

Figure 8.11
Typical Section of Waterfront

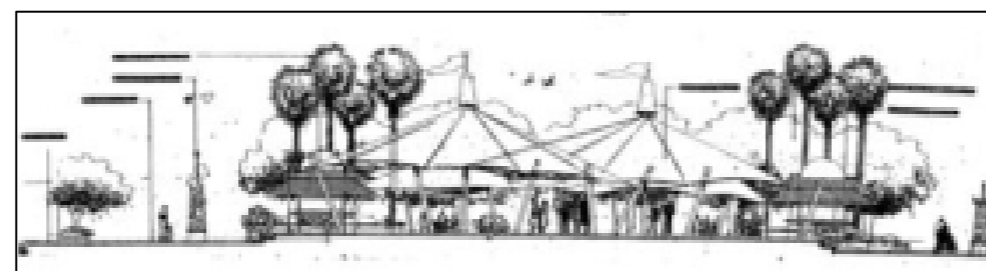


Figure 8.12
Typical Section of Festival

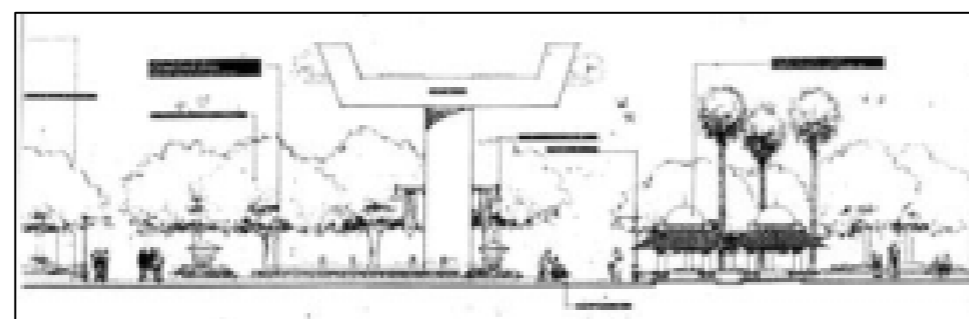


Figure 8.13
Typical Section of Civic

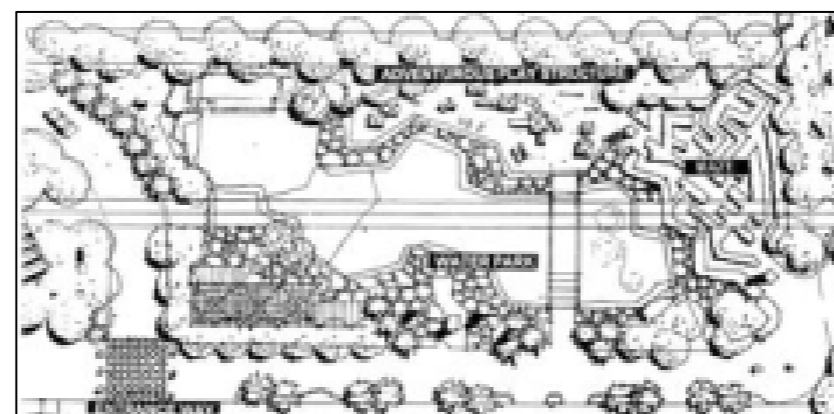


Figure 8.14
Typical Plan of Kiddies Park

URBAN PARK

5. Landscape Elements

- Facilities planned shall cater for the promotion of performing arts, busking, street artist and other public facilities that create a vibrant and lively atmosphere within the space.
- Landscape furniture within the park shall have a coordinated design vocabulary common to each section of the park. Street furniture shall be durable, robust and aesthetically pleasing.
- Type, design and detailing of landscape elements and facilities shall be consistent with the intended character of each section of the Urban Park as highlighted in **Table 8.6**.

Table 8.6 Design Style of Landscape Elements within District Park/Urban Park

Elements	Use/ Location	Design Style	Materials
Paving, Walls and Steps	Various locations, large paved areas for clear circulation	Expansive, formal, geometric	Stone, clay brick, tiles
	Professional ground	Formal, linear	Stone
Site Furniture	Regularly laid out to reinforce the geometry	Decorative, traditional	Sustainable hardwood, tiles
Lighting	Spedally designed lighting columns, regularly laid out to reinforce the geometry	Traditional, formal, large scale	Aluminium, steel
Drainage	Enclosed drainage in paved areas located away from the focus of attention	Enclosed drainage	Stone finish to match paving
Decorative Accessories	Symmetrically and formally arranged pots and ornament	Decorative, traditional	Stone, clay
Structures and Shelters	Shade structure for seating, possible pavilion	Traditional	Metal, tiles to concrete
Signage	Entrance feature and only where absolutely when necessary	Decorative and subtle	Engraved stone and metal
Fences, Gates and Barriers	To form entrance features	Traditional	Formed concrete with patterns
Water Features	Main feature of the park	Expansive, calm, symmetrical	Stone, tiles, patterning
Art in the Environment	Secondary feature not in competition with the pool	Symbolic, large scale	Natural materials

Source: Putrajaya Federal Government Administrative Centre Peripheral Areas: Urban Design Analysis and Strategy, Volume 3, Part 5(b): Landscape, 1 Dec 1998.

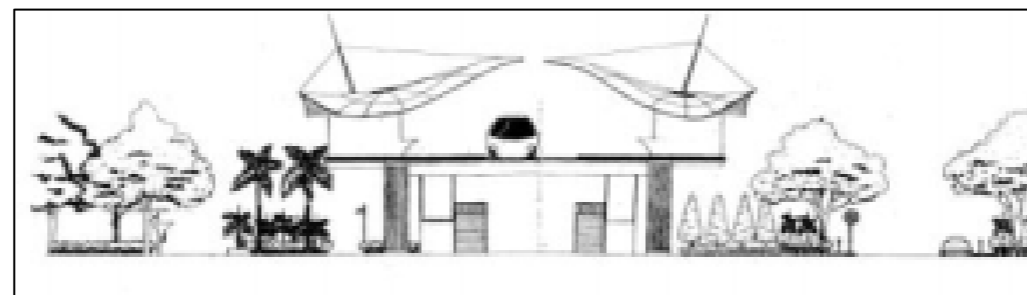


Figure 8.15
Typical Section of Station Plaza

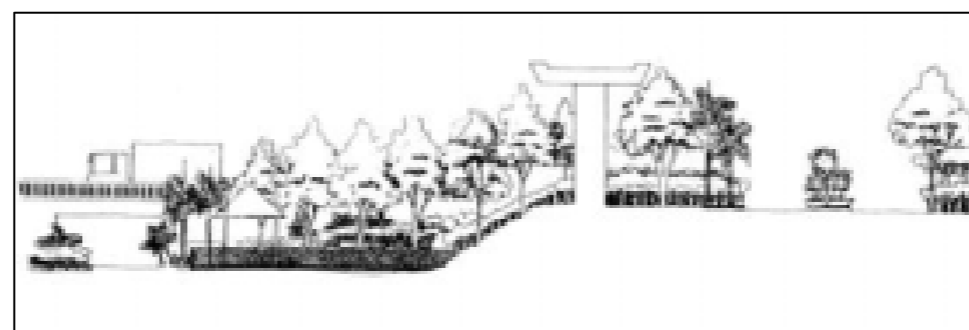


Figure 8.16
Typical Section of Sanctuary Garden



Figure 8.17
Typical Section of Adventure Plaza

URBAN PARK

- Light levels shall be adequate enough to provide a safe public environment within the park.
- The quality of materials, finish and design should be of a superior quality to enhance the overall atmosphere of the civic space and maintain and up lift civic pride
- Composition of soft and hard landscape within each part shall conform to the requirements as indicated in **Table 8.7**.

Table 8.7 Composition of Soft and Hard Landscape Within District Park/Urban Park

Section Of Urban Park	Softscape	Hardscape
Waterfront Plaza	20%	80%
Festival Square	50%	50%
Civic Plaza	50%	50%
Kiddies Park	70%	30%
Station Plaza	40%	60%
Sanctuary Garden	20%	80%
Adventure Plaza	60%	40%

8.7 Local Park

Local Park is an open space that provides short distance recreational facilities for local population of various Planning Blocks within the Local Plan Area.

8.5.1 Location and Size

Local Parks within the Local Plan Area are located in PB8.1, PB9.1 and PB10.3.

8.5.2 Function

As Local Park, these parks shall serve to provide recreational open spaces for local population living within its catchments area, namely several Planning Blocks in the Local Plan Area. The recreational facilities shall be more towards community recreational facilities of a lower hierarchy than Metropolitan Park and Urban Park.

8.5.3 Character

Local Park shall generally provide outdoor and active recreational facilities within an informal environment.

LOCAL PARK

1. Facilities

- Facilities for local park shall include: -
- i. Active recreational facilities such as numerous ball courts and pitches
- ii. Children play area/equipment
- iii. Footpath
- iv. Exercise Stations
- v. Associated amenities

2. Linkage and Circulation

- The park shall be connected directly via the Green Connectors.
- A minimum of one through pedestrian route shall be fully accessible to the handicapped.
- Internal circulation shall be limited to avoid damage or disturbance to the wildlife. Circulation shall comprise of boardwalks slightly raised above the wet ground level and shall be accessible to the handicapped.
- Parking spaces shall be provided in accordance to the following:-

Parking	1 car parking space : 0.05 hectare
	1 motorcycle parking space : 0.15 hectare
	Minimum 1 bicycle rack

3. View Corridors

- Filtered views shall be provided in Lake Valley Park towards Putrajaya Lake.

LOCAL PARK

4. Vegetation

- Thick screening vegetation shall be located on the periphery of the Lake Valley and Riparian Parks.
- The dominant vegetation type shall be suitable for wetland habitats. Drought tolerant species are also encouraged to reduce demand for water for irrigation purposes. Recommendations with regard to irrigation of the park as highlighted in **Irrigation Master Plan for Putrajaya** shall be taken into consideration. Refer **Irrigation Master Plan for Putrajaya** for list of drought tolerant species.
- Recommended plant species shall be as indicated in **Table 8.8**.

Table 8.8 Recommended Plant Species For Local Park

Species	Common Name
Adenantha Pavnina	Saga
Alstonia Spatulata	Pulai Paya
Andira Inermis	Cabbage Tree
Cananga Odorata	Kenanga
Cassia Fistula	Golden Shower
Cassia Grandis	Horse Cassia
Cassia Spectabilis	Cassia
Cinnamomuniners	Kayu Manis
Cratoxylum Formosum	Pink Memphat
Eleocarpus Spp	Pinang Pergam
Eugenia Polyantha	Salam
Felicism Decipiens	Fern Tree
Gardenia Carinata	Chempaka Utan
Lagerstroemia Speciosa	Bungor
Meleleuca Leucadendron	Gelam
Michelia Alba	Chempaka Putih
Peltophorum Pterocarpum	Batai Laut
Planchonella Obovata	Menasi
Pongamia Pinnata	Mempari
Saraca Thaipingensis	Gapis
Sterculia Parviflora	Kelumpang Burong
Sterculia Foetida	Kelumpang Jari
Barringtonia Asiatica	Putat Laut
Cratoxylum Cochinchinese	Kayu Arang
Ficus Benjamina	Beringin
Fragrea Fragrans	Tembusu
Terminalia Catappa	Ketapang
Tristania Sumatrana	Palawan
Dipterocarpus Oblongifolius	Neram

8.6 NEIGHBOURHOOD PARK

Neighbourhood Park is an open space designated for neighbourhood sports and passive recreational facilities/activities of the residential population of each neighbourhood.

8.6.1 Location and Catchments Area

The Neighbourhood Parks in the Local Plan Area are located in PB8.1, PB8.2, PB8.3, PB9.1, PB9.2, PB9.3 and PB10.3. The size of each neighbourhood park varies from the smallest of 0.24 hectares to the biggest of approximately 1hectare. Each neighbourhood park shall cover a catchment's population of approximately 3000 people.

8.6.2 Function

The neighbourhood park shall function as an active outdoor recreational open space for various age groups of the neighbourhood residential populations where variety of recreational interest and needs are provided for. Community facilities, such as children's play area and small-scale active recreation facilities shall be associated with these park.

8.6.3 Character

The character of the park shall be closely related to the character of the surrounding residential areas and shall be carefully related to the site topography and existing landscape features.

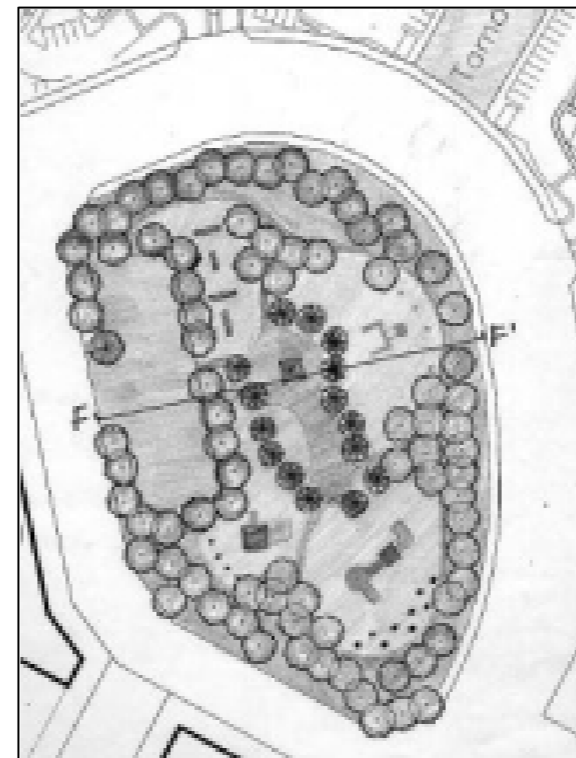


Figure 8.18
Typical Plan of Neighbourhood Park

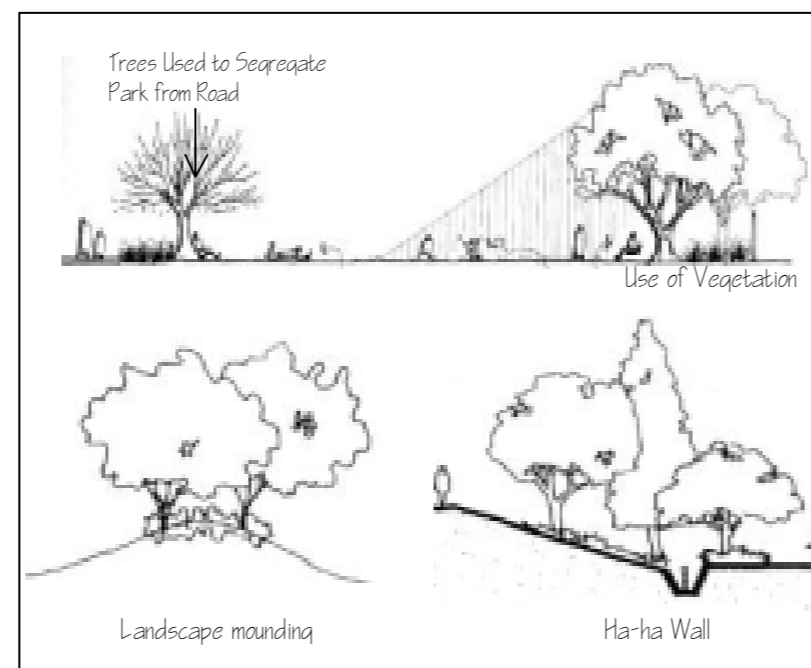


Figure 8.19
Possible Solution to Fencing or Boundary Demarcation

NEIGHBOURHOOD PARK

1. Facilities

- A range of community activities, such as separate children's play areas for different age groups, small scale active recreation facilities such as jogging and cycle track shall be provided for all neighbourhood parks.
- Areas for children's play equipments shall be located on a flat surface with maximum slope of not more than 15%. It shall be well-drained with appropriately designed sub-soil drainage system especially around football fields.

2. Linkage and Circulation

- The neighbourhood park shall be easily accessible for residents and shall be inter-connected with each other by a series of green corridors providing cycle and pedestrian routes. These pedestrian routes shall be fully accessible to the handicapped.
- Vehicular access roads shall be provided around the periphery of the park. The internal pedestrian footpaths shall reflect the site natural topography.

- Parking shall be provided in accordance to the following:-

Parking	1 car parking space : 0.05 hectare
	1 motorcycle parking space : 0.15 hectare
	Minimum 1 bicycle rack

3. Topography

- The existing topography shall be maintained and enhanced where applicable. The use of swale type drains shall be maximised to blend into the existing topography.

4. Vegetation and Landscaping

- Landscaping measures such as earth moulding, change in levels, ha-ha walls, trees and other devices such as bollards and benches, logs can be used to demarcate boundary and to physically segregate park area from roads and drains. Requirements in the **Putrajaya Fencing Design Guideline Manual, 1999** shall be adhered.

NEIGHBOURHOOD PARK

- Drought tolerant species are encouraged to reduce demand for water for irrigation purposes. Recommendations with regard to irrigation of the park as highlighted in **Irrigation Master Plan for Putrajaya, 2001** shall be taken into consideration. Refer **Irrigation Master Plan for Putrajaya, 2001** for list of drought tolerant species

5. Landscape Elements

- Type, design and detailing of landscape elements and facilities shall be consistent with the intended character of each section of the Neighbourhood Park as highlighted in **Table 8.9**.

Table 8.9 Design Style of Landscape Elements for Neighbourhood Park

Elements	Use/ Location	Design Style	Materials
Paving, Walls and Steps	Footpath, cycletracks, stone entrance feature paving, edging, change in level, concrete block car park	Informal, Robust Reflect character of adjacent neighbourhood	Gravel, stone, timber, concrete blocks grasscrete
Site Furniture	Seating, litter bins, bollards	Robust, minimal, informal Reflect character of adjacent neighbourhood	Timber, metal, stone concrete
Lighting	Footpath, cycle track, car park, low level entrance, high level entrance	Robust, minimal Reflect character of adjacent neighbourhood	Metal, timber
Drainage	Away from paving and at lowest level	Natural swales	Stone
Structures and Shelters	Wakaf, shade, shelter, picnic, viewing tower, public convenience	Informal, minimal robust Reflect character of adjacent neighbourhood	Timber, metal, stone
Play Features	Children play areas for all age groups	Integrated, robust, minimal	Timber, conform to SIRIM standard
Sport Features	Kick around areas, jogging, bicycle track, games court	Informal, minimal, robust	Grass, gravel
Bridges and Boardwalks	Water courses	Informal, minimal, robust	Timber, concrete, stone
Decorative Accessories	Entrance gate, flag pole	Informal, minimal robust Reflect character of adjacent neighbourhood	Timber, metal, stone
Water Features	At viewing point, seating area	Informal, natural	Boulders and stone
Art in the Environment	At viewing point, focal point, seating area, path intersections	Informal, natural, minimal art features	Stone, timber, earth, sculpture

8.7 PLAYGROUND

Playground is an open space area allocated for daily recreational facilities of school age children and toddlers living within the vicinity of respective housing areas/smaller neighbourhoods. It shall form part of the ten percent requirement of provision of open space within each development project.

Typically, playground can be categorised into two types: -

- i. Playground for all children within the residential neighbourhoods. This playground shall ideally be centrally located for easy access of all children within the area or near other community facilities within the development.
- ii. Play lot or tot lot for smaller children (i.e. toddlers). This shall be located normally on smaller area than the playground and closer to dwelling units for easier supervisions. There can be several play lot scattered within any particular development.

8.7.1 Location and Catchments Area

Playground shall be centrally located within each housing scheme or within walking distance of not more than 1.5km of residential dwellings. It shall cover a catchments area of between 1,000 to 3,000 populations.

The minimum size of playgrounds shall be sufficient to accommodate for facilities as indicated in the guideline of this Manual. Playground shall be of minimum size of 0.6 hectare for every 1,000 people or 0.6 square metre per person.

8.7.2 Function

Playground shall function to cater for recreational needs of children living within the immediate vicinity of the residential area.

8.7.3 Character

Its character shall relate to the residential surrounding and shall be sensitive to its potential users, which are school age children and toddlers.

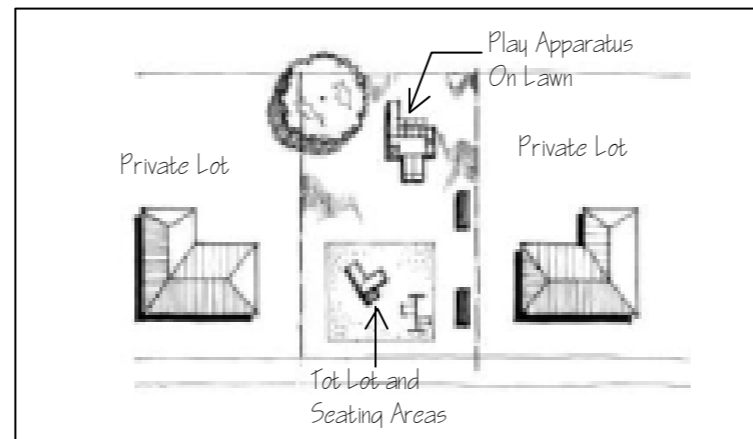


Figure 8.20
Typical Location of Playground



Figure 8.21
Typical Images Of Playground

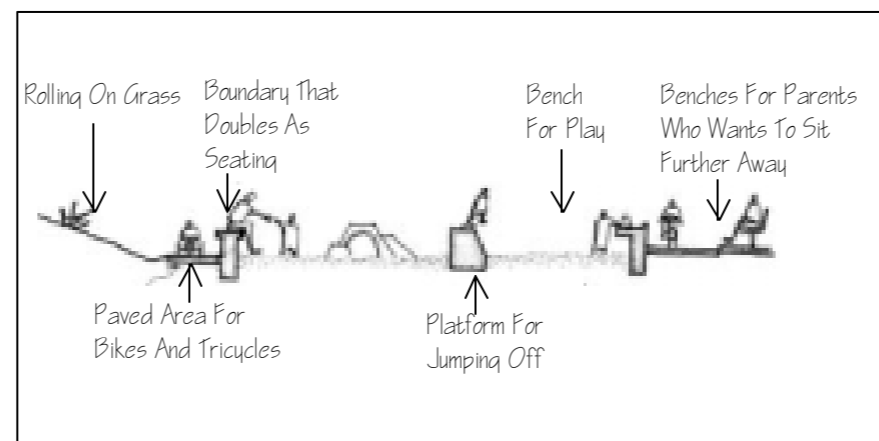


Figure 8.22
Typical Facilities at Playground

PLAYGROUND

1. Provision Requirement

- Playground shall be provided for all residential developments.
- A minimum size of 0.6 hectare shall be provided for playground or at the ratio of 0.6 square metres per person.

2. Facilities

- Planning and design of the playground/play lot shall provide variety of activities and serve the needs of different ages and the handicapped.
- Playground should incorporate spaces for the following: -
 - i. Play equipments
 - ii. Open space for running, jumping and informal play
 - iii. Court and field games area such badminton, sepak takraw etc.
 - iv. An area for quiet games such as checkers, hobbies, etc
 - v. Landscape planting, benches.
- For smaller play lot, space for the following should be incorporated: --
 - i. Play equipment
 - ii. Turfed area for running and active play
 - iii. Shade area for quiet activities
 - iv. Landscape planting, benches etc.
- The minimum facilities required for both playground and play lots shall be as indicated in **Table 8.10**. However, if space permits, more choices of play equipments and activities shall be provided.

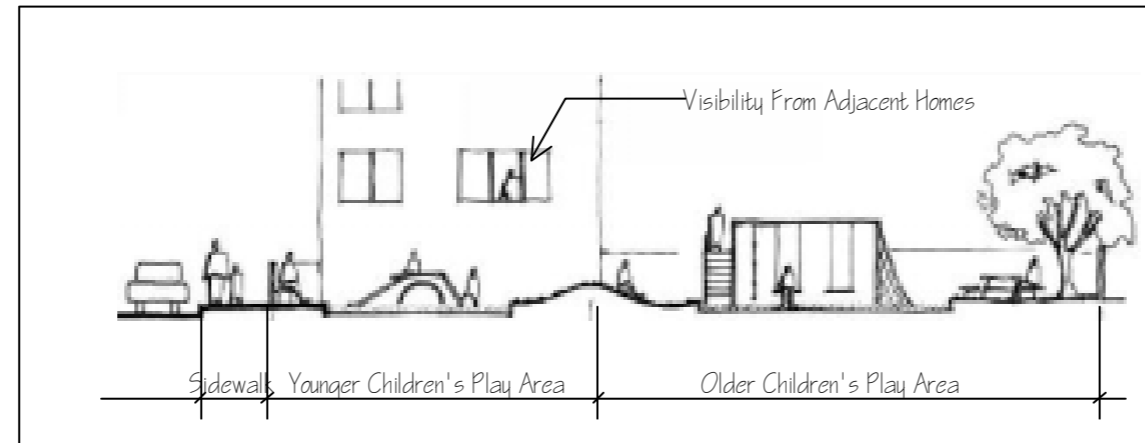


Figure 8.23
Section Showing Separation between Play Areas for Younger and Older Children

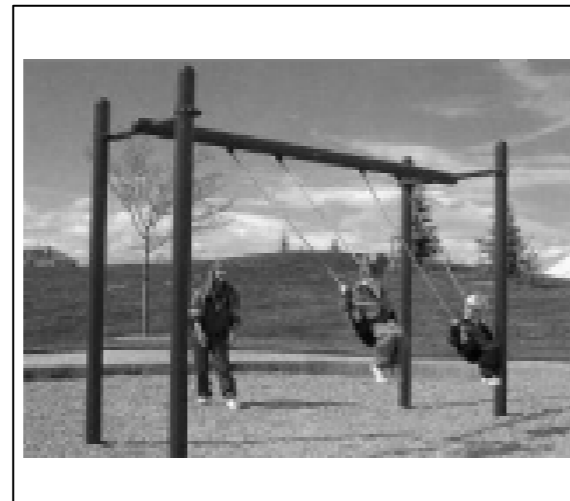


Figure 8.24
Typical Junior Swing Set



Figure 8.25
Typical See Saw



Figure 8.26
Typical Integrated Play Structure

PLAYGROUND

Table 8.10 Minimum Requirement for Play Equipments at Playground and Play Lot

Playground			Play Lot		
Play Equipment	No. of Pieces	Min. Space Requirement	Play Equipment	No. of Pieces	Min. Space Requirement
Senior Swing Set	1	125sm	Junior Swing Set	1	47sm
Junior Swing Set	1	47sm	See Saw	1	20sm
Integrated Play Structure	1	97sm	Slide	1	39sm
See Saw	2	41sm	-	-	-
Area for Circulation and Landscape	50% of total space requirement	155sm	Area for Circulation and Landscaping	50% of total space requirement	53sm
Total Min. Space Requirement	-	465sm	Total Min. Space Requirement	-	159sm

- Play lot shall be surrounded by a low enclosure with supplement planting.
- Surface area shall be from seamless rubber flooring or rubber mat. Sand shall not be permitted.
- Equipment shall be carefully selected and arranged for the safety of the children. All the equipment shall conform to the standard specification for playground for, park, school and domestic use (MS 966: 1985/86 or approved by SIRIM QAS Sdn. Bhd.) to ensure safety and quality.
- The design of the play equipment shall be in colourful and beautiful manner so that it can create a creative atmosphere for the children.
- Appropriate signage for direction and information shall be provided at various locations within the playground in accordance to specification and requirements set out in **Signage and Advertising Design Guideline for Putrajaya, 1999.**

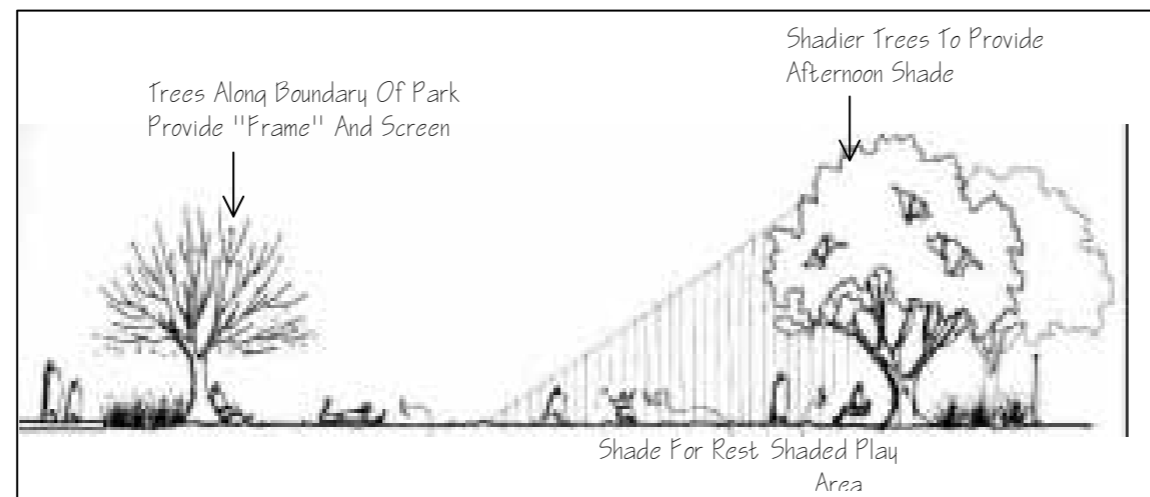


Figure 8.27
Use of Planting for Shades and Boundary

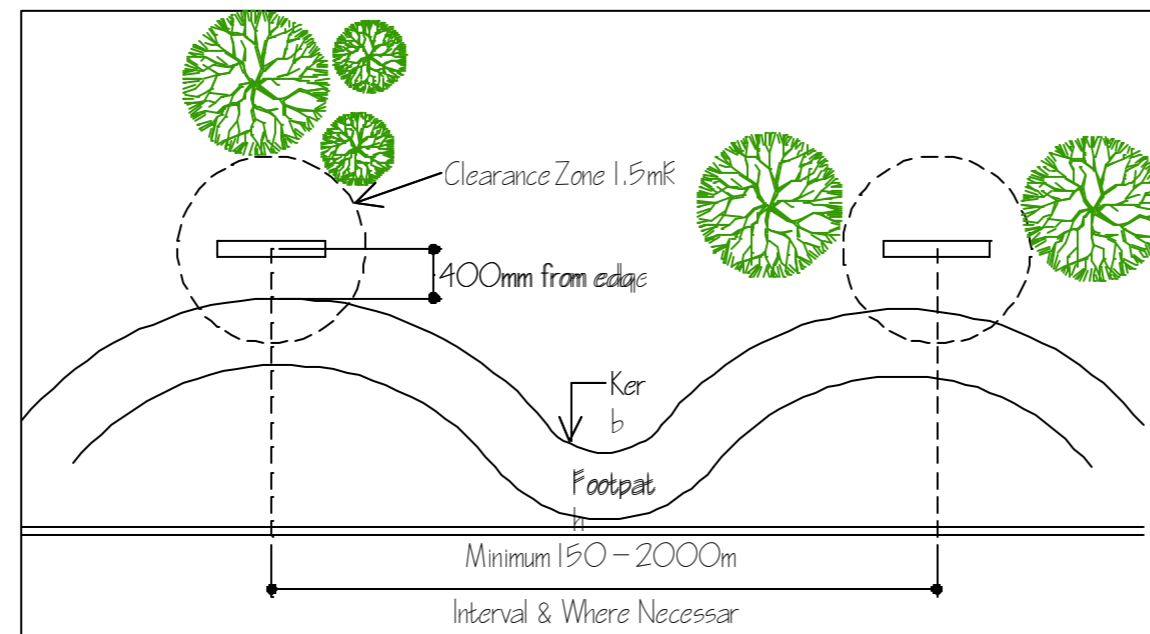


Figure 8.28
Position of Signboards along Pedestrian Route
Source: Signage and Advertisement Design Guideline For Putrajaya, 1999

PLAYGROUND

2. Linkage and Circulation

- Each playground or play lot shall be linked to residential units or apartment blocks through segregated footpath and cycle path and shall not be in conflict with vehicular access. If footpath needs to cross any roads, priority shall be given to pedestrian and cyclists through the use of drop kerbs and different surface materials at the crossing points.
- Circulation within the playground shall provide safe movement and in orderly manner. Pedestrian footpath within and around the playground/play lot shall be at a minimum distance of 1.5m away from any moving objects such as swings.
- Ramps shall be provided for the handicapped to come to the playground.

3. Vegetation

- All plant materials used should be potential resources for children. Plants can be labelled to encourage learning by children. Climbable trees are also good for exploration and discovery as they provide opportunity for variety of challenges and levels of skill development. However, if low-branching trees are provided where children can climb, it is necessary to provide shock-absorbent surfacing under the tree.
- Trees must be located to provide shaded sitting areas on both benches and green areas. Trees shall also be used to define edge and mark clear but permeable separation between areas for example between play lot for toddlers and school age children.
- Planting shall also be used to define boundaries of playground from adjoining land and shall conform to **Putrajaya Fencing Design Guidelines, 1999**.
- All plant materials must be tough, impervious to trampling, fast growing and not poisonous. Species chosen shall be those requiring less maintenance, or the park will likely become unkempt. Species with thorn should be avoided to ensure safety of children while using the playground/play lot.

8.8 GREEN CONNECTORS

Green Connectors are green spaces, which shall provide pedestrian and cycleway linkages between the metropolitan, local and neighbourhood open spaces. The green corridors are intended as a secondary level of access formed from either cycle and pedestrian routes or solely pedestrian routes.

8.8.1 Function

Green connectors are amenity space which shall primarily provide pedestrian and cycle-way linkages between the metropolitan, district and local open spaces. The green corridors shall also serve as links to the other precincts of the local plan area as well as acts as a drainage reserve system serving the development.

8.8.2 Character

Green corridors shall be of informal character with natural materials and simple lines. Gateway features to identify entrance to green corridors should be emphasize and be distinct to encourage use.

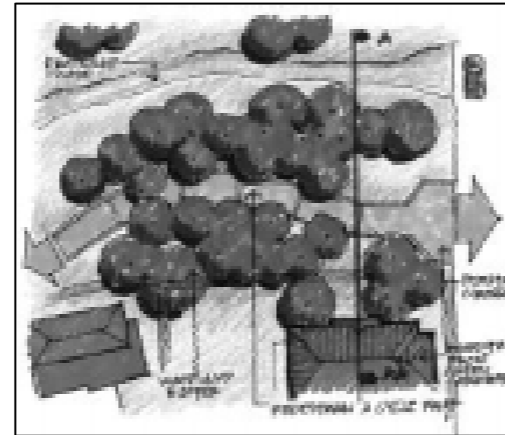


Figure 8.29
Typical Concept of Green Connectors

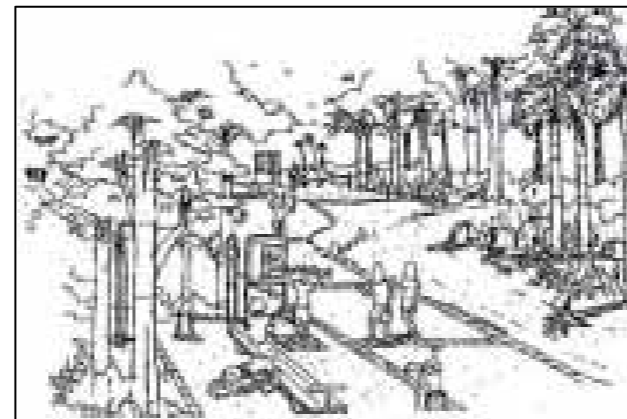


Figure 8.30
Pedestrian Footpath and Fitness Equipment Within Green Connectors

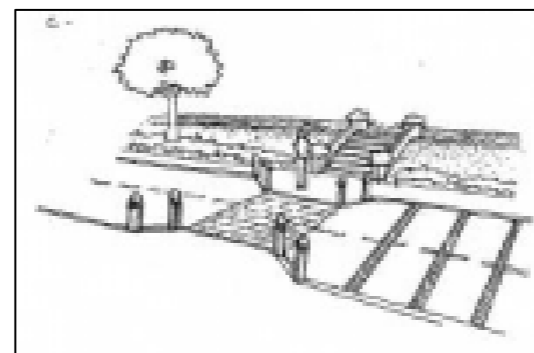


Figure 8.31
Road Crossing along Green Connectors

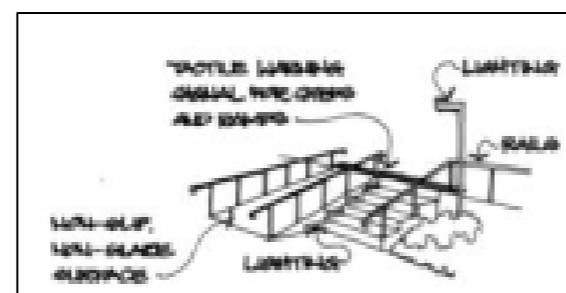


Figure 8.32
Provision of Ramp along Green Connectors

GREEN CONNECTORS

1. Facilities

- Green connectors shall provide for the following: -
 - i. Space for pedestrian footpath and cycle lane.
 - ii. Boundary and landscape buffer to adjacent land uses.
 - iii. Shaded areas

- The optimal width of the cycle lane and pedestrian route shall be 3 meters (minimum width 2 meters). A minimum of 50% of the route shall be of the optimum width. The optimum width of pedestrian route shall also be 3 meters.

- The boundary of the green connectors shall be formed by the adjacent land use however the boundary treatment shall not create a closed in feeling. The boundary treatment shall use landscape planting and shall be of maximum height of 1.8 meters as stipulated in the **Putrajaya Fencing Design Guidelines Manual, 1999**. See **Putrajaya Fencing Design Guidelines Manual, 1999**.

- The green connectors shall be well lit for safety.

2. Linkage and Connections

- Green connectors shall provide links from park to park and from park to residential areas as well as between the residential areas to the roads providing alternative routes from those used by vehicles and providing permeability to the Local Plan Area.

- Green connectors should be continuous and where it is interrupted by roads, appropriate crossing shall be provided. Where green connectors meet roads, drop kerb and separate material for road surface at the crossing points such as interlocking pavers shall be applied. Crossing to highways shall be grade separated using underpasses, particularly where natural valleys occur, and footbridges. Crossings to distributor and collector roads shall be at grade using pedestrian priority crossings.

- Handicapped, partially sighted and wheel chair users are to be considered in the location and treatment of the green connectors. The routes shall provide short cuts to those that would otherwise be provided by the road which may reduce travel time for the partially sighted and slopes no steeper than 1:17 shall assist the wheelchair bound users.

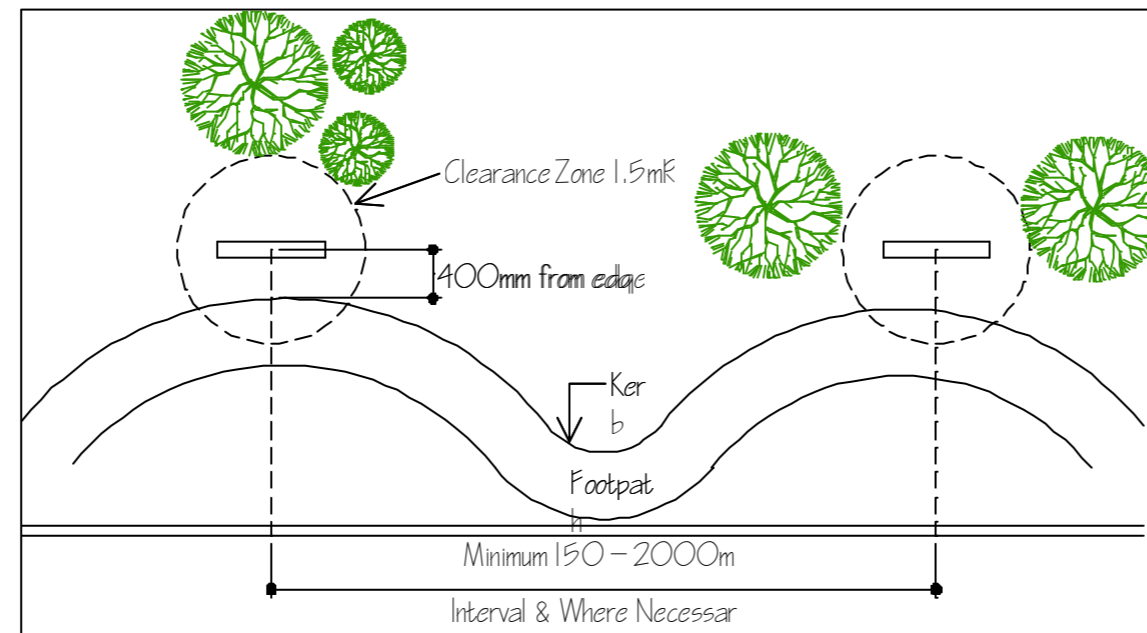


Figure 8.33

Position of Signboards along Green Connectors

Source: Signage and Advertisement Design Guideline For Putrajaya, 1999

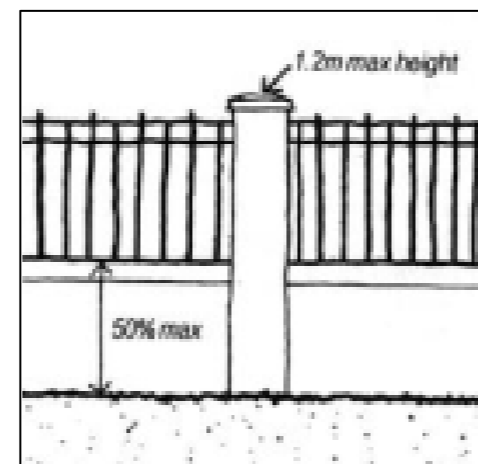


Figure 8.34
Fencing of Adjacent Property along Green Connectors

GREEN CORRIDORS

- Entrance to the green corridors shall be well marked. Clear information as to what the green connectors is and where it is going shall be provided at the entrances. Signage shall conform to requirements as stipulated in the Signage And Advertisement Design Guidelines For Putrajaya. See **Signage And Advertisement Design Guidelines For Putrajaya, Part B1: Landscape and Placement, 1999.**

- Entrances to the green connectors shall be safe. Entrances shall be a minimum of 5 meters wide at road junctions to allow for an area for people to gather prior to crossing the road. All other entrances shall be a minimum of 3 meters wide.

3. Vegetation

- Trees and shrubs shall provide screening and shades.
- Vegetation to form the boundary treatment shall provide a sense of security as well as variety of interest.

4. View Corridors

- Visual linkages shall assist orientation and provide a sense of safety. There shall be no abrupt changes of direction along the route and only gentle curves shall be provided.

5. Lot Boundary Treatment Of Adjacent Property

- The adjacent lot boundary treatment shall be primarily vegetative. The boundaries of the lots shall have a varied character utilising a combination of hedges grown either independently or with an informal open fences of no more than 1.2 meters high. Where security fencing is required, open or infill panel or landscape fences up to a height of 1.8m. See **Putrajaya Fencing Design Guidelines Manual, 1999.**

GREEN CORRIDORS

5. Landscape Elements

- Type, design and detailing of landscape elements and facilities shall be as highlighted in **Table 8.11**.

Table 8.11 Design Style of Landscape Elements for Green Corridors

Design Style	Materials	Use/ Location
Paving, Walls and Steps		
Informal, natural, simple	Stone, concrete pavers, timber edgings, tarmac	Various location
Smooth, simple	Tarmac	Cycle ways to be segregated from pedestrian routes at junctions
Patterned vernacular	Concrete pavers	Entrance to the routes to be marked with a varied paving pattern
Site Furniture		
Cotemporary, simple	Sustainable hardwood	Located at the entrances and the centre of long runs
Lighting		
Simple	Steel	Mixtures of bollards and pole tops
Drainage		
Swales	Stone boulders and pebbles	Along the route of the green corridor
Structures and Shelters		
Informal, natural	Sustainable hardwood	Shade structures seating areas
Signage		
Solid, formal	Steel, stone, timber	Functional and at key points e.g., entrances
Fences, Gates and Barriers		
Simple	Sustainable hardwood	Entrance feature
Art in the Environment		
Vernacular, simple	Sustainable hardwood, stone	Small scale use for occasional interest

9.0 INFRASTRUCTURE AND UTILITIES

9.1 USE

This guideline shall be used for all infrastructure and utilities projects located within the Local Plan area. They are: -.

- i. Electricity
- ii. Water Supply
- iii. Telecommunications
- iv. Gas Supply
- v. District Cooling
- vi. Solid Waste
- vii. Drainage
- viii. Sewerage

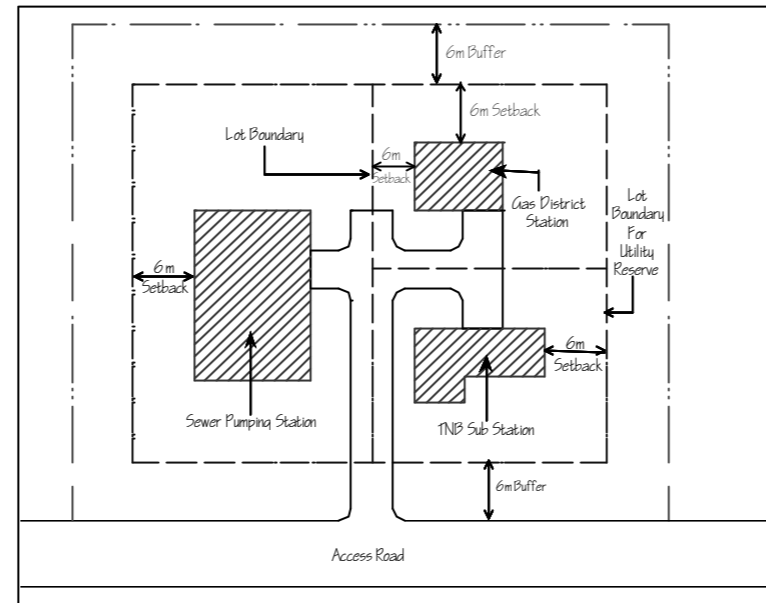


Figure 9.1
Typical Concept Of Grouping Infrastructure And Utility Reserves In One Area

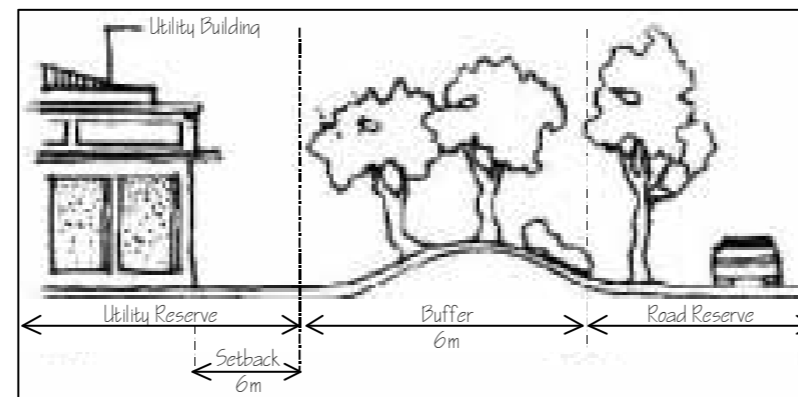


Figure 9.2
Use of Earth Moulding To Demarcate Boundary



Figure 9.3
Location of Sub-Stations

GENERAL REQUIREMENTS

- It is desirable that all reserves for infrastructure and utility services are grouped closely together with adjoining land area so that common access and landscaping buffer can be shared.
- The building should be designed to blend with adjacent developments. Corporate logos and signage for utility company can be allowed within the utility compound, but must comply with **Signage and Advertising Design Guidelines for Putrajaya, 1999**.
- Fencing of utility reserves shall conform to **Putrajaya Fencing Design Guidelines, 1999**
- In addition, the visual impact should be minimised by external landscaping treatments in a 6m margin all around. These landscaping treatments such as in the form of earth moulding or change in levels can also act as boundary demarcation and screen public views into the utility reserves.
- Location of utility reserves such electric sub-stations adjoining neighbourhood parks and playgrounds shall not be allowed.

9.2 ELECTRICITY

Infrastructure for electricity supply is categorised into the following levels depending on catchments and supply load: -

- i. Main intake station (PMU – Pencawang Masuk Utama)
- ii. Main distribution Station (PPU – Pencawang Pembahagian Utama)
- iii. Substation

The locations of PMU and PPU have been determined in the Proposal Map of the Local Plan. Substations however will depend on individual layout and building submissions.

Feeder Pillar is an electrical distribution board for street lighting supply fed from TNB substations or looping from another feeder pillar.

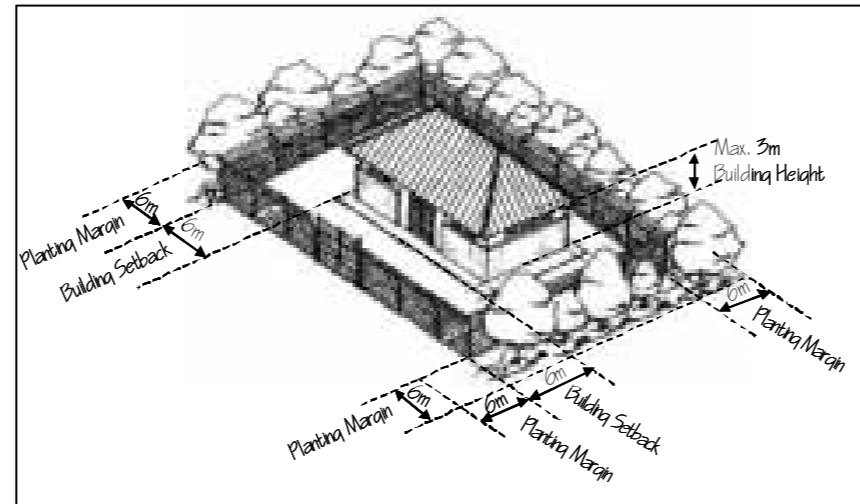


Figure 9.4
Typical Substation Building with Landscaping As Buffer

ELECTRICITY

Planning Standard

- Provision of reserves for electricity requirements shall conform to minimum specification as indicated in **Table 9.1**.

Table 9.1 Requirements For Electricity Reserves

Type	Threshold	Min. Size	Note
Main intake station (PMU)	Depending on total load and subject to TNB's decision	1.6 hectare	<ul style="list-style-type: none"> ▪ 6m buffer is to be provided around the TNB reserve. ▪ Service road is to be provided
Main Distribution station (PPU)	Depending on total load and subject to TNB's decision	45m x 45m	
Substation (SS)	<ul style="list-style-type: none"> ▪ 1 : 100 dwellings for residential development ▪ 1 : 30 shops for commercial developments 	<ul style="list-style-type: none"> ▪ 16.5m x 13.5m (Single chamber) ▪ 20m x 13.5 (Double chamber) 	<ul style="list-style-type: none"> ▪ Final decisions on sizes are subject to Tenaga Nasional Berhad. ▪ Substations are not allowed to be located near or on open spaces.

- Within commercial, or other large scale developments, the location and size of these substations should be established during the preliminary design stage and, where ever possible, they should be fully integrated within the development: either at ground floor or basement level, rather than as separate independent structure.
- Stand-by facilities, for main power supply for public buildings, are advisable. Sub-stations should be sited along the rear or side elevations of high-rise or commercial buildings, to avoid intruding upon commercial and retail frontages.
- In residential areas, the location of these sub-stations should be determined during the preliminary layout stage, and they should be either fully integrated within the development or stand-alone.

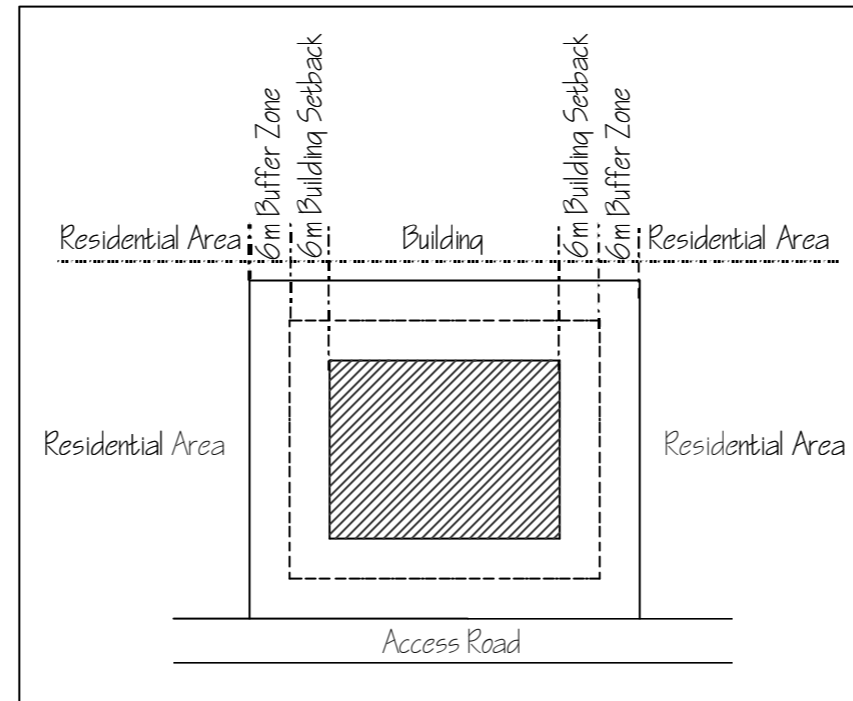


Figure 9.5
Setback for Sub-station Building

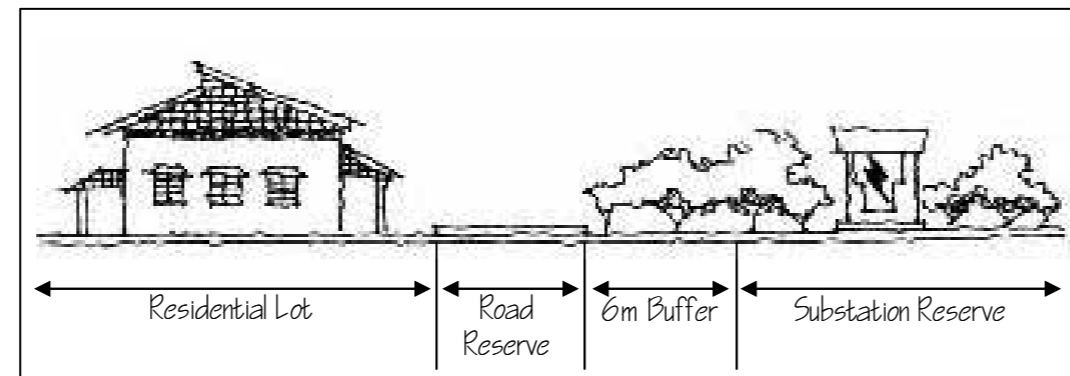


Figure 9.6
Buffer For Substation

ELECTRICITY

Setback and Buffer Requirements

- Road green corridors or buffer shall separate substation reserve from adjacent lot/land
- Buffer of 6m shall be provided outside substation reserve. The buffer shall be used as planting margin that screen of the utility building from public view.
- Sub-station building shall be setback to a minimum of 6m from the boundary line.

Access Road

- Direct access from local road shall be provided for management and services for the substation.

Design Consideration

- The building should be designed to blend with adjacent developments. Substations located in or adjacent in to neighbourhoods and should be designed to invoke a residential character in both scale and materials.

Feeder Pillar

- Feeder Pillar for street lighting shall be located within the utility routing of the road reserves. These however shall not be located within the clear sidewalk zone to ensure continuous and undisturbed pedestrian flow on the sidewalk.
- A plinth of 1800mm x 1000mm shall be required for feeder pillar and shall be located together with other utilities such as Fiber Distribution House, telephone kiosks, bus stops and gazebos to share common access and landscaping buffer.

9.3 WATER SUPPLY

Water tank/reservoir to supply water to the Local Plan area is located in PB9.2 near the Metropolitan Park. Total area allocated is 1.48 hectares.

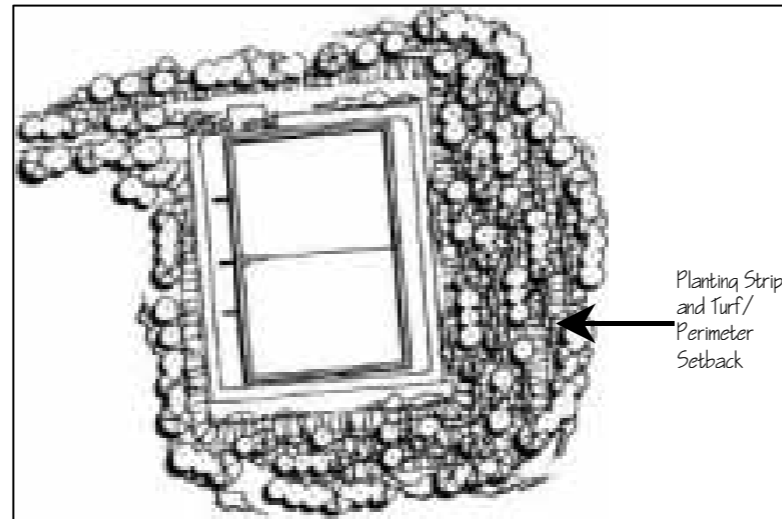


Figure 9.7
Typical Layout of Water Reservoir

WATER SUPPLY

Access

- The access road should be aligned to closely follow the existing topography.

Design Consideration

- To reduce the visual impact it is recommended that: -
 - i. The perimeter setbacks of minimum 15m
 - ii. The reservoirs should be set entirely below ground and should, on completion, be covered over: with only the vents visible.
- Design criteria of water tank and its distribution network shall conform to guidelines specified by the Malaysian Water Association (MWA) and the Jabatan Bekalan Air, Selangor.

9.4 TELECOMMUNICATION

Telecommunication services and facilities within the Local Plan area shall be used for telephone, telex, facsimile, data transmission and other services such as video and entertainment.

Reserves for telecommunication services within the Local Plan area are categorised into two as the following: -

- i. Telephone Exchange
- ii. Fibre Distribution House (FDH)

Telephone exchange shall be located in PB7.1 on an area of 0.915 hectares. The first phase of development will include a Telephone Exchange Building and associated car parking. Whilst future development will consist of a second Exchange Building and Administration Building.

FDH however shall be determined based on individual detail layout proposal.



Figure 9.8
Artist Image of Telephone Exchange Building



Figure 9.9
Location of Manhole Within Road Reserve

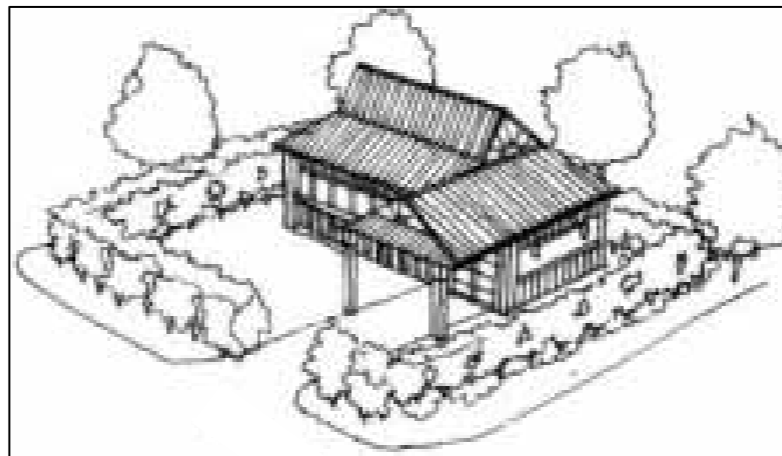


Figure 9.10
Fibre Distribution House Concept

TELECOMMUNICATION

Provision Requirement

- Site for Fibre Distribution House (FDH) shall be provided for every 500 dwellings on a minimum area of 0.02 hectare. The final decision however will be subject to Telecom Malaysia Berhad.
- Ducting and inter-linking manhole shall be by way of network and shall be placed along the utility reserves within the road reserves. Locations of manhole shall not be within the clear sidewalk zone of the sidewalk to ensure smooth pedestrian access along the sidewalk.

Setback

- FDH buildings shall have a minimum setback of 6 meters from the boundary and landscape treatment shall be applied at the perimeter.

Access Road

- Direct access from local road shall be provided for management and services of the telephone exchange and the FDH.

Design Consideration

- Design of exchange building in terms of colour scheme and construction materials should be carefully selected to ensure an aesthetic quality consistent with that of a major public building and compatible with the built environment in which they are sited.
- The building should compliment other buildings in adjacent areas. Roofscape design shall also be carefully considered.

9.5 GAS SUPPLY

Gas supply within the Local Plan area shall be served by Gas District Stations, Public/Private Natural Gas Vehicles (NGV) outlets and Area Stations via high-pressure feeder pipelines. All the gas supply will be provided by Gas Malaysia Sdn. Bhd. (GMSB).

Gas District Station is where a high-pressure gas line is regulated to medium pressure and fed to the Gas Area Stations.

Gas Area Station is where the medium pressure gas line is regulated to low pressure 300mm H₂O for residential use.

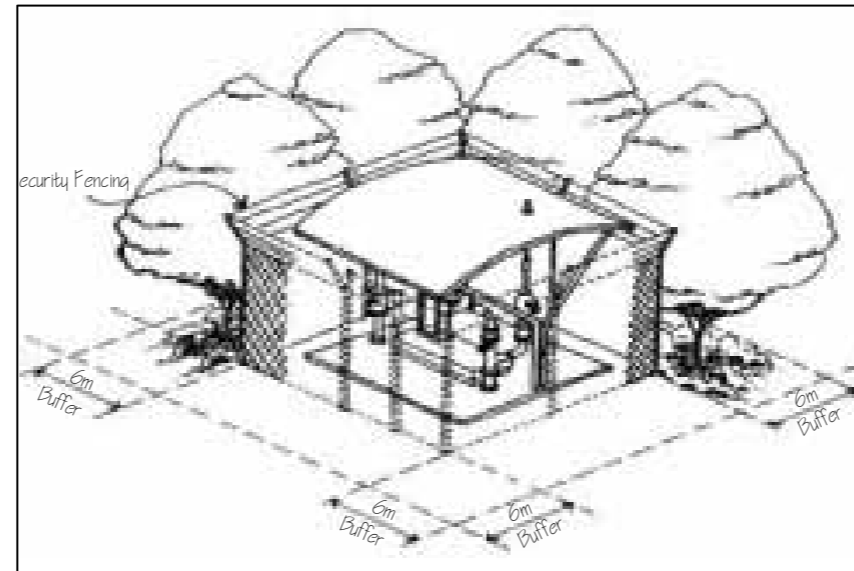


Figure 9.11
Gas District Station Concept

GAS DISTRICT STATION/GAS AREA STATION

- The gas district station shall be divided by road, side lane or green corridor from the nearest residential buildings.
- Site for gas district station shall be surrounded by a 6m buffer and the buffer shall be planted all around for safety and aesthetic reasons. Fencing for the gas district station building shall conform **Putrajaya Fencing Design Guideline Manual, 1999**.
- The size of Gas District Stations / Gas Area Stations shall be as indicated in **Table 9.2**.

Table 9.2 **Sizes of Gas District Stations/Gas Area Stations**

Gas District Stations	13m x 5m
Gas Area Stations	10m x 10m

- To reduce the visual impact of these installations, it is recommended that walls with adequate ventilation should be used. Alternatively, these facilities could be totally screened by landscaping.

9.6 GAS DISTRICT COOLING

Gas District Cooling Plant is a centralised chiller plant using gas as the fuel to supply chilled water to mainly commercial buildings.

Gas District Cooling Plant in the Local Plan Area shall be located in PB7.1 near the Sub-Commercial Centre and the Western Transport Terminal.

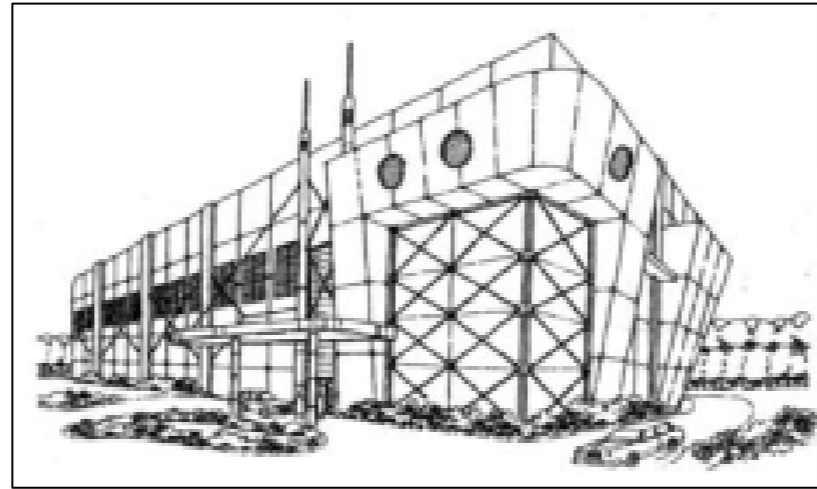


Figure 9.12
District Cooling Centre Building

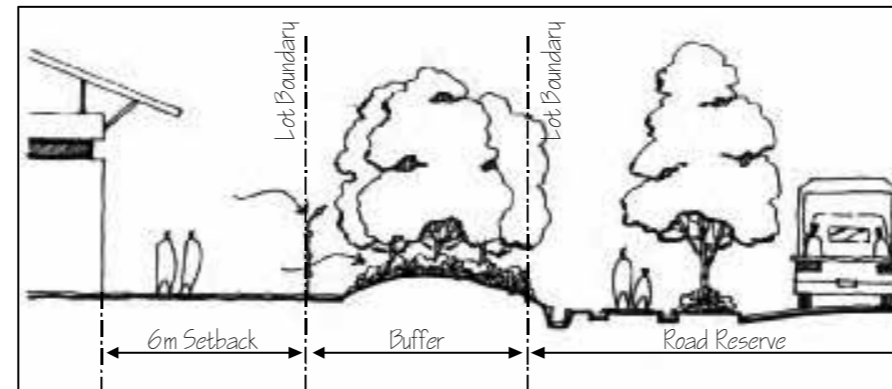


Figure 9.13
Infrastructure and Utility Area

GAS DISTRICT COOLING

Setback and Buffer

- Plant building shall have a minimum setback of 6 meters from the boundary line.
- A 6m buffer outside the GDC reserve shall also be provided.

Design Consideration

- Design of building shall have commercial influence on the façade. Gas turbine and cooling towers shall be innovatively concealed as part of building design.

Fencing

- Fencing of District Cooling Building shall conform to requirements as specified in the **Putrajaya Fencing Design Guidelines, 1999**.

Environmental Considerations

- The plant will have significant quantity of diesel fuel and therefore the storage tank area should be bunded to contain any spillage. There should be no connections to the drainage or the sewerage system within the bunded area.
- The plant in particular the gas turbine and the cooling towers, should be designed so that the noise-level at the site boundary will be at maximum of approximately 66dB(A).
- The temperature of the fuel gas from the HRSG (Heat Recovery Steam Generators) or the gas-fired boilers shall not exceed 210°C, and the NO₂ density shall not exceed 150 ppm.

9.7 SOLID WASTE

The consideration for solid waste covered in this Manual shall be only related to storage and collection facilities by individual developments such as residential and commercial. The solid waste storage and collection in peripheral are grouped according to building types as the followings: -

Development Type	Storage and Collection Facilities
Residential	
▪ Bungalows/ Semi-D/Terrace (landed property)	Bins
▪ High-rise apartment/flats/condominiums/cluster houses	Refuse chambers/compactors/refuse house
Commercial	
▪ Shop houses/shop offices	Bin centres
▪ Shopping complexes/supermarkets	Refuse chambers/compactors/refuse house
Institutional	
▪ 1-2 storey office lots	Bin centres
▪ High-rise offices	Refuse chambers/compactors/refuse house
Recreational/Public Spaces	
▪ Parks, plazas, open spaces	Bins/ Bins Centre/ compactors/ Drop-off points (as appropriate)

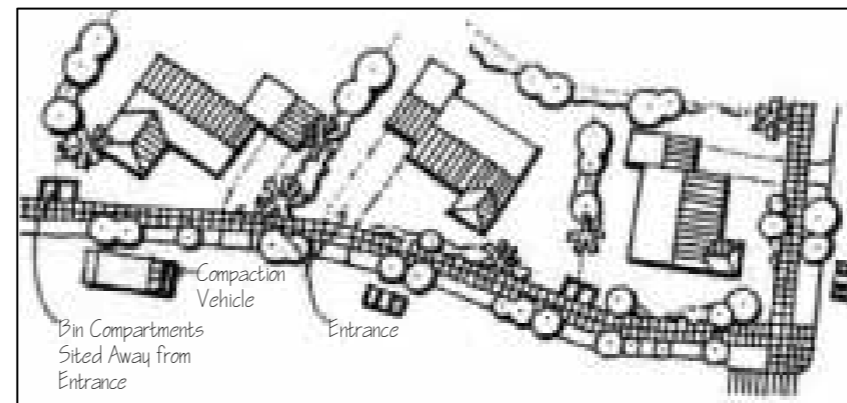


Figure 9.14
Typical of Kerb Side Pickup

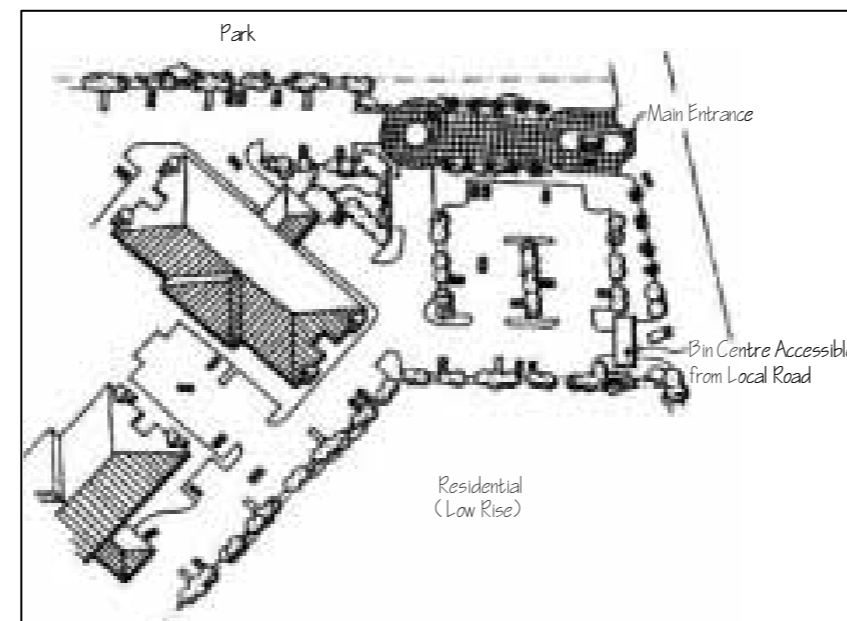


Figure 9.15
Location of Bin Centre in High Rise Residential

SOLID WASTE

Bins

- In residential areas especially for landed residential units, kerb-side pick-up should be made available, preferably with bin compartments. These bin compartments should be: -
 - i. Appropriately located at the front but away from the main entrance of the house.
 - ii. Conveniently accessible to garbage collectors/refuse vehicles.
 - iii. Well-ventilated but enclosed to protect from rain and stray animals.
 - iv. Screened from public view.

Bins Centres

- In a small apartment cluster or shop houses, at least one bin centre should be provided at an appropriate location as follows: -
 - i. Convenient accessible to collector and refuse vehicle.
 - ii. The bin centre should be well-ventilated but enclosed to protect from rain, stray animals and vandals.
 - iii. The centre should be strategically located on site (e.g. a corner or parking area) away from public view but readily accessible to tenants / residents.

Refuse Chambers

- Refuse chambers apply to larger or high-rise buildings. Their sizes and number depends on the scale of the building. They should be located at the basement or ground floor near loading bays. They may be with or without compactors. Design considerations include: -
 - i. Good ventilation and lighting level (daylight and artificial).
 - ii. White glazed wall and impervious ceramic floor or similar.
 - iii. Proper drainage for access water/liquid away from public area/walkways.
 - iv. Fully screened from public view. Strong louvered metal doors are encouraged.

Refuse House/Station Compactors

- Refuse house refers to stand alone building or shed to accommodate large communal bins or compactor. Design criteria include: -
 - i. Appropriately located on site, preferably at a corner in car park areas away from main entrance or public spaces.
 - ii. The building form should blend in with the surrounding.
 - iii. Recycling bins should be placed just outside the refuse house.
 - iv. All other criteria are the same as refuse chambers.

SOLID WASTE

Access for Garbage Collection

- Garbage truck will generally utilize the normal standard roads to access residential, commercial and public amenities area. The normal standard road is not a major concern for garbage trucks; however, internal circulation system for multi-stories facilities and complexes should incorporate certain provision for garbage trucks.
- Issues that need to be examined at an early stage in the design should include the following: -
 - i. To maintain a minimum height clearance of 4.1 meters, wherever the path for the garbage trucks have been identified.
 - ii. To maintain a minimum slope of 1:12 for the design of access road for garbage trucks.
 - iii. Provision for “ 3 point turns” or “cul-de-Sac” should be incorporated wherever necessary.

Environmental Considerations

- Biodegradable waste should be disposed at an approved dumping site as soon as possible.
- Contractor approved by the respective authority shall undertake collection and transportation of domestic and commercial waste.

9.9 DRAINAGE

Design of drainage system for all developments within the Local Plan Area shall conform to guidelines and requirements set out in various documents as the following: -

- i. Putrajaya Stormwater Management Design Guidelines, 1998
- ii. Urban Stormwater Management Manual for Malaysia, (MaSMA, 2000)

DRAINAGE

- The proposed stormwater drainage network is to be presented in a series of drawings showing the proposed routes of the stormwater minor drainage system and the stormwater major drainage system.
- In formulating the layout of the stormwater drainage system, every effort should be made to adopt an approach that allows the multiple objectives of stormwater management to be address. The 'rapid discharge' approach of utilising highly efficient flow conveyance systems of pipes and concrete lined channels should be avoided wherever possible. 'Zero discharge' as specified by the **Urban Stormwater Management Manual for Malaysia, (MaSMA, 2000)** should be aimed at. Refer **Urban Stormwater Management Manual for Malaysia, (MaSMA, 2000)**.
- An underground drainage system should be provided to safely convey stormwater of frequent events without causing disruption to urban activities.
- Design standard for minor drainage system shall be as follows:-
 - i. Commercial area - 100 year ARI event
 - ii. Residential area - 5 year ARI event
- Design standard for major drainage system shall be 100 year ARI event.
- It is necessary to provide adequate number and location of stormwater entry pits. The number required shall be based on inlet capacities of these pits which needs to be compatible with the runoff rate generated from the local street catchments for the design event.
- Engineers designing and submitting drawings for drainage system should refer to the following documents: -
 - i. **Putrajaya Stormwater Management Design Guidelines, 1998**
 - ii. **Urban Stormwater Management Manual for Malaysia, (MaSMA, 2000)**
- Gross Pollutant Traps (GPTs) shall be constructed on waterways prior to entering the Putrajaya Lake.

9.10 SEWERAGE

A centralised sewerage treatment system has been provided for the whole of Putrajaya. As such, design of sewerage system for the individual precincts within the Local Plan area is only confined to sub-catchments area design where wastewater from the development is conveyed to the main reticulation systems and finally to the sewerage treatment plant before effluent is discharged.

SEWERAGE

- The design of the sewerage reticulation system for any development within the Local Plan Area shall be based on the principle and guidelines set out in **MS1228: 1991 – Code of Practice of Design and Installation of Sewerage System**.
- The recommended population equivalent is based on the type of premise or establishment proposed as set out in **Guideline for Developers – Sewerage Treatment Plant Design, 1998. (Table 9.3)**.

Table 9.3 Recommended Population Equivalent (PE)

TYPE OF PREMISE/ ESTABLISHMENT	POPULATION EQUIVALENT (recommended)
Residential	5 per house
Commercial; (including offices, shopping complex, entertainment/recreation centres, restaurants, cafeteria, theatres)	3 per 100m ² gross area
Schools/Educational Institutions: <ul style="list-style-type: none"> ▪ Day schools/institutions ▪ Fully residential ▪ Partial residential 	0.2 per student 1 per student 0.2 per student for non residential student and 1 per student for residential student
Hospitals	4 per bed
Hotels (with dining and laundry)	4 per room
Factories (excluding process water)	0.3 staff
Market (wet type)	3 per stall
Market (dry type)	1 per stall
Petrol Kiosks/Service stations	18 per service bay
Bus terminal	4 per bus bay
Taxi terminal	4 per taxi bay
Mosque	0.5 person
Church/Temple	0.2 person
Stadium	0.2 person
Swimming Pool/Sports Complex	0.5 person
Public Toilet	16 per wc
Laundry	10 per machine

- The sewerage reticulation systems shall be designed based on gravity flow. Pump stations shall only be introduced where topographical constraints are encountered or where the depth of sewer or manhole exceeds 7 metres.
- Locations of manhole shall not be within the clear sidewalk zone of the sidewalk to ensure smooth pedestrian access along the sidewalk.

9.11 PARK AND RIDE

Park and Ride refers to facilities that provide common location for individuals to transfer from a low-occupancy travel mode to a high-occupancy travel mode. It is oriented towards providing parking spaces for automobiles connected with bus or rail stations and frequent transit services.

The primary purpose of a Park-And-Ride within the Local Plan area is to provide transfers between car users to LRT for trips to and from the core-precincts because of the Putrajaya car restraints policy.

This guidelines shall be used for all Park-And-Ride located within the Local Plan area as indicated by the Proposal Map. Two Park-and-Ride sites have been identified as shown in **Figure 9.16**. The first Park-and-Ride is located next to the Western Transport Terminal and the second Park-and-Ride facility is situated south of Persiaran Utara, hemmed in between the ERL corridor and Precinct 9.

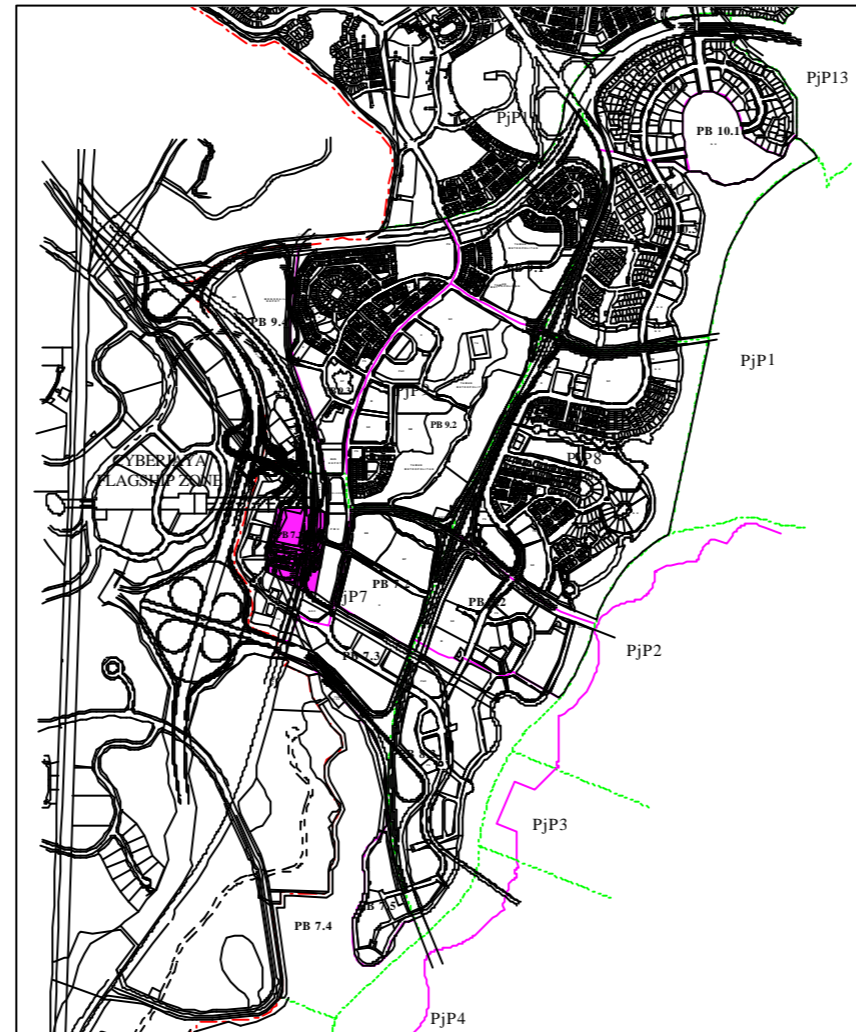


Figure 9.16
Location of Park and Ride

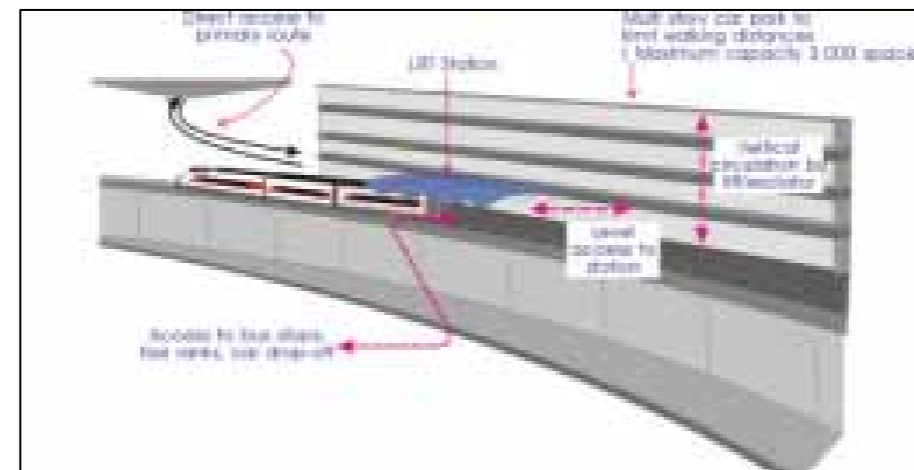


Figure 9.17
Typical Layout of Park and Ride Facility

PARK AND RIDE

CIRCULATION

- The Park-and-Ride facilities would comprise peripheral car parks with direct access to and from the primary road network and linked into the proposed LRT stations.
- The total number of Car Parking spaces shall not exceed 3000 spaces, otherwise delays become disincentive to the driver.
- In addition, because of the high traffic volumes and parking facilities, these facilities require a very large area per passenger. The basic principles governing the design are: -
 - i. Priority in convenience of access should be given to modes in this sequence: pedestrians; feeder transit; bicyclist, taxis, Park-And-Ride.
 - ii. Maximum possible separation of all modes is desirable.
 - iii. The pedestrian walk between access modes and the station platform should be safe, convenient and as short as possible.
 - iv. Adequate capacity, easy orientation and smooth traffic flow should be provided for each mode.
- Pedestrian access from all streets and parking areas requires walkways, which should be at least 1.5 m wide. Design of pedestrians access should use lowered curb, mild gradients and convenient doors to allow access to stations by the handicapped on wheelchairs.
- A strategy for driver information and management will be needed to ensure demand and capacity is matched at individual park-and-ride sites.
- A high-quality loading and unloading facilities should be provided for both cars and bus passengers, the latter including feeder and longer-distance buses.
- Parking layout within Park and Ride Station should consider pedestrian safety and circulation for people with disabilities (PWD). PWD car parks should be located near to the exit points.

PARK AND RIDE

DESIGN CONSIDERATION

- Façade treatment should be of innovative design that reflect modern technology, transport architecture and modern local features.
- Monotonous and large plain facades should be avoided. Blank façade should be avoided or camouflaged with planting.
- The park and ride facility should fit into its surroundings. Considerations that should be taken into account are:-
 - i. Appropriate massing, which complements the surrounding developments
 - ii. The need for 'human scale' in space and façade treatment, especially at street level.
- Special elevation treatment and/or roof structures should emphasize key locations such as the station entrance.
- Multi storey parking structure should be bright and airy. Skylight or atria are encourage for these purposes, as well as providing a good sense of orientation.

10.0 PROMENADE, LAKE EDGE & WATER BODIES

10.1 USE

This guideline shall be used for all adjoining lake and Promenade frontage developments in **PB 7.4, PB 7.5, PB 8.3, PB8.2, PB8.1, and PB10.3.**

10.2 USE CLASS ORDER

Activities permissible on the promenade area and lake fronting the promenade shall conform to Use Class Orders as stipulated in Volume 1 of the Local Plan, which have been formulated to conform to requirements set out by the **Putrajaya Lake Use And Navigation Master Plan And Lake And Wetland Emergency Response Plan¹**.

Use Class Order is the prescribed activity for the use of land or building. It is categorised into classes where change from one class to the other shall be deemed to constitute development and therefore shall require planning approval. Change within the same class however shall not require planning approval under the provision of the Local Plan

¹ Perbadanan Putrajaya, "Putrajaya Lake Use And Navigation Master Plan And Lake And Wetland Emergency Response Plan, Final Report, May 2001.

USE CLASS ORDER

- Permissible activities within the promenade area and the adjacent water bodies shall conform to the general activities as highlighted in **Table 10.1**.

Table 10.1 Permissible Activities on Promenade and Water Bodies

Planning Block	Water Body Zone	Permissible Activities	Reference Use Class Table In Volume 1 of Local Plan Report
PB7.4	Zone 5	<ul style="list-style-type: none"> Promenade Pedestrian and cycle path Viewing deck Sports rowing, paddling training and events Model sailing and power boating within designated area Pedal powered leisure craft hire within designated areas Ferry, tour and cruise boating Junior sports racing for special events Sailing within designated areas Canoeing, kayaking, rowing skiffs Water skiing within designated areas Parasailing and towed ride within designated areas Jet ski or boating racing for special events Permanent water display features within designated areas Special advertised sporting, public display and festivity events by permit. Marina berthing Foreshore fishing and fishing from boats within designated areas. Lake maintenance vessels 	Table 4.3, Page 4-14

USE CLASS ORDER

Table 10.1 Permissible Activities On Promenade and Water Bodies (cont.)

Planning Block	Water Body Zone	Permissible Activities	Reference Use Class Table In Volume 1 of Local Plan Report
PB7.4 (cont.)	Zone 6	<ul style="list-style-type: none"> ▪ Promenade ▪ Pedestrian and cycle path ▪ Viewing deck ▪ Designated Fish Habitats sector ▪ Leisure canoeing, kayaking and row boating ▪ Sports rowing and paddling training ▪ Small powered hire boating ▪ Powered leisure boating ▪ Fishing from boats ▪ Foreshore fishing within designated areas ▪ Special fishing competitions ▪ Lake maintenance vessels 	Table 4.3, Page 4-14
PB7.5	Zone 5	<ul style="list-style-type: none"> ▪ Promenade ▪ Pedestrian and cycle path ▪ Sports rowing, paddling training and events ▪ Model sailing and power boating within designated area ▪ Pedal powered leisure craft hire within designated areas ▪ Ferry, tour and cruise boating ▪ Junior sports racing for special events ▪ Sailing within designated areas ▪ Parasailing and towed ride within designated areas ▪ Jet ski or boating racing for special events ▪ Permanent water display features within designated areas 	Table 4.3, Page 4-14

USE CLASS ORDER

Table 10.1 Permissible Activities On Promenade and Water Bodies (cont.)

PB7.5 (cont.)	Zone 5	<ul style="list-style-type: none"> ▪ Special advertised sporting, public display and festivity events by permit. ▪ Marina berthing ▪ Foreshore fishing and fishing from boats within designated areas. ▪ Lake maintenance vessels 	Table 4.3, Page 4-14
PB8.3	Zone 4	<ul style="list-style-type: none"> ▪ Promenade ▪ Pedestrian and cycle path ▪ Viewing deck ▪ Wakaf ▪ Public amenity space ▪ Children Play Area ▪ Alfresco Dining ▪ Sports rowing, paddling training and events ▪ Powered leisure boating and small powered hire boating ▪ Ferry, tour and cruise boating ▪ Junior sports racing for special events ▪ Foreshore fishing within designated location ▪ Special advertised sporting, public display and festivity events by permit. ▪ Canoeing, kayaking, rowing skiffs and dragon boats for club activities and sports events ▪ Jet ski for special events ▪ Lake maintenance vessels. 	Table 4.4, Page 4-17

USE CLASS ORDER

Table 10.1 Permissible Activities On Promenade and Water Bodies (cont.)

PB8.2	Zone 4	<ul style="list-style-type: none"> ▪ Promenade ▪ Pedestrian and cycle path ▪ Viewing deck ▪ Wakaf ▪ Public amenity space ▪ Children Play Area ▪ Sports rowing, paddling training and events ▪ Powered leisure boating and small powered hire boating ▪ Ferry, tour and cruise boating ▪ Junior sports racing for special events ▪ Foreshore fishing within designated location ▪ Special advertised sporting, public display and festivity events by permit. ▪ Canoeing, kayaking, rowing skiffs and dragon boats for club activities and sports events ▪ Jet ski for special events ▪ Lake maintenance vessels. 	Table 4.4, Page 4-16
PB8.1	Zone 4	<ul style="list-style-type: none"> ▪ Promenade ▪ Pedestrian and cycle path ▪ Viewing deck ▪ Wakaf ▪ Public amenity space ▪ Children Play Area ▪ Sports rowing, paddling training and events ▪ Powered leisure boating and small powered hire boating ▪ Ferry, tour and cruise boating 	Table 4.4, Page 4-15

Alfresco Dining refers to outdoor dining associated with restaurant activities on commercial development located next to promenade.

Clear Sidewalk Zone is the zone within the streetscape where pedestrian flow is in continuity and uninterrupted by any structures such as columns or any landscape furniture such as trees, benches, kiosks and utility elements such as covers and gratings.

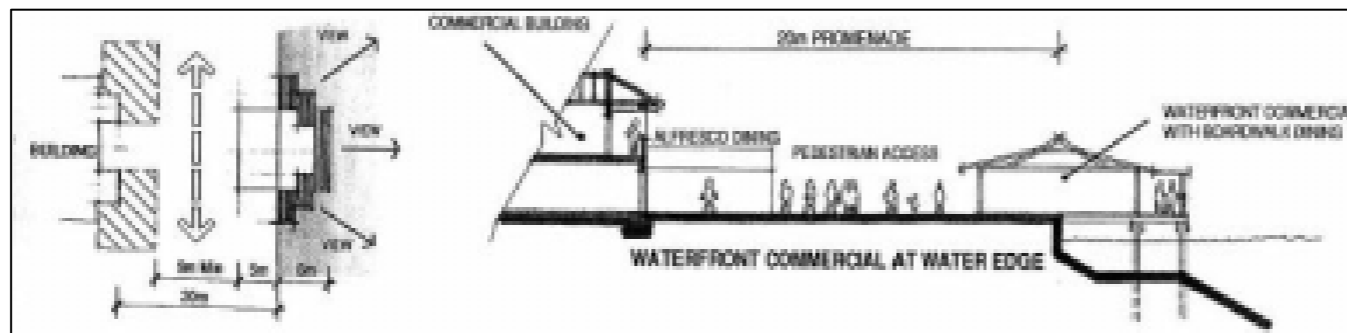


Figure 10.1
Alfresco Dining within the Promenade

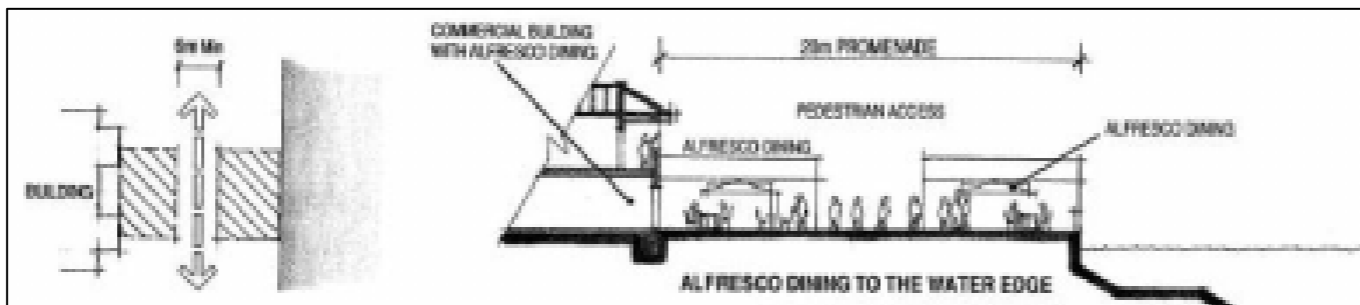


Figure 10.2
Alfresco Dining to the Water Edge

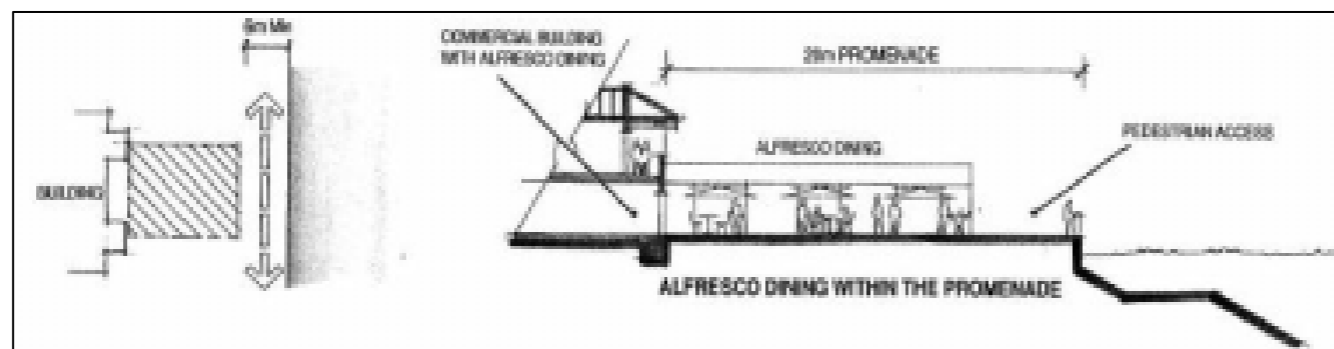


Figure 10.3
Waterfront Commercial at Water Edge

USE CLASS ORDER

Table 10.1 Permissible Activities On Promenade and Water Bodies (cont.)

PB8.1 (cont.)	Zone 4	<ul style="list-style-type: none"> Junior sports racing for special events Foreshore fishing within designated location Special advertised sporting, public display and festivity events by permit. Canoeing, kayaking, rowing skiffs and dragon boats for club activities and sports events Jet ski for special events Lake maintenance vessels. 	Table 4.4, Page 4-15
PB10.3	Zone 3	<ul style="list-style-type: none"> Promenade Pedestrian and cycle path Viewing deck Wakaf Public amenity space Children Play Area Aquatic sporting events Tour and cruise boating Foreshore fishing within designated location Canoeing, kayaking, rowing skiffs and dragon boats for sports events Lake maintenance vessels. 	Table 4.6, Page 4-22
PB10.1		<ul style="list-style-type: none"> Promenade Pedestrian and cycle path Viewing deck Wakaf Public amenity space Children Play Area 	Table 4.6, Page 4-21

Alfresco dining on the promenade is permissible in **PB8.3** and shall be of temporary structures. A minimum clearance of 6m shall be ensured at all time to allow for clear sidewalk zone and service access for maintenance vehicles (**Figure 10.1 to 10.3**).

10.3 PROMENADE TYPE

Promenade refers to strip of land area located between the Putrajaya Lake and individual land parcels next to it, the width of which shall be 20m measured from the top of slope of the lake edge.

Promenade Type is associated with adjacent landuse and lake edge treatments to the shoreline. Typically characterised as formal, semi formal and natural.

Formal Promenade refers to promenade area characterised by hard paving with handrails where pedestrian access to the edge of the promenade immediately before the water is maximised. This type is normally associated with very urban ambience particularly commercial areas and public realms.

Semi-formal Promenade refers to promenade area where the predominant character shall be of park land with naturalistic plantings intermingled with series of events or activity points. Pedestrian access to the water edge shall typically through boardwalks. This type is typically associated with residential character on the adjoining land.

Natural Promenade refers to promenade area where the lake edge shall be screened using dense woodland and vegetation. Typically associated with parks and areas where public access to the waterfront and its adjoining landuse is restricted.

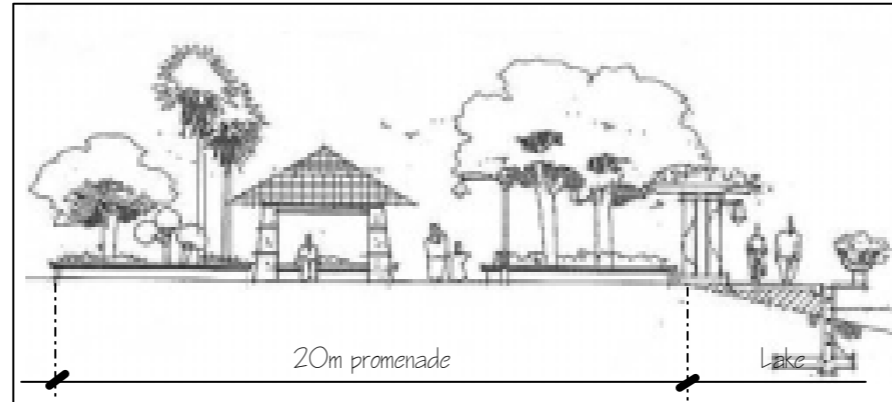
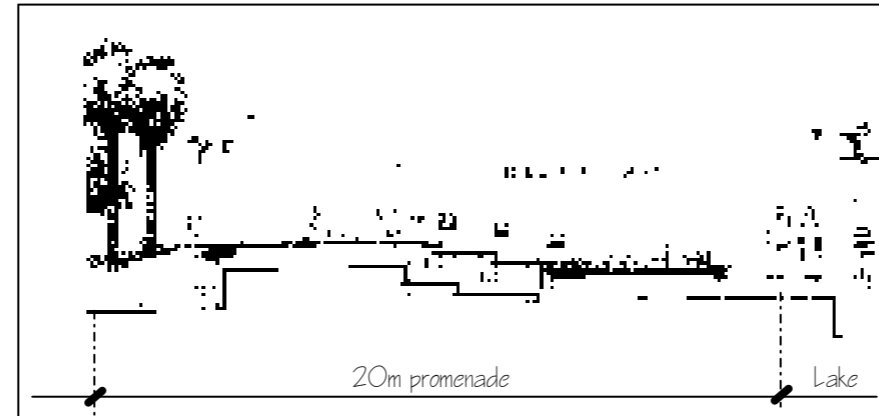


Figure 10.4

Typical Character of Formal Promenade

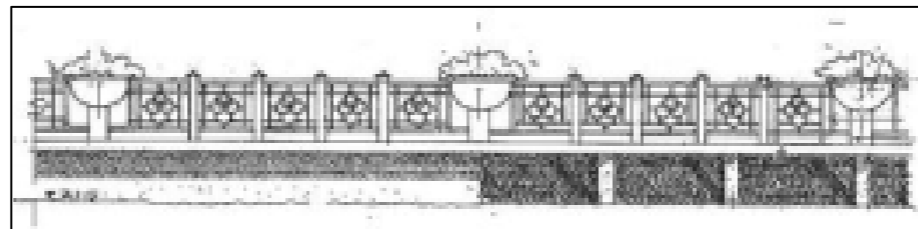


Figure 10.5

Typical Front Elevation of Formal Promenade

PROMENADE TYPE

1. Formal Promenade

- The water edge shall have a promenade character and shall consist of hard paving with handrails, attractive lighting and ornamental and shady trees.
- Pedestrian access to the waterfront shall be ensured at all times along the promenade and a minimum clearance for clear sidewalk zone of 6m shall be provided.
- Service access for lake maintenance vehicles shall be allowed for at designated locations. Service access of minimum width of 3.0m to the promenade area shall be provided at interval of 800 meter away from the nearest public right of way.
- Pedestrian footpath and cycle path along promenade nearest to the water edge shall be provided subject to the following minimum requirements: -

i. Segregated Pedestrian Footpath	-	1.5m
ii. Segregated Cycle Path	-	2m
iii. Dual Use Path	-	3m
- Occasional semi-permanent structures such as kiosks, public toilets etc. can be located on the promenade and shall occupy no more than 800 square metres of space on the promenade for each structure.
- Lake edge treatment to the shoreline shall conform to designation and requirements as specified in this Manual. See **Lake Edge Treatment**

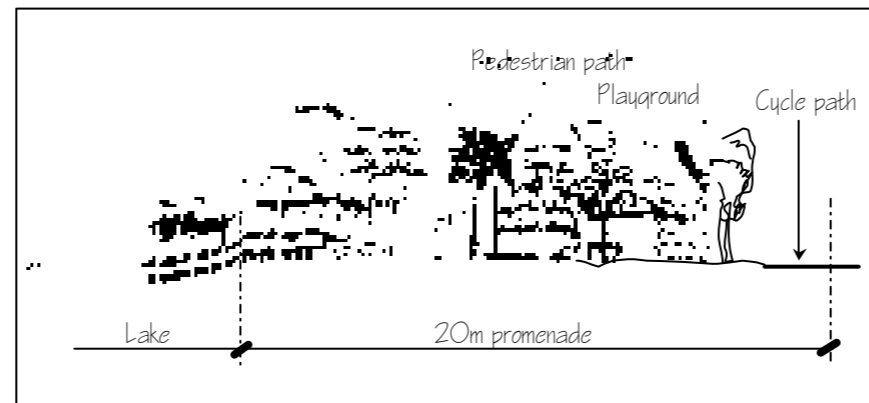


Figure 10.6
Typical Section of Semi-Formal Promenade

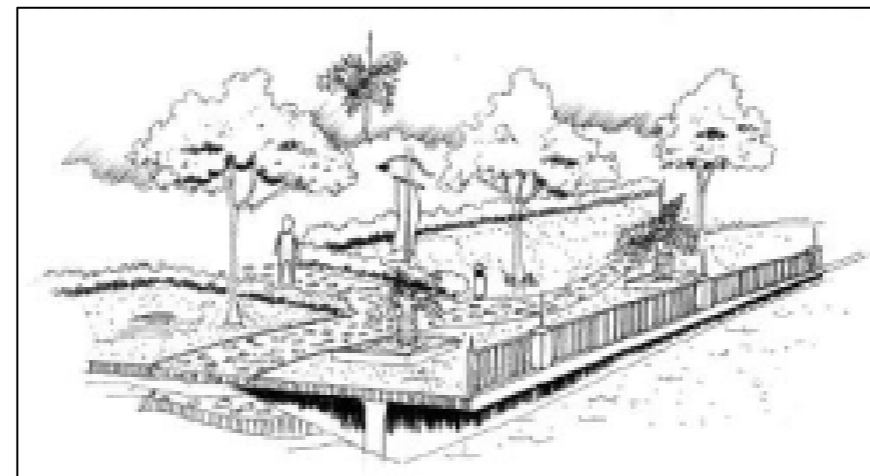


Figure 10.7
Boardwalk for Pedestrian Access within Promenade Area

PROMENADE TYPE

2. Semi-Formal Promenade

- The character shall be that of a park with naturalistic planting, framed views, winding path and series of activities along the route.
- Pedestrian access along the waterfront shall be through boardwalks and direct access to the water edge can be provided at designated locations, also via boardwalks.
- Service access of minimum width of 3.0m to the promenade area shall be provided at interval of 800 metres away from the nearest public right of way.
- Pedestrian footpath and cycle path along promenade nearest to the water edge shall be provided subject to the following minimum requirements: -

i. Segregated Pedestrian Footpath	-	1.5m
ii. Segregated Cycle Path	-	2m
iii. Dual Use Path	-	3m
- Occasional activity points or events such as picnic areas, bird feeding platform, wildlife observation hides, children play area etc. can be located along the promenade and shall be concentrated at designated locations of a minimum size of 150m and maximum 300m.
- Lake edge treatment to the shoreline shall conform to designation and requirements as specified in this Manual. *See Lake Edge Treatment*

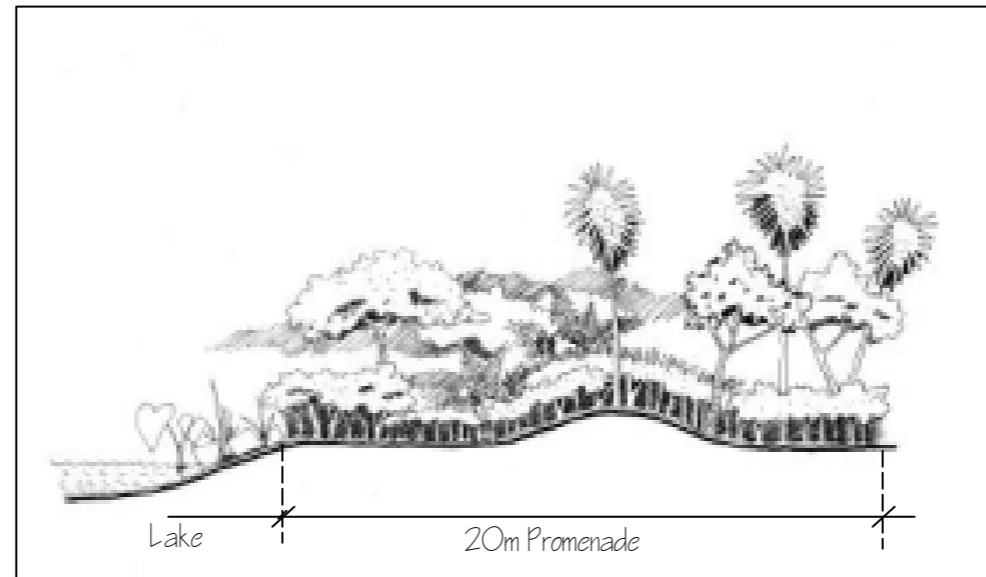


Figure 10.8
Typical Section of Natural Promenade

PROMENADE TYPE

3. Natural Promenade

- The character shall be that of a naturalistic wetland where dense tree vegetation will form a green backdrop.
- Pedestrian access of minimum 1.5m to the water edge shall be only at designated locations where water is shallow and through natural boardwalks.
- Service access of minimum width of 3.0m to the promenade area shall be provided at interval of 800 meters away from the nearest public right of way.
- Lake edge treatment to the shoreline shall conform to designation and requirements as specified in this Manual. *See Lake Edge Treatment*.

10.4 TRANSPORTATION AND ACCESS

The Putrajaya Lake has been planned to cater for multi-functional uses, including water transport, recreation, fishing and water sports. Water transport will be in the form of ferry services and other licensed private boats.

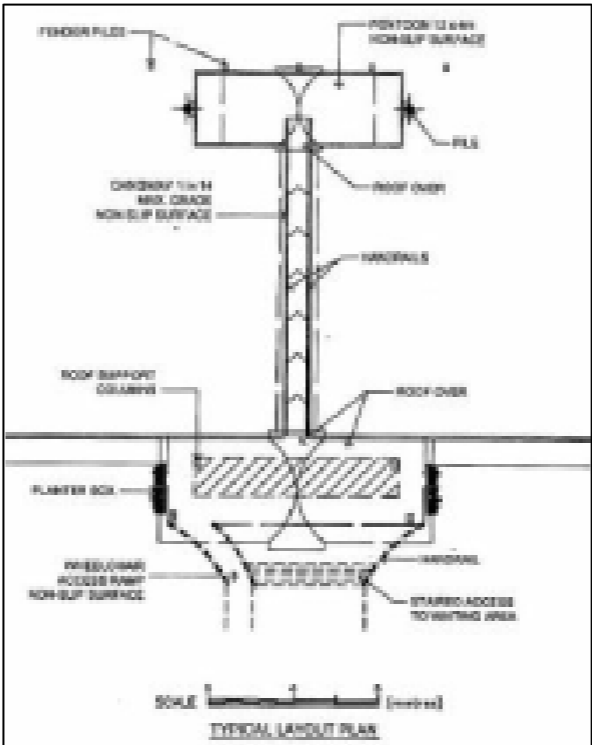


Figure 10.9
Typical Layout Plan for Type One Ferry and Tour Boat Terminal

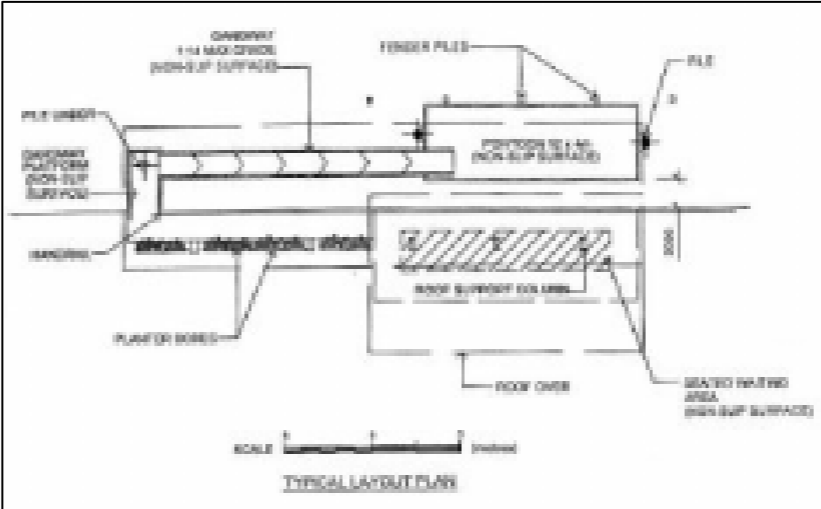


Figure 10.10
Typical Layout Plan for Type Two Ferry and Tour Boat Terminal

TRANSPORTATION

- Type One ferry and tour boat as indicated in the Putrajaya Lake Use and Navigation Master Plan and Lake and Wetland Emergency Response Plan, 2001 (Figure 10.9) is preferred.
- All pedestrian ramps and gangways around the terminal shall be designed to satisfy criteria applicable to wheelchair access.
- Provision for a bus stop, taxi rank, drop off and pick up zone and limited short and long-term parking shall be made for ferry terminal in PB8.1. See Lake Use and Navigation Master Plan and Lake and Wetland Emergency Response Plan, 2001.

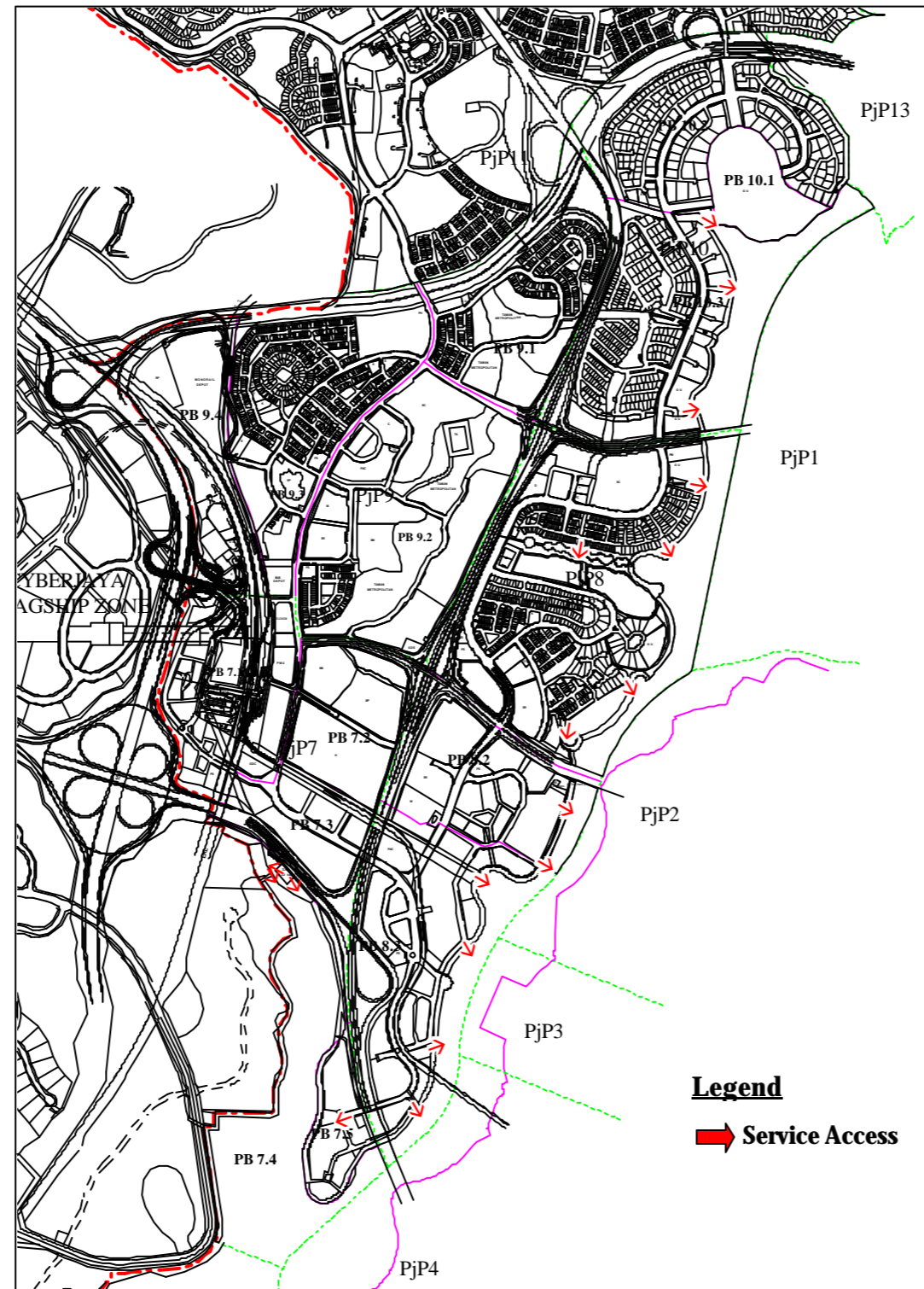


Figure 10.11
Indicative Locations of Service Access for Promenade
and Lake Maintenance Vehicles

SERVICE ACCESS

- Service access on the promenade of minimum width of 3.0m shall be provided at interval of 800 meters away from the nearest public right of way. Indicative locations of the service access are as shown in **Figure 10.11**.

10.5 LAKE EDGE TREATMENT

Lake Edge Treatment refers to the treatment of the embankment of lake or the lake shoreline from the promenade boundary.

As defined by the **Putrajaya Lake Use And Navigation Master Plan And Lake And Wetland Emergency Response Plan**, there are three types of lake edge treatments, defined as follows; -

Formal Hard Edges refer to vertical or battered formed walls that have a profiled or decorative applied surface treatment. The main structural component of these walls will typically be reinforced concrete.

Protected or Reverted Edges refer to edges formed by loose laid and freestanding natural materials such as boulders, quarry stones, gabions, bakau piles or rock. A reverted edge shall be the minimal required treatment for this type of edge protection.

Soft Edges refer to natural soil edge where the slope profile runs into the water with no protective barrier into the water with no protective barrier for wash and wave action.

Promontory refers to localised variations in the shoreline that allow the promenade to extend onto the 5m wide submerged bench. It is to facilitate for additional edge variation and to allow better access to deeper water for fishing.

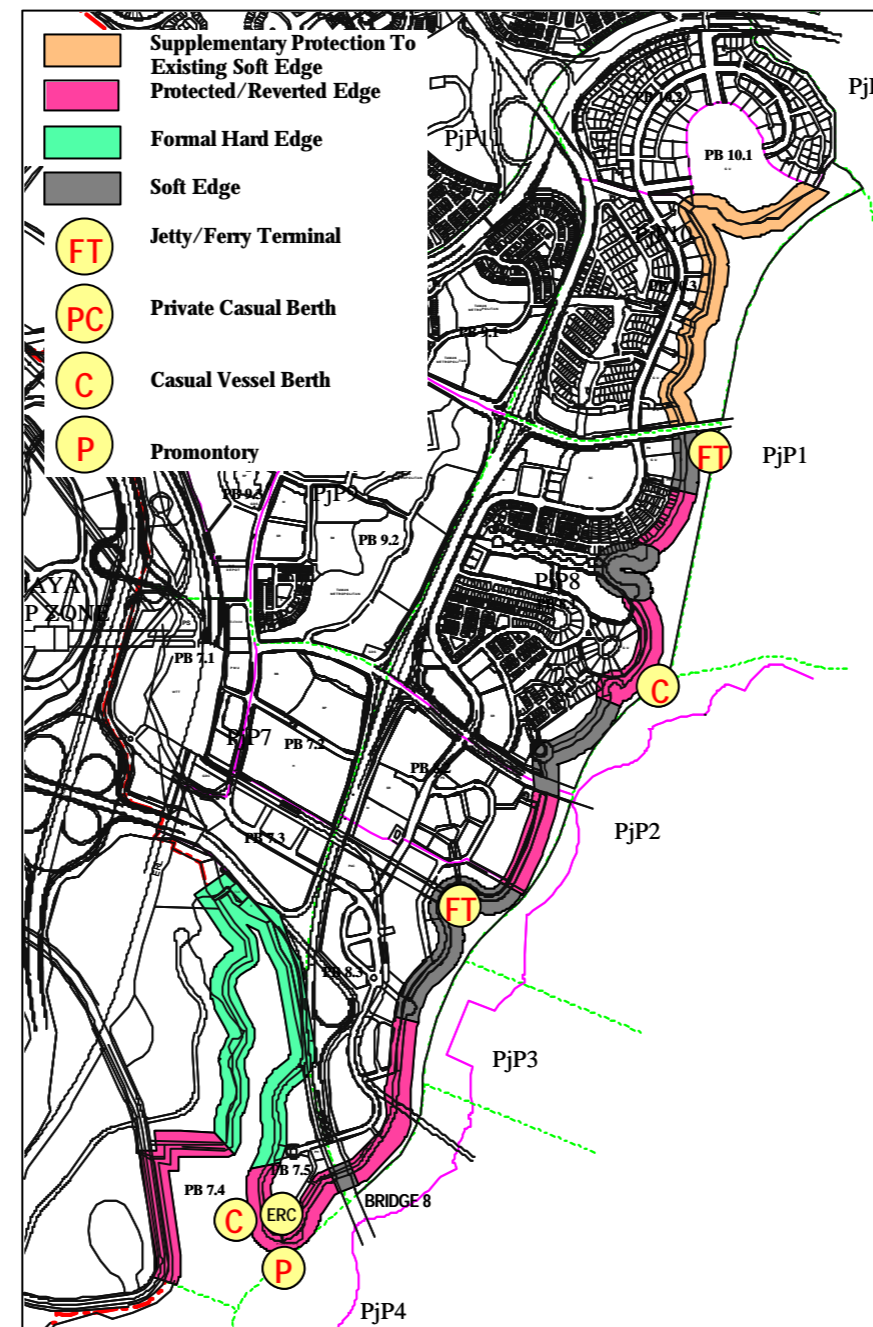


Figure 10.12
Lake Edge Designation

LAKE EDGE TREATMENT

- Edge treatment of the promenade shoreline shall conform to specific edge designations as shown in **Figure 10.12**.

FORMAL EDGE TREATMENT

- Where Formal Hard Edges are designated, the any of the following shall be applied: -

- i. Full height vertical edge walls, (**Figure 10.13**)
- ii. Low height formal edge walls, (**Figure 10.14**)
- iii. Stepped and terrace edge walls, or (**Figure 10.16**)
- iv. Particular vertical wall requirements applicable to ferry, tour boat, cruise boat and casual moorings.

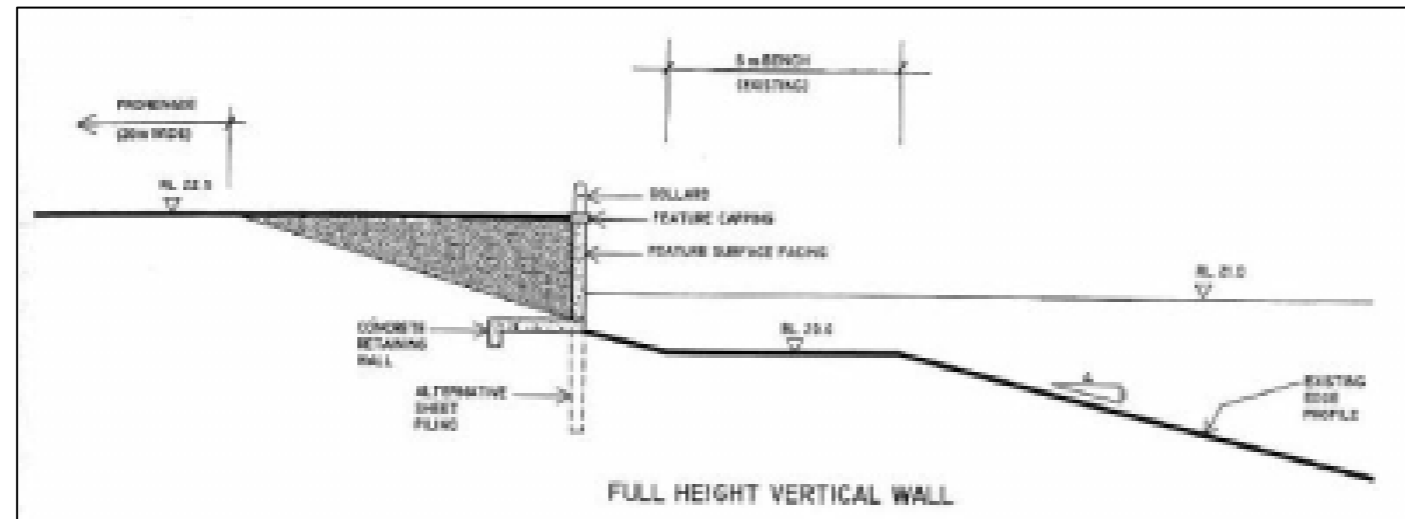


Figure 10.13

Typical Formal Edge Treatment - Full Height Vertical Wall

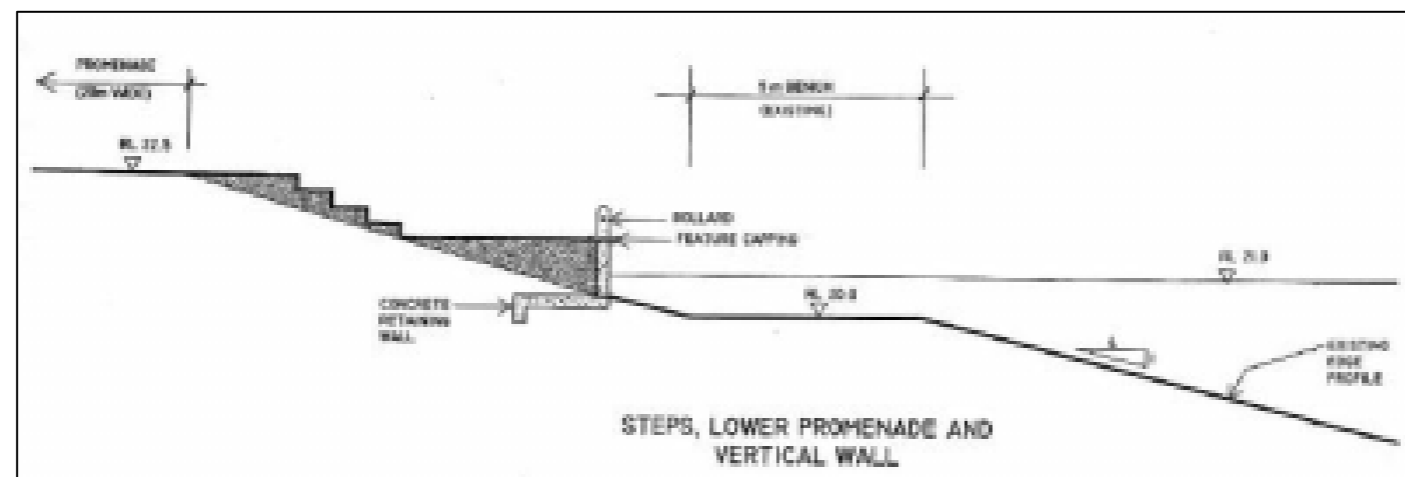


Figure 10.14

Typical Formal Edge Treatment - Steps, Lower Promenade and Vertical Wall



FORMAL EDGE TREATMENT

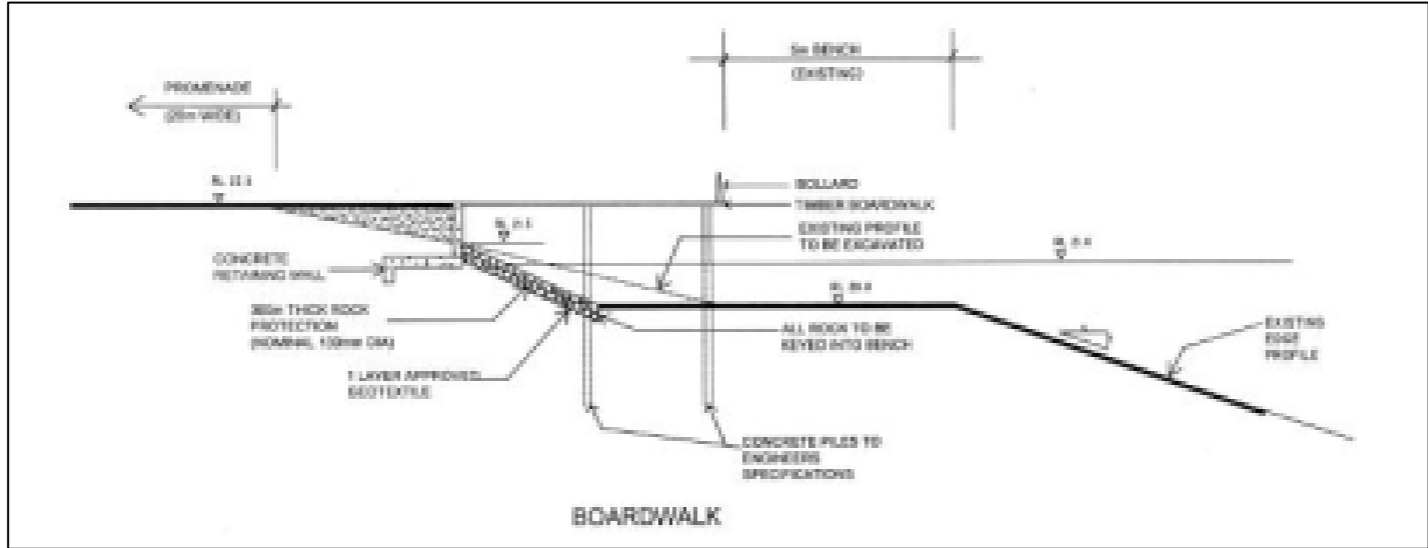


Figure 10.15
Typical Formal Edge Treatment - Boardwalk

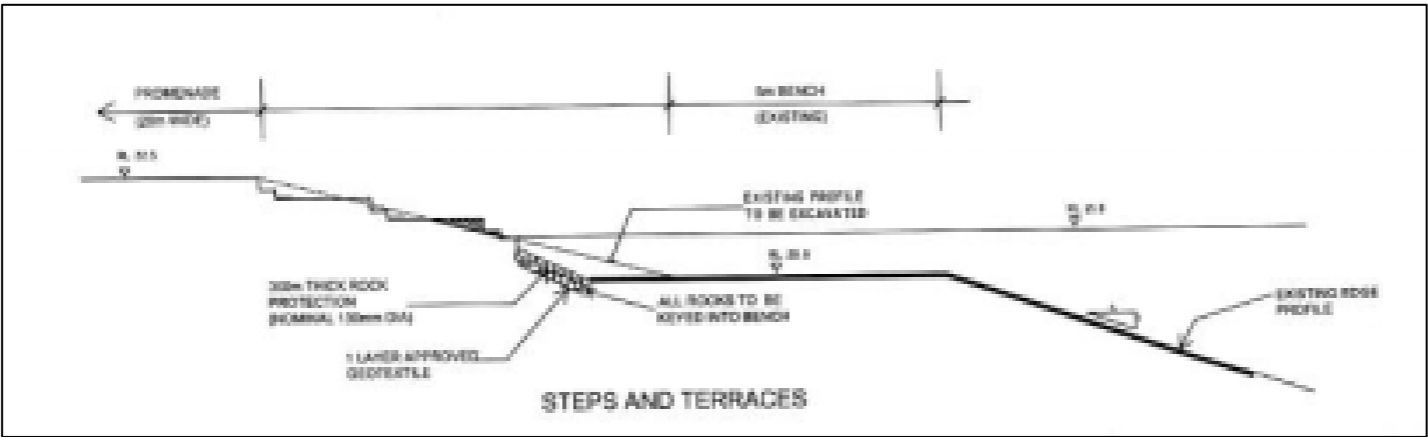


Figure 10.16
Typical Formal Edge Treatment - Steps and Terraces

LAKE EDGE ROCK REVETMENT

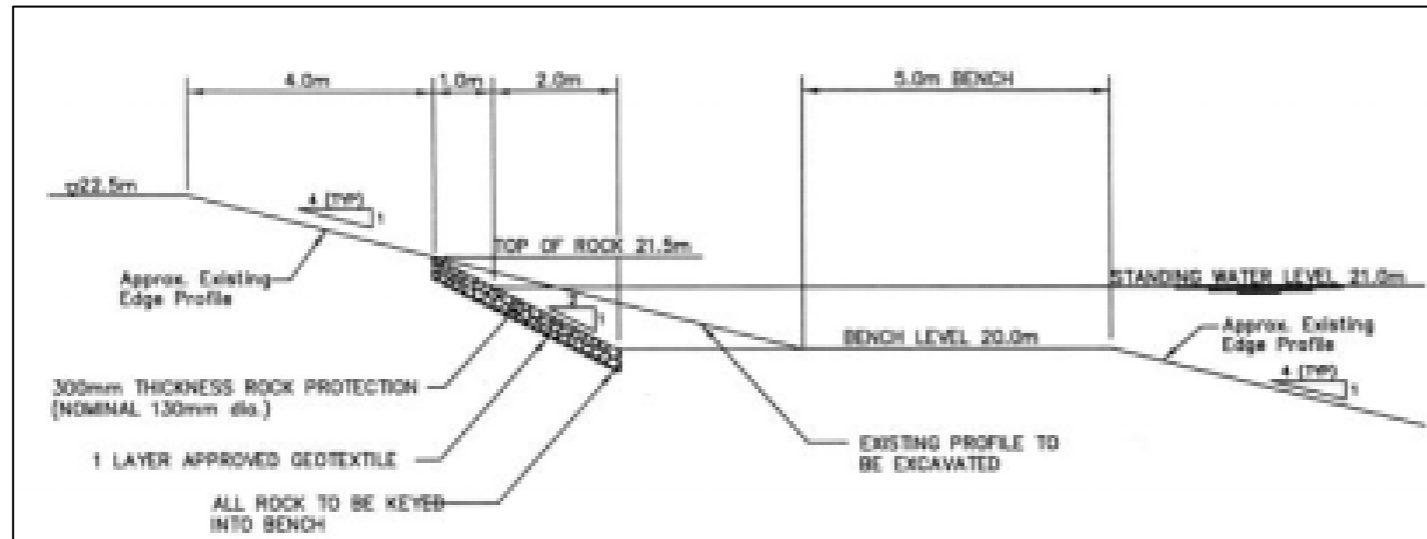


Figure 10.17
Typical Basic Rock Revetment Profile - Type A

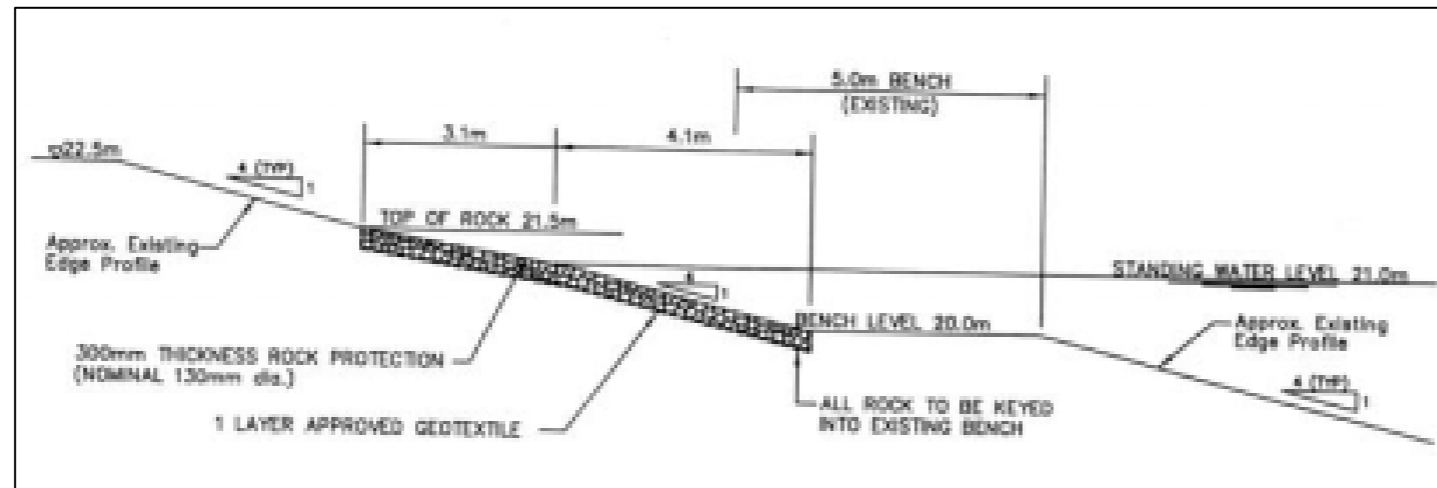


Figure 10.18
Typical Basic Rock Revetment Profile - Type B

- Type A is the preferred rock revetment profile. It is planned as an economical solution that minimizes horizontal and lateral visual impact of the exposed revetment surface.
- Reverted slope gradients flatter than 1:2 to the maximum allowable Type B profile may be considered where dictated by site conditions and construction economics. See **Putrajaya Lake Use and Navigation Master Plan and Lake and Wetland Emergency Response Plan** for details.