Pedestrian and Cycle Links

DESIGN OBJECTIVES

- Off-road shared Cycle-Pedestrian links are on all Collector Roads and Dobell Road on one side of the street, with standard pedestrian paths located on the opposite side of the road.
- Where Collector Roads front a park, the shared path will be located on the open space side.
- All other local streets have standard pedestrian paths on both sides of the street
- Existing pedestrian paths along the linear park will be retained where possible, and linked to form a continuous access corridor connecting Fullwood Reserve, the School and Brady Park.
- The Linear Park Corridor has a shared way (path / cycleway) along it's length, with pedestrian paths crossing the corridor at key locations

Street Tree Strategy

DESIGN OBJECTIVES

- Local Streets - solar aspect defines tree selection to shade from the western sun in summer, allow good solar access in winter
- Local Streets have informal layout to accommodate driveway locations
- Entry statement & intersection design - punctuate regular street tree planting on Collector Roads with intersection planting - terminates views along adjoining streets - refer Landcom Street Tree Design Guidelines
- Collector Roads and Dobell Road - Street trees in parking bays. Layout is a formal avenue punctuated by intersections and entry statement.

Entry Statement

Intersection Treatment 1
(Entry Road x Dobell Road)

Intersection Treatment 2
(Entry Road x Local Road)

Intersection Treatment 3
(Collector Road x Dobell Road)

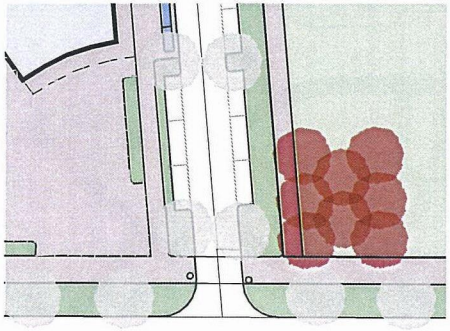
Intersection Treatment 4
(Dobell/ Collector Rd x Local Road)

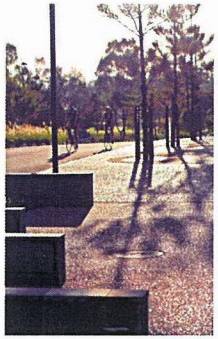
High points
Entry Road
Dobell Road
Collector Road
Local Road - N-S
Local Road - E-W
Local Road - N/E-S/W
Local Road - N/W-S/E
Site Boundary

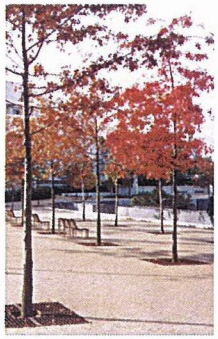
0 20 50 100 200 500m

Intersection Treatments

ENTRY STATEMENT TREATMENT

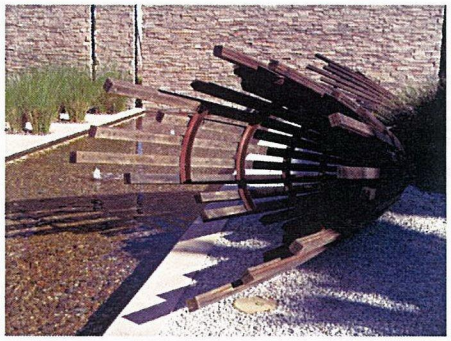






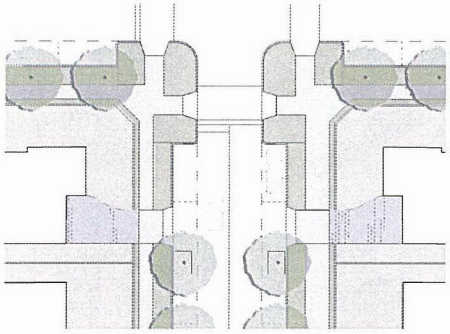
Native / Cultural tree plantings to highlight entry

Diverse and coloured underplanting to highlight entry

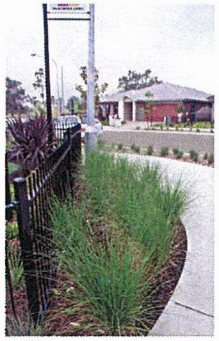


Local artist to create a sculptural response to complement entry

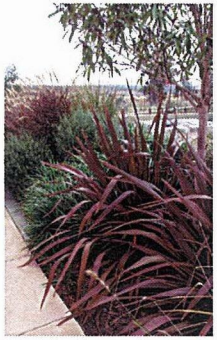
INTERSECTION TREATMENT: TYPES 1 - 4



- Layout of Intersection Treatment Types 1-4 are the same. Treatments vary only in plant species selection and design. These selections are themed according to the street types. (eg. Local x Collector)



Detailed planting design at intersections (Gregory Hills Residential Estate)



Parking bays to be screened with low planting at intersections

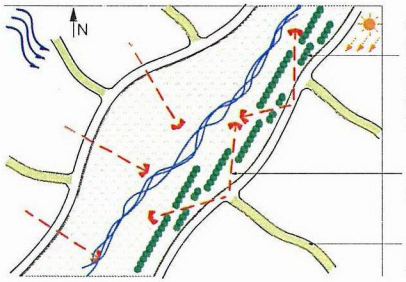


Figure 3.12: Shelter Belt and Solar Street Strategy Principle

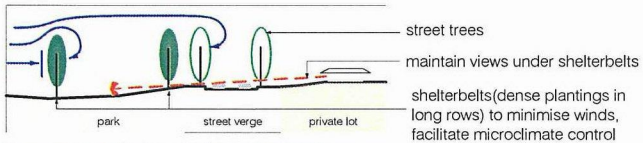
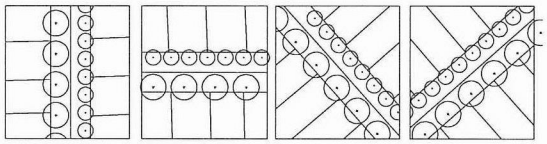


Figure 3.14: Shelter Belts in Open Space

2. Wind rows/ shelterbelts to south eastern edges of open space to protect residents from both strong hot+cold northwest winds, across open space



Street Trees responding to Street Aspect

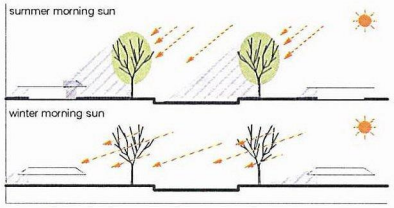
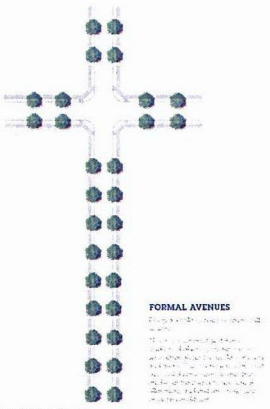
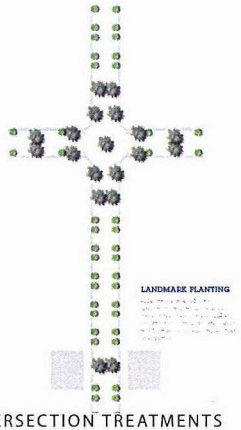


Figure 3.13: Solar Street

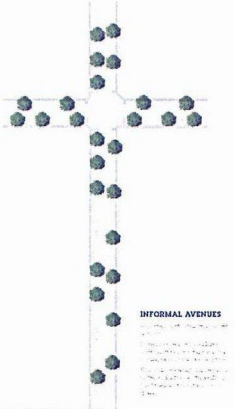
1. Deciduous trees planted to north eastern side of built form or amenity/ structure to maximise winter morning sun and minimise summer morning sun, without impacting on winter winds (ie; creating a wind tunnel along the street).
(Source: Googong Landscape and Open Space Strategy, AECOM, 2010)



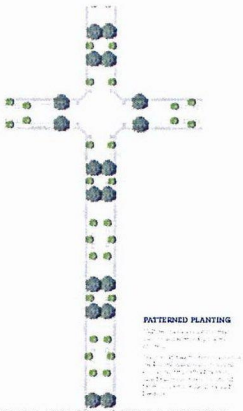
ENTRY STREET



INTERSECTION TREATMENTS ON ENTRY STREET / DOBELL ROAD / COLLECTOR ROAD



LOCAL STREETS



DOBELL ROAD / COLLECTOR ROAD

(source: Landcom)

Microclimate and Street Trees

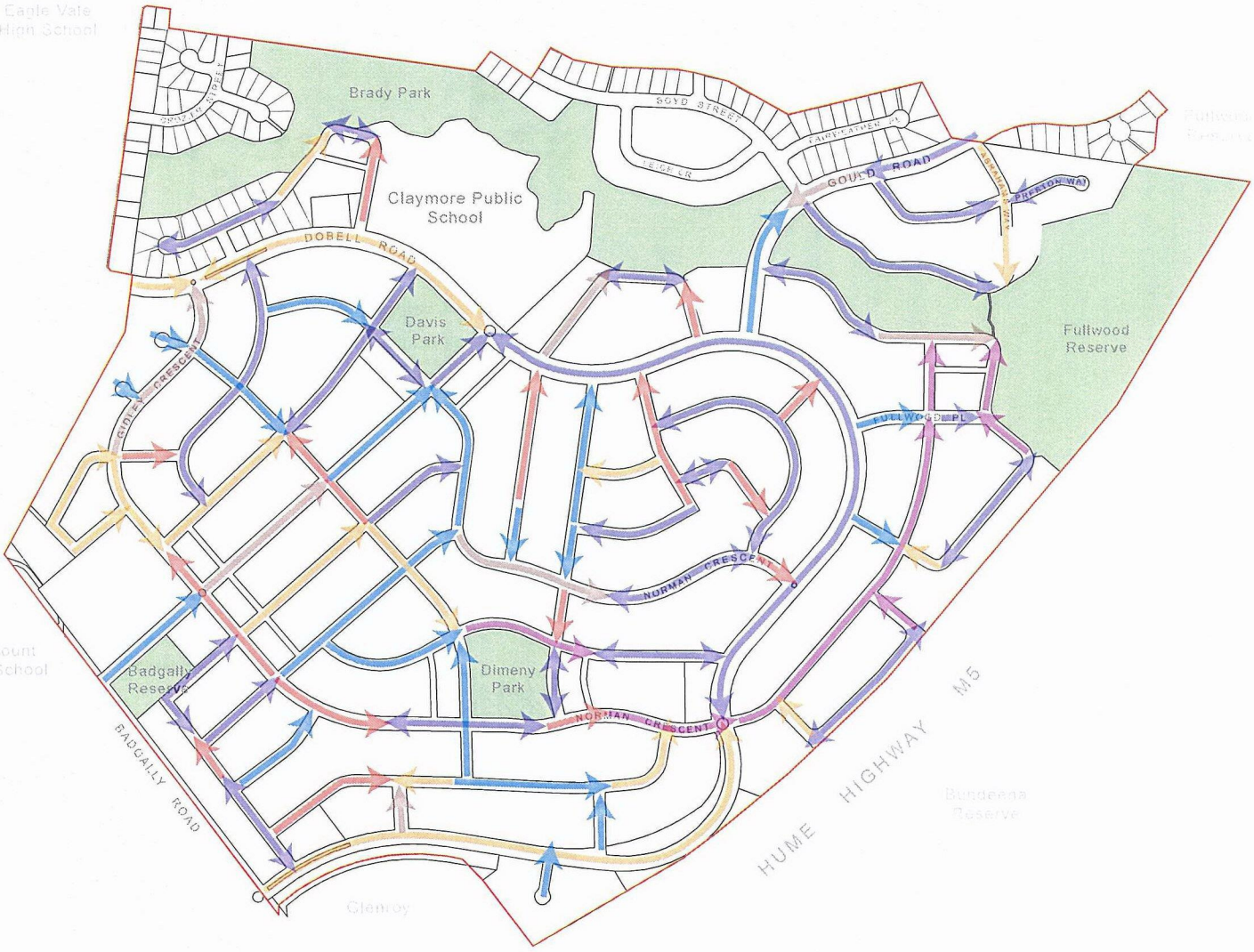
DESIGN OBJECTIVES

- Where possible use street trees to provide microclimate benefits - this includes shading from hot western sun in winter, and allowing solar access for the lower angled northern sun in winter
- For local streets - larger canopies for lot frontages facing West and South
- For local streets - smaller canopies for lot frontages facing North and East

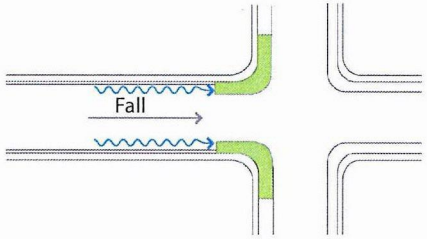
Street Slopes

DESIGN OBJECTIVES

- Street slopes define view sheds and combined with aspect, street tree design and street hierarchy (local or collector) form the character of the street.
- NE streets run along the contours or are the most gentle slopes
- NW streets go from ridge-valley-ridges
- Street slopes influence front fence design articulation and choice of material

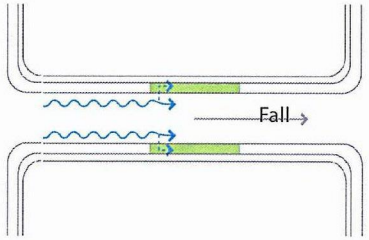


WSUD integration options



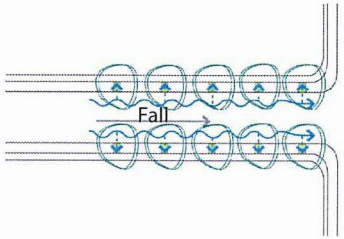
1

Verge blisters with planting at intersections



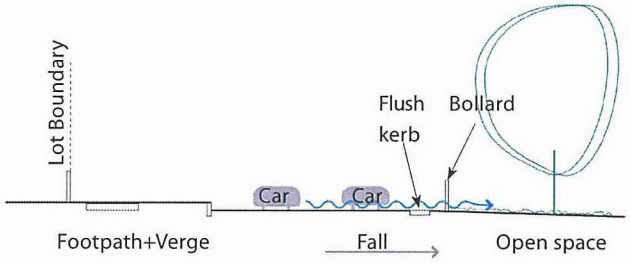
2

Planting beds at centre of streets to capture street runoff



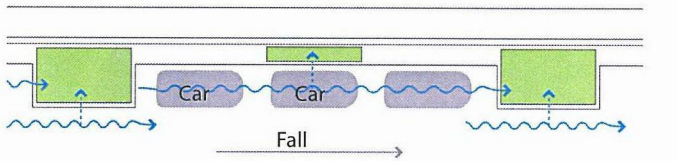
3

Tree pits may be used to capture street runoff on steep grades



4

Castellated or flush kerbs installed at edge roads to open spaces to allows street runoff through to planting



5

Urban context - indented Parking Bays to allow street runoff to planting beds

(Source: Googong Landscape and Open Space Strategy, AECOM, 2010)

Views and Open Space

DESIGN OBJECTIVES

- Retain trees where possible within existing open space areas and road corridors
- Retain where possible existing pedestrian pathways and facilities and incorporate into the new design
- Where possible reinforce views to open space from perpendicular streets to provide good visual connectivity and legibility (sense of orientation and place)
- Generally, views are down-slope on perpendicular streets to open space areas

Illustrative Landscape Master Plan

DESIGN OBJECTIVES

- Street design to be cohesive public realm with consistent street character
- Street tree hierarchy and fencing responds to location and aspect
- Retain & enhance existing trees where possible
- Integrate existing park facilities into new layout
- Provide pedestrian connections between open space areas
- Create clear pedestrian view lines in Linear Parkland Corridor to encourage passive surveillance
- Provide a mix of passive & active recreation opportunities
- Integrate passive irrigation into street tree bays
- Integrate WSUD into Linear Parkland Corridor and localised areas within parks
- Upgrade existing sport fields and facilities and integrate into new urban subdivision
- Highlight estate and Linear Park Corridor entrances

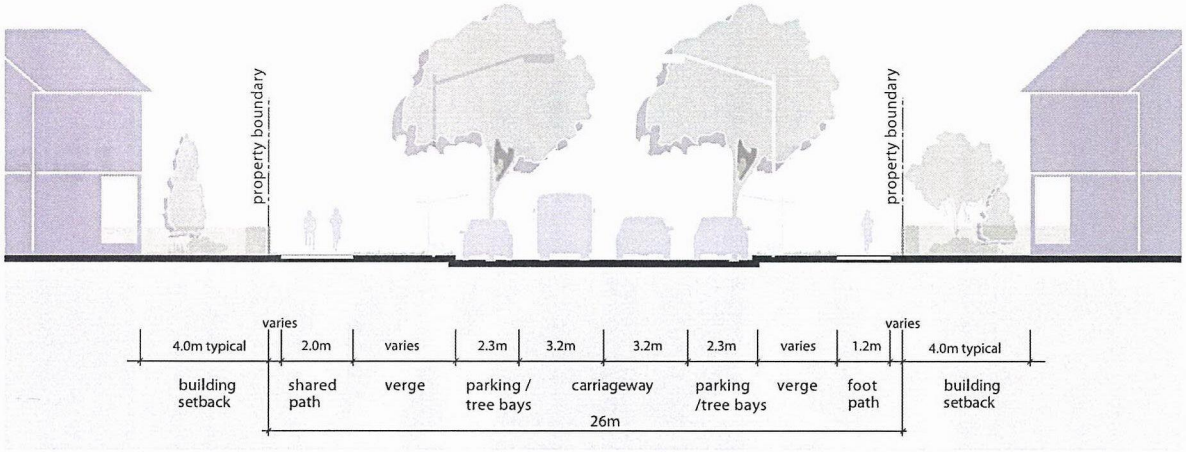
04

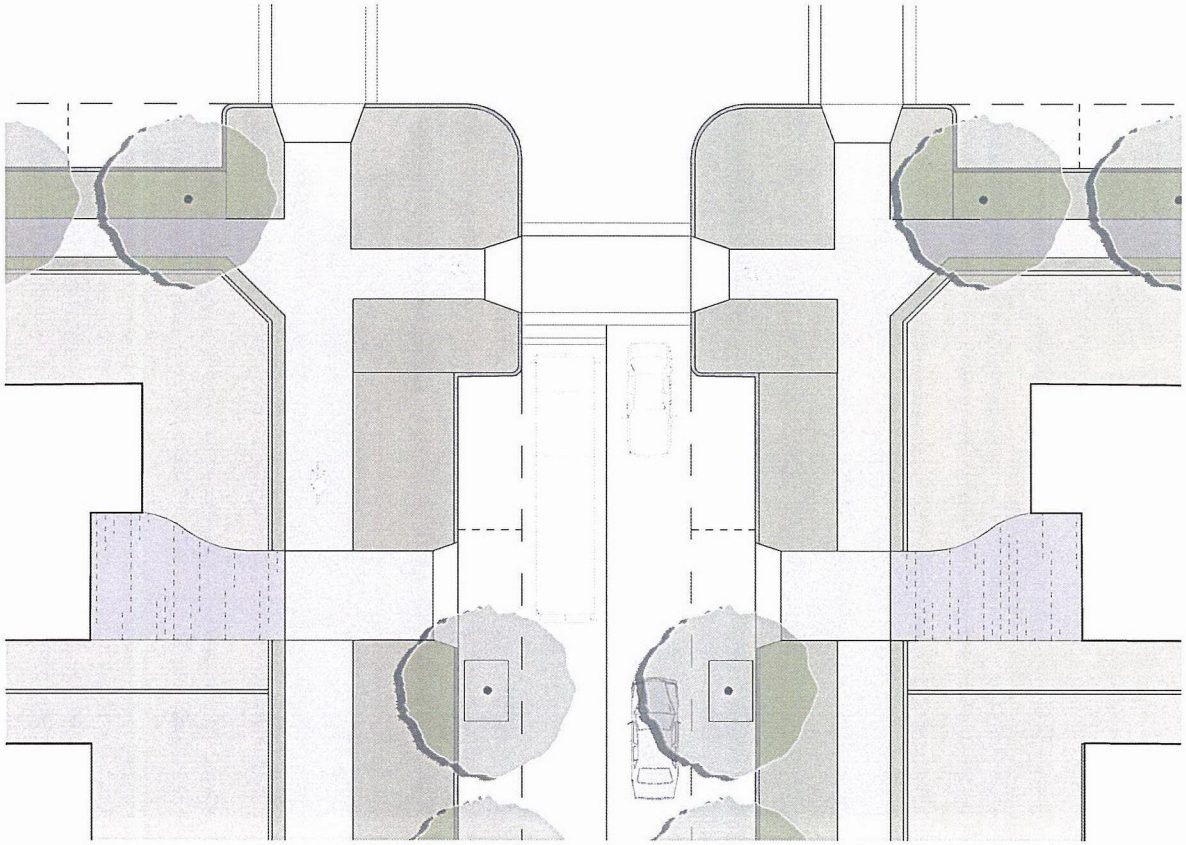
Street Types - illustrative

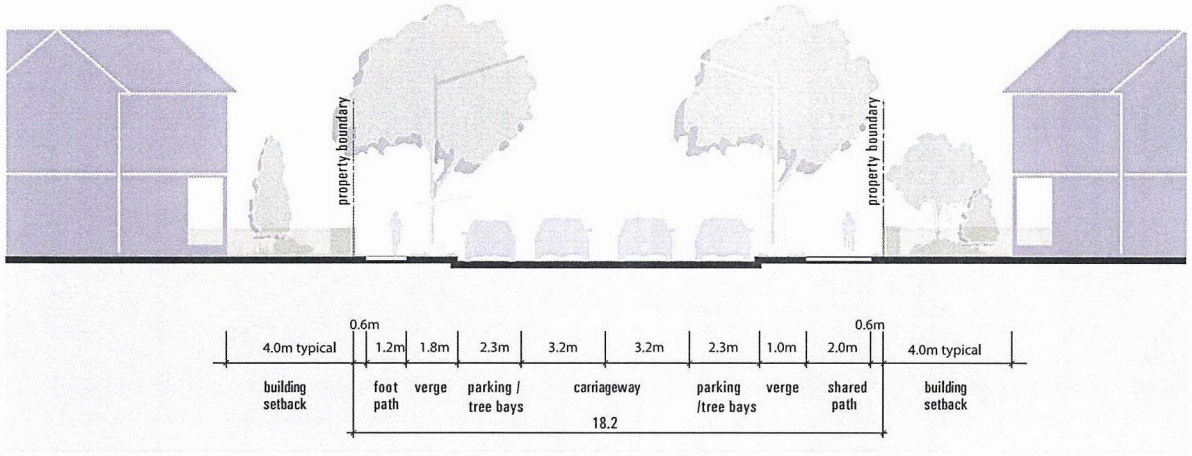
Dobell Road / Collector

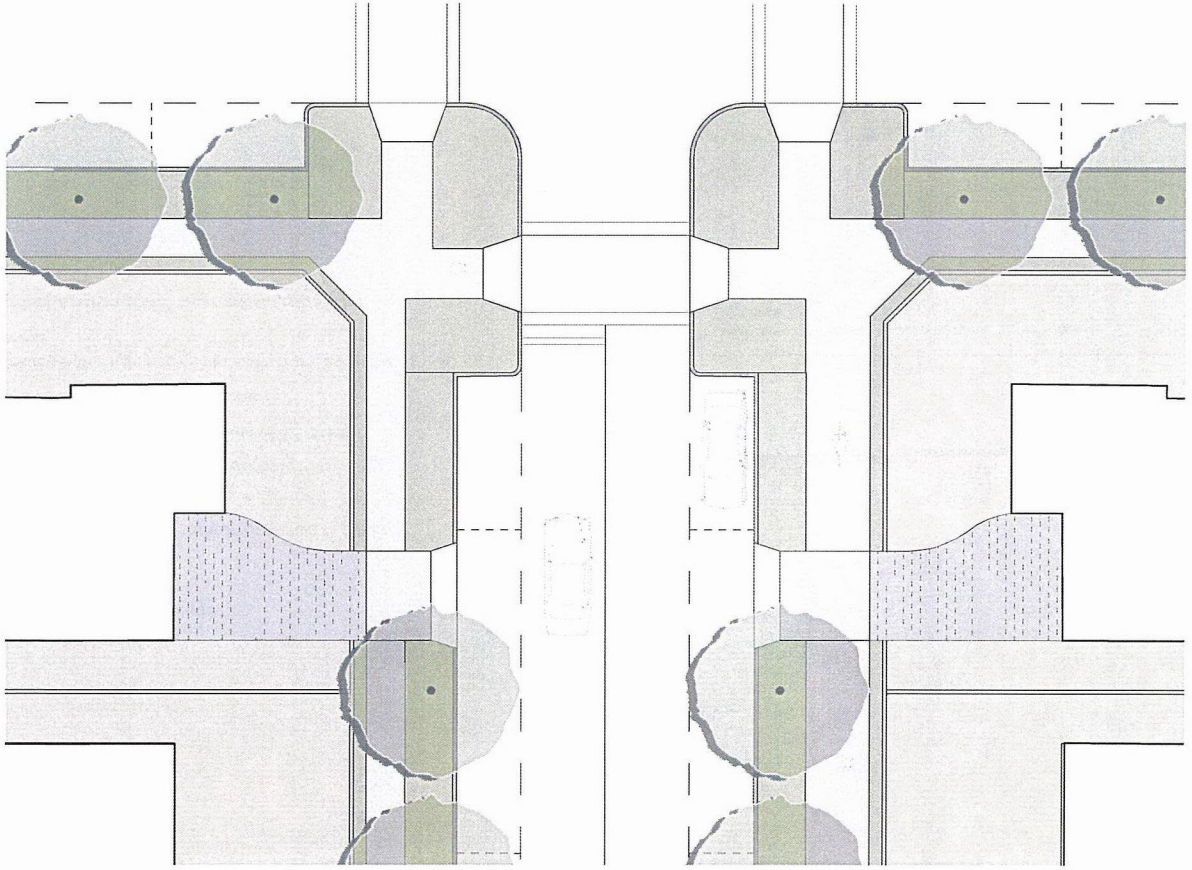
DESIGN OBJECTIVES

- Consistent driveway and footpath materials in public realm
- Trees bays in parking bays (not behind kerb)
- Shared pedestrian / cycle path on one side of the street - standard pedestrian footpaths on the other side
- Street tree planting formal and regular layout
- Building setback typically 4.0m to the front, 5.5 to the garage.









Typical Entry / Minor Collector

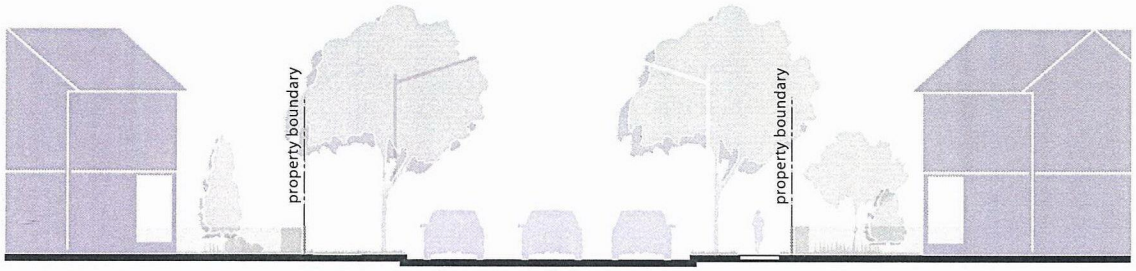
DESIGN OBJECTIVES

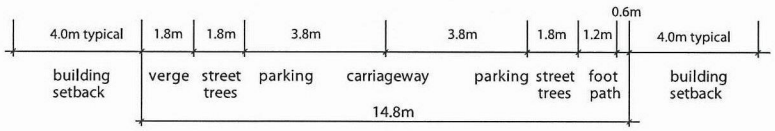
- Consistent driveway and footpath materials in public realm
- Trees bays in parking bays (not behind kerb)
- Shared pedestrian / cycle path on one side of the street - standard pedestrian footpaths on the other side
- Street tree planting formal and regular layout
- Building setback typically 4.0m to the front, 5.5 to the garage
- For lots less than 300m^2, front to be setback 3.0m

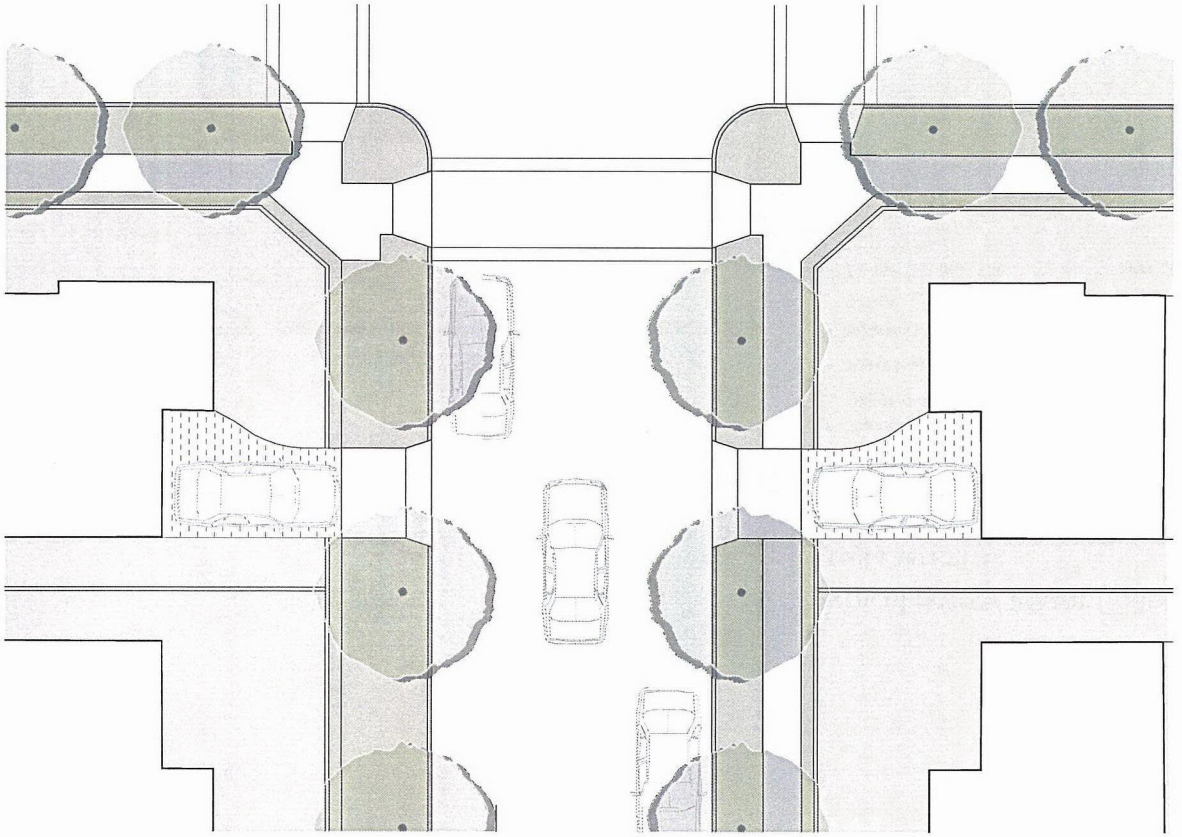
Typical Local Street

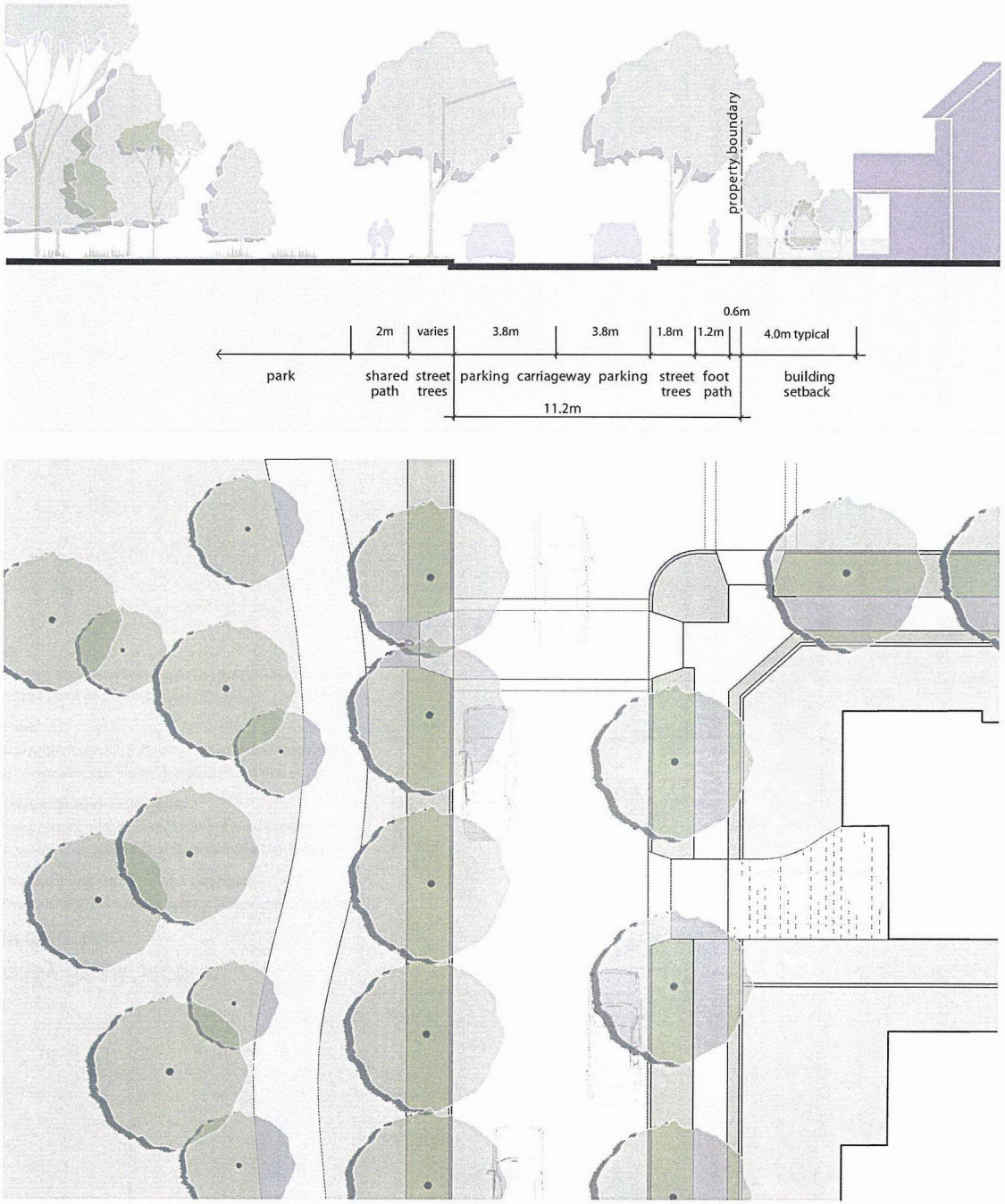
DESIGN OBJECTIVES

- Consistent driveway and footpath materials in public realm
- Trees behind kerb (not in parking bays)
- Pedestrian footpaths on both sides of the street
- Street tree planting informal layout
- Building setback typically 4.0m to the front, 5.5 to the garage
- For lots less than 300m^2, front setback to be 3.0m.









Typical Park Edge Street

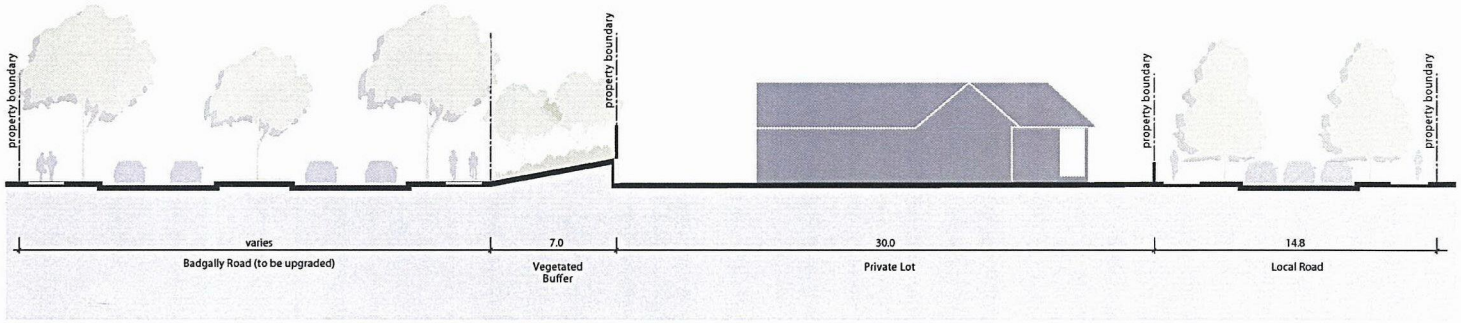
DESIGN OBJECTIVES

- Consistent driveway and footpath materials in public realm
- Trees behind kerb (not in parking bays).
- Pedestrian footpaths on both sides of the street - those on the open space side can meander
- Street tree planting informal
- Building setback typically 4.0m to the front, 5.5 to the garage
- For lots less than 300m^2, front setback 3.0m.

Badgally Road Section

DESIGN OBJECTIVES

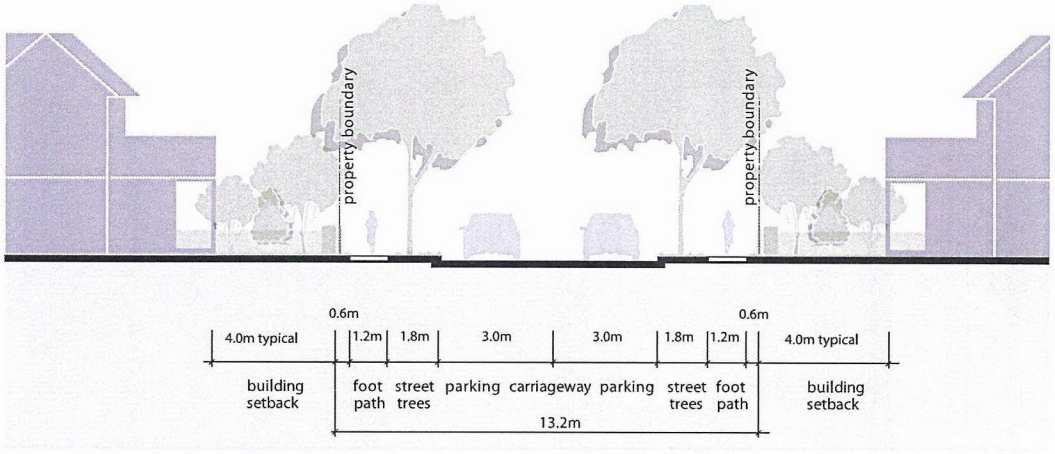
- Provide visually separation of back yard areas with small mound and wall with planting treatment
- Fence on top of retaining wall to be brick piers with treated timber infill to provide impressive entry statement to the whole estate
- This treatment 'bookends' the main entrance to the estate with seniors living to the west, and residential to the east.
- Badgally Road to be upgraded by the RTA. The project works include the vegetated buffer and adjoining verge areas.

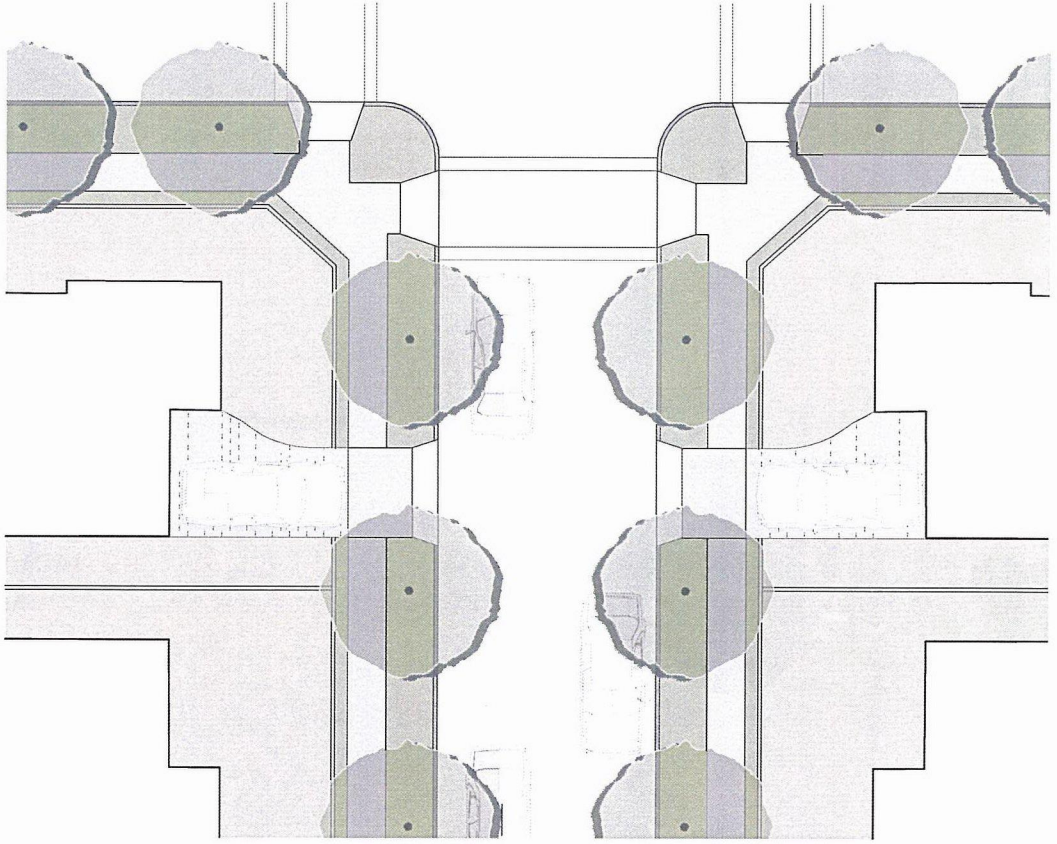


Cul-De-Sac

DESIGN OBJECTIVES

- Consistent driveway and footpath materials in public realm
- Standard pedestrian footpaths on both sides
- Building setback typically 4.0m to the front, 5.5 to the garage

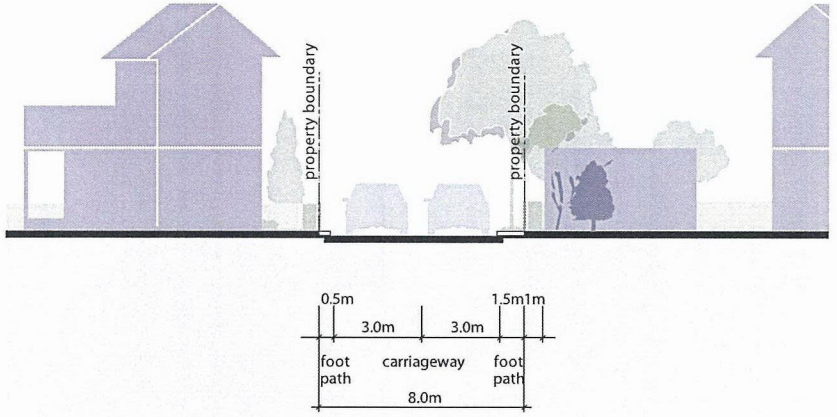




Laneway

DESIGN OBJECTIVES

- Provide rear access to higher density residential dwellings
- Shared pedestrian / vehicle carriageway
- 1.0m setback to garage
- Garage-top studio on corner lots provides surveillance to the laneway to create safe environment



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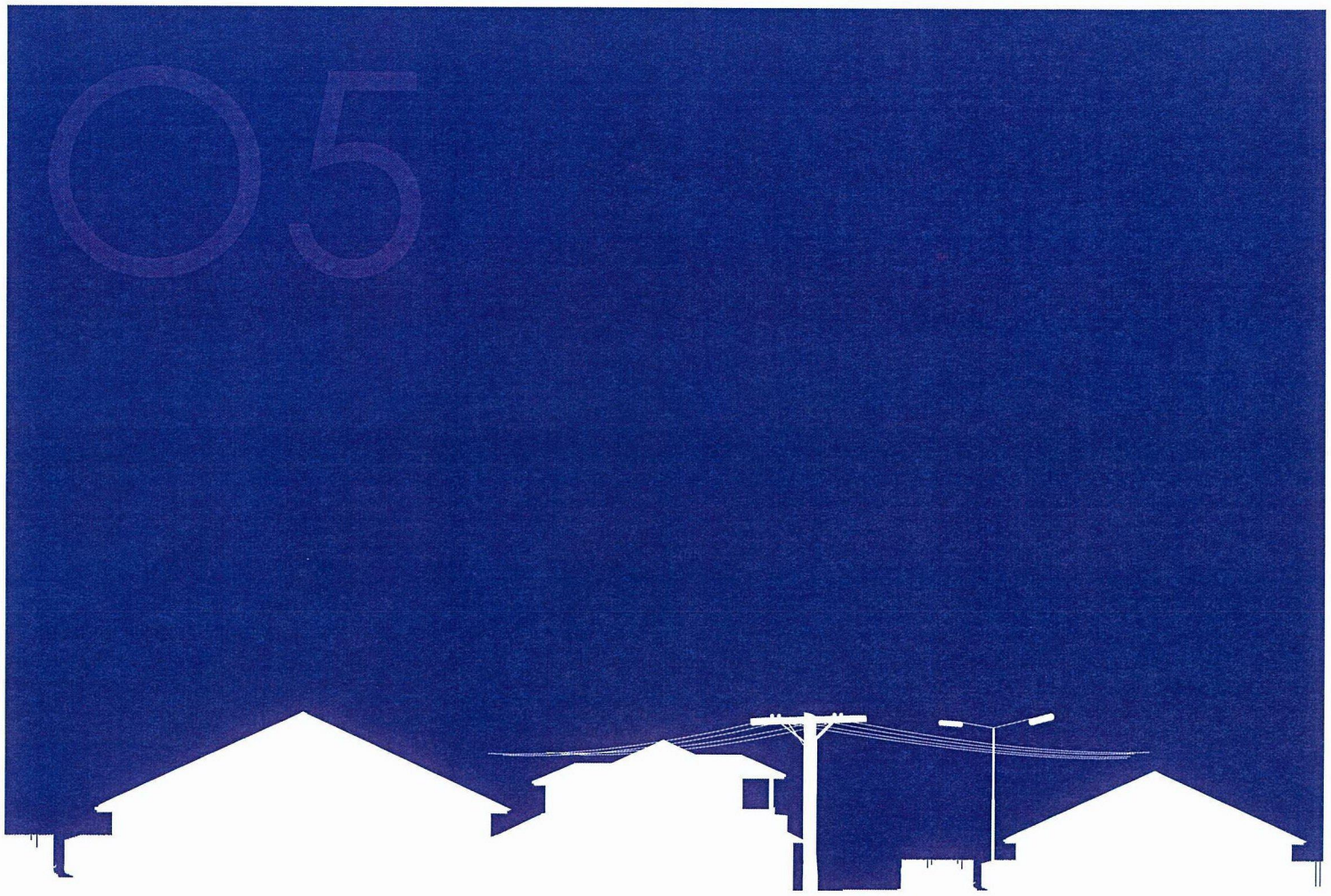


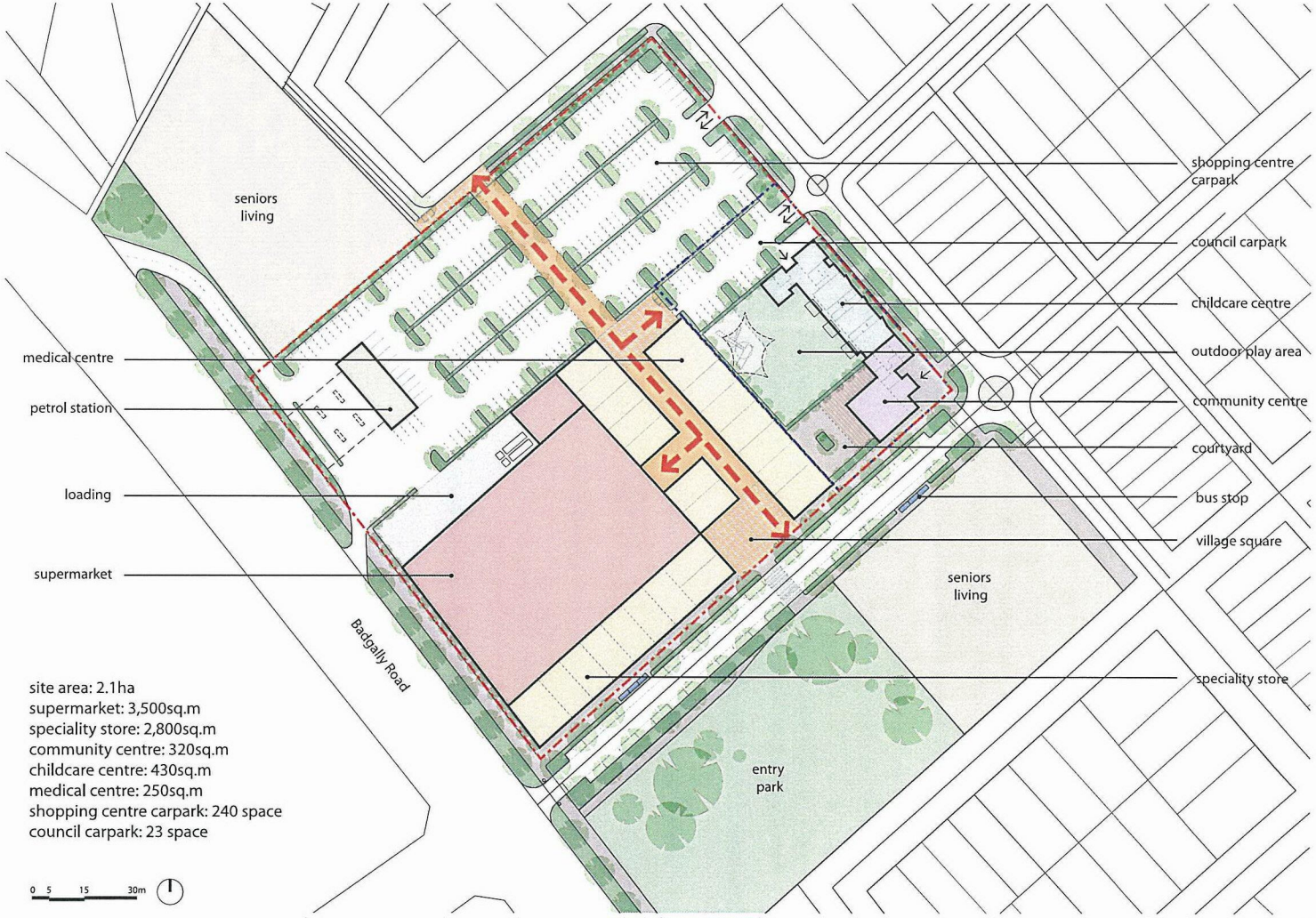
Retail Centre and Community Precinct Concept Plan

Concept Plan

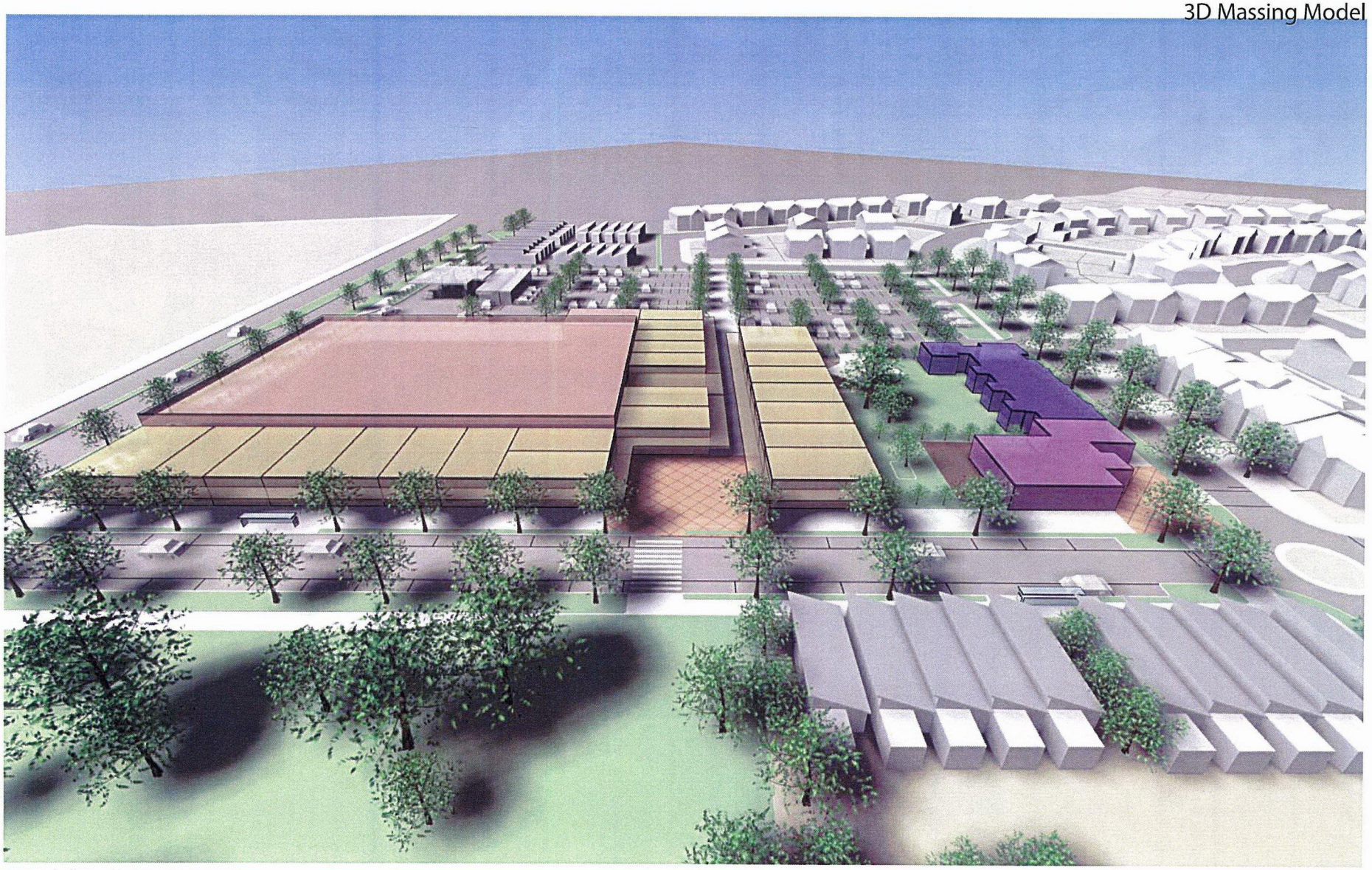
The concept plan proposes the consolidation of the existing retail centre and community facilities (such as the child care centres, youth centre, community rooms and multiple training centres) into an integrated retail and community precinct located at the new entry to the development along the Badgally Road frontage. The re-development of the Claymore estate creates this opportunity to provide a better urban outcome and develop best practice amenity for the future community.

The proposed retail precinct provides a key entry statement to the new development and will be accessible to both new residents of the redeveloped Claymore estate as well as existing residents in surrounding areas. The retail precinct has also been designed to take full advantage of upgraded amenities such as the Entry Road, the new Badgally Reserve and local public transport services (buses to Campbelltown CBD and Campbelltown Rail Station).

The concept plan proposes integrated housing, seniors living units and new streets around the retail and community precinct to create a safer environment and more opportunities for effective surveillance as a result of the higher residential density.

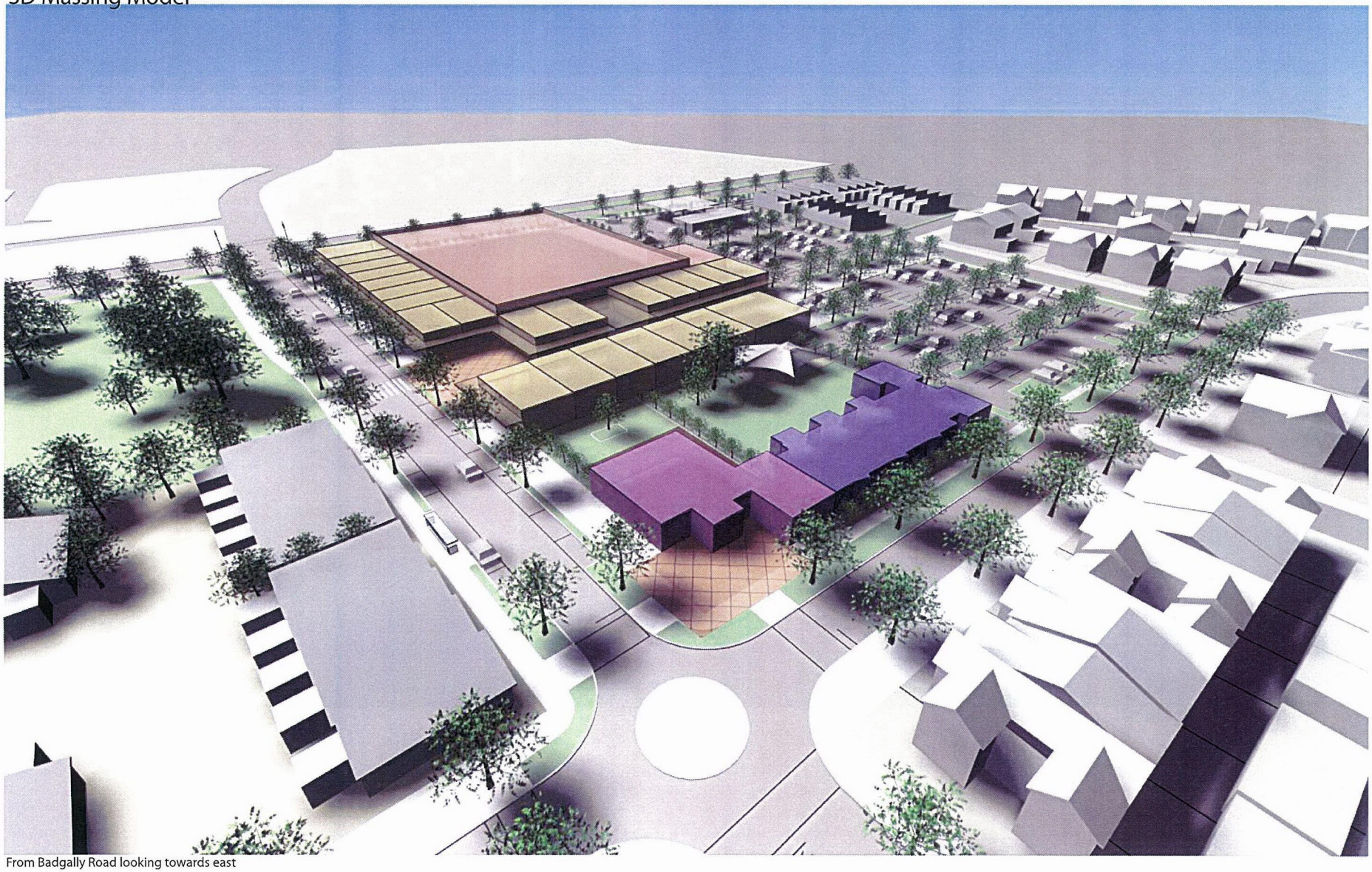


3D Massing Model



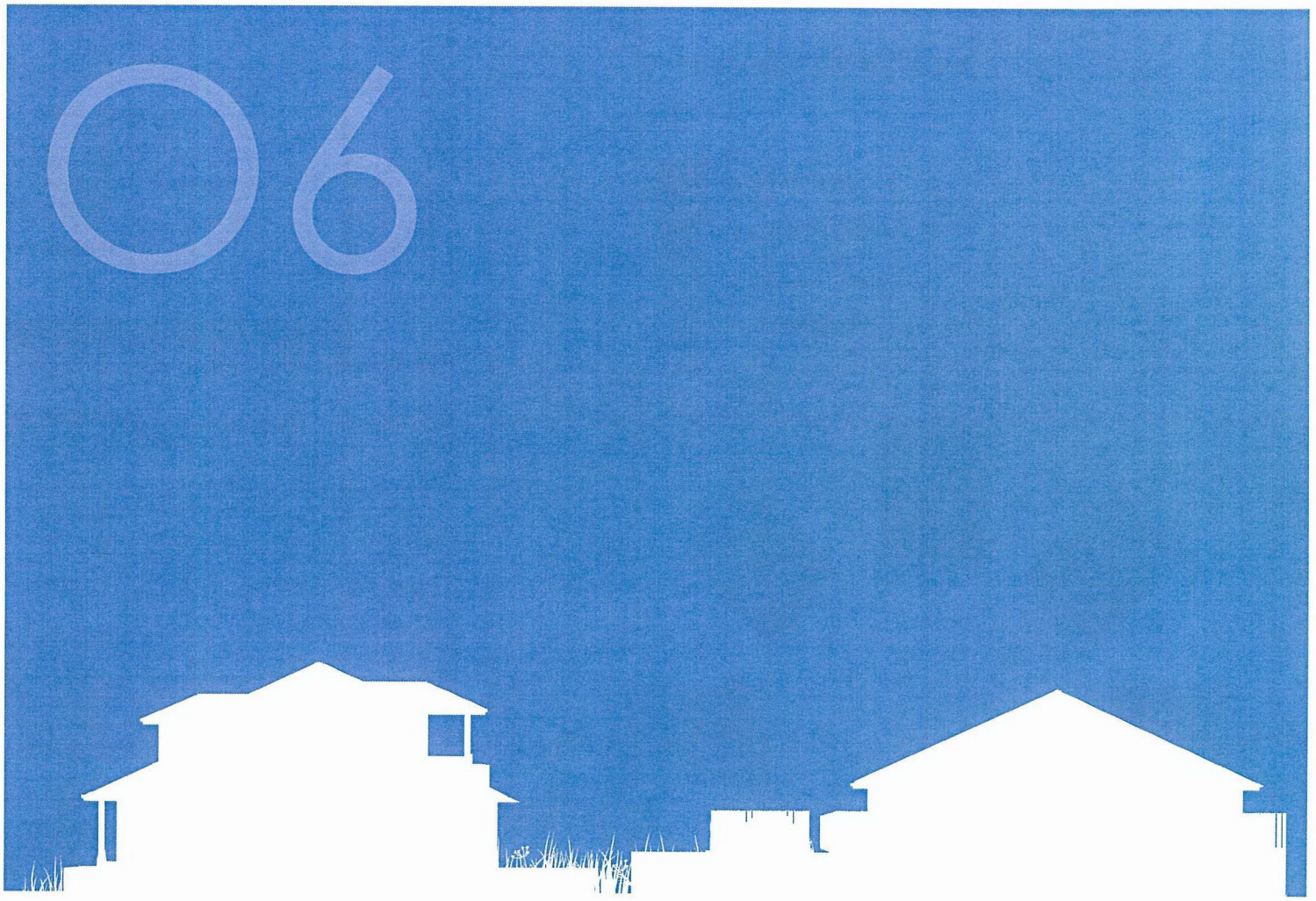
From Badgally Road looking towards north

3D Massing Model



From Badgally Road looking towards east

06



Dwelling Envelope and Built Form Controls

Dwelling Envelope Controls

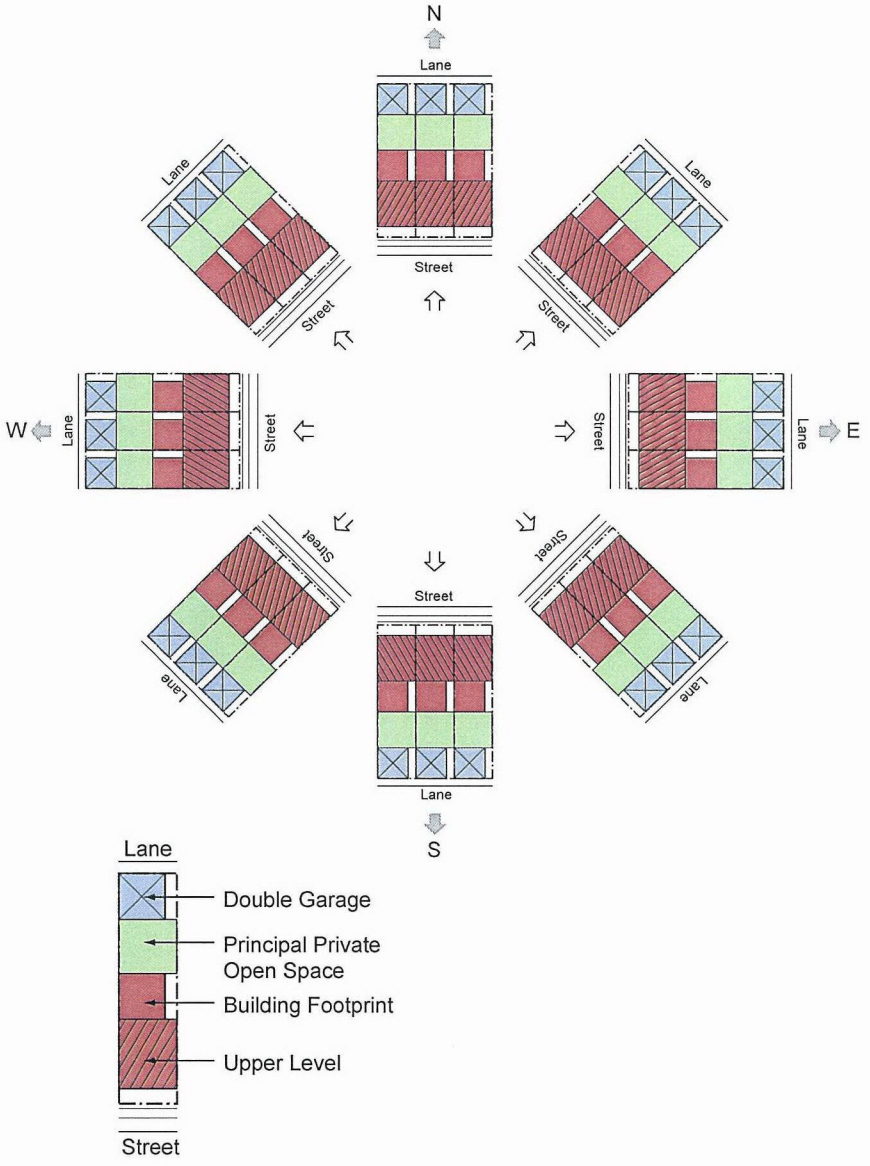
The following Envelope Controls have been developed to provide high quality urban design outcomes. Side setbacks have been standardised at ground and upper levels to reduce construction cost and promote affordable products. Where sloping land creates added complexity the lot layouts will be determined considering environmental, social and economic impacts (eg. sloping lots - garages to be situated on the low side). Built form diagrams for standard lot types (6m, 8m, 10m, 11m, 13m and 15m) indicate the preferred location for the dwelling element based on orientation and street location.

Dwelling Development Criteria

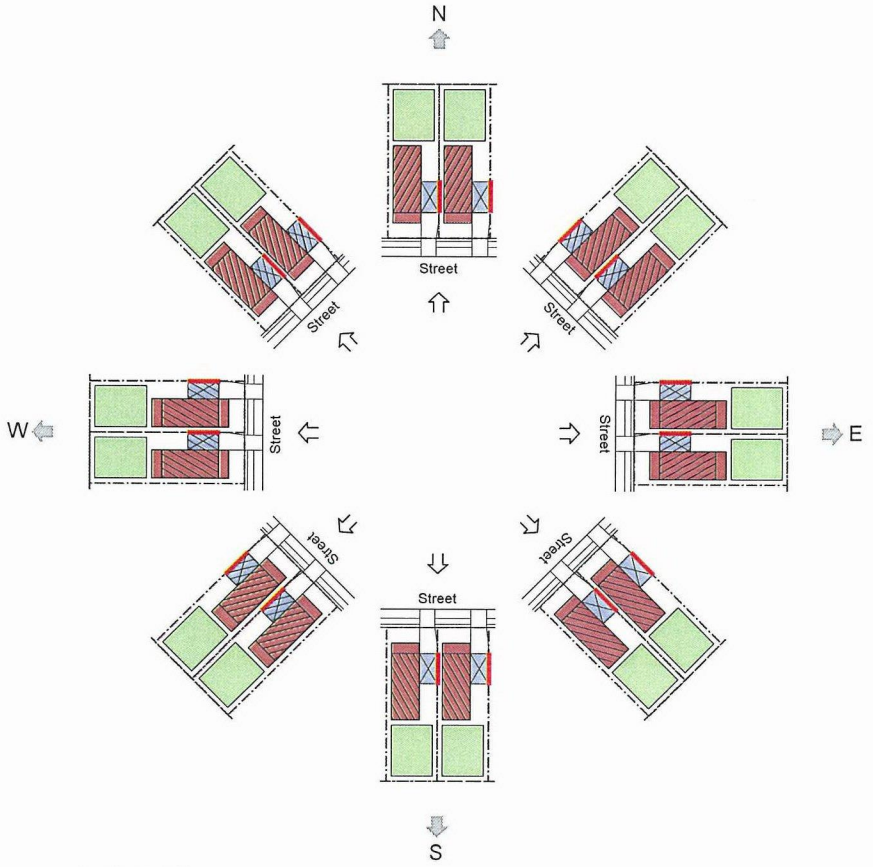
Item	Lot Size	200-250m^2	250-300m^2	300-450m^2	450-600m^2	600-900m2
1	Maximum site coverage	70%	65%	60%	55%	55%
2	Primary street setback	3.0m	3.0m	4.0m	4.0m	4.0m
3	Secondary street setback	1.0m	1.0m	2.0m	2.0m	2.0m
4	Rear boundary setback	1.0m for rear access garage	1.0m for rear garage or 3.0m where no garage	3.0m	4.0m	4.0m
5	Side setbacks	refer Item 6	refer Item 6	0.9m	0.9m	0.9m
6	Built to boundary (zero lot line walls)	Lot width 6-8m: both sides Lot width 8-10m: one side and 0.9m other		n/a	n/a	n/a
7	Maximum length of zero lot line walls	66% of the lot depth		n/a	n/a	n/a
8	Garage setback	1.0m for rear access garage or 5.5m to primary street		5.5m	5.5m	5.5m
9	Garage dominance	Rear access garage (6.0m max door width) or single garage only to primary street		Garage door not wider than 50% of the total dwelling width		
10	Principal private open space area (directly accessible to living room)	16 square metres (provision of 4m x 4m square)		24 square metres (provision of 6m x 4m rectangle)		
11	Maximum building height	9.5m				
12	Maximum floor area for detached studio on laneway	45 square metres (not to be separately titled)		n/a		

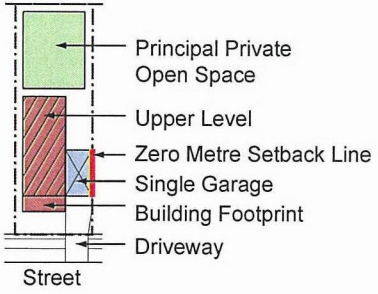
All built form to comply with the following additional criteria:

* Contemporary architectural design
* A maximum roof pitch of 36 degrees
* Provision of eaves up to 450mm (except on zero lot line or parapet walls)
* A minimum of 1 enclosed car space per dwelling
* Garage to be setback a minimum of 1m behind the front building line
* Location of all services and bin storage areas behind the front building line out of public view
* Submission of a landscaping plan, also incorporating required fencing
* Submission of shadow diagrams for all 2 storey dwellings.

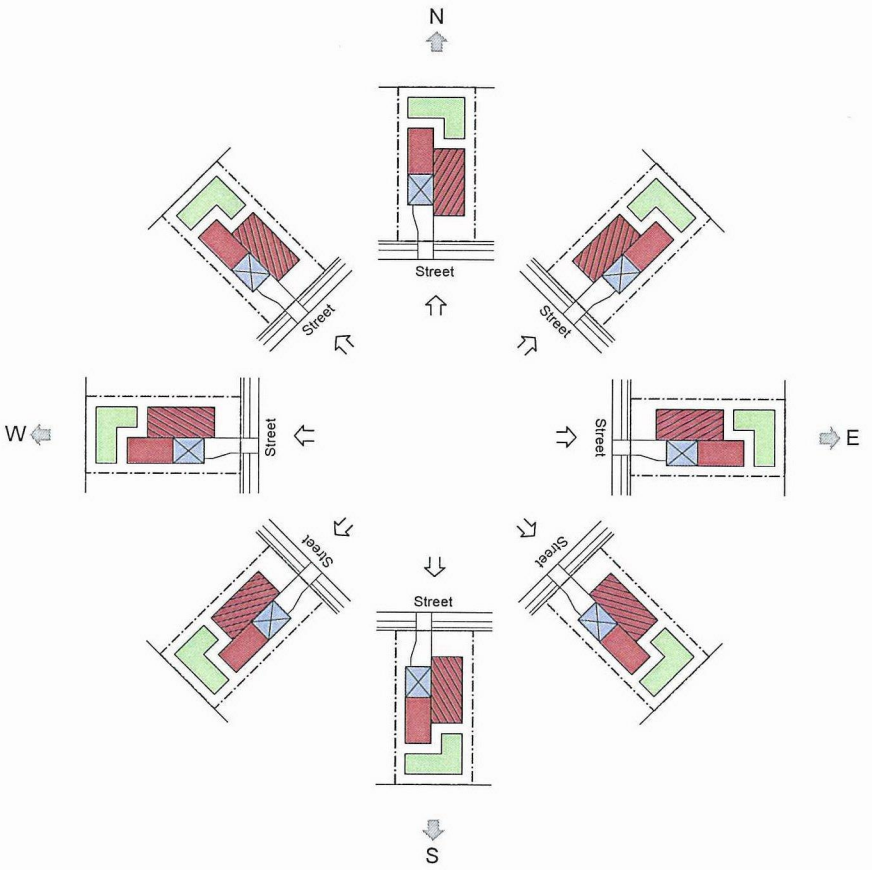


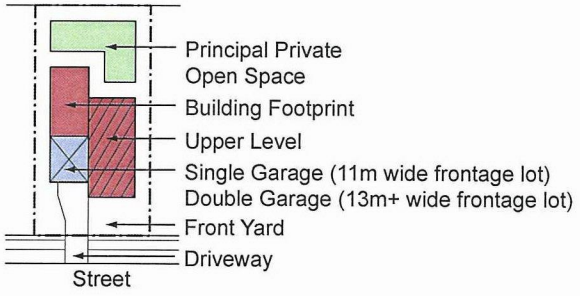
6m-8m wide frontage lot





8m-10m wide frontage lot
(zero metre setback on one side)





11m+ wide frontage lot

Typical housing mix and shadow study

The diagrams indicate potential subdivision of blocks with a mix of the standard housing products.

The shadow diagrams demonstrate that all building types will receive 3 hours for sun light to the rear yards (private open space) during mid winter.

DESIGN OBJECTIVES

- Provide diverse housing mix ranging from 6m to 15m wide frontages
- Ensure adequate solar access to private open space areas
- Larger lots front Entry Road, Collectors and Dobell Road
- Smaller lots front open space areas and local streets
- Setbacks based on Landcom Built Form Guidelines
- Provide rear lane access to end-lots fronting parks and local retail centre

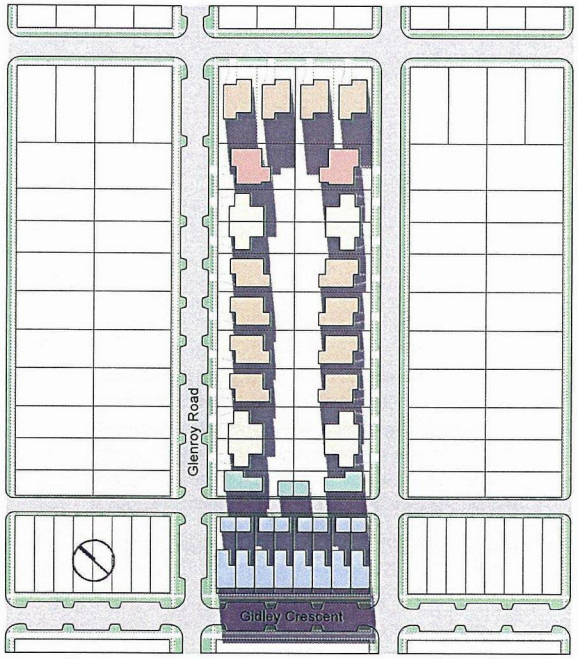
Terrace (6x30m)
Zero Lot Dwelling (8x30m)
Zero Lot Dwelling (10x30m)
Detached Dwelling (11,13x30m)
Detached Dwelling (15+x30m)

9am 21 June

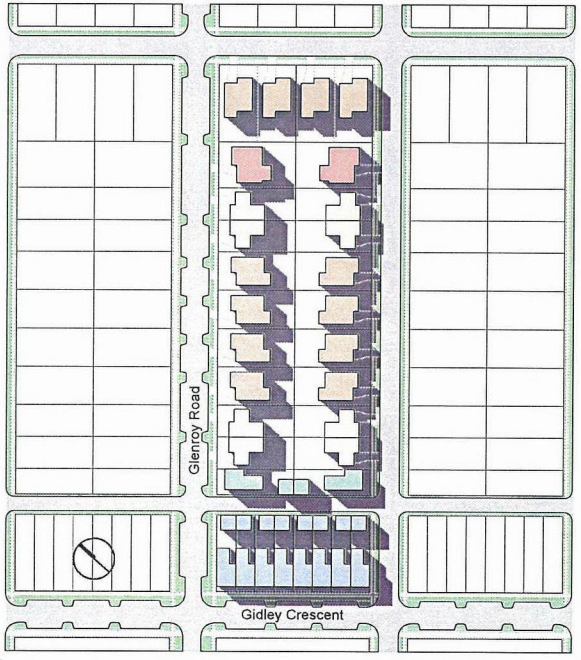
12pm 21 June

3pm 21 June

Terrace (6x30m)
Zero Lot Dwelling (8x30m)
Duplex Dwelling (10x30m)
Detached Dwelling (11,13x30m)
Detached Dwelling (15+x30m)



9am 21 June



12pm 21 June

3pm 21 June

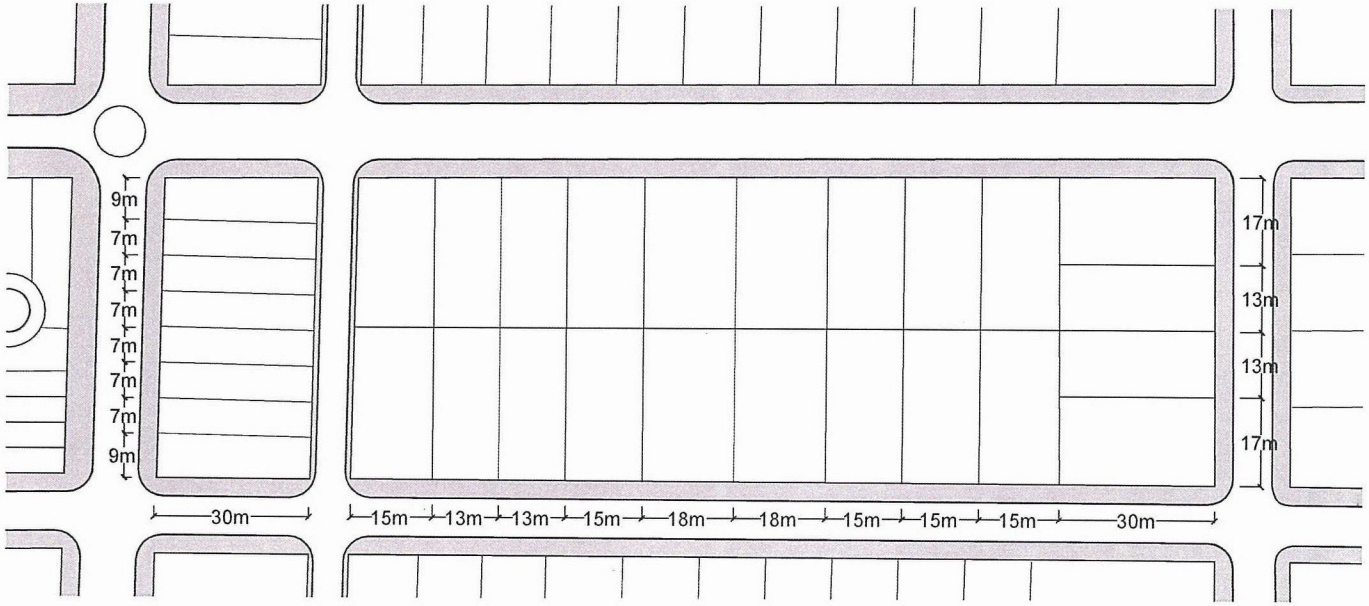
Subdivision Lot Orientation Principles

Lot orientation and configuration is to be generally consistent with the subdivision principles shown in the following diagram. The preferred lot orientation is either on a north-south or east-west orientation. Where other amenities such as views and outlook over open space are available, an alternative lot orientation can be considered.

Lot Frontage Variation Principles

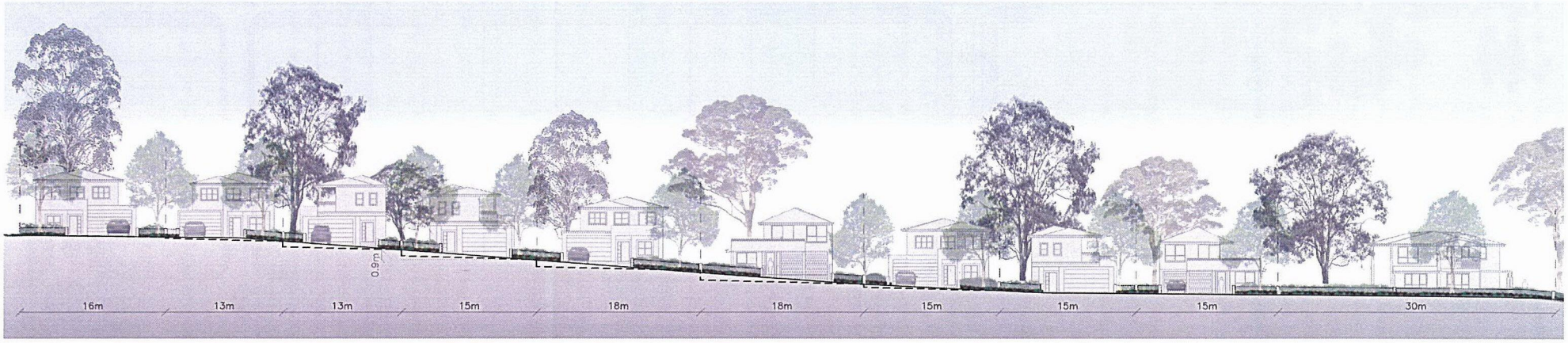
A diverse range of lot types and frontages will be provided in each street. The repetition of lots with the same frontage along a street is to be avoided. For lots

13m wide and above, no more than three in a row should have the same frontage. The minimum change in lot width shall be 2m.

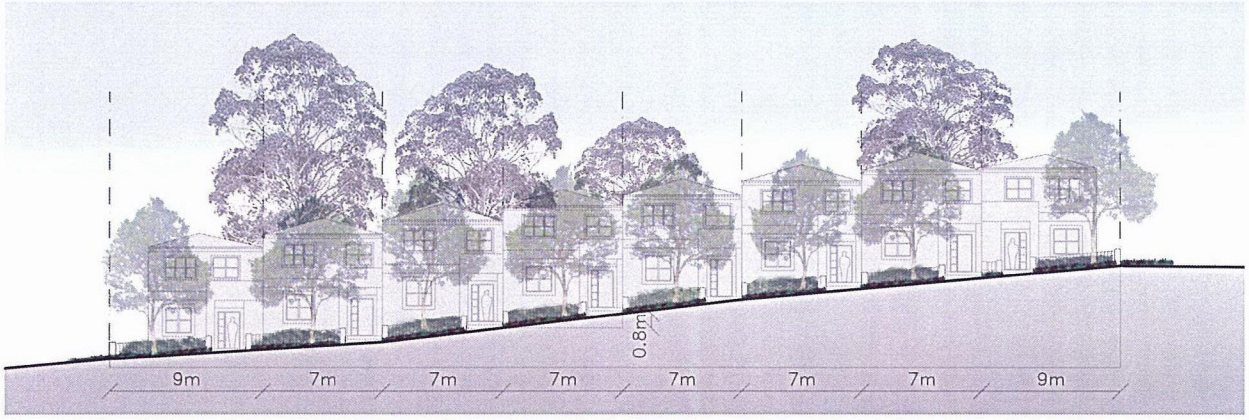


A diverse range of lot types will be provided in each street

Streetscapes



A diverse range of lot types and frontages will be provided in each street. The dashed line above illustrates stepping within property boundary.



Maximum stepping height from adjoining lot is less than 2m

3D Massing Model

- 7m wide frontage lot
- 9m wide frontage lot
- 10-11m wide frontage lot
- 13m wide frontage lot
- 15+m wide frontage lot

3D Massing Model

3D Massing Model

7m wide frontage lot
9m wide frontage lot
10-11m wide frontage lot
13m wide frontage lot
15+m wide frontage lot

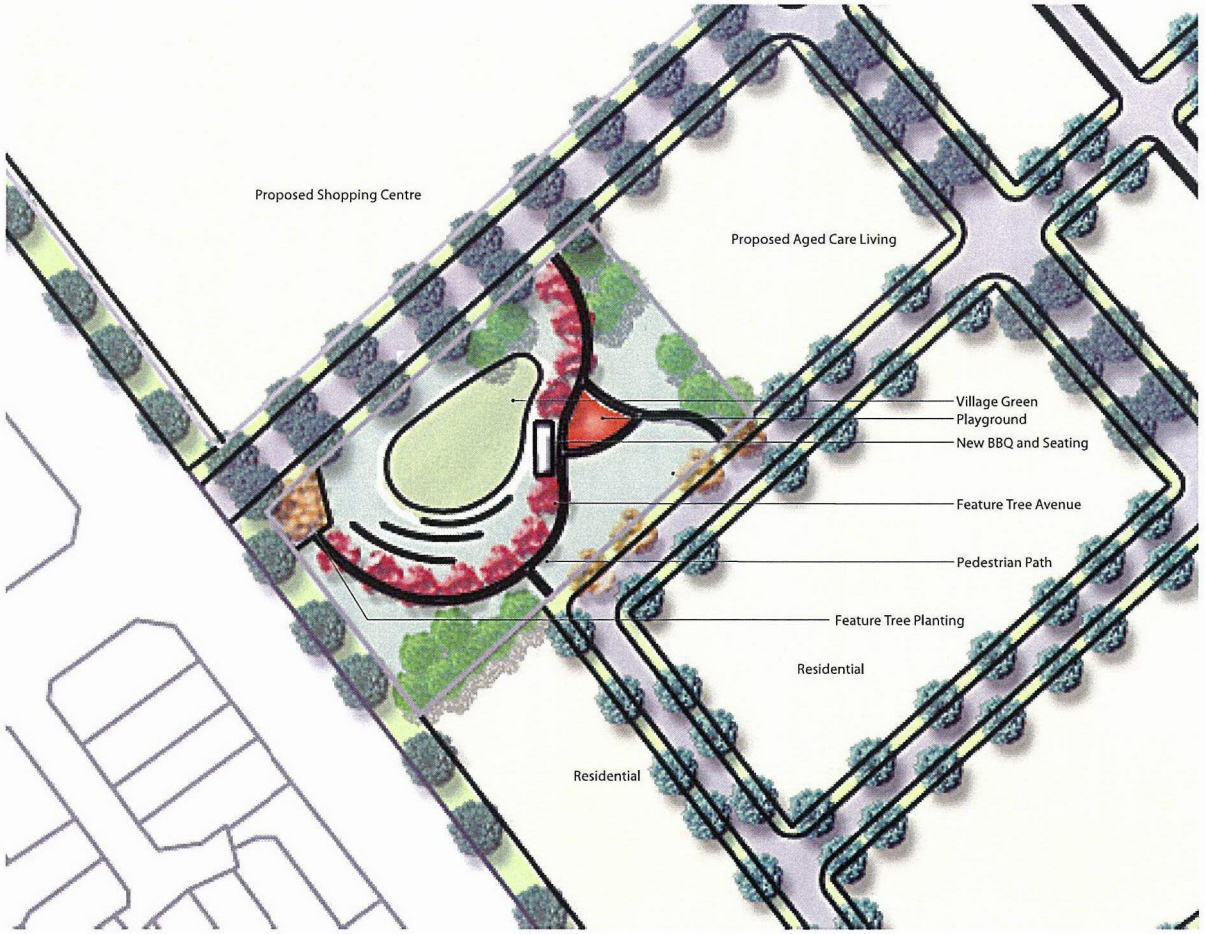
07

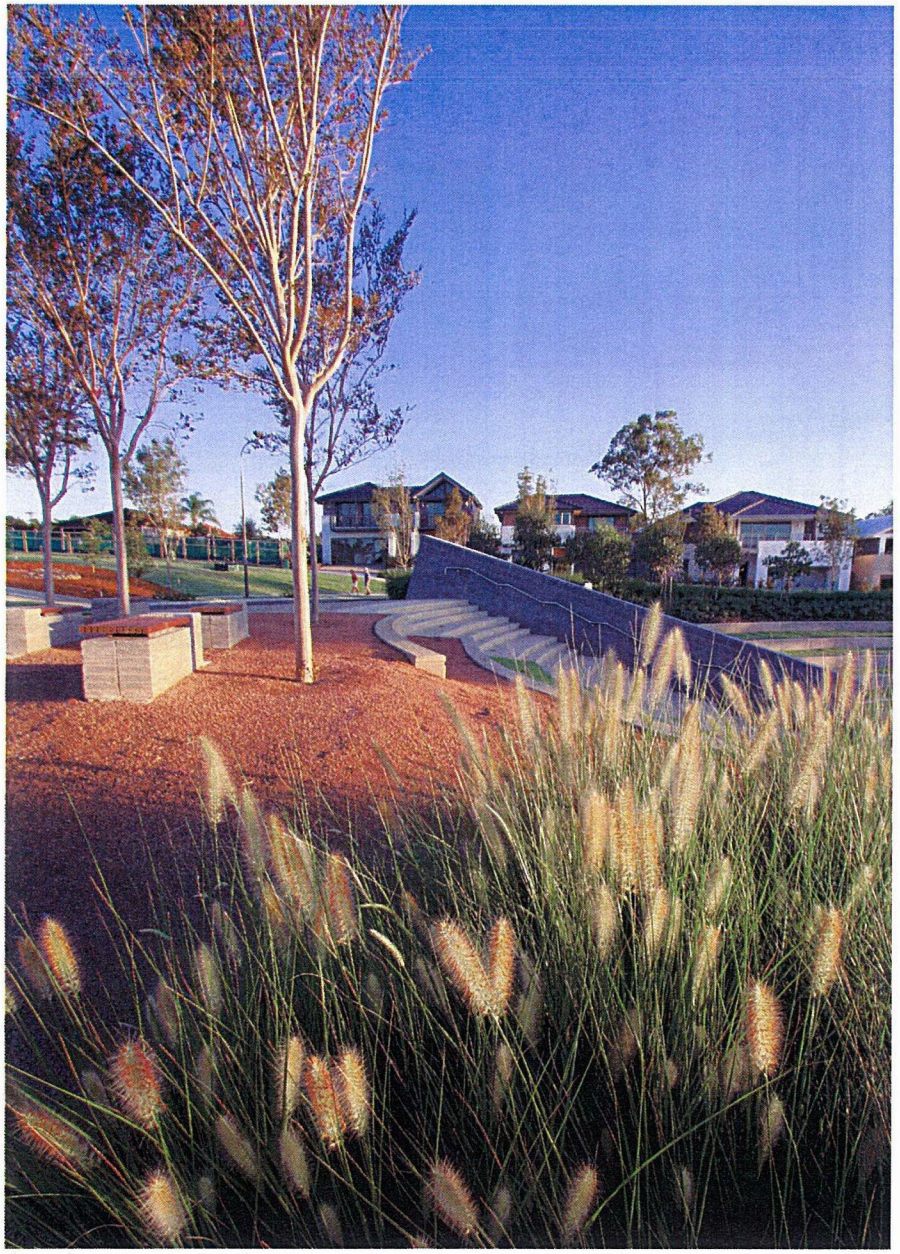
Park and Open Space Plans

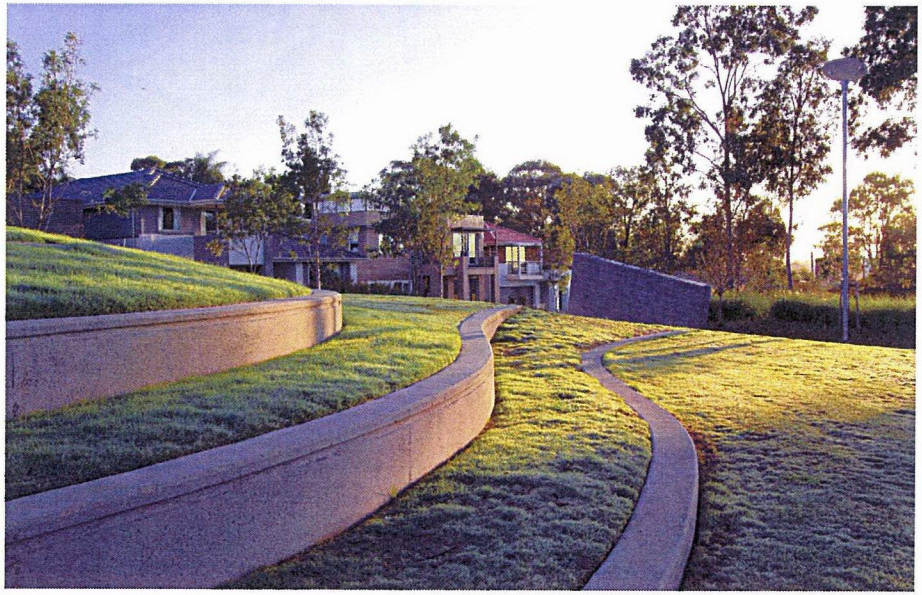
Badgally Reserve

DESIGN OBJECTIVES

- Key Entry Statement and focal point for the estate
- Adjoins the new retail centre
- Provide good pedestrian connections across the park and link to signalised intersection
- Provides small play equipment areas near to adjoining seniors living
- Provide strong visual interest and inviting park space with good solar access
- Use slopes for informal seating areas





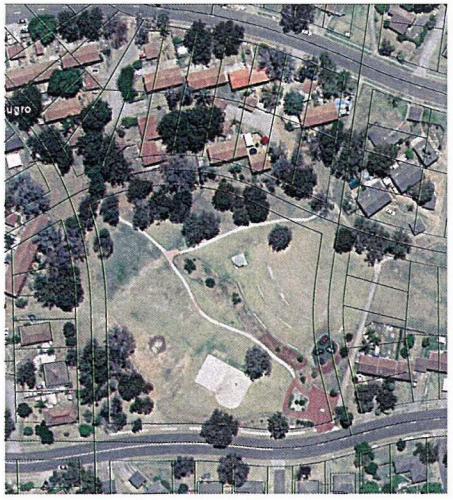


Character Images (Georges Fair, Design by AECOM)

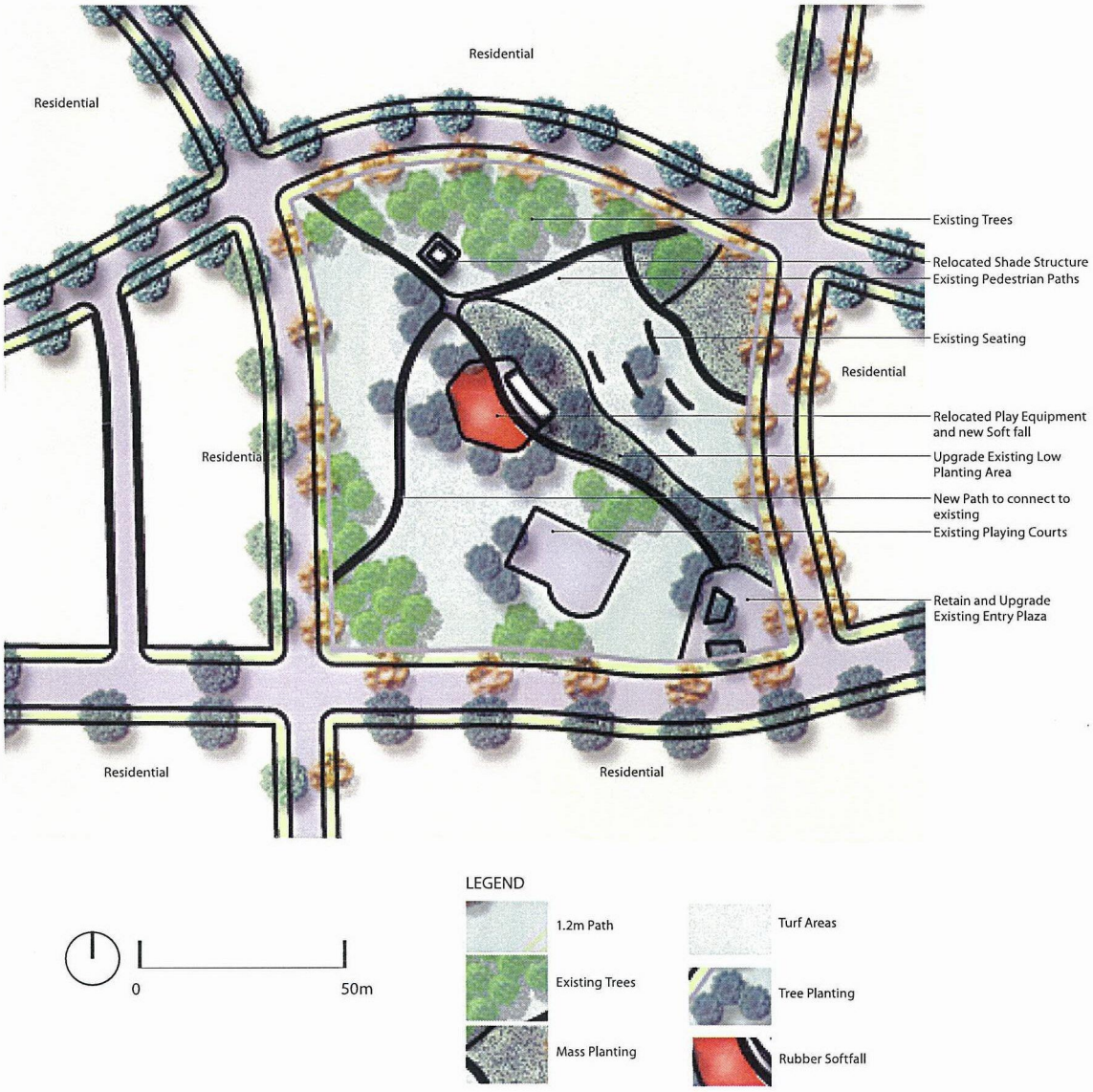
Dimeny Park

DESIGN OBJECTIVES

- Retain much of the park infrastructure and facilities in place - move play equipment and reinstate at more central location in park
- Retain culturally significant items within the park - relocate only if necessary due to new road alignments
- Retain tree planting and built upon this structure with embellished low planting and some additional tree planting
- Use colourful foliage and a balanced mixture of tree species to provide seasonal interest
- Maintain good sight lines and CPTED principles



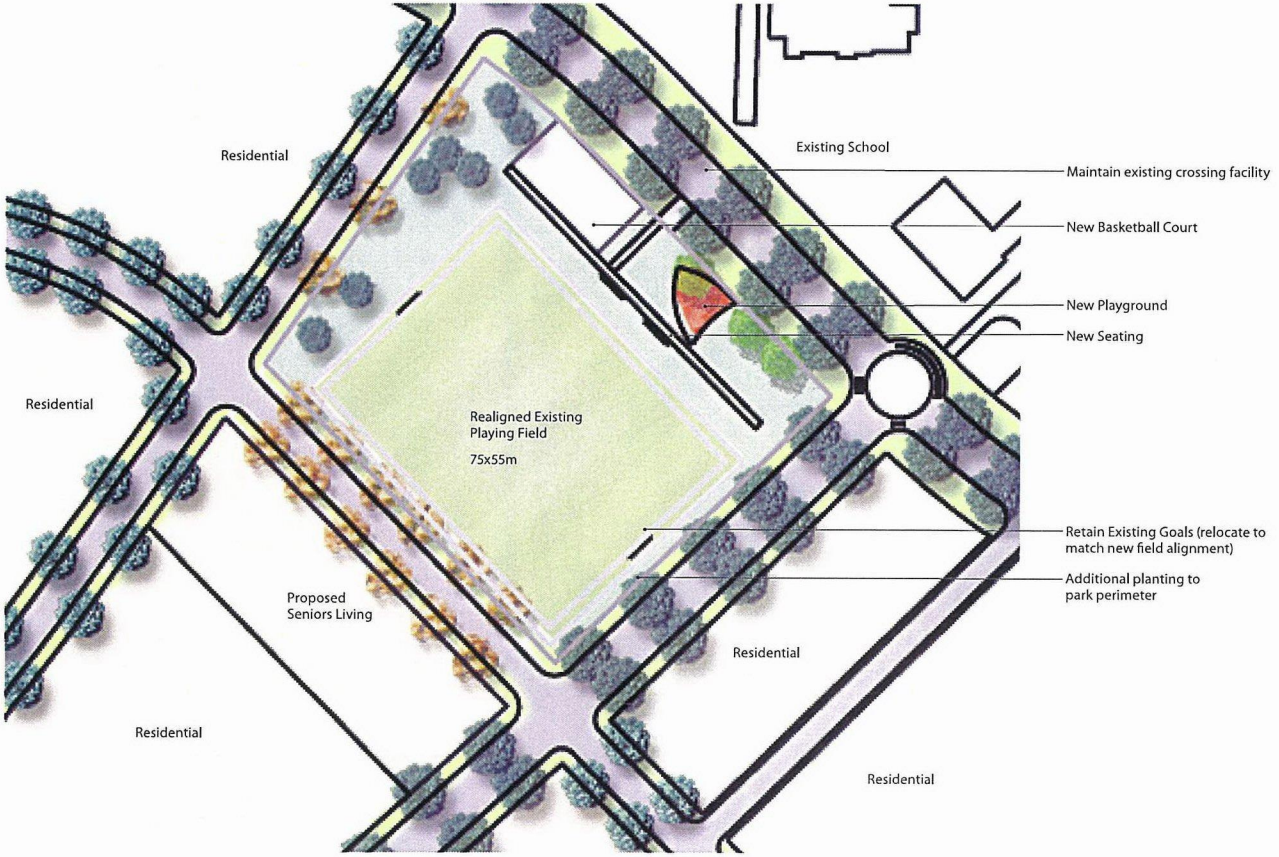
Proposed road layout overlaid existing aerial photo

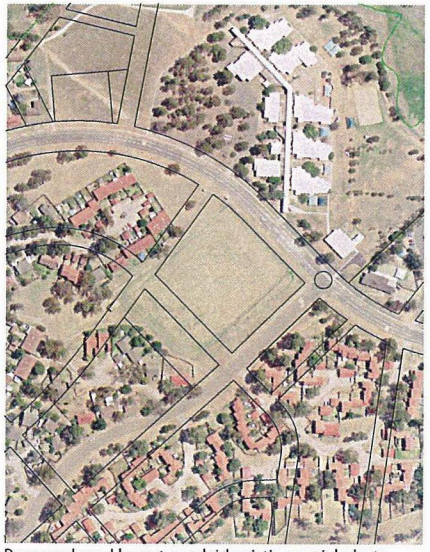


Davis Park

DESIGN OBJECTIVES

- Realign playing field to suit new road alignment
- Retain pedestrian crossing link to school
- Remove existing structures
- Use level change on eastern side to provide informal seating
- Integrate the edge of the park with the surrounding streetscape





Proposed road layout overlaid existing aerial photo

Fullwood Reserve - Sports Field Upgrade

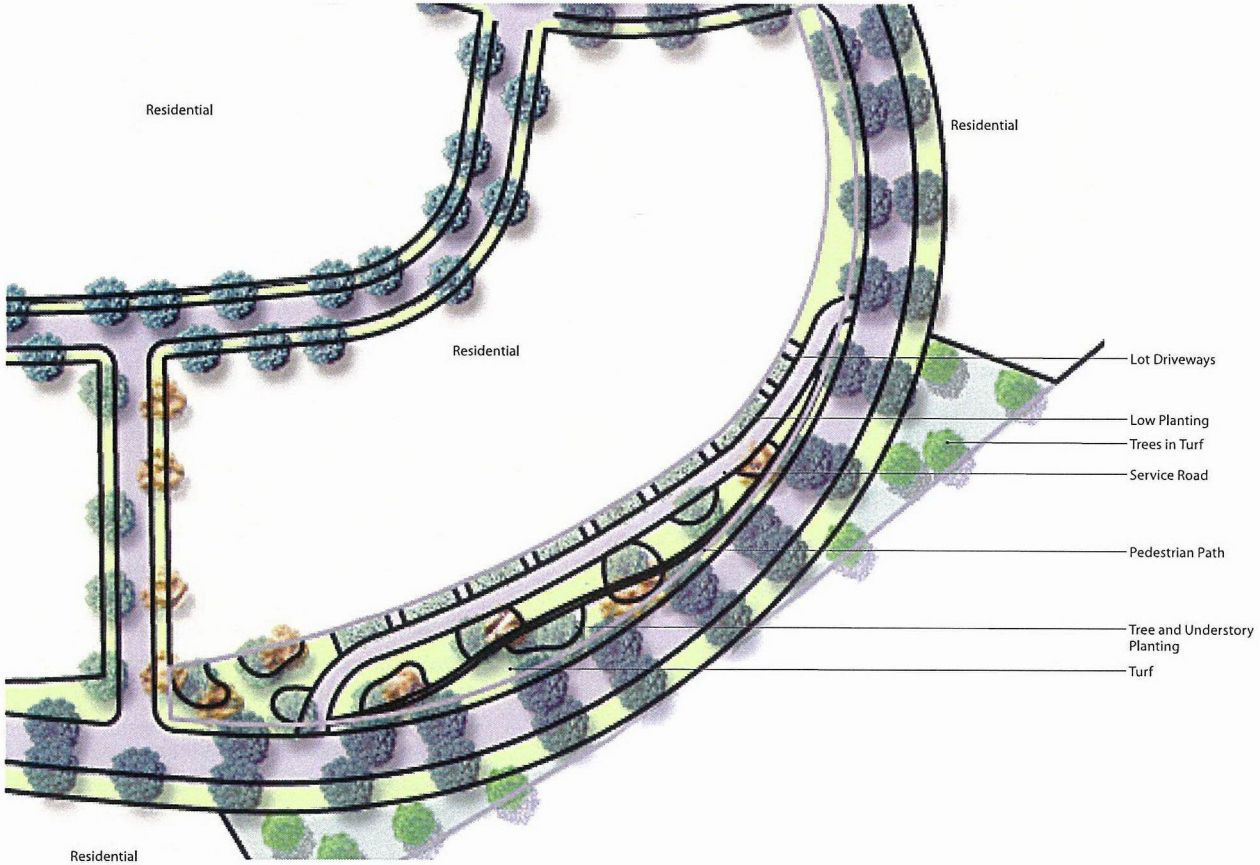
DESIGN OBJECTIVES

- Upgrade the existing facilities (eg. off-street parking, spectator viewing areas)
- 2 formalised playing fields with 1 semi-formal warm-up area
- Retain existing Brifen fencing and lighting to the sports fields.
- Integrate pedestrian pathways into network
- Existing structures to be assessed at detailed design stage.

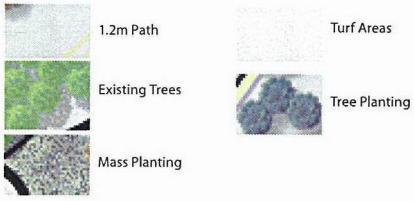
Dobell Road Setback Area

DESIGN OBJECTIVES

- This landscape reinforces the generous setbacks near the Badgally Road entrance and Heritage building grounds
- Principally it is to provide access lane to driveways to lot frontages that are setback from Dobell Road
- The visual character is to create an open park-like landscape with highlights of low planting
- Pedestrian path can take advantage of the additional setback and not be so close to the road



LEGEND



Linear Park Corridor (Brady Park and Fullwood Reserve)

DESIGN PRINCIPLES

- 5 ha. of Cumberland Plain and River Flat Forest Offset Areas (additional 2.1 ha. off site for a total of 7.1 ha.)
- Retain existing pathways where possible and augment with new
- Maintenance of mown grass to provide clear lines of sight on pathway systems and rear of back fences
- Flood conveyance areas - small isolated stands of trees with no understorey
- Infiltration swale planted with native grasses
- 1:1 flood areas planted with water tolerant species

Legend

- CORRIDOR BOUNDARY
- 1:100 FLOOD AREA
- PARKLAND OUTSIDE 1:100 AREA
- 1:1 FLOOD AREA
- FLOOD CONVEYANCE AREA
- INFILTRATION SWALE AREA
- CUMBERLAND PLAIN WOODLAND
- RIVER FLAT FOREST
- PEDESTRIAN / CYCLE PATHWAYS
- CONTOURS (0.5M)
- EXISTING TREES RETAINED
- VIEW CORRDIORS


BOYD STREET
FAIRWEATHER PL
LEIGH CR
GOULD ROAD
Fullwood
Reserve
FULLWOOD PL

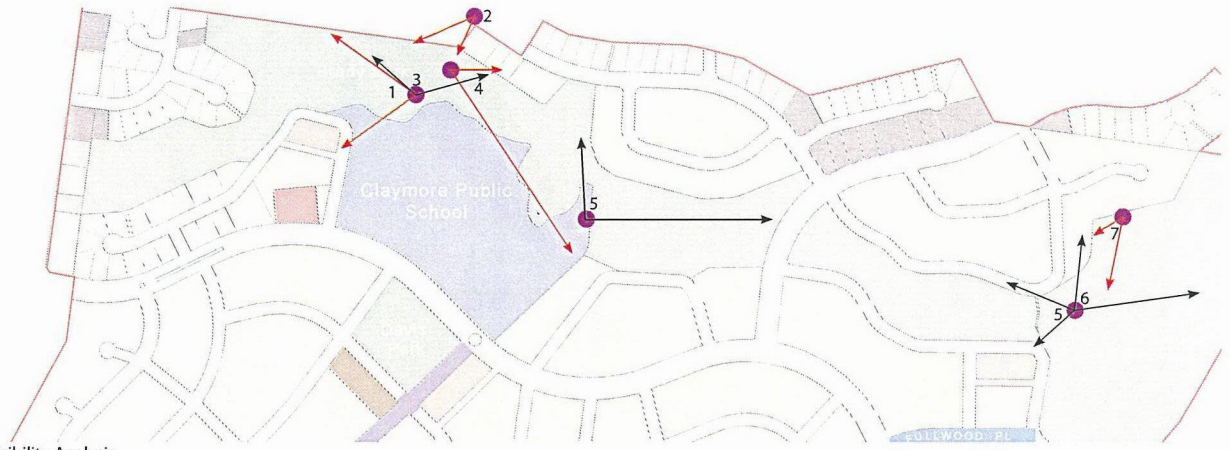
Linear Park Corridor (Brady Park and Fullwood Reserve)

VISIBILITY ANALYSIS

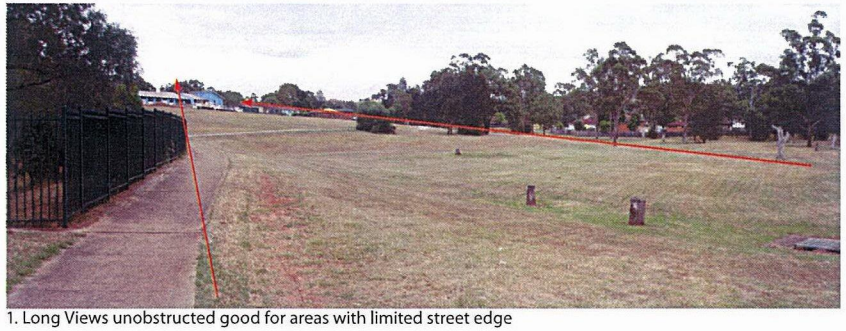
- Passive surveillance is a key CPTED principle and has the highest potential on pathways and road edges to the park, lowest at back fences and at the creek centreline where the landform obscures views
- Pathways and road edges have the highest visibility and passive surveillance opportunity
- High-level tree canopies offer great backdrops for views within the park (and good for screening back fences) while maintaining good visibility at ground level
- Low-level planting (>1M, <3M clearance) should be avoided in the drainage invert as landform also obscures views in these locations

LEGEND:

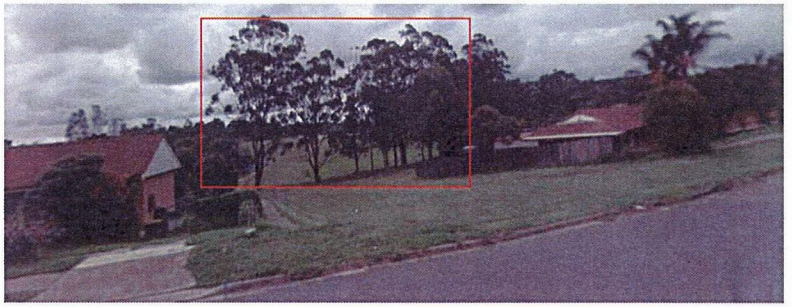
Photo key



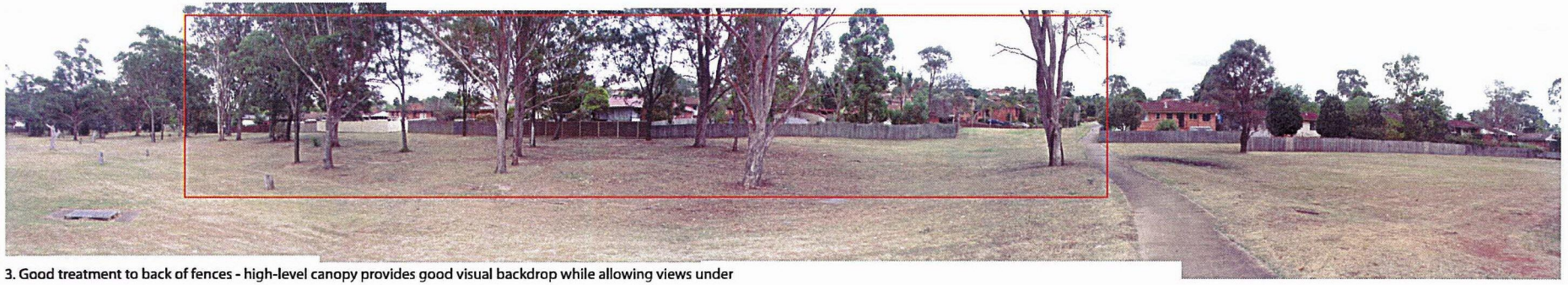
Visibility Analysis



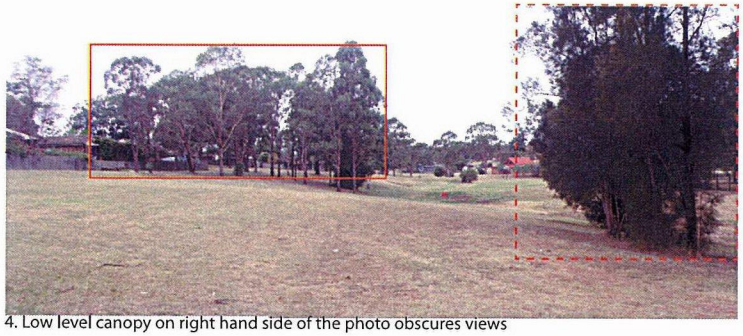
1. Long Views unobstructed good for areas with limited street edge



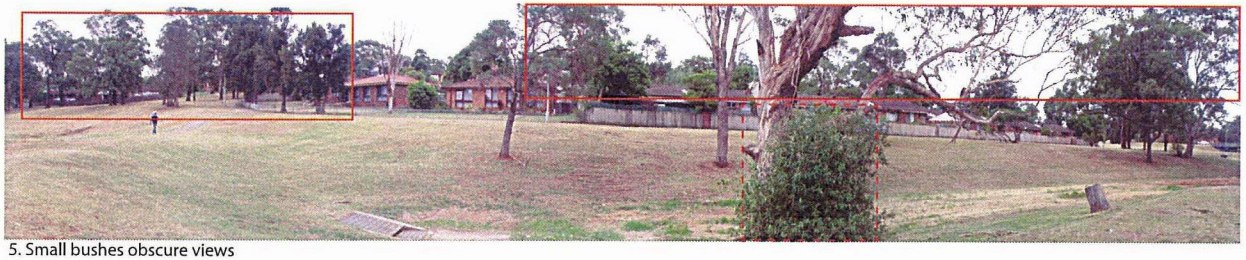
2. Views into the park from streets important - note high-level tree canopy allows views under



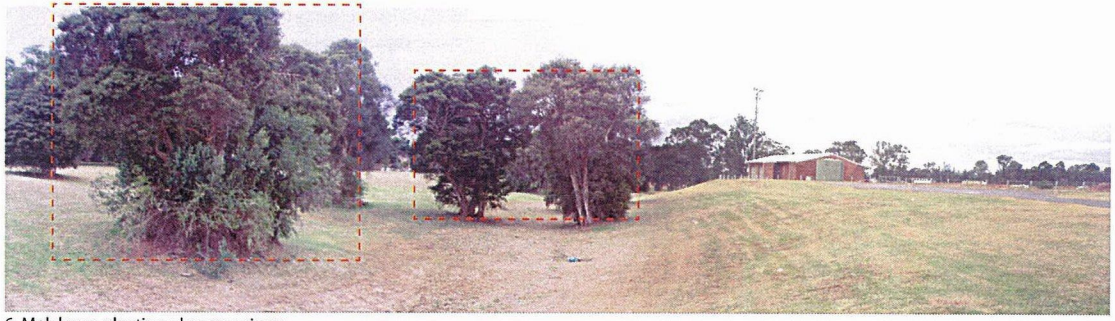
3. Good treatment to back of fences - high-level canopy provides good visual backdrop while allowing views under



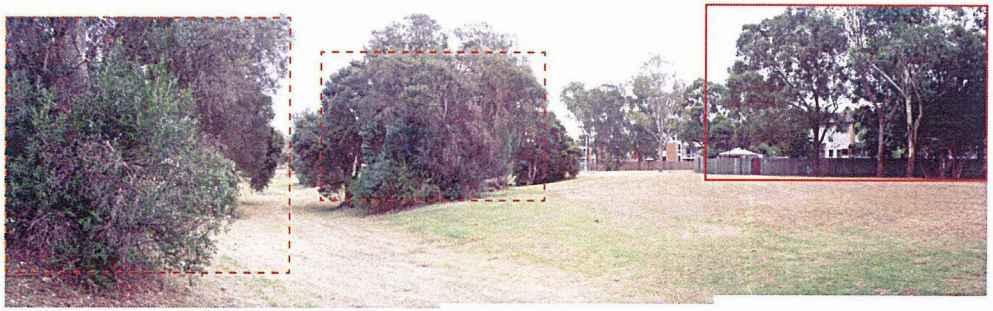
4. Low level canopy on right hand side of the photo obscures views



5. Small bushes obscure views



6. Melaleuca planting obscures views



7. Melaleuca planting obscures views to the left in the photo - high-level canopy on the right provides a good backdrop to rear fences will maintaining views underneath

KEY

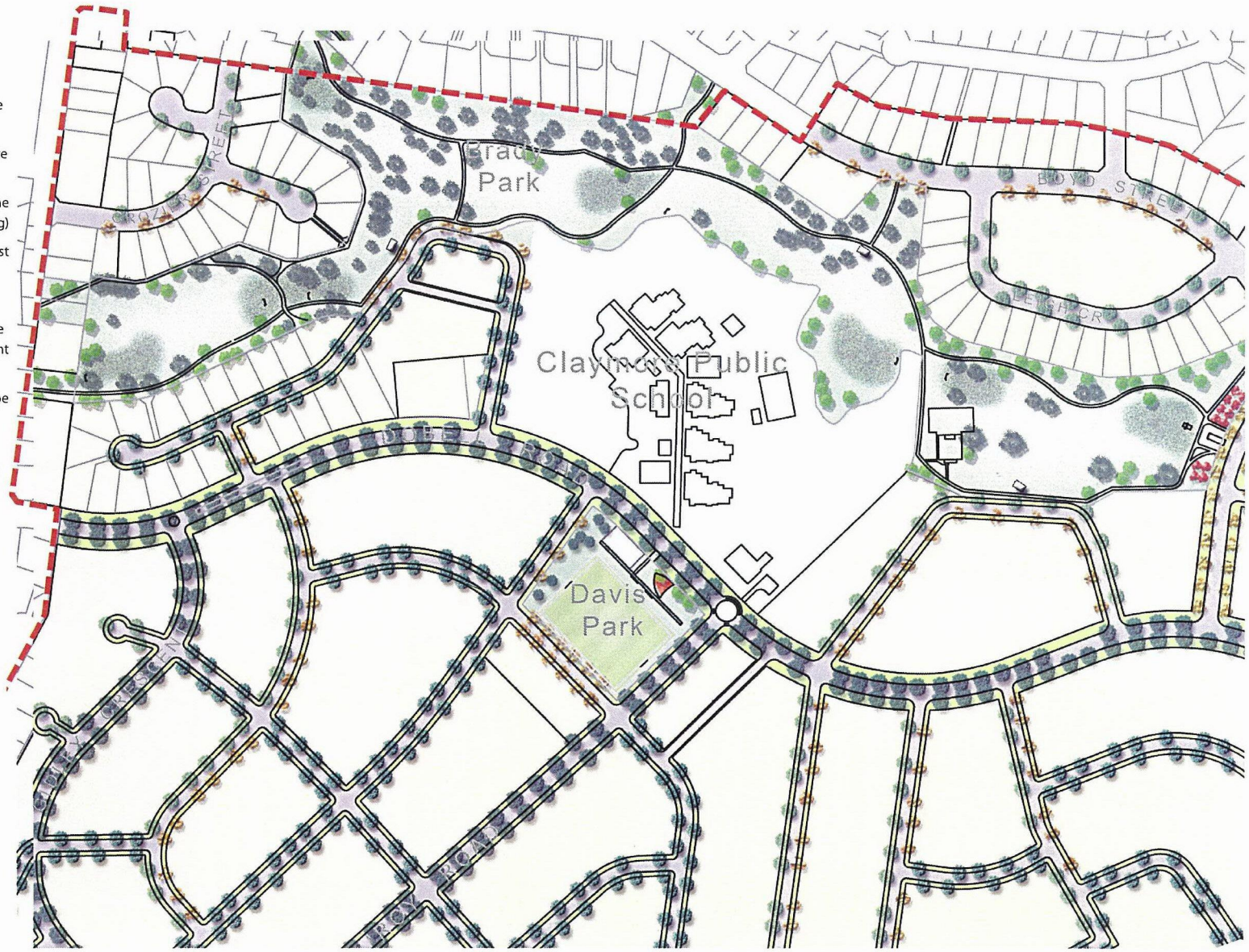
High-level canopy with good visibility underneath

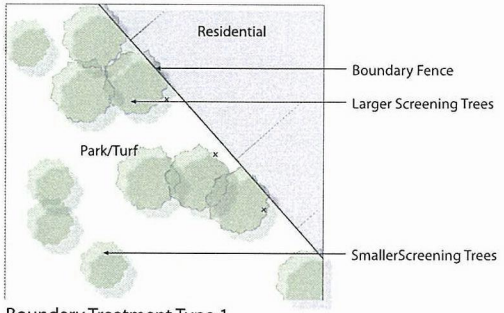
Low level canopy obstructing views

Linear Park Corridor (Brady Park and Fullwood Reserve)

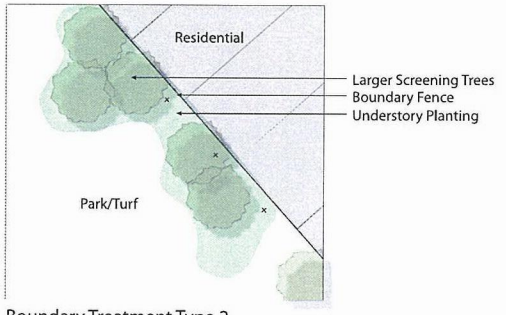
DESIGN OBJECTIVES

- Provide accessible pedestrian paths linking across the corridor and along the length
- Where possible retain existing pathways and integrate these into the new network
- Focus embellishment at entry points and links across the corridor (eg. rest stops, lighting, additional tree planting)
- Retain Cumberland Plain woodland and River Flat Forest tree species as priority
- Retain basin areas and culverts
- Ensure ground-water dependant River Flat Forest tree species are not adversely impacted by the development
- Enhance Fullwood Reserve with upgraded parking facilities, spectator seating areas and general landscape embellishments to create an attractive and inviting active recreation area
- Provide a variety of approaches to the rear boundary fences for lots that back onto the parkland
- Provide good visual permeability and CPTED design principles - refer visibility analysis

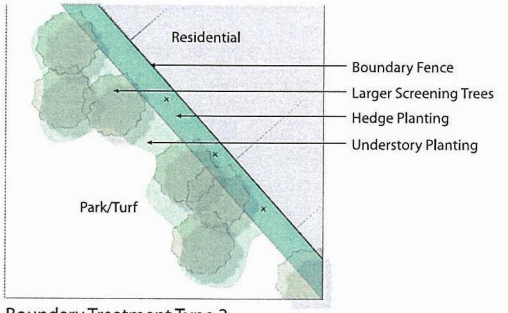




Boundary Treatment Type 1

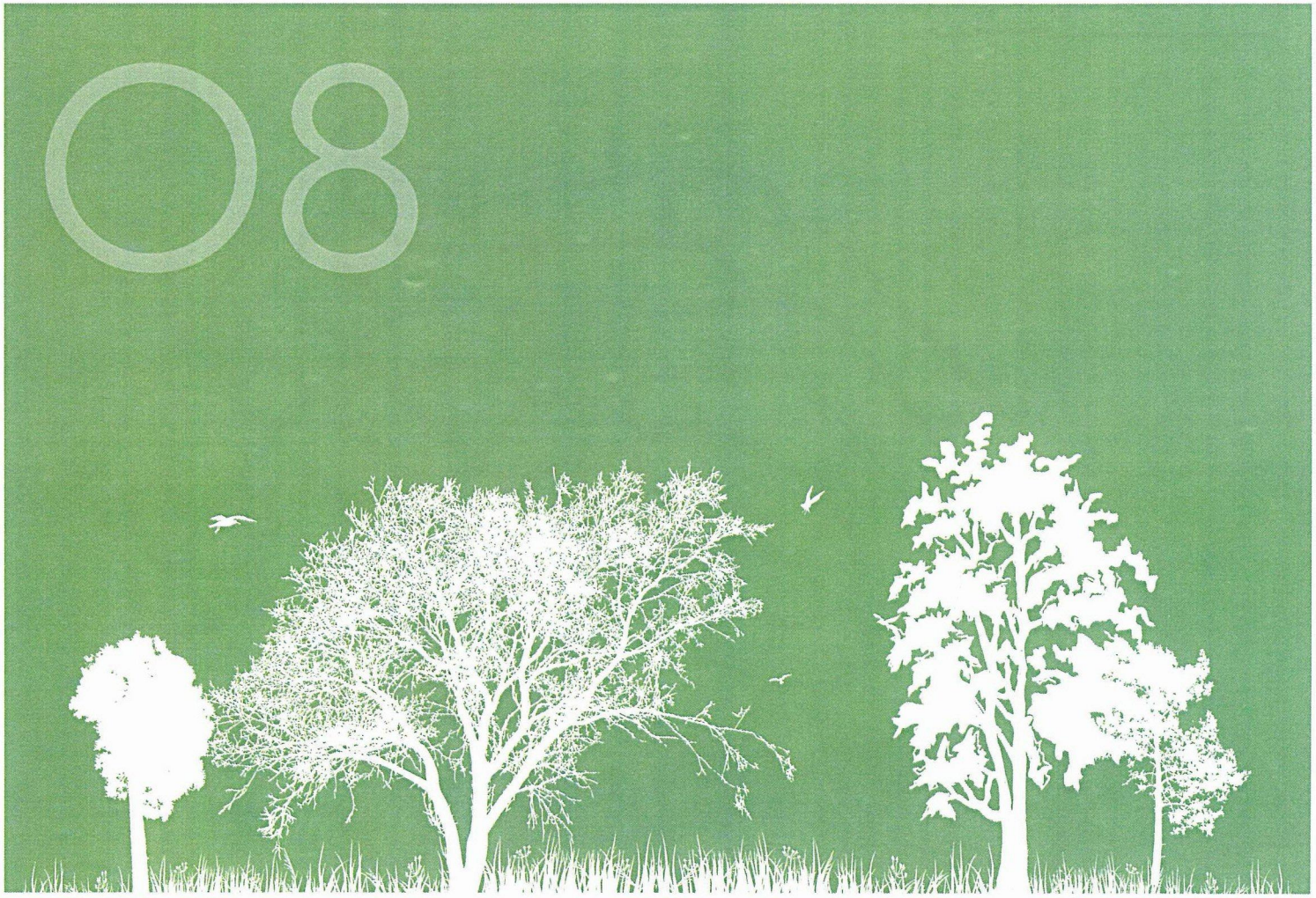


Boundary Treatment Type 2



Boundary Treatment Type 3

Edge Treatments to rear of lots fronting open space

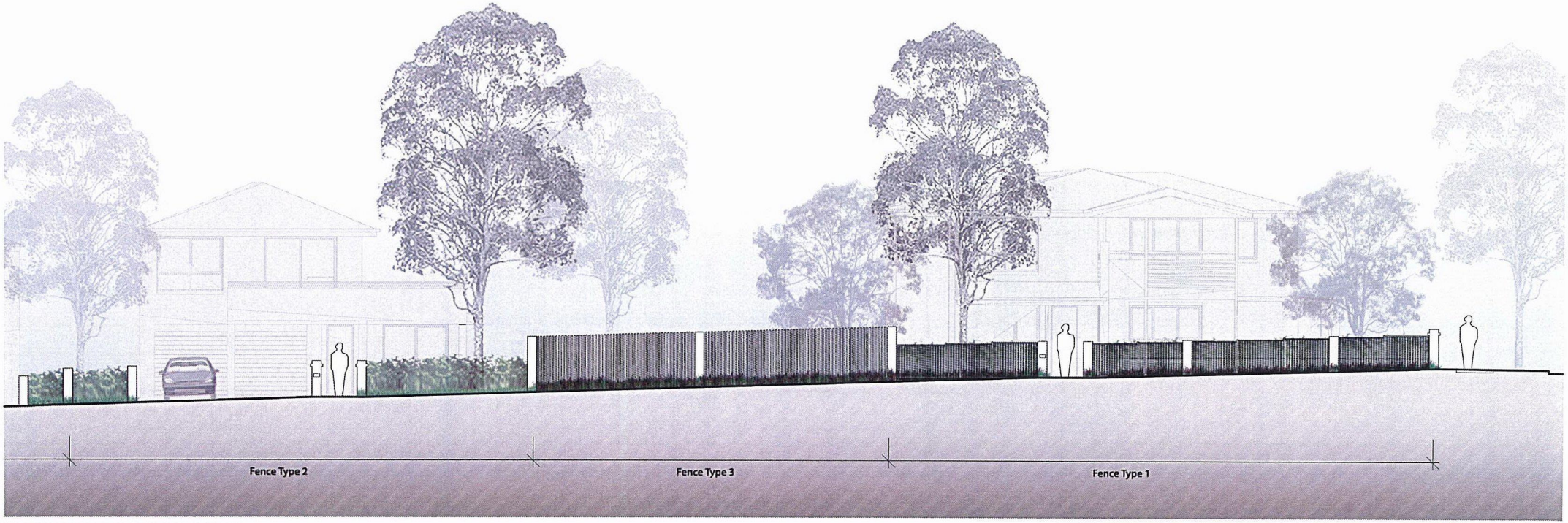


Fence Strategy

Fencing Strategy

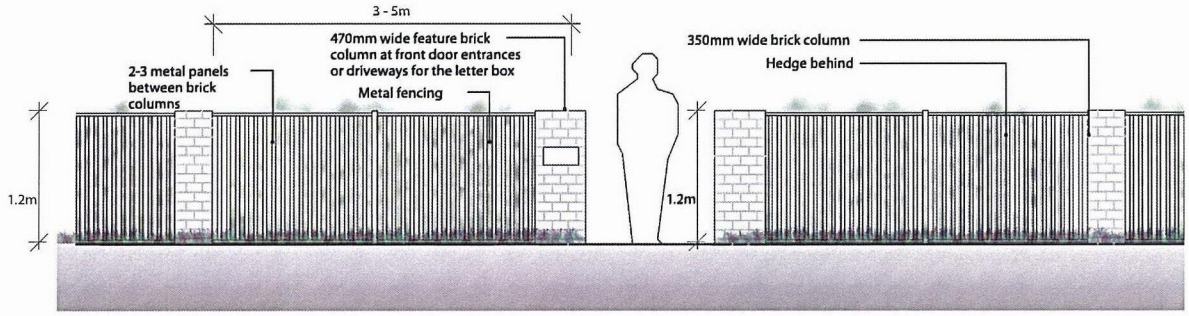
DESIGN OBJECTIVES

- Front fences are to reinforce the overall public domain and provide good street address
- Maintain good sightlines and passive surveillance while giving some level of privacy through visual separation of the street to the front yard.
- Corner lots need additional treatment to provide good street address
- Fence types need to respond to the topography
- Fence materials and composition to reinforce street hierarchy
- Refer Fence Types for more details
- Side and rear fences will be treated timber 1.8m high (lapped and capped). On side fences these are to terminate 2m from the house frontage with a full-height brick pier

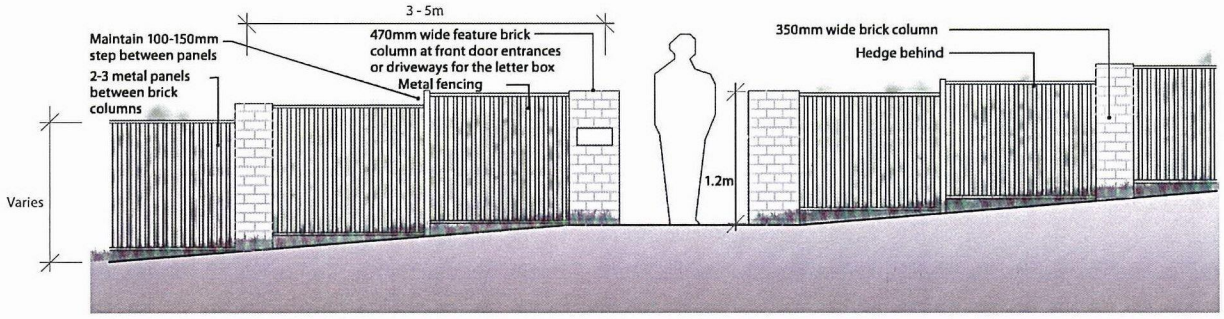


TYPICAL STREET ELEVATION - ENTRY ROAD

Fence Types

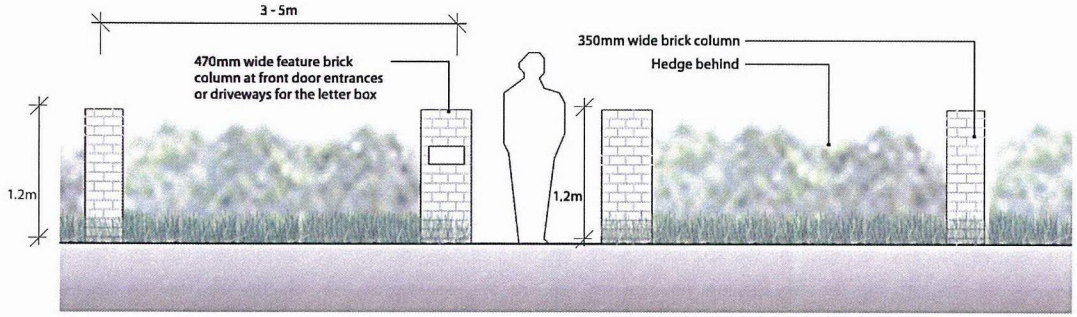


TYPICAL FENCE ELEVATION ON FLAT GRADE

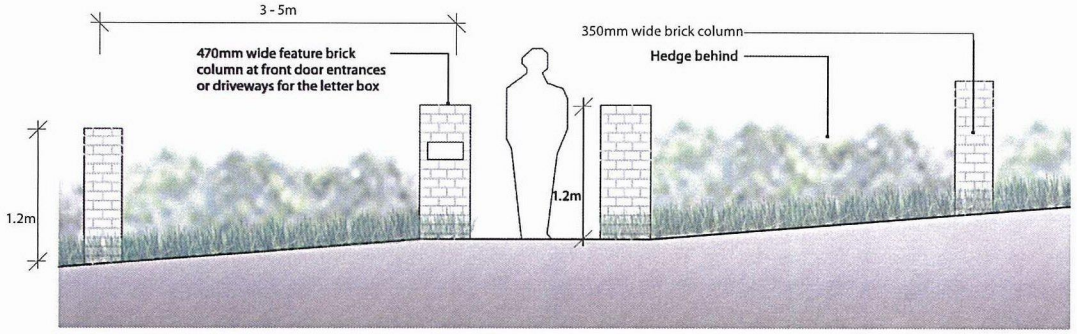


TYPICAL FENCE ELEVATION ON SLOPE

Fence Type 1 - Entry Road and Dobell Road

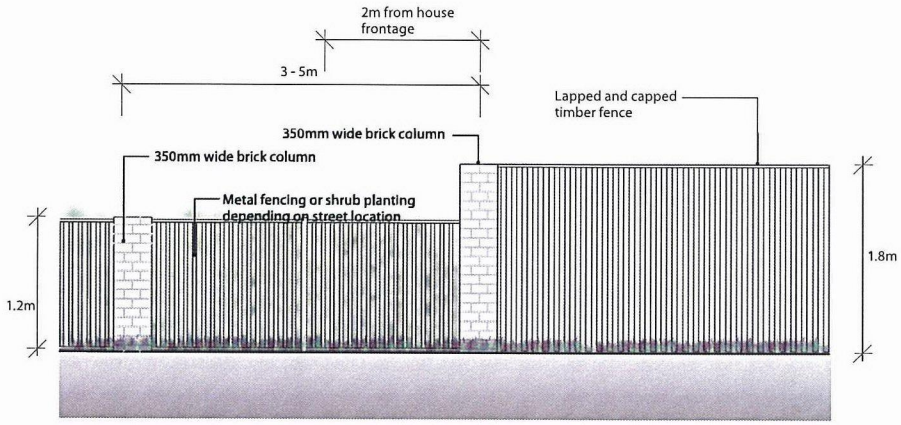


TYPICAL FENCE ELEVATION ON FLAT GRADE

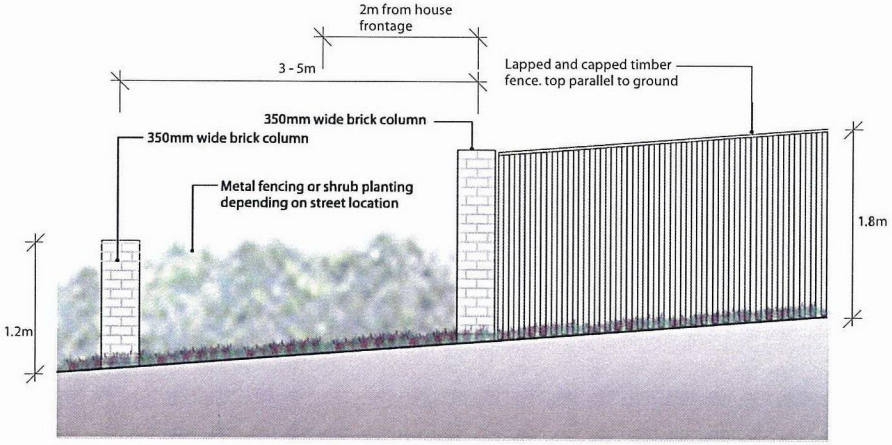


TYPICAL FENCE ELEVATION ON SLOPE

Fence Type 2 - Local Streets



TYPICAL FENCE ELEVATION ON FLAT GRADE



TYPICAL FENCE ELEVATION ON SLOPE

Fence Type 3 - side fences for corner lots

09

Planting Pallette

Planting Pallette - Entry Road and around Hill Tops

Botanical Name	Common Name	Height (m)	Spread (m)	Pot Size	Notes:	Uses
Trees						
Angophora floribunda	Rough-bark Apple	20	5		Endemic to Cumberland Plain	ST
Brachychiton populneus	Kurrajong	15	4		Endemic to Cumberland Plain	ST/YT
Corymbia maculata	Spotted Gum	25	5	100L	Endemic to Cumberland Plain	ST/YT
Corymbia maculata	Spotted Gum	25	5	500L	Endemic to Cumberland Plain	ST/YT
Elaeocarpus eumundii	Eumundii Quandong	10	6	100L		YT
Elaeocarpus reticulatus	Blue Berry Ash	9	4	100L		ST/YT
Eucalyptus crebra	Narrow-leaved Ironbark	30	6		Endemic to Cumberland Plain	ST
Eucalyptus eugenioides	Thin-leaved Stringybark	25	4		Endemic to Cumberland Plain	ST
Eucalyptus fibrosa	Broad-leafe Ironbark	30	6		Endemic to Cumberland Plain	ST
Eucalyptus moluccana	Grey Box	24	5		Endemic to Cumberland Plain	ST
Eucalyptus longifolia	Woollybutt	25	5		Endemic to Cumberland Plain	ST
Eucalyptus tereticornis	Forest Red Gum	35	7	500L	Endemic to Cumberland Plain	ST
Eycalyptus sideroxylon	Red Ironbark	25	5		Endemic to Cumberland Plain	ST
Fraxinus griffithii	Flowering ash	6	4	100L		YT
Magnolia grandiflora 'Exmouth'	Magnolia Exmouth	8	3	100L		ST
Magnolia grandiflora 'Little Gem'	Magnolia Little Gem	4	2	100L		YT
Pittosporum tarata	Lemonwood Tarata	8	5	45L		YT
Tristaniopsis laurina 'Elite'	Water Gum	8	5	500L		YT
Syzygium australe 'Select Form'	Brush Cherry Select	8	4	100L		YT
Syzygium australe 'Hunchy'	Brush Cherry Hunchy	3	1	100L		YT
Ulmus parvifolia 'Burnley Select'	Chinese Elm	12	5	100L		ST/YT
Waterhousia floribunda	Weeping Lilly Pilly	13	4	100L		ST
Shurbs						
Acacia decurrens	Black Wattle, Green Wattle	10			Endemic to Cumberland Plain	
Acacia falcata	Falcate Wattle	3			Endemic to Cumberland Plain	
Acacia floribunda	White Sallow Wattle	4 to 5			Endemic to Cumberland Plain	
Acacia longifolia subsp. longifolia	Sydney Green Wattle	3 to 4			Endemic to Cumberland Plain	
Acacia parramattensis	Parramatta Green Wattle	8			Endemic to Cumberland Plain	
Acacia ulicifolia	Prickly Moses	1.5			Endemic to Cumberland Plain	
Acmena smithii var. minor	Dwarf Lilly Pilly					
Bursaria spinosa	Sweet Bursiaria	2 to 3			Endemic to Cumberland Plain	
Buxus japonica	Japanese Box	1	0.5	300mm		
Camellia sasanqua	Sasanqua Camellia	2.5	1.5	300mm		
Cordyline baueri 'Red Sensation'	Cordyline Red Sensation	2.5	0.8	300mm		
Cycas revoluta	Sago Palm	1	1			
Doryanthes excelsa	Gymea Lily	2	1.5	300mm		
Duranta repens 'Sheena's Gold'	Sheena's Gold	1	1	300mm		
Duranta repens 'Sheena's Green'	Sheena's Green	1	1	300mm		
Exocarpos cupressiformis	Cherry Ballart	2 to 4	2		Endemic to Cumberland Plain	
Gardenia augusta 'Florida'	Gardenia	1	1	200mm		
Leptospermum patersonii	Lemon-Scented Tea Tree	2	2			
Lissanthe strigosa		0.5	0.5		Endemic to Cumberland Plain	
Metrosideros 'Fiji Fire'	Sping Fire	2	1.5			
Murraya paniculata	Orange Jessamine	3	2	150mm		
Nandina domestica 'Gulf Stream'	Japanese Sacred Bamboo	2.5	1	300mm		
Photinia sp. 'Red Robin'	Phontinia	2.5	1.5	300mm		
Raphiolepis indica	Indian Hawthorn	1	1	300mm		
Strelitzia parvifolia	Bird of Paradise	1	1			
Syzygium australe 'Bush Chirstmas'	Brush Cherry Christmas	2.5	1.5	300mm		
Syzygium australe 'Select Form'	Brush Cherry Select	3.5	2	300mm		
Syzygium australe 'Hunchy'	Brush Cherry Hunchy	2	1	300mm		
Viburnum odoratissimum	Sweet Virburnum	3	2	300mm		
Yucca elaphatides	Spinless Yucca	3	1	150mm		
Grassess/Lillies						
Arthropodium milleflorum	Vanilla Lilies	0.5			Endemic to Cumberland Plain	
Cyperus gracilis	Slender Flat Sedge	0.3			Endemic to Cumberland Plain	
Dianella caerulea 'Breeze'	Flax Lily	0.8	0.5	200mm		
Dianella longifolia	Long Leaved Flax Lily	0.8	0.5		Endemic to Cumberland Plain	
Dianella revoluta	Mauve Flax Lily	1	1		Endemic to Cumberland Plain	
Dichelachne micrantha	Shorthair Plume Grass	0.8	0.6		Endemic to Cumberland Plain	
Liriope gigantea	Evergreen Giant	0.8	0.8	150mm		
Liriope muscari	Liriope	0.6	0.6	150mm		
Lomandra filiformis		0.3	0.1		Endemic to Cumberland Plain	
Lomandra longifolia	Spiny Mat Rush	1	1	150mm		
Lomandra multiflora		0.5	0.2		Endemic to Cumberland Plain	
Phormium tenax 'Purpureum'	Purple Flax	1	1	300mm		
Microlaena stipoides	Weeping Rice Grass	0.5	0.2		Endemic to Cumberland Plain	
Themeda australis	Kangaroo Grass	1	0.8		Endemic to Cumberland Plain	
Groundcovers						
Brachycome angustifolia	Rock Daisy	0.3	0.5			
Convolvulus mauritanicus	Morning Glory	0.3	0.5			
Dichondra repens	Kidney Weed	0.1	0.6		Endemic to Cumberland Plain	
Eremophila debilis	Winter apple	0.2	1		Endemic to Cumberland Plain	
Gazania sp.	Gazania	0.3	0.5			
Goodenia hederacea	Violet-leaved Goodenia	0.2	1		Endemic to Cumberland Plain	
Hibbertia diffusa	Wedge Guinea Flower	0.2	1		Endemic to Cumberland Plain	
Myoporum parvifolium	Creeping Boobialla	0.5	0.5			
Trachelospermum jasminoides	Chinese Star jasmine	0.5	5	200mm		
Viola hederacea	Native Violet	0.2	0.5			
Turf						
Stenotaphrum secundatum 'SS100'	Soft Leaf Buffalo 'Palmetto'			Turf		
Herbs/other						
Hardenbergia violacea	False Sarsaparilla	3	4		Endemic to Cumberland Plain	
Trachelospermum jasminoides	Chinese Star jasmine	3	4	200mm		

ST: Street Tree YT: Yard Tree

Planting Palette - Neighbourhood Streets / Local Parks

Botanical Name	Common Name	Height (m)	Spread (m)	Pot Size	Notes	Uses
Trees						
Agonis flexuosa	Peppermit Tree, Willow Myrtle	9	4.5	100L		ST
Angophora floribunda	Rough-bark Apple	20	5		Endemic to Cumberland Plain	ST/YT
Brachychiton populneus	Kurrajong	15	4		Endemic to Cumberland Plain	ST/YT
Corymbia maculata	Spotted Gum	25	5	100L	Endemic to Cumberland Plain	ST/YT
Corymbia maculata	Spotted Gum	25	5	500L	Endemic to Cumberland Plain	ST/YT
Elaeocarpus eumundii	Eumundii Quandong	10	6	100L		ST
Elaeocarpus reticulatus	Blue Berry Ash	9	4	100L		ST
Eucalyptus crebra	Narrow-leaved Ironbark	30	6		Endemic to Cumberland Plain	ST
Eucalyptus eugenioides	Thin-leaved Stringybark	25	4		Endemic to Cumberland Plain	ST
Eucalyptus fibrosa	Broad-leafe Ironbark	30	6		Endemic to Cumberland Plain	ST
Eucalyptus moluccana	Grey Box	24	5		Endemic to Cumberland Plain	ST
Eucalyptus longifolia	Woollybutt	25	5		Endemic to Cumberland Plain	ST
Eucalyptus tereticornis	Forest Red Gum	35	7	500L	Endemic to Cumberland Plain	St/YT
Eycalyptus sideroxylon	Red Ironbark	25	5		Endemic to Cumberland Plain	YT
Magnolia grandiflora 'Exmouth'	Magnolia Exmouth	8	3	100L		YT
Magnolia grandiflora 'Little Gem'	Magnolia Little Gem	4	2	100L		
Tristaniopsis laurina 'Elite'	Water Gum	8	5	500L		
Syzygium australe 'Select Form'	Brush Cherry Select	8	4	100L		
Syzygium australe 'Hunchy'	Brush Cherry Hunchy	3	1	100L		
Ulmus parvifolia 'Burnley Select'	Chinese Elm	12	5	100L		
Waterhousia floribunda	Weeping Lilly Pilly	13	4	100L		
Shrubs						
Acmena smithii var. minor	Dwarf Lilly Pilly					
Anigozanthus flavidus	Kangaroo Paw	1.2	0.5	200mm		
Bursaria spinosa	Sweet Bursiaria	2.5	1.5		Endemic to Cumberland Plain	
Buxus japonica	Japanese Box	1	0.5	300mm		
Cordyline baueri 'Red Sensation'	Cordyline Red Sensation	2.5	0.8	300mm		
Cycas revoluta	Sago Palm	1	1			
Doryanthes excelsa	Gymea Lily	2	1.5	300mm		
Duranta repens 'Sheena's Gold'	Sheena's Gold	1	1	300mm		
Duranta repens 'Sheena's Green'	Sheena's Green	1	1	300mm		
Exocarpos cupressiformis	Cherry Ballart	3	2		Endemic to Cumberland Plain	
Gardenia augusta 'Florida'	Gardenia	1	1	200mm		
Lissanthe strigosa		0.5	0.5		Endemic to Cumberland Plain	
Leptospermum patersonii	Lemon-Scented Tea Tree	2	2			
Metrosideros 'Fiji Fire'	Sping Fire	2	1.5			
Murraya paniculata	Orange Jessamine	3	2	150mm		
Nandina domestica 'Gulf Stream'	Japanese Sacred Bamboo	2.5	1	300mm		
Photinia sp. 'Red Robin'	Phontinia	2.5	1.5	300mm		
Raphiolepis indica	Indian Hawthorn	1	1	300mm		
Syzygium australe 'Bush Chirstmas'	Brush Cherry Christmas	2.5	1.5	300mm		
Syzygium australe 'Select Form'	Brush Cherry Select	3.5	2	300mm		
Syzygium australe 'Hunchy'	Brush Cherry Hunchy	2	1	300mm		
Viburnum odoratissimum	Sweet Virburnum	3	2	300mm		
Westringia fruticosa	Costal Rosmary	1	2	150mm		
Grasses/Lillies						
Arthropodium milleflorum	Vanilla Lilies	0.5			Endemic to Cumberland Plain	
Chloris truncata	Windmill Grass	0.5			Endemic to Cumberland Plain	
Chloris ventricosa	Plump Windmill Grass	1	0.5		Endemic to Cumberland Plain	
Cyperus gracilis	Slender Flat Sedge	0.3			Endemic to Cumberland Plain	
Dianella caerulea 'Breeze'	Flax Lily	0.8	0.5	200mm		
Dianella longifolia	Long Leaved Flax Lily	0.8	0.5		Endemic to Cumberland Plain	
Dianella revoluta	Mauve Flax Lily	1	1		Endemic to Cumberland Plain	
Dichelachne micrantha	Shorthair Plume Grass	0.8	0.6		Endemic to Cumberland Plain	
Liriope gigantea	Evergreen Giant	0.8	0.8	150mm		
Liriope muscari	Liriope	0.6	0.6	150mm		
Lomandra filiformis		0.3	0.1		Endemic to Cumberland Plain	
Lomandra longifolia	Spiny Mat Rush	1	1	150mm		
Lomandra multiflora		0.5	0.2		Endemic to Cumberland Plain	
Microlaena stipoides	Weeping Rice Grass	0.5	0.2		Endemic to Cumberland Plain	
Themeda australis	Kangaroo Grass	1	0.8		Endemic to Cumberland Plain	
Groundcovers						
Brachycome angustifolia	Rock Daisy	0.3	0.5			
Convolvulus mauritanicus	Morning Glory	0.3	0.5			
Dichondra repens	Kidney Weed	0.1	0.6		Endemic to Cumberland Plain	
Eremophila debilis	Winter apple	0.2	1		Endemic to Cumberland Plain	
Gazania sp.	Gazania	0.3	0.5			
Goodenia hederacea	Violet-leaved Goodenia	0.2	1		Endemic to Cumberland Plain	
Hibbertia diffusa	Wedge Guinea Flower	0.2	1		Endemic to Cumberland Plain	
Myoporum parvifolium	Creeping Boobialla	0.5	0.5			
Trachelospermum jasminoides	Chinese Star jasmine	0.5	5	200mm		
Viola hederacea	Native Violet	0.2	0.5			
Turf						
Stenotaphrum secundatum 'SS100'	Soft Leaf Buffalo 'Palmetto'	Turf	Turf	Roll		
Herbs/other						
Hardenbergia violacea	False Sarsaparilla	3	4		Endemic to Cumberland Plain	
Trachelospermum jasminoides	Chinese Star jasmine	3	4	200mm		
Brunoniella australis	Blue Trumpet	0.3			Endemic to Cumberland Plain	
Cheilanthes sieberi	Mulga Fern	0.2			Endemic to Cumberland Plain	
Hypericum gramineum		0.3			Endemic to Cumberland Plain	
Hypoxis hygrometrica	Yellow Stars	0.3			Endemic to Cumberland Plain	
Phyllanthus filicaulis		0.5			Endemic to Cumberland Plain	
Pratia purpurascens	White Root	0.1			Endemic to Cumberland Plain	
Vernonia cinerea		0.5			Endemic to Cumberland Plain	
Wahlenbergia gracilis	Native Blue Bell	0.3			Endemic to Cumberland Plain	

Planting Pallette - Bushland and Parkland Corridor

Botanical Name	Common Name	Height(m)	S pread(m)	Pot Size	Notes:	Uses
Trees						
Angophora floribunda	Rough-bark Apple	20	5		Endemic to Cumberland Plain	ST
Brachychiton populneus	Kurrajong	15	4		Endemic to Cumberland Plain	ST/YT
Corymbia maculata	Spotted Gum	25	5	100L	Endemic to Cumberland Plain	ST/YT
Corymbia maculata	Spotted Gum	25	5	500L	Endemic to Cumberland Plain	ST/YT
Elaeocarpus reticulatus	Blue Berry Ash	9	4	100L		ST/YT
Eucalyptus crebra	Narrow-leaved Ironbark	30	6		Endemic to Cumberland Plain	ST
Eucalyptus eugenioides	Thin-leaved Stringybark	25	4		Endemic to Cumberland Plain	ST
Eucalyptus fibrosa	Broad-leafe Ironbark	30	6		Endemic to Cumberland Plain	ST
Eucalyptus moluccana	Grey Box	24	5		Endemic to Cumberland Plain	ST
Eucalyptus longifolia	Woollybutt	25	5		Endemic to Cumberland Plain	ST
Eucalyptus tereticornis	Forest Red Gum	35	7	500L	Endemic to Cumberland Plain	ST
Eycalyptus sideroxylon	Red Ironbark	25	5		Endemic to Cumberland Plain	ST
Tristaniopsis laurina 'Elite'	Water Gum	8	5	500L		St/YT
Syzygium australe 'Select Form'	Brush Cherry Select	8	4	100L		YT
Syzygium australe 'Hunchy'	Brush Cherry Hunchy	3	1	100L		YT
Shrubs						
Acacia decurrens	Black Wattle, Green Wattle	10			Endemic to Cumberland Plain	
Acacia falcata	Falcate Wattle	3			Endemic to Cumberland Plain	
Acacia floribunda	White Sallow Wattle	4			Endemic to Cumberland Plain	
Acacia longifolia subsp. longifolia	Sydney Green Wattle	3.5			Endemic to Cumberland Plain	
Acacia parramattensis	Parramatta Green Wattle	8			Endemic to Cumberland Plain	
Acacia ulicifolia	Prickly Moses	1.5			Endemic to Cumberland Plain	
Acmena smithii var. minor	Dwarf Lilly Pilly					
Anigozanthus flavidus	Kangaroo Paw	1.2	0.5	200mm		
Austromyrtus 'Aurora'	Austromyrtus					
Banksia ericifolia	Heath Banksia	2	1			
Banksia spinulosa	Honeysuckle Banksia	2	2			
Bursaria spinosa	Sweet Bursiaria	2.5			Endemic to Cumberland Plain	
Daviesia ulicifolia	Gorse Bitter Pea	1.5			Endemic to Cumberland Plain	
Dillwynia sieberi		1.5			Endemic to Cumberland Plain	
Exocarpos cupressiformis	Cherry Ballart	3	2		Endemic to Cumberland Plain	
Indigofera australis		1	1		Endemic to Cumberland Plain	
Lepidosperma laterale		0.8	0.2		Endemic to Cumberland Plain	
Leptospermum flavescens	Tea Tree	3	2			
Leptospermum patersonii	Lemon-Scented Tea Tree	2	2			
Lissanthe strigosa		0.5	0.5		Endemic to Cumberland Plain	
Solanum pungetium		0.5	0.3		Endemic to Cumberland Plain	
Syzygium australe 'Bush Chirstmas'	Brush Cherry Christmas	2.5	1.5	300mm		
Syzygium australe 'Select Form'	Brush Cherry Select	3.5	2	300mm		
Syzygium australe 'Hunchy'	Brush Cherry Hunchy	2	1	300mm		
Westringia fruticosa	Costal Rosmary	1	2	150mm		
Grasses/Lillies						
Aristida ramosa	Three-awn Speargrass	0.8			Endemic to Cumberland Plain	
Aristida vagans	Three-awn Speargrass	0.8			Endemic to Cumberland Plain	

Arthropodium milleflorum	Vanilla Lilies	0.5			Endemic to Cumberland Plain	
Chloris truncata	Windmill Grass	0.5			Endemic to Cumberland Plain	
Chloris ventricosa	Plump Windmill Grass	1	0.5		Endemic to Cumberland Plain	
Cyperus gracilis	Slender Flat Sedge	0.3			Endemic to Cumberland Plain	
Dianella caerulea 'Breeze'	Flax Lily	0.8	0.5	200mm		
Dianella longifolia	Long Leaved Flax Lily	0.8	0.5		Endemic to Cumberland Plain	
Dianella revoluta	Mauve Flax Lily	1	1		Endemic to Cumberland Plain	
Dichelachne micrantha	Shorthair Plume Grass	0.8	0.6		Endemic to Cumberland Plain	
Echinopogon caespitosus	Tufted Hedgehog Grass	0.8	0.8		Endemic to Cumberland Plain	
Echinopogon ovatus		0.8	0.2		Endemic to Cumberland Plain	
Entolasia marginata					Endemic to Cumberland Plain	
Eragrostis leptostachya					Endemic to Cumberland Plain	
Lomandra filiformis		0.3	0.1		Endemic to Cumberland Plain	
Lomandra longifolia	Spiny Mat Rush	1	1	150mm		
Lomandra multiflora		0.5	0.2		Endemic to Cumberland Plain	
Lomandra 'Tanika'	Tankia Mat Rush	0.5	0.5		Endemic to Cumberland Plain	
Microlaena stipoides	Weeping Rice Grass	0.5	0.2		Endemic to Cumberland Plain	
Oplismenus aemulus	Basket Grass	0.3	0.1		Endemic to Cumberland Plain	
Panicum simile	Two Colour Panic	0.4	0.2		Endemic to Cumberland Plain	
Themeda australis	Kangaroo Grass	1	0.8		Endemic to Cumberland Plain	
Tricoryne elatior	Yellow Rush-lily	0.3	0.1		Endemic to Cumberland Plain	
Groundcovers						
Commelina cyanea	Native Wandering Jew	0.2	0.5		Endemic to Cumberland Plain	
Dichondra repens	Kidney Weed	0.1	0.6		Endemic to Cumberland Plain	
Eremophila debilis	Winter apple	0.2	1		Endemic to Cumberland Plain	
Goodenia hederacea	Violet-leaved Goodenia	0.2	1		Endemic to Cumberland Plain	
Hibbertia diffusa	Wedge Guinea Flower	0.2	1		Endemic to Cumberland Plain	
Hibbertia scandens	Climbing guinea flower	0.5	2			
Myoporum parvifolium	Creeping Boobialla	0.5	0.5			
Viola hederacea	Native Violet	0.2	0.5			
Turf						
Stenotaphrum secundatum 'SS100'	Soft Leaf Buffalo 'Palmetto'			Turf		
Climbers						
Glycine clandestina	Love Creeper	1	1		Endemic to Cumberland Plain	
Glycine tabacina	Love Creeper	1	1		Endemic to Cumberland Plain	
Hardenbergia violacea	False Sarsaparilla	3	4		Endemic to Cumberland Plain	
Herbs/other						
Asperula conferta	Common Woodruff	0.4			Endemic to Cumberland Plain	
Brunoniella australis	Blue Trumpet	0.3			Endemic to Cumberland Plain	
Cheilanthes sieberi	Mulga Fern	0.2			Endemic to Cumberland Plain	
Hypericum gramineum		0.3			Endemic to Cumberland Plain	
Hypoxis hygrometrica	Yellow Stars	0.3			Endemic to Cumberland Plain	
Phyllanthus filicaulis		0.5			Endemic to Cumberland Plain	
Pratia purpurascens	White Root	0.1			Endemic to Cumberland Plain	
Vernonia cinerea		0.5			Endemic to Cumberland Plain	
Wahlenbergia gracilis	Native Blue Bell	0.3			Endemic to Cumberland Plain	

References

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APPENDIX 2

CLAYMORE URBAN REDEVELOPMENT PROJECT

ABORIGINAL CULTURAL HERITAGE ASSESSMENT

PREPARED FOR LANDCOM

May 2012

AHMS

ARCHAEOLOGICAL & HERITAGE MANAGEMENT SOLUTIONS

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SUMMARY

This report presents an Aboriginal Cultural Heritage Assessment for Landcom's proposed Claymore Urban Renewal Project, Campbelltown Local Government Area.

The proposed Claymore Urban Renewal Project assessment area was subject to an Aboriginal cultural heritage assessment, including consultation with the Aboriginal community broadly consistent with the preliminary steps described in the *Draft Guidelines For Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DEC 2005).

An archaeological survey of the potential impact area was conducted to assess the potential impacts of the proposed Claymore Urban Renewal Project. Combined with the results of previous surveys in the immediate area, the survey was deemed to be of sufficient effectiveness to characterise the nature of the archaeological record, and the heritage values inherent in it. Consultation with the Aboriginal community and Claymore community was used to inform broader Aboriginal cultural heritage values for the area.

The assessment area contains 1 known Aboriginal archaeological site, Claymore 1, discovered during the current assessment.

The site Claymore 1 was assessed as having low archaeological significance, but good archaeological potential. The site indicates that there is the potential for Aboriginal objects to remain in the study area, in relatively undisturbed contexts, despite the previous urban development. Although of low archaeological significance, Aboriginal objects have cultural heritage value to the Aboriginal community as they are a demonstrative example of the occupation of the Claymore area by Tharawal people prior to European arrival. The Claymore Urban Renewal assessment area was assessed to have some cultural landscape values, although these exist in a highly fragmented landscape context.

The site Claymore 1 is at risk of direct harm from the proposed Claymore Urban Renewal Project construction and operation. Management measures will need to be implemented to: ensure there is no unnecessary impact to areas of archaeological potential.

As a result of the likely impact to the identified site Claymore 1 and the potential impact to Aboriginal objects which may be present in relatively undisturbed contexts, the proposal was assessed to be likely to have a minor detrimental impact to the Aboriginal cultural landscape values of the assessment area.

The following recommendations were made:

1) The Claymore area should be subject to further archaeological investigation prior to development. The purpose of the investigations would be to:
   - intensively and systematically survey all areas of reasonably undisturbed land to identify the presence or absence of Aboriginal objects, both stone artefacts and scarred trees.
   - based on the results of the survey, sub-surface testing may be required to fully assess the archaeological significance of the area.

2) The site Claymore 1 will be directly harmed by the proposed changes that will take place under the Concept Plan. Prior to further development the harm should be more

fully assessed by sub-surface testing (excavation), and if appropriate mitigated by artefact collection.

3) The maintenance of the cultural heritage values expressed for Dimeny Park and the carved stones that are currently within the Park, should be incorporated into the planning of Dimeny Park in the Concept Plan. Such maintenance would involve retaining the carved stones in the proposed public open space and enhancing the Park's status and interpretation as a place that acknowledges the traditional Tharawal custodians.

4) Subject to discussion with the Aboriginal community and appropriate arrangements for security of Aboriginal objects, Aboriginal artefacts collected from other parts of Claymore may be able to be stored or deposited at the Dimeny Park.

5) An Aboriginal Cultural Heritage Management Plan (ACHMP) should be developed to guide the ongoing management of Aboriginal cultural heritage matters throughout the Claymore Urban Renewal Project implementation. The recommendations at Point 1 are an essential first step for the ACHMP.

1.0 INTRODUCTION

This report presents an Aboriginal Cultural Heritage Assessment (ACHA) for Landcom's proposed Claymore Urban Renewal Project. For the purposes of this report Aboriginal cultural heritage includes both archaeological objects (as defined by the *National Parks and Wildlife Act 1974* NSW), cultural landscapes and contemporary Aboriginal cultural values.

Landcom has been engaged by Housing NSW (HNSW) to deliver the Claymore Urban Renewal Project. AHMS Pty Ltd has been commissioned by Landcom to provide Aboriginal and non-Indigenous Cultural Heritage Services for the project. Niche Environment and Heritage Pty Ltd was commissioned by AHMS Pty Ltd to assist in the implementation and preparation of the ACHA.

The project brief stated that the cultural heritage statement was required to address the following components:

a) The significance and an assessment of the impact on and of any heritage items;

b) Consultation with the relevant Aboriginal groups, including Tharawal LALC and Cubbitch Barta representatives; and,

c) The significance and an assessment of the impacts on and of any Aboriginal heritage items and other matters of cultural importance.

The Director-General's Requirements for the project were issued on 24 March 2011. They identify Aboriginal Heritage as a key issue, and state the following guidance for assessment:

> The EA shall address Aboriginal Heritage in accordance with the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation 2005. This should include relevant consultation with the Local Aboriginal Land Council and Native Title Claimants. The relevant contact bodies include:
>
> - Robyn Straub
>   Chief Executive Officer
>   Tharawal LALC
>   PO Box 168 PICTON NSW 2571
>
> - Glenda Chalker
>   Cubbitch Barta Native Title Claimants Aboriginal Corporation
>   55 Nightingale Road
>   PHEASANTS NEST NSW 2574

The objective of this Aboriginal Cultural Heritage Assessment is to address these requirements; to identify the nature and extent of Aboriginal heritage values associated with the Claymore area; and provide an assessment of potential impacts to these values from the proposed urban renewal project Concept Plan. In addition this Aboriginal Cultural Heritage Assessment provides advice on the conservation of the heritage values, and recommendations for amelioration of potential impacts.

This Aboriginal Cultural Heritage Assessment has been prepared by Jamie Reeves and Renée Regal of Niche Environment and Heritage, and has been project managed and reviewed by Peter Douglas of AHMS. The site inspection was conducted by Donna Whillock (Tharawal LALC), Glenda Chalker (Cubbitch Barta Native Title Claimants), Renée Regal and Jamie Reeves.

This report was written by Jamie Reeves and Renée Regal.

2.0 LOCATION

Claymore is situated approximately 56 km south-west of Sydney, in the Campbelltown Local Government Area. The suburb is located adjacent to the M5 Motorway, with the urban area of Campbelltown to the east and semi-rural land to the west.

Claymore is located in the Cumberland Lowlands physiographic region. The Cumberland Lowlands are characterised by low lying, gently undulating plains and low hills on shale and sandstone. The area has been cleared of most native vegetation, although some patches and isolated examples of old growth trees are present, and subject to urban and semi-rural development. Claymore itself was established in the late 1970s.

3.0 THE PROPOSAL

Claymore is one of the largest public housing estates in South Western Sydney, containing 1096 public housing dwellings including detached cottages and townhouses. The estate was planned using Radburn design principals with cul-de-sac, pedestrian pathways and excessive large open spaces, which have proven to be unsuccessful in this context. The proposed works involve developing a new Concept Plan for Claymore.

The project will be developed in stages over 12-15 years. This requires listing the area as a State Significant Site and having it dealt with as a Major Project under Part 3A of the *Environmental Planning and Assessment Act 1979*. The land will be rezoned concurrently to permit the intended uses.

Landcom is preparing an environmental assessment for a Project Application to facilitate Infrastructure and Early Works, including site preparation, infrastructure and roads for Stages 1 and 2.

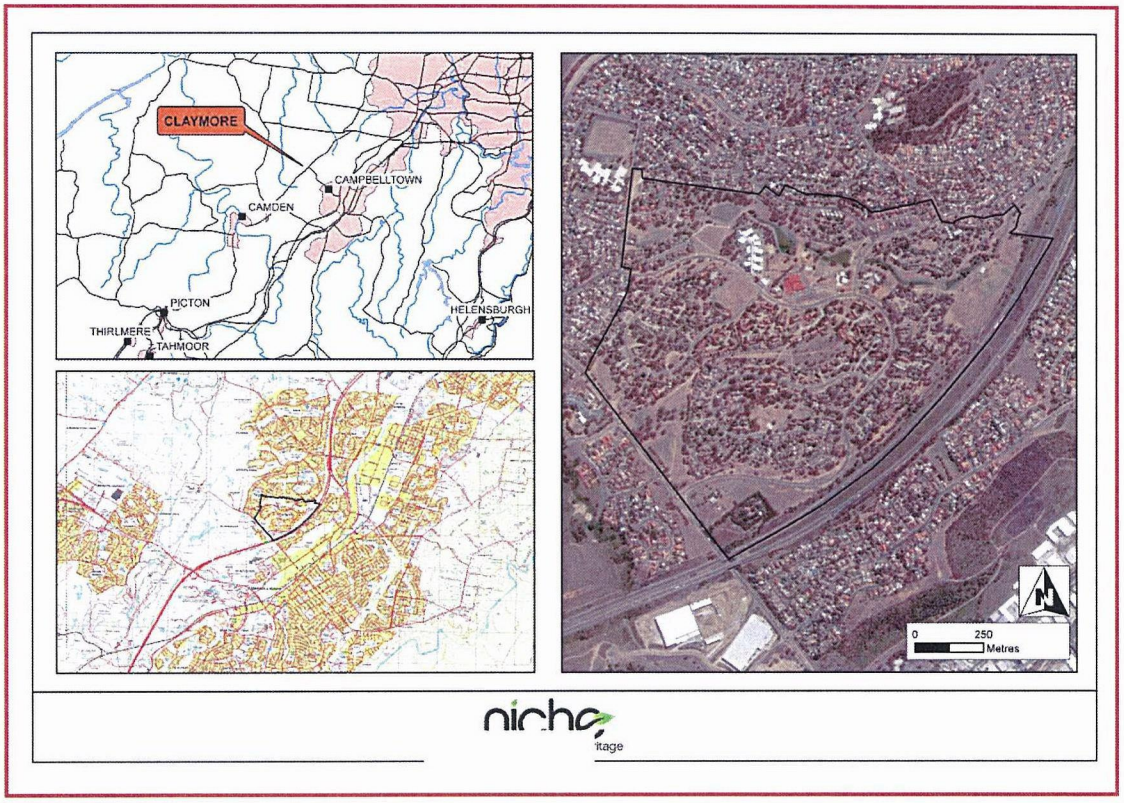

Figure 1. Location of the proposed Claymore Urban Renewal Project.

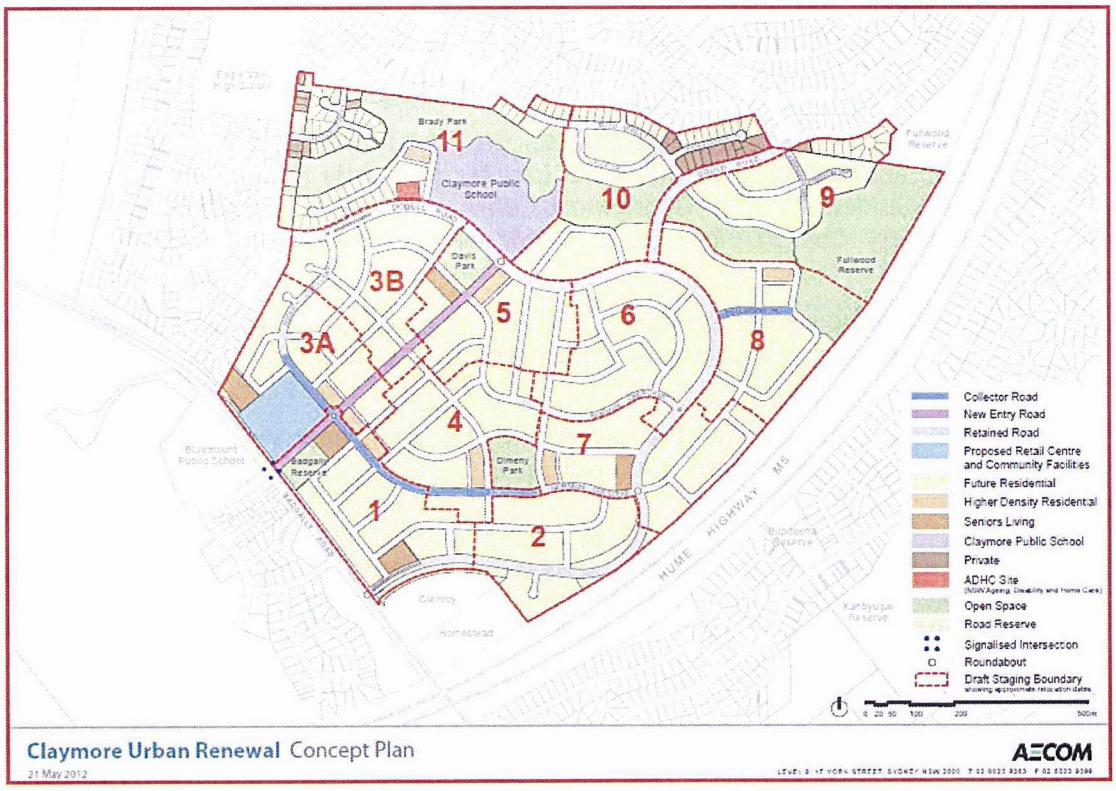

Figure 2. Proposed Concept Plan (Landcom)

4.0 AIMS

This Aboriginal Cultural Heritage Assessment aims to:

- Identify the cultural and archaeological values that may be present at Claymore;
- Determine the effect the proposal will have on the identified values; and,
- Propose measures to conserve heritage values through avoidance or amelioration of any potential impacts to the Aboriginal cultural heritage and heritage values identified.

5.0 METHODS

The broad methodology for this project is outlined below:

- Undertake a background review of relevant literature and conduct searches of relevant heritage databases, including the Office of Environment and Heritage Aboriginal Heritage Information Management System (AHIMS);
- Consult with the Aboriginal community;
- Undertake a preliminary archaeological survey of the assessment area;
- Record any cultural and/or archaeological sites that occur in the assessment area;
- Assess the cultural heritage significance of the individual sites and the assessment area in accordance with the *Burra Charter* (Australia ICOMOS 1999) and OEH *2005 Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DECC 2005) and *Standards and Guidelines Kit* (NPWS 1997);
- Determine the potential impacts from the proposal to the cultural heritage value of individual sites, the cultural landscape as a whole, and contemporary cultural values;
- Provide recommendations to avoid impacts and conserve values, or to mitigate impacts where avoidance is not possible.

The site inspection involved walking over selected sections of the Claymore subject area on foot, and inspecting areas of exposure for the presence of Aboriginal objects on the ground surface. Where present, old growth trees were inspected for Aboriginal scarring. The riparian corridor of McBarron Creek was not included in the preliminary survey because it is not proposed for change of use/development under the Concept Plan, and it has been heavily modified by landscaping. In addition Dimeny Park was visited to observe and record contemporary heritage items.

A differential GPS was used to record the area that was walked over, and the location of features and finds. A 12 megapixel digital camera was used to photograph finds and features, and the general landscape setting.

Field notes were recorded in a notebook, and as annotations on aerial photos.

6.0 CONSULTATION WITH THE ABORIGINAL COMMUNITY

As outlined in the Director-General's Requirements (DGR's) this Environmental Assessment (EA) has been carried out in accordance with the *2005 Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation*. This has included initial consultation with both the Tharawal Local Aboriginal Land Council and Cubbitch Barta Native Title Claimants Aboriginal Corporation through a site inspection, and general discussion prior to and during the inspection.

A field assessment was carried out on 28 April 2011 with Donna Whillock from Tharawal Local Aboriginal Land Council and Glenda Chalker from Cubbitch Barta Native Title Claimants.

Comments regarding Aboriginal cultural heritage value were noted during the field survey, where appropriate. The Tharawal LALC and Cubbitch Barta Native Title Aboriginal Corporation will provide specific written advice regarding the Claymore Urban Renewal Project that will accompany the final version of this report.

Comments on the report submitted by Cubbitch Barta Native Title Aboriginal Corporation are reproduced in the Appendix.

7.0 LANDSCAPE CONTEXT

The assessment area is situated approximately 56 km south-west of Sydney and 2 km north of the CBD of Campbelltown. The area is bordered by Badgally Road in the south west and McBarron Creek in the north. The assessment area is situated in the southern margins of the Cumberland Lowlands physiographic region, which generally consists of low lying, gently undulating plains and low hills (Hazelton and Tille 1990: 2).

The landscape of the site consists of undulating plains with ridgelines running parallel along Badgally Road. Along Dobell Road on the southern boundary of the site there are a number of hillcrests and gully heads. The main drainage feature of the area is McBarron Creek, a 2nd order stream. On the Cumberland Plain the combination of a 2nd order stream and similar hilly landscapes has been suggested to be likely to present artefact frequencies and densities higher than what may be expected to occur in the vicinity of lower order streams (White and McDonald 2010).

7.1 Soils and Topography

There is one soil landscape present across the entire study area and that is the Blacktown soil landscape (Hazelton & Tille 1990; 27-30). The Blacktown landscape consists of gently undulating rises on Wianamatta Group shale. These rises consist of local relief to 30 m, and slopes that are usually less then 5% gradient. However there are some uncharacteristically steeper areas along the southern boundary of the site that consist of slopes greater then 18 % (Landcom 2011;3). Overall the impression of the study area is one of rolling hills with sometimes long crests, rolling to the small valley of McBarron Creek in the north of the study area.

The soils consist of generally shallow podzolic soils, with loams overlying clay and shale bedrock. Hazelton and Tille (1990; 28-29) describe the soils, in stratigraphic order from the surface as:

1. Friable greyish brown loam (topsoil) with occasional fine gravel and charcoal, abundant roots
2. Hardsetting brown clay loam (subsoil) with platy ironstone and gravel fragments, rare organic material
3. Strongly pedal, mottled brown, light clay (subsoil)

The site inspection confirmed the presence of this soil profile in all inspected areas that had not been subject to intensive development or disturbance. The profile is clearly visible in Plate 1.

Plate 1. Exposure at site Claymore 1 shows the typical soil profile of the area

These soils have formed in situ from the weathering of the parent shales and therefore they are likely to have preserved, through burial or incorporation into the soil matrix, any Aboriginal stone artefacts that have been discarded on the landscape in the past (Hazelton & Tille 1990; 28-30). Aboriginal artefacts, if present, would be most likely to occur in the topsoil or at the transition/boundary of the topsoil and underlying brown clay subsoil.

The soils present within the study area are moderately erodible, resulting in sheet and gully erosion. Sheet erosion is present in virtually all parts of the study area, sometimes accounting for large areas of land within parks, reserves or open space areas in the urban environment.

7.2 Ecology and Cultural Heritage

The study area is a heavily urbanised environment. Nevertheless, stands and isolated individuals of old growth trees are present in some parts. The older trees are predominantly ironbarks in drier areas and grey box and red gum. Notable stands of remnant trees are found in the gully heads of the unnamed tributaries of McBarron Creek, near Badgally Road and along the riparian corridor of McBarron Creek. It is unclear whether or not these trees are old enough to pre-date European arrival, or to date to the contact period, and hence show signs of traditional Aboriginal modification or scarring. Often, in disturbed environments such as this, remnant vegetation can have significance to Aboriginal people as it provides an example, and possibly link between the landscape of today, and that inhabited by their ancestors.

7.3 Disturbance and Modification

The site of Claymore has a high level of disturbance as it was developed in the late 1970s and early 1980s as a housing estate. Prior to this the area had been rural in nature, being cleared of most native vegetation. Within the current suburb there are a number of previously undeveloped sites that are defined as open space. These open spaces are grassed areas with minimal landscaping, and sometimes contain old eucalypt trees that predate the development by at least several decades. In many cases utilities are present in these areas, although the installation of these will have had a confined and linear impact footprint.

In the north of the study area, prior to the development of Claymore, McBarron Creek was a meandering 2nd order stream. However, the development of Claymore has resulted in the

meanders being straightened by artificial channels and the extensive landscaping of the banks and slopes around the stream channel. Many older trees were retained in the landscaping. Such development will have significantly reduced the Aboriginal archaeological potential of the riparian area, especially for Aboriginal stone artefacts. Scarred trees may still potentially be found in this area.

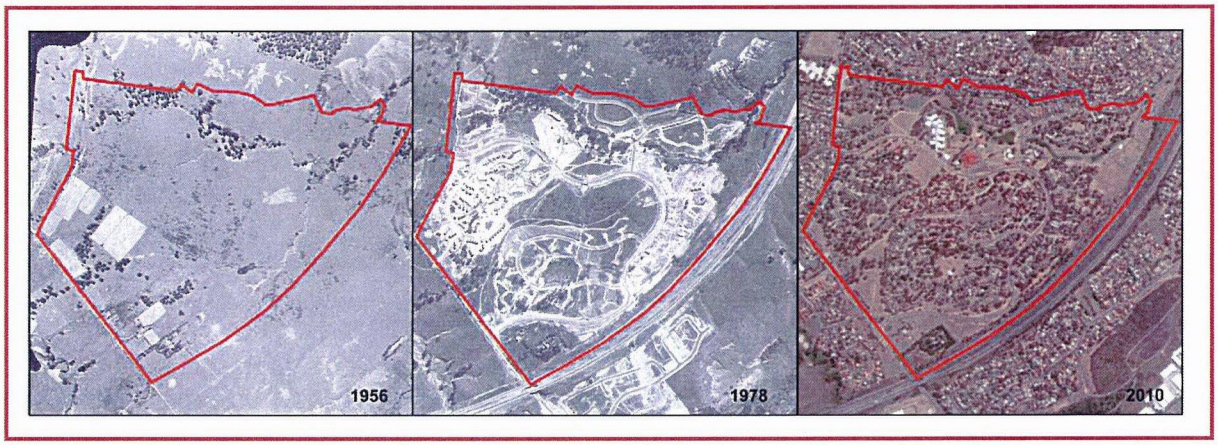

Plate 2. Comparison of the Claymore area through time. Note realignment of McBarron Creek.

The following landscape modifications are present within the Claymore study area:

- Native vegetation has been cleared;
- McBarron Creek has been straightened and its banks landscaped;
- Roads and pedestrian access;
- Various residential and community use buildings;
- Tree and hedge rows;
- Buried infrastructure: sewers, pipes and cables.

8.0 ABORIGINAL HISTORY

The Claymore area is the traditional country of the Tharawal people. Tindale has identified the Tharawal boundaries as being from the south side of Botany Bay to north of the Shoalhaven River, and running inland to the Campbelltown and Camden area (Attenbrow 2010: 34, SA Museum 2010). Traditional Owner Glenda Chalker describes the area as being 'Gundungurra and Tharawal tribal country' as the area is a transitional boundary between the Tharawal and their westerly neighbours, the Gundungara (Attenbrow 2010: 23, DEC 2007: 7). Attenbrow (2010:35) points out that such boundary mapping, undertaken as it was in the nineteenth century is indicative at best, however there appears to be reasonably strong agreement between those who have mapped language boundaries that the area is indeed a transitional boundary between the Tharawal and Gundangara.

The records and histories of the Tharawal and their country at the time of contact with Europeans are subject to bias and are generally fragmented, providing nothing like a complete picture of the way Aboriginal people were living prior to European interference. Nevertheless, we know the Tharawal regularly communicated, moved, traded and participated in ceremonies between their country and neighbouring areas. It is most likely family groups or clans would 'intermingle and interact along both physical and social boundaries' rather than be strictly confined to the 'tribal' borders that were to be artificially imposed by European anthropologists (Organ 1990: xliii).

The first documented European to visit the area was Francis Barrallier, a Frenchman assigned with the New South Wales Corps. In 1802 Governer King tasked Barrallier with exploring a route to cross the Blue Mountains. In November 1802 Barrallier forded the Nepean River near Menangle (Barrallier 1975). He counted 162 head of feral cattle near here, and reported an abundance of eels, fish, possums, "squirrels" and kangaroo and noted these as all being food resources for the Aborigines (Barrallier 1975: 3-4). However, by the time Barrallier crossed the Tharawal and Gundungara country the traditional life of the local Aboriginal populations would likely have been catastrophically impacted by European arrival. The smallpox epidemic of April 1789 is known to have decimated Aboriginal populations in the Sydney area and surrounds, including the western Cumberland Plains (Attenbrow 2010: 21).

In the early nineteenth century European settlers began to arrive, and stay in the district. (DEC 2005a). This period was a time of drought, and the competition for resources between the Europeans and the Tharawal, who were adapting to the massive changes that were so quickly brought to them, led to several years of conflict. Organ (1990) documents the various skirmishes, killings and reprisals between Europeans and the Tharawal during the 1814 - 1815 period in the Cowpastures, Camden and Appin districts. Eventually this sporadic bloodshed would lead to larger scale all out conflict, with Governor Macquarie implementing a sustained punitive action against the Aboriginal population in the district. This resulted in the Appin Massacre of 17 April 1816, in which Aboriginal people were shot and driven over the steep cliffs (probably near Broughtons Pass) to their death during a surprise attack by a detachment of the 46th Regiment, in the middle of the night. The detachments leader, Captain James Wallis, recorded the massacre in his journal:

> I formed line ranks, entered and pushed on through a thick brush towards the precipitous banks of a deep rocky creek. The dogs gave the alarm and the natives fled over the cliffs. A smart firing now ensued... I regret to say some had been shot

> and others met their fate by rushing in despair over the precipice (quoted in Organ 1990: 77).

Surveying the carnage later that morning Wallis concluded fourteen Aborigines, including women and children, had been killed. By the end of 1816 most of the Aboriginal population had been forcibly removed from the Cowpastures and Appin area, and Macquarie ceased hostilities in the district in November 1816 (Organ 1990: 55; 92). The process of dislocating the Tharawal people from their traditional lands continued as pastoralists and European settlers increasingly took hold. With so many people killed or institutionalised the traditional and adaptive systems of kinship and land use, which had held on throughout Macquarie's war, were broken with the Aboriginal population reduced to a marginal and tenuous existence in a world turned upside down. Despite all this the Tharawal continue as custodians of the land, and many continue to live in the Gundungara and Tharawal tribal country today.

9.0 REGISTER SEARCHES

A search of the Office of Environment and Heritage AHIMS database was conducted on 11 April 2011. The search area consisted of a 6 km buffer around the suburb of Claymore (**Figure 3**). The AHIMS search returned 15 records for the search area (**Table 1**).

Figure 3. AHIMS search results

Table 1. AHIMS search results

Site Features	Number of Sites
Artefact(s)	14
Scarred Tree	1
Total	*15*

Open sites containing stone artefacts are the most abundant site type present in the area searched and indeed in the Cumberland Plain as a whole (Attenbrow 2010; 50). Of the sites recorded in the vicinity of the study area most contained less than 5 artefacts, with several being isolated finds. The sites with the highest frequencies of artefacts contained 17 and 37 artefacts respectively. All other things being equal, these sites are exceptional in the local context for the high numbers of exposed artefact present. Typically for the Cumberland Plain the artefact assemblages in the local area comprise mostly silcrete flaked stone artefacts, with lower frequencies of the raw materials tuff, chert and quartz.

10.0 Previous Archaeological Work

The last decade has seen increasing levels of archaeological investigation in the Claymore area, revealing a characterisation of the type of material traces of past Aboriginal land use that are present here. The previous investigations with relevance to the current assessment area are reviewed below.

Overview of Previous Investigations

Jo McDonald Cultural Heritage Management (Jo McDonald CHM) conducted a survey of the Currans Hill area, approximately 3 km west of Claymore, in 2000 (Jo McDonald CHM 2000). The survey covered a large area and was assisted by frequent exposures providing good albeit patchy conditions for the detection of archaeological sites. However, during the survey Jo McDonald CHM only discovered 4 sites, with 3 of these containing isolated artefacts and 1 containing 2 artefacts. The study concluded that whilst there was a continuous background scatter of Aboriginal stone artefacts across the landscape, the distribution of concentrations of artefacts, and artefact concentrations themselves were not present in the area due to a lack of permanent water and relatively steep hill slopes.

In 2007 Jo McDonald CHM conducted extensive surveys for land planning in the Oran Park area, approximately 8 km northwest of Claymore (Jo McDonald CHM 2007). These surveys discovered 44 archaeological sites containing stone or glass artefacts, and 4 areas of potential archaeological deposit (PAD). The majority of the sites contained less than 10 artefacts, however on site contained 193 stone artefacts in a high density concentration. Jo McDonald CHM was unable to reach detailed understandings of Aboriginal occupation of the area based on surface data alone. However, significantly for the Claymore area they did conclude that occupation appeared to be focused on the junction of lower streams, and that ridge tops, hill crests and low order creek flats appeared to also be a focus for activity and artefact discard, something which may be novel to this part of the Cumberland Plain.

Subsequent to Jo McDonald CHM's surveys a large program of archaeological excavation has been undertaken at Oran Park area. The excavations have recovered over 5000 artefacts, including flaked glass and "extensive arrays of pre-contact sites with low intensity Aboriginal activity" (AECOM 2010: 8). Based on the results of these studies a model of archaeological

deposit was developed. The model suggests that "Aboriginal archaeological material will occur in topsoil up to 300 m from 4th order creeks, 200 m from 3rd order creeks and 100 m from 2nd order creeks (AECOM 2010: 8).

Summary

In their natural state the soils and landforms in the Claymore area are likely to have preserved any Aboriginal objects that have been discarded onto them during Aboriginal occupation of the area in the past. Based on the results of previous models of occupation in the vicinity of 2nd order streams it is suggested that Aboriginal occupation in these areas was sporadic, with occasional focussed activity areas.

The Claymore area has been subject to relatively intensive urban development, including the straightening of the channel and landscaping of the banks of McBarron Creek, the largest drainage feature in the locality. This development will have impacted any Aboriginal archaeological remains, especially along McBarron Creek. Nevertheless there is an opportunity for past traces of Aboriginal land use to be preserved in two ways: 1) stone artefact sites in areas of less development, such as parks, reserves and other public open space; and 2) scarred trees in remnant stands or isolated individual old trees. Previous archaeological studies and modelling suggest that the stone artefact sites will be more frequent and have a higher density of artefacts closer to McBarron Creek. Smaller, less frequent and less dense stone artefact sites might occur on the ridges, crests and hills in other parts of the study area.

The area in the vicinity of Claymore has been subject to increasing archaeological study over the last decade. The recent investigations have shown that the area contains many stone artefact sites, as is the case with virtually the entire Cumberland Plain (White and McDonald 2010). Generally, the stone artefact sites in the vicinity of the Claymore area comprise small sites with only a few artefacts or a single artefact, with some notable exceptions. This partly reflects the lack of investigation until recently and is possibly a result of generally limited archaeological exposure in the landscape. It may also be due to the way Aboriginal people used this part of the landscape, where most of the area is associated with lower order streams only. To date, the main issues that have been dealt with by these studies have necessarily been to do with questions of presence or absence of sites, their size and density, and the broad characterisation of where the sites occur in the landscape. As with other parts of the Cumberland Plain, and as demonstrated by the recent AECOM (2010) work, a detailed understanding of the distribution of traces of past Aboriginal land use can only be achieved by investigating and characterising both the surface and sub-surface archaeological record.

11.0 PREDICTIVE MODEL

The review of previous archaeological investigations presented above showed that the material traces of past Aboriginal and use in the Claymore area comprise:

- Stone artefact sites, generally with low artefact numbers, in open contexts;
- Rare scarred trees.

Generally, the stone artefact sites are small in area and the number and density of artefacts they contain. Overall investigators have focused on questions of presence/absence of

archaeological sites as there has not been sufficient data or scope of investigation to date to allow more detailed models of past Aboriginal land use. Generally, in comparison to the rest of the Cumberland Plain, artefact density around the Camden area is considered to be quite sparse, although this may simply be a lack of previous intensive sub-surface investigation.

On the Cumberland Plain at Rouse Hill, west of Sydney, White and McDonald (2010) have analysed the distribution of stone artefacts across the Rouse Hill Development Area, which measures around 5 km x 5 km. This is the first such peer reviewed and published analysis and predictive model. White and McDonald analysed several landscape variables against the results of sub-surface investigations (a database containing 4429 stone artefacts) and concluded that the stream order (the size of a drainage line) and landform were the most important factors in determining artefact density and distribution. In summary they conclude:

> *Factors influencing artefact density include (1) stream order, with higher order streams tending to have higher artefact densities and more continuous distributions than lower order streams; (2) landform, with higher densities occurring on terraces and lower slopes, and with sparse discontinuous scatters on upper slopes; (3) aspect on lower slopes associated with larger streams, with higher artefact densities occurring on landscapes facing north and northeast; and (4) distance from water, with higher artefact densities occurring 51-100 m from 4th order streams, and within 50 m of 2nd order streams.* (White and McDonald 2010: 36)

White and McDonald's observation about the importance of stream order and landform on artefact distribution and density is noteworthy and describes the known distribution of stone artefact sites in the Claymore area, such that it is. There are no high order streams within close proximity to Claymore, with McBarron Creek being a 2nd order stream. This suggests artefacts will be present within the landscape, but they will be more dispersed, and have concentrations containing relatively few (less than 50, for example) artefacts. The most frequent and highest density concentrations are likely to be within 50 m of McBarron Creek (White and McDonald 2010; 34).

Considering the characteristics of the Cumberland Plain in general, and the specific results of previous investigations in the Claymore area the following predictive statements can be made:

- Open stone artefact sites may occur anywhere in the landscape, but are most likely to occur on flats, lower slopes and hill crests.
- Relatively higher density stone artefact sites will occur on lower slopes or flats in close (50 m - 100 m) proximity to McBarron Creek.
- Relatively moderate density stone artefact sites will occur on ridges and crests in proximity to McBarron Creek.
- Scarred trees may occur wherever there is remnant woodland vegetation of sufficient age.

The predictive statements are limited to the open stone artefact and scarred tree site types, as these are the only site types with a predictable likelihood to occur in the assessment area.

12.0 ARCHAEOLOGICAL SURVEY - RESULTS

A field assessment was conducted on 28 April 2011, in fine conditions. Participants in the survey were:

- Donna Whillock, Tharawal Local Aboriginal Land Council;
- Glenda Chalker, Cubbitch Barta Native Title Claimants Aboriginal Corporation;
- Renee Regal and Jamie Reeves, Niche Environment and Heritage.

The survey inspected several areas, focusing on areas known to be relatively undisturbed. The surveyed area is shown in Figure 4 and the summarised in Table 2. A single archaeological site was discovered during the survey, Claymore 1 (Figure 5).

Table 2. Survey Results

Survey Unit	Soil Landscape	Landform	Visibility %	Exposure %	Area (sq.m)	Effective Coverage (sq.m)	Archaeology / Comments
1	Blacktown	Simple slope	50	60	9,960	2,988	Dimeny Park. Landscaped. **Contemporary Values**
2	Blacktown	Simple slope	10	10	6,640	66	Landscaped area Old/large trees
3	Blacktown	Crest	70	50	21,800	7,630	Natural surface / soil profile **Claymore 1**
4	Blacktown	Ridge	50	50	53,980	13,495	Natural surface / soil profile with areas of disturbance Old/large trees
5	Blacktown	Simple slope	90	90	3,700	2,997	Landscaped area
6	Blacktown	Lower slope	80	90	2,580	1,858	Landscaped area
7	Blacktown	Simple slope	40	60	2,320	557	Natural surface / soil profile
Total					**100,980**	**29,591**	

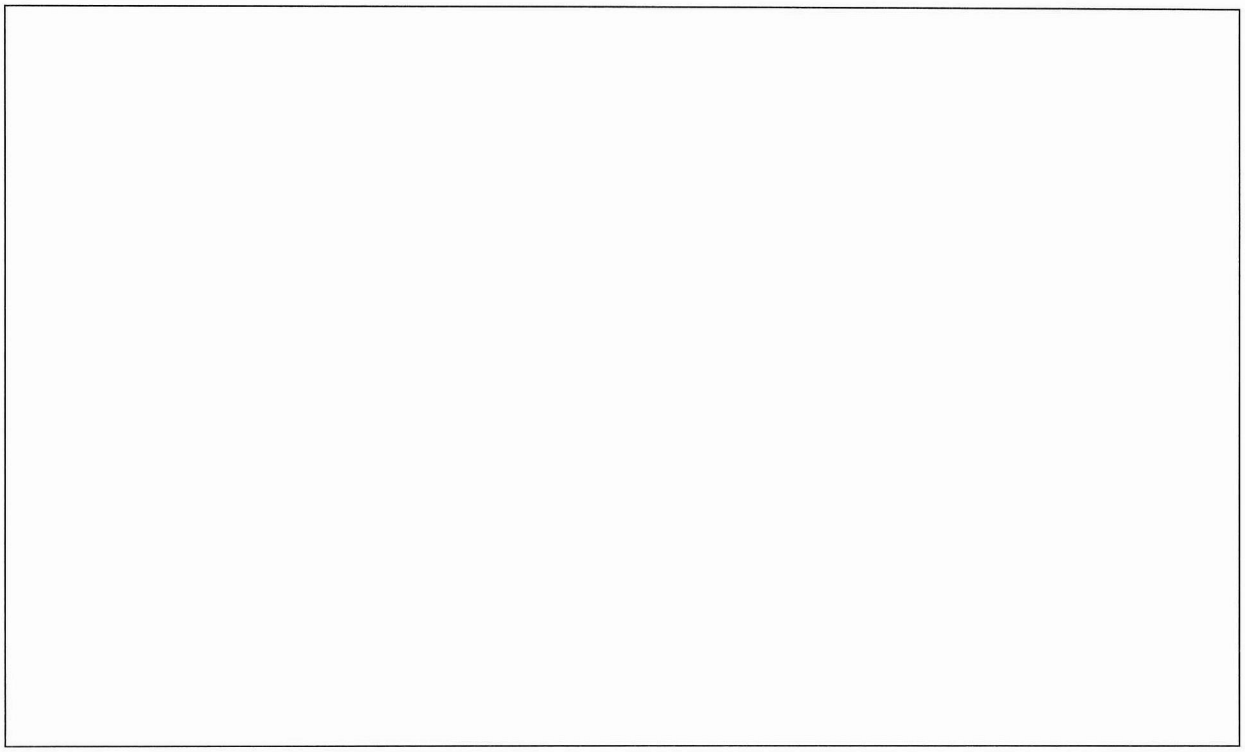

Figure 4. Survey areas and results

Figure 5. Survey Results - Claymore 1

The site inspection demonstrated that there are areas of markedly differing archaeological potential within the study area. The survey focused on parks and open spaces. In some cases, such as at Dimeny Park, it was clear there had been significant landscaping in the past. Other areas are clearly remnants of the original ground surface and soil profile, despite the urban development in very close proximity. In some cases it was not possible to distinguish between landscaped/mixed soils and natural profiles, although in these cases it is most likely the areas had been heavily disturbed in the past. A single Aboriginal archaeological site was found.

Site Description: Aboriginal Archaeological Site - Claymore 1

The site, Claymore 1, was a low density stone artefact site that contained 6 stone artefacts, located in exposures caused by sheet erosion in open public space on the south side of Dobell Road (Figure 5). A shallow band of grey topsoil remains in areas that have not been eroded, and this is interpreted to be a remnant of the original land surface and soil profile (Plate 3). It is likely the topsoil contains further Aboriginal objects. The site is situated on a high crest, approximately 100 m from the head tributary of McBarron Creek. Artefacts were discovered in two exposures: 2 artefacts on the west side of Gidley Crescent in an exposure measuring approximately 50 m x 10 m; and 4 artefacts on the east side of Gidley Crescent in an exposure measuring approximately 250 m x 20 m. The assemblage included two backed artefacts, both made of silcrete (Plate 4).

Plate 3 View north-east over Claymore 1.

Plate 4 Backed artefact at Claymore 1.

Other Cultural Heritage Values

The following advice from a current Claymore resident has been provided to Landcom through their community consultation process:

> *The carved stones in the grove of trees at the top of the Park were created by a group of Aboriginal Stone mason students from Miller TAFE Trade School. The stones were provided by Housing NSW.*
>
> *The stones are now an important part of the Park as they represent and acknowledge the Tharawal People as the original owners and custodians of the land.*

Staff at the Claymore ITM and the TAFE instructor met with the Aboriginal Students prior to the stones being carved and placed. The stones were placed where they are because it is the highest point in the park and it was felt that the area was an appropriate site for the past Elders to watch over the park.

The stones were carved to depict the animals unique to Australia and Aboriginal culture, the larger stone in the middle with the circles represents a meeting place. Poles at the entrance to the park came from Campbelltown City Council and were reused from another park, I don't know where. Perhaps the stones could be relocated to the Glenroy Precinct they would still be on a high place and it would be appropriate.

Plate 5. Carved stones looking over Dimeny Park.

Dimeny Park and the carved stones have contemporary cultural significance, in particular Aboriginal cultural significance, to the current Claymore community. The park and the stones reflect that for the contemporary Claymore community there is an Aboriginal presence in the landscape, and that this is something to commemorate and respect. The cultural significance of Dimeny Park is that it presents a place in the landscape that acknowledges Aboriginal history and Aboriginal contributions to the community as a whole. Significantly the place has developed organically through community interactions.

Neither the Tharawal LALC or Cubbitch Barta representatives who attended the field survey were aware of the significance of Dimeny Park to the contemporary community. However, Glenda Chalker of Cubbitch Barta had conducted several 'Welcomes to Country' at Claymore. Glenda Chalker's comments concerning the significance of the carved stones are included in the Appendix

13.0 ANALYSIS AND DISCUSSION

The preliminary archaeological survey of the Claymore Urban Renewal Project assessment area achieved a reasonable level of effectiveness, although there were limitations due to landscape disturbance from previous urban development and sometimes poor archaeological visibility and exposure. However, it is worth highlighting that the patches of exposure were frequently quite large in area, and quite sufficient to reveal significant archaeological objects had they been present. This was demonstrated by the discovery of the site Claymore 1.

The predictive model suggested that the most likely Aboriginal site types to be encountered would be stone artefacts sites of small size and density, and scarred trees. The results of the survey have confirmed the predictive model, which was simply a reiteration of aspects of the models proposed by previous researchers, in particular White and McDonald (2010) and AECOM (2010).

The undeveloped or less disturbed parts of the assessment area have archaeological potential in that they are likely to have sub-surface Aboriginal objects present (see **Figure 6** for indicative mapping). These objects will likely be typical of what has been reported for other sections of the Cumberland Plain in the vicinity of low order streams. However, as Jo McDonald CHM note, the archaeological record of the Camden area of the Cumberland Plain is less extensively studied that the areas to the west of Sydney, and there are indications that the past Aboriginal use of this landscape – and hence the distribution of the traces of that use – may have been different to areas with more frequent higher order streams. In summary past Aboriginal occupation appears to be focused on the junction of lower order streams, and ridge tops, hill crests and low order creek flats appear to also be a focus for activity and artefact discard. This may be a pattern of past Aboriginal land use specific to this part of the Cumberland Plain, giving it some comparative value in regards to the rest of the Plain.

In conclusion, the Claymore landscape has the potential to yield some information about past Aboriginal life in the area. Dependent on the further understanding of the sub-surface occurrence of artefacts in areas of remnant soil, however, the area probably has little to contribute other than to be noted as an area with a characteristic occurrence of stone artefacts, and some remnant vegetation.

Figure 6. Indicative extent of reasonable undisturbed land (shaded yellow) within the subject area. Note that this mapping has not been confirmed by survey (source of photograph: LPI, SIX Viewer).

14.0 ABORIGINAL CULTURAL HERITAGE SIGNIFICANCE

The Burra Charter (Australia ICOMOS 1999) defines the basic principles and procedures to be observed in the conservation of important places. It provides the primary framework within which decisions about the management of heritage sites in Australia should be made. The Burra Charter defines cultural significance as being derived from the following values:

Aesthetic value
Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the place and its use.

Historic value
Historic value encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all of the terms set out in this section.

A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.

Scientific value
The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality or representativeness, and on the degree to which the place may contribute further substantial information.

Social value
Social value embraces the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group.

Other approaches
The categorisation into aesthetic, historic, scientific and social values is one approach to understanding the concept of cultural significance. However, more precise categories may be developed as understanding of a particular place increases.

The NSW DECCW guidelines for the significance assessment of Aboriginal archaeological sites are contained within the *Aboriginal Cultural Heritage Standards and Guidelines Kit (NPWS 1997)*. The Kit identifies with two main streams in the overall significance assessment process: the assessment of cultural/social significance to Aboriginal people and the assessment of scientific significance to archaeologists.

This approach encapsulates those aspects of the Burra Charter that are relevant to Aboriginal archaeological sites. The guidelines specify the following criteria for archaeological significance, as paraphrased below:

Research Potential

It is the potential to elucidate past behaviour which gives significance under this criterion rather than the potential to yield collections of artefacts. Matters considered under this criterion include - the intactness of a site, the potential for the site to build a chronology and the connectedness of the site to other sites in the archaeological landscape.

Representativeness

As a criterion, representativeness is only meaningful in relation to a conservation objective. Presumably all sites are representative of those in their class or they would not be in that class. What is at issue is the extent to which a class of sites is conserved and whether the particular site being assessed should be conserved in order to ensure that we retain a representative sample of the archaeological record as a whole. The conservation objective which underwrites the 'representativeness' criteria is that such a sample should be conserved.

Rarity

This criterion cannot easily be separated from that of representativeness. If a site is 'distinctive' then it is by definition, part of the variability found within a representative. The criteria might best be approached as one which exists within the criteria of representativeness, giving a particular weighting to certain classes of site. The main requirement for being able to assess rarity will be to know what is common and what is unusual in the site record but also the way that archaeology confers prestige on certain sites because of their ability to provide certain information.

The criterion of rarity may be assessed at a range of levels: local, regional, state, national, global.

Educational Potential

Heritage sites and areas should be conserved and managed in relation to their value to people. It is assumed that archaeologists have the ability to speak of the value of sites to members of their own profession. Where archaeologists or others carrying out assessments are speaking for the educational value of sites to the public the onus is on them to go to the public for an assessment of this value, or to reputable studies which have canvassed public demand for education. The danger, otherwise, is that archaeologists will be projecting their values onto a public which is itself given no voice on the matter.

Aesthetics

Archaeologists are not expected to include an assessment of aesthetic significance along with their assessment of scientific significance. In relation to heritage places, aesthetic significance is generally taken to mean the visual beauty of the place. Aesthetic value is not inherent in a place but arises in the sensory response people have to it.

Although the guidelines provide no expectation for archaeologists to consider *aesthetic values* it is often the case that a site's or a landscape's aesthetic is a significant contributory value to significance. Examples of archaeological sites that may have high aesthetic values would be rock art sites, or sites located in environments that evoke strong sensory responses - a local example would be the visually striking Illawarra Escarpment.

For this reason we consider it appropriate to include aesthetic values as part of the significance assessment below.

The DECCW *Standards and Guidelines Kit* (NPWS 1997) also provides advice on the assessment of Aboriginal cultural significance, based on the critical starting point that Aboriginal people are the primary determinants of the significance of their cultural heritage. DECCW's *2005 Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DEC 2005b) provide advice on the heads of consideration for project assessments under Part 3A of the EP&A Act. The Draft Guidelines focus on highlighting the multilayered and dynamic nature of Aboriginal cultural heritage and require that such considerations be included in heritage assessments. The Draft Guidelines also provide advice with regard to cultural landscapes:

> *...the significance of individual features is derived from their inter-relatedness within the cultural landscape. This means that features cannot be assessed in isolation, and that assessments need to consider the feature and its associations in a holistic manner. This may require a range of assessment methods with the close involvement and participation of Aboriginal people. Assessment will include lands, waterways, landscape features and native plants and animals that are culturally significant to Aboriginal people (DEC 2005b: 2).*

Assessment of Archaeological Significance - Aboriginal Archaeological Sites

An assessment of archaeological significance for the sites recorded within the assessment area is presented below. A statement of significance for the cultural landscape is also presented. This final statement of significance draws together both archaeological (or scientific) and cultural values.

Claymore 1
Archaeological Significance: LOW
Considerations against values criteria:
Research Potential
The site has low value against this criterion, as it exists in a disturbed and modified context. It has no potential beyond its recording in the landscape, which contributes to the overall patterning of archaeological sites, and understanding of Aboriginal occupation of the landscape in conjunction with other locally and regionally recorded sites.
Representativeness
The site has some representative value, as a site that has survived in a modern urban environment. However it is an example of the most common class of site in the locality and the region, and it is likely that many further similar sites exist, but have not yet been documented.
Rarity
Sites containing stone artefacts are not rare. The site contains a small assemblage that is typical of the area. Locally and regionally the site is of low value against this criteria as it is an example of the most common class of sites.
Aesthetic
The site is located in a heavily disturbed and modified urban environment. It has no value under this criterion.

Assessment of Significance - the Cultural Landscape

An assessment of the significance of the cultural landscape considers the landscape as a contiguous geographic area (DEC 2005c: 174), within which the relationships between locations and features in the landscape provide a holistic and dynamic historical record (Moylan *et al.* 2009, Guilfoyle 2006).

The landscape of the assessment area today is that of an urban suburb, on the fringes of continuous urban area. The area has been cleared of native vegetation, landscaped, modified and enclosed. There are pockets and isolated individual occurrences of remnant vegetation, however these exist within the urban environment in planned open space areas, and hence provide little connectedness to the wider landscape. Archaeological work on the Cumberland Plain over the last few decades has demonstrated that it holds a rich record of the material traces of past Aboriginal land use and history (Attenbrow 2010, White and McDonald 2010). This archaeological richness is well known to the Aboriginal community, and is a key cultural value. The representatives from the Tharawal LALC and Cubbitch Barta both advised whilst on site that the Aboriginal objects present at Claymore 1 are culturally significant as they are evidence of Aboriginal occupation of the Claymore area prior to European arrival. Further discussion of the cultural significance of the site can be found in the submission from Cubbitch Barta, reproduced in the Appendix.

In summary, the assessment area has low cultural landscape significance. The significance derives from values associated with the archaeological record of stone artefact sites and areas of archaeological potential: these provide a connectedness to the past within the now urban landscape. These past traces of Aboriginal land use provide a tangible link with the past for the contemporary Aboriginal custodians. The cultural landscape significance is adversely affected by the high levels of landscape modification that have taken place to create the suburb of Claymore. The creation of the suburb has isolated the area from the surrounding landscape, adversely affecting the connectedness of Aboriginal objects and places inside the suburb to those outside it. Nevertheless, a sense of the importance of the landscape to the Aboriginal community, and vice versa, continues and is expressed through the contemporary significance of Dimeny Park and the Aboriginal art work present there.

Overall the Claymore area makes relatively little contribution to the regional cultural heritage landscape values, as it is an area that has seen significant urban development. To the west and south of the Claymore area there still exist significantly less fragmented landscapes, with higher potential cultural landscape value.

15.0 IMPACT ASSESSMENT

Potential Impacts

The development of a Concept Plan is not an activity that in and of itself cause harm to Aboriginal objects as per the definitions in the *National Parks and Wildlife Act 1974*. Therefore the following impact assessment assumes harm will occur to objects as a result of activities conducted pursuant to the Concept Plan. The type of activities undertaken pursuant to the Concept Plan would include impacts such as excavation and land filling to implement the Urban Renewal Project. The potential for the proposal to impact the cultural landscape needs to be considered in terms of the further development and fragmentation of an already heavily modified landscape.

Sites and Areas of Archaeological Potential

Development works subsequent to the proposed Concept Plan will have a direct harm on the Aboriginal objects recorded as site Claymore 1. The proposed Concept Plan may also impact on Aboriginal objects that have the potential to occur in all reasonably undisturbed parts of Claymore. The potential significance of the archaeological heritage values of the Claymore area have previously been reduced due to urban development. The proposed further development, including areas that remain relatively undisturbed, will have a further cumulative and adverse effect on the Aboriginal heritage significance of Claymore. Notably, however, the preliminarily assessed archaeological significance—which should be further informed by sub-surface testing—is low.

The Cultural Landscape

Dimeny Park will be modified by the proposed Concept Plan. This has the potential to have an adverse effect on the contemporary cultural heritage values that have been identified as significant at the Park.

As noted earlier there are several stands and isolated individual old growth trees in the Claymore area. Many of these are situated around the current channel of McBarron Creek, and will be retained in the Concept Plan. The retention of the old growth trees, wherever possible is considered to be a positive cultural heritage outcome. Nevertheless, the further development and fragmentation of the landscape, including the development of those extant areas of remnant landscape that may possibly retain further buried Aboriginal objects will have a detrimental impact to the cultural landscape, such that it is.

Conclusion

The proposed Concept Plan is assessed to have an adverse minor impact to the Aboriginal cultural heritage values of the Claymore area, as described above. Given the already urbanised nature of the Claymore area these minor impacts are considered to be acceptable if the proposed mitigation measures recommended below are implemented.

16.0 RECOMMENDATIONS

Based on the above Aboriginal Cultural Heritage Assessment the following recommendations are made:

1. The Claymore area should be subject to further archaeological investigation prior to development. The purpose of the investigations would be to:
   - intensively and systematically survey all areas of reasonably undisturbed land to identify the presence or absence of Aboriginal objects, both stone artefacts and scarred trees.
   Based on the results of the survey, sub-surface testing may be required to fully assess the archaeological significance of the area.

2. The site Claymore 1 will be directly harmed by the proposed changes that will take place under the Concept Plan. Prior to further development the harm should be more fully assessed by sub-surface testing, and if appropriate mitigated by artefact collection.

3. The maintenance of the cultural heritage values expressed for Dimeny Park and the carved stones that are currently within the park should be incorporated into the planning of Dimeny Park in the Concept Plan. Such maintenance would involve retaining the carved stones in the proposed public open space and enhancing the Park's status and interpretation as a place that acknowledges the traditional Tharawal custodians.

4. Subject to discussion with the Aboriginal community and appropriate arrangements for security of Aboriginal objects and land tenure being put in place, Aboriginal artefacts collected from other parts of Claymore may be able to be stored or deposited at Dimeny Park. Arrangements for the long-term management for any such objects should be made prior to collection.

5. An Aboriginal Cultural Heritage Management Plan (ACHMP) should be developed to guide the ongoing management of Aboriginal cultural heritage matters throughout the Claymore Urban Renewal Project implementation. The recommendations at Point 1 are an essential first step for the ACHMP.

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APPENDIX:

SUBMISSION FROM CUBBITCH BARTA NATIVE TITLE CLAIMANTS ABORIGINAL CORPORATION

Cubbitch Barta Native Title Claimants
Aboriginal Corporation RNTBC
55 Nightingale Road,
PHEASANTS NEST. N.S.W. 2574.
2nd February, 2012

Mr Adam Coburn,
Campbelltown City Council,
P.O. Box 57,
CAMPBELLTOWN. NS.W. 2560.

Dear Adam,

RE; CLAYMORE RENEWAL PROJECT

Thank you for sending me the CD about the proposed project, which I would like to take this opportunity of commenting on the Aboriginal Cultural Heritage Assessment part of the proposed project.

This is the first time that I have seen the ACHD. I took part in the survey for the proposed project on the 28th April, 2011, and as from the map on page 21, you can see that the whole of the area was not surveyed.

Even though the area has been greatly modified from the original development, there is still one Aboriginal site that still exists within the Claymore area. The carved stones at Dimeny Park, are of contemporary cultural significance, because they were made with respect in honour of the Dharawal people. I therefore would like to make the following recommendations;

1. The location of the site, Claymore 1 within the concept plan at the moment will be destroyed. My recommendation therefore is that this site should be retained within an open area, and proactively preserve the location and surrounding area for the posterity of the people of Claymore, and the greater Campbelltown area. This area requires works to prevent any further erosion, so that other artefacts present will remain sub-surface.
2. I do not recommend any sub-surface testing of the area. The artefacts that can be seen there today, and their place in the landscape, are enough evidence of its existence. It would appear at the present moment that this is the only Aboriginal site still existing within Claymore.
3. The carved stones that currently are within Dimeny Park should remain there, but if that is not possible, then perhaps they could be moved to the site now known as Claymore 1, if this site can be retained.
4. The carved stones were made out of respect for the Dharawal people, and how fitting for them if they were placed at Claymore 1, a recorded Aboriginal place. I was not aware of their existence originally, but when told the story, I do consider them Culturally significant.

Campbelltown City Council has always been respectful of Aboriginal culture, and its significance to Aboriginal people. How better than to help preserve a little bit that is left within this residential area, for the future of not only the Aboriginal people of Campbelltown, but to the whole community.

I would also like to suggest perhaps some interpretative signs for Dimeny Park, if the carved stones remain, and if my first recommendation comes to fruition then the same.

When an Aboriginal Heritage Assessment goes on public display, the locations of any sites, and that includes photographs, GPS points and maps should not be put on public display. Too many of our sites and places are being destroyed by vandals and thiefs. The location of sites may only exasperate the problem.

Yours faithfully,

G. Chalker.

Glenda Chalker
Phone/Fax 02 46841129 0427218425

APPENDIX 3

CLAYMORE URBAN RENEWAL PROJECT

Ecology Study

For:

Landcom

May 2012

Final

CUMBERLAND ECOLOGY

PO Box 2474
Carlingford Court 2118

CUMBERLAND ECOLOGY

Report No. 11022RP4

The preparation of this report has been in accordance with the brief provided by the Client and has relied upon the data and results collected at or under the times and conditions specified in the report. All findings, conclusions or recommendations contained within the report are based only on the aforementioned circumstances. The report has been prepared for use by the Client and no responsibility for its use by other parties is accepted by Cumberland Ecology.

Approved by:	David Robertson
Position:	Director
Signed:	David Robertson
Date:	*28 May, 2012*

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INTRODUCTION

Purpose

The purpose of this report is to present the findings of an investigation into the potential ecological impacts of the proposed urban renewal project at Claymore ("the Project") in western Sydney. The scope of work for this project entailed mapping and assessment of existing native flora and fauna across the subject site, evaluating drafts of the Concept Plan and then assessing the impacts of the preferred Concept Plan on native flora and fauna.

This impact assessment covers all native flora and fauna including terrestrial and freshwater species but focuses upon threatened communities, species and populations listed under both the NSW Threatened Species Conservation Act 1995 (TSC Act) and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

Background

Cumberland Ecology was engaged by Landcom to conduct an ecological investigation of land at Claymore in western Sydney. The Claymore Urban Renewal Project is a 139.8 ha public housing estate located along Badgally Road adjacent to the Hume Highway M5 in the Campbelltown Local Government Area (LGA). This land was originally cleared and used for farming early in the history of Sydney. The predominant agricultural use was for grazing and by the late 1970s the subject site consisted of open grassland areas with scattered young regrowth of native trees.

Claymore is one of the largest public estates in South West Sydney, containing 1096 public housing dwellings, including detached cottages and townhouses. The estate was planned in the 1980s using the Radburn design principle with cul-de-sac, pedestrian pathways and excessive large open space areas; this design having proved to be unsuccessful in this context.

The Project will be delivered in stages over a 12-15 year period. Upon completion, it is anticipated that the Project will deliver approximately 1,280 dwellings/lots of which a maximum of 30% of the final yield will be retained for public housing. The development will include:

- The demolition of existing townhouses, poorly configured cottages and structures including roads and services;
- Upgrades to existing Housing NSW (HNSW) cottages to be retained on site;

- The construction of a new subdivision with works including new streets, stormwater management works, utility services and bulk earthworks;
- Public domain improvements, including landscaped reserves and new parks, as part of a network of public open spaces and street trees; and
- A use of land for housing and related purposes.

METHODS

A literature review was conducted of relevant ecological literature that covered flora and fauna of the subject site and surrounding locality. Databases containing flora and fauna records, including the State Wildlife Atlas and the Commonwealth Protected Matters Search Tool, were also interrogated to acquire information about flora and fauna known to occur in the locality.

Vegetation mapping of the subject land and that in the surrounding locality by the NSW Department of Environment and Heritage (NSW DEH) was studied to gain an appreciation of broad vegetation types that occurred.

Field surveys were conducted in April/May 2011 to ground truth the NSW DEH vegetation mapping; examine the nature and extent of fauna habitats; and to search for threatened species.

Vegetation was studied by completing 400 metre square quadrats within mapped native vegetation on the subject site. Within each quadrat each species of vascular plant was recorded and assigned a cover value. Plant community type was recorded and notes were made about the quality of fauna habitat.

Within patches of native trees and semi-natural grassland, targeted surveys were done for threatened plants, Cumberland Land Snail (Meridolum corneovirens) and for threatened bat habitat. The methods used for surveying these species is summarised within this report.

All habitats for native flora and fauna on site were considered and covered in the survey including remnant forest and woodland trees and riparian (stream) areas.

RESULTS OF FIELD INVESTIGATIONS

The subject site has had a long history of human land use and development. Originally used for farming, the land had been cleared and heavily modified by the time of the original housing development in the 1980s. All original trees appear to have been cleared and the native trees that occurred scattered across the gently undulating site are made up of regrowth and planted trees of various ages. The canopy is largely dominated by planted Australian native trees, most of which are representative of the original vegetation community within the area; however irregular occurrences of non-indigenous native trees indicate that most of the trees in the area have been planted. It is predicted that this planting occurred either in an agricultural setting, or following the original housing development.

Notwithstanding the high degree of modification of the landscape, areas of semi-natural vegetation remain and these have been derived from, or are low quality examples of, two TSC Act listed threatened vegetation types:

- River-flat Eucalypt Forest; and
- Cumberland Plain Woodland.

River-flat Eucalypt Forest is listed as an Endangered Ecological Community (EEC) under the TSC Act. Cumberland Plain Woodland is also listed as an EEC under the TSC and as a Critically Endangered Ecological Community (CEEC) under the EPBC Act. However, due to its relatively poor quality, the area of Cumberland Plain Woodland vegetation on the subject land does not conform to the EPBC Act listing for this community.

The natural or semi-natural vegetation that occurs on the subject site forms patches within reserves including Badgally Reserve, Dimeny Park, Fullwood Reserve and Davis Park. All of these areas are mown regularly and the vegetation consists of trees above a mown lawn, consisting of both native and exotic herbaceous plants. Young mature native trees occur within the yards of houses and along roadsides within the subject site.

The River-flat Eucalypt Forest includes scattered, highly modified stands of paperbarks (*Melaleuca spp*) and various trees such as Swamp Oak (*Casuarina glauca*) and Cabbage Gum (*Eucalyptus amplifolia*). The occurrences of Cumberland Plain Woodland include specimens of Coastal Grey Box (*E. moluccana*), Forest Red Gum (*E. tereticornis*), Narrow-leaf Ironbark (*E. crebra*) and Spotted Gum (*Corymbia maculata*).

Native shrubs and creepers are essentially missing from treed areas due to mowing. The ground stratum includes grasses such as Austrostipa racemosa, Windmill Grass (*Chloris ventricosa*), and Weeping Meadow Grass (*Microlaena stipoides*). Native herbaceous plants include Einadia polygonoides, Kidney Weed (Dichondra repens), Twining Glycine (*Glycine clandestina*) and Oxalis perenans. Exotic grasses are abundant and include such species as Couch (*Cynodon dactylon*), Paspalum (*Paspalum distichum*), African Love Grass (*Eragrostis curvula*) and Kikuyu (*Pennisetum clandestinum*). Exotic herbs include such species as Cats Ear (*Hypochaeris radicata*), Common Plantain (*Plantago lanceolata*), Fireweed (*Solanum madagascariensis*) and Spear Thistle (*Cirsium vulgare*). A list of species encountered in the field surveys and/or predicted to occur based upon literature review and interpretation of database records is presented in this report.

Fauna habitats are quite limited in the subject site. Most trees lack hollows, which reduces the value of the area for a wide variety of hollow dependant fauna including arboreal mammals, birds and bats. There are no major water bodies present, and the gully that occurs along the northern boundary of the subject site is a dry ephemeral creek that has been drained and is now regularly mown.

Due to its high degree of modification, the fauna of the subject site is typical of suburban areas. It is dominated by hardy native birds such as the Australian Magpie (*Cracticus tibicen)*, Australian Raven (Corvus coronoides), Eastern Rosella (*Platycercus eximius*), Rainbow Lorikeet (*Trichoglossus haematodus*) and Noisy Miner (*Manorina melanocephala*).

Likely fauna occurring in this area includes the Ringtail Possum (*Pseudocheirus peregrinus*) and Common Brush-tail Possum (*Trichosurus vulpecula*). Herpetofauna is poorly represented due to mowing but is likely to include common species such as the grass and garden skinks (*Pseudomoia spp*, and *Lampropholis spp.*) as well as the Common Eastern Froglet (*Crinia signifera*) and Spotted Marsh Frog (*Limnodynastes tasmaniensis*). A list of species encountered in the field surveys and/or predicted to occur based upon literature review and interpretation of database records is presented in this report. Likely feral animals include foxes and feral cats and Black Rats (*Rattus rattus*).

Targeted surveys for threatened species did not locate any threatened species of plants or animals. However, several threatened species have limited potential to occur, these comprising mainly wide ranging threatened species such as bats, including the Grey-headed Flying Fox (Pteropus poliocephalus) and various microbats.

IMPACTS OF THE PROPOSED REDEVELOPMENT

The proposed redevelopment of the subject site will remove patches of species-poor Cumberland Plain Woodland within Badgally Reserve and along the eastern side of the subject site. Of the total C/EEC vegetation present within the subject site, 37% will be removed and 63% will be avoided as indicated in **Table S.1** below. River-flat Eucalypt Forest will be completely avoided and retained. The removal of this Cumberland Plain Woodland will be appropriately compensated for and as such is not expected to have a significant impact upon the community.

Due to the highly disturbed nature of the vegetation within the subject site, fauna habitat is considered of little value to many species. Therefore, the proposed extent of removal of trees from this urban landscape is not expected to have a significant impact on any threatened species habitat, or threatened plant and animal species or populations within the LGA.

Table S.1 Summary of Vegetation Clearance and Retention

Vegetation Community	Area currently on site (ha)	Area to be cleared (ha)	Area to be retained (ha)
Cumberland Plain Woodland (CEEC)	2.75	1.15	1.6
River Flat Eucalyptus Forest (EEC)	0.33		0.33
Planted Native & Exotic Weeds	6.55	3.52	3.03
Total	**9.64**	**4.67**	**4.97**
Total EEC	3.08	1.15	1.93
		(37%)	(63%)

CONCLUSION

The subject site has been cleared and highly modified for many years, originally as a result of clearing for agriculture, then as a result of urban development in the 1980s. The remaining patches of woodland and open forest are highly modified and exist within mown parklands and to a lesser extent, within other open space (roadsides) and housing lots. Under a "do nothing" scenario, such vegetation has limited viability in the long term. Only one threatened species, Little Lorikeet was recorded flying over the subject site and is likely to forage in the area.

The proposed redevelopment of the subject site will remove patches of species-poor Cumberland Plain Woodland within Badgally Reserve and the north western corner of the subject site. It will remove native trees from across the existing suburban areas. The development is not likely to have a significant effect on CPW if the avoidance, mitigation and compensatory measures described in this report are implemented.

The impact avoidance and mitigation measures to be implemented will minimise the adverse effects of the Project on Cumberland Plain Woodland and threatened species habitat. Notwithstanding this, an offset strategy is proposed to address the net loss of Cumberland Plan Woodland on the subject site. The offset strategy is currently being developed to identify an appropriate offset area location and size and to include the principles of maintain, improve and protect. Ongoing management under a VMP is to improve and maintain the quality of the vegetation within the offset area.

No significant impacts are predicted for threatened species of plants or animals as a result of the redevelopment of the subject site.

Introduction

This chapter outlines the general purpose of the surveys and then goes on to briefly describe the objectives that this report plans to achieve. It also provides a table of the terms and abbreviations throughout the report.

1.1 Purpose

The purpose of this report is to assess the potential impacts to flora and fauna of the proposed Claymore Urban Renewal Project, with particular attention paid to species listed under the *Threatened Species Conservation Act 1975* (TSC Act) and the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). The subject site is located in the suburb of Claymore within the Campbelltown City Council along the Hume Highway in Sydney's South West.

The objectives of this report are to:

- Describe and map the vegetation communities on the subject site;
- Describe fauna habitats and fauna usage of the subject site;
- Assess the likelihood of threatened species as listed under the TSC Act and the EPBC Act occurring on the subject site;
- Assess the ecological constraints and opportunities for development on the subject site; and
- Where relevant, suggest mitigation measures to reduce the impacts of the proposed development on flora and fauna.

The report will be included as part of the Environmental Assessment (EA) of the Project to be submitted to the Department of Planning (DoP) (now known as the Department of Planning and Infrastructure (DP&I)) under the former Part 3A of the *Environment Planning and Assessment Act 1979* (EP&A Act) (which is subsequently being replaced: refer to Section 3.2)

1.2 Terms and Abbreviations

This report uses the following terms and abbreviations:

Table 1.1 Terms and Abbreviations Used in this Report

Term / Abbreviation	Meaning
CEEC	Critically Endangered Ecological Community listed under the TSC Act and/or EPBC Act
DSEWPC	Commonwealth Department of Sustainability, Environment Water, Populations and Community
DoP	NSW Department of Planning
EA	Environmental Assessment
EEC	Endangered Ecological Community listed under the TSC Act and/or EPBC Act
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
HNSW	Housing NSW
Important Habitat – Migratory Species (EPBC Act)	An area of 'important habitat' for a migratory species is: a) habitat utilised by a migratory species occasionally or periodically within a region that; ➢ supports an ecologically significant proportion of the population of the species; and/or ➢ habitat that is of critical importance to the species at particular life-cycle stages; and/or ➢ habitat utilised by a migratory species which is at the limit of the species range; and/or ➢ habitat within an area where the species is declining.
LGA	Local Government Area
Locality	The area within 10km of the subject site
Local Population	The population of a given species that occurs associated with the subject site.
Population of a migratory species (EPBC Act)	'Population' in relation to a migratory species means the entire population or any geographically separate part of the population of any species, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries including Australia.

Table 1.1 Terms and Abbreviations Used in this Report

Term / Abbreviation	Meaning
OEH	NSW Office of Environment and Heritage
Subject site	Refers to the parcel of land with the boundary outlined in **Figure 2.1**
Threatened flora and fauna	Refers to communities, populations and species listed as Vulnerable or Endangered under the EPBC and TSC Acts
TSC Act	*NSW Threatened Species Conservation Act 1995*
VMP	Vegetation Management Plan

Chapter 2

Site Assessment

This chapter provides a general description of the subject site based on information provided by the Department of Planning (DoP) as well as a short description of the general physical features of the subject site.

2.1 The Site

The Claymore Urban Renewal Project is a 139.8 ha public housing estate located along Badgally Road adjacent to the Hume Highway M5 in the Campbelltown Local Government Area (LGA) (**Figure 2.1**). It is approximately 2 km north of Campbelltown Town Centre and is surrounded by the established residential area of Eagle Vale and Blairmount.

Claymore is approximately 56 km from the Sydney CBD and approximately 2 km north of Campbelltown Town Centre. The topography of the subject site is undulating, with ridgelines generally extending parallel along Badgally Road. There are a number of high points along this southern side of the site with additional rises in the central portion. The low points of the subject site are generally within the linear park traversing the northern portion of the subject site.

Some steep areas of land with slopes greater than 18% meander through the site, partially contributing to the form of the existing road pattern. Such slopes will have a significant impact on the size of lots in some areas, even after significant bulk earthworks have been completed and consideration has been given as to whether 100% of existing roads should be demolished.

2.2 The Project

Claymore is one of the largest public housing estates in South West Sydney, currently containing 1,123 public housing dwellings including detached cottages and townhouses. The estate was planned in the 1980's using Radburn design principles with cul-de-sac, pedestrian pathways and large open space areas. This design has been shown to be unsuccessful in this context, and therefore this area is proposed to be redeveloped to increase the number of dwellings present in this area.

Landcom has been engaged by Housing NSW (HNSW) to deliver the Claymore Urban Renewal Project, following the Federal Government's recent allocation of $12.96M under the

Housing Affordability Fund (HAF) to develop a master plan and undertake site works at Claymore. The preferred plan for the subject site can be seen in **Figure 2.2** below.

2.3 The Planning Process

The subject site will be developed in stages over 12-15 years. This requires listing the area as a State Significant Site and having it dealt with as a Major Project under the EP&A Act. Part 3A of the EP&A Act has recently been abolished and no new major projects will be assessed under Part 3A. Interim legislation has been implemented by the State Government to assist with the transitional period prior to establishing a new review process for major projects.

Landcom is preparing an environmental assessment (EA) for a Project Application to facilitate Infrastructure and Early Works, including site preparation, infrastructure and roads for Stages 1 and 2.