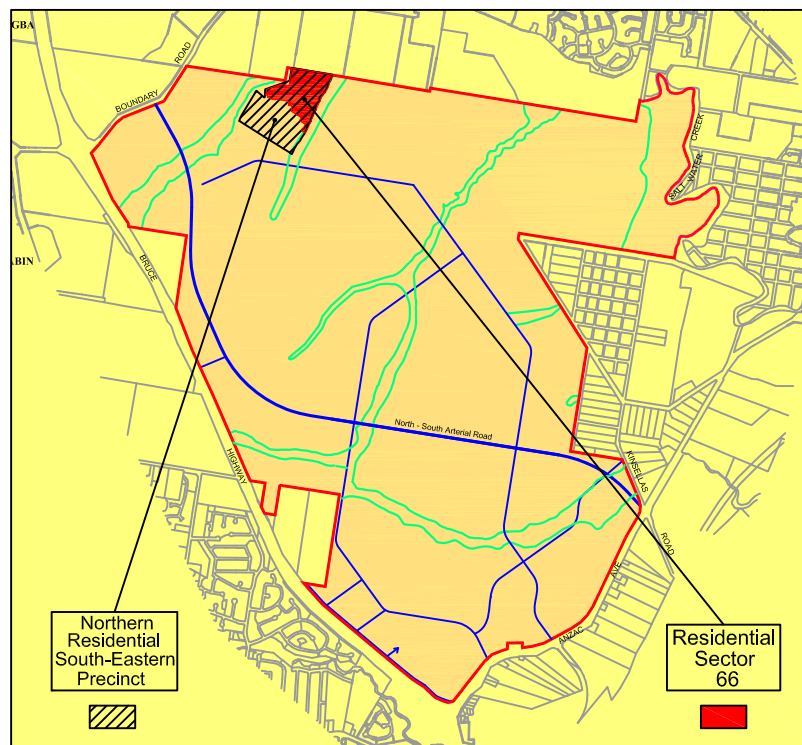


MANGO HILL INFRASTRUCTURE DEVELOPMENT CONTROL PLAN

Sector Plan 047-2000



Northern Residential East Precinct Residential Sector 66

14 October 2013

MANGO HILL INFRASTRUCTURE DEVELOPMENT CONTROL PLAN

Sector Plan No. 047-2000

for

Residential Sector Sixty-Six

Northern Residential East Precinct

North Lakes Development

Minor Amendment

14 October 2013

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1.0 Introduction

- 1.1 The Mango Hill Infrastructure Development Control Plan (DCP) provides for the creation of a sector within a precinct. The area of the sector may be chosen by the principal developer. The principal developer must then prepare a sector plan and lodge it with Council for approval in accordance with the relevant provisions of the DCP.
- 1.2 A sector plan is the final plan in the plan making process. Its purpose is to provide the code of development for the land in the sector. It will form the basis for assessment of development applications and self assessable development.
- 1.3 To the extent this sector plan provides development requirements which are inconsistent with those in the planning scheme, local laws, policies and codes, the requirements in this sector plan prevail as provided by clause 1.11 of the DCP.
- 1.4 To the extent this sector plan does not provide development requirements, then the provisions of the planning scheme relevant to the particular form of development will apply as also provided by clause 1.11 of the DCP.
- 1.5 The principal developer has created a sector to be known for planning purposes as *Residential Sector Sixty-Six*. This document constitutes the sector plan for Residential Sector Sixty-Six.
- 1.6 The location of the sector within the DCP area and the Northern Residential North Eastern Precinct (the precinct) is shown on Figure 1.
- 1.7 Northern Residential North Eastern Precinct Plan No.047 outlines the intents and performance criteria to be complied with in the development of the sector. This sector plan outlines acceptable solutions which, if satisfied by development, will in turn achieve the requirements of the precinct plan.

2.0 Sector Plan Context

- 2.1 Residential Sector Sixty-Six covers the remaining five stages of the Northern Residential East Precinct (Plan No. 047). The Sector is broadly bounded by the proposed Sector Sixty-Four to the south and linear Open Space to the west and east (Tributary A and 1). The sector forms part of the Urban Residential Area land use element. The location of the sector within the precinct is shown on Figure 2.
- 2.2 The area of the sector is approximately 8.727ha. This total area includes areas to be dedicated for roads and parks as well as the residential lots.
- 2.3 The plan in Figure 3 shows the final boundary of the Urban Residential Area land use element relative to this sector. The Proposed Metes and Bounds Description of the sector is provided in Annexure A.

3.0 General Desired Environmental Outcomes

3.1 General

In relation to the 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.”*

3.2 Specific

The DCP provides a number of specific desired environmental outcomes for the *Urban Residential Areas* element as outlined below:

- “(a) To promote a diverse, innovative and highly flexible choice in low, standard and medium density housing in accordance with community aspirations, needs and affordability.*
- (b) To promote residential villages which are linked to the major road network, public transport services and community facilities through safe, convenient, legible local street and path networks.*
- (c) To provide residential villages which are focused on local open space and situated conveniently to local community facilities, including education and recreation facilities, convenience shopping and open space.*
- (d) To promote a community with a high standard of residential amenity characterised by convenience, accessibility, safety, privacy, high quality design and integrated planning.*
- (e) To ensure visual integration of residential development with the natural environment, including development responsiveness to the topography, drainage patterns and remnant stands of significant vegetation.*
- (f) To ensure the development of urban residential areas includes appropriate environmental protection measures and the potential effects of incompatible land uses or transport corridors are mitigated.*
- (g) To ensure urban residential areas develop sequentially and efficiently in residential villages, serviced with the community and engineering infrastructure necessary for achieving a high standard of residential amenity and quality of life for residents.”*

4.0 Planning Intent

- 4.1 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.”

- 4.2 The planning intent for Residential Sector Sixty-Six is to provide for a range of traditional and small lot dwellings as well as medium density housing types including zero lot lined detached houses on small lots, up to a maximum density of 40 dwellings per hectare. All lots within the sector are greater than 250m², with the minimum lot size being approximately 262m²(13 lots).

This sector will form the northern half of the Precinct 047 residential village. Residents will be situated close to the district playing fields south of the sector, the Village Park near the southern boundary of the sector and Tributary A west of the sector. Linear Park will buffer the Tributary A environmental corridor and provide recreational pedestrian/cyclist pathways. The Village Park within Sector Sixty-Four will be centrally located for most of the residents. The extent of open space to be provided in and adjoining this sector would be expected to satisfy the main recreational and leisure needs of residents.

5.0 Development, Landscape and Environmental Concepts

5.1 Development Concepts

Residential Sector Sixty-Six is proposed to be developed as a high quality, mixed residential community forming an integral part of the North Lakes development. It will comprise medium and low density housing including detached housing on small lots and a range of traditional and small lot dwelling types as provided for in the DCP (refer Figures 7a and 7b).

The Proposed Plan of Subdivision for the sector is shown in Figure 4. This plan identifies the following key land use elements:

- (i) Part of a residential village accommodating 129 lots;
- (ii) An internal road network offering high connectivity, esplanade roads, and safe/convenient access for local traffic; and
- (iii) Suitable pedestrian linkages, linear parks and buffer/transition areas to the broader open space network.

The principles for residential planning and design are outlined in the Northern Residential North Eastern Precinct Plan. More specific development and urban design principles behind the residential layout concept for this sector include the following:

- (i) A standard residential development including low and medium density residential development including a mixture of detached housing on small lots (zero lot line);
- (ii) A maximum density of less than 40 dwellings per hectare (13 lots at 38 dwellings per hectare);
- (iii) Incorporation of a modified grid road layout with high connectivity and responsiveness to topography;
- (iv) Inclusion of street planting and attractive streetscapes for housing within the sector;
- (v) Location of small lot housing generally on more gentle topography;
- (vi) Location of larger lots generally on steeper topography; and
- (vii) Streets aligned to minimise rear drainage where practicable.

5.2 Landscape Concepts

The landscape structure and treatment of the sector is shown in conceptual form on Figure 6. The principal spatial elements or key areas of the Landscape Concept Plan for the wider precinct as applied to the sector may be summarised as follows:

- *Major Open Space:* Under the Structure Plan, Tributaries A and 1 are major open space areas and are to form the key community focal points for of the Precinct. The east-west connections through these tributaries will provide convenient pedestrian / cyclist connections between the adjacent residential areas.
- *Buffers and Transition Areas:* Buffers and transition areas will be established between the sector and incompatible land uses that are external to the site (in accordance with Section 9.1.2b of the DCP). These may incorporate loop roads or vegetated distances that utilise the open space system as an effective means for maintaining high levels of environmental quality through water management, habitat protection, wildlife corridor protection and acoustic buffering (in accordance with Section 9.1.2h of the DCP).
- *Streetscape Planting:* The streetscape treatments of local collector and access streets will create 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 intended scale and characteristics of each road. In particular, widened road reserves for collector streets within the sector may be provided to allow for additional special landscape treatments and visual linkages to the open-space, as well as ensuring a meaningful way of reinforcing different road types in the road hierarchy.
- *Linear park/s:* Will buffer the Tributary A environmental corridor in providing a continuous link between the Bruce Highway and the northern boundary of the DCP area for wildlife movement. Linear parks will accommodate recreational pedestrian/cyclist pathways and provide linkages throughout the precinct and surrounding precincts. They will also accommodate artificial wetlands and water

bodies for water management and buffer the existing Tributary A corridor from this function.

As part of the overall landscape strategy for the sector the natural features, such as the gently sloping topography, existing drainage lines and ridge lines, have been recognised. This site responsive approach to residential planning will be enhanced by landscape plantings within private gardens, and along public road reserves, as well as within proposed parkland.

The use of native species as the predominant plantings will visually reflect the existing natural setting of the DCP area, as well as offering benefits of reduced maintenance and water requirements (refer Annexure B). In addition, exotic and flowering species may be used as feature planting, for example, to announce entries to the sector, distinguish roadway networks and provide visual interest and contrast in parks and gardens.

Where appropriate, park and street furnishings and lighting will be utilised in addition to landscaping to create more liveable spaces for residents. These elements will be unified throughout the Northern Residential South Eastern Precinct and other adjacent residential precincts to establish a common theme.

5.3 Environmental Concepts

The broad environmental management concepts, principal elements and key planning objectives to implement these concepts are identified in the Precinct Plan. The key planning objectives for environmental management in the Sector Plan area are summarised as follows.

5.3.1 Stormwater Discharge

Ensure that stormwater infrastructure, constructed within the catchments of Tributaries A and 1, are designed to meet agreed discharge standards for specific stormwater pollutants and that peak flow regimes are at pre-development levels. Water discharged must meet the requirements of Environmental Protection Policy (EPP) Water, and in particular, must be designed to achieve the Annual Mean Concentrations at Chelmsford Road as stipulated in the Precinct Plan.

5.3.2 Flora & Fauna

The sector must facilitate protection of ecological processes and natural systems by providing the means for the establishment or enhancement of habitat areas and wildlife corridors primarily along the linear parks through the DCP area connecting with the regional open space network.

5.3.3 Air Quality

To ensure people are protected from undue pollution of the air from smoke, dust, odour, fumes and gases generated by development within the Precinct. Air quality must meet the requirements of Environmental Protection Policy (EPP) Air and construction activities are to comply with Council's Policy LP32.

Detailed reporting has been undertaken within the subject site with respect to odour levels stemming from industrial activities north of Boundary Road. These studies include the *Narangba Industrial Estate Health Impact Assessment*, by Queensland Health and dated May 2011; and the *Odour Amenity Assessment 'Northern Residential' Precincts North Lakes*, by MWA Environmental dated 5 July 2011.

The abovementioned reports identify that the impact of odour upon the land within the sector area does not exceed the threshold for odour nuisance as specified in the *Ecoaccess Guideline: Odour Impact Assessment from Development* produced and adopted by the former Department of Environment and Resource Management (i.e. Odour concentrations are not predicted to exceed the 2.5 odour units in the 99.5th percentile, one hour average).

5.3.4 Noise

To ensure noise generated is not unreasonable, noise generated from development should be 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 shall be in accordance with Council Policy LP25.

5.3.5 Lighting

To ensure that lighting associated with development does not create a nuisance no person will cause, carry out or erect a light source in such a manner that light emanating from the source is a nuisance. Council may choose to provide lighting for sporting activities in the district playing fields. Surrounding development should acknowledge the use of the district playing fields which may include lighting in the future.

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.

6.0 Land Use Rights

- 6.1 Clause 2.4.9 of the DCP requires the final specification of land use rights for land in a sector to be chosen from the supplementary Tables of Development in the DCP for each land use element. If a purpose set out in column B of a supplementary Table of Development is not nominated for land in the sector, then that purpose thereafter for that land becomes permissible development (column C).

- 6.2 Land within the sector may be used for the purposes specified in column A of the respective supplementary Table of Development for the Urban Residential Area element which is the subject of this sector plan.
- 6.3 The following purposes set out in column B of the supplementary table of development for the Urban Residential Areas element and the Open Space element are permissible purposes for land in this sector (i.e. they become column C purposes).
- 6.4 The Supplementary Table of Development (Urban Residential Areas Element) setting out the final specification of land use rights for land in this sector is contained in Annexure C.

7.0 Development Requirements

7.1 Introduction

Clause 2.4.2 of the DCP requires a sector plan to specify development requirements for land in the sector. Clause 1.11 of the DCP provides that to the extent a sector plan does not make these provisions, then the provisions of the planning scheme for that particular form of development will prevail.

7.2 General Requirements for all Development

The requirements for development specified in the planning scheme apply to development in this sector, except where inconsistent with requirements specified in clause 7.3 or the design and siting guidelines in Section 8 or where relaxations are granted in accordance with Section 10 of this sector plan.

For the purposes of this clause, where relevant:

- (i) references in the planning scheme to a zone are to be taken as a reference to the Special Development Zone;
- (ii) references in the planning scheme to an attached flat are to be taken as a reference to an associated unit; and
- (iii) references in the planning scheme to a multiple dwelling are to be taken as a reference to apartments.

7.3 Specific Requirements

The following requirements apply to development within this sector:

7.3.1 Lot Number and Size

The maximum number of developable lots is 129, excluding proposed park and road reserves. Only one detached house is permitted on each lot.

The minimum area of each residential lot type is to be as specified in Table 1.

7.3.2 Vehicular and Pedestrian Access

- .1 Indicative Vehicular Access locations are shown on the Sector Plan Map for smaller lots, and certain larger lots where special locational circumstances dictate the need for more specific access requirements. Other access point locations are acceptable where:

- (i) the garage is not built to a zero lot line; or
- (ii) site specific issues warrant a different driveway location (e.g. as a response to land form, streetscape works or manoeuvrability requirements for vehicles).

- .2 Where optional vehicular access locations are shown on a lot (e.g. a corner lot), only one access point is to be used.
- .3 Restricted Lot Access is highlighted on the Sector Plan Map. Driveways to lots are not permitted along those highlighted frontages.
- .4 Provision for pedestrian access must be made within the sector as shown indicatively on the Sector Landscape Plan.
- .5 Additional pedestrian pathways may be provided in locations and to details approved by Council.

7.3.3 Lighting and Glare Management

- .1 No person will cause, carry out or erect a light source in such a manner that light emanating from the source is a nuisance.
- .2 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 sector plan are 10pm - 6am, unless otherwise varied by Council.
- .3 Lighting must provide the level of illumination necessary for safe vehicular and pedestrian movement through the sector.
- .4 Where provided within landscaped areas, the choice and location of lighting must allow for plant and tree growth and, conversely, not become obscured as the landscape matures.
- .5 Permanent strobe, laser, flashing, oscillating, moving or alternating lights are not permitted.

7.3.4 Rain Water Tanks

Where a rain water tank is proposed, the following requirements are to be satisfied:

- .1 All rain water tanks greater than 9m² in area are to be located underground.
- .2 All rain water tanks are to be located to ensure the tank is not visible from the street or adjoining areas of public open space, and does not obstruct private open space areas on the lot. Unfinished metal rain water tanks of any size are not permitted. Locating rainwater tanks of any size underground is encouraged.

7.3.5 Noise Attenuation Measures for Housing next to Major Roads

- .1 For dwellings abutting Major Roads, a traffic noise fence (or other suitable treatment as proposed by a qualified acoustic consultant - such as an earth mound) is required to be constructed on the boundary of the

sector in order to reduce traffic noise levels on those dwellings.

- .2 Where dwellings abutting Major Roads are elevated above the ground or are two storey design, the predicted long term traffic noise levels may exceed 63dB(A). To minimise intrusion of traffic noise into these dwellings they are to be designed to Categories 3 or 4 as defined in Australian Standard AS3671-1989. Residents / builders should seek advice from a person expert in dwelling design which reduces traffic noise intrusion.

8.0 Design and Siting Guidelines

The Northern Residential North Eastern Precinct Plan provides a comprehensive range of design intents and performance criteria for residential development which must be complied with in the development of Residential Sector Sixty-Six. In addition to the precinct plan general criteria and by way of further elaboration on design intentions, a range of detailed residential design and siting guidelines have been included in this sector plan and are considered by Council to be acceptable solutions which are consistent with the performance criteria of the *Queensland Residential Design Guidelines* (QRDG).

As a standard residential development, the following guidelines relate to development on residential lots throughout the sector and, as stated above, represent acceptable solutions to a range of residential design and siting issues. The acceptability of modifications to any of the guidelines will need to be demonstrated to, and approved by, the Council after consultation with the principal developer. Any modifications will only be considered where site-specific issues warrant special consideration or where a variation can be demonstrated to achieve contemporary best practice in residential planning, design and development. The assessment of such modifications would be based on the intents and performance criteria specified in the Northern Residential North Eastern Precinct Plan.

The Sector Plan Maps (Figures 5a, 5b, 5c and 5d) show the Proposed Plan of Subdivision and key design and siting controls for the various lots within Residential Sector Sixty-Six. As required by clause 2.4.8 of the DCP, Figures 5a, 5b, 5c, 5d and 5e must also show indicatively the nature of intended development for urban residential land within 100 metres of the sector boundaries except for those parts of the sector which abut major roads or major open space.

8.1 Standard Residential Design and Siting Guidelines

Table 1 provides a summary of the key residential design and siting requirements in relation to the range of lot types proposed within the sector as a standard residential development. The design and siting requirements in Table 1 for each lot type must be complied with in the development of that lot type. These requirements must be read in conjunction with the development requirements contained in this document.

TABLE 1: KEY RESIDENTIAL DESIGN & SITING REQUIREMENTS SUMMARY

LOT TYPE	MIN. LOT SIZE (m ²)	MINIMUM BUILDING SETBACKS (Refer to Note 1)										PRIVATE OPEN SPACE (POS)			MINIMUM CAR PARKING PROVISION (Refer to Note 2)		OTHER REQUIREMENTS (Refer to Note 3)	
		Typical Av. Lot Width (m)	Mandatory Zero Lot Line [as shown on Sector Plan Map]	FIRST STOREY				SECOND STOREY				Indicative Location of POS shown on Sector Plan Map	Minimum Area (m ²)	Minimum Circle Diameter (m)	On-site	Visitor parks	Maximum Building Site Cover (%)	Indicative Driveway Location shown on Sector Plan Map
				Front (m) [Subject to additional garage setbacks where relevant]	Rear (m)	Side Setback (m) [for non ZLL boundary]	Secondary Street Setback (for corner lots)	Front (m)	Rear (m)	Zero Lot Line	Side Setback (m)							
Medium Density – Town Villa	262.5	10.5	Yes	3	3	1.0	1.5	3	3	1.0	1.5	Yes	20	4.5	2	0.5	50	Yes
Medium Density – Town Premium Villa	312.5	12.5	Yes	3	3	1.0	1.5	3	3	1.0	1.5	Yes	20	4.5	2	0.5	50	Yes
Patio Villa	350.0	14	No	3	3	1.5	1.5	3	3	1.0	1.5	Yes	25	5	2	0.5	50	Yes
Villa	320.0	10	Yes	3	3	1.0	1.5	3	3	1.0	1.5	Yes	25	5	2	0.5	50	Yes
Premium Villa	400.0	12.5	Yes	3	6 ²	1.0	1.5	3	6	1.0	1.5	Yes	40	5	2	0.5	50	Yes
Medium Density – Town Premium Courtyard	400	16	No	3	3	1.5	1.5	3	3	1.0	1.5	Yes	20	4.5	2	0.5	50	Yes
Courtyard	450.0	14	No	3	6 ²	1.5	1.5	3	6	1.5	2	Yes	40	5	2	0.5	50	Yes
Premium Courtyard	512.0	16	No	3	6 ²	1.5	1.5	3	6	1.5	2	Yes	40	5	2	0.5	50	Yes
Traditional	575.0	18	No	4.5	6 ²	1.5	3.0	4.5	6	1.5	2	Yes	60	5	2	0.5		
Premium Traditional	640.0	20	N/A	4.5	6 ²	1.5	3.0	4.5	6	N/A	2	No	-	-	3	0.5	50	No (except where specific access location required)
Townhouse Units	800.0	18	N/A	4	6 ²	1.5	1.5	4	6	N/A	1.5	No	40 (ground lvl)	4	1.5	0.5	50	Yes

1 The side setback distance to the second storey may be reduced to ZLL where the side boundary adjoins the ZLL of another Terrace Lot or where exclusively to accommodate a stairwell access, for a length of not more than 6m.

2 Where a 6m setback is required a portion of the dwelling may extend to an absolute minimum rear setback of 3m, Where the portion of the dwelling (including patios, verandahs and pergolas) located between the 6m and 3m rear setback zone is not permitted to exceed 60% of the lot width measured across the rear boundary.

3 The side setback may be reduced to 1m exclusively to accommodate a stairwell access, for a length of not more than 5m.

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IMPORTANT NOTES ON TABLE 1

The side setback distance to the second storey may be reduced to ZLL where the side boundary adjoins the ZLL of another Terrace lot

1. MINIMUM BUILDING SETBACKS

1. The minimum building setbacks outlined in Table 1 and illustrated on the Sector Plan Map do not take into account any features of the land, existing or proposed easements, and/or other underground services which may require increased building setbacks.
2. The design of the development has taken into consideration the visibility at intersections and the amenity of the proposed neighbourhood. Consequently, for the purposes of the Standard Building Regulations (i.e. corner truncations setbacks), further application for corner truncation setbacks is not required, provided that the setback specifically dimensioned and referenced on the Sector Plan Map (figures 5a, 5b, 5c, 5d and 5e) is complied with.
3. Where a lot fronts a park, the Sector Plan Map may nominate that the garage is to be set back a minimum of 5.5 metres from the property boundary to provide additional space for on-site visitor car parking in lieu of the standard on-street parking provision.
4. Where a setback is specifically dimensioned and referenced on the Sector Plan Map (5a, 5b, 5c, 5d and 5e), the Sector Plan Map requirement will prevail over Table 1.
5. On Traditional and Premium Traditional lots, unenclosed spaces such as verandahs, terraces, balconies, and pergolas may project into the front setback by a maximum distance of 1.5 metres provided the outermost projection is no closer than 3 metres from the front boundary. An additional setback to the garage is required as per note 2(d).
6. Where a 6m setback is required a portion of the dwelling may extend to an absolute minimum rear setback of 3. Where the portion of the dwelling (including patios, verandahs and pergolas) is located between the 6m and 3m rear setback zone, it is not permitted to exceed 60% of the lot width measured across the rear boundary.

2. CAR PARKING PROVISION

- (a) At least one on-site parking space is to be covered.
- (b) A single storey dwelling on a Villa or Medium Density – Town Villa lot is only permitted to have a single width garage, however, a second covered car parking space may be provided in a tandem garage arrangement.
- (c) Where a single garage is proposed on any lot, a minimum front setback of 5.5 metres is required for the garage.
- (d) Where a third on-site parking space is required (i.e. for Premium Traditional lots), the minimum front setback for a double garage will be 4.5 metres.
- (e) On-street car parking is to be provided at the rate of one space per two lots.

3. BUILDING SITE COVERAGE

- (a) Except for Premium Traditional lots, pergolas, gazebos, verandahs, shade structures and other leisure and recreational purpose areas (whether fully roofed or not) are permitted as additional building site coverage to a further maximum of 10% of the total site area.

The summary of requirements in Table 1 are expanded below and the following are to be satisfied.

8.1.1 Dwelling Size

- .1 The maximum building height is ten (10) metres measured from the natural ground level to the top of the roof.
- .2 The maximum number of storeys is two (2). Attics which are wholly contained within the roof space are not defined as a storey.
- .3 Where a two storey dwelling is proposed, the upper storey must extend for at least 50% of the total width of the dwelling (including the garage and verandahs) as viewed from all street frontage.
- .4 A dwelling on a Patio lot may be one or two storeys.

8.1.2 Façade Treatment

- .1 All lots are required to present appropriate rooms and windows to the street, according to the lot type as listed below:
 - (i) All lots must:
 - a. Have a minimum of 10% of the façade area of each dwelling (including garage or car port) facing the street or other public area as windows or glass;
 - b. One or more habitable rooms and windows facing the street; and
 - (ii) The front façade for Traditional and Premium Traditional dwellings are required to satisfy one of the following:
 - a. Two habitable rooms and windows facing the street; or
 - b. One or more habitable rooms which comprise a minimum internal width of 5.4 metres (excluding the width of the entry foyer), to be measured in the same plane as the front alignment of the garage. Significant glazing must be provided to this frontage proportional to the size of the room provided.
 - (iii) For Medium Density Town Premium Villa, Patio, Villa, Premium Villa, Courtyard and Premium Courtyard dwelling types with one or more habitable rooms at the front facade; significant glazing must be provided to this frontage proportional to the size of the room provided.
 - (iv) Where a two-storey dwelling is proposed, the requirement for habitable rooms and windows can be either fully or partly satisfied on the second storey.
 - (v) Where a two-storey dwelling is proposed on a Medium Density Town Villa (MDTV), and the requirement for the habitable rooms is fully satisfied on the second storey, dwellings are required to satisfy the following additional criteria:
 - a) to provide for appropriate presentation to the street the dwelling must either:
 - recess the garage at least 900mm behind the alignment of the second storey and have a minimum of 20% of the facade area of

each dwelling (including garage or car port) facing the street shall be windows or glass;

OR

- where the garage or carport is not recessed, the façade must:
 - * have a minimum of 20% of the facade area of each dwelling (including garage or car port) facing the street shall be windows or glass; and
 - * include a second storey verandah with a minimum width of 50% of the dwelling and minimum depth of 1200mm, and must not protrude into the front setback identified in Table 1.
- .3 For lots fronting and having a common boundary with a secondary street, park, lake or containing dual street frontage the façade facing these features must mimic the design features and detail of the main façade of the dwelling, (i.e. through replicating the design, scale and dimension of roof style, stepping, setbacks, windows and verandahs).

8.1.3 Entry Treatment

- .1 Front façades for all dwellings must incorporate at least one of the following design elements:
 - (i) A verandah with a minimum area of 6m² and minimum depth of 1.5 metres, or
 - (ii) An entry portico with a minimum area of 4m² and minimum depth of 1.5 metres.
- .2 Where the site frontage is 18.0 metres or greater, unless the façade contains a step of a minimum depth of 1m (excluding the step at the garage), the following elements will be required in addition to clause 8.1.3.1:
 - (i) An entry portico and verandah with a minimum depth of 1.5m and a total minimum area of 10m² (the element provided under clause 8.1.3.1 may be included as part of this total area), or
 - (ii) A full front verandah with a minimum depth of 1.5 metres for the length of the frontage of the dwelling (not including the garage).
 - (iii) An entry portico with columns that have a minimum width of 350mm and recess the doorway a minimum of 230mm.
- .3 For lots fronting and having a common boundary with a secondary street, park, lake, or containing dual street frontage the façade facing these features must mimic the design features and detail of the main façade of the dwelling, (i.e. through replicating the design, scale and dimension of roof style, windows and verandahs).
- .4 All entrance foyers must include either sidelight or highlight windows in the entry alcove. The only exceptions are as follows:

- (i) On all other lots where one large door with integrated glazing is used (the door is to be a minimum of 1.2m wide and contain no less than 20% of the door area as glazing.)
- (ii) On all other lots where a set of double doors is provided.

8.1.4 Roof Form

- .1 A minimum roof pitch of 25 degrees is to apply for all lot types.
- .2 Innovative roof designs incorporating curved, flat or skillion elements will be assessed on their individual architectural merits by Council in consultation with the principal developer.
- .3 A skillion roof is permitted on a two storey dwelling provided the roof design includes the following elements:
 - (i) The roof pitch is a minimum of 15 degrees;
 - (ii) A minimum of two roof planes are required. i.e. One continuous roof plane across the entire width of the dwelling is not permitted. A separate portico or verandah roof will be considered as a separate roof plane;
 - (iii) Overhangs/eaves not less than 600mm (excluding gutters) are to be incorporated except where a zero lot line has been utilised; and
 - (iv) Articulation and variation of materials used for the external walls.
- .4 Where a skillion roof is proposed on a single storey dwelling, the roof design will be assessed on its individual architectural merit by Council in consultation with the principal developer. As a guide, the following elements should be considered:
 - (i) The roof pitch is a minimum of 15 degrees and it must be demonstrated that the skillion roof has a similar ridge height to that which would be achieved with a 25 degree pitch roof;
 - (ii) A minimum of two roof planes are required. i.e. One continuous roof plane across the entire width of the dwelling is not permitted. A separate portico or verandah roof will be considered as a separate roof plane;
 - (iii) Where two roof planes form a clerestory or similar, the height of this feature is to be in the order of 500mm;
 - (iv) Overhangs/eaves not less than 600mm (excluding gutters) are to be incorporated except where a zero lot line has been utilised; and
 - (v) Articulation and variation of materials used for the external walls.
- .5 Parapet walls are not permitted if a dwelling is required to be built to a side boundary.

8.1.5 Garages/Carports

- .1 The garage requirements for each lot are summarised in the below table. It is noted that additional provisions are included under Table 1 regarding parking and setback provisions

	Patio		Villa and Medium Density – Town Villa		Premium Villa and Medium Density – Town Premium Villa		Courtyard Premium Courtyard and Medium Density Premium Courtyard		Traditional Premium Traditional	
	1 storey	2 storey	1 storey	2 storey	1 storey	2 storey	1 storey	2 storey	1 storey	2 storey
Single Garage	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗
Double Garage	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓
Minimum Garage Setback	Single garage - minimum setback of 5.5 metres Double garage - minimum of 3.9 metres.								5.4m	4.5m*

*two storey section must extend over no less than 50% of the garage

- .2 All garages and carports must:
- (i) Be set back a minimum 900mm from the front building line (the front building line is a line containing no less than 3.4 metres of the dwelling excluding unenclosed spaces) or where a two storey section extends over no less than 50% of the garage, the garage may be in line with second floor;
 - (ii) Occupy no more than 55% of the length of the frontage of single storey homes; and
 - (iii) Incorporating a tilt up, panel lift doors or single roller doors. Double roller doors will be considered on their architectural merit where they complement the design of the dwelling.
- .3 Triple garages are only permitted on two storey homes on lots with a minimum 20m frontage and must have:
- (i) One parking bay and door integrated within the front façade where a two storey section extends over no less than 100% of the width of this garage, the garage may be in line with second floor;
 - (ii) All other garage doors set back a minimum 900mm from the front building line (the front building line is a line containing no less than 3.4 metres of the dwelling excluding unenclosed spaces).

8.1.6 Building Colours and Materials

- .1 Bright colours, highly reflective finishes (eg. unfinished metal), and colours and finishes which are otherwise unsympathetic (eg. discordant patterns) are not permitted as major colours for roof, wall, garage door and other major vertical surfaces such as front courtyard walls and secondary street frontage walls.
- .2 Roof, wall and garage door colours are to be selected to be complementary.
- .3 Gutters and downpipes are to be prefinished or painted to match the dwelling, or to provide appropriate colour accents.
- .4 The major wall materials are to be one or a combination of the following:
 - (i) Rendered painted masonry or bagged and painted masonry;
 - (ii) Fibre cement with rendered and painted textured finish;
 - (iii) Facebrick
 - (iv) Painted or stained weatherboard; or
 - (v) Stone or prefinished materials provided they have a natural appearance.

Other materials are to be considered on their merits by Council in consultation with the principal developer and, if acceptable, are to be recorded in Council's 'North Lakes Register of Alternative Acceptable Design Solutions'.

- .5 Where a wall extends to the underside of eaves in a gabled roof or where the roof design incorporates a gable, it is to be treated as a wall extension element rather than a roof gable for the purpose of building material selection. Fibre cement cladding used as a minor element to this part of the wall or gable is therefore required to be rendered.
- .6 The materials and colours to be used to infill above windows and doors on a façade facing a street or public area must be the same materials and colours used on the remainder of that façade.
- .7 Roofing materials are limited to the following:
 - (i) Corrugated prefinished and coloured metal sheets (e.g. colorbond); or
 - (ii) Clay, concrete or slate tiles.

8.1.7 Building Controls

- .1 Site coverage, as specified for each lot type in Table 1, is defined as that portion of a site covered by a building (including garages), fixed structure, or outdoor storage area, but not including unroofed parking areas and roof eaves. Pergolas, gazebos, verandahs, shade structures and other leisure and recreational purpose areas (whether fully roofed or not) are included in site coverage. Except for Premium Traditional lots, a further 10% building site cover is permitted to accommodate the above semi-enclosed outdoor structures, thereby permitting a maximum of 60%.

8.1.8 Building Setbacks

- .1 Building setbacks for lots must comply with the setback requirements of Table 1 (unless dimensioned otherwise on the Sector Plan Map).
- .2 *One Storey* (for single storey or ground floor of two storey buildings)
 - (i) Notwithstanding Section 8.1.8.1 for Traditional and Premium Traditional lots, unenclosed spaces such as verandahs, terraces, balconies, and pergolas may project into the front setback by a maximum distance of 1.5 metres provided the outermost projection is no closer than 3 metres from the front boundary.
 - (ii) Garage setbacks are outlined in Section 8.1.5.1.
 - (iii) Where a six (6) metre setback is required a portion of the dwelling may extend to an absolute minimum rear setback of three (3) metres where the portion of the dwelling (including patios, verandahs and pergolas) located between the six (6) metre and three (3) metre rear setback zone is not permitted to exceed 60% of the lot width measured across the rear boundary.
 - (iv) Side entry canopies or gateway structures over dwelling entries are permitted within the side boundary setback area.
 - (v) Eaves excluding gutters are permitted to extend up to 600mm within setback areas (other than where buildings are built to a zero lot line boundary), provided that a minimum side boundary clearance from eaves and gutters of 400mm is provided.
 - (vi) Setbacks other than a zero lot line are to ensure unrestricted pedestrian access around the dwelling.
- .3 *Second Storey*
 - (i) The front and rear setbacks and the setback to a secondary street frontage (corner lots) for each lot type nominated on the Sector Plan Map are to comply with the setback requirements specified in Clauses 8.1.8.1, 8.1.8.2 (i) - (iii) and Section 8.1.8.4.
 - (ii) The second storey setback to a secondary street frontage is to be two (2) metres for a corner courtyard lot.
- .4 *Zero Lot Line Boundary Requirements*
 - (i) Where lots have a mandatory zero lot line nominated on the Sector Plan Map, an external wall of the dwelling must be built to this boundary. The balance of any dwelling not built to this boundary must comply with the relevant side setback requirement for that lot type.
 - (ii) Where a non-mandatory zero lot line nominated on the Sector Plan Map is not utilised (or for the balance of any dwelling not built to this boundary) on a Traditional, Premium Courtyard, Courtyard or Patio lot, it must comply with the relevant side setback requirement for that lot type.

- (iii) Notwithstanding Section 8.1.8.4(ii) above, a side garage wall (maximum 9 metres in length with no openings) may be built a minimum of 1 metre from an unutilised zero lot line boundary on a Courtyard lot only.
- (iv) Walls built to a mandatory or non-mandatory zero lot line boundary are to be constructed with materials and finishes consistent with the balance of the dwelling extending 150mm below the anticipated level of the adjacent lot's platform in accordance with Council's requirements.
- (v) A building built to a zero lot line boundary must have a minimum length of wall on this boundary of six (6) metres. The maximum length of wall that can be built to a zero lot line boundary is 60% of the length of the nominated boundary.
- (vi) Where an internal courtyard is incorporated on the zero lot line boundary, a courtyard fence to the height of 1.8 metres must be constructed in accordance with Section 8.1.10.7 or with the same finish as the zero lot line wall of the dwelling. For the avoidance of any doubt, the length of courtyard fence is not included in the minimum or maximum wall lengths identified in Section 8.1.8.4 (v).
- (vii) A zero lot line tolerance of up to 250mm is permitted to accommodate a gutter overhang

8.1.9 Private Open Space and Landscaping

- .1 The preferred location of the private open space nominated in Table 1 for each lot type other than Premium Traditional lots is shown on the Sector Plan Map, although other locations within each lot are acceptable having regard to the natural features of the lot, desirable northerly orientation, view opportunities and housing layout.
- .2 Major private open space is to have a maximum gradient of 1 in 10.
- .3 All private open space is to be designed to ensure useability, e.g. entry courts, outdoor living areas or service areas must demonstrate a clear relationship to the internal living area of the dwelling.

8.1.10 Boundary Fencing

- .1 'Soft' enclosures and demarcations of the front property boundary, e.g. hedges, earth mounding and landscape planting, are encouraged. Where hedges are established to delineate a front boundary, gates may be incorporated, providing established and vigorous plantings are utilised for hedges.
- .2 Front fencing is not permitted with the following exceptions:

- (i) secondary street frontages on corner lots; or
 - (ii) screening to front private courtyards.
- .3 A wall or fence is required to enclose a front private courtyard must:
- (i) include side returns extending a minimum of one (1) metre behind the front building line of the dwelling;
 - (ii) be a maximum of 1.8 metres high and be constructed of face brickwork or rendered and painted masonry piers and base (minimum 300mm base);
 - (iii) include infills of complementary masonry, coloured metal tube, painted or treated timber lattice or battens; and
 - (iv) not exceed 50% of the lot width.
- .4 Despite clause 8.1.10.3 where the lot is identified as a Medium Density – Town Villa or a Medium Density – Town Premium Villa the following additional elements are required to enclose a front private courtyard:
- (i) include side returns extending a minimum of one (1) metre behind the front building line of the dwelling;
 - (ii) be a maximum of 1.8 metres high and constructed of face brickwork or rendered and painted masonry piers and base (minimum 400mm piers and base);
 - (iii) include infills of coloured metal tube, painted or treated timber lattice or battens set at the rear of the fence piers with a minimum of 25% transparency;
 - (iv) Fencing between building line and side boundary is to be set back 1 metre from the front boundary;
 - (v) include dense or feature landscaping planted within the 400mm strip between frontage and courtyard fence infills;
 - (vi) provide a screen to the frontage of the nominated bin storage area set back a minimum of 2.0 metres, with dense or feature landscaping planted between the frontage and the bin storage; and
 - (vii) not exceed 50% of the lot width.
- .5 Fencing on the secondary street frontage of corner blocks must:
- (i) be a maximum of 1.8 metres high;
 - (ii) may extend for the length of the secondary street boundary if transparent fencing (more than 25% transparent when viewed directly on); or
 - (iii) may not extend for greater than 50% of the length of the secondary street boundary if any solid fencing (less than 25% transparent when viewed directly on) is proposed; and
 - (iv) be constructed of:
 - (a) Painted or treated timber palings with capping and feature posts;
 - (b) Open style steel fencing coloured metal tube panels complemented by hardwood timber posts measuring 125mm x 125mm; or

- (c) a decorative fence as stated in clause 8.1.10.3 (constructed either with or without a base.)
- .6 Where zero lot line boundary is utilised, fencing is not permitted to be constructed along the boundary adjacent to this length of external wall (including when the 250mm tolerance is used).
- .7 Solid pre coloured metal fencing is not permitted.
- .8 All side and rear fencing (other than fencing referred to in section 8.1.10.8) must be:
 - (i) a maximum of 1.8 metres high;
 - (ii) constructed of treated timber paling; and
 - (iii) set back 1 metre behind the front wall of the dwelling.
- .9 For the lots having a common boundary with a park, fencing along the common boundaries with the park is to be:
 - (i) a maximum of 1.8 metres high;
 - (ii) constructed of face brickwork or rendered and painted masonry piers (either with or without masonry base) and/or hardwood timber posts;
 - (iii) infills of coloured metal tube: and
 - (iv) any side fence must match the style, height and finish of the fence front the park extending no less than 1 metre behind the adjacent wall of the dwelling.
- .10 Where the principal developer has constructed a fence, it must be maintained by the owner to the standard at which it was constructed.
- .11 Vertical retaining walls must be no more than 1 metre above natural ground level. All vertical retaining walls and/or earthworks greater than 1 metre in height must be stepped with a minimum 500mm landscape area between successive wall segments. Retaining walls facing the street must be constructed from stone or masonry to match the dwelling. An integrated fence and retaining wall is permitted, provided that the total height of the combined fence and retaining wall does not exceed 1.8m in height. Alternatively, the fence must be setback a minimum of 1.0m from the top of the retaining wall and be incorporated with landscaping to the street frontage. Timber retaining walls may be constructed along side boundaries and rear boundaries. Timber retaining walls may protrude forward of the front building line provided the wall tapers to meet the finished ground line at the front property boundary.
- .12 An integrated front private courtyard fence and retaining wall is permitted, provided that the total height of the combined front fence and retaining wall does not exceed 1.8m in height. Alternatively, the front private courtyard fence must be setback a minimum of 1.0m from the top of the retaining wall and incorporated with landscaping to the street frontage.

- .13 A building or structure and any retaining wall on a lot is to be structurally independent of a building or structure or retaining wall on an adjoining lot.

8.1.11 Driveways

- .1 One driveway is required for each lot, and must be completed prior to occupation of the dwelling.
- .2 Plain concrete driveways are not permitted (eg. A plain concrete driveway with a border and/or motif only is not permitted).
- .3 Indicative Vehicular Access locations are shown on the Sector Plan Map for smaller lots, and certain traditional lots where special locational circumstances dictate the need for more specific access requirements and must be complied with unless otherwise approved. Other access point locations are acceptable where:
- (i) the garage is not built to a zero lot line; or
 - (ii) site specific issues warrant a different driveway location (e.g. as a response to land form, streetscape works or manoeuvrability requirements for vehicles).
- .4 All driveways must:
- (i) be no wider than three (3) metres wide at the property boundary for a single garage or carport;
 - (ii) be no wider than five (5) metres at the property boundary for a double width garage or carport; and
 - (iii) allow for at least 500mm of landscaping between the driveway and the side property boundary.
- .5 Driveways are to be paved for their full width (i.e. “car tracks” are not permitted).
- .6 The maximum grade for driveways is 1:5 except for lots which have a single garage, where additional carparking spaces are to be provided on the driveway, a maximum grade of 1:8 is required. All driveway grades from the property boundary (not the kerb) to the garage are to conform with the North Lakes standard drawings for residential driveway layout and construction. The profile of the section of driveway between the front property boundary and the kerb is to follow the Council approved grade.
- .7 If a footpath has been constructed in front of your property the driveway must abut and not cut through the footpath. The balance of the driveway between the footpath and the kerb may be plain concrete to match the footpath.
- .8 If a crossover is provided and not used then it must be removed and the verge and kerb must be constructed at the owners cost, to Council’s standard.

8.1.12 Lots Fronting a Park

- .1 Where a lot fronts a park, the Sector Plan Map may nominate that the garage is to be set back a minimum of 5.5 metres from the property boundary to provide additional space for on-site visitor car parking in lieu of the standard on-street parking provision.
- .2 Despite any other requirements for fencing in this document, fencing to a park frontage is permitted to be 1.2 metres high only unless provided by the principal developer.
- .3 The principal address and letterbox location for the lot will be facing the street frontage.

8.1.13 Planting Requirements and Landscape Structures

- .1 Landscaping of the front garden for lots with a front boundary of 14 metres or wider, or on corner blocks both the front and external side garden must include the following as a minimum at the time of planting:
 - (i) 3 plants, each at a minimum of 2 metres in height, and
 - (ii) 5 plants, each at a minimum of 1 metre in height, and
 - (iii) Garden beds mulched and edged, and
 - (iv) Turf to the remainder of the front garden area.
- .2 Landscaping of the front garden for lots with a front boundary less than 14 metres wide must include the following as a minimum at the time of planting:
 - (i) 1 plant, at a minimum of 2 metres in height, and
 - (ii) 5 plants, each at a minimum of 1 metre in height, and
 - (iii) Garden beds mulched and edged, and
 - (iv) Turf to the remainder of the front garden area.
- .3 Landscaping of the front garden for MD-V and MD-PTV lots must include the following as a minimum at the time of planting:
 - (i) Dense or feature landscaping planted within the 400mm strip between frontage and courtyard fence infill panels; and
 - (ii) Provide a screen to the nominated bin storage area, set back a minimum of 2.0 metres from the frontage, with dense or feature landscaping planted between the frontage and the bin storage.

8.1.14 Ancillary Structures

.1 *Landscaping*

The minimum landscaping requirements outlined above are to be retained and maintained to an acceptable standard.

.2 *Letter box*

The letterbox is to complement the dwelling.

.3 *Sheds*

Sheds greater than 9 square metres in area are to meet the building setback requirements for all lot types. The design, appearance and materials of these sheds are to complement the appearance of the main dwelling by meeting the requirements for building materials and colours of a main dwelling (refer Clause 8.1.6). All rain water tanks greater than 9m² in area are to be located underground.

Unfinished metal sheds and rainwater tanks of any size are not permitted. Sheds and rainwater tanks of any sizes are to be suitably screened from the street, and park (i.e. located behind or to the side of the main dwelling, screened by landscaping and/or side fence returns, etc.).

.4 *Shade Sails*

Shade sails, with a combined area greater than 9m², are to meet building setback requirements for all lot types.

.5 *Pergola*

Ground level open type pergolas may be built abutting any side boundary. No part of any such structure abutting a side boundary is to be attached to the wall of an adjoining building.

.6 *Signs*

Signs and hoardings for advertising products and businesses are not permitted on residential lots with the exception of businesses being undertaken from home within the definition of a detached house, approved home occupations or display home signage, which may only be erected with the prior approval of the principal developer. Builders/tradespersons' signs are permitted where they are required on lots but only during construction.

.7 *Air Conditioners*

Air conditioners are to be located below the eaveline and screened from public view. Air conditioning units may only be permitted above the eaveline if they are of a low profile and coloured to match the roof colour.

Roof-mounted or unscreened wall and window mounted air conditioning units facing the street or parks are not permitted.

.8 *Television/Radio Antennae & Satellite Dishes*

Internal or under the roof antennae are encouraged. An external antennae, if required, is to be located towards the rear of the dwelling. Satellite dishes are only acceptable below the roof line.

.9 *Solar Water Heaters*

Where practicable, solar water heaters are to be located on roof pitches which minimise their visibility from public areas. Solar collector panels are to lie on the roof and not be supported on a frame. Where practicable, storage tanks are to be detached and concealed from view by locating them within the roof space.

.10 *Other Structures*

Clotheslines, hot water systems, gas systems, fuel storage tanks, rainwater tanks and meter boxes are to be screened or located away from any street or park frontage.

.11 *Unsightly Objects*

To maintain an attractive overall streetscape, trucks, caravans, boats or trailers are not permitted to be parked on lots unless they are completely housed within a garage or screened from public view.

.11 *Bin Storage*

A screened enclosure, suitable to accommodate 2 x 240L wheelie bins (no higher than 1.5m and no wider than 2m), shall be provided to the side of the dwelling (preferred) or forward of the main building line. Where forward of the main building line the enclosure shall be no closer than 1 metre to the front property boundary and suitably screened by landscaping between the enclosure and the boundary.

8.2 Landscaping of Parks and Road Reserves

8.2.1 Design Strategy

- .1 Landscaping is an integral part of the total design of the DCP area and landscape development within the road reserves in this sector must be consistent with the overall intent of the Landscape Concept Plan and landscape design principles for the wider precinct.
- .2 Landscaping within the sector must:-
 - (i) be predominantly native planting species;
 - (ii) unify the sector through planting type, texture, colour and hard landscaping elements;
 - (iii) be in scale with the buildings and outdoor spaces;
 - (iv) create a comfortable and attractive environment;
 - (v) screen utility installations from public view;

- (vi) ensure that planting effects are contextually appropriate within the broader landscape strategy for the precinct;
 - (vii) achieve an aesthetic balance of en masse groundcover planting, shrub planting and canopy tree planting;
 - (viii) address the landscaping of the various areas as shown on the Sector Landscape Plan in accordance with the requirements of this clause; and
 - (ix) ensure that if plant species are chosen which are different for the purpose of creating visual and horticultural interest, they are nevertheless compatible aesthetically and ecologically with each of the other species chosen for the various areas.
- .3 The species of trees, shrubs and ground covers used road reserves are to be selected from the Plant List in Annexure B. Plants of similar characteristics may be substituted for a species in the Plant List and other plant types may be permitted, if approved by Council.
 - .4 The Sector Landscape Plan (refer Figure 6) shows the areas of road reserves to be landscaped based on the Proposed Plan of Subdivision. The layout and location of planting areas and the like are shown in indicative terms only and will vary as a result of detailed design development.

8.2.2 Streetscape Design

The locations of street planting along the residential streets within the sector are shown indicatively on the Sector Landscape Plan. This plan also shows the indicative locations and alignments of carriageways and pathways which may be provided.

8.2.3 Landscape and Planting Plan

The final landscaping and planting within road reserves of the sector, including details on planting size, layout and density, must be carried out in conformity with Landscape and Planting Plans prepared in accordance with the requirements of this sector plan by a qualified Landscape Architect. These plans must be submitted to, and approved by, the Council at the time of lodging a development application for operational works or building works.

8.3 **Signage and Artworks within Parks and Road Reserves**

8.3.1 Signage within the road reserves of the sector must provide:

- .1 visible and legible signs;
- .2 an uncluttered streetscape;

- .3 professional and co-ordinated graphics for the identification of different uses within the sector (if required);
 - .4 signs compatible with their surroundings; and
 - .5 generally simple, robust and low maintenance signage elements.
- 8.3.2 The location, form, scale, materials and colour selection of signage must be in keeping with the residential environment and must not dominate the urban landscape at ground level.
- 8.3.3 Works of high quality urban art, including paving patterns, water features and sculptures, are encouraged. These artworks must contribute strongly to enhancing the architecture and landscape of the residential environment, and achieve humanising elements.

9.0 Infrastructure Obligations of the Principal Developer

9.1 Infrastructure to be Provided

The infrastructure required to be provided by the principal developer to serve the sector 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:

9.1.1 Roads

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

- .1 All internal collector roads and access streets;
- .2 The provisions and timing of construction of the North-South Arterial Road from Aurora Boulevard to Node D (and connecting with Boundary Road, Endeavour Boulevard and the internal MIBA road network to the final standard of construction) will be completed by the date Council approves a Sector Plan which allows for development of 85% of the DCP area, or when required by conditions of development approval in accordance with Section 4.2.2 (h) of the MHIA, whichever is the sooner.
- .3 The provisions and timing of construction of the North-South Arterial Road from Node D to Node C (and connecting with Endeavour Boulevard and Discovery Drive) will be completed to the final standard of construction by the date Council approves a Sector Plan which allows for development of 90% of the DCP area, or when required by conditions of development approval in accordance with Section 4.2.2 (h) of the MHIA, whichever is the sooner.

- .4 Bikeways and pathways, including commuter and recreational bikeways generally as shown on Figure 4, in accordance with the MHIA.

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.

9.1.2 Water

- .1 Construct internal reticulation systems to service all properties in the sector.
- .2 Construct a water supply network within the DCP area, including those sections of the mains shown on Figure 9, necessary to service the anticipated demand in the precinct; and
- .3 Provide contributions towards water headworks and bulk water supply in accordance with the MHIA.

9.1.3 Sewerage

Unless already provided, construct all internal sewerage systems to service the properties in the sector and make contributions towards sewerage headworks in accordance with the MHIA, and unless otherwise agreed with Council:

- .1 Construct the gravity trunk sewer main GTS6 from the connection point with the internal sewerage system to the proposed GTS5 as shown on Figure 10 – Sewerage Headworks;
- .2 Construct the trunk gravity main TM6 from the connection point with the internal sewerage system to the proposed gravity trunk sewer main GTS6.
- .3 Construct an Interim Sewerage Discharge Scheme to cater for sewerage discharge until scheme in points 2 and 4 above is completed, if required.

9.1.4 Stormwater

- .1 Construct stormwater management works progressively in accordance with the Stormwater Management Plans for Tributaries A and 1 as approved by Council; and
- .2 Construct stormwater drainage systems to roads, parks and lots as required by the MHIA and Council's Design Manual.

9.1.6 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.

9.1.7 Communications

- .1 Arrange for the installation of underground telephone communications services for all properties in the sector.

9.2 **State Government Infrastructure Requirements**

- 9.2.1 There are no items of State Government infrastructure to be provided by the principal developer in conjunction with the development of the precinct.
- 9.2.2 The principal developer must contribute towards the cost of providing kerbside infrastructure associated with the public transport system. Such contribution is to be in accordance with the agreement with the State Government.

9.3 **Infrastructure Affected by Development**

- 9.3.1 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 and gas supply;
 - .8 Communications systems; and
 - .9 State Government infrastructure.
- 9.3.2 The infrastructure described in clauses 9.1 and 9.2, together with the obligations of the principal developer under the MHIA, is required to mitigate the adverse affects on such infrastructure.

9.4 How the Required Infrastructure Relates to the Infrastructure Agreements

- 9.4.1 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 9.1 are the principal developer's obligations under the MHIA.
- 9.4.2 Infrastructure Agreements have been entered into by the principal developer with the Department of Main Roads and Queensland Transport. Any infrastructure requirements of those State Government Departments relating to this precinct will be provided in accordance with the existing agreements.

9.5 Program for Infrastructure Provisions

- 9.5.1 The principal developer will provide all the infrastructure referred to in clause 10.1 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 December 2011. The completion of the roadworks where approved by Council will be as described in clause 9.1.1 and the MHIA.
- 9.5.2 Except as described elsewhere in this clause, no other works depend on the provision of this infrastructure.
- 9.5.3 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.

9.6 Water and Sewerage Demands

- 10.6.1 As required by the MHIA, the principal developer states as follows:
 - .1 For the purpose of assessing water supply capacity, the estimated number of Equivalent Tenements for this precinct is 89.40 ET;
 - .2 For the purpose of assessing sewerage capacity, the estimated number of Equivalent Persons for this precinct is 350.37 EP.

10.0 Assessment of Compliance with Precinct Plan Performance Criteria

As stated in section 8.1, the design and siting guidelines contained in this sector plan are considered by Council to be acceptable solutions which are consistent with the performance criteria of the *Queensland Residential Design Guidelines* and satisfy the performance provisions of the precinct plan. Other design and siting solutions will be considered by Council on their merits having regard to the performance criteria of the precinct plan.

11.0 Definitions

If a term used in this sector plan is defined by the DCP or the Infrastructure Agreement then that term or expression has the meaning given to it by the DCP or the Infrastructure Agreement unless the context otherwise required.

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ANNEXURE A

PROPOSED METES AND BOUNDS DESCRIPTION FOR URBAN RESIDENTIAL AREAS ELEMENT OF SECTOR

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METES & BOUNDS
NORTHERN RESIDENTIAL SOUTH EASTERN PRECINCT
NORTHERN RESIDENTIAL EASTERN SECTOR TWO

FROM THE POINT OF COMMENCEMENT BEING ON AMG COORDINATES
EASTING -500646.766 METRES, NORTHING -6990025.050 METRES, THENCE
IN A NORTH WESTERLY DIRECTION AT A BEARING OF 302°0'
FOR A DISTANCE OF 28.384 METRES (MORE OR LESS), THENCE
IN A NORTH EASTERLY DIRECTION AT A BEARING OF 32°0'
FOR A DISTANCE OF 32 METRES (MORE OR LESS), THENCE
IN A NORTHERLY DIRECTION AT A BEARING OF 20°11'55"
FOR A DISTANCE OF 15.324 METRES (MORE OR LESS), THENCE
IN A NORTH EASTERLY DIRECTION AT A BEARING OF 32°0'
FOR A DISTANCE OF 3 METRES (MORE OR LESS), THENCE
IN A NORTH WESTERLY DIRECTION AT A BEARING OF 302°0'
FOR A DISTANCE OF 45 METRES (MORE OR LESS), THENCE
IN A NORTH EASTERLY DIRECTION AT A BEARING OF 32°0'
FOR A DISTANCE OF 25 METRES (MORE OR LESS), THENCE
IN A NORTH WESTERLY DIRECTION AT A BEARING OF 302°0'
FOR A DISTANCE OF 81.454 METRES (MORE OR LESS), THENCE
IN A NORTHERLY DIRECTION AT A BEARING OF 9°0'
FOR A DISTANCE OF 35.353 METRES (MORE OR LESS), THENCE
IN A WESTERLY DIRECTION AT A BEARING OF 279°0'
FOR A DISTANCE OF 25 METRES (MORE OR LESS), THENCE
IN A NORTHERLY DIRECTION AT A BEARING OF 9°0'
FOR A DISTANCE OF 25 METRES (MORE OR LESS), THENCE

IN A WESTERLY DIRECTION AT A BEARING OF $287^{\circ}46'10''$
FOR A DISTANCE OF 18.213 METRES (MORE OR LESS), THENCE
IN A WESTERLY DIRECTION AT A BEARING OF $279^{\circ}0'$
FOR A DISTANCE OF 72 METRES (MORE OR LESS), THENCE
IN A SOUTHERLY DIRECTION AT A BEARING OF $189^{\circ}0'$
FOR A DISTANCE OF 3.851 METRES (MORE OR LESS), THENCE
IN A WESTERLY DIRECTION AT A BEARING OF $279^{\circ}0'$
FOR A DISTANCE OF 32 METRES (MORE OR LESS), THENCE
IN A NORTHERLY DIRECTION AT A BEARING OF $9^{\circ}0'$
FOR A DISTANCE OF 7 METRES (MORE OR LESS), THENCE
IN A WESTERLY DIRECTION AT A BEARING OF $279^{\circ}0'$
FOR A DISTANCE OF 25 METRES (MORE OR LESS), THENCE
IN A NORTHERLY DIRECTION AT A BEARING OF $9^{\circ}0'$
FOR A DISTANCE OF 12.5 METRES (MORE OR LESS), THENCE
IN A WESTERLY DIRECTION AT A BEARING OF $287^{\circ}24'45''$
FOR A DISTANCE OF 13.141 METRES (MORE OR LESS), THENCE
IN A NORTHERLY DIRECTION AT A BEARING OF $9^{\circ}0'$
FOR A DISTANCE OF 40.538 METRES (MORE OR LESS), THENCE
IN AN EASTERLY DIRECTION AT A BEARING OF $71^{\circ}0'$
FOR A DISTANCE OF 99.881 METRES (MORE OR LESS), THENCE
IN AN EASTERLY DIRECTION AT A BEARING OF $99^{\circ}0'$
FOR A DISTANCE OF 49.81 METRES (MORE OR LESS), THENCE
IN AN EASTERLY DIRECTION AT A BEARING OF $84^{\circ}0'$
FOR A DISTANCE OF 3.106 METRES (MORE OR LESS), THENCE
IN A NORTH EASTERLY DIRECTION AT A BEARING OF $54^{\circ}0'$

FOR A DISTANCE OF 3.106 METRES (MORE OR LESS), THENCE
 IN A NORTH EASTERLY DIRECTION AT A BEARING OF 24°0'
 FOR A DISTANCE OF 3.106 METRES (MORE OR LESS), THENCE
 IN A NORTHERLY DIRECTION AT A BEARING OF 9°0'
 FOR A DISTANCE OF 113.078 METRES (MORE OR LESS), THENCE
 IN AN EASTERLY DIRECTION AT A BEARING OF 99°19'55"
 FOR A DISTANCE OF 277.826 METRES (MORE OR LESS), THENCE
 IN A SOUTHERLY DIRECTION AT A BEARING OF 199°00'50"
 FOR A DISTANCE OF 98.988 METRES (MORE OR LESS), THENCE
 IN A SOUTH WESTERLY DIRECTION AT A BEARING OF 216°59'50"
 FOR A DISTANCE OF 60.609 METRES (MORE OR LESS), THENCE
 IN A SOUTH WESTERLY DIRECTION AT A BEARING OF 204°00'20"
 FOR A DISTANCE OF 245.005 METRES (MORE OR LESS), THENCE
 IN A SOUTH WESTERLY DIRECTION AT A BEARING OF 211°01'05"
 FOR A DISTANCE OF 30.973 METRES (MORE OR LESS),
 TO THE POINT OF COMMENCEMENT AND CONTAINING AN AREA OF
 8.727 HECTARES (MORE OR LESS).

We, RPS Australia East Pty Ltd A.C.N. 140 292 762 hereby certify that the
 Metes and Bounds description contained herein has been prepared by the
 company and the AMG connection used for the commencement point has
 been determined by field survey.



 Cadastral Surveyor/
 Authorised Delegate

6/6/12

 Date

ANNEXURE B

PLANT LIST

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**Annexure C: Plant List -
Residential Sector Sixty-Four
Public Parks & Road Reserves**

Botanical Name	Common Name
Trees & Palms	
<i>Acmena smithii</i>	Lilly Pilly
<i>Agathis robusta</i>	Kauri Pine
<i>Allocasuarina littoralis</i>	Black She Oak
<i>Allocasuarina torulosa</i>	Forest She Oak
<i>Araucaria cunninghamia</i>	Hoop Pine
<i>Archontophoenix cunninghamia</i>	Pickabeen Palm
<i>Backhousia citriodora</i>	Lemon Scented Myrtle
<i>Backhousia myrtifolia</i>	Carrol
<i>Banksia integrifolia</i>	Coast Banksia
<i>Barklya syringifolia</i>	Crown of Gold Tree
<i>Brachychiton acerifolius</i>	Flame Tree
<i>Brachychiton rupestre</i>	Bottle Tree
<i>Buckinghamia celsissima</i>	Ivory Curl Flower
<i>Callistemon salignus</i>	Pink Tips
<i>Callistemon viminalis</i>	Weeping Bottlebrush
<i>Callitris columellaris</i>	Bribie Island Pine
<i>Castanospermum australe</i>	Black Bean
<i>Casuarina cunninghamia</i>	River She Oak
<i>Casuarina glauca</i>	Swamp She Oak
<i>Cupaniopsis anacardioides</i>	Tuckeroo
<i>Elaeocarpus eumundii</i>	
<i>Eucalyptus citriodora</i>	Lemon Scented Gum
<i>Eucalyptus ptychocarpa</i>	Swamp Bloodwood
<i>Eucalyptus curtisii</i>	Plunkett Mallee
<i>Euodia elleryana</i>	Pink Euodia
<i>Ficus hillii</i>	Hill's Fig
<i>Ficus macrophylla</i>	Moreton Bay Fig
<i>Ficus rubignosa</i>	Port Jackson Fig
<i>Flindersia australis</i>	Crows Ash
<i>Flindersia pimenteliana</i>	Flindersia
<i>Flindersia schottiana</i>	Bumpy Ash
<i>Grevillea robusta</i>	Silky Oak
<i>Harpullia pendula</i>	Tulipwood
<i>Hymenosporum flavum</i>	Native Frangipani
<i>Livistona australis</i>	Livistona
<i>Livistona decipiens</i>	Weeping Cabbage Palm
<i>Livistona nitida</i>	Livistona
<i>Lophostemon confertus</i>	Brush Box
<i>Lophostemon suaveolens</i>	Swamp Box
<i>Melaleuca linariifolia</i>	Snow in Summer
<i>Melaleuca leucadendron</i>	Small Leaved Paperbark
<i>Melaleuca quinquenervia</i>	Broadleaved Paperbark
<i>Metrosideros queenslandicus</i>	Queensland Golden Myrtle
<i>Oreocallis sp. nova (wickhamii)</i>	Tree Waratah
<i>Podocarpus elatus</i>	Brown Pine
<i>Roystonea regia</i>	Cuban Royal Palm
<i>Syzygium australe</i>	Scrub Cherry

**Annexure C: Plant List -
Residential Sector Sixty-Four
Public Parks & Road Reserves**

Botanical Name	Common Name
Trees & Palms	
Syzygium franchisee	Giant Water Gum
Syzygium leuhmanii	Small Leaved Lilly Pilly
Syzygium paniculatum	Dwarf Magenta Cherry
Tristanopsis laurina	Water Gum
Waterhousia floribunda	Weeping Myrtle
Xanthostemon chrysanthus	Golden Penda
Shrubs	
Baeckea sp. Mt Toza	Dwarf Baeckea
Baeckea virgata	Twiggy Myrtle
Baeckea virgata dwarf	Dwarf Baeckea
Banksia Birthday Candles	Dwarf Banksia
Banksia ericifolia	Heath Banksia
Banksia integrifolia	Coastal Banksia
Banksia robur	Swamp Banksia
Banksia spinulosa var collina	Hairpin Banksia
Callistemon Dawson River	Dawson River
Callistemon Little John	Little John
Callistemon Ned Kelly	Ned Kelly
Callistemon pachyphyllus	Bottlebrush
Cyathea australis	Rough Tree Fern
Gardenia Florida	Double Gardenia
Grevillea "Coconut Ice"	Coconut Ice
Grevillea "Majestic"	Majestic
Grevillea "Robyn Gordon"	Grevillea
Grevillea "Superb"	Superb
Grevillea banksii	Red Silky Oak
Grevillea Honey Gem	Honey Gem
Grevillea Ned Kelly	Ned Kelly
Hovea acutifolia	Pointed Leaf Hovea
Leptospermum flavescens	Tantoon Tea Tree
Leptospermum petersonii	Lemon Scented Tea Tree
Leptospermum Pink Cascade	Pink Cascade
Melaleuca linariifolia Snowflake	Dwarf Tea Tree
Pittosporum revolutum	Brisbane Laurel
Pittosporum undulatum	Mock Orange
Syzygium Blaze	Dwarf Lilly Pilly
Syzygium Elite	Compact Lilly Pilly
Syzygium Tiny Trev	Dwarf Lilly Pilly
Tibouchina jules	Tibouchina
Westringea fruticosa	Wynyabbie Gem
Groundcovers	
Agapanthus africanus	Lily of the Nile
Agapanthus orientalis	Lily of the Nile
Agapanthus Peter Pan	Dwarf Agapanthus
Anigozanthos hybrids	Kangaroo Paws
Blechnum cartilagineum	Fern

**Annexure C: Plant List -
Residential Sector Sixty-Four
Public Parks & Road Reserves**

Botanical Name	Common Name
Cissus rhombifolium	Grape Ivy
Groundcovers	
Cissus Ellen Danica	Grape Ivy
Crinum pendunculatum	River Lily
Dianella revoluta	Flax Lily
Dietes bicolor	Japanese Iris
Dietes grandiflora	Japanese Iris
Evolvulus pilosus	Blue Sapphire
Gardenia radicans	Dwarf Gardenia
Grevillea Bronze Rambler	Bronze Rambler
Grevillea Royal Mantle	Prostrate Grevillea
Hardenbergia violacea	Purple Coral Pea
Hardenbergia violacea Bushy Blue	Bushy Blue
Helichrysum ramosissimum	Yellow Buttons
Hemerocallis species	Day Lily
Hibbertia dentata	Toothed Guinea Flower
Hibbertia scandens	Snake Vine
Liriope "Evergreen Giant"	Liriope
Lomandra hystrix	Creek Mat rush
Lomandra longifolia	Mat Rush
Lomandra multiflora	Long Leaved Mat Rush
Myoporum ellipticum	Creeping Boobialla
Myoporum parvifolium	Myoporum
Pittosporum Miss Muffet	Dwarf Pittosporum
Pittosporum tobira	Miss Muffet
Viola hederaceae	Native Violet
Zierra Carpet Star	Carpet Star
Grasses	
Cynodon dactylon	Green Couch
Danthonia induta	Wallaby Grass
Digitaria didactyla	Blue Couch
Greenlees Park	Hybrid Couch
Poa australis	Native Poa
Vines	
Jasminum polyanthum	Jasmine
Pandorea pandorana	Wonga Wonga Vine
Pandorea jasminoides	Bower of Beauty
Trachelospermum jasminoides	Variegated Star Jasmine
Trachelospermum jasminoides	Star Jasmine

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ANNEXURE C

SUPPLEMENTARY TABLE OF DEVELOPMENT (URBAN RESIDENTIAL AREAS ELEMENT) FOR THIS SECTOR

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SUPPLEMENTARY TABLE OF DEVELOPMENT (URBAN RESIDENTIAL AREAS ELEMENT) FOR RESIDENTIAL SECTOR SIXTY-SIX

Purposes for which premises may be erected or used without the consent of Council (Permitted Development) COLUMN A	Purposes for which premises may be erected or used without the consent of Council subject to conditions (Permitted Development subject to conditions) COLUMN B	Purposes for which premises may be erected or used only with the consent of Council (Permissible Development) COLUMN C	Purposes for which premises may not be erected or used (Prohibited Development) COLUMN D
<p>Associated unit in association with lot types 1-3 (table 6.1 of the DCP) Caretaker's residence Detached house Display home Domestic storage and recreation structures where <8% of the site area Family day care centre Local utilities Park</p>	<p>Any one or more of the following purposes on land nominated for that purpose or purposes on an approved sector plan.</p> <p>Sales and information centre</p> <p>Any purpose in this column not nominated for land by the sector plan becomes for that land a permissible development.</p>	<p>For land in a sector any purpose not listed in Column A, D or included in Column B but not nominated for that land in an approved sector plan</p>	<p>Adult product shop Agriculture Air strip Amusement premises Animal husbandry Aquaculture Bulk garden supplies Camping grounds Car park Car wash Caravan park Casino Catering premises Cattery Cemetery Commercial services Communication services Communication station where part of any mast is higher than 10m above ground level, or is attached to a building and projects more than 3m from that building Community premises Concrete batching plant Contractor's depot Convention centre Correctional institution Crematorium Cultural facility Dairy Educational establishment Entertainment library Extractive industry Fuel depot Funeral parlour General industry Hardware centre Hazardous industry Heavy vehicle parking Heavy vehicle sales Helicopter landing site Hospital</p>

Purposes for which premises may be erected or used without the consent of Council (Permitted Development) COLUMN A	Purposes for which premises may be erected or used without the consent of Council subject to conditions (Permitted Development subject to conditions) COLUMN B	Purposes for which premises may be erected or used only with the consent of Council (Permissible Development) COLUMN C	Purposes for which premises may not be erected or used (Prohibited Development) COLUMN D
			Host farm Hotel Indoor recreation Institution Junk yard Kennels Licensed club Lot feeding Mini-brewery Motel Motor sport or shooting Occasional market Office Outdoor recreation Outdoor sales Passenger terminal Piggery Place of worship Poultry farm Re-cycling depot Restaurant Retail nursery Retail showroom Rural industry Service industry Service station Shop >200m ² GFA Shopping centre Showground Simulated conflict Special use Stable Stock sales yard Technology industry Tourist facility Transport terminal Transportable home village Turf farming Vehicle hire depot Vehicle sales yard Veterinary clinic Veterinary hospital Warehouse

The provisions of the Supplementary Table of Development are subject to section 2.4.9 of the DCP.

ANNEXURE D

Vector Report

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**Northern Residential Precinct
Plans 044 (West) & 047 (East)
North Lakes**

**Biting Insect Management
Review and Control Recommendations**

For

Stockland

2 September 2011

Prepared by

**Darryl McGinn
Director and Medical Entomologist**

Mosquito Consulting Services Pty Ltd

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e-Mail: Darryl.McGinn@MCSPTY.COM

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1.0 Introduction

In August 2011, Stockland engaged Mosquito Consulting Services Pty Ltd to undertake a review of biting insect matters and further consider amelioration measures proposed for its Northern Residential Precinct (Plans 044 & 047) at North Lakes. Source documents provided include the report by Mr Harry Standfast of International Vector Consultants (IVC) titled “Mosquito and Biting Midge Management – Woodside Residential Precinct” (2003) and various locality and detail plans for the Northern Residential Precinct. See Map 1 for locality of precinct plans 044 & 047 to which this report relates. The purpose of the IVC report review was to provide expert comment on biting insect fauna characterisation and control strategies first noted in 2003 and propose appropriate control strategies in the context of the current Northern Residential Precinct urban design.

Map 1: Northern Residential Precinct (Plan 044 West & 047 East) (approx boundaries)



2.0 Review of IVC's 2003 Report

The author of the IVC report, Mr Harry Standfast is an acknowledge expert in the field of Medical Entomology and has wide experience in developing management plans for control of biting insects and vector borne disease. IVC was engaged in 2003 to examine the biting insect risks and propose control measures specifically for the Woodside Precinct (approx 1.5-2.2 km east of the Northern Residential Precinct). It is general practice when investigating biting insects in given locations for the entomologist to develop information on species abundance and

distribution over a relatively wide area. This is in order to identify potential risks likely to impact on future residents from both nearby (on site) breeding sites and other significant (off site) habitat producing species likely to disperse into the site from time to time.

The IVC report followed that searching approach and comprehensively characterises the likely mosquito and biting midge fauna typically found in the North Lakes locality pre-development. Mosquito Consulting Services Pty Ltd (Darryl McGinn) is in agreement with the IVC report and because of its wide scope considers it an appropriate source document relative to the current Northern Residential Precinct.

The terms of reference for the IVC investigation included considering an effective biting insect control in the context of the combined environmental corridor adjoining Saltwater Creek and adjacent linear park abutting residential allotments. It is noted that in 2003, the urban design for the Woodside Precinct included residential allotments with otherwise direct connection with potential biting insect harbourage vegetation across its combined environmental corridor and linear park. This is not the case for the current Northern Residential Precinct.

The major findings of the IVC report were noted in its Executive Summary. Of material interest to the current considerations is the recommendation for achieving and maintaining “*A 20 metre wide Barrier Zone cleared of all vegetation except closely mown grass between the development (dwellings) and the Environmental Park.*”. Further recommendations about maintaining access for Council’s mosquito management programme vehicles and equipment to undertake possible biting insect control are also relevant and will be addressed in this report.

With respect to the IVC’s report recommendation for a 20 metre Barrier Zone, this technique has been now used successfully in a number of other residential developments to provide separation between dwellings and known mosquito harbourage. While many mosquito species have flight ranges exceeding several kilometres (e.g. *Aedes vigilax*), and other species rarely disperse far over open ground (e.g. *Verrallina funerea*), it has been observed (Standfast various studies) that where good quality harbourage understory and mid-story vegetation does exist, most mosquito species prefer to remain within the more protective understory and mid-story levels than transit over inhospitable open space. It is this general preference for mosquitoes to keep within vegetation cover that allows relatively narrow open ground dimensions (of around 20 metres) to reduce their impact on people at home.

3.0 Proposed measures to separate dwellings from mosquito harbourage

The general arrangement of ecological corridors, linear parkland, roadways and dwelling setbacks for the Northern Residential Precinct is as follows:

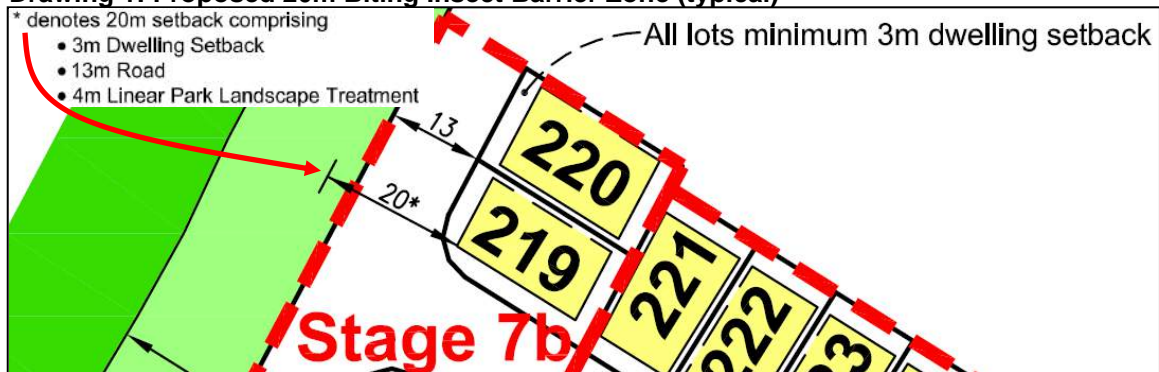
- Ecological Corridor to the watercourse,
- Linear Park not less than 15m wide adjoining the Ecological Corridor,
- Road reserve not less than 13m wide adjoining the Linear Park,
- Dwelling setback from allotment front boundary not less than 3m.

Open ground provided by the dwelling setback and road reserve is therefore $3+13 = 16\text{m}$.

It is currently proposed to revegetate portions of the linear park in three layers (Understory, Mid-story and Canopy) to provide additional protection and wildlife corridor space (beyond the designated Ecological Corridor) for the watercourse. There is opportunity to enhance the 16 metres of currently available barrier zone for biting insect amelioration, to 20 metres, by modifying the proposed linear park revegetation in the first 4 metres adjoining the road reserve.

Within the first 4 meters of the linear park retention of taller tree canopy and prostrate ground covers would still be supported however; reduction of understory and mid-story would provide the 20 metres of biting insect barrier zone recommended by IVC. Drawing 1 below shows a typical view of the recommended biting insect barrier zone as it would be applied to the Northern Residential Precinct.

Drawing 1: Proposed 20m Biting Insect Barrier Zone (typical)



4.0 Access for operational biting insect control

The IVC report recommended use of the 20 metre biting insect “Barrier zone” to provide a dual function. Firstly to provide a passive barrier to dispersal of biting insects and secondly; for access of vehicles and equipment for providing additional mosquito control (fogging/misting/larviciding) during periods of increased biting activity/public health risks. It was proposed within the IVC report for the Woodside Precinct that the entirety of the biting insect barrier zone would be within the linear park adjacent to the ecological corridor and be maintained to allow vehicle access. The currently proposed Northern Residential Precinct follows a different design but still provides access as may be required.

The recommended Northern Residential Precinct biting insect barrier zone is largely made up of road reserve with an additional 4 metres of modified linear park revegetation. As such, the road reserve provides excellent access to vehicles and equipment that may be deployed in the future to support control of biting insects along this interface with harbourage vegetation.

5.0 Conclusions and Recommendations

In 2003 International Vector Consultants (Mr Harry Standfast) produced a suite of recommendations for management of biting insects based on the Woodside Precinct urban design thinking of the time. By and large, the recommendations of the IVC report are still relevant to the Northern Residential Precinct (Plans 044 & 047) with minor differences in how its recommended 20 metre “Barrier Zone” for biting insect amelioration might now be achieved.

The main difference with past and current design is the placement of a road reserve between residential dwellings and the existing and proposed revegetated ecological corridor and (now also) linear parks to the waterways. The road reserves provide a useful biting insect barrier zone over its 13 metre dimension. This is enhanced by a minimum 3 metre setback of dwellings from allotment front boundaries. Further improvement of biting insect protection is possible by minor modification of the revegetation of the linear park. Doing so will achieve the desired 20 metre of biting insect barrier zone. Roadways now also provide adequate access for biting insect control vehicles and equipment as may be required from time to time.

Recommendations

- The main conclusions of the IVC report (2003) for the Woodside Precinct are considered relevant for the Northern Residential Precinct and are supported including the achievement of a 20 metre wide barrier zone to

minimise dispersal of biting insects into residential dwellings from protective vegetation for watercourses draining into Saltwater Creek.

- The proposed revegetation of the linear park could be modified slightly to minimise biting insect harbouring understory and mid-story within the first 4 metres (roadside) but still allowing tall tree canopy and prostrate ground covers if required.

It is considered that implementation of the final recommendation for the Northern Residential Precinct would provide reasonable management of the biting insect risk generally identified in North Lakes by IVC in 2003.



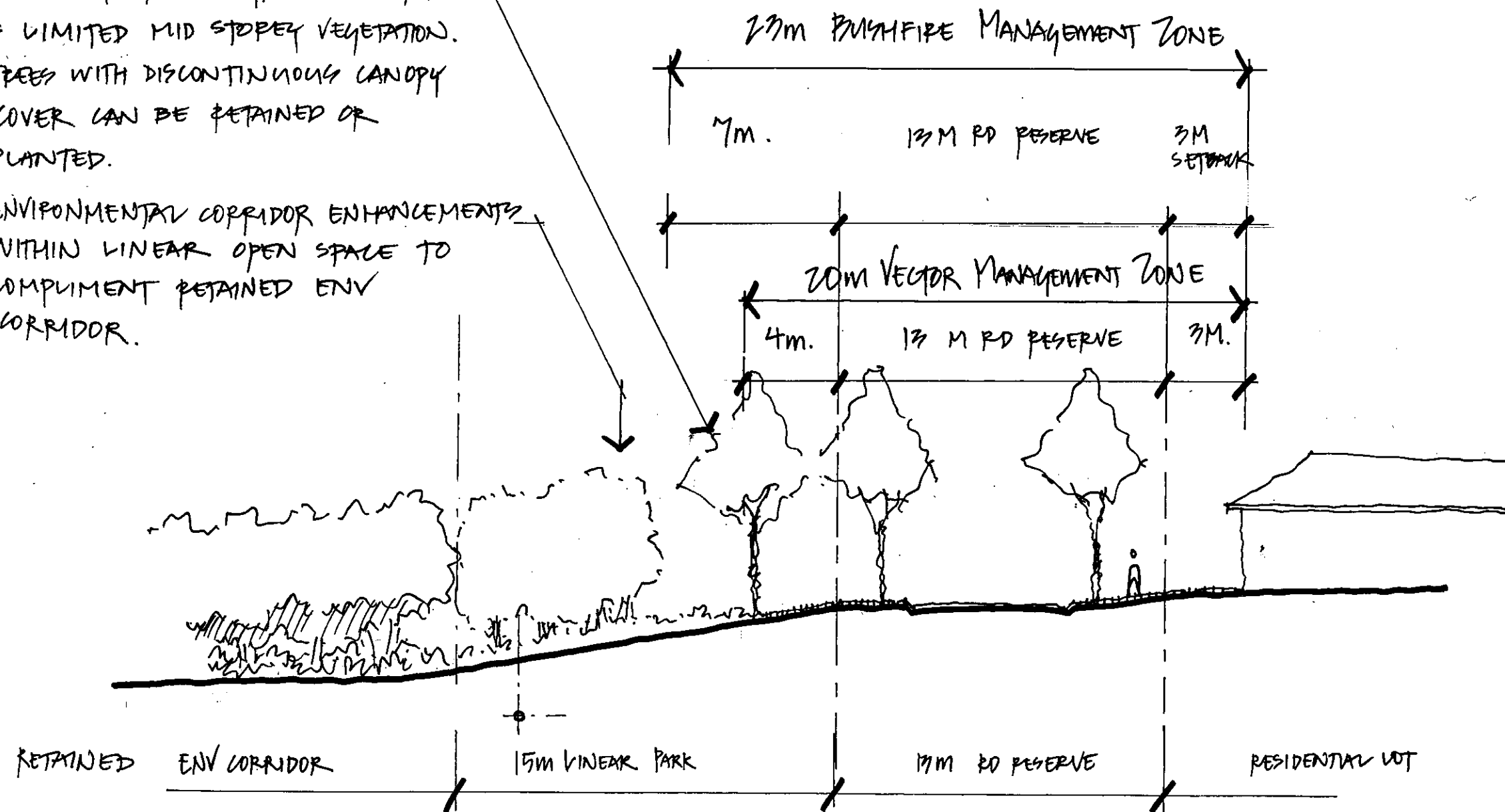
Darryl McGinn
Mosquito Consulting Services PtyLtd

ANNEXURE E

Landscape Concept Cross Section

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- MANAGED AREA CONTRIBUTING TO BUFFER TO CONSIST OF LOW GROUND COVER & LIMITED MID STOREY VEGETATION. TREES WITH DISCONTINUOUS CANOPY COVER CAN BE RETAINED OR PLANTED.
- ENVIRONMENTAL CORRIDOR ENHANCEMENTS WITHIN LINEAR OPEN SPACE TO COMPLIMENT RETAINED ENV CORRIDOR.



LANDSCAPE TREATMENT INTENT - ENVIRONMENTAL CORRIDOR & BUFFER