4.0 Planning

4.1 Site Development

The location and development of the site shall be in accordance with the requirements of the Urban Planning Council and the local Municipality. Summarized below are the main criteria to be considered when developing a site accommodating a health facility.

4.1.1 Environmental Impact

The aesthetics and form of a health facility shall be sympathetic with its immediate environment, either built or natural; e.g. domestic scale and treatments where built in a residential area; the building should enhance the streetscape.

Note: This is not a mandatory requirement but is highly recommended.

Consideration should also be given to the setting of a health facility to ensure that it is accepted as an asset by the community and not thought of as an imposition and/or inconvenience on the neighborhood.

4.1.2 Landscaping

A suitable landscaping scheme shall be provided to ensure that the outdoor spaces are pleasant areas in which patients, visitors and staff may relax. The scheme should also ensure that the buildings blend into the surrounding environment, built or natural.

Water conservation should be a consideration when designing layouts and selecting plants. The use of mains water for reticulation is restricted; therefore the local authority on water supply should be consulted for current regulations.

4.1.3 Site Grading

The balance of a health facility site not covered by buildings should be graded to facilitate safe movement of the public and staff. Where this is not possible, access should be restricted.

4.1.4 Public Utilities

Impact on existing local service networks may be substantial. In establishing a health facility on any site, the requirements of authorities regulating water, electricity, gas, telephones, sewerage and any other responsible statutory or local authority must be complied with.

4.1.5 Structural Requirements

If the site is low lying, on the side of a hill, or partly consists of rock, then structural engineering advice should be sought at an early stage to minimize future drainage or settlement problems.

4.2 Master Plan Development

4.2.1 Planning Relationships and the Use of Planning Models

The planning of health facilities requires general knowledge of the appropriate relationships between the various components. Certain components (also referred to as Functional Planning Units or FPUs) need to be adjacent or close to other components. Most FPUs must be accessible independently without travelling through other components. In short, the planning of a health facility requires a certain logic which is derived from the way the facility functions.

Good Planning Relationships:
- Increase the efficiency of operation
- Promote good practice and safe health care delivery
- Minimize recurrent costs
- Improve privacy, dignity and comfort
- Minimize travel distances
- Support a variety of good operational policy models
- Allow for growth and change over time.

Inappropriate Planning Relationships:
- Result in duplication and inefficiency
- May result in unsafe practices
- Increase running costs
- May result in reduced privacy, dignity and comfort
- Increase travel distance or force unnecessary travel
- Result in lack of flexibility to respond to future growth and change
- May limit the range of operational possibilities.

Planning Models

The planning of a complex health facility is based on applying commonly recognized 'good relationships' as well as taking into consideration site constraints and conformity with various codes and guidelines. In theory, it is possible to go back to the basics every time. In practice however, designers soon discover that this is an inefficient way of arriving at appropriate planning solutions. Just as in other buildings types e.g. hotels and shopping centers, health facilities have over time evolved around a number of workable Planning Models. These can be seen as templates, modules, prototypes or patterns for the design of new facilities.

These Guidelines include a number of flow diagrams, also referred to as Functional Relationship Diagrams (FRD) which represent Planning Models for various Functional Planning Units. The flow diagrams are referred to in the appropriate sections of these Guidelines and cover internal planning and relationships within the FPUs. Designers may use these diagrams to set out the various components and then manipulate them into the appropriate shapes to suit the site constraints.

Designers are encouraged to see the overall design as a model; a good health facility plan usually can be reduced to a basic flow diagram. If the diagram has clarity, is simple and logical, as demonstrated in the FPUs in these Guidelines, it probably has good potential for development. A skilled designer will use these planning models to assemble the requirements of a health facility on the site without compromising functionality.

If, on the other hand, the model is too hard to reduce to a simple, clear and logical flow diagram, it should be critically examined; it is not sufficient to satisfy immediate or one-to-one relationships. Similarly, it may not be sufficient to satisfy only a limited, unusual or temporary operational policy, it is more important to incorporate planning relationships that can satisfy multiple operational policies due to their inherent simplicity and logic.

4.2.2 Master Planning

In the health care industry, the term 'Master Plan' has different meanings in different contexts. The most common use of the term Master Plan refers to words, diagrams and drawings describing the 'global arrangement of activities' in a health facility with particular emphasis on land use, indicating growth and change over time.

Under this definition, a Master Plan is a fundamental planning tool used to identify options for current needs as well as projected future needs. Its purpose is to guide decision making for clients and designers.

Health facility owners and designers are encouraged to prepare a Master Plan before any detailed design is undertaken. A Master Plan can be prepared in conjunction with detailed briefing, so that valuable feedback can be obtained regarding real world opportunities and constraints. Ideally, a successful Master Plan will avoid incorrect long-term strategic decisions, minimize abortive work, prevent future bottlenecks and minimize expectations that cannot be met in the given circumstances.

A Master Plan diagram is typically a simplified plan showing the following:

- The overall site or section of the site relating to the development
- Departmental boundaries for each level related to the development
- Major entry and exit points to the site and the relevant departments
- Vertical transportation, including stairs and lifts
- Main inter-departmental corridors (arterial corridors)
- Location of critical activity zones within departments but without full detail
- Likely future site development
- Areas (if any) set aside for future growth and change
- Arrows and notes indicating major paths of travel for vehicles, pedestrians, goods and beds
- Services Master Plan showing the engineering impact, plant locations, availability of services and future demand.

Master Plan diagrams and drawings should be prepared for several options (typically three) to an equal level of resolution and presentation so that each option reaches its maximum potential, only then is a decision maker in a position to compare options on equal terms. The above diagrams and drawings are typically accompanied by a report covering the following headings as a minimum:

- Project description
- Outline brief
- Opportunities and constraints
- Options considered
- Evaluation criteria
- Evaluation of the options including cost impact (if any)
- Recommended option
- Executive summary and recommendation.

The exact deliverables for a Master Plan can be adapted to the nature of the project. The most typical additional deliverables are listed below; clients may refer to them by name and by reference to these Guidelines.

- Stacking Plans – This is typically used for locating departments in major multi-story developments where the shell is already well-defined
- Master Concept Plan – This is generally used as a further development of the preferred Master Plan option so that the design implications can be further tested and priced
- Staging Plan – A Staging Plan shows a complete Master Plan defined for each stage of the development rather than simply a zone allocation for future works
- Strategic Plan – A Strategic Plan refers to higher level ‘what if’ studies, providing a range of development scenarios. These may include the use of alternate sites, private-public collocation, purchase versus lease, alternative operational policies etc.

4.2.3 Planning Policies

Planning policies refer to a collection of non-mandatory guidelines that may be adopted by health facility designers or owners. These policies generally promote good planning, efficiency and flexibility.

The planning policies below are included in these Guidelines so that in the process of briefing, designers or clients can simply refer to them by name or require compliance from others.

Loose Fit

Loose Fit is the opposite of Tight Fit. This policy refers to a type of plan which is not so tightly configured around only one operational policy that it is incapable of adapting to another.

In healthcare, operational policies change frequently. The average cycle seems to be around five years. It may be a result of management change, government policy change, turnover of key staff or change in the marketplace. On the other hand, major health facilities are typically designed for 30 years but tend to last more than 50 years. This immediately presents a conflict, for example, if a major hospital is designed very tightly around the operational policies of the day or the opinion of a few individuals (who may leave at any time) then a significant investment may be at risk of early obsolescence.

The Loose Fit Planning Policy refers to planning models which can not only adequately respond to today's operational policies but have the inherent flexibility to adapt to a range of alternative, proven and forward-looking policies.

At macro level, many of the commonly adopted health facility planning models, including those enclosed within these Guidelines, have proven flexible in accommodating multiple operational policies.

At micro level, designers should consider simple, well-proportioned, regular-shaped rooms with good access to simple circulation networks that are uncomplicated by a desire to create interest. Interior features should not be achieved by creating unnecessary complexity.

Change by Management

This concept refers to plans which allow for changes in operating mode as a function of management rather than physical building changes. For example, two Inpatient Units can be designed back-to-back so that a range of rooms can be shared. The shared section may be capable of isolation from one or the other Inpatient Unit by a set of doors. This type of sharing is commonly referred to as Swing Beds. It represents a change to the size of one Inpatient
Unit without any need to expand the unit or make any physical changes.

The same concept can be applied to a range of planning models to achieve greater flexibility for management. Further information on other planning policies is included in this section.

Overflow Design

Some functions can be designed to serve as overflow for other areas that are subject to fluctuating demand. For example, a waiting area for an Emergency Unit may be designed so that it can overflow into the hospital’s main entrance waiting area. Alternatively, an Emergency Unit Procedure Room or a Birthing Room may be designed specifically to provide an Emergency Operating Room for Caesarean Sections in case the standard allocated operating room is not available.

Any area that includes bed bays, such as an Emergency Unit, may be designed to absorb the available open space and provide room for additional beds in case of natural disasters.

Progressive Shutdown

Even large facilities may be subject to fluctuating demand. It is desirable to implement a Progressive Shutdown policy to close off certain sections when they are not in use, allowing for savings in energy, maintenance and staff costs.

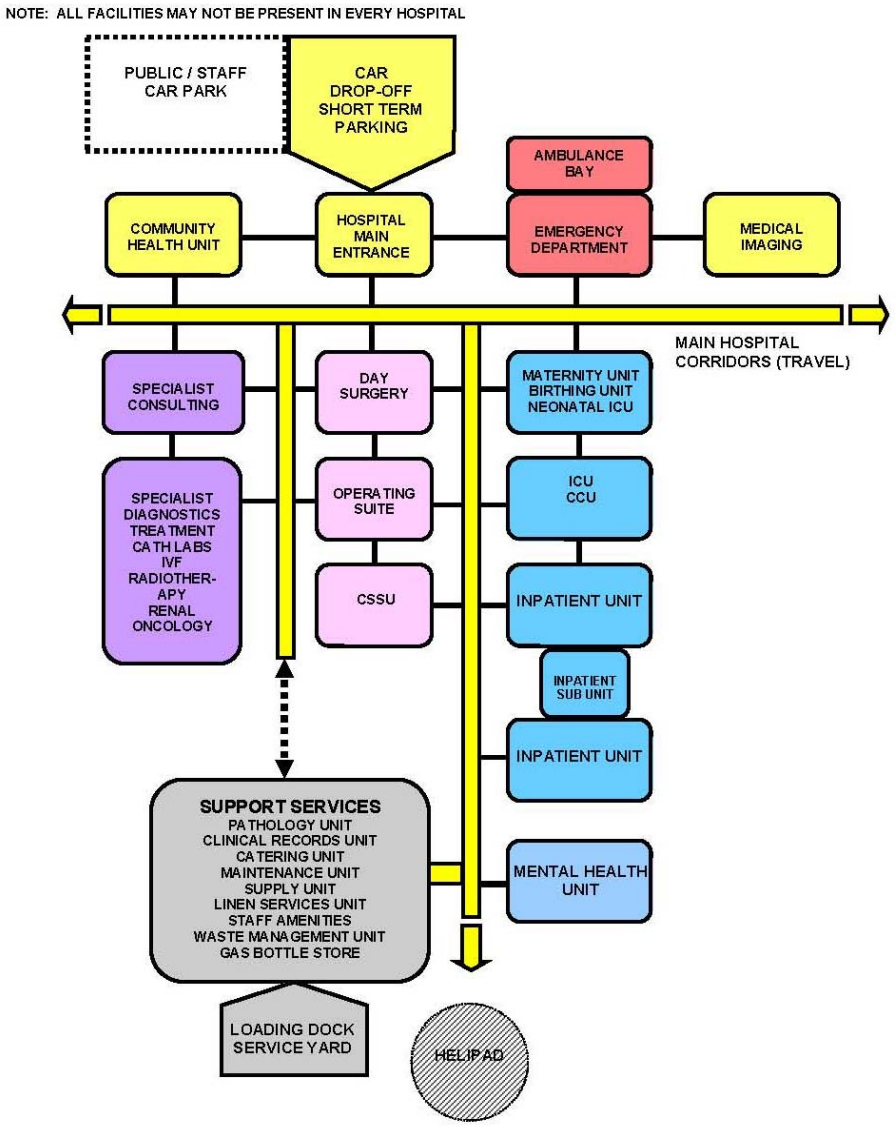
It also concentrates the staff around patients and improves communication and security. In designing for Progressive Shutdown, designers must ensure:

- None of the requirements of these Guidelines are compromised in the remaining open sections
- The open sections comply with other statutory requirements, such as fire egress
- The open patient care sections maintain the level of observation required by these Guidelines
- In the closed sections, lights and air-conditioning can be shut off independently from other areas
- The closed sections are not required as a thoroughfare for access to other functions
- Nurse Call and other communication systems can adapt to the shut-down mode appropriately
- The shut-down strategy allows access to items requiring routine maintenance.

Open-Ended Planning

A health facility designed within a 'finite' shape, where various departments and functions are located with correct internal relationships may look and function very well at first, however any expansion will be difficult. Some expansion requirements can be accommodated in new external buildings with covered links but over time the site will become complicated with random buildings and long walkways.

The opposite of this scenario is to use 'Open Ended Planning' – planning models and architectural shapes that have the capability to grow, change and develop additional wings (horizontally or vertically) in a controlled way. As an example, a typical health facility flow diagram which promotes Open Ended Planning is represented below.



Below are some of the concepts involved in Open Ended Planning Policies:

- Major corridors should be located so that they can be extended outside the building
- As far as possible, FPUs should have one side exposed to the outside to permit possible expansion
- If a critical FPU must be internal, it should be adjacent to other areas that can be relocated, such as large stores or administration areas
- External shapes should not be finite
- External shapes should be capable of expansion
- Finite shapes may be reserved for one-off feature elements such as a Main Entrance Foyer
- Roof design should consider expansion in a variety of directions
- Avoid FPUs that are totally land-locked between major corridors
- Stairs should not be designed to block the end of major corridors
- The overall facility flow diagram should be capable of linear or radial expansion whilst keeping all the desirable relationships intact
- Fixed internal services such as plant rooms, risers, service cupboards should be placed along major corridors rather than in the center of FPUs.

Open Ended Planning Policies can be applied to entire facilities as well as individual FPUs.

Modular Design

This is the concept of designing a facility by combining perfectly designed standard components. For example, a designer may create a range of Patient Bedrooms, a range of Utility Rooms and other common rooms that are based on a regular grid such as 600mm. These rooms can then be combined to create larger planning units such as an Inpatient Unit.
The Inpatient Unit can then be used as a module and repeated a number of times, as required.

This approach, in the hands of a skilled designer, has many benefits as modules can be designed only once to perfection and repeated throughout the facility. No redesign is necessary to adjust to different planning configurations, instead the plan is assembled to adapt to the modules with errors in both design and construction minimized.

The opposite to this approach is to start from a different architectural shape for each FPU, divide it into various shapes for the rooms, then design the interior of each room independently. This approach, in the hands of a skilled designer, can also result in satisfactory solutions but at a higher risk of errors and at a greater cost. For example, in a typical health facility, one might find 10 Dirty Utility Rooms which are entirely different.

Modular Design should not necessarily be seen as a limitation to the designer's creativity, but a tool to achieve better results. Designers are encouraged to consult with clients and user groups to agree on perfect modules, then adopt them across all FPUs.

Universal Design

This concept is similar to Modular Design. Universal Design refers to Modules (or standard components) designed to perform multiple functions by management choice.

For example, a typical single Patient Bedroom can be designed to suit a variety of disciplines including Medical/Surgical/Maternity and Orthopedics. Such a room can be standardized across all compatible Inpatient Units, permitting a change of use between departments if the need arises. Universal Design must take into account the requirements of all compatible uses and allow for all of them. The opposite of this policy is to ‘specialize’ the design of each component to the point of inflexibility.

Other examples of Universal Design are as follows:
- Universal Operating Rooms which suit a range of operations
- Bed cubicles in Day Surgery which suit both Pre-operative and Post-operative functions
- Offices which are standardized into only a limited number of types for example 9m² and 12m²
- Toilets may all be designed for disabled access or as unisex.

The main point of Universal Design is to resist unnecessary variation in similar components, where the change in functionality can be accommodated in one standard design.

Single Handing

It is common practice to design identical and adjoining planning modules in mirror image, as this is believed to be more economical. This is most common in the assembly of Patient Bedrooms with Ensuites.

The concept of Single Handing is the exact opposite. Single Handing refers to situations where mirror image (Handing) may not be necessary.

In areas requiring a high level of staff training, such as in operating suites, it may be more appropriate to ‘hand’ all key rooms in an identical manner. This makes the task of staff training easier and may also reduce the possibility of mistakes.

In a hypothetical example, a staff member entering any operating room, regardless of its location and approach from the corridor will find the service panel on the left, X-Ray viewer on the right and door to the Sterile Stock Room in the front.

In another example, at micro level, medical gases may always be located to the left side of the patient's bed-head, regardless of the direction of approach.

Note: Single Handing is a matter of individual choice and may not suit all conditions.

Natural Disaster

All health facilities should be capable of continued operation during and after a natural disaster, except in instances where a facility sustains primary impact. This means that special design consideration is needed to protect essential services such as emergency power generation, heating and/or cooling systems, water supply etc. Typical problems such as disruption to public utilities including water or sewer mains and energy supplies may affect the operation of onsite services.

Appropriate construction detailing and structural provision shall be made to protect occupants and to ensure continuity of essential services in areas where there is a history of earthquakes, cyclones, flooding, bushfires or other natural disasters.

Consideration shall be given to possible flood effects when selecting and developing a site. Where possible, facilities shall NOT be located on designated flood plains. Where this is unavoidable, take extra care when selecting structural and construction methodology and incorporate protective measures against flooding into the design.

Facilities shall be designed and constructed to withstand the minimum earthquake design loads on structures.

In cyclonic areas, special attention shall be given not only to protection against the effects of the direct force of wind (structural detailing, special cladding fixings, cyclonic glazing etc.) but also against such things as wind-generated projectiles (trees, cladding, fencing etc.) and localized flooding.

In all cases, effective long-range communications systems which do not rely on ground lines to function, are essential.

Consultation with Emergency Services is recommended to ensure arrangements are in place for emergency long-range communications assistance in the event of emergency situations or a major disaster.

4.3 Local Design Regulations

Typical design criteria for health facilities in the United Arab Emirates include the following:

- Access to Recovery areas for relatives
- Separation of male and female recovery areas
- Separation of male and female waiting areas
- Larger family waiting areas
- The provision of prayer rooms
- Independent male and female Inpatient Unit accommodation.

Prayer Rooms

The typical health facility should respect the local customs of the population. Prayer Rooms in evenly spread locations throughout the facility are required. There should be separate Prayer Rooms for males and females. The following considerations should be given to Prayer Rooms:

The location of the Prayer Room should be in an accessible area but away from noise, distraction and heavy clinical traffic

Orientation of the Prayer Room is important; appropriate location of entrance into the Prayer Room is essential

An Airlock to the Prayer Room is desirable; this may accommodate hand basin for ablution, shoe racks, bag lockers and coat hooks, as deemed necessary

Appropriate finishes on the floor and walls is desirable

Windows are desirable.

4.4 Land Area Measurement Methodology and Definitions

Building Footprint

Building Footprint represents the Ground Floor Area (which is the Gross Floor Area of the Ground Floor level).

For External Services allow the following areas:

- External Services (cables, pipes, water tanks, etc.) = 15% of Ground Floor Area
- Footpath/s = 10% of Ground Floor Area
- Landscaping = 15% of Ground Floor Area

Total allowances for external area (except parking) = 40% (open space excluding car park).

Land Area

Land Area required for a health facility represents:

Ground Floor Area (GFA of the Ground level) + Total Allowance for External Services (40%) + Car Parking Allowance (35m² per car, if on ground level).

4.5 Floor Area Measurement Methodology, Definitions and Diagrams

Within these Guidelines, room areas, departmental boundaries, Travel and Engineering are defined and calculated according to the following standards.

4.5.1 How to Measure Floor Areas

To measure drawings, the following measurement technique will apply.

Rooms

Room areas are measured as follows:

- To the inside face of outside walls
- To the center of walls to adjoining rooms
- To the full thickness of corridor walls facing rooms
- To the center of departmental boundary walls (except where boundary wall adjoins a corridor).

Areas not included are:

- Circulation % (represented by departmental corridors)
- Service risers, service cupboards and Plant Rooms
- Fire hose reels, fire stairs, lift shafts.

Departments

The gross FPU (Departmental) area is the sum of the room areas within the FPU plus circulation – internal corridors, measured as follows:

- FPU areas are measured to the face of corridor walls
- To the inside face of outside walls.

Areas not included are:
- Service risers, service cupboards and Plant Rooms
- Fire hose reels, fire stairs, lift shafts.

Travel

Travel includes:
- Corridors between Departments (FPUs), measured as follows:
  - To the face of corridor walls
  - To the inside face of outside walls
- Stairs including fire stairs
- Internal fire stairs and ramps.

Areas not included are:
- Service risers and cupboards
- Fire hose reels, lift shafts
- Plant Rooms.

Engineering

Engineering includes:
- Plant Rooms, fire hose reels and service cupboards, measured as follows:
  - To the center of adjoining walls
  - To the inside face of outside walls
  - To the full thickness of riser walls.

Areas not included are lift shafts (the void area).

4.5.2 Impact of Wall Thickness

The minimum room sizes in these Guidelines assume wall thicknesses of 100mm. For wall thicknesses of more than 120mm, the minimum area of the room (as measured in accordance with these Guidelines) shall be increased to compensate for the greater wall thickness. Refer to Area Measurement Diagrams attached below for a visual representation of these area measurements.

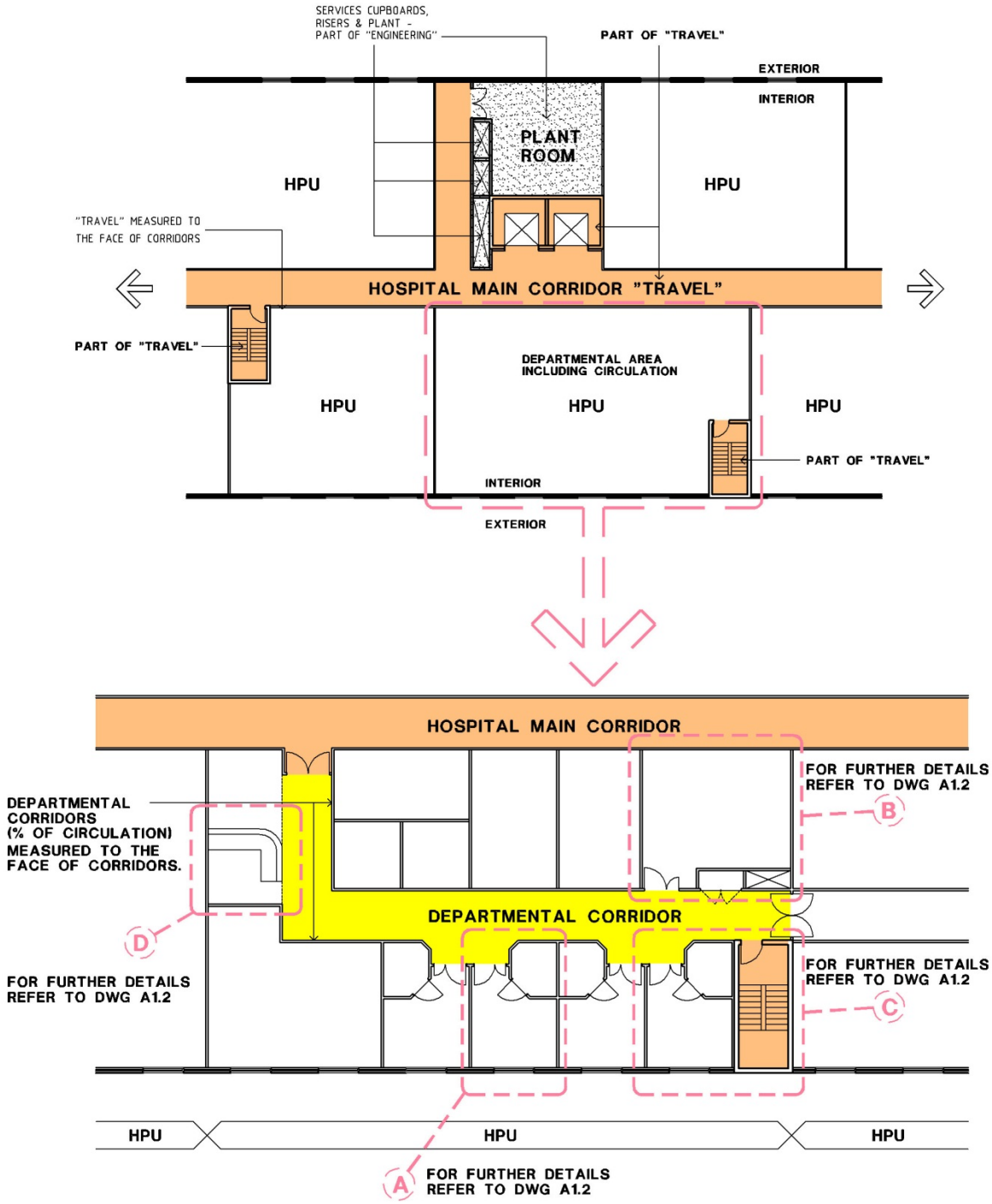
4.5.3 Gross Floor Area

Gross Floor Area (GFA) represents the sum of the Departmental areas on the floor, measured as described in Departments above plus Travel (measured as described in Travel above) plus Engineering areas (measured as described in Engineering above).

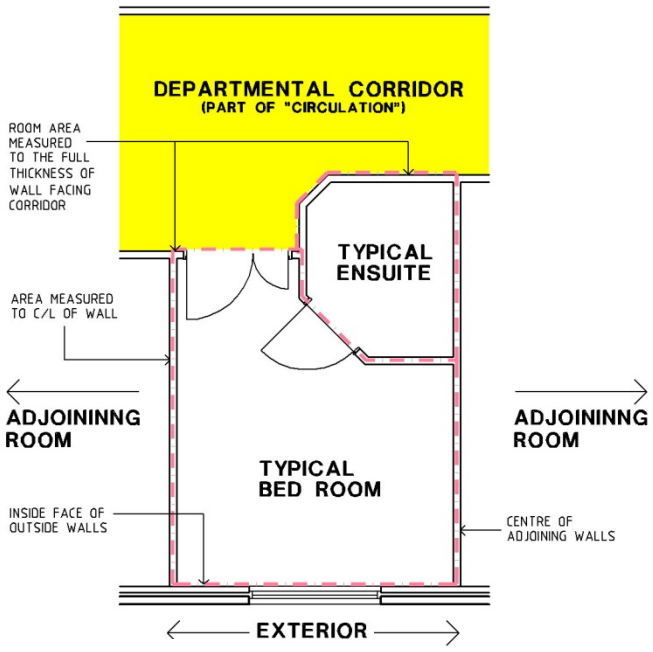
4.5.4 Area Measurement Diagrams

The above measurement descriptions are represented below diagrammatically.

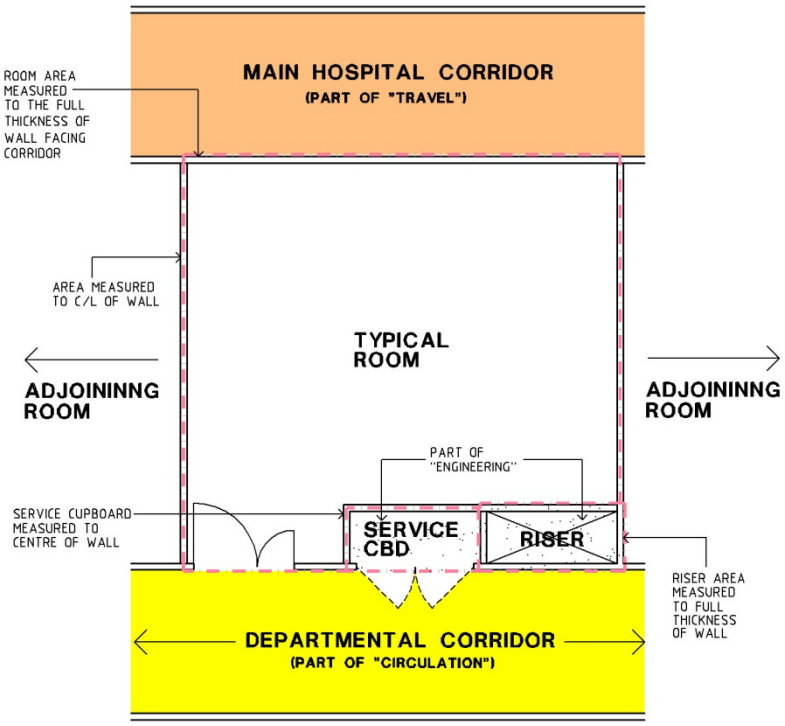
Measurement of Departments, Travel



Measurement of Rooms, Corridors, Travel

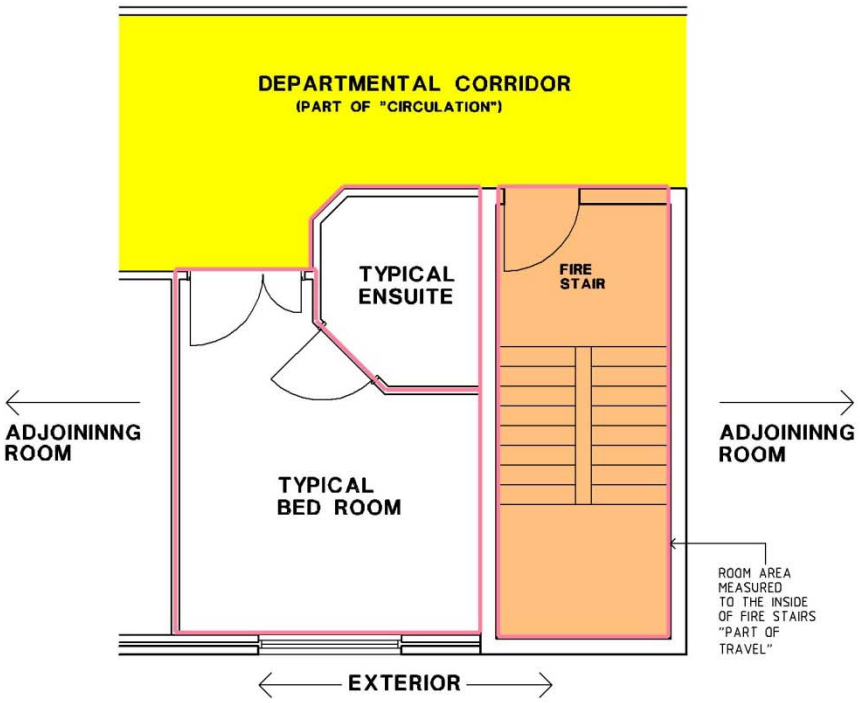


A – Typical Bed Room and Ensuite

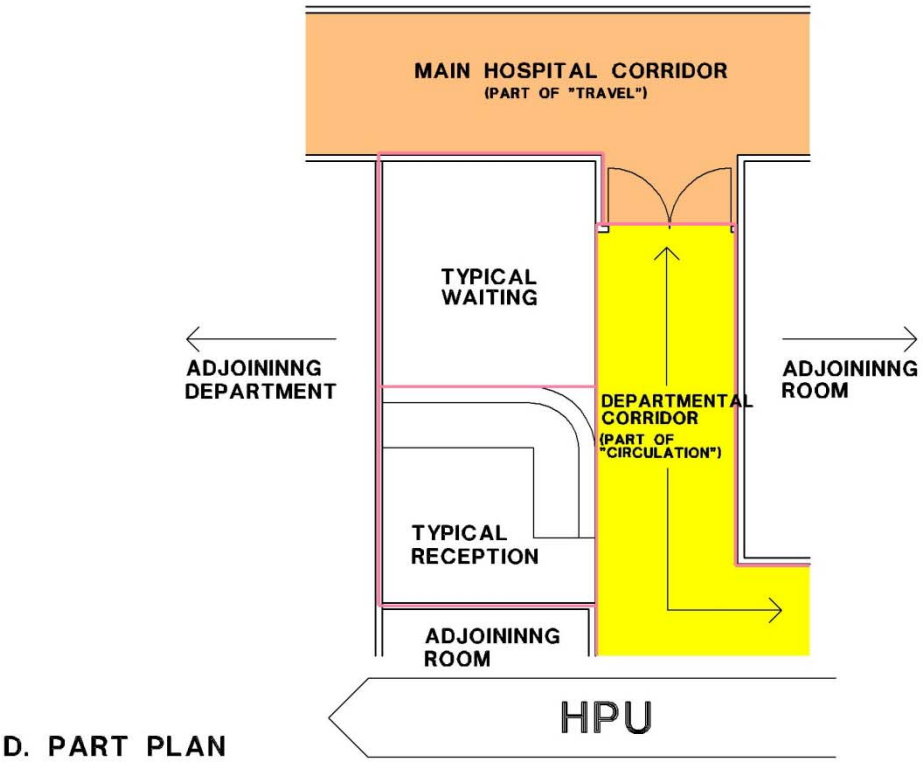


B – Typical Room adjoining Departmental Corridor and Travel Corridor

Measurement of Rooms, Corridors, Travel



C – Typical Bed Room adjoining Stairwell



D – Typical Reception adjoining Departmental Corridor

4.6 Parking and Vehicular Access

4.6.1 Introduction

In a new health facility development, planned parking and vehicular access is essential and should be provided based on health facility functions, available staff, community needs and space available.

The parking should provide an adequate number of spaces for vehicles including cars, commercial vehicles, emergency vehicles and two-wheelers such as motorcycles, scooters and bicycles. Access to and from parking areas should meet applicable disability standards and other relevant local safety standards.

4.6.2 General Design Guidelines

Physical Location

Various circumstances may dictate the location of the parking such as:

- Location of the Emergency Department
- Location of the Main Waiting area
- Proximity to staff, patients and other users
- Practicality of consolidated parking versus spread-out parking
- Transport policy objectives determined by the local Road Transportation Authority
- Any other specific services offered at the health facility.

Physical Characteristics

The physical characteristics of a car park must meet the needs of different types of vehicles in use or expected to be in use.

For private and emergency vehicles, the car park or drop-off areas should adhere to local building authority guidelines. For emergency areas, designated ambulance drop-off and parking is essential for the safety and well-being of patients and staff. Clear access ways and designated parking spots shall be demarcated to avoid misuse.

For commercial and service vehicles such as delivery and waste management trucks, loading docks should be designed that are compatible with the type of vehicles to be used or expected to be used in the future. Traffic controls may need to be provided to segregate vehicles according to their use. For example, loading/unloading areas for a 'Clean' delivery truck and a waste management truck. Similarly, access points and access ways through the site need to be designed so that patient access does not interfere with emergency and service vehicle access.

Disabled Access Parking

All access to and from the car park will need to adhere to applicable disability guidelines. Parking spaces for use by people with disabilities should be in accordance with such guidelines. A parking space for a person with a disability should consist of an unobstructed area with a firm and level surface and a fall not exceeding the minimum requirements of the local disability code. Space width and overlap allowances also need to be designed in accordance with such codes.

A continuous, accessible path of travel should be provided between each parking space to an accessible entrance/lift. Parking spaces should be identified by a sign incorporating the international symbol of access for people with disabilities.

Community Safety

Car parking and vehicular access ways should provide a safe environment for users. Clear sightlines should be provided throughout the car parking areas to enhance safety and prevent confusion. Car parks should be directly linked to accessible pedestrian pathways leading directly to the main building or reception areas. Adequate lighting is essential after-hours for patients and staff to access their vehicles. Communication and security systems may be installed in large car parks depending on the location, function and layout. Adequate traffic controls may be required to safely navigate pedestrian and vehicular traffic through the parking area; this could be achieved through signage or other electronic controls.

Access ways and parking spots for emergency vehicles should kept clear of any public interference for the wellbeing of both patients and the general public. Loading and unloading areas should follow minimum applicable standards for Occupational Safety and Health (OSH). This shall include adequate lighting, clear access ways and designated parking spots. Communications and security systems may be installed to monitor areas that have low frequency of visitors or vehicular access.

Landscaping and Signage

Car parks should generally be attractive and pleasant spaces that are aesthetically designed for public and private use. To avoid unattractive expanses of paving, vegetation may be used to soften the visual impact; landscaping should generally respect the terrain of the land.

Trees may be utilized to provide greenery as well as shade during summer months. Plants should be selected that have vigorous growth, longevity, minimal maintenance and ample shade. Care should be taken that sub-soil drainage is provided for all trees and adequate drainage is provided for surface water run-off from paved areas.

Wayfinding and signage are important elements that safely guide patients and staff to and from the health facility. Signage should prominently highlight pedestrian/disabled access ways. Clear directions to the nearest stairwell or lift should be posted at prominent locations or at proper intervals.

Proper signage also helps visitors to identify a particular location so that they are able to access their vehicles in an easy and timely manner. Care should be taken that exit and direction signs are clearly visible to avoid incidents and security systems may be installed to discourage miscreants.

Maintenance

The design of car parks and vehicular access ways should aim to achieve minimum maintenance. Elements such as signs, landscape, barriers etc. should be designed to ensure minimal maintenance and discourage vandalism. For example, sealed pavement may be used instead of gravel that requires constant maintenance.

4.6.3 Healthcare Facility and Community Land Use Policies

Travel associated with community and health facility land use covers a range of purposes including the journey to work, personal business and recreation. Modes of travel vary depending on the prevalent functions associated with the health facility. For example, the local authority may require a drop-off/pick-up area for public transportation. Some communities encourage sustainable lifestyles and may require bicycle parking or direct pedestrian access from main arterial roads. Ready access to public transport is often particularly important because of the absence of viable alternatives for the community.

The design of the health facility should ensure that due consideration is given to policies laid by the applicable authority with regard to community land use and the amenities required for such land use. The safety of all users at all times is essential and care should be taken that no safety hazards are created by the provision of access and parking facilities for a development.

4.6.4 *Car Parking Calculations*

Designers of health facilities should refer to local guidelines for calculating the number of parking spaces required for the facility.

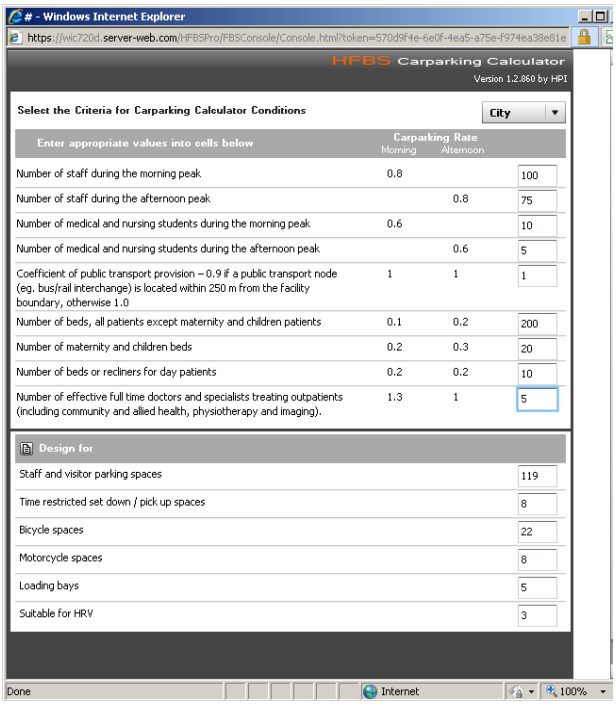
Parking Rates

The following car parking rates apply to health facilities (these rates represent the minimum requirements by SHCC; other applicable authority's requirements should be followed if they exceed these rates).

Land Use Description	Parking Rate	Unit
Hospital	1.49	Per Bed
Clinic and Medical Center	4.0	Per 100m² GFA (Gross Floor Area)
Day Procedure Center	4.0	Per 100m² GFA
Diagnostic Center	4.0	Per 100m² GFA
Rehabilitation Center	4.0	Per 100m² GFA
Pharmaceutical Facility	2.15	Per 100m² GFA
General Retail Areas	2.15	Per 100m² GFA
Office Areas	2.6	Per 100m² GFA
Mobile Unit	4.0	Per 100m² GFA
Mosque	6.26	Per 100m² GFA
Library	2.1	Per 100m² GFA

Health Facility Briefing System (HFBS) Car Parking Calculator

The Health Facility Briefing System (HFBS) provides a tool that designers can use to rapidly and accurately estimate the number of parking spaces required for cars, trucks and other vehicles. The tool is based on algorithms devised by transportation experts. Based on a set of nine questions related to the number of staff and beds, the tool is able to accurately predict the estimated car parking load for the health facility. HFBS can be accessed on the website: [www. healthdesign. com. au](http://www.healthdesign.com.au)



Above: Car Parking Calculator – Health Facility Briefing System (HFBS)

4.6.5 Car Parking Design

Parking bays may be organized in a variety of arrangements including 30^0, 45^0, 60^0 and 90^0 with single or two-way aisles. The preferred parking angle is 90^0 which allows for the flexibility of two-way aisles.

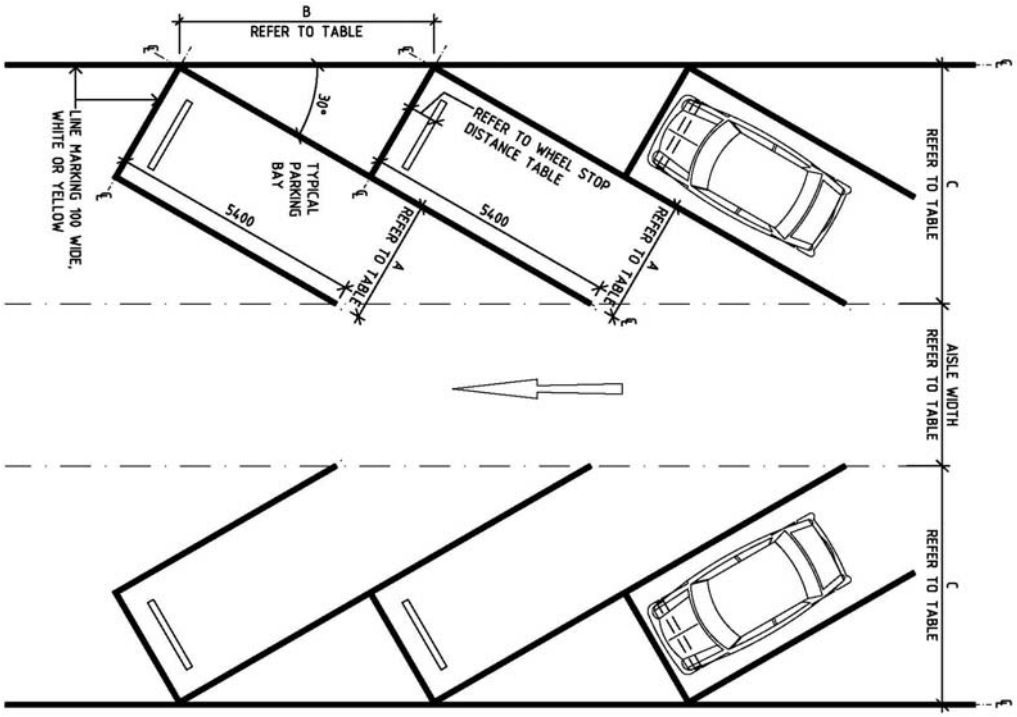
Allow an area of 35m² for a typical car parking space; this allowance includes the aisle space required.

Car Park Bay Dimensions

Provide the following minimum car parking bay dimensions:

Bays at 30^0:

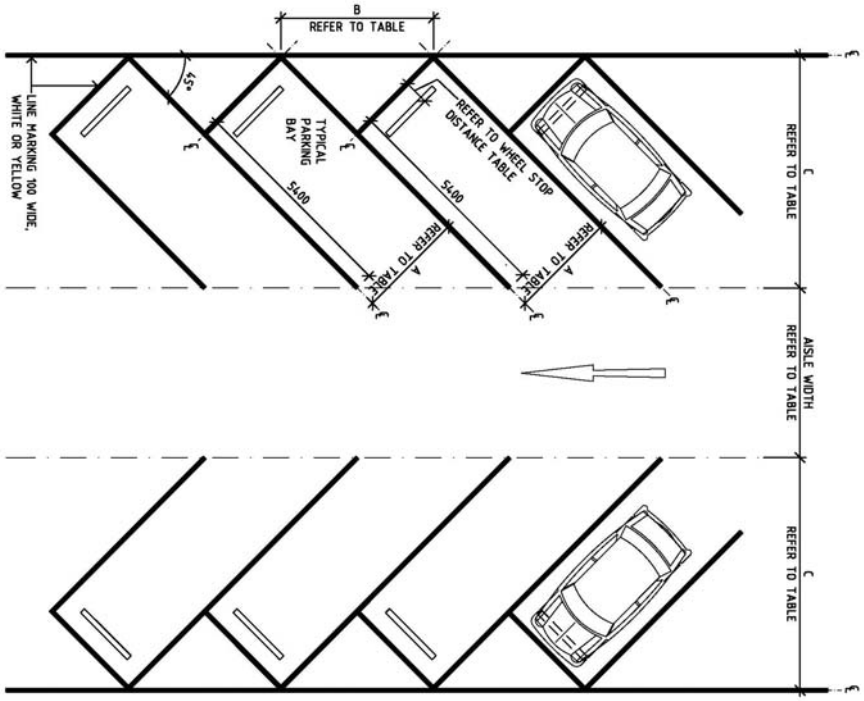
Classification	**Dimension A mm** Bay Width	**Dimension B mm** Bay Width	**Dimension C mm** Bay Length to wall or high kerb with no overhang	**Dimension C mm** Bay Length to low kerb which allows 600mm overhang	**Dimension C mm** Bay Length with wheel stops*	**Aisle Width mm**
Employee and Commuter parking; staff only (all day)	2100	4200	4400	4100	4500	3100
Hospital and Medical Centers (mix of patient and staff parking)	2500	5000	4400	4100	4900	2900



Above: Typical Car Parking Bays at 30^0

Bays at 45^0:

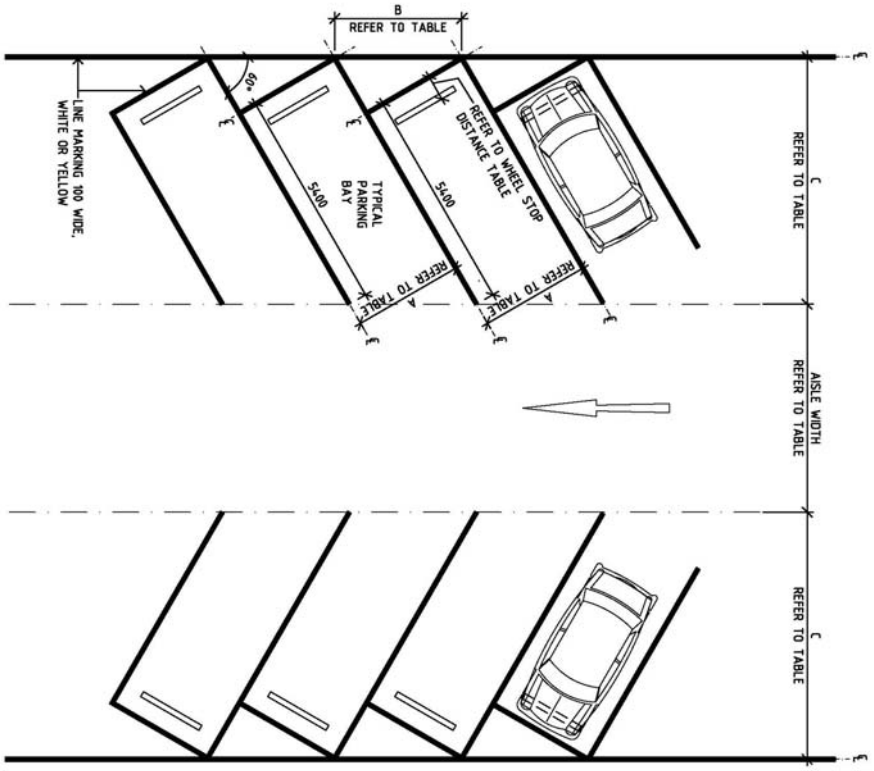
Classification	Dimension A Mm Bay Width	Dimension B Mm Bay Width	Dimension C Mm Bay Length to wall or high kerb with no overhang	Dimension C Mm Bay Length to low kerb which allows 600mm overhang	Dimension C Mm Bay Length with wheel stops*	Aisle Width mm
Employee and Commuter parking; staff only (all day)	2400	3400	5200	4800	5500	3900
Hospital and Medical Centers (mix of patient and staff parking)	2600	3700	5200	4800	5700	3500



Above: Typical Car Parking Bays at 45^0

Bays at 60^0:

Classification	Dimension A mm Bay Width	Dimension B mm Bay Width	Dimension C mm Bay Length to wall or high kerb with no overhang	Dimension C mm Bay Length to low kerb which allows 600mm overhang	Dimension C mm Bay Length with wheel stops*	Aisle Width mm
Employee and Commuter parking; staff only (all day)	2400	2750	5700	5100	5900	4900
Hospital and Medical Centers (mix of patient and staff parking)	2600	3000	5700	5100	6000	4300



Above: Typical Car Parking Bays at 60^0

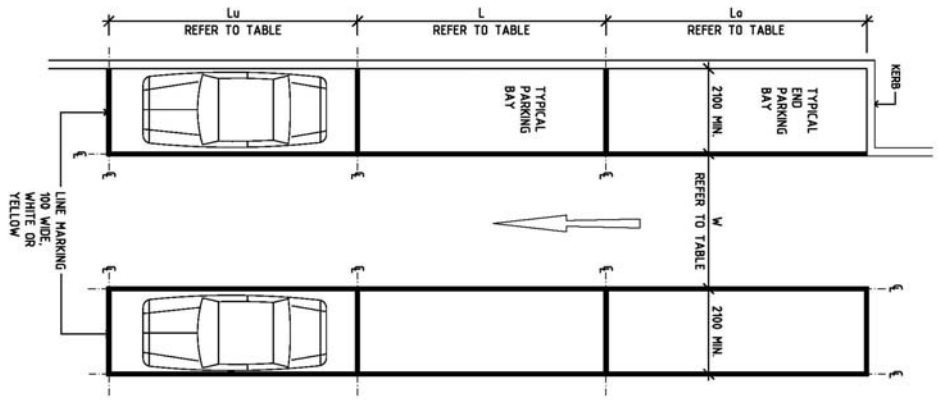
Parallel Parking Bays

Provide the following minimum dimensions for parallel parking with a one-way aisle:

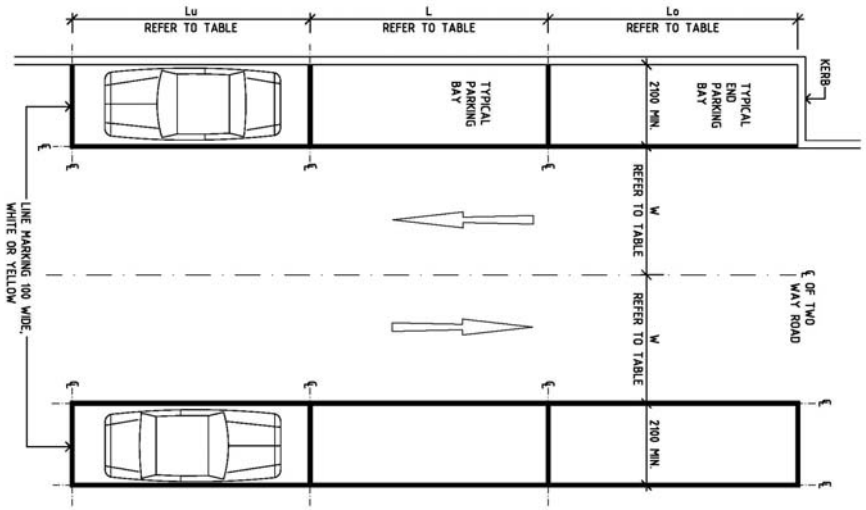
Aisle Width One way W	Space Length L	Space Length Obstructed end spaces L_0	Space Length Unobstructed end spaces L_u
3000	6300	6600	5400
3300	6100	6400	5400
3600	5900	6200	5400

Parallel spaces shall be located at least 300mm clear of obstructions higher than 150mm such as walls, fences and columns. If the opposite side of the aisle is bounded by obstructions higher than 150mm, then the aisle width (W) should be increased by at least 300mm.
If a single space is obstructed at both ends the dimensions of the space shall be increased by 300mm.

For parallel parking on both sides with a two-way aisle, the aisle width identified for one-way traffic (W) above shall be doubled.



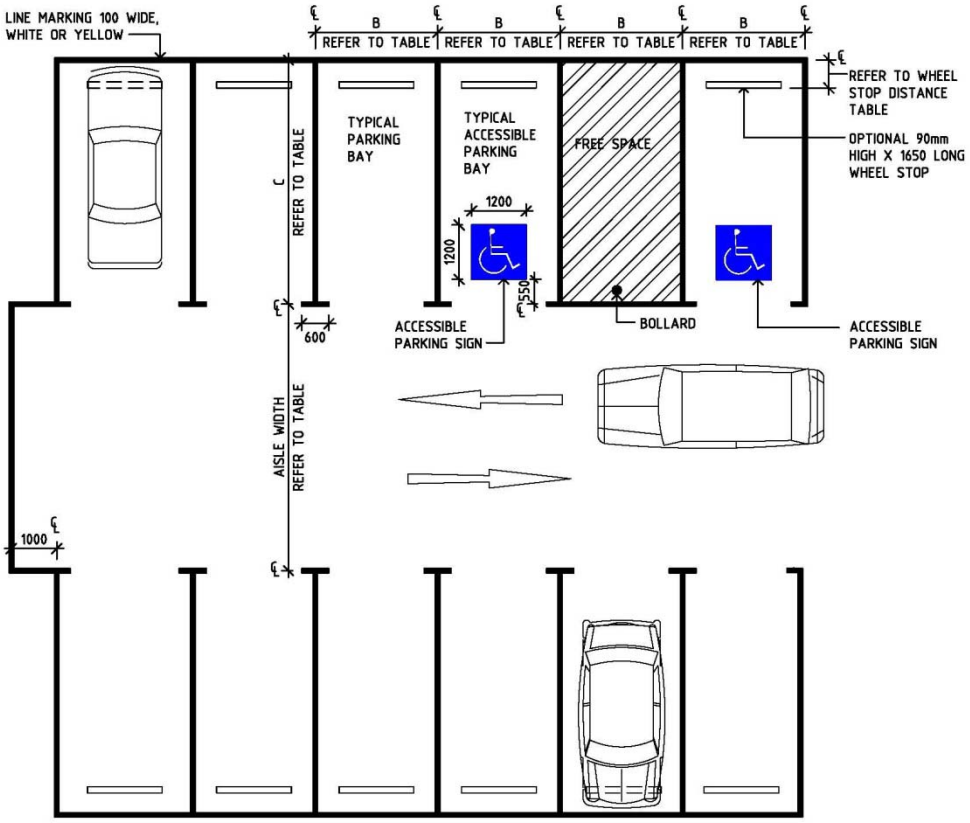
Above: Parallel Parking on Both Sides of a One-Way Aisle



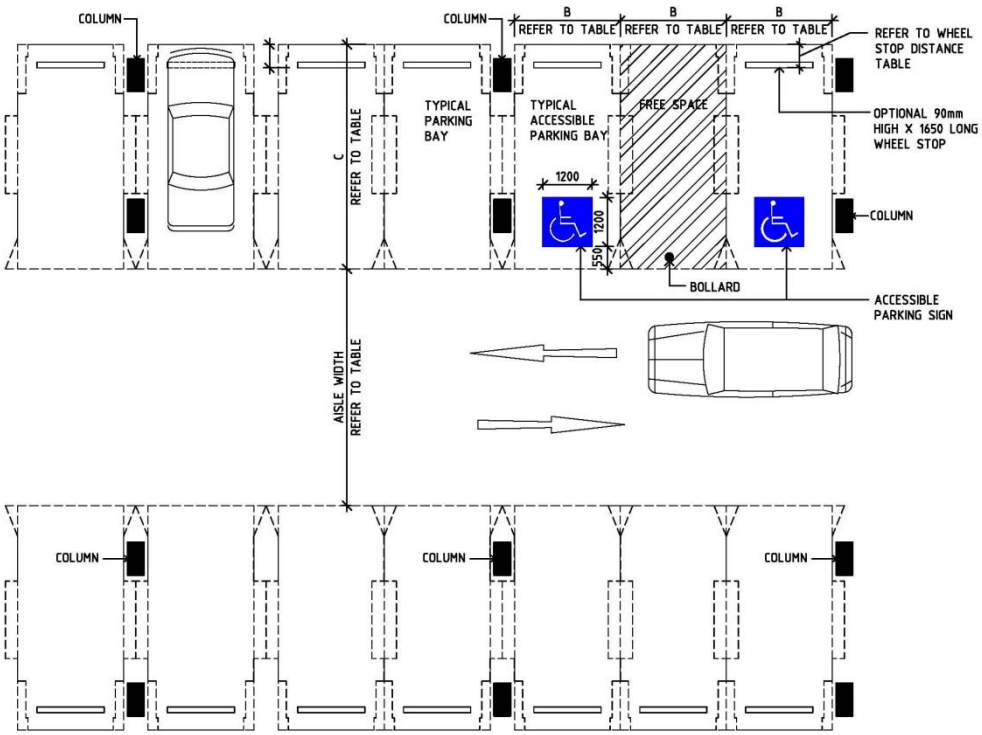
Above: Parallel Parking on Both Sides of a Two-Way Aisle

Bays at 90^0:

Classification	Dimension A mm Bay Width	Dimension B mm Bay Width	Dimension C mm Bay Length to wall or high kerb with no overhang	Dimension C mm Bay Length to low kerb which allows 600mm overhang	Dimension C mm Bay Length with wheel stops*	Aisle Width mm
Employee and Commuter parking; staff only (all day)	2400	2400	5400	4800	5400	6200
Hospital and Medical Centers (mix of patient and staff parking)	2600	2600	5400	4800	5400	5800



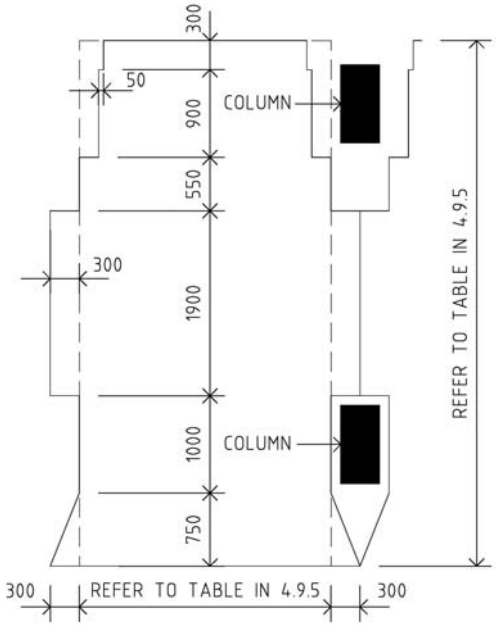
Above: Typical External Use Parking Bays at 90^0



Above: Typical Internal Use Parking Bays at 900 Showing Clearances for Obstructions

Design Envelope For Internal Parking Bay

Use the template below to ensure adequate clearance around columns, walls and obstructions. This template must fit into any internal parking bay without obstruction for columns, walls and bollards.



Above: Template for Clearances within Parking Bay

Parking Aisles

Aisles for 90^0 bays need to allow for two-way traffic. Aisles for 30^0, 45^0 or 60^0 angled bays shall be one-way traffic. Parallel parking bay aisles may be either one-way or two-way traffic. The width of aisles for angled parking bays will vary according to the width of the parking bays; wider bays require less aisle width.

Where there are blind aisles, the aisle shall extend one meter beyond the last parking bay. If the last parking bay is bounded by a wall or a fence, it should be widened by 300mm.

Wheel Stops

Wheel stops may be provided if necessary to limit the travel of a vehicle. Wheel stops should not be used in situations where they are in the path of pedestrians moving to and from parked vehicles or where pedestrians cross a car park. If required, wheel stops are installed at right angles to the direction of parking or where the ends of angled parking form a sawtooth pattern.

If wheel stops are required, install to the front of the car parking space according to the following dimensions.

Parking Direction	Wheel stop Distance to Front of Parking Space			
	Parking to Kerb ≤ 150mm high		Parking to Kerb > 150mm high or wall	
	90mm high wheel stop	100mm high wheel stop	90mm high wheel stop	100mm high wheel stop
Front in parking	630mm	620mm	830mm	820mm
Rear in parking	910mm	900mm	1110mm	1100mm

Accessible Parking Bays

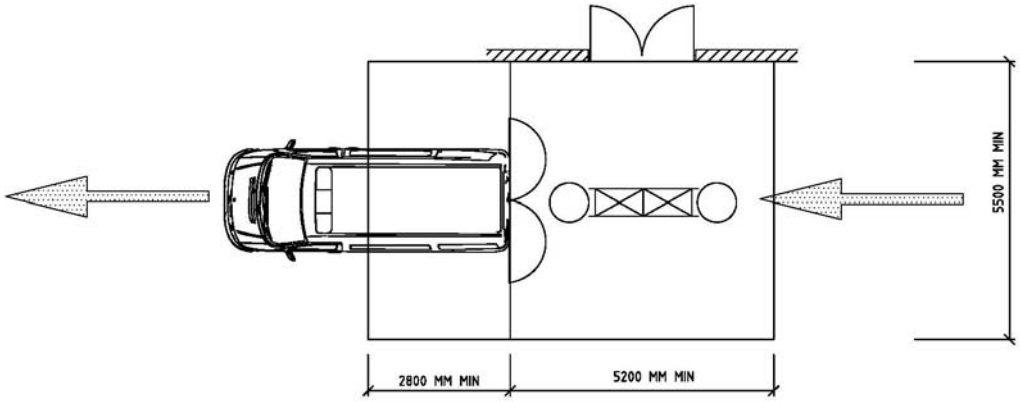
Accessible parking bays shall have the following minimum dimensions with a clearance height of 2500mm from the entry/exit to the bay.

Description	**Width mm**	**Length mm**
Angled Bays ($45–90^0$)	2600	5400
Parallel Bays	3200	7800

A shared area should be provided to the side of the accessible parking bay for loading and unloading; two accessible bays may be located either side of a single shared space.

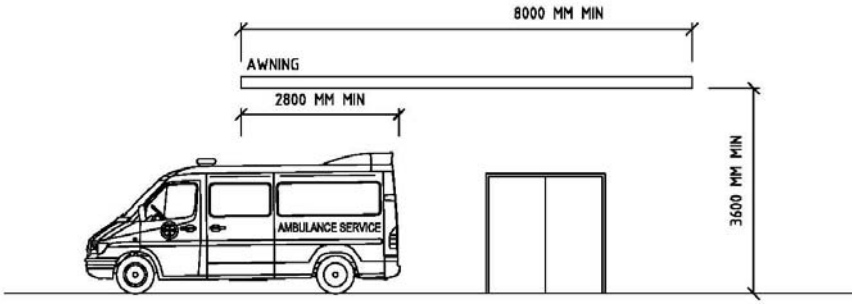
Ambulance Bays

Provide the following minimum drive-through area for ambulances:



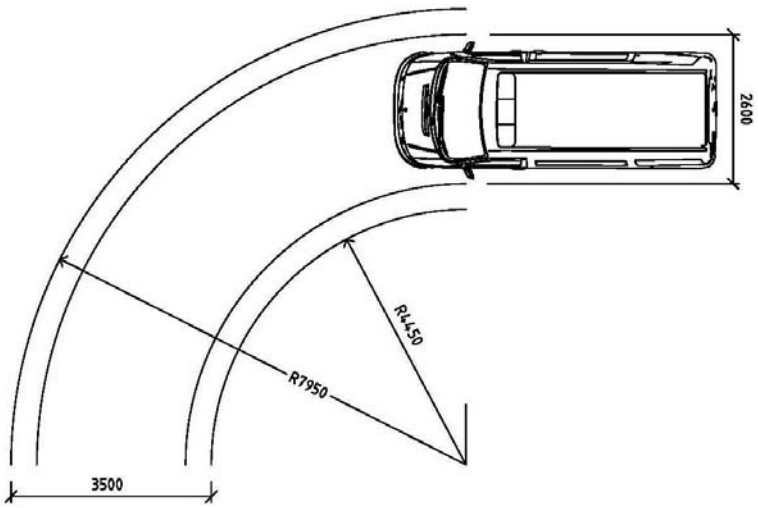
Minimum width is 5200mm; minimum depth is 5500mm.

The ambulance bay requires a covered space with a minimum length of 8000mm and height of 3600mm:



Ambulance Turning Circle

Ambulances will require the following minimum radius for turning:



For additional information on ambulance unit and requirements refer to the Emergency Unit FPU, Functional Areas section of these Guidelines.