

**MANGO HILL INFRASTRUCTURE
DEVELOPMENT CONTROL PLAN**

Precinct Plan No. 001

for

Lakeside Residential Precinct

North Lakes Development

17 April 2000

(Approved subject to conditions by Council on 4 May 1999 (conditions incorporated) and incorporating amendments approved on the 18 October 1999, 5 April 2000 and 17 April 2000(MP00/1047))

CONTENTS

- 1.0 Introduction**
- 2.0 Structure Plan Context**
- 3.0 General Desired Environmental Outcomes**
- 4.0 Planning Intent**
- 5.0 Development Concept**
 - 5.1 Development Context
 - 5.2 Concept Overview
- 6.0 Precinct Plan**
 - 6.1 Introduction
 - 6.2 Land Use Pattern
 - 6.3 Transport and Circulation System
 - 6.4 Open Space and Landscape Concept
 - 6.5 Engineering Services
 - 6.6 Stormwater Management
- 7.0 Design Intentions and Performance Criteria - Urban Residential Area and Major Open Space Land Use Elements**
- 8.0 Design Intentions and Performance Criteria - Other Land Use Elements**
 - 8.1 Local Community Facilities Land Use Element
 - 8.2 Town Centre Frame Land Use Element
- 9.0 Environmental Management Objectives**
 - 9.1 Stormwater Discharge
 - 9.2 Flora & Fauna
 - 9.3 Air Quality
 - 9.4 Noise
 - 9.5 Lighting
- 10.0 Special Design Criteria**
- 11.0 Infrastructure Obligations of the Principal Developer**
 - 11.1 Overview of Infrastructure Obligations
 - 11.2 State Government Infrastructure Requirements
 - 11.3 Infrastructure Affected by Precinct Development
 - 11.4 How the Required Infrastructure Relates to the Infrastructure Agreement
 - 11.5 Preliminary Program for Infrastructure Provision
 - 11.6 Estimated Water and Sewerage Demands

List of Figures	Drawing Number	Dated
1. Location Plan	LRP-PP-F01(B)	February 2000
2. Structure Plan Context	LRP-PP-F02(B)	February 2000
3. Development Context and Concept Principles	LRP-PP-F03(A)	February 2000
4. Precinct Plan Map	LRP-PP-F04(H)	March 2000
5. Principles Plan	LRP-PP-F05(H)	March 2000
6. Landscape Concept Plan	LRP-PP-F06(C)	March 2000
7. Road layout Plan	LRP-PP-F07(C)	February 2000
8. Water Supply Headworks	LRP-PP-F08(C)	February 2000
9. Sewerage Headworks	LRP-PP-F09(C)	February 2000

Tables

1. Indicative Summary of Assessed Needs
2. Village and Local Parks - Approved PE Works

1.0 Introduction

- 1.1** The Mango Hill Infrastructure Development Control Plan (DCP) provides for the creation of a precinct within any part of the DCP area chosen by the principal developer. The principal developer may then prepare a precinct plan and lodge it with Council for approval in accordance with the relevant provisions of the DCP.
- 1.2** The purpose of a precinct plan, as provided for in the DCP, is to show in indicative terms more detail for a planning area within one land use element of the DCP Structure Plan or across a number of elements. This planning area is created to allow for a more detailed interpretation of a part of the structure plan.
- 1.3** The principal developer has created a precinct to be known for planning purposes as the Lakeside Residential Precinct. This document constitutes the precinct plan for the Lakeside Residential Precinct.
- 1.4** The location of the precinct within the DCP area is shown on Figure 1. The area of the precinct is approximately 92 hectares although, consistent with DCP requirements, the areas and boundaries shown on the plan are only notional.
- 1.5** Where a discrepancy arises between the performance criteria of this precinct plan and the requirements of the DCP or Mango Hill Infrastructure Agreement, the requirements of the DCP or Infrastructure Agreement will prevail.

2.0 Structure Plan Context

The precinct is located in the southern central part of the DCP area. It is broadly bounded by the east-west section of the proposed North-South Arterial Road and the main east-west part of the major open space shown on the Structure Plan. While the precinct predominantly comprises the Urban Residential land use element, it also includes parts of the Town Centre Frame and Open Space land use elements together with a Local Community Facilities element. The location of the precinct within the Structure Plan is shown on Figure 2.

3.0 General Desired Environmental Outcomes

In relation to the predominant land use element of Urban Residential Area, the DCP states the following general desired environmental outcomes:

- “(a) to establish residential villages that have a high level of amenity and sense of community;*
- (b) to establish residential villages that are appropriately designed in the context of ecological sustainability and offer a range of dwelling types that are conveniently located with respect to community facilities, open spaces and public transport.”*

The desired environmental outcomes for other minor land use elements within the precinct are contained within sections 5.1, 8.1, and 9.1 of the DCP.

4.0 Planning Intent

Clause 6.2 of the DCP provides an outline of the planning intent for the Urban Residential Area, including the following summary:

“The urban residential area is intended to provide for a wide range of housing needs in a variety of forms, styles and densities to reflect the prevailing market demands. Residential development will occur in a collection of residential villages reflecting a range of densities being low, standard and medium density. Each village will focus on a centrally located village park. Villages are to be progressively developed having particular regard to the timely, efficient and economic provision of engineering and social infrastructure.”

The planning intents for the minor areas of other land use elements within the precinct are contained within sections 5.2, 8.2, and 9.2 of the DCP.

5.0 Development Concept

5.1 Development Context

Figure 3 shows the urban design concept for the Lakeside Residential Precinct in relation to its wider development context.

The precinct’s location, adjacent to the linear park (major open space on structure plan), the Town Centre Frame, other Urban Residential areas and the Major Community Facilities elements, and its timing as the first development precinct, have strongly influenced the design concept. Key principles to consider in the wider development context of the precinct are outlined below:

- 5.1.1 The Lakeside Residential Precinct is set within the wider context of the southern part of the DCP area. This wider southern part basically comprises the Town Centre (core and frame), Major Community Facilities, Urban Residential Area, and a Local Community Facilities node and, is an identifiable development area south of the North-South Arterial Road focused on the linear park ‘valley’. The linear park is intended to have an attractive landscape character and a range of recreational opportunities. It will become a strong unifying urban design element which links the lower density Lakeside Residential Precinct and the higher density residential and mixed use Town Centre Frame Precinct together, and connects them to the wider DCP area. Pedestrian, bicycle and vehicular linkages to, across and around the town park/linear park have been determined in this context.

- 5.1.2 The proximity of the precinct to the future Town Centre Core, Town Centre Frame and Major Community Facilities land use elements (from 600 metres to 1200 metres distance or 10 to 15 minute walk to the Town Centre Core) means residents will have reasonably convenient access to a wide range of retail, commercial, employment, community and recreational facilities which, as a consequence, reduces the need for such facilities within the Lakeside Residential Precinct.
- 5.1.3 The need to create a strong arrival image with a project sales and information centre and the initial stages of residential development has led to the creation of a landmark activity node around the eastern end of a 5 hectare lake within the proposed town park (refer Figure 3). The initial stages of development will include a builders' display village on the northern side of the lake which will reinforce this landmark activity node.
- 5.1.4 The north-south spine road comprising Memorial Drive and Discovery Drive has been positioned to create a strong urban design axis with views to the lakeside node. It will also provide a strong development corridor in the initial years of development linking this node south to the Town Centre Core and Anzac Avenue and north to future residential villages.
- 5.1.5 Within the Town Centre Frame, Memorial Drive is proposed with a wide park-like median to provide both a strong initial landscape link back to Anzac Avenue and an attractive setting for a mixed use development corridor linking to the Town Centre Core. In later years, through traffic to and from the DCP area will find it more convenient to by-pass this low speed, landscaped 'mainstreet' corridor incorporating special streetscape treatments and use an alternative higher speed, more direct major road through the town centre extending from the Halpine Drive intersection to the east.
- 5.1.6 In the eastern part of the precinct the proposed educational facilities have been located to provide access to sports fields adjacent to the linear park, to reinforce the wider educational and community development area formed with the proposed school campus to the south (Major Community Facilities element) and with convenient access to the main access spine of Discovery Drive.

- 5.1.7 The centrally located local community facilities shown on the precinct plan map (refer to Figure 4) will combine with the proposed educational facilities, the lakeside sales and information centre, the town parklands and other adjacent mixed use development along Memorial Drive and within the Town Centre Frame to create a strong activity node as a northern anchor to the urban design corridor link to the Town Centre Core.

5.2 Concept Overview

The Lakeside Residential Precinct is proposed to be developed as a high quality, residential community comprising a mix of residential dwelling types. It will integrate a range of low to medium density housing types and associated community facilities, as provided for in the DCP, together with extensive areas of parkland, recreational open space and supporting engineering infrastructure.

The planning study, prepared in support of the DCP, envisages that the following community needs will be served by facilities to be established within or in reasonable proximity of the Lakeside Residential Precinct:

Overview of Assessed Community Service Needs

- A range of transport options will need to be provided, with emphasis on reducing dependence on private motor vehicles.
- Housing diversity is essential.
- Provision will need to be made to largely self contain the child care needs of the population.
- Schools need to be provided for the residents of the DCP area and surrounding areas. Schools should be located adjacent to open space.
- Local community facilities and services should be integrated with urban residential areas.
- Playgrounds are to be provided.
- Structured recreation facilities should also be located in or adjoining district parks or schools (opportunity for co-location).

The development concept and indicative arrangement of land uses for the precinct is shown in Figure 4. This plan identifies the principal land use elements which form the basic structure of the precinct, including:

- Two residential villages which have an overall capacity to accommodate approximately 2,000 residents;

- Town Centre Frame elements including lakefront sites at the northern end of Memorial Drive and along Lakefield Drive intended to accommodate the principal developer's sales and information centre, as well as allowing for other mixed use development. Consistent with the DCP, the principal developer must provide community premises and a kiosk to serve the needs of initial residents and these facilities may be provided either within the sales and information centre or elsewhere within the precinct. It is intended that the other sites on either side of the sales & information centre may be developed for a range of commercial, retail, community or possibly medium density residential uses. Similarly, the sales and information centre site could ultimately be redeveloped for a comparable range of town centre frame uses.

- Centrally located Local Community Facilities to the east along Discovery Drive serving local residents' needs, which will include educational facilities, and possibly child care facilities, convenience retail, a church and such like. The provision of these community facilities will be closely coordinated with housing development in the manner envisaged for the overall North Lakes development in section 8.0 of the DCP;

- A range of park types recognised in Table 9.1 of the DCP and which occupy a total area of approximately 16 hectares or some 17.5% of the precinct. These park provisions are intended to meet the passive and active open space needs of approximately 2,000 residents in this precinct as well as surrounding future precincts, and basically consist of:
 - (i) district level open space in the form of a linear park following the main overland flow path and incorporating local sportsfields (within adjacent school grounds), trunk pedestrian/cycle paths, possible picnic and playground facilities and extensive landscape treatments. Consistent with Table 9.1 of the DCP, the linear park may also incorporate various forms of commercial recreation such as a golf course, however, such commercial uses would be limited to the west of the collector road that connects this precinct to the Town Centre;

 - (ii) part of the town parklands adjacent to the principal developer's sales and information centre and integrated with the linear park. As envisaged in the DCP, the town park will consist of a five hectare ornamental lake as well as other high order urban parkland facilities which may include an outdoor amphitheatre, commercial parkland concessions, picnic facilities, works of urban art and outdoor recreational areas and furnishings serving the initial 2,000 residents of this precinct and ultimately the whole community of North Lakes; and

 - (iii) local open space in the form of notionally located village and local parks serving adjacent housing in accordance with the residential planning principles established in the DCP. The local park requirements in the southern portion of the precinct will be satisfied by the linear park/town

park in acknowledgment of the multiple functions of some portions of the linear open space; and

- A major internal road network with a legible and formal geometry providing safe and convenient access for local traffic.

The precinct plan shows the major land uses and structuring elements in sufficient detail to allow for the preparation of more detailed sector plans. The areas and locations of the various land uses, roadways, intersections, parkland and other elements are indicative only and subject to variation following detailed subdivision and engineering design. Consistent with the DCP, it is important that flexibility be maintained for future planning which needs to be responsive to changing requirements of the community and the market-place. Sector plans to be prepared in the future for individual stages and land uses will provide more detail on the precise locations of roads, parks and various forms of development

6.0 Precinct Plan

6.1 Introduction

Figure 4, Lakeside Residential Precinct Plan Map, provides a more detailed interpretation of the land use planning and development intents for a part of the North Lakes Structure Plan. The key principles which have determined the urban design structure for the precinct plan are summarised on Figure 5 and explained below.

6.2 Land Use Pattern

6.2.1 Background

In accordance with section 2.3.2(f) of the DCP, the desirable and undesirable land uses are to be identified in generic terms during the preparation of this precinct plan. The desirable land uses are described below. The sector plans stemming from this precinct plan will finalise the specific land use rights as required by section 2.4.9 of the DCP.

6.2.2 Urban Residential

Two residential villages are proposed with an overall capacity to accommodate approximately 700 dwellings or 2,000 residents. The villages are to provide for a range of housing choices from traditional to small lot housing and, where appropriate, medium density units. Rear lane access may also be provided to some small lots, which are generally located adjacent to parks, to achieve a distinctive architectural style and streetscape by removing motor vehicle accommodation and garbage collection to the rear of housing.

A small residential area adjacent to the educational facilities is separated from the balance of the easternmost village by the main entry spine road of Discovery Drive. The limited extent of housing development adjacent to the school campus is intended to minimise any intrusion of traffic and noise impacts into the wider residential area resulting from the

educational facilities. This small sub-village of houses is, however, focused around a local park and offers the added advantages of close proximity to the local community facilities nodes and the sportsfields and associated parkland facilities of the adjacent linear park. It is also intended that this sub-village include various forms of small lot and/or medium density housing types which benefit from close proximity to community facilities and major open space.

6.2.3 Open Space

A hierarchy of open spaces is proposed to provide a special identity for each residential village. Each village will be developed around a village park with most housing within a 400 metre radial walking distance of this open space. Smaller local parks will also be provided where appropriate generally within 200 metre radial catchments of residents. However, in the southern portion the precinct, the linear park/town park will perform this role. In particular, these local parks would be appropriately located in the central northern residential areas of the precinct which are furthest from the linear and town parklands. Consistent with the Mango Hill Infrastructure Agreement (MHIA), the village and local parks will provide a range of recreational opportunities including play structures, seating, drinking fountains and, in the case of the village parks, shelters and picnic facilities. These village and local parks will be linked to the linear park, town park and local community facilities via pedestrian pathways, and the local road network.

The linear park and town park forming the southern boundary of the precinct will provide a range of recreational opportunities including an ornamental lake, playgrounds, walkways, picnic areas, informal open space areas, an outdoor amphitheatre, and seating and viewing facilities. Commercial recreational facilities may also be established in the linear park, although any proposal to include a golf course would be limited to the area (external to precinct) to the west of the collector road that connects this precinct to the Town Centre.

6.2.4 Community Facilities

A range of community and convenience facilities are proposed to service the needs of residents. The following is a summary of the community facilities to be provided within this precinct.

- **Educational Facilities**

At least one primary/pre-school will be developed within the local community facilities node. This facility may also be expanded into a pre-school to secondary (P-12) campus.

The educational facility provided within the local community facilities area of this precinct has been located:

- (i) with frontage to the linear park to enable direct access to the major bicycle/pathway system and to allow school sportsfields (located within the school campus) to be integrated with this wider open space and recreation corridor;
- (ii) with convenient access to, and visibility from, the north-south spine road of Discovery Drive which links the school campus to the future residential villages it will serve; and
- (iii) Along the planned bus route following Discovery Drive with a proposed private school loop road connection for buses and cars through the campus and linking between the two intersections with Discovery Drive; and
- (iv) to form part of a wider major grouping of educational facilities at the eastern end of the Town Centre Frame.

It is proposed that housing opposite the school campus and in the immediate vicinity of the local community facilities node will not have direct vehicular access to the collector road in order to minimise potential conflicts with school traffic at peak times.

An additional school site may be required by education Queensland within this Precinct. Detailed planning of the nature and location of this possible school has not yet been concluded, however Education Queensland with the support of the Principal Developer will define its requirements at the earliest opportunity. Should an additional school site be required, the Principal Developer will provide assistance and co-operation in defining an appropriate site having adequate topographic characteristics and infrastructure services for the construction and operation of a school.

- **Retail and Other Community Facilities**

A major sales, information and estate administration centre is proposed at the lakeside entry node adjacent to Memorial Drive, as discussed in Section 5. The principal developer intends to establish a small convenience shop within this centre by the time new residents locate in the precinct. As a requirement of the DCP, this local convenience shopping outlet must be maintained to serve the needs of residents of the Lakeside Residential Precinct until such time as a viable alternative is established.

The development of the sales and information facility as with development on the other two Town Centre Frame sites cannot be at the expense of residential amenity enjoyed by dwelling houses surrounding the lake. This issue can be resolved through a number of methods, including both building design and the restriction

of the available land uses within the sectors containing the sales and information centre and other Town Centre Frame developments. The proposed sector plans for these lakefront sites must clearly address this issue.

Other convenience retail, commercial and community facilities may be established as development extends generally southwards from the sales and information centre, into the adjacent Town Centre Frame mixed use 'mainstreet'.

The local community facilities nodes adjacent to the school campus will accommodate a range of community facilities within the precinct, which may include uses such as a child care centre, a local church or convenience shopping.

The local community facilities nodes have been located adjacent to the school campus in response to the potential nexus between the educational facilities and supporting facilities such as a church, child care centre or possibly indoor recreational activities. The local community facilities will be connected by pathways and located in close proximity to the linear park with its major bicycle/pathway system. They will offer convenience for motorists with direct access off the main access spine of Discovery Drive. Careful attention will be given to the detailed planning of these local community facilities at the sector planning stage to ensure appropriate management of traffic and, in relation to the northernmost community facilities node, protection of the amenity of adjacent residential development.

The following table (Table 1) provides an indicative summary of the key community needs and the services and facilities proposed to be provided within or in reasonable proximity of the Lakeside Residential Precinct.

Table 1: Indicative Summary of Assessed Needs

Community Service Needs	Development to Provide
A range of transport options will need to be provided, with emphasis on reducing dependence on private motor vehicles.	<ul style="list-style-type: none"> • An effective development design to promote the viability of public transport. • Local accessibility to facilities and services, especially by pedestrian routes and cycleways. • Community bus to serve initial residents of the DCP area and link to regional public transport system.
Housing diversity is essential.	<ul style="list-style-type: none"> • A range of lot sizes and dwelling types, including detached houses, duplex dwellings and possibly townhouses.
Provision will need to be made to largely self contain the child care needs of the population.	<ul style="list-style-type: none"> • A range of long day and occasional child care services.
Schools need to be provided for the residents of the DCP area and surrounding areas. Schools should be located adjacent to open space.	<ul style="list-style-type: none"> • Provision of a primary school with a pre-school. • A possible P-12 school by either the State or a private provider. • Possible shared use of facilities to minimise duplication and increase community accessibility. • Possible integration of some social infrastructure facilities eg. child care, ministry centres and libraries.
Local community facilities and services should be integrated with Urban Residential areas.	<ul style="list-style-type: none"> • Facilities and services, eg. child health services, community nursing and outreach support programs, primarily provided in adjacent town centre.
Access for people with disabilities.	<ul style="list-style-type: none"> • Access for people with disabilities.
Playgrounds	<ul style="list-style-type: none"> • Provide adventure play spaces for 7 - 11 year olds. • Provide meeting places for older children and the aged. • Create larger district parks (ie. linear park and town park) incorporating a range of activity settings.
Structured recreation facilities should also be located in or adjoining district parks or schools (opportunity for co-location).	<ul style="list-style-type: none"> • Some structured recreation facilities possibly co-located with school.

6.3 Transport and Circulation System

Consistent with the DCP Structure Plan, the major internal road network is based on a modified grid layout. Roads are to be generally located in minor overland flowpaths or running with the natural contours and will provide high connectivity throughout the precinct. Major internal roads will typically allow vistas of the linear park and central lake or of village and local parks. Special streetscape treatments along the major roads will promote the concept of a 'green' environment, thereby enhancing the driving experience. Major entry points to the precinct may also incorporate gateway signage and ornamental landscaping to create a strong sense of community identity.

A clear hierarchy of roadways related to traffic function including bus movements, is to be adopted in the detailed design of the precinct. The amenity of residential villages is to be preserved by minimising the amount of through traffic. The road network has been planned so that through traffic will be generally limited to the sub-arterial and arterial roads associated with the precinct.

External road connections are provided via:

- Connections to the main north-south access spine formed by Memorial Drive and Discovery Drive which connects through the precinct from Anzac Avenue in the south to the proposed North-South Arterial Road in the north and residential villages beyond. This will be the main approach road to the precinct and will provide access to the initial stages of development. However, as discussed above, the Memorial Drive link through the Town Centre will ultimately be replaced as the main access thoroughfare by a new road connection to the Halpine Drive intersection at Anzac Avenue.
- A collector road which will connect through to the future Town Centre by crossing the linear park to the west of the lake.
- A connection in the western part of the precinct to the proposed North-South Arterial Road.
- Connections to a collector road which forms the eastern boundary of the precinct. This connects north-east to the North South Arterial Road and Mango Hill Village and south-west to another future school campus (within Major Community Facilities element) and the Town Centre Frame precincts.

The collector roads of the precinct are to be designed to link the residential villages to adjacent arterial and sub-arterial roads. Some local roads will form esplanade roads with the linear park and town park to enable community ownership and casual surveillance of these major open spaces. Variations in the horizontal alignment of roadways and only limited use of traffic management devices, together with the landscape treatment of verges and the use of special threshold treatments, will assist in controlling vehicle speed within the precinct, particularly in lower order residential streets and access places.

Residents of the Lakeside Residential Precinct will all be within 400 metres (5 minutes walking time) of a local bus route. Provision will be made for buses to utilise collector roads through the precinct and the adjacent major roads to ensure this high level of access to public transport is achieved. The bus route will also pass directly by the local educational and community facilities node (refer Figure 5). In accordance with section 10.3.1 of the DCP, a community bus service will be commenced by the principal developer to address the needs of the initial residents.

Pedestrian and bicycle circulation within the precinct will be a priority of open space and landscape planning. The linear park and town park will provide the main spine of the pedestrian/cycleway network (including a pedestrian/cycle underpass to Discovery Drive) which will be linked to the residential villages and local park system via lower order roadways and pathways where required. This pedestrian/cycleway network will provide access to community facilities, as well as to the future Town Centre, Mixed Industry and Business Area and adjoining Urban Residential Precincts.

A pedestrian/cycle connection across the North South Arterial Road is also proposed via the westernmost at grade intersection.

6.4 Open Space and Landscape Concept

The landscape setting of the precinct will be established to ensure its integration into the surrounding local and regional landscapes. Open space provisions within the precinct will form part of the comprehensive and integrated system of open space planned for the DCP area, fulfilling aesthetic, recreation, transportation and environmental management functions. The principal spatial elements or key areas of the Landscape Concept Plan (refer Figure 6) are summarised as follows:-

- **Linear Park:** Being part of the district open space system which, together with the town park, is planned as a network of linked bushland areas, managed waterways and water cycle management systems (e.g. gross pollutant traps, artificial wetlands and the lake) and open spaces aligned with the principal east-west overland flow path. This linear park is adjacent to the school ovals and may later extend to the east to include an area identified for future district sportsfields.

- **Town Park:** An urban park on the edge of the Town Centre Frame and integrated with the linear park and principal developer's sales and information centre. This park is intended to form part of a series of interconnected urban parklands extending throughout the town centre. It will incorporate a lake, an outdoor amphitheatre, possible commercial parkland concessions such as a restaurant and catering premises, public gardens and more formalised areas of landscaped open space, and picnic and recreational facilities. The park also forms an important arrival node and setting for the initial sales and information centre.

The town park will focus on a 5 hectare lake which performs aesthetic, passive recreational and environmental management functions. This lake may include one or a number of special feature elements, such as urban artworks within the water or fountains, for enhanced visual interest. It is intended the lake be constructed of a combination of hard and soft edge treatments, including the use of rock and rendered concrete walls adjacent to the sales and information centre and grassy banks giving way to reeds and sedges in areas where water quality management is the primary objective.

- **Village and Local Parks:** Active and passive recreation areas of minimum 5,000 square metres and 2,000 square metres, respectively, and placed at convenient locations across the precinct to serve the needs of local residents in accordance with residential planning principles outlined in the DCP.
- **Streetscape Planting:** Streetscape treatments of major roads and local streets creating a cohesive and positive impression of the development, with selection of plant materials for roadways based on aesthetic, practical, maintenance and safety considerations, and the scale of each reserve width in the hierarchy.

The final location and size of the various park elements will be determined at the sector plan stage. The landscape treatments of these areas will be planned in such a way that their different roles, natural features and locational characteristics will be recognised and enhanced. The resulting open space system within the precinct should have diversity and interest for a wide range of users while at the same time serving as a mechanism for restoring the DCP area's degraded landscape environment.

The Landscape Concept Plan promotes the planting of predominantly native species to reflect the original natural setting of the DCP area. This planting strategy will establish a landscape framework which enhances habitat values, reduces maintenance and water requirements, influences the built form in terms of visual integration and creates a 'green' environment for residents and visitors. Exotic and flowering species may be used primarily for special colour accents at significant entry points or as feature planting within parks. The landscape planning will also include the enhancement of major roads through or adjacent to the precinct with the planting of trees and provision of acoustic mounds and fencing to establish an attractive visual and acoustic buffer and to enhance the amenity of adjacent residential development.

The landscape treatment of residential frontages to streets and parkland will be controlled through design and siting guidelines in the sector plan. These guidelines will give

particular attention to ensuring a consistent landscape effect along residential frontages to the town park/linear park.

Memorial Drive/Discovery Drive extending from Anzac Avenue will provide access to the initial stages of development. Attractive entry statements, which may include gateway signage walls, landscape planting and possibly water features, will be used to create a sense of arrival. Landscaping and presentation of this main entry road is therefore critical in establishing standards for the overall North Lakes development.

The road reserve of Memorial Drive leading to the precinct has been increased in width to provide the opportunity for a wide park-like median and an attractive tree-lined boulevard approach to the sales and information centre, local community facilities and residential development. The main entry road will also provide vistas down to the main lake within the central area of the town park. This section of Memorial Drive is ultimately intended to form a 'mainstreet' which links the lake through the Town Centre Frame to the Town Centre Core. Special street design characteristics, landscape treatments and traffic management measures will be progressively implemented along Memorial Drive to create the 'mainstreet' character.

Within the precinct, Discovery Drive will continue as an attractive landscaped corridor with a median and widened verges to accommodate sound attenuation measures and landscape plantings. Sound attenuation treatment and major landscape plantings are also proposed along the North-South Arterial Road frontage.

6.5 Engineering Services

6.5.1 Sewerage

Sewerage infrastructure will be provided by a trunk gravity sewer within the linear park. The gravity sewer will ultimately drain to Pump Station 1 which is adjacent to the southern boundary of the linear park system.

The principal developer may include an interim sewerage discharge system in accordance with Council's approval on the 4th October, 1999.

The nearest proposed residential lot is more than 100 metres from both the interim pump station and Pump Station 1.

6.5.2 Water Supply

Trunk water mains are proposed along Discovery Drive and Memorial Drive, North-South Arterial Road and the future major road to the west of the precinct. Individual lots and sectors will be served by a network of reticulation mains designed in accordance with Council's Design Manual and Policy WS. W13.

6.5.3 Energy and Communications

Electricity supply will be provided by Energex or another appropriate supplier of electricity. The primary supply to the area is ultimately proposed to be augmented by a major overhead line located along the North-South Arterial Road and via Anzac Avenue to a sub-station located outside of the precinct. The precinct area will be serviced by underground power to pad-mounted transformers located within the local road reserves.

Gas can be supplied from an existing gas main in Anzac Avenue. It is proposed that the supply of gas will be negotiated as an underground supply to individual lots.

Communications and cable services will be installed underground. The network will be installed at each stage of subdivision development. Towers are not proposed to be located within this precinct.

6.6 Stormwater Management

The linear park and town park within the precinct contain a major flow path which drains an upstream catchment to the west as well as the precinct area. A lake, stormwater filtration wetlands and gross pollutant traps will be integrated into this continuous open space system. These devices are part of an overall stormwater management strategy to manage the impacts of development on stormwater flows and quality. Peak discharges will be limited by a major detention basin located downstream of the precinct and upstream of Kinsellas Road. While the detention basin will be constructed in stages, it will have sufficient capacity to mitigate stormwater flows from the developed area at any time. The lake, wetlands and other devices are part of the system designed to achieve stormwater discharge quality standards. The lake and associated wetlands will be the first elements of the stormwater management system to be constructed.

The individual sectors within the precinct will be serviced by an underground pipe system servicing individual sub-catchments. The system will be designed to take a 1 in 5 years storm. Overland flow will be accommodated in roadways, pathways or open space linkages within residential sectors connecting to the linear park.

An overland flow path is located immediately east of the sales and information centre and caters for the sub-catchment upstream. The minor flows from the sub-catchment upstream are to be diverted by a pipe system east across Memorial Drive/Discovery Drive discharging downstream (east) of the lake embankment.

7.0 Design Intents and Performance Criteria - Urban Residential Area and Major Open Space Land Use Elements

Queensland Residential Design Guidelines, Queensland Department of Communications, Information, Local Government and Planning (QRDG), provides statements of intent and performance criteria for a range of design elements which are applicable to housing development, open space planning and residential street design within the precinct. The QRDG criteria cover the range of urban residential development forms, including

detached housing, attached housing (eg. duplexes, townhouses and residential units up to 3 storeys over carparking), and residential components of mixed use projects. Both the QRDG and *AMCORD - a National Resource Document for Residential Development* (the basis of QRDG with modifications to suit Queensland conditions) are recognised by the DCP as providing appropriate design and siting principles for residential development within the DCP area. By adopting this precinct plan, Council has resolved to apply the provisions of QRDG to this precinct and has made a similar resolution in accordance with Section 45 of the Standard Building Regulation.

The performance criteria outlined in the QRDG are intended to promote best practice in urban residential design and enable more creative and efficient use of land in relation to a wide choice of housing styles. Compliance with these criteria is required for all development works in the Urban Residential Area and Open Space land use elements.

8.0 Design Intents and Performance Criteria - Other Land Use Elements

8.1 Local Community Facilities Land Use Element

8.1.1 Intent

To provide a range of community and educational facilities which:

- are conveniently located;
- primarily serve the needs of local residents; and
- are integrated with the overall development of the precinct and of the adjacent Town Centre Frame and Major Community Facilities precincts.

8.1.2 Performance Criteria

The intent may be achieved where:

- (i) A range of complementary land uses are established, such as primary and/or secondary educational facilities, community services, convenience retail, recreational facilities and social activity centres, to the extent required to serve the local community and in the context of intended civic, community, recreational and commercial facilities planned within the adjacent Town Centre Frame.
- (ii) Building development is low rise and sympathetic to the site and the surrounding predominantly urban residential character of the precinct.
- (iii) Building forms and architectural features are to be of a high standard, consistent with the prominent parkfront location of the facilities.

- (iv) The landscape treatment of the local community facilities provides an attractive landscape setting and assists in breaking up the scale of the buildings and carparking areas.
- (v) An appropriate streetscape presentation is established consistent with the development's significant community function.
- (vi) Convenient accessibility from cycleway, pedestrian movements and public transport is available to the facilities.
- (vii) Pedestrian areas and public spaces are located to maximise opportunities for casual surveillance, generally separated from traffic areas and linked to the open space network by pathways.
- (viii) Carparking and bus setdown areas are readily accessible to the community and educational facilities buildings, partially screened with landscaping from pedestrian areas and public spaces and planted with shade trees.
- (ix) Signage is unobtrusive from residential lots and public open space, and in keeping with the character of the local community facilities development without overwhelming the visual integrity of development and landscaping.
- (x) Any interface between local community facilities and residential development ensures that the affect on the amenity of the residential area is minimised.

8.2 Town Centre Frame Land Use Element

8.2.1 Intent

To provide opportunities for mixed use development which benefits from, and relates to, the town park setting. One of these sites (refer Figure 4) is intended to initially provide for the development of an integrated sales and information centre, principal developer's project office and possibly community premises for early residents within a landmark building which responds appropriately to the South East Queensland climate and to its lakefront location while ensuring the standard of amenity of surrounding residents. A range of other commercial, civic, community and residential uses may also establish on these mixed use development sites and, in the case of the sales and information centre, such uses may be integrated with this primary purpose or form part of a longer term redevelopment of the site. A local convenience shopping outlet is to be provided from the time new residents locate in the DCP area and this facility could be established in the sales and information centre.

8.2.2 Performance Criteria

The intent may be achieved where:

Mixed Use Development

- (i) The arrangement of uses on these town centre frame sites acknowledges the future development within the surrounding precincts as well as adjoining sectors and ensures that the affect on the amenity is minimised.
- (ii) The concept of mixed uses on individual sites is pursued, including development in which the uses are mutually supporting and are physically and functionally integrated.
- (iii) A harmonised mix between land uses such as commercial, retail, community and/or residential is achieved, and for any residential component of a mixed use project, residential amenity and privacy is preserved.
- (iv) In the case of a mixed use development, land uses which are incompatible by virtue of the potentially conflicting nature of the uses (e.g. hotel and place of worship) are not developed within the one site.
- (v) Mixed use development incorporating a residential use addresses residents' needs for security, privacy and opportunities for views, as well as provides access to units which is separate from other uses. The Queensland Residential Design Guidelines' intents and performance criteria of relevance to residential components of mixed use developments provide appropriate design and siting principles for this form of development.

Building Design

- (vi) The design of any building(s) must acknowledge the future development within the surrounding precincts as well as adjoining sectors and ensure that the amenity is not unreasonably affected.
- (vii) Building forms and architectural treatments contribute to the creation of a distinctive arrival landmark node adjacent to the lake and set the 'tone' for the North Lakes commercial/mixed use development.
- (viii) Building development is low rise and sympathetic to the site and its surrounds, creating an appropriate internal and external human and urban scale.
- (ix) The overall design establishes a close physical and visual relationship with the lake and associated parklands by the creation of appropriate transition spaces which allow a close inter-relationship of indoor and outdoor spaces, wherever practicable, and the use of such elements as boardwalks, decks, terraces and courts.

- (x) Building design provides an appropriate response to the South-East Queensland climate with a contemporary interpretation of traditional vernacular elements such as verandahs, terraces, balconies, pergolas and sun shading devices.
- (xi) Design elements such as variations in building setbacks and plan and elevational treatments, and in external wall materials and in roofscape treatments are encouraged.
- (xii) The activities are organised with an appropriate degree of separation of public and private uses and so that the public activities are inter-related and readily identifiable and accessible from both the road and parkland approaches.

Landscape Design

- (xiii) The landscape design produces an attractive sub-tropical landscape image and integrates the building forms with outdoor spaces, car parks, driveways and paths together with the overall design of the adjacent parkland and streetscapes.
- (xiv) Landscape planting contributes positively to the streetscape, provides shade and softens the visual impact of buildings and paved areas.
- (xv) Hard landscape elements, signage and artworks are designed to complement the overall architectural and landscape character and appropriately located to allow for the ready identification of developments and their points of access and different uses.
- (xvi) An attractive, safe and convenient pedestrian environment is provided.

Car Parking and Access

- (xvii) Car parking and setdown areas are conveniently accessed and their design integrated with the landscape setting so as to soften the visual impact of such areas from adjacent public areas.
- (xviii) Servicing is properly provided for and service areas appropriately landscaped and screened from public view.
- (xix) Where appropriate (e.g. if the sites are used for community premises), a bus setdown may be required to cater for potential demand arising from the land use.

9.0 Environmental Management Objectives

9.1 Stormwater Discharge

Objectives

To ensure that stormwater infrastructure, constructed within the catchment of Tributary C, is to be designed to meet agreed discharge standards for specific stormwater pollutants and that peak flow regimes are at pre-development levels.

Performance Indicators

Water discharged must meet the requirements of Environmental Protection Policy (EPP) Water, and in particular, must be designed to achieve the following Annual Mean Concentrations at Kinsellas Road:

- Total Phosphorous - 0.1 mg/l
- Total Nitrogen - 0.75 mg/l
- Suspended Solids - 50 mg/l

The design parameters for peak flows must not exceed the values in the Stormwater Management Plan approved by Council.

9.2 Flora & Fauna

Objectives

To re-establish fauna habitats and wildlife corridors.

To re-establish stands of native vegetation

Performance Indicators

Retain significant remnant stands of native vegetation in areas of open space where reasonable and practicable.

Establishment of new stands of appropriate native vegetation which incorporates food species for indigenous fauna.

9.3 Air Quality

Objectives

To ensure that people are protected from undue pollution of the air from smoke, dust, odour, fumes and gases generated by development within the precinct.

Performance Indicators

Air quality must meet the requirements of Environmental Protection Policy (EPP) Air.

During construction of the precinct:

- infrastructure complaints in excess of one per week may indicate unacceptable work practices. For the purposes of this clause, a complaint is one resulting in the issue of an abatement notice under EPP (Air); and
- construction activities are to comply with Council's Policy LP32.

9.4 Noise

Objectives

To ensure noise generated is not unreasonable.

Performance Indicators

Noise generated from development is reasonable as provided by the Environmental Protection Policy (EPP) Noise.

Noise generated from development which is unreasonable is abated as required by EPP (Noise).

During construction of the precinct infrastructure complaints in excess of one per week may indicate unacceptable work practices. For the purposes of this clause, a complaint is one resulting in the issue of a noise abatement notice under EPP (Noise).

Provision of traffic noise amelioration in accordance with Council Policy LP25.

9.5 Lighting

Objectives

To ensure that lighting associated with development does not create a nuisance.

Performance Indicators

No person will cause, carry out or erect a light source in such a manner that light emanating from the source is a nuisance.

All lighting other than public lighting (e.g. road lighting) is to comply with AS4282-1997 *Control of the obtrusive effects of outdoor lighting*. The curfew hours applicable to this precinct are to be 10pm - 6am, unless otherwise varied by a sector plan or Council resolution.

10.0 Special Design Criteria

During the course of development and as contemplated by the DCP, variations to Council's existing development standards are anticipated and will be considered on their technical merits with reference to the intents and performance criteria outlined in previous sections of this precinct plan. Technical details and supporting information on design variances will be recorded in Council's *North Lakes Register of Alternative Acceptable Design Solutions*.

11.0 Infrastructure Obligations of the Principal Developer

11.1 Overview of Infrastructure Obligations

The infrastructure required to be provided by the principal developer to serve the precinct includes internal and external infrastructure to be provided in accordance with the Mango Hill Infrastructure Agreement 1999 (MHIA) and agreements made with the State Government in accordance with the DCP. These obligations are summarised as follows:

11.1.1 Roads

Construct the following roads including carriageways, stormwater drainage, verges, bus setdowns, footpaths, bikeways, landscaping, traffic control devices and streetlighting. Any reference to initial construction in this section is a reference to construction approved by Council in accordance with the rezoning conditions and MHIA.

- .1 All internal collector and access roads and streets;
- .2 A four lane median divided arterial road (Waterford Drive) between Node H and Node I in accordance with the MHIA and State Government Agreements. The initial standard of construction will be a two lane median divided road;
- .3 Anzac Avenue/Waterford Drive intersection to suit the construction of Waterford Drive between Nodes H and I and the requirements of the Department of Main Roads and Queensland Transport, including associated auxiliary right turn, left turn and stand-up lanes and traffic signals;
- .4 A two lane sub-arterial or trunk collector standard road (Memorial Drive) between Node I and Node J in accordance with the MHIA. Part of this road may be constructed as a two lane median divided road with the approval of Council;
- .5 A four lane median divided arterial road (Discovery Drive) between Node J and Node C in accordance with the MHIA. The initial stage of construction will be a two lane median divided road between nodes J and K and work on road verges abutting the Precinct between nodes K and C;

- .6 A four lane median divided road (North-South Arterial Road) with provision for a public transport corridor between Node B and Node C in accordance with the MHIA. The initial standard of construction will be a two lane road which may be required earlier than the lot turnoff threshold in the MHIA if a transport study demonstrates a need for this facility to provide relief for internal roads in the precinct. An initial stage may also be work on road verges abutting the precinct;

- .7 A four lane median divided road (North-South Arterial Road) with provision for a public transport corridor between Node C and Node D road in accordance with the provisions of the MHIA. The initial standard of construction will be a two lane road and/or work on road verges abutting the precinct;
- .8 A two lane trunk collector or sub-arterial road between Node J and Node B in accordance with the MHIA;
- .9 Intersections at Nodes I, J, K, B, C and the additional intersection with the North-South Arterial Road between Nodes C and D to suit the standard of construction of adjacent roads including, if required, auxiliary left turn, right turn, stand-up lanes and traffic signals. The staging of traffic signals may be undertaken in accordance with a timetable approved by Council in accordance with MHIA;
- .10 Bikeways and pathways, including commuter and recreational bikeways generally as shown on Figure 4, in accordance with the MHIA;
- .11 A bikeway/pedestrian underpass under the road between Nodes J and K at the time of the initial construction of this section of road; and
- .12 A possible bikeway/pedestrian connection at the intersection between Nodes C and D at the time of construction of this section of road.

The construction of the abovementioned infrastructure to the final standard is to be undertaken in accordance with the staging and timing outlined in the MHIA. The initial standard of construction referred to above will be undertaken to suit the rate of development of the precinct. Where initial construction is not stated, the road is to be constructed to the standard described above to suit the rate of development of the precinct.

11.1.2 Water

- .1 Construct internal reticulation systems to service all properties in the precinct.
- .2 Construct a connection to Council water supply at Node 32 as shown on Figure 8 and construct a connection at Node 89 when total development in the DCP area exceeds 500 equivalent tenements;
- .3 Construct water supply network within the DCP area (including those sections of the mains shown on Figure 8) necessary to service the anticipated demand in the precinct; and

- .4 Provide contribution towards water headworks and bulk water supply in accordance with the MHIA.

11.1.3 Sewerage

Construct all internal sewerage systems to service the properties in the precinct and make contributions towards sewerage headworks, and unless otherwise agreed with Council:-

- .1 Construct the rising main RM1 as shown on Figure 9 from the precinct to Murrumba Downs Sewerage Treatment Plant;
- .2 Construct Pump Station No. 1 shown on Figure 9;
- .3 Construct Trunk Main TM1 as shown on Figure 9;
- .4 Construct RM115 as shown on Figure 9.
- .5 Construct an interim system for the western portion of the precinct and enter into an arrangement with Council regarding the operation of this interim system.

The principal developer may construct an interim sewerage system in accordance with Council's approval dated 4th October 1999. This interim system does not relieve the principal developer of its obligations for the overall system as outlined above.

11.1.4 Stormwater

- .1 Submit Stormwater Management Plan for Tributary C;
- .2 Submit Stormwater Management Plan for the portion of Tributary B affected by this precinct plan.
- .3 Construct stormwater management works progressively in accordance with the agreed Stormwater Management Plan; and
- .4 Construct stormwater drainage systems to roads, parks and lots as required by the MHIA and, to the extent it is not applicable, Council's Design Manual.

11.1.5 Park

- .1 Provide as park that part of the linear park generally as shown on Figure 4;
- .2 Provide town park generally as shown on Figure 4;
- .3 Provide village parks generally as shown on Figure 4;
- .4 Provide local parks generally as shown on Figure 4;

- .5 Provide Park Enhancement Works in the Linear Park and Town Park in accordance with the provisions of the MHIA.
- .6 Provide the required Park Enhancement Works to each village park in accordance with Table 2; and
- .7 Provide the required Park Enhancement Works to each local park in accordance with Table 2.

11.1.6 Community Facilities

- .1 Provide 150m² of space for community use purposes until the principal developer constructs the community centre as provided by section 12.7 of the DCP; and
- .2 Provide a local convenience shopping outlet in the Sales and Information Centre or another suitable location within the precinct as provided by clause 8.3.1 of the DCP.

11.1.7 Electricity Supply and Lighting

- .1 Provide underground electricity distribution to all properties within the precinct to Energex (or another appropriate supplier of electricity) and Council standards;
- .2 Provide public lighting to all roads, streets, parks and other public areas and facilities within the precinct to Energex (or another appropriate supplier of electricity) and Council standards; and
- .3 Provide high voltage electricity services to service the precinct to Energex (or another appropriate supplier of electricity) and Council standards.

11.1.8 Communications

Arrange for the installation of underground telephone and broadband communications services for all properties in the precinct.

11.2 State Government Infrastructure Requirements

- 11.2.1 The State Government infrastructure to be provided by the principal developer in conjunction with the development of the precinct is the connection to the State controlled road, Anzac Avenue (refer clause 11.1.1).
- 11.2.2 The State Government has previously given its 'in principle' support to the possible provision of a state primary school within the precinct, either as a stand alone facility or as part of a shared campus primary school or P-12 school campus, (refer to letters from Education Queensland to Lend Lease Development dated 4th December 1998 and 15th April 1999). However, this government facility may eventually be located elsewhere in the DCP area.

- 11.2.3 A local bus service will be provided to service the precinct. The timing and funding arrangements are to be as agreed between the principal developer and the State Government.

11.3 Infrastructure Affected by Precinct Development

Without the provision of additional infrastructure, the development of this precinct may place demands on the following infrastructure:

- .1 Roads external to the DCP area and accessing to the precinct;
- .2 Water supply infrastructure;
- .3 Sewerage infrastructure;
- .4 Stormwater;
- .5 Parks;
- .6 Community facilities;
- .7 Electricity supply;
- .8 Communications systems; and
- .9 State Government Infrastructure.

The infrastructure described in clauses 11.1 and 11.2, together with the obligations of the principal developer under the MHIA, is required to mitigate the adverse affects on such infrastructure.

11.4 How the Required Infrastructure Relates to the Infrastructure Agreements

The MHIA describes the infrastructure which must be provided by the principal developer as part of its obligations to provide infrastructure as envisaged by Chapter 12 of the DCP. The works described in clause 11.1 are the principal developer's obligations under the MHIA.

Infrastructure Agreements have been entered into by the principal developer with the Department of Main Roads and Queensland Transport. Infrastructure requirements of those State Government Departments will be imposed as conditions of relevant development approvals relating to this precinct.

11.5 Preliminary Program for Infrastructure Provision

The principal developer will provide all the infrastructure referred to in clause 11.1 at times to satisfy the requirements of the MHIA which provides for the infrastructure to be constructed to meet the rate of development in the precinct. Initial infrastructure works are anticipated to be constructed by 30th November 1999. The staging of the roadworks where approved by Council will be as described in clause 11.1.1 and the MHIA.

The principal developer is to provide for community use purposes 150m² of suitable space in an agreed location which may be in the sales and information centre until the community centre referred to in section 12.7 of the DCP has been provided. The elementary local convenience shopping outlet in the sales and information centre or another suitable location within the precinct is to be provided from the time new residents locate in the DCP area until such time as a viable alternative is provided.

The local bus service will be provided in accordance with clause 11.2.3.

Except as described elsewhere in this clause, no other works depend on the provision of this infrastructure.

Council is to use its best endeavours, including its powers of resumption if lawful, to obtain all necessary rights to permit the construction of water and sewerage infrastructure if such infrastructure is constructed on land external to the DCP area over which Council does not have such rights.

11.6 Estimated Water and Sewerage Demands

As required by the Infrastructure Agreement, the principal developer states as follows:-

- 11.6.1 For the purpose of assessing water supply capacity, the estimated number of Equivalent Tenements for this precinct is 750;
- 11.6.2 For the purpose of assessing sewerage capacity, the estimated number of Equivalent Persons for this precinct is 2,520.

Table 2
Village and Local Parks – Approved PE Works

ITEM	REQUIRED PARK ENHANCEMENT WORKS	LOCAL PARK	VILLAGE PARK
1	Park Signage	●	●
2	Rubbish Bins	●	●
3	Bench Seating	●	●
4	Shelter or Gazebo or Pergola or Shade Structure		●
5	Entry Structure		●
6	Playground/Equipment/Softfall		●
7	Electric Barbeque		●
8	Picnic Table		●
9	Community Related Recreation Facility		●
10	Drinking Fountain	●	●
11	Vehicular & Access Prevention (Bollards/Barriers)	●	●
12	Quick Coupling Valves (QCVs)	●	●
13	Landscape Lighting		●
14	Garden Edging	●	●
15	Hard Pavement Under Park Furniture & Structures	●	●
16	Bike Rack		●
17	Pathway Network		●
	Value of Approved PE Works	\$10,000	\$100,000

ITEM	ADDITIONAL PARK WORKS	LOCAL PARK	VILLAGE PARK
18	Community Infrastructure Related Retaining Walls (not Drainage Related)	●	●
19	Fencing	●	●
20	Automatic Irrigation	●	
21	Bike Racks	●	
22	Shelter or Gazebo or Pergola or Shade Structures	●	
23	Pathway Network	●	
24	Other Items agreed by Council eg Public Artwork	●	●

NOTE 1: Value of Approved PE Works is to be escalated in accordance with the Infrastructure Agreement.

NOTE 2: Approved PE Works to comply with specifications contained in the Infrastructure Agreement.