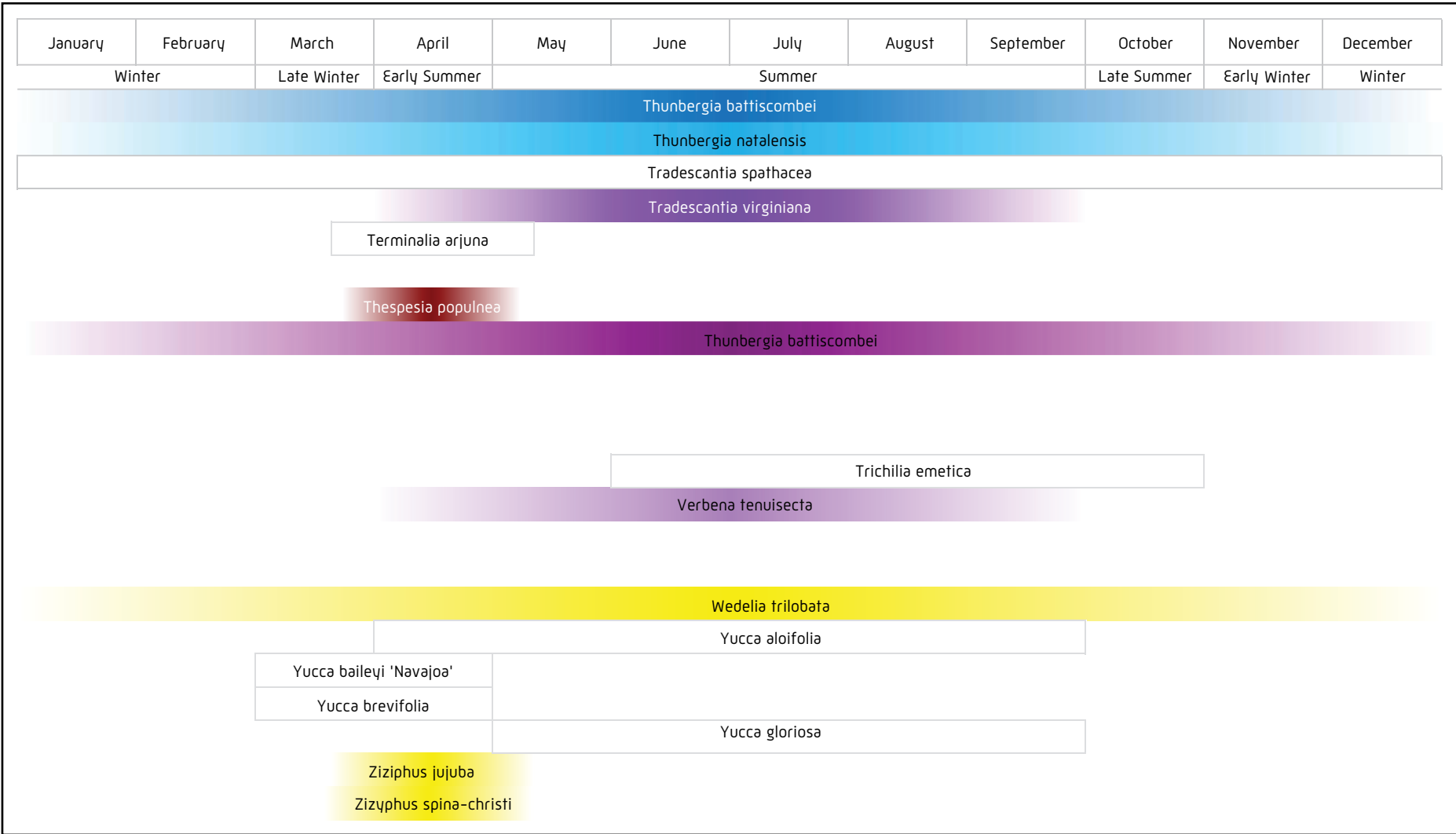
Botanical Name	Common Name	Plant Type	Softscape Palette A = Desertscape # B = Waterfront # C = Suburban D = Urban	Mosque Typologies 1 = Masjid 2 = Jame'e 3 = District Jame'e	Bloom Colour	Bloom Time	Leaf Texture	Fragrant	Cautionary User Notes	Irrigation Demand
Rhodocoma capensis	South African Restio	Shrubs	C	1, 2, 3	Green	Early Summer	Grass			***
Russelia equisetiformis	Firecracker Plant	Shrubs	C,D	1, 2	Red/Yellow	Early Summer/Summer				***
Rhoeo spathacea	Oyster Plant, Moses-in-the-Cradle	Groundcover & Grasses	C,D	2, 3	White	Early Summer/Summer				**
Saccharum officinarum	Sugarcane	Groundcover & Grasses	C	1, 2	White	Early Winter				***
Saccharum ravennae	Ravenna or Sugarcane Plume Grass	Groundcover & Grasses	C	1, 2	White	Late Summer				**
Sansevieria trifasciata	Mother-in-Law's Tongue	Succulent & Perennials	A,C,D	1, 2	Green	Early Summer				***
Saraca indica	Ashoka	Trees	C,D	1, 2	Orange	Late Winter/Early Summer		Yes		***
Scaevola frutescens	Beach Naupaka	Shrubs	B,D	2	White	All Year	Coarse			***
Senecio cineraria	Dusty Miller	Groundcover & Grasses	C,D	2, 3	Yellow	Summer				***
Sesuvium portulacastrum	Sea Purslane	Groundcover & Grasses	B,D	1, 2	Pink/Magenta/ Violet	Early Summer/Summer				**
Sesuvium verrucosum	Rohama	Groundcover & Grasses	C,D	1, 2, 3	Pink	Early Summer/Summer				**
Setcreasea purpurea	Purple Heart syn Tradescantia purpurea	Groundcover & Grasses	C,D	2, 3	Pink	Early Summer				***
Spathodea campanulata	African Tulip Tree	Trees	B,D	2	Red-Orange	Winter/Early Summer				***
Strelitzia nicholii	Giant Bird of Paradise	Succulent & Perennials	D	3	Blue/Purple/ White	Early Summer/Summer				***
Strelitzia reginae	Bird of Paradise	Succulent & Perennials	D	3	Orange-Yellow	Early Summer/Late Winter				***
Strobilanthes dyeranus	Persian Shield	Groundcover & Grasses	D	3	Purple	Early Summer				***
Syagrus romanzoffiana	Queen Palms	Palms	D	1, 2	Inconspicuous	N/A				***
Tabebuia impetiginosa	Purple Trumpet Tree	Trees	D	2, 3	Mauve	Early Summer				***
Tamarindus indica	Tamarind	Trees	B,C	2	Mauve/Yellow	Mid Winter				***
Tabebuia rosea	Pink Trumpet Tree	Trees	D	2	Pink/Violet/ White	Early Summer				***
Tecomella undulata	Rohida, Desert or Marwar Tree	Trees	C	1	Yellow/Orange/ Red	Winter				**
Tecoma stans	Yellow Trumpet Bush	Shrubs	D	2, 3	Yellow	Summer				***
Tecoma x smithii	Orange Bells	Shrubs	D	2, 3	Orange/Yellow	Early Summer/Summer/ Early Winter				***
Tecomaria capensis	Cape Honeysuckle	Shrubs	B,D	2, 3	Yellow	Late Summer/Winter		Yes		***

Phenology Chart



Botanical Name	Common Name	Plant Type	Softscape Palette A = Desertscap # B = Waterfront ## C = Suburban D = Urban	Mosque Typologies 1 = Masjid 2 = Jame'e 3 = District Jame'e	Bloom Colour	Bloom Time	Leaf Texture	Fragrant	Cautionary User Notes	Irrigation Demand
Thunbergia battiscombei	Blue Glory, Clock Vine, Scrambling Sky Flower	Climbers	C,D	2	Blue/Violet/Purple	All Year				***
Thunbergia natalensis	Dwarf Thunbergia, Natal Blue Bell	Shrubs	C,D	2, 3	Light Blue	All Year				***
Tradescantia spathacea	Oyster Plant, Moses-in-the-Cradle, Boat-Lily	Groundcover & Grasses	D	2, 3	White	All Year				**
Tradescantia virginiana	Virginia Spiderwort, Lady's Tears	Groundcover & Grasses	C,D	2, 3	Violet	Early Summer/Summer				***
Terminalia arjuna	Arjuna, White Marudah	Trees	B,D	2	White	Early Summer				***
Terminalia catappa	Tropical Almond	Trees	A,B,C,D	1, 2	Inconspicuous	N/A				***
Thespesia populnea	Portia Tree, Indian Tulip Tree	Trees	A,B,D	1	Yellow/Maroon	Early Summer				***
Thunbergia battiscombei	Blue Glory, Clock Vine, Scrambling Sky Flower	Climbers	C,D	1	Blue/Violet/Purple	All Year				***
Thunbergia natalensis	Dwarf Thunbergia, Natal Blue Bell	Shrubs	C,D	3	Light Blue	All Year				***
Tradescantia spathacea	Oyster Plant, Moses-in-the-Cradle, Boat-Lily	Groundcover & Grasses	D	3	White	All Year				**
Tradescantia virginiana	Virginia Spiderwort, Lady's Tears	Groundcover & Grasses	C,D	3	Violet	Early Summer/Summer				***
Trichillia emetica	Natal Mahogany Tree	Trees	C,D	3	White	Mid Summer/Late Summer				***
Verbena tenuisecta	Moss Verbena	Groundcover & Grasses	C,D	3	Lavender/White	Early Summer/Summer				***
Washingtonia filifera	California Fan Palm	Palms	A,B,D	1, 2	Inconspicuous	N/A			Leaf Stem Spikes	***
Washingtonia robusta	Mexican Fan Palm	Palms	A,B,D	1, 2	Inconspicuous	N/A			Leaf Stem Spikes	***
Wedelia trilobata	Creeping Daisy, Yellow Dot	Groundcover & Grasses	B,D	1, 2	Yellow	All Year				***
Yucca aloifolia	Spanish Bayonet	Succulent & Perennials	A,B,D	1, 2, 3	White	Early Summer/Summer			Sharp Pointed Leaves	***
Yucca baileyi 'Navajoo'	Navajo Yucca	Succulent & Perennials	A,D	1, 2, 3	White	Late Winter/Early Summer			Sharp Pointed Leaves	**
Yucca brevifolia	Joshua Tree	Trees	A,D	1	White	Late Winter/Early Summer			Sharp Pointed Leaves	**
Yucca gloriosa	Spanish Dagger	Succulent & Perennials	A,B,D	1, 2,3	White	Summer			Sharp Pointed Leaves	***
Ziziphus jujuba	Common Jujube, Chinese Date	Trees	A,B,C	1, 2	Yellow	Early Summer				***
Zizyphus spina-christi	Sidr Tree	Trees	A,B,C	1, 2	Yellow	Early Summer			Thorns	**

Phenology Chart







لجنة تطوير المساجد  
mosque development committee

## Glossary

# Glossary

## Administrative Terms

Term	Definition
<b>Abu Dhabi Public Realm Design Manual (PRDM)</b>	The policies and guidelines to be utilised for all public realm planning and design in the Emirate of Abu Dhabi.
<b>Abu Dhabi Urban Street Design Manual (USDMA)</b>	The guidelines and technical specifications to be utilised for all urban street planning and design in the Emirate of Abu Dhabi.
<b>TCA</b>	Abu Dhabi Tourism & Culture Authority.
<b>ADCD</b>	Abu Dhabi Civil Defence.
<b>ADDC</b>	Abu Dhabi Development Code.
<b>ADIBC</b>	Abu Dhabi International Building Code.
<b>ADIECC</b>	Abu Dhabi International Energy Conservation Code.
<b>ADIFC</b>	Abu Dhabi International Fire Code.
<b>AD IMC</b>	Abu Dhabi International Mechanical Code.
<b>ADIPC</b>	Abu Dhabi International Plumbing Code.
<b>ADMDR</b>	Abu Dhabi Mosque Development Regulations.
<b>ADSSC</b>	Abu Dhabi Sewerage Services Company.
<b>ADWEA</b>	Abu Dhabi Water and Electricity Authority.
<b>ANSI</b>	The American National Standards Institute.
<b>ASHRAE</b>	American Society of Heating, Refrigerating and Air-Conditioning Engineers.
<b>ASPE</b>	American Society for Plumbing Engineers.
<b>Auqaf</b>	The General Authority for Islamic Affairs and Endowments (GAIAE).
<b>BS</b>	British Standards.
<b>CIBSE</b>	Chartered Institution of Building Services Engineers.
<b>DMA</b>	Department of Municipal Affairs.
<b>DoT</b>	Abu Dhabi Department of Transport.

Term	Definition
<b>Estidama</b>	Meaning sustainability in Arabic, it is the established principles and guidelines for the promotion of sustainability in development projects within the Emirate of Abu Dhabi.
<b>Guideline</b>	The preferred practice in typical situations or an advisory statement on how to comply with a standard.
<b>IBC</b>	International Building Code.
<b>IEC</b>	International Energy Commission.
<b>IES</b>	Illuminating Engineering Society.
<b>MDC</b>	Mosque Development Committee of the Emirate of Abu Dhabi.
<b>MDSS</b>	The Mosque Development Support System: a GIS-based workflow for mosque plot approval and allocation.
<b>NFPA</b>	National Fire Protection Association.
<b>GSEC</b>	The General Secretariat of the Executive Council.
<b>Red Crescent</b>	An international humanitarian movement founded to protect human life and health to ensure respect for all human beings and to prevent and alleviate human suffering.
<b>RSB-EWR</b>	Latest Regulation and Supervision Bureau-Electricity Wiring Regulations Including Amendments.
<b>Safety &amp; Security Agencies</b>	Government agencies including, but not limited to Abu Dhabi Police, Abu Dhabi Civil Defence, etc.
<b>SLL</b>	Society of Light and Lighting.
<b>UAE Fire and Life Safety Code of Practice</b>	Standardised legislation within the UAE covering fire and life safety, for use by fire systems consultants.
<b>UPC-AD</b>	Uniform Plumbing Code - Abu Dhabi.



## Religious Terms

Term	Definition
<b>Ablution</b>	Is the mandatory cleansing prior to prayer.
<b>Al Athan/Athan</b>	The call to announce the beginning of the prayer period.
<b>Al-Eqameh</b>	The call to start the prayer in the mosque.
<b>District Jame'e</b>	A jame'e located adjacent to district-level community facilities.
<b>Eid prayers</b>	Special prayers offered to commemorate 2 Islamic festivals, Eid Al Adha and Eid Al Fitr.
<b>Holy Qur'an</b>	The holy book of Islam.
<b>Imam</b>	Islamic religious leader of prayer. The Imam also manages the day-to-day running of the mosque.
<b>Jame'e</b>	Mosque used for Friday prayers, and other daily prayers.
<b>Friday Prayer</b>	The weekly congregational prayer that occurs every Friday at noon time.
<b>Khutba</b>	Speech delivered to the worshippers by the Imam before the Friday prayer.
<b>Makkah</b>	Makkah (or Mecca) in the Kingdom of Saudi Arabia is regarded as the holiest city in Islam.
<b>Masjid</b>	Mosque used for daily prayers – the colloquial term is 'local mosque'.
<b>Mihrab</b>	Niche or similar architectural element indicating the direction of qibla.
<b>Minaret</b>	Vertical architectural element of the mosque, traditionally used by the Mu'athen for the call for prayer. It is also useful in locating the mosque from a distance.
<b>Minber</b>	Raised platform used by the Imam to perform the khutba.
<b>Mu'athen</b>	A person who assists the Imam and is responsible for the call to prayer.
<b>Musalla</b>	Meaning 'place for performing prayer' in Arabic. Throughout this volume, it specifically refers to a secondary prayer facility that is usually embedded in a building, with a predominant non-religious use, such as an office building or a shopping mall.
<b>Shoe zone</b>	The zone in a mosque, where the worshipper is allowed to wear shoes, e.g. toilets.
<b>Qibla</b>	The direction of performing prayers, which is towards the kaaba in Makkah, Kingdom of Saudi Arabia.
<b>Ramadan</b>	The Holy month of Ramadan is the ninth month of the Islamic calendar.
<b>No shoe zone</b>	Clearly defined zone in a mosque where users should not wear shoes. For example, the prayer hall and the ablution facility.

## Technical Terms

Term	Definition
<b>Ablution unit</b>	A place of ablution for a single worshipper.
<b>Access and Circulation Management Strategy</b>	The strategy to manage the access, flow and direction of people and/or vehicles through a site.
<b>Access</b>	Approach and transition to the mosque plot.
<b>Accessibility</b>	The ability for people of all ages, including those with impaired mobility, to physically access desired destinations, services and/or activities.
<b>Air Cooled Liquid Chiller (ACLC)</b>	A chiller system which is cooled by air.
<b>Affection Plan</b>	Also known as a Site Plan or Plot Plan. A graphic illustration showing the exact coordinated location of a site, as issued and approved by the Abu Dhabi Government, which includes the following information: plot owner, plot area, land use, sector, and plot identifier.
<b>Air Handling Unit (AHU)</b>	A device used to condition and circulate air as part of a Heating, Ventilating and Air-conditioning (HVAC) system.
<b>Ancillary Function</b>	All other supporting functional components which support the mosque.
<b>Architectural Lighting</b>	External or internal lighting used to enhance architectural elements or features.
<b>Articulation</b>	The manner or method of joining or defining parts, such that each part is clear and distinct in relation to the other.
<b>Awqaf Managed Mosques</b>	Mosques which are maintained by an Awqaf-appointed maintenance contractor.
<b>Badgir</b>	A traditional natural wind catcher.
<b>Barjeel</b>	A wind tower used in traditional UAE houses.
<b>Baseline Flow Rates</b>	Used in the Estidama process, as a point of reference to measure predicted water savings in a building.
<b>Basement</b>	The habitable storey of a building, which is wholly or partly below the ground level.

## Technical Terms (Continued)

Term	Definition
<b>Building Management System (BMS)</b>	A computer based system with the capability to monitor, control and optimise the performance of building systems, controls and functions.
<b>Built Form</b>	The mass, height, density, footprint and style of a building or buildings, as distinguished by its external substance or material. It is also the organisation of elements of composition to create a coherent image of a building or buildings.
<b>Capital</b>	A defined upper end of a column.
<b>CEB</b>	Compressed Earth Block.
<b>Celebrate</b>	Visibility and prominence of an element, relative to its context (also 'celebrate').
<b>Circulation</b>	Describes the flow of people throughout a building or space.
<b>City Grid</b>	The grid or pattern of streets within a built context.
<b>Coefficient of Performance (COP)</b>	The ratio of the net cooling energy exported from the system to the total electrical power used by the system.
<b>Colour Palette</b>	A designated list of colours which has been approved for use within a design.
<b>Community</b>	An immediate walkable area within which a group of residents live.
<b>Community and Emergency Support</b>	As defined by the Emergency Planning Authorities of Abu Dhabi and the UAE.
<b>Compatible</b>	The characteristics of different design elements which, despite their differences, can be located near each other in harmony, such as scale, height, materials, texture and colour.
<b>Computer-Based Control System</b>	In reference to landscape design, the use of a common programme logic to speak to all of the irrigation timers within a specific system, allowing the total control of an irrigation system from 1 source. Additionally provides instant feedback or notice of network damage, water consumption, weather data, and general performance.
<b>Crèche</b>	A facility used for childcare.
<b>Crime Prevention Through Environmental Design (CPTED)</b>	Strategic opportunities identified during project planning and design to enhance public safety by reducing the potential for crime; often includes eliminating concealment areas, maintaining open sight lines, locating activity areas in clear view, enhancing communication ability, providing adequate illumination and maximising public access or use of space.

Term	Definition
<b>Cross Ventilation</b>	A form of air circulation whereby forced exterior air (wind) enters a space through an opening, forcing interior air out of the space through an outlet.
<b>Daily Prayer Hall</b>	A prayer hall used for daily prayer.
<b>Design Elements</b>	Fundamental components that are assumed to be the basis of an intentional visual design strategy.
<b>Design Grid</b>	An architectural design tool in the form of a reference grid in which the grid lines are spaced at exact multiples of the Design Module width or depth, which facilitates the spatial distribution of functions to create a plan.
<b>Design Module</b>	A unit of area based on a depth to width ratio of 1:1 that is used to standardise design proportions for the spatial layout of all primary functional components of a mosque, allowing flexibility and variety.
<b>Diffused light</b>	Light received through indirect source with reduced intensity from the original light source.
<b>Directional Sign</b>	An on-site sign, designed to direct or guide pedestrian or vehicular traffic, which is non-commercial in nature, except for a logo and directional information, for example, handicapped parking, one-way, exit, and entrance.
<b>District</b>	A collection of several neighbourhoods.
<b>District Cooling</b>	The centralised production and distribution of cooling energy.
<b>Digital Signal Processing (DSP)</b>	The processing of digital signals within sound equipment, for the purpose of public address.
<b>Direct Expansion (DX)</b>	Refers to a geothermal heat pump system in which the refrigerant circulates through copper tubing placed in the ground.
<b>Eastern Toilets</b>	Toilet fixtures used in the squatting position.
<b>Emergency Maintenance</b>	The maintenance response to a sudden or unexpected problem with equipment or structure.
<b>Emirati Vernacular Mosque</b>	The architecture of a contemporary mosque (in the Emirate of Abu Dhabi) that is representative of the traditional Emirati form.
<b>Energy Transfer Station (ETS)</b>	Equipment which carries chilled water from the delivery network to customer installations in a district cooling network.
<b>European Toilets</b>	Toilet fixtures used in the seated position.
<b>EVA</b>	Emergency Vehicular Access.

## Technical Terms (Continued)

Term	Definition
<b>Evapotranspiration</b>	The transport of water into the atmosphere from surfaces, including soil and vegetation.
<b>External Cleaning</b>	Cleaning of the areas outside the mosque building, but within the mosque plot.
<b>External Lighting</b>	Illumination of space or features for use in an external environment (not indoors).
<b>Façade</b>	The exterior wall of a building exposed to public view, or a wall that is viewed by persons not within the building.
<b>Fan Coil Unit (FCU)</b>	A unit that provides cooling and/or heating as part of a comfort air conditioning system. An FCU uses heated or chilled water and supplies air via 1 or more electrically driven fans.
<b>Female Access</b>	An access to the mosque plot only for female worshippers.
<b>Fenestration</b>	The arrangement of windows in a building.
<b>Fire Suppression System</b>	The system within a building that discharges inert gases or chemical agents to control/extinguish a fire.
<b>Flow Sensor</b>	A device that senses the rate of fluid flow.
<b>Frontage</b>	All property fronting on 1 or more streets or sikkak.
<b>Gateway</b>	The design of a structure, site or landscape to symbolise an entrance or arrival at a place of significance.
<b>Gathering Area</b>	A feature area designed to accommodate groups of people that provides relief from the heat and sun and can include site furniture, shade structures, landscaping, fountain(s) and/or drinking fountain(s).
<b>Gross Floor Area (GFA)</b>	The sum of all horizontal areas of each floor of a building or structure, measured from the wall faces of the exterior walls, or from the centre line of walls adjoining 2 buildings, subject to the rules of measurement for determining Gross Floor Area.
<b>Glare</b>	The result of excessive contrast between bright and dark areas in the field of view, causing discomfort or reducing the ability to discern detail.
<b>Glass Reinforced Plastic (GRP)</b>	A material used for utility infrastructure pipes.
<b>Hardscape</b>	Areas such as patios, decks, driveways, paved plazas, paths and sidewalks not requiring irrigation, but used in the overall improvement of a site's landscape aesthetic.
<b>High Density Polyethylene.</b>	A material used for utility infrastructure pipes.

Term	Definition
<b>Hemispherical</b>	1 half of a symmetrical, approximately spherical object as divided by a plane of symmetry.
<b>Hierarchy</b>	A structure or ordered grouping of elements within a system.
<b>Highly Urban Settlement Context</b>	An area of population greater than 200 persons per hectare.
<b>Human Scale</b>	How humans perceive the size of their surroundings and their comfort with the elements of the natural and built environment relative to their own size.
<b>HVAC</b>	Heating Ventilation and Air Conditioning. The equipment, distribution systems and terminals that provide heating, ventilating or air conditioning to a building or portion of a building.
<b>Hydrozone</b>	A distinct grouping of plants with similar water needs and climatic needs. The hydrozone is served by a valve or set of valves with the same schedule.
<b>Hypostyle Hall</b>	Flat roofed space supported by rows of columns.
<b>Incandescent lamp</b>	A lamp in which light is produced by a filament heated to incandescence by an electric current.
<b>Individually Managed Mosques</b>	Mosques which are maintained by an individual donor and not Awqaf.
<b>Internal Cleaning</b>	Cleaning of the internal (permanently covered) areas of a mosque building.
<b>Ingress Protection (IP)</b>	Code classifies and rates the degrees of protection provided against the intrusion of objects or matter.
<b>Internet Protocol (IP)</b>	The principal communications protocol used for relaying data across an internet work.
<b>Integrated Part Load Value (IPLV)</b>	A prediction of chiller efficiency at the ARI Standard Rating Point.
<b>Interstitial Space</b>	A space that intervenes between functional components of the mosque.
<b>Irrigation</b>	A utility that supplies treated water to dry areas in order to help vegetation grow.
<b>Local Area Network (LAN)</b>	Interconnection of computers within a defined limited area.
<b>Landforms</b>	A recognisable natural or man-made feature on the earth's surface.
<b>Landmark</b>	A building which creates a distinct visual orientation point, and provides a sense of location to an observer within a neighbourhood.

## Technical Terms (Continued)

Term	Definition
<b>Legionnaires' Disease</b>	A respiratory disease caused by inhaling Legionella bacteria either in the form of contaminated water droplets (aerosols) or in droplet nuclei (after water has evaporated). Fatal in approximately 12% of reported cases.
<b>Light Pollution</b>	The adverse effect of artificial light, including sky glow, glare, light trespass, light clutter, decreased visibility at night and energy waste.
<b>Liturgical Process</b>	Process related to conducting a fixed set of customs/ceremonies at a public place of religious worship.
<b>Main Prayer Hall</b>	Prayer hall dedicated for male worshippers that may be used for daily and juma'a prayer.
<b>Mashrabiya</b>	Traditional decorative perforated panel made of wood or carved gypsum.
<b>Massing</b>	Mass is the combination of the 3 dimensions of length, height and depth which gives a building its overall shape. A building is often composed of many masses, hence the term massing, which is used to describe the form or shape of collective structures.
<b>Matched Precipitation System</b>	A method of water delivery within the irrigation system which ensures that the same volume of water (at the same rate) is delivered to all parts of the system equally.
<b>Main Distribution Frame (MDF)</b>	A distribution hub in a fixed telecommunications network.
<b>MEP/MEPF</b>	Mechanical, Electrical Plumbing, including fire protection systems.
<b>Meter</b>	A device for measuring units.
<b>Microclimate</b>	The localised climate conditions within an urban area or neighbourhood.
<b>Minimum Landscape Area</b>	The minimum area of landscaping as defined by development type and location within the Abu Dhabi Development Code.
<b>Minimum Net Space</b>	The minimum internal area required for an allocated functional component. It is measured between the inside finish of permanent exterior building walls, excluding columns, and projections which reduce the overall usable space. This excludes circulation space between the spaces and/or unit.
<b>Mitigation</b>	The measures taken to avoid or reduce negative impacts.

Term	Definition
<b>Mixed-Mode Ventilation</b>	The combination of natural ventilation and mechanical ventilation and/or cooling to ventilate a space. In the context of this document and the UAE climate, this refers to changeover mixed-mode design and operation. This implies a change of ventilation and cooling mode from fully sealed in the hotter months, to 1 of natural ventilation through operable windows in the cooler months.
<b>Mosque Catchment Area</b>	The area of planned influence and service area of the mosque.
<b>Mosque Planning Summary Sheet</b>	A sheet summarising the development control parameters of a mosque plot such as capacity, context, plot area, GFA and height. It also provides minimum design provisions such as open space and parking capacity.
<b>Native Species</b>	An indigenous species living naturally within a given area.
<b>Natural Surveillance</b>	The arrangement of streets, buildings, spaces and other plot features that limits the opportunity for crime by increasing the perception that people can see or be seen.
<b>Neighbourhood</b>	A collection of 3 to 4 communities.
<b>Non-Leakage Drip Line</b>	The use of dripped irrigation where the system prevents irrigation water drainage from the end of the irrigation cycle.
<b>Off-Site Parking</b>	Parking provided at a site, adjacent to or not within the mosque plot. It is a typical solution for dispersed parking.
<b>On-Site Parking</b>	Parking areas and parking spaces that are located within the mosque plot.
<b>On-Street Parking</b>	Parking areas and parking spaces that are located on the street and/or in areas adjacent to the street, within a right-of-way.
<b>Parapet</b>	A portion of a wall that projects above a roof.
<b>Parking Area</b>	An area specifically designated for vehicle parking.
<b>Parking Space</b>	The division of a parking area marked by column spacing, or markings on the ground.
<b>Passive Thermal Control</b>	The design method of passively altering the indoor temperature through the rejection of solar heat gain by using innovative design or construction methods.
<b>Perforated Wall</b>	A façade with windows, openings or mashrabiya panels.
<b>Pergola</b>	A passageway of columns supporting a roof of trelliswork.
<b>pH</b>	The measurement of acidity given on a scale of 1.0 to 14.0 with 7.0 being neutral.
<b>Place making</b>	The process of creating a public place that will attract people because it is interesting.

## Technical Terms (Continued)

Term	Definition
<b>Planting Palette</b>	A designated list of plant material which has been approved for use within the design.
<b>Plot Coverage</b>	The portion of a plot that is occupied by any building(s) or structure(s), typically expressed as a percentage of the building footprint area to total plot area.
<b>Portal</b>	A primary gateway which defines the entrance to the sahan. This may be striking or indicative through other design elements or planting.
<b>Porticos</b>	A structure consisting of a roof supported by columns or piers, usually attached to a building as a porch.
<b>Potable Water</b>	Water of a high enough quality for safe human consumption.
<b>Pressure Compensating Emitter</b>	In landscape design, is an emitter or series of emitters designed to operate at a specific pressure. This allows emitters on the same system to operate, ensuring the same delivery of water along all points.
<b>Pressure Reducing Solenoid Valves</b>	In landscape design is a remote control valve fitted with a device that allows for additional pressure reduction at each valve. This provides more irrigation control at each zone to ensure optimum performance.
<b>Preventative Maintenance</b>	Maintenance which is completed to meet manufacturer requirements.
<b>Primary Entrance</b>	The main and most celebrated entrance to the mosque.
<b>Primary Energy Ratio (PER)</b>	The ratio of the amount of primary energy used in a system to the amount of energy delivered as cooling.
<b>Primary Function</b>	A functional component which is associated with the process or act of prayer.
<b>Private Space</b>	A space restricted for private use, not intended for public use, primarily the Imam's and Mu'athen's residences.
<b>Public Open Space</b>	An open space or park outside of the mosque plot that is accessible for public use within the public realm.
<b>Public Realm</b>	The public spaces of a town or city, especially the street spaces within the right-of-way, and open space such as parks and squares.
<b>Public Space</b>	A public area inside a mosque plot that is open and accessible to worshippers.
<b>Qibla Wall</b>	The wall of the prayer hall on which the mihrab is located.
<b>Recess</b>	A small space created by a building part of a wall set back from the vertical plane.
<b>Recessed Lighting</b>	Lighting elements installed to the finished surface that do not protrude and/or cause a trip hazard.

Term	Definition
<b>Recycling</b>	The processing of previously used materials to create new products.
<b>Restricted Space</b>	A space restricted from worshippers and accessible to the mosque management and maintenance team.
<b>Right-of-Way</b>	Publicly operated corridor for transportation for all modes and utilities.
<b>Riwaq</b>	A colonnade or arcade leading to the main prayer hall.
<b>Rhythm</b>	The regular succession of opposite elements such as solid and void.
<b>Rural Settlement Context</b>	A low-density area as defined by the Abu Dhabi Community Facility Planning Standards.
<b>Sahan</b>	Forecourt to the riwaq or main prayer hall with a defined boundary. This may be used for prayer.
<b>Scale</b>	The sense of proportion or apparent size of a building or element, created by the placement and size of the building in its context.
<b>Sculpted Landforms</b>	Softscape mounds designed to create varying contours on a site.
<b>Secondary Entrance</b>	Supporting entrance to the mosque, used to aid accessibility to functions of the mosque.
<b>Secondary Function</b>	A functional component which is not associated with the process or act of prayer.
<b>Semi-Private Space</b>	A space between the public and private areas, which allows limited access to the public, e.g. the Imam's office.
<b>Semi-Public Space</b>	Space between the public and private areas which have a defined public use, such that some worshippers can enter and use for limited periods, e.g. a crèche.
<b>Setback</b>	The minimum distance between a property line or demarcated boundary and the location where a structure or facility can be built.
<b>Settlement Context</b>	A classification used to describe Highly Urban, Urban, Suburban or Rural areas within the Emirate, based on varying built forms, geographic areas and access to services, as per the Abu Dhabi Community Facility Planning Standards.
<b>Shading</b>	Screening against light or heat.
<b>Sikka</b>	A pedestrian routeway between buildings.
<b>Sikkak</b>	Plural of sikka.
<b>Site</b>	A single plot or a combination of plots that are under single ownership or unified control, and together form the boundaries of an area to be developed.
<b>Softscape</b>	Elements of the landscape that comprise live, horticultural elements; may also include synthetic materials that exhibit similar characteristics and appearance.

## Technical Terms (Continued)

Term	Definition
<b>Soil Moisture Sensor</b>	An instrument used to measure the moisture content of the planted area and relay the specific data back to a control mechanism which can determine if further irrigation is required.
<b>Solar Powered Lighting</b>	Lighting which is powered by photo voltaic cells rather than by direct connection to a power source.
<b>Solid-Void</b>	The relationship of window, recessed panel, and door opening to the solid wall surface area of the building façade.
<b>Spatial Layout</b>	The basic 2 dimensional arrangement of the functional components within the plot.
<b>Sqm</b>	Square metres
<b>Energy Star Accreditation</b>	An international standard for energy efficient consumer products.
<b>Street Furnishing</b>	Equipment placed within the open space, e.g. light fixtures, fire hydrants, telephones, trash bins, signs and benches.
<b>Streetscape</b>	The visual elements of a street, including the road, sidewalk, street furniture, trees and open spaces that combine to form the street's character.
<b>Sub-Meter</b>	A utility meter that allows for the monitoring of usage on a portion of a distribution system past a main meter.
<b>Suburban Settlement Context</b>	Defined by the Abu Dhabi Community Facility Planning Standards.
<b>Sustainability</b>	Identifies a concept and attitude in development that considers a site's natural land, water and energy resources as integral aspects of the development.
<b>Territorial Reinforcement</b>	The use of boundary design to differentiate between private and public areas.
<b>Thermal zones</b>	The logical sub-divisions of building spaces based on anticipated thermal load and the need for occupant control.
<b>Threshold</b>	The interface or transition at the boundary of 2 uses or characters. This is applicable to a plot boundary, or functional boundary within the same plot.
<b>Transition area</b>	An area of circulation between functional components.
<b>Typology</b>	The systematic classification of types of uses/styles that have characteristics, traits or functions in common.

Term	Definition
<b>Universal Access</b>	The ability of all people to have an equal and unobstructed opportunity to use facilities, regardless of social status, ethnicity or physical, mental and sensory ability.
<b>Up-lighting</b>	Lighting installed to provide light in an upward direction, usually to accentuate a feature, wall or tree.
<b>uPVC</b>	Unplasticised Polyvinyl Chloride.
<b>Urban Settlement Context</b>	As defined by the Abu Dhabi Community Facility Planning Standards
<b>Variable Refrigerant Flow (VRF)</b>	Allows 1 condensing unit to be connected to multiple evaporators, while modulating the amount of refrigerant being sent to each evaporator. This system can provide simultaneous heating and cooling if required.
<b>Vernacular</b>	A landscape or architectural style common to, or representative of, an area.
<b>Vertical Rhythm</b>	A repetition of a vertical pattern at regular or harmonious intervals.
<b>Void</b>	An opening, window, door, mashrabiya panels or recessed panel on a façade.
<b>Walkway</b>	A path or route intended for pedestrian use, such as a concrete or asphalt surface or continuous blocks of pavers.
<b>Water Calculator (Estidama PBRS)</b>	A tool used in the Estidama Pearl Building Rating System (PBRS) process for predicting water consumption in a building.
<b>Water Features</b>	A design focal point that emphasises the display of water; may include pools, fountains, cascades and/or spray jets.
<b>Wayfinding</b>	The process by which people orientate themselves in a space and navigate their way from place to place.
<b>Weather Station</b>	A set of instruments used to measure wind speed, temperature, humidity, evapotranspiration and other meteorological data, which can influence the use of irrigation water within a localised system.
<b>Women's Entrance</b>	The entrance of the mosque for the use of women.
<b>Women's Prayer Hall</b>	A prayer hall dedicated for female worshippers and children.
<b>Worshipper</b>	A member of the public using the mosque facility for religious activity.



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## Acknowledgements

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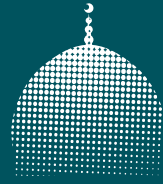
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