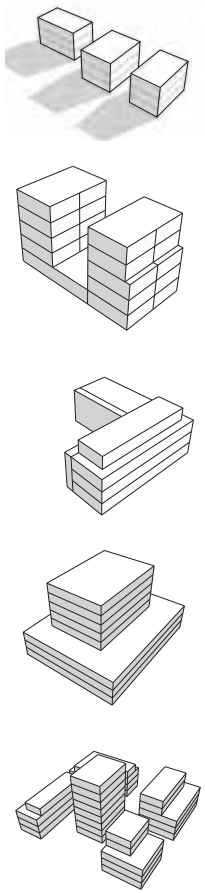
STIRLING CITY CENTRE

URBAN TYPOLOGY FRAMEWORK



CODA robertsday

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1.0

Typology Framework

1.1 INTRODUCTION

The Stirling City Centre has been identified as a 'Strategic Metropolitan Centre' under the Department of Planning's Directions 2031. It is the intention of the Department that Stirling City Centre…'will ultimately develop to complement Perth central area as a major employment centre, and will become more diverse with the progressive introduction of housing and associated social infrastructure.' This handbook has been devised to provide a framework for Stirling's renewal and development that will enable it to meet these targets established by the Department of Planning. It does this by establishing an architectural language that is coherent across an area in excess of 300 hectares; it will be key in ensuring that Stirling City Centre achieves the goal of becoming 'a 21st century sustainable city by 2031'.

This Urban Typology Framework has been divided into 4 parts: Analysis, Architecture of its Climate, Place and Culture, Character Zones and Building Typologies.

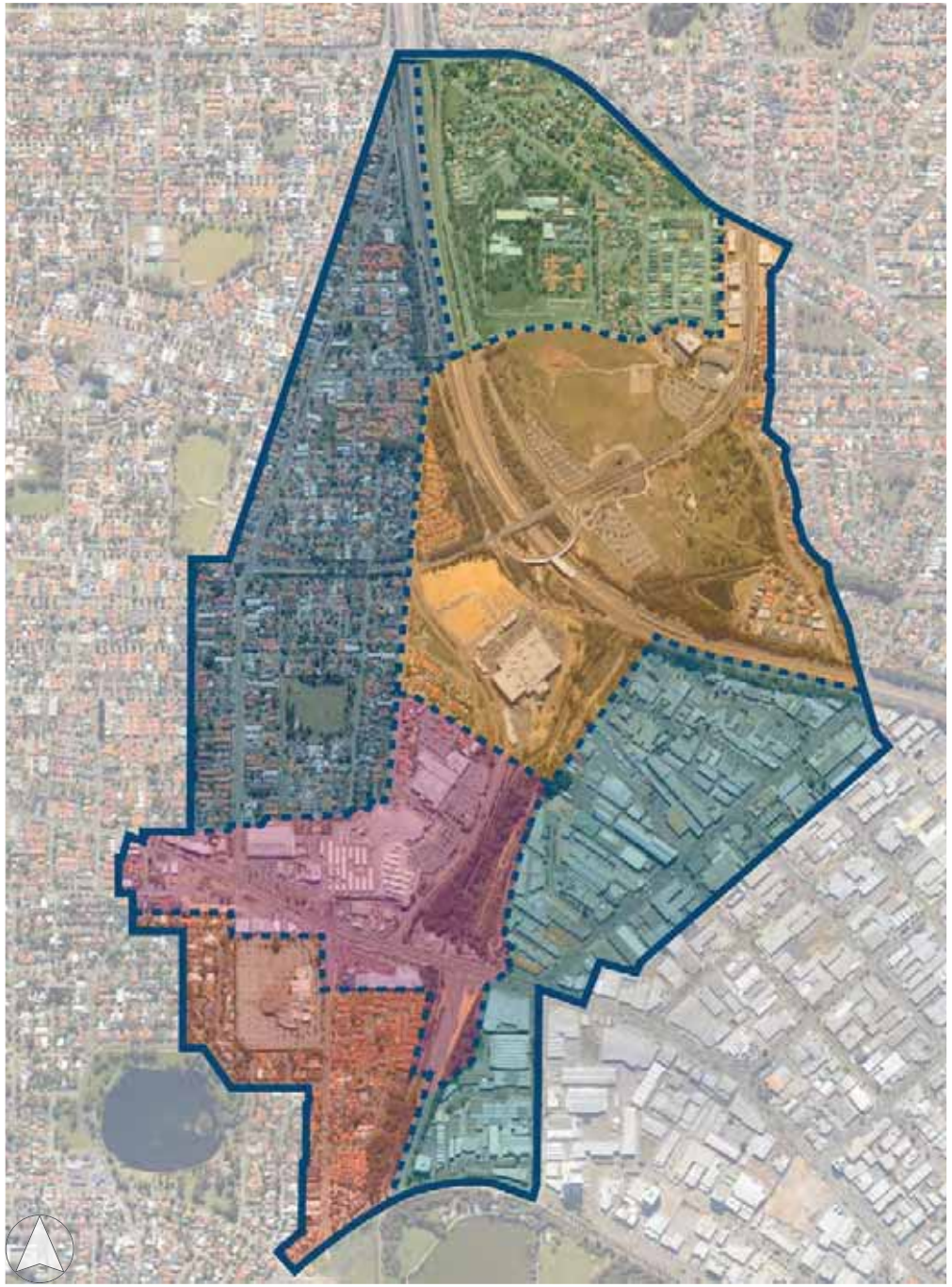
The first part, Analysis, provides a study of the architectural language that currently informs each of the 6 precincts making up the City Centre. Positive and negative elements have been included in order to show successful architectural techniques from the past as well as those that should be avoided in the future. The Analysis provides a study of overseas, interstate and Perth-based precedents that could inform new building principles in Stirling.

Part 2, Architecture of its Climate, Place and Culture provides a description of the key attributes that will inform the development of each new building typology. The broad distribution of these attributes across the each building type will ensure the development of a strong and coherent architectural language for the city centre. Imagery and diagrams are used to ensure that the intention of each attribute is understood.

Part 3 translates these key attributes into 4 place specific, identifiable character zones. These zones will provide the variety of scale, density and texture required of a fully realised urban centre. This section will provide guidance on such considerations as design intent, building articulation, architectural detail and landscape.

Part 4, Building Typologies, provides specific detail and guidance for the development of each new building type. It does this through a combination of text, 3D drawings, plans and section diagrams.

To summarise, the purpose of the Urban Typology Framework is to communicate a range of contextually appropriate built form and urban realm standards that would enable successful development within the Stirling City Centre. It does this by providing a thorough analysis of the existing environmental, architectural and cultural framework of the city, the precedents that could inform new development as well as presenting a range of visual and written examples for potential development.



STIRLING CITY CENTRE

1.2 STIRLING CITY CENTRE URBAN TYPOLOGY FRAMEWORK

WHAT IS AN URBAN TYPOLOGY AND URBAN TYPOLOGY FRAMEWORK?

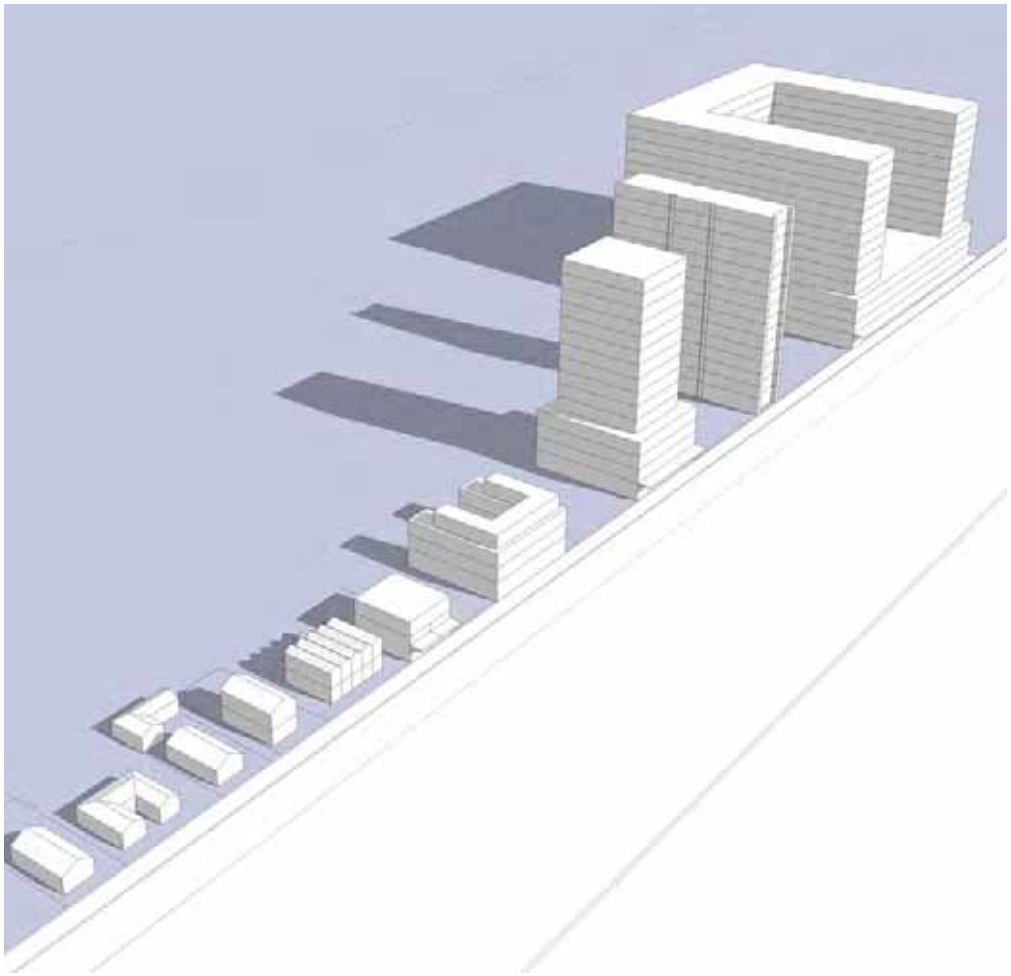
An urban typology is the physical aspect of an urban pattern that determines the character of a place and is comprised of a wide range of physical and controllable elements that are categorised into to 3 distinct but also interrelated categories; built form, thoroughfares and civic spaces. These are the three controllable physical aspects which will collectively influence most experiences and memory of a place. Our sense of place is the sum of the total experience from arrival to departure, which will involve experiences of buildings, thoroughfares and civic spaces. The Urban Typology Framework focuses its analysis on building types and architectural elements, and their relationship to the public realm, although the landscape and public realm is subject to a separate brief.

WHAT IS A BUILDING TYPOLOGY?

A building typology is a tool for categorising and describing buildings based upon common physical characteristics. A building typology is not a building in itself but instead a generic building form which allows us to group and describe the character and scale of both pre-existing buildings within the Stirling City Centre and of that of future developments.

Applying building typologies to lots of various sizes allows us to assess the quality of the built outcome for those who will use and occupy the building and whether that typology is conducive to the desired built form character for a particular area. Therefore a list of different building typologies that are suitable for different areas can be built up

The transition from a building typology to an actual building requires an adaption based upon site specific constraints and opportunities. Building typologies are not entirely prescriptive and the final built outcomes may be a hybrid building type which combines multiple building typologies into a single built form or multiple building typologies grouped on a single site provided that it is large enough.



BUILDING TYPOLOGIES OF INCREASING DENSITY

1.3 RELATIONSHIP TO FBC

The Stirling City Centre Urban Typology Framework explores a core set of values, objectives and design principles that will be used as a reference point to guide the realisation of the Stirling City Centre Vision.

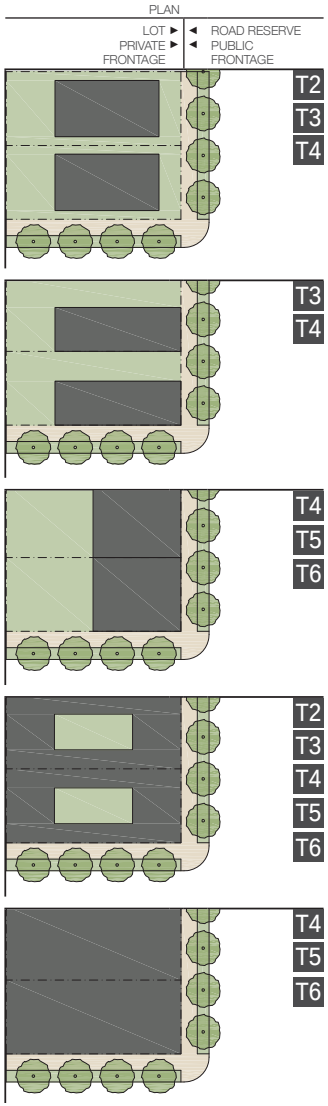
The content of the Urban Typology Framework, together with the Stirling City Centre Structure Plan will be synthesized and applied to create a set of planning and building design "rules" commonly referred to as Detailed Area Plans (DAP) and Form Based Codes (FBC). Together, these documents will integrate important values and design principles and propose detailed design solutions for buildings, streets and public spaces – the total experience of the place.

The DAP will become the overall "regulating plan" or master plan which will cater for the desired land use mix, employment and density targets and the FBC will provide the appropriate controls for buildings, the interface between public and private through control of building frontages; and public realm controls for the various street types and public spaces.

Form Based Codes's are unique in that they place increased emphasis on the physical form of buildings and infrastructure and utilise graphics to clearly illustrate the required form of new development.

The Stirling City Centre FBC will apply the character precinct qualities and methodology of the Urban Typology Framework– an organising principle that is based on physical character and the continuum of intensity that ranges from the Residential Gardens zone to the most urban characteristics of the City Centre Heart zone. This will ensure that all buildings are visually compatible and will embrace vernacular and contemporary building traditions appropriate to Stirling and the wider Perth region and its climate.

Stepbacks/Arcade Heights. The diagrams below show Arcade Frontages. Diagrams above apply to all other Frontages.

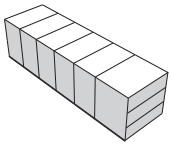
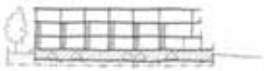
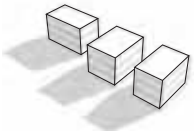
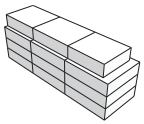
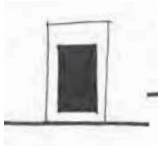
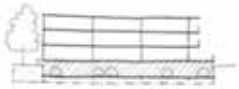
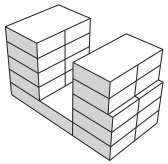
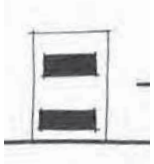
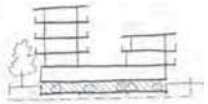
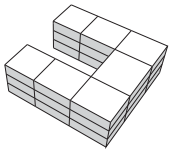
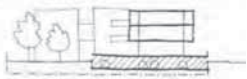
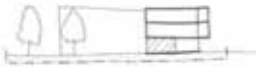
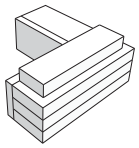
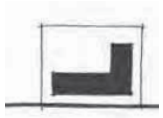


EXAMPLE OF FORM BASED CODES

TYPOLOGY FRAMEWORK

	TYPE	MIN LOT SIZE	OPTIMUM LOT ORIENTATION	CARPARK OPTION	USE	LOCATION DETAIL (x)=max storey	PRECINCT
1	3 storey GROUP HOUSE	500 m^2-1500m^2	E-W	UNDER MAIN BUILDING SEMI-BASEMENT	RES	Tip site – edge Sth hospital All Innaloo Woodlands – edge Cinema edge	STATION NORTHERN INNALOO WOODLANDS
2	3 storey PAVILION CLUSTER	700 m^2	DESIGN SPECIFIC	UNDER MAIN BUILDING ON GRADE REAR SEMI-BASEMENT	RES	Tip site – edge Sth hospital All innaloo Woodlands - edge	STATION NORTHERN INNALOO WOODLANDS
3	3-4 storey CENTRAL BLOCK	800 m^2	E-W	UNDER MAIN BUILDING ON GRADE REAR SEMI-BASEMENT	RES	Around La Dongara (4) All innaloo (3) Sth hospital(3) Liege st (3) Woodlands–edge(3)	INNALOO NORTHERN WOODLANDS
4	3-5 storey DOUBLE BLOCK	800 m^2	N-S	UNDER MAIN BUILDING ON GRADE REAR SEMI-BASEMENT	RES MIX	Oswald,Twyford Stavely. Betw Step + Ellen stirling mid-blk. Cinema edge	STATION SOUTHERN WOODLANDS
5	3-4 storey COURTYARD	1600 m^2	E-W	UNDER MAIN BUILDING ON GRADE REAR SEMI-BASEMENT	RES	Liege. Cinema edge. Woodlands–edge Innaloo (3) Parkland Villas	WOODLANDS INNALOO
6	3-4 storey PARTIAL COURTYARD	700 m^2	ANY	UNDER MAIN BUILDING ON GRADE REAR SEMI-BASEMENT	RES	Around La Dongara (4) All innaloo (3) Sth hospital(3) Woodlands–edge(3) Liege st (3) Parkland Villas	INNALOO NORTHERN WOODLANDS

TYPOLOGY FRAMEWORK

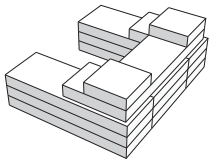
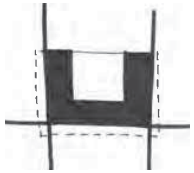
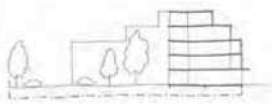
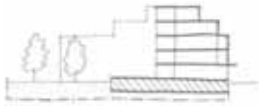
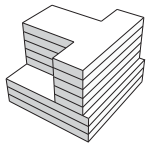
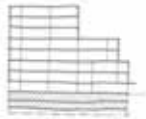
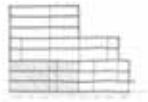
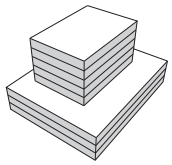
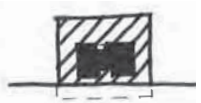
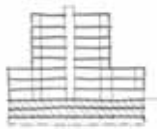
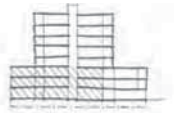
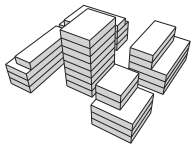
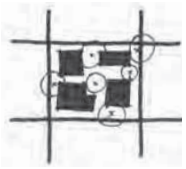
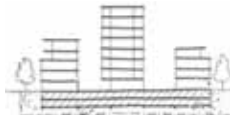
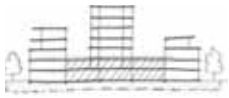
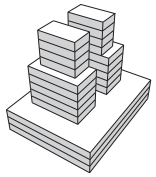
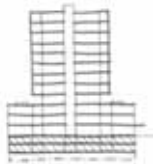
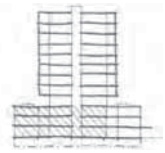
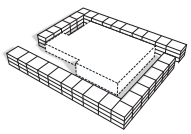
CHARACTER ZONE	MASSING MODEL	BUILDING FOOTPRINT	SECTION: ON-GRADE	SECTION: BASEMENT	SECTION: UMB/DECK PARKING
RESIDENTIAL GARDENS					
RESIDENTIAL GARDENS					
RESIDENTIAL GARDENS					
RESIDENTIAL GARDENS MIXED-USE LIFESTYLE					
RESIDENTIAL GARDENS					
RESIDENTIAL GARDENS					

1.4 URBAN TYPOLOGY MATRIX

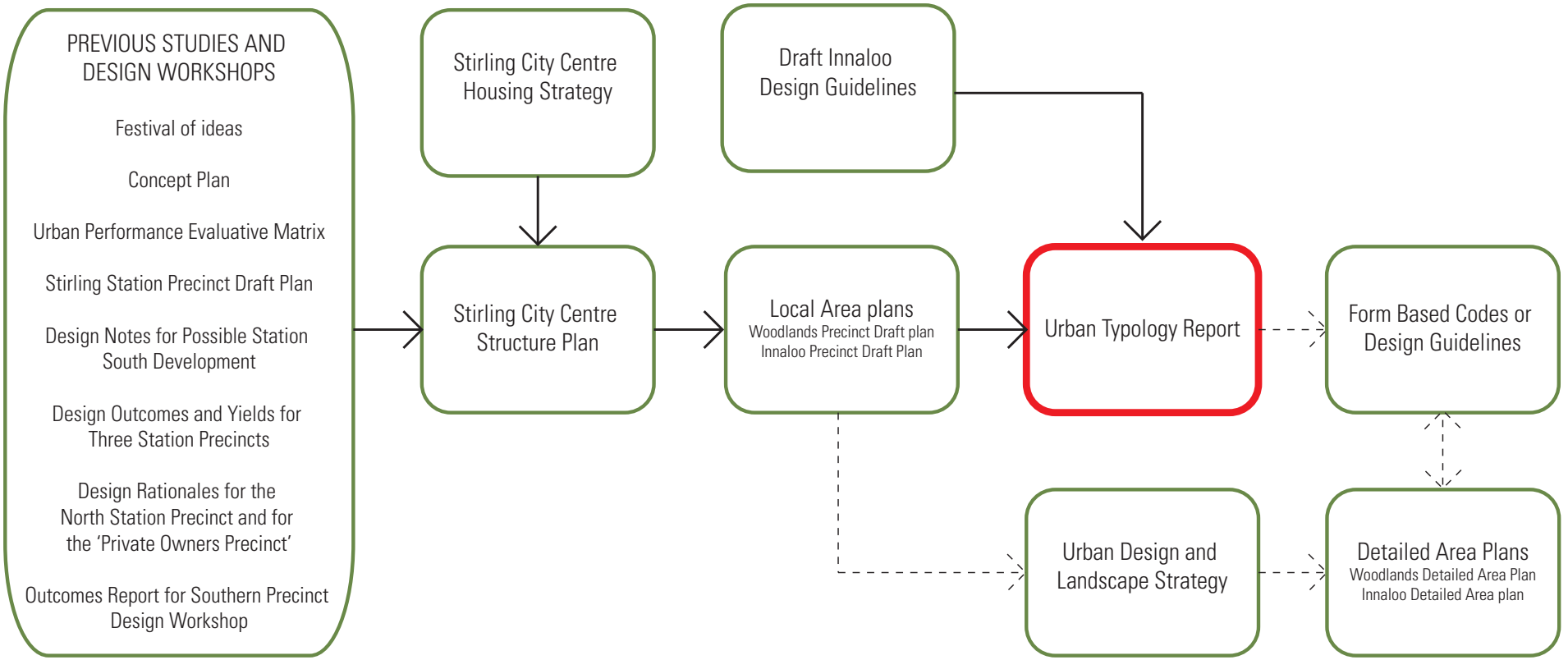
TYPOLOGY FRAMEWORK

	TYPE	MIN LOT SIZE	OPTIMUM LOT ORIENTATION	CARPARK OPTION	USE	LOCATION DETAIL (x)=max storey	PRECINCT
7	3-5 storey PERIMETER	1600 m^2	E-W	UNDER MAIN BUILDING ON GRADE REAR SEMI-BASEMENT DECK	MIX RES	Oswald/Twy/Stav Tip site , Cedric Ellen stirling Stephenson Cin nth(4) Parkland Sch Bch King Edw	STATION SOUTHERN WOODLANDS OSBORNE PARK
8	5-8 storey T BLOCK	1200 m^2	-	BASEMENT DECK	MIX RES	Stephenson Sch Bch (5) Cedric (5) Oswd/Twy/Stav(5) King Edw (5) Cinema –inner (7)	SOUTHERN STATION OSBORNE PARK WOODLAND
9	5-8 storey PODIUM	2000 m^2	-	BASEMENT SEMI-BASEMENT DECK	MIX RES	Tip site Station area Sand patch Stephenson Sch Bch (5) Cnr(7) King Edw (5)	SOUTHERN STATION OSBORNE PARK WOODLAND
10	4-8 storey CLUSTER	4000 m^2	DESIGN SPECIFIC	BASEMENT SEMI-BASEMENT DECK	RES	Tip site – inner Cinema – inner (7) Parkland villa (5) Inner area	STATION WOODLANDS OSBORNE PARK
11	8-15 storey PODIUM/TOWER	2000 m^2	-	BASEMENT DECK	MIX RES	Station area Sand patch	STATION
12	3-4 storey LINER BUILDING	500 m^2	N-S	ON GRADE REAR OFF SITE	COMM	Ellen Stirling Boulevard Scarborough Beach Road Sand Patch(IKEA)	STATION SOUTHERN

TYPOLOGY FRAMEWORK

CHARACTER ZONE	MASSING MODEL	BUILDING FOOTPRINT	SECTION: ON-GRADE	SECTION: BASEMENT	SECTION: UMB/DECK PARKING
RESIDENTIAL COMMUNAL MIXED-USE LIFESTYLE CITY CENTRE CIVIC IDENTITY					
RESIDENTIAL COMMUNAL MIXED-USE LIFESTYLE CITY CENTRE HEART CIVIC IDENTITY					
RESIDENTIAL COMMUNAL MIXED-USE LIFESTYLE CITY CENTRE HEART CIVIC IDENTITY					
RESIDENTIAL COMMUNAL					
CITY CENTRE HEART					
CITY CENTRE HEART					

1.5 RELATIONSHIP TO PREVIOUS STUDIES

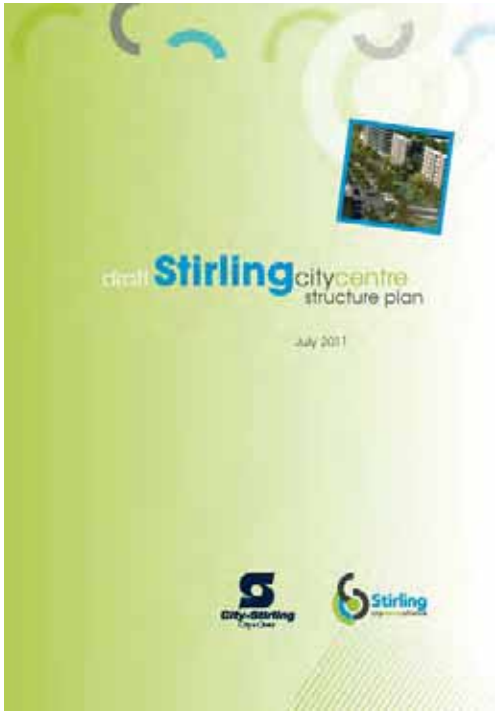


- - - - - To be completed in 2013/2014

1.5 RELATIONSHIP TO PREVIOUS STUDIES

STRUCTURE PLAN

The Stirling City Centre Structure Plan has been prepared to guide planning and decision making in order to realise the Stirling City Centre Vision. Although conceived as a single cohesive mixed use centre the Stirling Alliance has identified a variety of "neighbourhoods" or precincts each of which contains and will continue to evolve their own distinct character and image, ultimately enabling a rich diversity of experiences across the City Centre. The 6 precincts include the Southern Precinct, Station Precinct, Northern Precinct, Osborne Park Precinct, Innaloo Precinct and Woodlands Precinct. Each precinct is identified by a unique composition of uses and infrastructure elements.



Design Rationales
for the North Station Precinct
and for the 'Private Owners Precinct'
7 November, 2010

Prepared for the Stirling City Centre Alliance by
Ecologically Sustainable Design Pty Ltd
(the goal)
ACN 077 677 948; ABN 31 673 528 551
243 McKean Street
North Fitzroy, 3068, Victoria, Australia
tel 61-3-9481-0637, fax 61-3-9481-0585, email: esdesign@netspace.net.au
www.ecologicallysustainabledesign.com

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Outcomes Report
for the
Stirling City Centre
Southern Precinct Design Workshop
Of 27-29 September, 2011

Prepared for Stirling City Centre Alliance
By

Ecologically Sustainable Design Pty Ltd (ESD)
243 McKean Street
North Fitzroy, 3068, Victoria, Australia
tel 61-3-9481-0637, fax 61-3-9481-0585, email: esdesign@netspace.net.au
www.ecologicallysustainabledesign.com
and
Moule Polyzoides Architects and Urbanists (MPA)
180 E. California Blvd, Pasadena, California
tel 00111-626-844-2400, spolyzoides@mparchitects.com
www.mparchitects.com

Architecture
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2.0

Analysis

2.1 **OVERVIEW**

This section provides an overview of the architectural language that currently informs each of the 6 precincts making up the City Centre. Positive and negative elements have been included in order to show successful architectural techniques from the past as well as those to be avoided in the future. Included in the Analysis is a study of overseas, interstate and Perth-based precedents that have the potential to inform new building principles in Stirling.

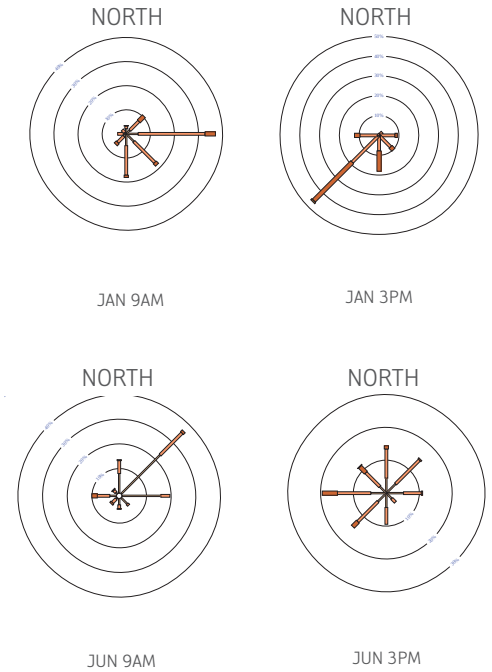
EXISTING BUILDING TYPOLOGIES WITHIN STIRLING CITY CENTRE

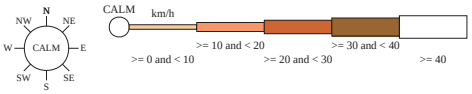
2.2 CLIMATE

Stirling City Centre has a temperate climate, with mild winters and hot dry summers and an average of eight hours sunshine a day. The summer months from December to February have an average temperature of 30 degrees Celsius during the day, and 17 degrees Celsius at night but can rise to and above 40 degrees at the height of summer. The area experiences a very low rate of humidity.
In general, shading is encouraged to protect all walls, in particular those facing east and west. Passive cooling through the capturing of the sea breeze also assists in the lowering of temperatures. Mechanical cooling is often required during the hottest summer months in particular for the more inland precincts.
The winter months from June to August are mild, with average temperatures of 18 degrees Celsius during the day, and 9 degrees Celsius at night. The average yearly rainfall is around 880mm with the wettest month being July. Temperatures at night are generally comfortable throughout the year, however the night purging of hot air can be used effectively to help maintain comfortable internal temperatures. From June through to September, nighttime temperatures often fall below the comfort limit. To control this the use of heavy mass materials could be employed to capture and store daytime solar heat gain. The design must ensure that the same mass is protected from solar heat gain in summer to prevent overheating.

WIND PATTERNS

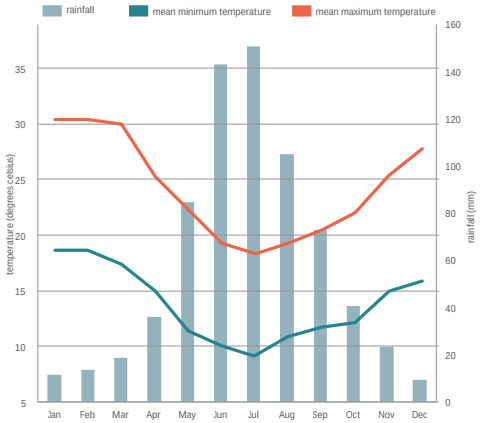
Wind patterns are typical of the west coast; easterlies blow in the morning whilst afternoon westerlies provide a cooling ocean breeze over metropolitan Perth and through to the Darling Ranges. This effect is due to differing rates in which land and seat alter in temperature. Land mass heats and cools faster than the sea.
The winter wind pattern is less predictable. Land temperatures are less extreme resulting in winds differing in direction and typically less that 20km/h in speed. A degree of mechanical assistance can be expected in the ventilation of buildings, however through the implementation of good passive control responses it's possible to limit reliance on these devices.





Perth Metro BOM station.
Site: 009225 ·
Opened Feb 1993 ·
Lat: -31.9192° ·
Long: 115.8728° ·
Elevation 24.m

WIND DIRECTION/STRENGTH



Subiaco treatment plant
BOM station.
Site 009151,
opened 1967.
Lat-31.9556
Long-115.7928
Elevation 20m

Information sourced from Bureau of Meteorology website on 30/07/2012

MONTHLY RAINFALL AND MEAN TEMPERATURE

2.3 LOT ORIENTATION

STATION, OSBORNE PARK & SOUTHERN
Typically these areas are dominated by large traffic thoroughfares and lack the smaller scale streets of the surrounding precincts. This has come about because of the predominance of large format retail, particularly in the Southern precinct, and industrial development in Osborne Park.
The land east of the train station is currently underdeveloped with Cedric Street, Mitchell Freeway and the proposed extension of Stephenson providing the major road structure for future subdivisions. These roads are generally non-cardinal and will need to be built upon with the access roads proposed in the structure plan. While the requirement for street front activation will dictate the orientation of most buildings, there may be increased opportunity to design to optimise solar orientation in deep lots.

NORTHERN, INNALOO & WOODLANDS
The street and lot network is already well established in these areas and unlikely to change in face of new development. These areas are largely cardinal in lot orientation which makes it easier to design to maximise solar orientation. The most significant change within these precincts will be the amalgamation of lots to allow for higher density redevelopment.

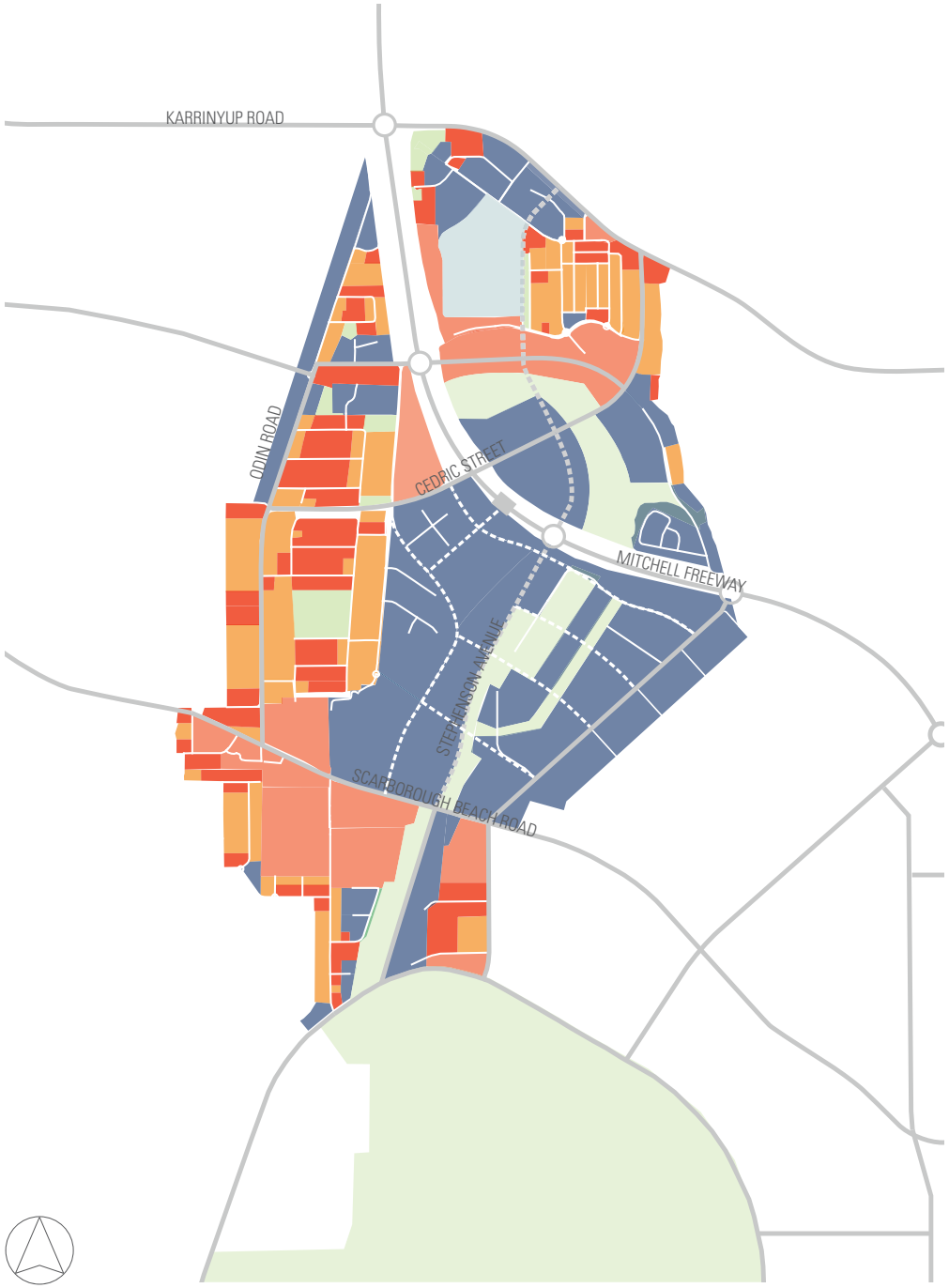
EAST-WEST (CARDINAL)

NORTH-SOUTH (CARDINAL)

NON CARDINAL

CARDINAL -LARGE LOTS (EITHER E-W OR N-S)

Non-cardinal: not orientated along the cardinal directions. ie not North-South or East-West.



LOT ORIENTATION PLAN

3.0
Analysis
Innaloo Precinct

3.1 **OVERVIEW**

The Innaloo Precinct is a suburban residential area dominated by single storey detached dwellings. The housing style of the 60s and 70s pervades most of the area, though more recent redevelopments are beginning to dominate around La Grange Reserve. Older buildings are typically the only examples of single detached dwellings, with newer developments taking advantage of high land values and the current R40 zoning by developing three grouped dwellings. Of the subdivided lots, battle axe subdivision and three lot survey strata layouts (group development) appear to be most popular redevelopment approach with few green title redevelopments evident. Approximately 25% of the area has already been developed in this form.

The prevalence of architectural styles from the 60s and 70s indicates the era in which most housing development occurred within the area. This typically results in houses with lower pitched, hipped or gabled, roofs covered with light colour (often orange) concrete tiles and light coloured exposed (salmon brick or painted) brick walls, often complemented by an external stone feature wall. Most houses had a smaller front verandah providing a clear entry to the street facing front door and well maintained and simple front yards, with large grassed areas. The relocation of the car garage from the rear of the block closer to the street, and often within the main roof, occurred during this period. These single garages extended the building to the side boundary perimeter with the only vehicle access to the rear yard via the garage. There is evidence Government housing may have been provided within the northern part of the precinct but not to the extent of other areas within the western portion of Innaloo.

The 1960s project homes were adapted to suit the topography of the subdivision, expressed by undercroft parking which reduces the carports presence to the street and results in some variation to the typical 60's house type. However this does not contribute specifically to the character or identity of the Innaloo Precinct. The most distinct feature of this precinct is La Grange Reserve, the subtle topography changes to the south and its close proximity to retail.

The recent strata redevelopments are typical of any R40 development area within Perth or WA's larger regional towns. This anonymous style of modern residential development will continue to spread and extend throughout the Innaloo Precinct if no changes to the zoning or design controls are implemented and will continue to diminish any precinct distinctiveness that previously existed.

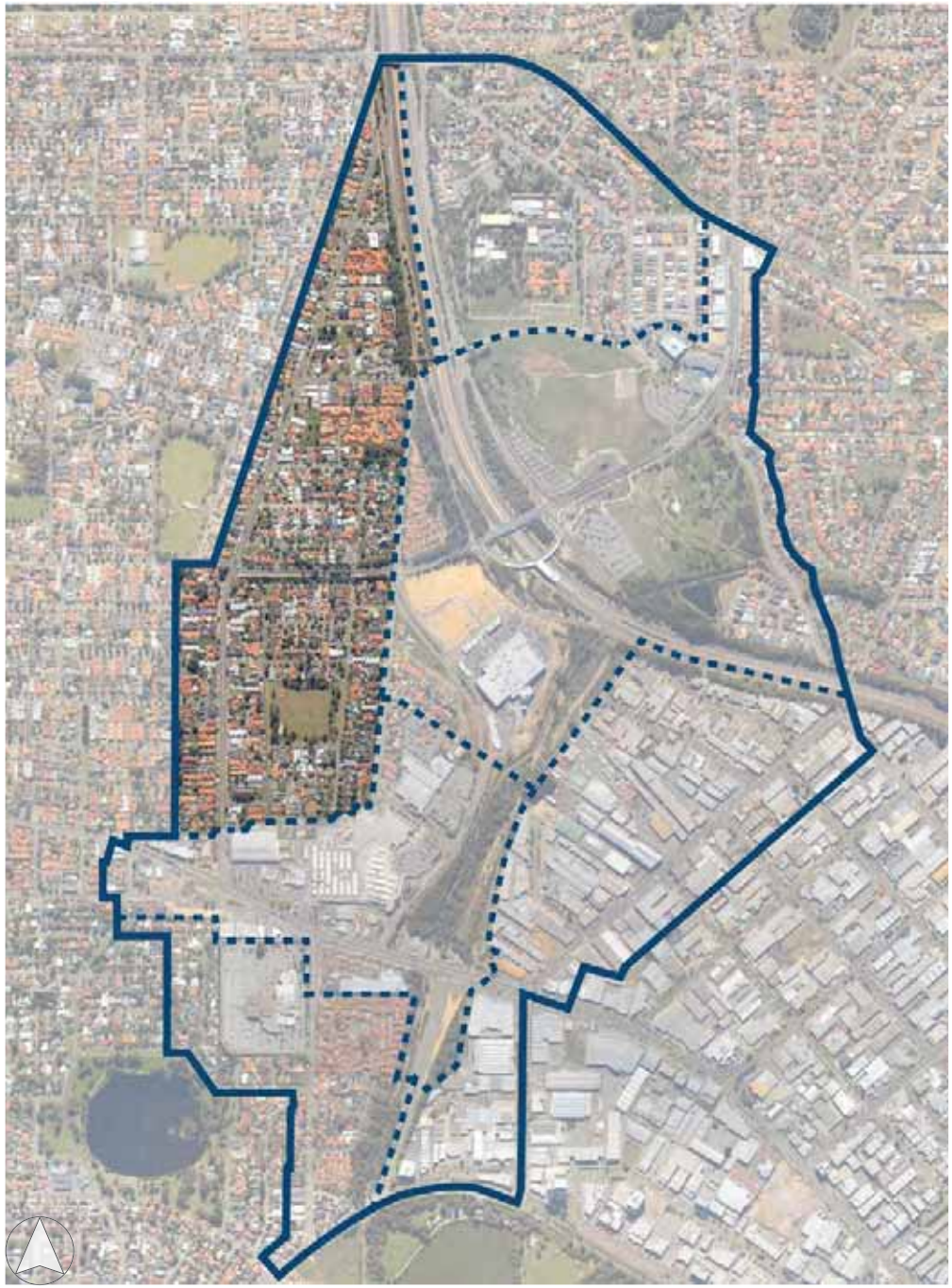
The Stirling City Centre Housing document presents a vision for the Innaloo Precinct as becoming Stirling's 'inner city' neighbourhood; a medium to high density residential area focussed around the La Grange Dongara Reserve, with dwelling densities equivalent from R50 to R80.

To glean some built form inspiration from the precinct's existing housing stock, we have analysed a cross-section of houses and development types to formulate a list of positive and negative elements that will assist in the development of future higher density housing types.

Current dwellings: 727
Target dwelling yield: 2500
Minimum dwelling yield: 1619
Average net density required to achieve target: 181 m2[1]

Analysis Area 01	Cloates Street
Analysis Area 02	Hartog Street
Analysis Area 03	Nangetty Street
Analysis Area 04	Dongara La Grange Reserve

1. Stirling City Centre Housing Strategy, Hassell Architects

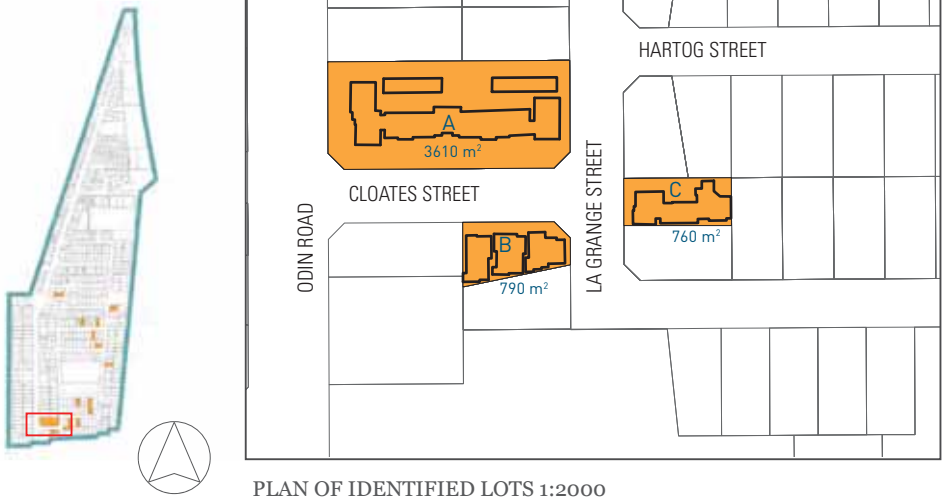


INNALOO PRECINCT

3.2 CLOATES STREET

AERIAL VIEW OF CLOATES STREET

Cloates Street functions as one of the primary access route into the Innaloo Precinct from the West. Currently this area has mix of building types, with 1980s units, 1990s group dwellings and a more recent battle-axe development. Of particular note are the multiple housing units located on the northern side of the street which serve as a pre-existing example of a housing type that will be utilised in the future redevelopment of the area, albeit to a higher density.



PLAN OF IDENTIFIED LOTS 1:2000

A Multiple Housing and group dwelling development from the 1980s containing 20 individual dwellings.

B Three lot strata subdivision from the 1990s or early 2000s.

C 2 lot strata subdivision in a battle axe formation built within the last 10 years.

3.2 HARTOG STREET

AERIAL VIEW OF HARTOG STREET

Hartog Street retains much of the original housing from the 1960s and 1970s, with little additional renovations or subdivision. A sloping topography has enabled undercroft parking for the original 1960s houses.

PLAN OF IDENTIFIED LOTS 1:2000

A Original 1960s housing type with feature stone entry. The lot's topography enables undercroft parking which minimises the carports presence on the street.

B Original 1960s or early 1970s housing type with aluminium windows, the exterior feature wall is of horizontally stacked brick rather than stone.

C Original 1970s housing type with narrower eaves, gable edge feature and a carport within the main roof.

3.2 NANGETTY STREET

AERIAL VIEW OF NANGETTY STREET

Nangetty Street has a relatively high level of redevelopment, with around 50% of buildings in this area being completed within the last 15 years. These newer developments have subdivided their blocks into group housing developments of two to three strata lots.

PLAN OF IDENTIFIED LOTS 1:2000

A Original 1960s house with newer battle axe development and carport addition. Eaves along the side have been reduced to facilitate development. The carport addition dominates the front facade. The original stacked stone feature wall is typical of 1960s houses.

B 3 dwelling group development with two storey house facing the street and single storey houses to the rear. Negative features are the lack of eaves, the blank wall facing the publicly accessible area, security shutters on the windows and a garage that faces the street.

C 3 lot group development, all two storey houses. There is a lack of fine grain interest due to the completely rendered facades. Other negative features include the narrow eaves, double crossover and services that can be viewed from the street.

3.2 DONGARA RESERVE

AERIAL VIEW OF DONGARA RESERVE

Dongara La Grange Reserve provides recreational amenity to the Innaloo Precinct, especially to those houses directly adjacent. Recent redevelopment has occurred here despite having a significantly higher redevelopment potential in the proposed Stirling City Centre Structure Plan. Unfortunately, most houses do not address the reserve, with carports, garages and large walls dominating street frontages. Furthermore, lots on the northern boundary, whose land directly abuts the park, turn their backs to the park with high solid fencing. One positive outcome has been the retention of established street trees.

PLAN OF IDENTIFIED LOTS 1:2000

A 1980s house, a full height masonry wall prevents any street interaction or surveillance of the reserve.

B Recent three lot strata subdivision with shared access. The single cross over, large windows to the street and permeable front fence are positive features of the development. Negatives are the narrow eaves and the entirely rendered facade that gives little textural interest.

C Recent green title development, the carport is the dominant feature of the street front, minimising the opportunity for ground level interaction with street or adjacent reserve.

3.3 EXISTING MATERIAL PALETTE

Walls

Original houses are often light coloured face brick

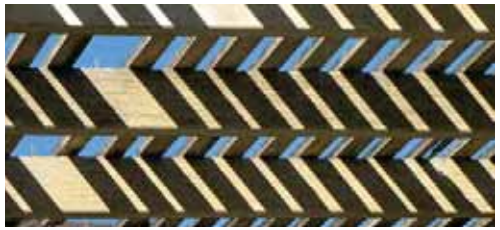
A different coloured brick for the base

Recent houses are predominately double brick with a painted rendered finish

Roof

Orange concrete roof tiles are predominate

Recent houses introduce colorbond roofing into the precinct



Pergolas provide shade for outdoor living space

Nearly all 1960s and 1970s houses contain a chimney

Features

Feature stack stone entry is found on several original 1960s houses

Breeze blocks

Features that reference architecture from migrants' country of origin

Feature brick walls on late 1960s and 1970s houses are common in the area

Landscape

Neat front gardens feature in the area- more trees would be desirable

Shared driveway access would be improved by landscaping

Established trees within lots need to be retained in new developments

Matching the size of tree to its planting area will avoid tree removal or heavy pruning in the future

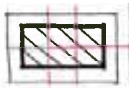
3.4 PRECINCT SUMMARY

Existing Building Types: Single detached dwellings, multiple & group dwellings

EXISTING CONSTRUCTION METHODS	Predominately double-brick construction Concrete tiles typically used for roofing. Some weatherboard/timber frame housing
DESIGN IDENTIFIERS	Low pitched roofs in either hip or split-truss style Front or rear verandah Light coloured brick walls with stone or patterned brickwork external entry feature wall House 'base' defined by band of darker brick, referencing the earlier houses that used limestone foundations.
ARCHITECTURAL STYLE	Typical Australian domestic style of the 60s and 70s, with some Italian references. Part of the first series of 'affordable' project homes to be developed in Perth. More recent developments reflect typical low cost group developments found throughout Perth suburbs.
POSITIVE FEATURES	Response to topography Car parking does not dominate the street view Clear view to front door, large window openings to the street Feature exposed brick work or stone provides fine grain textural treatment to the facade
NEGATIVE FEATURES	Introduction of the garage facing the street Narrow or no eaves Dominance of render in renovated and newer houses with no fine grain textural treatments Window shutters to street facing windows New development has failed to reference the original 1960's and 1970's project homes adjacent Additional cross-overs created by redevelopment Garage doors dominate the street facade Lack of facade interest through textural variation

Future Building Types Precedents:

ELEMENT APARTMENTS



3 storey apartments
1500 m2 site
Double loaded- 5 per level
Half underground parking

9 JAMIESON STREET

4 x 3 storey townhouse
610 m2 site
3 bedroom upmarket apartments

ELEMENTS APARTMENTS
Balconies and openings on the rear of the lot overlook the reserve.

9 JAMIESON STREET
Provide large openings and roof decks to overlook La Dongara Reserve

BELLEVUE HILL
Three separate pavilions house multiple residences on a single amalgamated site.

4.0
Analysis
Woodlands Precinct

4.1 OVERVIEW

The Woodlands Precinct is made up of the residential area south of Scarborough Beach Road and that surrounding the Innaloo Megaplex cinema complex. Much of the precinct has already been developed for housing at R30 and R20.

Detached single storey dwellings are the overwhelmingly dominant building typology present in the precinct, with a small number of duplexes and group housing types, and a private aged care development. The Parkland Villas Retirement Village, operated by Lend Lease Primelife, includes 185 villas and 55 apartments and is situated on a site of approximately 4.6 ha, with the main entry from Liege Street.

The precinct is characterised by a mixture of 1960s single detached houses to more recently constructed larger single detached houses, which reflect the area's increasing property values.

Historically a middle income area, cheaper construction methods have been utilised to produce the typical suburban house at a lower price, noticeable cost cutting measures include narrowing the eaves and lowering the chimney height and ceiling. The project home style of each era since the 1960s is reflected throughout the precinct with a recent housing trend of substantially renovating and extending the earlier 1960s and 1970s houses to an unrecognisable degree. The demolition of the original project home and subsequent construction of a significantly larger 2 storey house, often still built through a project home company, is also increasingly common in the area.

' Due to the large proportion of recent redevelopment and fragmented ownership in the precinct, changes to existing residential areas is likely to be incremental. Most development in the foreseeable future will therefore occur on the cinema site, which has land surplus to its needs, with the potential to redevelop the entire site if the cinema was to relocate. The precinct will be characterised by high quality medium to high density residential development, scaled to integrate with the existing low density, low scale residential neighbourhoods to the west and south. Quality mixed use developments would front Liege Street and well landscaped new streets, paths and parks will provide amenity and links with the surrounding areas, of particular importance are those connections over Scarborough Beach Road, which currently functions as major barrier to movement from Woodlands to the rest of Stirling City Centre' [1].

Current dwellings: 400
Target dwelling yield: 1200
Minimum dwelling yield: 777
Approximate average net density required to achieve target: 185 m2

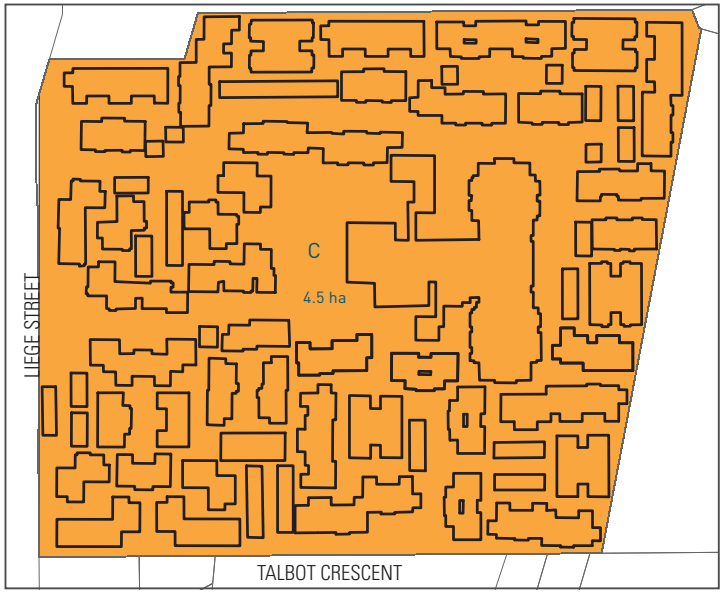
Analysis Area 01	Parkland Villas
Analysis Area 02	Clemantis Road
Analysis Area 03	Hakea Road
Analysis Area 04	Blackbutt Road
Analysis Area 05	Liege Street
Analysis Area 06	Talbot Crescent

1. Stirling City Centre Housing Strategy, Hassell Architects

4.2 PARKLAND VILLAS

AERIAL VIEW OF PARKLAND VILLAS

Parkland Villas is a 4.6ha site with potential for a much greater dwelling yield than it currently offers. It is a desirable location for an aged care facility, within walking distance to key services and amenity, however redevelopment could offer the same number of aged dwellings, high care facilities as well as additional residential apartments.



PLAN OF IDENTIFIED LOTS 1:2000

Main entry off Liege Street

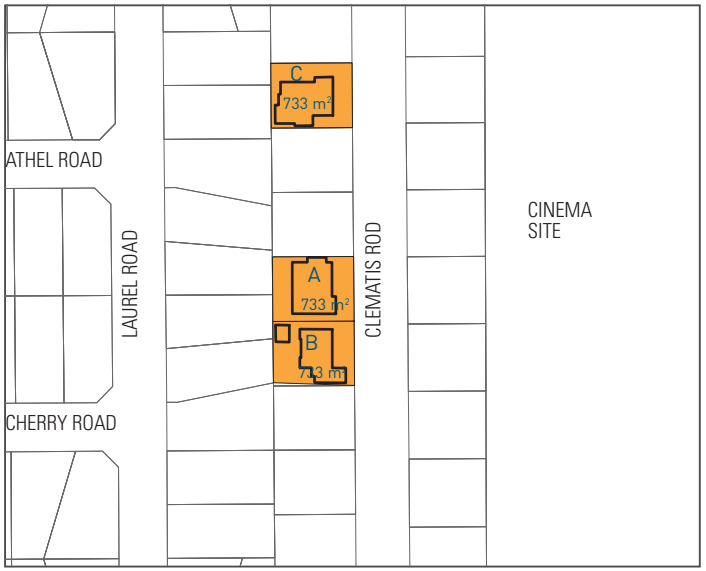
Entry off Talbot Crescent

Cinema site opposite Parklands Villas on the west of Liege Street

4.2 CLEMATIS ROAD

AERIAL VIEW OF CLEMATIS ROAD

Clematis Road has a notable presence of unaltered houses from the 1960s and 1970s, with early examples of project housing marketed at middle to lower income groups.



PLAN OF IDENTIFIED LOTS 1:2000

A 1960s salmon brick home with a double faced frontage. Simple geometric shapes define the building's form.

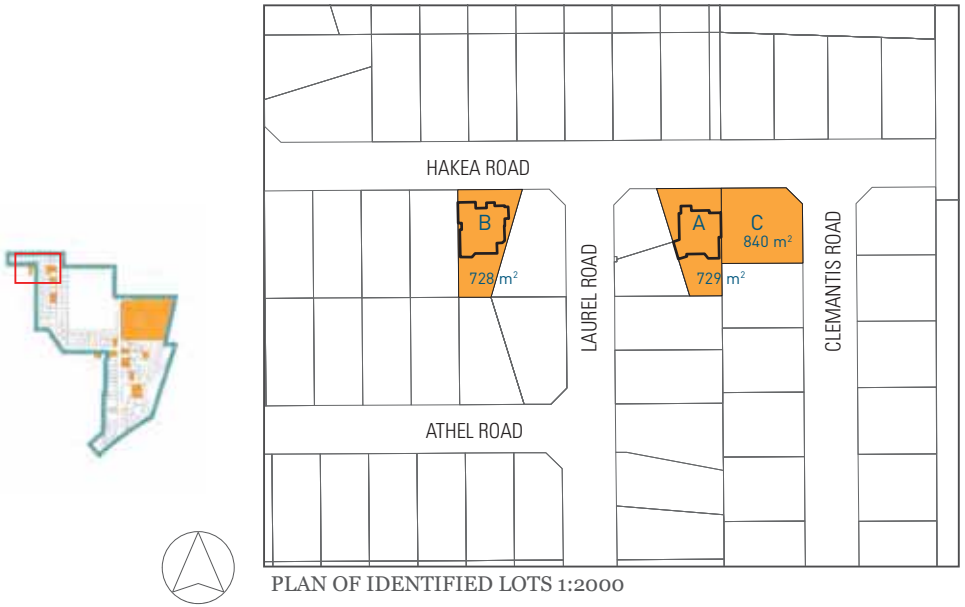
B An example from the late 60s or early 70s of a cost saving house, with a low chimney, narrow eaves and a low pitched gable roof.

C 1970s split truss roof home, inspired by 1950's architecture from the U.S and locally.

4.2 HAKEA ROAD

AERIAL VIEW OF HAKEA ROAD

This boundary area has a contrasting mix of detached dwellings. The earmarked medium density development along the precinct's perimeter will help consolidate a visual and scale aesthetic for this area.



PLAN OF IDENTIFIED LOTS 1:2000

A 1960s orange brick home with a triple faced frontage and a front pergola.

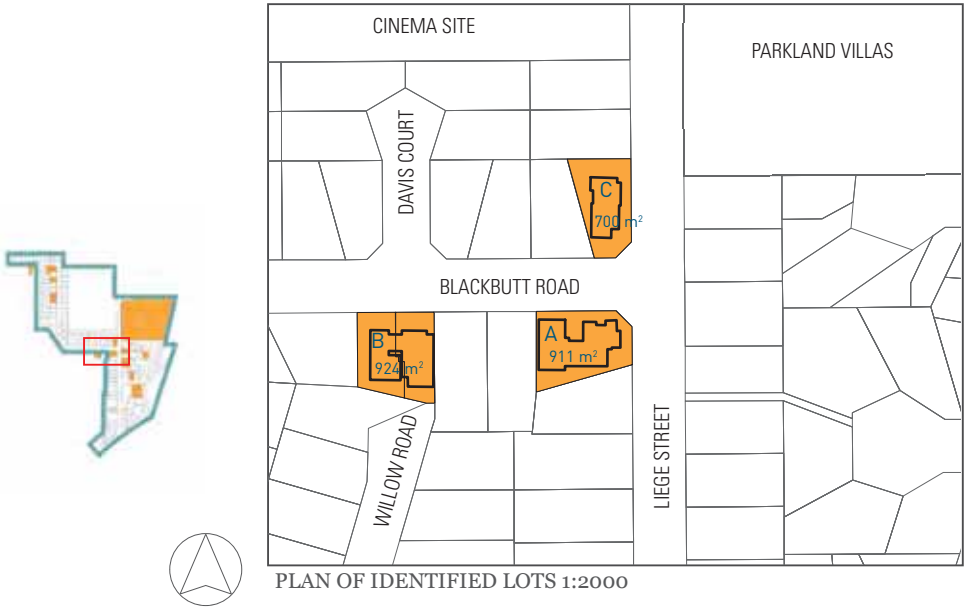
B Home built in the 2000s, opposite the Woodlands Precinct Border. The European references which define this homes formal characteristics are inappropriate in Perth, both climatically and aesthetically.

C Very recent project home that is typical of those found throughout Perth. The house has no reference to its surrounding context and could easily be found in any current green fill development in Perth.

4.2 BLACKBUTT ROAD

AERIAL VIEW OF BLACKBUTT ROAD

Blackbutt Road comprises of a mix of duplexes, constructed during the late 1970s and 80s, and single detached houses. The duplex form is of a similar scale to the single detached houses and suggests that maisonette type housing would be an appropriate redevelopment option along the precinct borders to assist in the reduction of scale but retention of a higher dwelling yield.



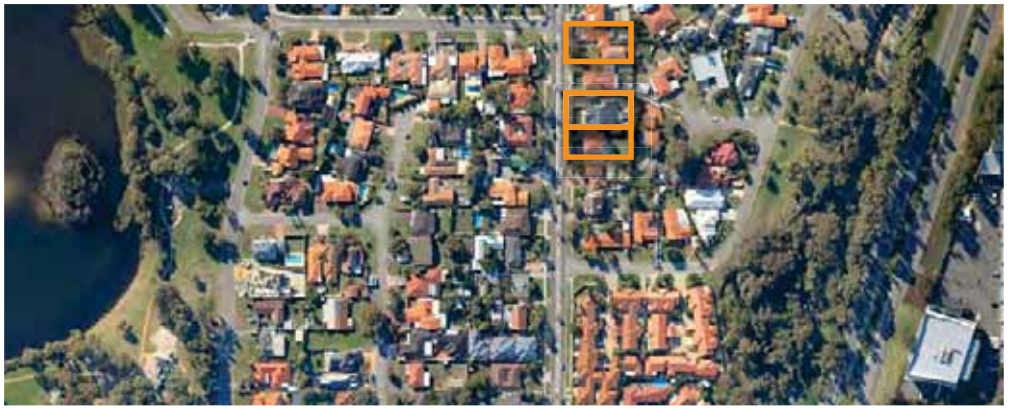
PLAN OF IDENTIFIED LOTS 1:2000

A 1980s duplex with typical dark brick and orange tiles. This duplex is of similar scale to the adjacent single detached houses and reads as one house from the street

B 1980s duplex along Blackbutt Road, but just outside the precinct boundary.

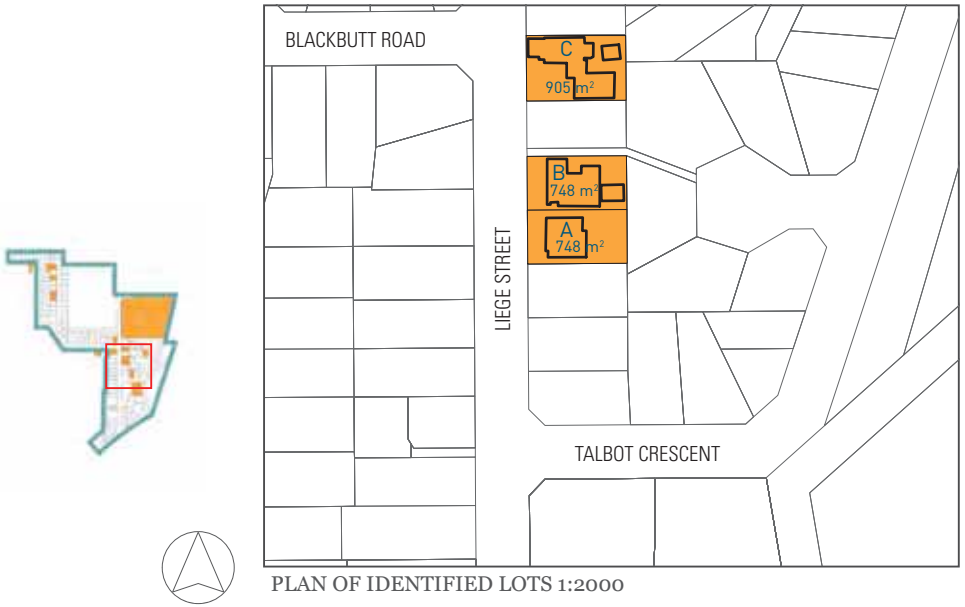
C 1980s single detached house on a corner site.

4.2 LIEGE STREET



AERIAL VIEW OF LIEGE STREET

Liege street currently serves as the major traffic route between John Sanders Drive and Scarborough Beach Road, despite Stephenson Avenue being intended as the area's primary vehicle thoroughfare. The houses along Liege Street have reacted to this by reducing their articulation with the street, screening their habitable rooms and outdoor spaces behind full height masonry walls and blank garage doors.



PLAN OF IDENTIFIED LOTS 1:2000

A 1980s free standing two storey home. Most likely to be a single builder development rather than a project home.

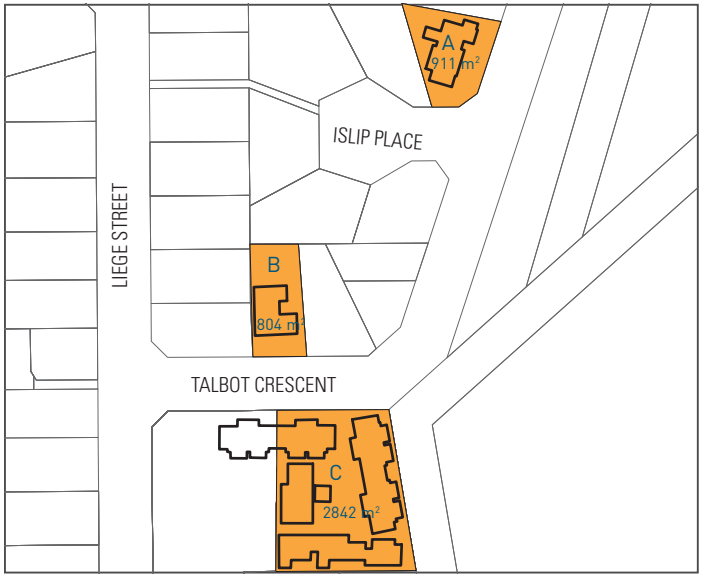
B 1980s project home with a Mediterranean influence. Skillion roofing with tiled gable verge.

C 1980s dark brick duplex. The large front wall dominates the street facade and is only broken to allow for the double carport. The two houses are entered from doors on either side of the carport.

4.2 TALBOT CRESCENT

AERIAL VIEW OF TALBOT CRESCENT

Talbot Crescent currently has a mix of housing types. All dwellings are single level and therefore the greatest impact to this area will be the increase in height. The amalgamation of 2-3 lots fronting the reserve would assist in the transition from low density - low rise dwellings to medium density - medium rise buildings.



PLAN OF IDENTIFIED LOTS 1:2000

A 1960s or early 1970s salmon brick house on a corner site. Large building setbacks create an expansive space between the house and the street.

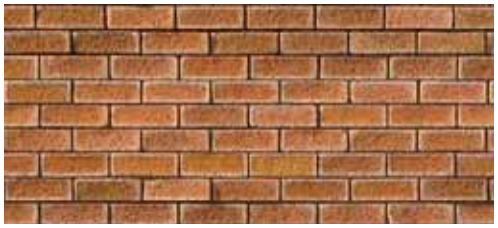
B 1980s dark brick home with skillion roof and exposed eave brackets.

C Typical low-rise group development.

4.3 EXISTING MATERIAL PALETTE

Walls


Light coloured 1960s face brick


orange coloured 1970s face brick


Recently renovated houses are predominantly double brick with a painted rendered finish


Recent house with painted render walls and stone feature

Roof


Orange concrete roof tiles predominate


Variation to the orange colour tile


Grey tiles


Recent houses introduce colorbond roofing into the precinct

Features


Limestone garden walls and feature wall on house facade


Horizontal timber framed windows


Recent introduction of timber board wall feature


Different colour brickwork to define the building's base

Landscape


Front gardens tend to be well maintained


A mix of species representing garden trends of the 1970s and 1980s


Planting along the driveway improves the view from the street


The majority of driveways are brick paved

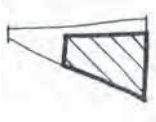
4.4 PRECINCT SUMMARY

Existing Building Types: Single detached dwellings, multiple & group dwellings

EXISTING CONSTRUCTION METHODS	Predominately double-brick construction Concrete tiles typically used for roofing
DESIGN IDENTIFIERS	Low pitched hipped or gabled roofs, also split-truss style and in the 1980s, skillion. Tiles are mainly orange. Mix of brown and lighter coloured brick walls. Brick and tile are the dominant construction materials with salmon and dark brown bricks dominant. Full height windows.
ARCHITECTURAL STYLE	Typical Australian domestic style of the 60s and 70s. Part of the first series of 'affordable' project homes to be developed in Perth. More recent developments are large, often 2 storey, single detached houses from contemporary project home builders and the occasional green title development that do not contribute to a distinctive Woodlands identity.
POSITIVE FEATURES	Retention of a consistent and generous street setback. Established trees, both on the street and within lots. Proximity to good private and public schools to the south and adjacent to Stirling City Centre to the north. 1970s duplex developments read as one large house. Large windows with earlier houses having corner windows from the lounge addressing the street. Low to medium pitch roof to a max of about 26'.
NEGATIVE FEATURES	New housing construction is large but not of a high design quality, but unlikely to be substantially changed. Renovated houses have been completely rendered resulting in the shadow and textural subtly of bricks being lost. More recent housing has narrower to no eaves. Duplex developments have no front outdoor living and access to the front door is via the carport. Solid front fences screen the house from the public realm, further emphasising the dominance of the double garage door.

Future Building Types Precedents

MIDLAND HOUSING
3 storey mixed use
3250 m2 site
Ground floor retail
2 floors affordable housing



CARRINGTON ROAD APARTMENTS
3 storey multiple residential
450 m2 corner site
Affordable housing

MIDLAND HOUSING
A mixed use development with affordable residential units above an active street frontage

ELEMENTS APARTMENTS
Balconies and openings over-look the street

NORTHBRIDGE:
A redeveloped site from an original single house lot to accommodating several apart-ments. Quality communal gardens, large balconies and openings with a mix of face-brick and render to provide facade interest.

5.0
Analysis
Northern Precinct

5.1 OVERVIEW

The Northern Precinct is located north of the former landfill site bounded by Mitchell Freeway and is largely taken up by The Osborne Park Hospital. The existing residential areas within the precinct are made up of two contrasting zones; one sits to the north of the hospital and comprises of mainly original 1960s single detached housing and one multiple development. The other is within the easternmost portion of the precinct and is a recent residential medium density subdivision. This newer development consists of typical row housing with rear laneway access. The contrast between new housing and the older single detached houses is particularly noticeable along Hugo Street.
The older residential area is made up of detached single storey dwellings with a small number of duplexes and group housing types. A small amount of redevelopment into survey strata battle axe type housing has occurred within the previous decade, along with lot development close to the freeway.

The precinct will remain primarily a hospital and residential area, similar in scale to the recent housing development.
'The main potential for new housing will be land on the south side of the hospital with proximity to new development and open space on the former landfill site, and the gradual redevelopment of existing older housing north of the hospital'.
This precinct will be particularly suited for aged housing or supported accommodation related to the hospital, and family housing [1].

Current dwellings: 280
Target dwelling yield: 1100
Approximate average net density required to achieve target: 278 m2

Analysis Area 01	Laga Court
Analysis Area 02	Osborne Place

1. Stirling City Centre Housing Strategy, Hassell Architects

Osborne Park Hospital

NORTHERN PRECINCT

5.2 LAGA COURT

AERIAL VIEW OF LAGA COURT

Laga Court is comprised of single detached dwellings from the 1960s to 1980s with some examples of duplexes from the same era. A sloping topography has allowed for undercroft parking. Strong Italian references exist in many of the homes.

PLAN OF IDENTIFIED LOTS 1:2000

A Duplex that appears to be retrofitted from a single 1960s detached dwelling. Original undercroft parking is much less dominant than the newer carport.

B Single detached home with undercroft parking, the strong Italian references found in this house are typical for the area.

C 1980s single detached home with rear carport.

5.2 OSBORNE PLACE

AERIAL VIEW OF OSBORNE PLACE

Osborne Place is made up largely of single detached dwellings from the 1960s to 1980s. Notable exceptions to these housing types include a 1950's California bungalow on a corner site, the oldest house in the area, as well as a 1970s multiple housing unit.

PLAN OF IDENTIFIED LOTS 1:2000

A 1950s California bungalow typical of those built throughout Australia, however rare for this particular area.

B 1970s salmon brick single loaded apartment block with dual aspect. A large building setback provides car parking for tenants with an additional small undercroft carport.

C 1970s split truss roof home, inspired by 1950's architecture from the U.S and locally.

5.3 EXISTING MATERIAL PALETTE

Walls & Roof

Light coloured 1950s painted brick Californian Bungalow

light coloured 1970s face brick with low pitch roof

Recently renovated houses are predominantly double brick with a painted rendered finish

Flat roof and painted brick

Features

Breeze wall

Recent houses with painted render walls with painted feature entry

Stone entry feature

Patterned brick work

The most recent development subdivision in the Northern Precinct is largely made up of two storey rowhouse types with rear vehicle access.

Although in Station Precinct, this strip of commercial and retail on Cedric Street north was part of the housing subdivision above.

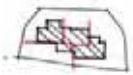
5.4 PRECINCT SUMMARY

Existing Building Types: Single detached dwellings, multiple & group dwellings Campus type building (hospital)

EXISTING CONSTRUCTION METHODS	Predominately double-brick construction Concrete tiles typically used for domestic roofing, a mix of colorbond and tile for the hospital
DESIGN IDENTIFIERS	Low pitched hipped or gabled roofs, mix of orange and brown roofs. only a couple examples of split-truss style Mix of red, brown and lighter coloured brick walls, rendered walls on recent townhouses Noticeably an Italian migrant settlement with building elements that reference this such as white colonnade verandahs
ARCHITECTURAL STYLE	Typical Australian domestic style of the 60s and 70s. Part of the first series of 'affordable' project homes to be developed in Perth. Evidence of these houses having been overlaid with Italian inspired features to the facade Recent detached 2 storey townhouse development within new subdivision Contemporary civic building, Refurbished previous civic building converted to office
POSITIVE FEATURES	Located adjacent to Osborne Park Hospital Mix of domestic house types from Californian Bungalow Style, 1950s inspired flat roof housing to recent detached medium density townhouses Precedent for larger public and commercial buildings within the area
NEGATIVE FEATURES	New housing construction is of standard rendered townhouse type, with no attempt to reference the existing suburb More recent housing has narrower to no eaves The one apartment block does little to relate to the adjacent single detached houses through form, setback or scale

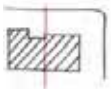
Future Building Types Precedents:

ESSENCE APARTMENTS



3 storey residential
9 apartments
basement parking
adjacent parkland

CASTLE STREET



2 x 2 storey townhouse
437 m2 site
undercroft parking

LAWRENCE STREET TERRACES
The use of various materials and openings articulates the street facade and creates interest.

CASTLE STREET
Visually integrates with surrounding single detached dwellings.

ESSENCE APARTMENTS
Large outdoor balconies form extensions of the major living spaces.

6.0

Southern Precinct

6.1 OVERVIEW

The Southern Precinct encompasses the large format retail areas along Scarborough Beach Road and the surrounding areas. Existing residential areas are located around the perimeter and in small pockets located on the southern side of Scarborough Beach road along Ewen Street, the southern side of Roebuck Street and to the east of Oswald Street, adjacent to large scale internal mall retail developments on Ellen Stirling Boulevard. The existing housing typically dates from the 1960s or early 1970s, with minimal recent redevelopment. Single storey detached dwellings are the dominant building typology, with some duplex and battle axe developments. The Shawford Lodge and Aged Care, a lodge style aged persons accommodation, operated by Egis Aged Care Group, is also located here. The Southern Precinct is intended to contain the heart of the Stirling City Centre. The existing shopping centre will be encouraged to address the street to complement the proposed street based shopping district. It is intended that a selection of uses, including entertainment and residential development will activate the area beyond standard business hours.

New housing will be medium to high density in the form of apartments, generally in a mixed use configuration which allows for non-residential uses such as retail, offices and commercial spaces to address the street. 'The most significant development potential will be on government owned land between Ellen Stirling Boulevard and the new Stephenson Avenue alignment - approximately 7 ha - and redevelopment of the strip development along the southern side of Scarborough Beach Road - approximately 1.4ha. This provides 8.4ha of potentially developable land.'[1].

Current Dwellings: 49
Target dwellings: 2100
Approximate average net density required to achieve target: 149 m2 (67 Dwellings per Hectare)

Analysis Area 01	Ewen & Roebuck Street
Analysis Area 02	Oswald and Twyford Street

1. Stirling City Centre Housing Strategy, Hassell Architects

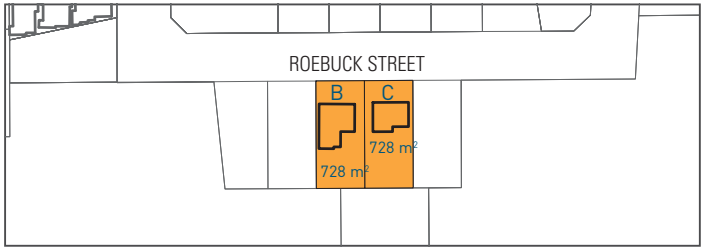
Westfield Shopping Centre entry from Scarborough Beach Road into Ellen Stirling Boulevard

SOUTHERN PRECINCT

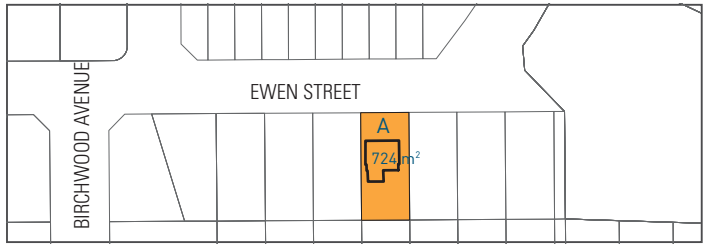
6.2 EWEN & ROEBUCK STREET

AERIAL VIEW OF EWEN & ROEBUCK STREET

Ewen Street and the southern side of Roebuck Street contain early examples of 1960s state housing with minimal redevelopment. Pale brick homes with single face frontages utilising cheap construction methods characterise these homes. Amalgamation of these lots into 2, 3 or 4 lots, results in 1500m2 to 3000m2 development parcels.
Roebuck Street has been identified as being a mixed use area in future development, it will be of particular importance as it will need to provide an interface between the large format retail to the north and residential only development to the south.



PLAN OF IDENTIFIED LOTS 1:2000



PLAN OF IDENTIFIED LOTS 1:2000

A An example of 1960s state housing, the light orange brick home has narrow eaves and a short chimney to lower construction cost. The form is made of a simple geometric shape with a single face frontage and large windows.

B 1970s home with two storey rear development. The carport has been moved to the street to facilitate battle axe development and dominates street front. Narrow eaves lower construction cost.

C Pale brick house with dark brick band around base.

6.2 TWYFORD PLACE & OSWALD STREET

AERIAL VIEW OF OSWALD STREET & TWYFORD PLACE

The existing residential area east of Oswald Place is largely comprised of single detached dwellings, with Shawford Lodge Aged Care being the most notable exception. The Italian character of homes in the area is reflective of its migrant population. Unfortunately a high proportion of houses fronting Oswald Street are totally screened by full height masonry walls, which minimises street activation.

Shawford Lodge has a lack of space allocated to the planting of substantial trees, an issue that needs to be avoided in future higher density developments. The benefit of tree planting is obvious aesthetically, at a micro-climatic level and at a scale where high density commercial development is within close proximity

PLAN OF IDENTIFIED LOTS 1:2000

A 1970s single storey detached home with tiled gable verge roof. A full height masonry wall fully screens the house from the street.

B 1980's double storey dwelling with tiled gable verge roofing.

C Shawford Lodge Aged Care facility, a 1980s development with federation housing references.

6.2 COMMERCIAL AREA

The Southern Precinct is largely comprised of inward facing, large-format retail buildings separated from the main road by expansive car parks. Pedestrian access along these major traffic routes is limited.
To better integrate these buildings with the streetscape, it would be possible to sleeve them behind new linear buildings with active retail frontages that directly address the street. Buildings of this type currently sleeve the IKEA building, however until the lots opposite have been developed their success will be limited due to the lack of surrounding pedestrian access.
The intersection of Ellen Stirling Boulevard and Scarborough Beach Road houses a power sub station whose removal would be cost prohibitive. Given the critical nature of this intersection, it will need to be carefully integrated into any new development.

Separate commercial buildings are set back from the street and do not contribute to defining the corner of the major road in the City Centre.

The concealment of the substation on the corner of Ellen Stirling Boulevard and Scarborough Beach Road is required.

Recent redevelopment along Scarborough Beach Road with large front setbacks for car parking is highly unlikely to be redeveloped within 20 years.

6.3 PRECINCT SUMMARY

Existing Building Types: Single detached dwellings & group dwellings
Inward facing mall type shopping centre
Detached commercial buildings

EXISTING CONSTRUCTION METHODS	Predominately double-brick construction for housing, tilt-up or rendered masonry for commercial Concrete tiles typically used for roofing on housing with metal sheeting (colorbond) for commercial
DESIGN IDENTIFIERS	Low pitched hipped or gabled roofs, also split-truss style and in the 1980s, skillion. Tiles are mainly orange. Mix of brown and lighter coloured brick walls. Brick and tile are the dominant construction materials with salmon and dark brown bricks dominant. Full height windows.
ARCHITECTURAL STYLE	Typical Perth construction with an Australian suburban style from the 1960s to the 1980s. Large format commercial buildings, range of individual commercial developments. Inward facing mall type shopping centre
POSITIVE FEATURES	A new housing type for Stirling can be developed in this precinct. Comprising of apartments in buildings from 5 to 15 storeys with active commercial on the ground floor. Some short-stay and hotel uses could also be located in this precinct.
NEGATIVE FEATURES	Limited housing precedents in the area, what is evident is single detached and is limited in providing high density, medium to high rise housing typology cues. Existing commercial buildings are typical suburban centre types and require major renovation or preferably redevelopment Basement parking is not viable in the area, therefore decked parking solutions need to be discreetly inserted into the built fabric

Future Building Types Precedents:

RENAISSANCE SUPER IGA

4 storey mixed use
2000 m2 site
Ground floor commercial use
Commercial only parking

BLACKWOOD STREET

4 storey mixed use
2400 m2 site
Ground floor commercial use
50% affordable housing
Rear decked parking

EDO MIXED USE BUILDING
Balconies overlook the street.

BLACKWOOD STREET
Residential apartments are provided with a courtyard

EDO MIXED USE BUILDING
High activiity ground floor uses spill onto the street

7.0

Station Precinct

7.1 OVERVIEW

The Station Precinct is focused around the Stirling Station, with notable existing developments including the City of Stirling Administration and Civic Centre and IKEA. A large portion of the land was previously a tip and is currently a reserve.These newer large scale developments as well as major traffic thoroughfares Mitchell Freeway and Cedric Street, which bisect the precinct along two axis, split the pre-existing residential areas into small pockets which are not directly accessible to each other.
'The remediated and redeveloped former landfill site will be a transition between the intensity and scale of the city centre around the station, and existing low scale, low density residential areas to the east and north. It will have predominantly residential development, shaped by a linear park/stream that is an important element of the overall city green corridor.

This precinct will be particularly appropriate for family housing (north of railway), aged persons' housing and affordable housing[1].' The area immediatley surrounding the Stirling Station is identified as being suitable for a mix of uses, with the largest buildings in the Stirling City Centre likely to be here. The biggest constraint to development is the limited locations where basement parking can be provided, therefore decked solutions will need to be explored throughout the precinct.

Current Dwellings: 169
Target dwellings: 4500
Approximate average net density required to achieve target: 99 m2 (101 Dwellings per Hectare)

Analysis Area 01	Telford Crescent
Analysis Area 02	Cedric Street
Analysis Area 03	Twyford & Staveley Place

1. Stirling City Centre Housing Strategy, Hassell Architects

Stirling civic administration building and adjacent office building (previously the civic administration building)

Sleeving the inactive frontages of large format retail buildings with active use liner buildings will assist in their integration within the new City Centre.

STATION PRECINCT

7.2 TELFORD CRESCENT

AERIAL VIEW OF TELFORD CRESCENT

Telford Crescent faces onto the Stirling Civic Gardens and most houses take advantage of this with their living areas overlooking the park. Older houses utilise undercroft or rear parking to minimise carport street presence.

PLAN OF IDENTIFIED LOTS 1:2000

A 1960s detached home with white brick render and limestone footing. Undercroft parking reduces carport's street presence.

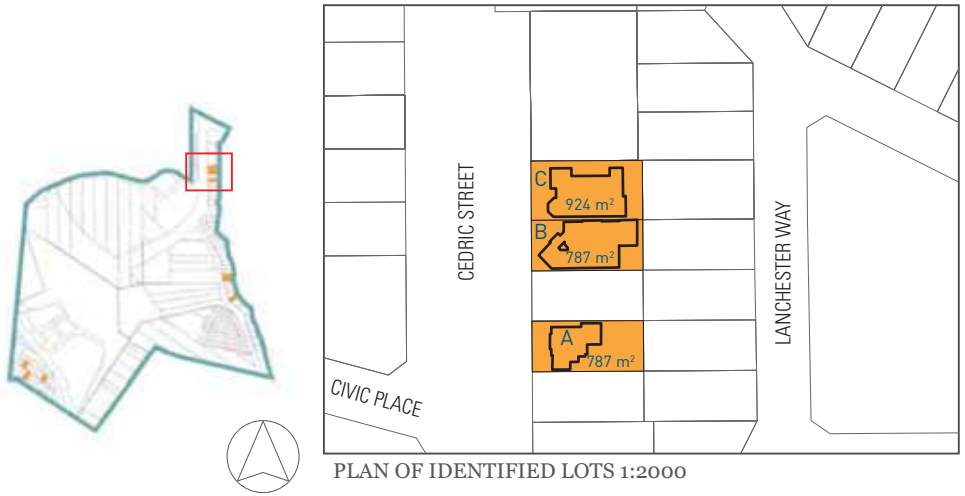
B Renovated single detached home with undercroft parking. Rendered brick with additional entry feature.

C 1980s dark brick detached house with double garage.

7.2 CEDRIC STREET

AERIAL VIEW OF CEDRIC STREET

This part of Cedric Street has a mix of the original single detached residential housing along with newer commercial development up to three storeys. This commercial development has been developed with a slip lane and limited front visitor parking as well as rear access for staff and commercial activities. Development is tilt-up slab, a typical construction response throughout Perth.
There is evidence of single detached houses being adapted for community and commercial purposes offering viable redevelopment opportunity, ideally as a 2 or 3 lot amalgamation (1500m2 - 2500m2).
This area is proposed to be mixed-use of up to three storeys to complement the recent developments on the west of Cedric Street.



PLAN OF IDENTIFIED LOTS 1:2000

A 1980s two storey detached residential house. A permeable fence and balcony promotes passive surveillance and connection to the steet. Arched windows and sculpted bannisters reference an Italian character. These houses are within the designated mixed-use zone and are likely to be redeveloped.

B Commercial building converted from residential, or designed to look like residential housing. Carport and parking dominate front.

C Future redevelopment will have minimal street setbacks with vehicle parking located at the rear of the site and screened from an active street frontage.

7.2 TWYFORD & STAVELEY PLACE

AERIAL VIEW OF TWYFORD & STAVELEY PLACE

Twyford Place and Staveley Place make up a small residential pocket situated between the large format shopping outlets of Westfield and IKEA. Despite its close proximity to Ellen Stirling Boulevard access is via the residential area to the west.
The eastern portion of this area will be developed as mixed use buildings that directly address Ellen Stirling Boulevard while the western portion will be a residential area integrated with the adjacent Innaloo precinct. Building heights up to five storeys will be permissible and lot amalgamation will be encouraged to successfully facilitate this.

PLAN OF IDENTIFIED LOTS 1:2000

A Single detached home from the 1980's.

B 1980's duplex with dark brown brickwork and symmetrical layout. An arched carport gives an Italian feel in what would otherwise be a fairly typical duplex.

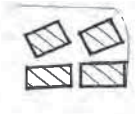
C Duplex. The carport and front wall completely screens one of the units from the street, while the other has closed roller shutters.

7.3 PRECINCT SUMMARY

Building Types: Single detached dwellings & group dwellings
Large format retail buildings
2 storey attached commercial buildings (Cedric St Nth)
3-4 storey civic and office building

EXISTING CONSTRUCTION METHODS	Predominately double-brick construction for housing Concrete tiles typically used for house roofing Large format retail, mall type floor plan, masonry construction, including tilt-up.
DESIGN IDENTIFIERS	Housing - Low pitched hipped or gabled roofs, also split-truss style and in the 1980s, skillion. Tiles are mainly orange. Housing - Mix of brown and lighter coloured brick walls. Brick and tile are the dominant construction materials with salmon and dark brown bricks dominant. Housing - Full height windows City of Stirling Administration Building- setback from the street Office/Commercial/ Retail - Large format retail, lack of street activation, buildings mainly setback from the street
ARCHITECTURAL STYLE	Typical Perth housing construction with an Australian suburban style from the 1970s to current Large format retail and attached commercial (tilt-up) Multiple storey office and purpose designed civic building
POSITIVE FEATURES	A range of new medium density housing types for Stirling can be developed in this precinct. City of Stirling Administration Building has a good use of materials which reference existing housing (eg. face brickwork) for facade variation in a commercial building context.
NEGATIVE FEATURES	Limited housing precedents in the area, what is evident is single detached and is limited in providing high density, medium to high rise housing typology cues. No mixed-use buildings Blank inactive wall in large format retail development Single use buildings A plethora of rendered facades with no contrasting material detail

Future Building Types Precedents:



RAMSGATE RESIDENCIES
4 storey residential apartments
7200 m2 corner site
Cluster layout
Affordable housing

401 ST KILDA ROAD

401 ST KILDA ROAD
6 storey mixed use
1900 m2 site
Ground floor commercial
3 levels offices set back
3 levels apartment further set back

FIVE DOCK
Mixed use development containing 102 residential apartments as well as a supermarket and library. The dark brick base references federation buildings in the area while simultaneously strengthening the streets existing datum level.

SW1 QUEENSLAND
Apartments are separated into multiple building forms which define a series of well planted communal outdoor spaces and pedestrian walkways in the spaces between them.

401 ST KILDA ROAD
Apartments on the top floor are set back from offices and highly activated ground floor retail.

8.0

Osborne Park Precinct

8.1 OVERVIEW

The Osborne Park Precinct is located within the greater Osborne Park industrial area and currently contains no housing. Instead it is comprised of factory and showroom type buildings from a range of eras. The earliest buildings may date back to the 1950s, but there is little evidence of any earlier redevelopments.
Unlike many older industrial areas, the re-use and adaption opportunity for existing industrial buildings in Osborne Park is unviable due to the high land cost and low rise building scale. Aesthetically the physical fabric offers little in regard to the retention of precinct character.
The transition and staging of high density residential development within the precinct should commence around the proposed public open space to offer an amenity not currently available.

Ultimately the precinct is to become a fulcrum point intended to ease the transition between continuing industrial activities in the eastern section of Osborne Park and the developing 'city centre' to the west. This will be achieved through a mixture of commercial and medium to high density residential developments focused around local parks. The connection of streets in this area across Stephenson Avenue will facilitate access to high levels of amenity and public transport.
This precinct will be particularly appropriate for family housing (north of railway), aged persons' housing and affordable housing[1].'

Current Dwellings: 169
Target dwellings: 4500
Approximate average net density required to achieve target: 99 m2 (101 Dwellings per Hectare)

1. Stirling City Centre Housing Strategy, Hassell Architects

OSBORNE PARK PRECINCT

8.2 INDUSTRIAL AREA

Osborne Park currently has a varied mix of lot sizes, ranging from around 1500m2 to a couple of hectares. Most of the built infrastructure is of average functional quality with little consideration of the surrounding public realm. The buildings are usually setback from the street to allow for visitor car parking.
There is a limited number of design inspired elements that could be translated into new development. The saw tooth roof offers access to natural daylighting into deep interior spaces and could be a design feature in future developments.
The mix of materials, such as face and rendered brick and colorbond roof and walls could be translated in new developments to help define a more industrial-urban character. Flat and saw tooth roof forms dominate the roofscape.
Buildings within the area have minimal overhangs and shading devices, while the precinct as a whole has a lack of mature landscaping. The undergrounding of power lines should be strongly recommended during redevelopment.
The current lot size enables high density mixed-use, commercial as well as residential only development without the need for lot amalgamation, but their unusually narrow shape mean that amalgamation into significantly larger lots is likely to occur.
Larger development parcels offer the opportunity for public access and pocket parks to be introduced into the precinct through development incentives.

PLAN OF IDENTIFIED LOTS 1:10 000

A Large format showroom building setback from the street. The frontage is dominated by carparking, high chainwire security fencing and service doors.

B Frontage to this showroom is dominated by signage and has a weak relationship with the pedestrian unfriendly King Edward Road. The building retains the classic saw tooth warehouse roof line.

C Large scale industrial warehouse with two storey masonry showroom at the front. A full height masonry wall disguises the fact that the majority of the building is a simple steel shed.

8.3 PRECINCT SUMMARY

Building Types: Large format retail/commercial buildings
Large format framed industrial buildings

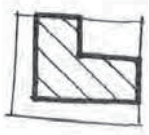
EXISTING CONSTRUCTION METHODS	No housing within this Precinct. The commercial buildings are a mix of types that support a range of uses, from heavy industrial to showroom. The construction also ranges from brick to tilt-up to aluminium framed sheeting. The predominant roof material is metal sheeting
DESIGN IDENTIFIERS	Flat roof concealed behind a parapet wall or saw tooth roof are the primary forms
ARCHITECTURAL STYLE	Typical Perth industrial and showroom construction
POSITIVE FEATURES	A new housing type for Stirling can be developed in this precinct, with its character referencing the historical industrial and showroom use Large lots means less lot amalgamation required for development, however they are still supported as they create an oppurtunity to provide public accessways and pocket parks
NEGATIVE FEATURES	With no housing precedents in the area, greater consideration of building type and materials will need to be developed Incremental development will need to co-exist with poor quality built from and public realm Poor quality streetscape and minimal mature street trees Dominance of signage The predominance of hardstand facilitates heat build up and a hotter than necessary micro-climate Long linear lot shape

Future Building Types Precedents:

JACOBS STREET

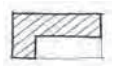
9 storey mixed use
2400 m2 site
Limited ground floor commercial

VERVE APARTMENTS



6-7 storey apartments
4858 m2 site
public park on site

WATERLOO STREET



6 storey mixed use
1900 m2 site
Ground floor retail
3 levels basement parking

VERVE APARTMENTS
Provision of a public park by the developer

WATERLOO STREET
Large balconies overlook the street

JACOBS STREET
Mixed use development in which live/work units face the street on the ground floor. Sleeved deck parking is located at the rear of the site.

9.0

Architecture of its Climate, Place & Culture

9.1 VISION & OBJECTIVES

Stirling City Centre strives to become a sustainable 21st century city – a place for everyone. It will be a hub for a diverse and prosperous community, offering wellbeing[1]

From a pre-defined vision, a core set of values and objectives have been defined to underpin the direction of growth in Stirling City Centre. The vision is further defined and expanded to include key objectives and all constitute part of the urban condition in which building typologies are to be positioned.

Buildings are integral to the composition of the broader city form and perform a pivotal role of framing city streets and places, but the primary goal is to create a city with a strong sense of community. As the people's city, Stirling will practice social sustainability by ensuring its planning decisions are based on what is best for the community.

ACCESSIBILITY AND URBAN FORM VISION:

Moving people with choice and efficiency

KEY OBJECTIVES

- A city that is active, vibrant and accommodates the working and residential populations.
- A city which has high quality built form design
- To Manage Parking
- Ensuring Safe, Legible and Accessible Road Networks
- Public over private transport
- Travel demand Management
- To ensure walking, cycling and public transport are the dominant modes of travel

ENVIRONMENTAL HEALTH VISION:

a green future with a green corridor

KEY OBJECTIVES

- Restore and enhance the level of biodiversity
- Reduce pollution to healthy levels
- Reduce energy, water consumption
- Maximise water re-use
- Maximise renewable energy production
- Reduce waste

COMMUNITY WELLBEING VISION:

Community.....a city for people

A socially sustainable society ensures excellent quality of life for current and future generations.

KEY OBJECTIVES

- Ensure affordable living and business opportunities
- Provide equitable access to a range of services
- Develop a strong cultural identity, shared vision and sense of place
- Promote a tolerant society
- Provide a safe, diverse, innovative and healthy city
- Provide open space for the community

ECONOMIC HEALTH VISION:

Prosperity and poised for diverse economic growth

KEY OBJECTIVES

- Provide opportunity for greater economic investment to improve viability for business
- Support a strong economic identity
- Support high levels of diverse local employment
- Reduce cost of infrastructure

GOVERNANCE VISION:

A flexible approach to support true collaboration

KEY OBJECTIVES

- Deliver the vision in a fair, effective and efficient way
- Deliver the vision in an progressive and systematic way
- Deliver the vision in a transparent and accountable way
- Deliver the vision in a collaborative way
- Build capacity across the system to enable growth and improvement

1. www.stirlingcitycentre.com.au/our-vision

9.2 KEY ATTRIBUTES

Many issues will inform and influence the built realm. We have divided these built realm issues into Buildings, Interface, Streetscape and City Form in order to provide an overview in identifying the key issues relevant to the formation of Stirling City Centre.

CITY FORM

IDENTITY: The heart of the city will not be in the area of highest density or of the tallest buildings. The tallest forms in the city will mark the train station location.

SCALE: The retail and commercial heart will be of a medium rise, compact nature with built form edging and containing all streets.

ACCESS: equitable access to the living stream and other pubic open space amenity.

ACKNOWLEDGEMENT: The living stream should be integral and integrated into the city centre.

ADAPTABILITY & resilience : the city needs the ability to change and respond to unprecedented technological innovations that could within a short period impact on the fundamental nature of a city centre.

STREETSCAPE

TREE CHARACTER: All streets to contain street trees, as a minimum along verges in residential areas and within medians in commercial areas.

CONNECTED: Pedestrian footpaths are to be provided and connected throughout Stirling City Centre and to surrounding residential areas.

LEGIBLE: Road hierarchy with supported uses and building form to enable easy navigation through and to key destinations.

HUMAN SCALE: Wherever possible constrain road widths to keep roads to a pedestrian scale.

CHOICES: Offer multiple options for crossing roads on foot.

SHELTER: Covered pedestrian routes under awnings and similar will be provided along all key streets that connect public transport to the retail and commercial heart.

WALKABLE: A street environment that encourages people to use public transport and walk throughout the city centre.

ACTIVATED & ENGAGING: support a range of uses including businesses that open on weekends and evenings.

STREET PARKING: All areas to accommodate short term street parking to encourage a high turnover of visitors to commercial and retail areas.

QUALITY: Materials, street furniture, public art and design to reflect the importance of the city centre with high quality, robust and locally identified material feature.

ACCESS: Low speed road design that does not inhibit vehicle or bicycle access. Where possible separate cycle lanes provided.

VEHICLE ACCESS: Discrete with car parking no visible from the street.

INTERFACE

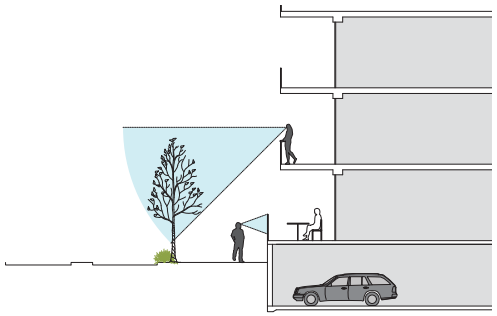
APPROPORIATE SCALE: Allow some flexibility to ensure different scale and building types are integrated along building type transition areas, such as from residential only to mixed use area.

INTERACTIVE: All frontage to address the street with large openings and/or outdoor living spaces, balconies.

SAFTEY & SECURITY: Maximise passive surveillance of the public realm

ENGAGING: Buildings at street level offer a high level of interest with quality material, large window openings to view the activities inside

SCREENING: At grade parking screened by buildings



BUILDING

CLIMATE: Temperate climate character, buildings oriented to maximize climate responsive design opportunities.

CHARACTER: Create a local character for the city centre that is distinguishable from other centres.

OVERSHADOWING: In residential buildings minimize overshadowing to adjacent buildings and in some cases the street.

CHOICE IN HOUSING: Provides alternative housing to what is currently available and supports an urban type lifestyle.

AFFORDABLE: Offers opportunities for affordable housing and a range of demographics.

HUMAN SCALE: Keeping the scale of a building on the street comfortable for people.

CONTRIBUTION: Material selection, reflectivity and colour use to contribute to the street and public realm.

QUALITY: Innovative design and design excellence

CONTEXT: A range of scales and heights to reflect the uses and character of the City Centre.

The following pages detail further the range of considerations that will guide design responses that are specific to Perth and in some instances only to Stirling City Centre.

9.3 CLIMATE APPROPRIATE DESIGN

AVOIDING AN URBAN HEAT ISLAND

The proportion of non-shaded mass within a development during summer can dramatically increase the temperature around the building. Incorporating shade trees can be the most effective and financially viable strategy in mitigating the heat island effect and improve outdoor comfort for people.

If the development has attractive usable outdoor living areas residents could use in summer and winter, a reduction in energy consumption in cooling would occur. (p137,Urban Microclimate: Design the Spaces Between buildings. E Erell, D Pearlmutter, T Williamson. Earthscan 2011)

Street trees and landscaped parks within high density areas are critical in reducing the urban heat island effect.

LOT ORIENTATION

Cardinal orientation is the optimum for Perth. The principles can be applied to lots that are off cardinal orientation by up to 10 degrees without significantly affecting comfort and efficiency.

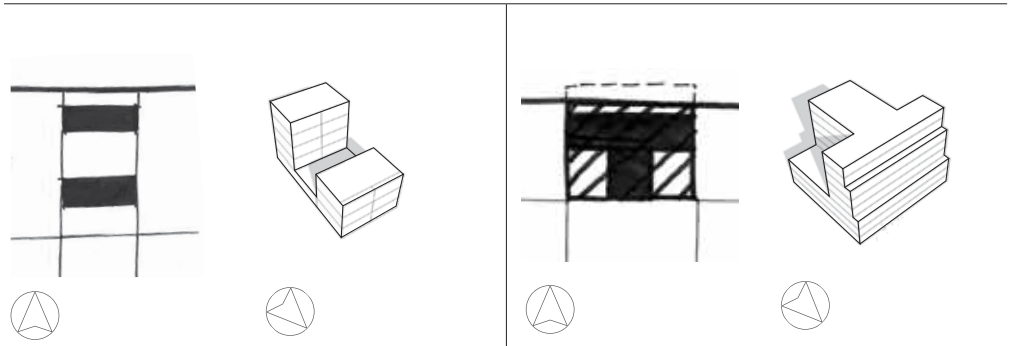
In single detached housing north-south street orientation works better than east-west street orientation when considering energy efficiency, thermal comfort and solar access. For medium to high density buildings, certain building types suit particular orientations and some types are flexible enough respond to either orientation.

Generally, north-south lots are ideal for buildings that can accommodate 0m side setbacks, negating east and west solar penetration. Front and rear setbacks are useful to enable outdoor living to the north and minimizing overshadowing to the south. Building types such as Row housing and wall edge are suitable.

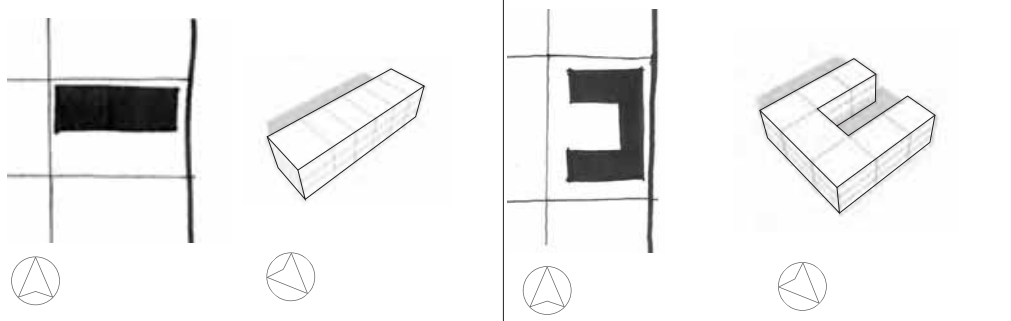
East-west oriented lots are ideal for buildings that accommodate or require side setbacks. The setback enables northern outdoor living areas with the south side for vehicle access. The south setback improves the adjacent properties solar access. Front and rear setbacks can be flexible to suit other requirements. , but may be determined by other factors including cross subdivision breeze movement.

Diagrams (right) identify types that suit either north-south street orientation or east west street orientation.

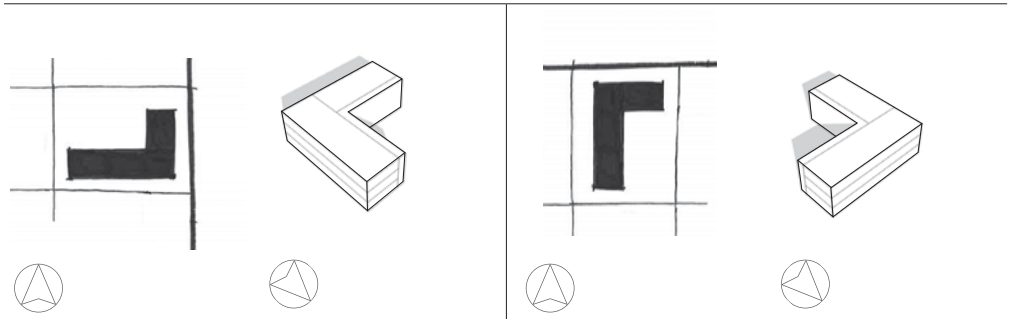
Optimum North-South Orientation



Optimum East-West Orientation



Any Lot Orientation



LOT ORIENTATION AND BUILDING TYOLOGIES

9.3 CLIMATE APPROPRIATE DESIGN

HEATING AND COOLING

Perth buildings require both winter heating solutions and also effective summer cooling strategies. Average winter temperature ranges of 15-18 degrees daytime maximum with 6-9 degree minimum overnight mean that there are more days of the year when energy is required to heat buildings than days of the year when air conditioning is required to cool.

PASSIVE COOLING

Buildings in Perth must be designed to shade walls during summer, however the design for the northern façade needs to ensure solar access during the winter is not compromised. The hot afternoon sun is also a primary shade consideration and requires a vertical shade solution to address the low sun angles. Stirling is approximately four kilometers from the sea and has the ability to utilize the cool afternoon south-westerly breeze during summer. The south-westerly can be used to purge heat from buildings during the evening if the building and apartment layout is designed to maximize cross-ventilation.

The general principle of hot air rising or the "stack effect" can be exploited by positioning air intake openings low on walls, and air expiration outlets higher in walls. Many innovative "cooling chimney" designs are available.

PASSIVE HEATING

In order to save energy for heating during winter, living areas must have access direct solar penetration. A building's thermal mass will then be able to absorb and store heat for re-emission when the temperatures drops at night. Perth enjoys a high percentage of sunny days during winter which is ideal for passive heating. In fact Perth can experience unseasonal hot days in late autumn, winter and early spring, so it is important that shading can be controlled on the exterior of the building to avoid overheating. The balance between large areas of glazing for winter sun penetration and the loss of heat via this glass must be considered with selection of "low-e" glass or double-glazing systems where appropriate.

Thermal mass (eg structural concrete floors, masonry walls) must not be insulated (no carpets or wood flooring) to allow for heat storage and transmission. Ceramic floor tiles and polished concrete are the best choices for floors on which winter sun will shine.

Building envelopes must be well sealed and insulated to assist in capturing and storing heat during winter.

OVERHANGS FOR SHADING AND WINTER SUN ACCESS

Sun altitude angles change with the seasons, and Perth's sunny, warm climate is ideal for harnessing this change in angle to allow for winter sun to penetrate the building, and to exclude summer sun by shading. In Perth at noon on the summer solstice the sun's altitude is 81.5 degrees, almost directly overhead. At noon on the winter solstice, the sun's altitude is 34.5 degrees. Intelligent shading design, with the use of horizontal louvres for example, will significantly improve the buildings performance. The general orientation of the building needs to be considered in conjunction with shading. The long axis (with major openings) ideally faces north, however an orientation no greater than 20 degrees east or west of north will still allow the sun to enter through them in winter, whilst excluding much of the summer sun

To calculate the ideal overhang required for north facing eaves or verandah widths, the distance from the eaves or soffit line to the base of the window is multiplied by a factor of 0.4 for shading from October to February and 0.7 for shade from September to March.

9.3 CLIMATE APPROPRIATE DESIGN

USE OF DECIDUOUS TREES & VINES

Although plants cannot alter building performance in a quantifiable way due to their impermanent nature, they can significantly assist building shading, privacy and inhabitant wellbeing. They help filter dust and provide habitat for native animal life.

Plants ideally provide a buffer or windbreak from hot morning easterly winds or cold winter south westerly storm winds. Seasonal changes in both interior light and building shade requirements are best assisted by the use of deciduous plants.

Few native Australian plants are deciduous, however seasonal pruning of native trees and vines can be effective. Trimming back in late autumn to allow for solar penetration to the building during colder months will stimulate new growth in spring in preparation for shading during summer.

PLAN CONFIGURATIONS FOR CROSS-VENTILATION

Buildings that 'breathe' and provide higher exchanges of fresh air are ultimately healthier for residents. An understanding of regional climate and how various features (topographic and man made) influence the microclimate of the site is paramount. For example prevailing winds travelling over hot road surfaces will be unwelcome, but if winds pass over a shaded garden or water feature they may be cooled. Stirling also receives the reliable afternoon south-westerly "sea breeze" during summer.

The maximum depth of a non-cross-ventilated room is around six metres. The maximum depth between opposing facades with openings is fifteen metres. Double-banked rooms restrict cross-ventilation, but are often difficult to avoid. (pg 122 "Stay Cool" Holger Koch-Nielsen)

Well ventilated internal corridors with openings from adjacent rooms must be considered to improve ventilation in buildings with non-linear, more square shaped plans with double-banked rooms.

Building design should utilise both in plan and section the colling effects of breeze paths.

USE OF MASS CONSTRUCTION EFFECTIVELY

Buildings constructed with masonry (brick or concrete) walls, with concrete slabs have a high thermal mass and have been traditionally favored in Perth's hot dry climate. The mass can be used effectively as a thermal store as its "thermal lag" period is long, meaning that it takes a long time to respond to changes in temperature. If buildings are designed to ensure mass is protected by well insulated roofs with appropriate eaves overhangs for shading, the mass can remain cool during hot days. This is particularly effective in multi story buildings. The diagram below shows the ways in which heat is gained and lost from buildings.

On hot dry days, building envelopes are sealed (windows shut) to prevent heat penetrating. Ventilating the building overnight when temperatures fall is important to prevent the building mass from gradually heating up after prolonged high temperatures common in Perth's summer. Stirling is close enough to the coast to benefit from the reliable afternoon south-westerly "sea breeze" during summer to assist in this ventilation of thermal mass.

USE OF FRAMED CONSTRUCTION & REVERSE BRICK VENEER EFFECTIVELY

Framed buildings can provide cost effective and flexible design alternatives to traditional cavity brickwork. Reverse brick veneer (RBV) has been demonstrated to out-perform cavity brick and is ideal for Perth climate. RBV buildings locate the brickwork skin (the larger mass) on the interior, and the lightweight material outside with good insulation between. The cladding material and insulation protect the brickwork from changes in temperature (thermal lag) resulting in a stable, cool environment internally. Local resistance to framed buildings persists because external brickwork is seen as highly durable, fire-resistant and lower maintenance than building cladding (compressed fibre cement sheet, timber boards etc). Each of these properties can be demonstrated to be equaled by framed buildings. In addition, when embodied energy of materials if considered, framed buildings compare favourably to cavity brick or other masonry walls. Sound transmission considerations must be addressed with careful consideration of the acoustic properties of cladding materials and insulation.

Composite building with reverse brick veneer for the west facing facade.

9.4 ENVIRONMENTAL DESIGN

PLAN CONFIGURATIONS ACCESS TO LIGHT

Energy required for artificial lighting can be reduced most efficiently if building plans are linear with access to daylight from most rooms rather than deep, square shaped plans.

Additionally, rooms with less active uses during the day (adult bedrooms, bathrooms, storage areas, laundries etc) can be placed in darker areas of the building, leaving the brightest areas of the building for the most active daytime rooms (living areas, offices). Northern orientations for these rooms are ideal.

ACOUSTIC SEPARATION

Developments adjacent to the Mitchell freeway are impacted by noise generated by road traffic. The buildings immediately adjacent to the freeway must be designed to offer acceptable acoustic comfort for residents. Sound attenuation treatments will need to meet the Australian Standard.

A range of methods can be used to mitigate noise.

These include:

1. Building design and room layout, such as locating outdoor living areas and indoor habitable rooms away from the freeway side.

2. Building construction techniques and upgraded treatment to facades, such as glazing, window frame and ceiling insulation and sealing of air gaps.

HIGH RISE TOWERS

These buildings require a higher degree of inhabitant operability with levels of balcony enclosure to address higher wind speeds. Access to generous, sheltered private exterior spaces (balconies) is important to allow for activities such as clothes drying, outdoor entertaining and growing vegetables.

The benefits of stacked concrete floor slabs that can be sheltered from hot weather can be exploited in multi-level buildings for passive cooling.

Shadows cast from high rise buildings onto adjacent buildings must be considered when selecting their locations.

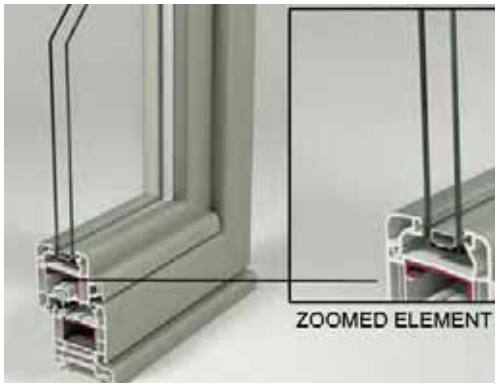
SIZE & TYPES OF OPENINGS

Consideration of prevailing winds, solar orientation, thermal heat loss through glass, views and privacy are all important when positioning and sizing windows and doors. In urban environments privacy concerns often restrict openings, but a number of innovative methods can be used to avoid this. Obscure glass, or solid panel awning windows with restricted opening angles can direct views downwards rather than outwards, whilst allowing for good control of ventilation by inhabitant.

Louvred window openings help direct air most effectively upwards or downwards into a room. Solid panels or obscure rather than glass louvre blades in combination with restricted opening angles can overcome privacy issues.

By providing a variety of opening sizes and orientation, the inhabitant can open and close up the building according to the weather. Insect and security screening must be provided in order for the openings to be able to be used effectively, including being left open overnight for effective ventilation after hot summer days. Reliance on tinted glass for solar control must be avoided.

Ensure rooms used during the day have access to natural light.



Detail of a double glazed window.

Sheltered balconies are required in higher rise buildings.

Smaller openings on the windward side of the building and larger openings on the leeward side will encourage the greatest ventilation through a space.

9.5 CONSTRUCTION VIABILITY

The shortage of good quality affordable housing is one of the most pressing problems facing Perth, threatening the long term viability of redevelopment within Stirling City Centre. Without the adequate supply of affordable housing, some households will be denied the opportunity to live within the City Centre.

MATERIALS & FINISHES

Affordable housing should be virtually indistinguishable from higher-end housing, so there must be a great deal of intelligence in selecting and positioning materials so buildings share similar qualities regardless of cost. Public areas and building facades should be the focus of high quality, durable materials, but there are less visible parts of buildings where less high specifications can be used.

The balance between short term cost and building lifespan is important in considering investing in materials with longevity and lower maintenance.

Consider selective material use: focus on higher quality attractive materials and finishes in areas that experience maximum exposure with plainer, more cost effective materials for less exposed areas of building.

DWELLING DIVERSITY

Perth inhabitants are currently challenging the notion that the most desirable home is a single, fully detached house on a large block. A number of factors have precipitated this. Smaller family sizes, with more single parent families. A desire for "empty nest" parents to downsize once children move out of family homes. Urban lifestyle benefits outweighing suburban. More mobile population, moving from house to house as jobs and families change, rather than more static lifestyle of previous generations.

Good apartment planning is important to ensure privacy, efficiency of space (flexibility of rooms) and healthy, well ventilated spaces.

CONSTRUCTION TIMEFRAME

The use of pre-fabricated buildings constructed off-site, assembled and craned into position is a relatively new innovation in medium to high density urban environments. This method has more traditionally been used to provide single residential buildings for remote locations, but new higher density uses can provide environmental and financial savings.

Lighter weight framed buildings can provide savings on structural footings, particularly relevant where foundations are questionable (high water table, reclaimed sites, acid sulfate soils).

Examples by Unitised Building (Aust) Pty Ltd allow accelerated on-site and off-site construction programs and have demonstrated the ability to deliver buildings faster, to a higher quality standard, while produced in a safer and more controlled work environment.

PARKING & SERVICES

Basement parking can be problematic in some areas of Stirling due to acid sulfate soils and re-claimed sites. A balance between adequate street parking, on-grade mass carparks and a desire for comfortable streetscapes unencumbered by cars must be found.

Options to reduce parking ratios must be considered as viable because of improved public transport and close walking distance to shops. Provision for safe bicycle travel and storage is another strategy.

Car sharing schemes are currently being introduced in urban areas of Perth with special parking bay allocation.

Currently Perth's suburban reliance on personal car ownership is being challenged as densities increase.

The upper levels of this mixed-use development are residential, with one level designed as affordable apartments and the other as market sale. The external facade treatment between the two levels is virtually indistinguishable.

Good planning will maximise the functionality of a small floor area.

9.6 ARCHITECTURAL RESPONSE

BUILDING INCREMENTS AT A HUMAN SCALE

The impact of buildings at streetscape level must be carefully considered to avoid overwhelming and isolating communities.

Mixed-use or purely residential buildings must be have active and appropriately scaled, stepped and shaded areas addressing the street rather than tall buildings abruptly meeting the street. Building design must enable social contact between passers-by, inhabitants and shoppers.

BUILDING ENTRIES

Differentiating between public and private areas at thresholds between outdoor and indoor and allowing outdoor spaces to sometimes penetrate underneath buildings to link various areas of the public realm.

APARTMENT ENTRIES

Clear differentiation between residential and commercial entries in mixed use buildings. Direct entry to ground floor apartments. A clearly defined public and private interface will help promote the safety of inhabitants

COMMERCIAL ENTRIES

Clearly identifiable to assist in way finding into the building. Avoiding over-branding and maintaining a sense of the building as its own identity.

FACADE COMPOSITIONS

Buildings with a variety of facade depths and materials composed not solely for the sake of complexity, but rather with real consideration of the different requirements of each area of the building. These include various levels of shading, privacy screening, acoustic separation.

Medium to high rise buildings need to be designed with a clear base, middle and top, assisting in breaking down its scale, relate to adjacent buildings and minimise the apparent bulk from the street.

QUALITY

Building quality does not directly correlate with the use of expensive materials (such as stainless steel facade systems) or adding extra decorative elements to a building, but rather with attention to detail and appropriate selection of material. Selecting professionals (architects and building designers) familiar with urban design principles rather than up-scaling from standard suburban housing is imperative.

MATERIALS

Consider issues such as cleaning and maintenance, response to local conditions such as staining from minerals in artesian water used for watering plants, mould and lichen build-up on southern facades. Reflectivity of steel roofs, canopies and cladding can adversely affect neighbouring buildings. Embodied energy, recyclability and longevity of materials must be considered.

Glazing needs to be carefully utilised to maximise its effectiveness while minimising the amount of facade glazing. Fully gazed facade treatment will not be supported in mixed-use and city centre areas.

9.6 ARCHITECTURAL RESPONSE

BUILDING ADAPTABILITY

Buildings that are designed to be flexible in use and that can be adapted to another use are more sustainable. Residential that can be converted to commercial create a flexibility of living and work spaces of different types, sizes and cost that can meet the needs of a range of sectors and respond to economic and social change.

BUILDING SCALE

Redevelopment with its subsequent increase in building height and bulk will occur over along period of time within established residential areas, therefore the co existence of single detached houses adjacent to multiple apartment buildings will occur. Dependent on lot orientation, overshadowing and overlooking may be an issue. The way a building is sited and consideration of where living areas are located to minimise these effects will enable livability for all types. Fine grain detail on the lower level facades using materials that integrate with the original houses will also assist in mitigating the extremes of scale.

PRIVATE OUTDOOR LIVING

In Perth our temperate climate enables us to spend significant time outside, with minimal cover. This has influenced the way we live with the desire for roofed outdoor living spaces that are large enough to act as a living room. This desire translates also to contemporary higher density apartments with larger balconies and solutions that avoid mechanical services.

COMMUNAL OUTDOOR SPACE

All residential developments need to provide high quality communal areas for residents to extend their outdoor living into. Multiple areas for residents to entertain visitors, with supporting amenity, such as a BBQ and shaded seating, go a long way in supporting the outdoor lifestyle the Perth climate offers.

9.7 ROOF FORMS

Roofs are an important architectural element in defining the overall character of a building, Their type, shape, materials and detail can significantly influence this character. They can also negatively affect the views and amenity of other buildings. Roof space has the potential to provide extra usable floor space that may otherwise not be achievable.

Roof design should also be a response to climatic considerations and its local context. View corridors from neighboring buildings and the street should be carefully considered to ensure the roof form and scale relate to the facade and overall composition of the building.

GREEN ROOF

A green roof is a system designed to promote the growth of various forms of vegetation on top of buildings and to also support various forms of renewable energy to the occupants of the building. Green roofs have the added benefits of providing a building with thermal insulation, increasing the lifespan of the roof structure, producing water retention ability and the slowed release of storm water, as well as increasing the life of roofing materials and reducing the urban heat island effect. Green roofs are distinct from traditional rooftop gardens because they promote proven sustainable concepts.

GREEN ROOFS - UTILITIES

A roof can contain or support many functional uses, including improving the energy efficiency of a building by locating services on the roof. The use of solar panels, wind turbines and rainwater tanks can greatly reduce energy and water consumption. Provision should be made for future innovations in sustainable design.

Any services located on the roof must be integrated and their view from neighbouring buildings and public realm minimised.

ROOF GARDEN

Roof areas could provide both communal and private living space. Given the high temperatures experienced in Perth over summer, adequate overhead structures need to be provided. In higher density areas roof space can provide highly sought after outdoor living space that also offers a different experience from ground level outdoor space. Planted roofs that are visible from street can also improve pedestrian experience and soften the higher density built form.

Thermal stack ventilation exhausts provide a design feature in the Bedzed development in London.

9.7 ROOF FORMS

ENVIRONMENTAL RESPONSE

Roof design should incorporate an environmental response to the site. Roof forms angled according to lot and building orientation to maximise solar access should be encouraged.

In lower rise buildings roofs have the potential to provide adequate shading to windows and outdoor living spaces immediately below.

ROOFTOP FARMS

Specifically designed green roofs can be developed as rooftop farms. These could grow food produce to supply local businesses or building occupants. Alternatively the rooftop itself could serve as a growers' market.

The reduction in transport means that produce can be grown at a lower cost than typical farms, while the smaller scale allows for better quality organic produce. This could make the green roof a viably profitable and lettable space.

LOW RISE ROOF FORMS

Currently, the more developed suburbs of Innaloo and Woodlands are dominated by single detached dwellings with pitched tiled roofs. New developments in these areas will be of a smaller scale in comparison with the rest of the city centre and their roofs will be an important design feature.

Roof forms in these new buildings should have reference to that of surrounding pre existing dwellings, however directly copying the elements and detail of single family houses in larger residential buildings should be avoided. Doing this limits the usability of roof spaces and is not necessarily the most climatically responsive outcome nor the most aesthetically pleasing; often resulting in a roof of an inappropriate proportion, scale and detail.

HIGH RISE ROOF FORMS

As buildings increase in height their formal importance in defining a building is lessened, however roofs still need to be well articulated and how they consider how they will 'meet the sky'.

Pitched roofs should be avoided unless used as a roof feature.

RELATIONSHIP TO BUILDING TYPOLOGIES

The opportunity to utilise roof space should be taken into consideration during the design process. With the exception of the 3 – 4 storey sleeve typology, all building typologies described in this report would support some form of liveable roof.

The pitched roof becomes a design feature in this development

9.8 STREET & POS INTERFACE

The Form Based Codes define where these interfaces will occur in greater detail, a range of building typologies can apply these principles in order to effectively adapt and respond to the precinct and immediate area.

FRONTAGE PRINCIPLES

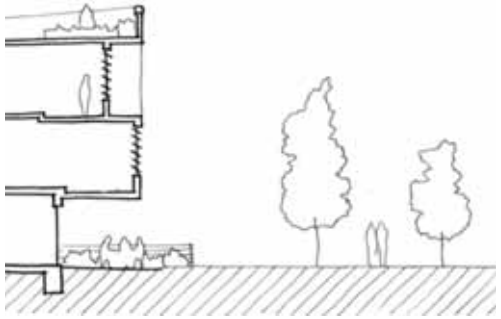
The term frontage refers to the privately owned land between the front elevation of a building and the front lot boundary. Frontage types will range in character across the character precincts and are progressively more urban towards the City Centre character zone. This is achieved through a combination of various design elements, including depth of setbacks and changes in levels and building elements such as fencing, verandas, awnings, shopfronts, arcades and the projection of balconies on upper levels. All frontage types should be designed to allow for casual social interaction and passive surveillance of the public realm. This includes all upper level residential dwellings, which are to have balconies facing the street and any public open space. Notably, blank walls and parking spaces should not be considered due to their adverse impact on pedestrian amenity. The ability of frontage encroachments to extend beyond building setbacks and potentially into the public realm will be explored to achieve protected and shaded pedestrian spaces along higher activity retail and commercial thoroughfares.

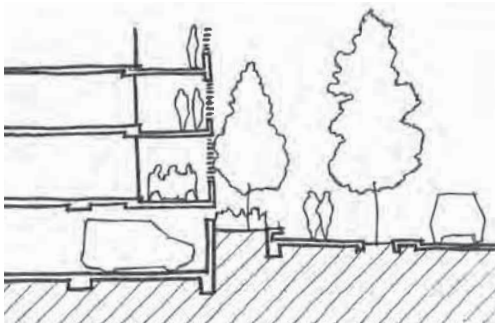
ADJACENT TO POS

In order to maximise the amenity provided by public open space, all buildings adjacent should primarily address the public open space to activate its edges and provide natural surveillance for users Opportunities for direct physical access from the development to the open space will be complemented with low permeable fencing and a reduced building setback.

RESIDENTIAL ON A BUSY STREET

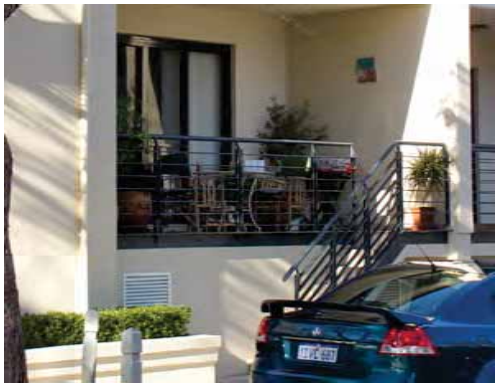
Residential only developments along busy streets, such a Liege Street and Odin Road, may need to create a change in level from the street to the private garden to provide a measure of privacy avoiding the need for high solid fencing, enabling building articulation to enrich the buildings street address. Direct pedestrian access from the street to ground floor apartments is also important with small building setbacks.





Reduced front setbacks still offer the potential for small gardens and balconies.

Balconies need to overlook public open space.



Raised ground floor balconies with direct apartment entries provide interest from the street

9.8 STREET & POS INTERFACE

RESIDENTIAL ON A LOCAL STREET

Residential developments in residential only areas need to also ensure all ground floor apartments facing the street have their main pedestrian access directly from the street in order to increase activate and support the surveillance of the street. These areas could be at grade or raised to enable semi-basement parking below. The front setback should be deep enough to enable outdoor living.

RETAIL STREET

Stephenson Boulevard, Scarborough Beach Road and Ellen Stirling Boulevard will contain highly activated edges that will require an on grade ground floor building edge with minimal to no setbacks to support this.

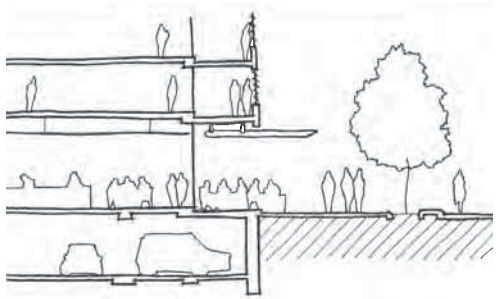
Development will contain uses such as retail and hospitality with entries clearly visible from the street and large visually permeable openings to enable interior activity to be viewed by pedestrians.

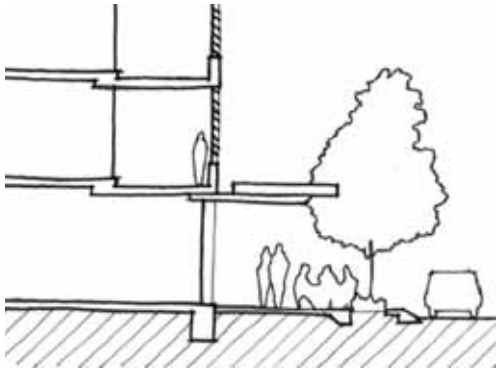
COMMERCIAL STREET

The northern sections of Stephenson and Ellen Stirling Boulevard, along with Odin Road and Liege Street will not be capable of supporting highly activated retail frontages along their entire length but will continue with no front setback. Stephenson Boulevard proposed uses are predominately commercial but will also support highly active uses, these will be less frequent compared to Ellen Stirling Boulevard.

INTERFACE OF LARGE FORMAT RETAIL CENTRES

New residential development behind Westfield and other areas will potentially adjoin a blank rear wall several metres in height. To address this interface , the building typology will require modification in order to address this undesirable interface.





Masonry walls break up glazed windows, avoiding the use of extensive use of glazing on retail frontages.

9.9 INTEGRATING COMMUNITY INTO URBAN SPACES

PERTH LIFESTYLE

Perth's renowned friendly and relaxed character, lacking in the self-consciousness and formality of European cities must be encouraged and embodied in Stirling's town centre.

Currently Perth's urban public spaces are predominantly active during daytime with most people returning home early in the evening, leaving town centres for the almost exclusive use of young revelers. This occurs despite the great number of mild evenings ideal for outdoor

Innovations such as outdoor community cinema (Northbridge) and summertime hawkers food evening markets (Perth) have been demonstrated to encourage participation by broader sections of the community.

Providing space, amenities and focus points for seasonal festivals, which most Perth urban centres hold annually (including George St East Fremantle, Mt Lawley, Perth Laneway festival, Subiaco)

CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED)

How a building design addresses public space is through providing clear sightlines from living spaces, balconies, hospitality and commercial areas will encourage use of public squares and open space, making the public realm safer.

A variety of building uses within the city centre should be encouraged so as to create activation across a range of time periods to avoid the desertion of areas at night.

AGED CARE

Aged persons housing will be a permitted use in all precincts, with the provision of universal housing a requirement in developments incorporating eight or more dwellings. This will allow the Stirling community to 'age in place'.

The example below integrates aged care with community facilities such as council meeting rooms, a public library, cafe and public parkland. Occupants are provided with generous balconies and communal outdoor courtyards. The building form responds to surrounding residential developments through both scale and use of materials.

SCHOOLING WITHIN THE CITY CENTRE

With an increase in residential population within the city centre, provision of a school will be required. In order to respond to the urban context and limited land availability, the school will need to be of a compact form, over multiple levels and potentially utilise or share public open space.

9.9 INTEGRATING COMMUNITY INTO URBAN SPACES

IMPROVED PEDESTRIAN ACCESS & MULTIPLE ACCESS

Throughout the city centre several proposed intimately scaled public /civic squares are located. These public squares have the potential to enhance cross circulation, enhancing street and laneway connections with multiple access points. To complement the squares, a consolidation of building typologies to facilitate community buildings, such as a library, along with retail and upper level residential provides pedestrian connection from the street to intra site links, the living stream and public squares.

In larger developments, mid-block pedestrian access links need to be incorporated when adjacent to a public square or open space. Apartment entries that provide access to not only the street, but also to a square or access lane promote cross circulation also.

CREATING PUBLIC SPACE WITHIN PRIVATE DEVELOPMENTS

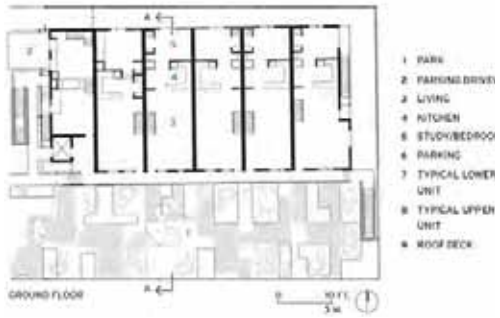
Instead of creating a series of small backyards or an internalized courtyard for the residential complex, this project sought to establish a pocket park that could be used by the public as well as apartment residents. This larger open space would add value to the dwelling units while serving as a public amenity for the entire neighborhood.

OPPORTUNITIES FOR USING THE STREET FOR OUTDOOR EATING

The capacity of buildings to sustain social experience and activities on a public street is a key to livability. Streets needs to offer the ability to allow for activities to flourish and this includes planned activities, shaded alfresco seating and public seating to encourage the general public to sit, rest and enjoy being part of the city without having to purchase anything.

PUBLIC OUTDOOR LIVING

High amenity public spaces offer increased options for social activities and social interaction between people of different ages and social backgrounds. Providing areas sheltered from sun and wind and possibly rain, that are multipurpose, with good access to facilities such as public toilets, water fountains. Outdoor living in the local Perth sense often includes play areas and interactive public artworks, which can bring a sense of delight and whimsy, adding to a "sense of place".



Apartment entries provide access to the street and also to a small pocket park or access lane promotes pedestrian cross circulation. North Fremantle

Public park provided by the developer of these apartments. Formosa 1140, West Hollywood.

9.10 INTEGRATING THE LIVING STREAM

The 'living stream' provides the City of Stirling with a uniqueness that no other centre in Perth offers. It gives the opportunity for retail, commercial and residential developments to interact with the stream in order to establish it as the heart of the city

STRENGTHENING THE IDENTITY OF STIRLING CITY CENTRE

Building development should take advantage of the potential of the 'living stream' as a key driver in the formation of a unique and positive identity for Stirling City Centre.

Built form and the stream should respond to each other in such a way that is mutually beneficial for the character of both.

AS THE CIVIC CENTRE & CIVIC HEART

The civic buildings and associated spaces should respond to the 'living stream' to create a destination point which will become the defining experience of visitor to Stirling City Centre.

EXPANDING INTO THE CITY

The 'living stream' should be brought into the City centre, whether figuratively or literally in order that the character of the stream permeates throughout the whole of the Stirling City Centre.

The use of water in civic spaces within the city could define public spaces and reference the stream without physically diverting water from the living stream.

FACILITATING ACCESS TO THE STREAM

The stream should be easily accessible throughout the Stirling City Centre. The provision of linear pocket parks which lead towards the stream will provide clear sight lines and create an enjoyable experience for pedestrians as they move towards the stream.








9.10 INTEGRATING THE LIVING STREAM

INTEGRATED WITH COMMERCIAL BUILDINGS

Commercial buildings will be designed to maximise the activation of the stream and associated spaces by locating balconies and major openings towards the stream. Commercial enterprises such as restaurants should focus public activity onto the stream, however steps should be taken to avoid the total privatisation of any part of the 'living stream'.

PROVIDING A VARIETY OF EXPERIENCES

The response of the built form to the 'living stream' should be modulated according to the location within the Stirling City Centre to create a variety of related experiences. These may include cafes and activities such as a water park.

TREATMENT OF THE STEPHENSON INTERFACE

Attention should be paid to the treatment of the stream along Stephenson Avenue as it will be the most visually prominent interface with the city centre and will therefore be key in linking the character of the stream to Stirling City's identity.

The substantial width of the existing road reserve along Stephenson will facilitate the formation of the stream. It should be taken advantage of by widening the stream in places, changing form and route to create a variable public realm that directly complements adjacent buildings and their use.

TREATMENT OF THE RESIDENTIAL INTERFACE

Higher density residential development adjacent to the stream will rely on the provision of communal and public open spaces overlooking the 'living stream'.Direct multiple access to the stream should be encouraged.

Balconies and windows to major habitable rooms should address the 'living stream'.

9.11 INTEGRATING THE NATURAL LANDSCAPE

The integration of landscape to building typologies needs to be considered for all residential types. It is important for landscaped areas to be located in easy accessible areas, has access to some light and is designed to be easily maintained.

DEEP ROOT ZONE

In residential and some mixed use developments, an area of unencumbered land will be need to be provided. This deep root zone will enable large trees to be planted within higher density developments. Benefits to occupants will be significant, from improved communal area aesthetics, providing visual screening between apartments and natural shade during summer, cooling the micro-climate and minimising the heat island effect that higher density development can often generate.

TREE RETENTION

Street trees: In the Innaloo and Woodlands precinct established street trees exist. These trees need to be considered when developers are undergoing preliminary site planning of vehicle and services access location.

Lot trees: In higher density developments the amenity of a well placed established tree or trees cannot be underestimated. Mature trees offer a new development instant softscape impact for the upper levels and will differentiate between competing developments.

Endemic trees: Mature trees that are endemic (from the local bushland and existed prior to the suburb being created) are found in both Innaloo and Woodlands. The heritage and sense of place value of these few trees is yet to be recognised but where possible redevelopment of lots with these trees should have some incentive to find a solution to retain the tree in redevelopment.

SETBACKS TO SUPPORT STREET TREES

Although street trees will be planted or retained, if already existing, front setbacks to all residential developments enables all development frontages to contain some planting to soften the interface between the street and building. Where setbacks are greater small trees are also encouraged to be planted to complement the street trees.

Side and rear setbacks enable tree planting to occur, which can provide a buffer to adjacent developments, through minimising overlooking and improving the outlook from upper level apartments.

CONNECTED TO A NETWORK OF OPEN SPACE

Stirling City Centre will contain a defining linear park that will traverse precincts that are existing undeveloped land or in the existing industrial area. The opportunity for landscape treatment within developments to closely relate to and link with this public amenity will be significant and a potentially defining identity for these newly developed precincts.

The proposed 'living stream', will be connected to this network of linear parks and is planned to not only act as a significant destination for visitors and residents, but also provide enhanced pedestrian connection throughout the city centre.

To facilitate and enhance the movement to and through these open spaces buildings need to configure apartment balconies and major living areas to overlook these spaces.

9.12 VEHICLE PARKING

The Stirling Alliance aim to reduce the negative effects of cars on the public realm and promote a shift away from a reliance on cars for transport in their parking strategy. Parking at a rate of one car per dwelling will encourage this and limit the effect that high parking ratios have upon built outcomes.

ON-GRADE & OPEN CAR PARKING

On grade & open parking should be sleeved from behind buildings to avoid having a detrimental effect on the quality of the street. On-grade should only be permissible in developments that also provide a sufficient area for deep root planting zones and quality communal space.

ON-GRADE & COVERED CAR PARKING

Covered on grade parking allows the opportunity to build communal outdoor spaces or even components of the major built form above. Covered parking should be sleeved from the street and provide natural ventilation in their design. Covered parking on grade which does not provide habitable space above should not be permitted unless a satisfactory amount of outdoor space and deep root zone planting has been provided elsewhere. In these cases the parking covering should be of an architectural style complementary to that of the primary built form and ideally integrated within the building form.

DECK PARKING & ADAPTABILITY

Decked carparks should be designed so as to promote the future adaptability of developments. This can be done by setting a minimum floor to ceiling height for carparks which is adequate for future conversions to commercial or retail uses. The design of decked carparks with sloped floor plates should also be avoided.

Typically decked parking structures should be sleeved behind active building frontages on the ground floor and ideally upper levels. If It is deemed permissible for decked parking to front the street on upper levels it should be covered by a green wall or similar aesthetically pleasing screen in order to minimise the negative impact on the street.

SEMI-BASEMENT & BASEMENT

In areas where soil quality is not an issue, semi and full basement options provide the opportunity to satisfy parking requirements while maximising outdoor spaces and increased internal floor space area.

In lower density residential areas semi-basement parking should be utilised as it reduces the reliance on mechanical ventilation and can also contribute to dwelling privacy by slightly raising the floor level of ground floor apartments fronting the street.

Where possible full basement should be used in commercial and mixed use developments in which an active, larger ground floor area is required.

DISCRETE VEHICLE ENTRIES

Vehicle entrances to all parking types should be designed to minimise the view from the street and with minimum widths. For buildings fronting Ellen Stirling Boulevard, Stephenson Boulevard and other busy roads vehicle entries should be provided via a side street where possible.

Undercroft parking to the rear of the site.

Decked parking on upper levels is provided with an external screen. In Stirling City Centre upper level parking will need to be lined with commercial uses.

Ventilation for semi-basement parking provides space for street planting.

10.0

Character Zones

10.1 **OVERVIEW**

Each precinct is identified by a unique composition of uses and infrastructure elements. Given this, the Urban Typology Framework has focused on building types, architectural elements, their potential relationship to landscape and the urban realm. Through this process a visible pattern of increased urban intensity and character across the Structure Plan area has emerged. This indicates the Typology Framework can be organized according to distinctive "character zones" – zones that have a unique influence on the sensation of being in that place. The character zones engender the principles contained within the Structure plan and are defined according to their incremental proximity to the City Centre "heart". The naming protocol of the character zones has been selected to best describe a common understanding of the places. These include Residential Gardens, Residential Communal, Mixed Use Lifestyle, City Centre Heart and Civic Identity.

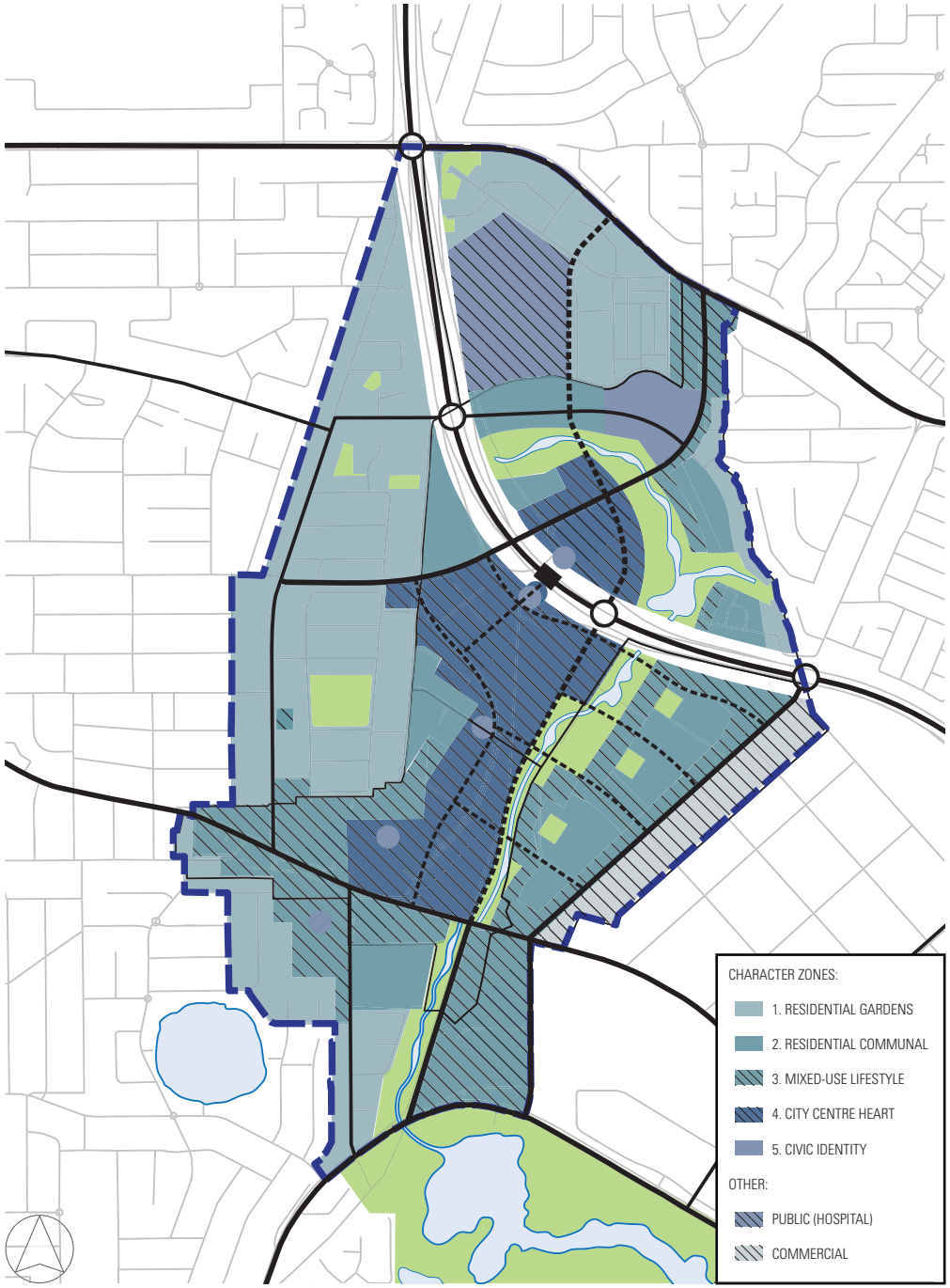
1. RESIDENTIAL GARDENS

2. RESIDENTIAL COMMUNAL

3. MIXED-USE LIFESTYLE

4. CITY CENTRE HEART

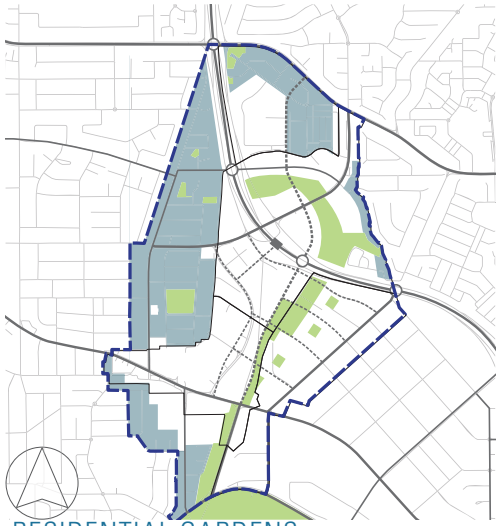
5. CIVIC IDENTITY



STIRLING CITY CENTRE CHARACTER ZONES

10.2 RESIDENTIAL GARDENS

The Residential Garden Zone will integrate the proposed higher density residential and commercial development with the surrounding lower density residential housing. Residential Garden Zones are located on the periphery of the Stirling City Centre, along the boundary between the existing residential areas Innaloo, Woodlands and the Northern Precincts.



RESIDENTIAL GARDENS

OVERVIEW

Re-development will occur within a framework that is constrained physically through existing lot subdivisions and a well established street network. It's essential that new developments integrate visually with pre-existing houses and streetscape, despite the increase in scale.

The greening of this Zone will occur through the upgrading of existing parkland and the incorporation of public space into all new development proposals.

BUILDING TYPES

3-5 Storey Residential-Single Loaded Apartments.

GENERAL CHARACTER

The architectural response must reference the existing qualities and features of a single-detached house, typical of the area. For instance, direct access from the street to the dwelling, large street-facing windows to the living room or bedrooms that overlook a landscaped front garden. The street facing facade of these houses often features a wall of stone or patterned brickwork. The application of these textural and material insertions will apply a level of contextual appropriateness, add detail and interest to the streetscape as well as assist in breaking down large-scale building form.

Due to high individual ownership and the difficulty in amalgamating adjacent lots, the transformation of this Zone is likely to take place over a protracted period.

DESIGN INTENT

To offer a broad range of building and plan types suiting a diverse demographic.

Provide high quality communal space.

Incorporate private outdoor areas and balconies that act as an extension of internal living areas.

To maximise solar access through appropriate building type and orientation and through the provision of generous communal and private outdoor spaces.

TYPICAL HEIGHTS

3-4 Stories, extending to 5-stories on occassion.

BUILDING DISPOSITION

2-4 m front setback

6+ m rear setback

3+ m side setback

Reduced rear setbacks and large balconies strengthen the connection between apartments and adjoining parkland while also providing passive surveillance. Building footprint is 50m x 20m deep (Block: 65m x 35m). Churchlands, WA.

10.2 **RESIDENTIAL GARDENS**

THE OUTDOOR LIFESTYLE

Allows residents the opportunity to live in a high density, urban environment whilst still enjoying high-quality landscape and public open-space amenity. This will occur through the provision of spacious private outdoor areas and communal spaces that can be shared by the broader community.

PUBLIC OPEN SPACE (POS)

Large existing parks upgraded to increase public amenity.

Developments that offer pocket parks to be encouraged through incentive schemes.

Developers encouraged to incorporate public access ways in their projects through a program of incentives.

COMMUNAL & PRIVATE OPEN SPACE

Oversized balconies or large private outdoor areas and roof decks overlooking POS and communal areas. Wide planters to provide privacy where necessary.

GENERAL LANDSCAPE

Existing trees should be retained where possible; whilst the planting of new trees within the allocated deep root zone should be incentivised as part of new large scale development.

Doing this will result in an overall improvement to the aesthetic of a landscape which has been degraded by recent, treeless duplex and triplex developments.

Streetscape amenity will be raised through the retention of street trees and addition of complementary in-fill planting. The individual identity of each area would be strengthened through contextually appropriate and consistent planting.

This precinct offers the opportunity to challenge the existing aesthetic of its streets. Specifically, wide road reserves could be used to develop develop linear parks and shared roads. Doing this would aid in the slowing of traffic whilst also discouraging the use of residential streets for shortcuts.

Apartments provide generous private outdoor spaces. Bellevue Hill, NSW

Large balconies function as an extension of internal living space and overlook the street and adjacent parkland. Churchlands, WA.

10.2 RESIDENTIAL GARDENS

The palette below is a sample of materials that are envisaged for Residential Gardens. A complete palette guide will be provided within the Design Guidelines for each precinct.

WALL MATERIALS


face brick


timber boards


render brickwork

glass

FEATURE MATERIALS


solid stone


horizontal timber slats


modern breeze blocks


highlight painted feature


Well articulated facade with a variety of materials creates good facade articulation and interest. Brisbane, QLD


Large balconies overlooking well planted communal open space. Freiburg, Germany.

10.2 RESIDENTIAL GARDENS

BUILDING FORM & FACADE COMPOSITION

Building facades should be well articulated and varied in their design. Techniques such as wall offsets, modulation of the building plane and the use of colour and texture will reduce visual bulk and help to better integrate each building with its surrounds.

Carport roofs and all ancillary buildings are to be fully integrated within the building envelope.

Buildings will be of a predominantly horizontal composition with punctuating vertical elements to modulate the facade. Doing this would reference the existing houses within the Zone which are mainly horizontal in composition with a chimney to provide a vertical element.

Roof types are to be selected for their climatic impact as well as aesthetic value.

Overshadowing and solar access are to be considered in each design.

Flat roofs will be accessible and able to be developed into open space.

Roofs running along a street facing facade should be highly articulated and reference the surrounding topography.

BUILDING FRONTAGE

Building frontages are to address the street through use of major openings and wide windowsills.

Balconies and facades are to possess a high level of architectural detail.

All ground floor units facing the street are to have direct private access.

Centrally located living spaces could be raised 1 metre above street level to increase privacy and provide some acoustic separation.

Planting within these small front setbacks will create a cohesive and vegetated streetscape.

ACCESS

Vehicle entry will be from the street or via an adjacent development access way.

The surface materials of driveways should be discrete and flexible in its use eg. turf cells, hardy grass varieties.

Residents' cars are to be parked at the rear of each site and or in naturally ventilated basements.

COLOURS

To reference existing houses without becoming overly repetitive.

MATERIALS

High quality materials to be used on the visible areas of the facade.

Wall materials: Face brick. cement render, fibre cement sheeting, timber cladding, and clear glass.

Recessed panels of stack bond brick or stone.

Minor offsets of light, honed concrete blockwork or low maintenance face brickwork.

Glass or visually permeable balustrades to be used when facing open space.

Roof space provides habitable living areas with balconies overlooking the street. Malmo, Sweden.

The third storey is integrated into the roof minimising the scale of the building against its single level neighbour. Northbridge, WA.

10.3 RESIDENTIAL COMMUNAL

A Residential Communal Zone is located in almost all precincts throughout the Stirling City Centre. These developments will be located on larger parcels of land and predominantly residential (2000m2 minimum). In two areas re-development will occur amongst the existing low density housing; all other development will occur within a purposed design subdivision or within an existing lot of a suitable size eg. Parkland Villa.

OVERVIEW

Public open space amenity will need to be created to support development across all areas. Specific development lots will be required to incorporate a defined public open space whilst other sites will be encouraged through an incentive scheme to incorporate smaller pockets of open space.

The appointment of an independent design panel to review development proposals would be of particular benefit to this Zone.

BUILDING TYPES

3-8 Storey Residential-Single loaded apartments with some double-loaded exceptions.

A flexible approach to heights should be considered. Buildings fronting the street have the potential to block views through to taller buildings located deeper within large lot developments. If the design minimises visual intrusion, taller buildings should be considered as an incentive for the provision of more public open space.

GENERAL CHARACTER

Each Residential Communal Zone will be defined by high levels of permeability and pedestrian access. Each residential development should linked with the 'living stream' through appropriately planted public and private pedestrian pathways. These pathways would provide shorter routes to commercial precincts and allow people to be less reliant on their cars.

BUILDING FORM & FACADE COMPOSITION

With the exception of the outdoor and open space objectives, the architectural response to an area with existing housing should be similar to that discussed in the Garden Residential Zone.

Osborne Park and the land to the east of the train station are new residential areas and therefore require a more detailed character response. Buildings within this Zone are tall and require less dominant roofs. Each roof should however be well articulated and contribute to defining the top of portion of each building.

THE OUTDOOR LIFESTYLE

Well executed communal space and public parkland encourages people outside of their apartments, creating a more active and social streetscape. Balconies should be large enough to be considered an extension of each living space, and provide an additional entertaining area for each apartment.

PUBLIC OPEN SPACE

Each development is to contain either a portion of public open space or a smaller-scale pocket park. Connections are to be made with the 'living stream'; the aesthetic of the landscape is to compliment the built form; and, a car-free lifestyle is to be supported whereever possible.

Connections to the train station are to be enhanced through the provision of a good network of pedestrian pathways.

COMMUNAL & PRIVATE OPEN SPACE

To contain a variety of external spaces, including residential gardens, swimming pools and public and private pedestrian thoroughfares. Rooftop gardens will be utilised to grow fresh produce.

ACCESS

Industrial and Ecological residential areas will have carefully arranged vehicle access points which limit the dominance of the car on the street and ensure that the pedestrian has priority within the public realm. Redevelopment areas within existing subdivisions will have limited access options, and where possible entries should be provided from a secondary street.

BUILDING FRONTAGE

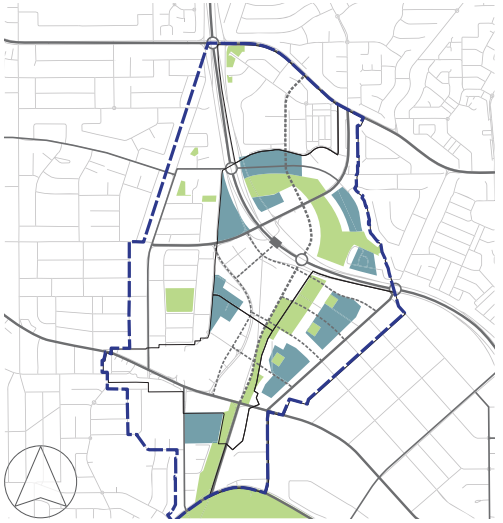
Building frontages must always address the street. This is achieved through a combination of opening, such as windows and balconies, and the incorporation of architectural detail into the design. Direct private access should be provided to all ground floor units.

TYPICAL HEIGHTS

6 Stories, although some may be higher.

BUILDING DISPOSITION

Refer to Form Base Codes.



RESIDENTIAL COMMUNAL

10.3 RESIDENTIAL COMMUNAL

INDUSTRIAL RESIDENTIAL

DESIGN INTENT

The Industrial Residential Sub-Zone presents an opportunity for high density development to be located within a functioning industrial area. It's essential that all new development reference this industrial context through its design.

Developments should aim to build economically viable business opportunities into their schemes and to incorporate community infrastructure such as cafés, communal gardens or shared workshops.

To lessen the industrial impact of this Zone, emphasis should be placed on its relationship with the 'living stream'. Visual and physical linkages to the stream should be made through the Zone through the creation of sightlines and pedestrian and bicycle pathways.

BUILDING FORM & FACADE COMPOSITION

The architectural language is simple and bold, using a tight selection of materials in a layered format. Contemporary materials such as natural block, painted concrete forms, aluminum screens and metal cladding are all suitable to a minimal, industrial context.

The following techniques could be used to create facades that both reference the past and are relevant to the current context: incorporation of ornamental facade treatments into the structural system, precast concrete panels as robust screens, or the over-laying of large scale precast concrete walls with finely-scaled aluminium frames and mesh for sunshading.

MATERIALS

Commonplace industrial materials such as concrete, aluminium, steel and glass should be reinterpreted to provide contextually appropriate, contemporary finishes.

COLOURS

Raw, unpainted materials provide an appropriate colour palette in this context.

GENERAL LANDSCAPE

Osborne Park will require a large-scale planting program to address the lack of trees within the area. A combination of public and private landscaping will assist in developing character and a sense of identity for the Zone, however issues of soil contamination may need to be addressed.

The overall intention is that building's within this Zone will be located within a landscape garden environment. Views must be provided through to the 'living stream' as well as physical connections made via a series of pocket parks and pedestrian paths.

Affordable Housing with a strong focus on providing communal spaces for occupants Industrial materials have been utilised, with unfinished concrete block construction combined with steel balustrades, rafters and wide pan sheeting. Kelvin Grove, QLD

Clear public access along the stream will avoid privatisation of the steam. Malmo, Sweden.

10.3 **RESIDENTIAL COMMUNAL**

The palette below is a sample of materials that are envisaged for Residential Communal. A complete palette guide will be provided within the Design Guidelines for each precinct.

WALL MATERIALS


render brickwork


timber boards


cladding


concrete

FEATURE MATERIALS


relief brickwork


narrow timber slats


modern breeze blocks


contrasting brick patterns

Parkland and residential building located on a remediated land fill site. Melbourne, VIC.

10.3 **RESIDENTIAL COMMUNAL**

ECOLOGICAL RESIDENTIAL

DESIGN INTENT

Development in this Sub-Zone should respond to the area's historical function as a landfill site. A distinct identity for the area will be created through careful consideration of the site's unique environmental concerns.

The lack of pre-existing development allows for an environmentally sustainable, ground-up approach to building orientation and design.

Development will focus around high quality amenity created via the 'living stream' and connected via the various communal areas through the site.

Larger developments should include a high level of bicycle and pedestrian permeability.

All subdivision design should make provision for a potentially car-free sub-precinct.

BUILDING FORM & FACADE COMPOSITION

A mix of façade compositions will be encouraged, with environmental considerations underpinning the selected building form and facade composition. Specific types, such as the cluster typology, are vertical in form with horizontal elements such as balconies and overhangs to help 'ground' the building within the landscape.

Extending the ecological approach through to the exterior through the use of such things as solar panels as eaves and operable sunshades will give a dynamic and contemporary character to the façade.

MATERIALS

To reduce construction costs, inexpensive and pre-finished materials should be used.

Integration of structure and wall is another option suitable in this area.

The selection of external materials will be determined according to their quality, longevity and ability to raise thermal performance.

East and west facing facades should be made of insulated masonry, reverse brick veneer or similar to minimize solar loading.

COLOURS

Colour, texture and pattern should be determined according to ecological decisions.

GENERAL LANDSCAPE

A total re-design of this area will need to take into account the existing trees and landscape.

However, given that most of the existing sub-soil will need to be re-mediated or removed due to contamination, it's unlikely that many trees can be retained. Where possible solutions should be explored for their retention or transplantation.

Unlike other areas within the City Centre and with the exception of select key road networks, a street wall will not dominate the city form.

All buildings should, where possible, maintain connections with the 'living stream' through a mix of private and communal outdoor areas.

Apartments with a strong connection to neighbouring open space and bicycle path. Stockholm, Sweden.

Apartments provide passive surveillance of public open spaces. Brussels, Belgium.

10.4 MIXED-USE LIFESTYLE

The mixed-use zone links residential areas with the city centre; it provides high level activation whilst continuing to respond to the scale of the adjacent residential areas.

OVERVIEW

This zone accommodates a range of medium density mixed-use types. For example, lower density shop top housing that is suitable for the non-amalgamated lots that run along the edges of the residential areas.

BUILDING TYPES

3-5 Storey perimeter wall

5-8 Storey podium/tower

5-8 Storey T-block

GENERAL CHARACTER

The architectural framework is confident and robust, whilst still providing room for designers to individualize their projects.

DESIGN INTENT

It's important that each retail space be robust and contemporary with an expressed structure and mass. These ideas are to be revealed through formal composition and material detailing, introducing solidity, confidence and a sense of permanence to the streetscape. For example, upper levels could utilise a raw concrete structure as both a beam and balcony enclosure.

TYPICAL HEIGHTS

4-5 Storeys in zones with close proximity to pure residential zones.

4-8 Storeys in zones close to city centre.

LIFESTYLE

Lifestyle choice focused on amenity, convenience and public transport

BUILDING DISPOSITION

0-2m front setback

0-6m side setback

Refer to Form Based Codes

PUBLIC OPEN SPACE

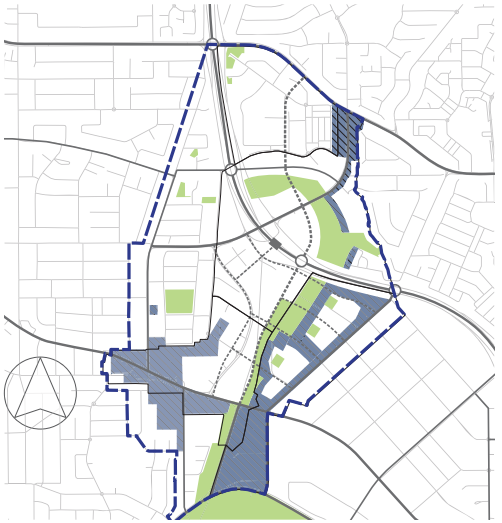
Opportunity for selected developments to house small urban courtyards that could be used for a range of social activity and infrastructure including outdoor cafe seating etc.

COMMUNAL & PRIVATE OPEN SPACE

Communal areas are likely to be located on a decked structure suspended over on-grade parking and defined through shade structures and the provision of vertical soft landscaping. It will need to be determined how best to incorporate the deep root zone within these spaces. Landscaped roof tops are ideal for this zone and could be either communal or private. Apartments located on top-levels should be set back to include generous terraces.

LANDSCAPE

Street trees planted along median strips will help to distinguish mixed-use and core city areas from the adjacent residential zones.



MIXED-USE LIFESTYLE

Mixed use building with strongly expressed concrete structure. Upper level is setback to express a strong datum line and provide residents with generous private outdoor space. Sydney, NSW.

10.4 MIXED-USE LIFESTYLE

BUILDING FORM & FACADE COMPOSITION

Building composition should relate to the scale, massing and patterns of the adjacent built form. Ideally, built form should be compact with a strong relationship to the street edge, ground floor detail and continuous awnings to provide shelter.

The upper levels of residential buildings shoud be articulated with balconies whilst upper level commercial floors should use expressed structures to create interest. These structure could extend down to meet the ground and modulate retail frontages. The use of expansive non-articulated glass walls should be prevented.

All apartments are to be cross-ventilated and single-loaded with select detailing to accentuate critical façade elements.

BUILDING FRONTAGE

Mixed use developments will demonstrate a high level of building activation and ground floor detail. Entrances should be well-marked and enhanced through an appropriate architectural and graphic treatment.

Residential building entrances should be expressed differently to retail storefronts, restaurants and commercial entrances.

The primary activity located within each building should be obvious from the street front.

Frontages are not permitted to have any blank walls nor be used for servicing courtyards, service boards or bin storage. With few exceptions, service areas are to be accessed from the rear of the property or through internal streets.

ACCESS

Through an incentive program, the insertion of laneways into developments is to be be encouraged.

COLOURS

Mass-housing construction of the 1960s and 1970s should be referenced through the colour palette. For example, coloured oxides could be used to replicate a concrete finish.

MATERIALS

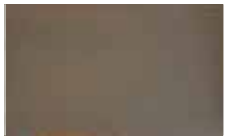
Steel, raw and oxide concrete or blockwork, with limited use of brick and timber. Pre-cast concrete panels could be utilized and robust metal screens. Development immediately adjacent to other character zones need to reference the precinct, taking guidance also from their material and colour palette.

Large balconies that over-look the street with strongly defined exposed concrete structure and textural timber detailing create an interesting and highly activated facade. The lower retail level is well defined from the upper resi-dential levels. Sydney, NSW.

The palette below is a sample of materials that are envisaged for Mixed-Use Lifestyle. A complete palette guide will be provided within the Design Guidelines for each precinct.

WALL MATERIALS

face brick



painted til-up concrete

bagged render

concrete

FEATURE MATERIALS

timber boards

colour backed glass

metal screen

glazed bricks

10.5 CITY CENTRE HEART

The 'destination point' of Stirling City Centre and central to defining its overall identity. The 'living stream' provides it with a unique and identifiable heart. High quality commercial and retail developments need to incorporate pedestrian links to the stream's many public spaces. Given the significance of the 'living stream' on the city's over-arching identity, it is essential that these public realm areas are of equal quality as the surrounding built form.

OVERVIEW

The central city centre is located in areas that preclude basement development due to prevalence of acid sulphate in the soil. Possible soil rehabilitation could enable basement construction, however in the short term, on-grade and decked car parking are the only parking solutions for the area. This constraint strongly informs the types of buildings possible, with increased site coverage required on medium density, medium rise buildings to accommodate parking. Access to public transport and the provision of quality streetscapes and pathways would encourage the use of alternate modes of transport.

BUILDING TYPES

3-5 Storey perimeter wall

5-8 Storey T block

5-8 Storey podium/

8-15 Storey podium/tower

GENERAL CHARACTER

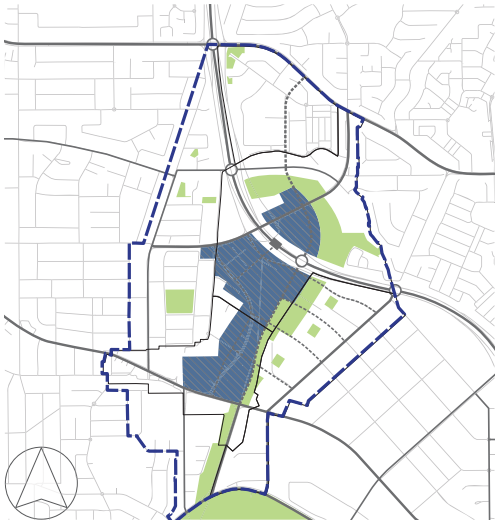
The city centre is defined by the two major roads, Ellen Stirling Boulevard and Stephenson Avenue and commercial activity will be concentrated on one of these thoroughfares. The form of the city centre will be defined by a continuous built edge, set back towers around Stirling Station and squat towers within the 'perimeter wall' and 'T block' buildings along Stephenson Avenue.

Ellen Stirling Boulevard will be a high amenity, slow speed main street with residential apartments and balconies located above ground floors.

Stephenson Avenue will contain larger format retail showrooms and office spaces.

Cafes and restaurants will be located on street corners, around key public areas directly linked to the 'living stream' and preferably with a direct view to open space.

Upper levels will contain a mix of office space/commercial and residential uses. These varied uses should be reflected in the character of the upper floor facades, with a mix of residential balconies and office windows.



CITY CENTRE HEART

DESIGN INTENT

The quality of the city centre will contribute to the experience of visitors to the area. Buildings should aim for a contemporary design, using high quality materials with a focus on creating a quality, highly activated ground level streetscapes. Facades should be eclectic, offering textural variation and interest at a pedestrian level.

10.5 CITY CENTRE HEART

TYPICAL HEIGHTS

Ellen Stirling Boulevard will have a 3-4 storey frontage and Stephenson Avenue a 7-8 storey frontage.

Heights are restricted by the limited opportunity for basement parking in most areas near the 'living 'stream'. If decked parking is utilised the opportunity for higher density built form will be possible. Immediately adjacent to the train station, the podium/tower building type of up to 15 storeys will be possible. Setbacks for upper levels will prevent a 'canyon' effect and effectively render these levels invisible to pedestrian traffic.

BUILDING DISPOSITION

Building footprints brought forward to the street create a defined street edge.

LIFESTYLE

A lifestyle of choice should be promoted with the provision of twenty-four hour amenity and a highly-activated public realm.

The public realm should act as an extension of each residents' home environment and become a space for people to gather socially. The use of local restaurants and cafes should be encourages as well as alternate modes of transport.

PUBLIC OPEN SPACE

Public thoroughfares are to be provided that connect major retail and commercial precincts through to urban squares and the open space surrounding the 'living stream'. The creation of key vistas to the stream and through to the taller buildings within the city centre will orientate visitors, assist in wayfinding and generally improve the overall visitor experience.

Activated

COMMUNAL & PRIVATE OPEN SPACE

Communal areas will be located above specified parking areas.

Constructed landscapes should be softened with vertical planting.

Trees need to be planted within tree wells, and carefully located to ensure access to adequate sunlight.

Top setback apartments are to include

GENERAL LANDSCAPE

The streets between Stephenson Avenue and Ellen Stirling Boulevard are to be planted with species of trees selected for their relevance to the area. The 'living stream' is the defining characteristic of this core city area, therefore it is essential that all sightlines lead to it and emphasise its importance.

The ecology of the stream should vary along its length and various types of public space should be available from which to enjoy it. Public squares should be developed along the more centrally located hard urban edges whilst the less defined edges should be planted out to the water's edge.

Large format retail sleeved with active shopfronts and upper level residential. Facebrick is used as a low maintenance facade feature.
Northbridge, WA

A building can frame public spaces that link the water to the building. Hamilton Harbour, QLD.

10.5 CITY CENTRE HEART

3 storey mixed used town centre built form concept.

Elements of this building relevant for Stirling City Centre:
3 storey development.
Upper level balconies for residential apartments.
Active retail on the ground floor.
Balconies cut into the building emphasise the street wall.
Vertical facade elements unite upper levels.
Identifiable break between ground floor and upper floors.
Textured screen provides privacy for occupants and interest in the facade.
Permeable frontage provides internal views.
Timber detailing

3 storey mixed used town centre built form concept.

Elements of this building relevant for Stirling City Centre:
3 storey development.
Upper level balconies for residential apartments.
Active retail on the ground floor.
Identifiable break between ground floor and upper floors.
Balconies define corner elements.
Glass balustrades maximise visual permeability.

10.5 CITY CENTRE HEART

BUILDING FORM & FAÇADE COMPOSITION

Developments along Stephenson Avenue and Ellen Stirling Boulevard should include laneway or secondary street access ways. This would create an unbroken street wall and would frame, enclose and activate the street.

To aid in building diversity, some lots in the city centre could be as small as 1200m2. They would be complimented by large lots utilizing a combination of building types to address multiple road frontages.

A controlled street wall height offers a consistent framework and enables a varied approach to façade composition. Balconies and terraces cut into the building form would emphasise the street wall, whilst contrasting sections of cantilevered balconies would reduce scale and create modulation and interest.

Openings are primarily vertical, with large vertical forms uniting the middle levels, allowing the building to be read as one form instead of multiple balconies over multiple levels. High rise towers also have a strong vertical element with an opportunity for roof features that integrate services and/or green roofs.

Regardless of a building's use, there should be an identifiable break between each building's ground and upper floors. This break may be brought about through a change in material, fenestration pattern or other visual effect.

All apartments are to be cross-ventilated with screened (west facing) balconies overlooking the street. A combination of fixed and adjustable vertical louvre elements will be employed to address the reflection into the street below and minimise solar heat gain.

BUILDING FRONTAGE

Permeable frontages providing internal views. High quality ground floor detail on all facades with awnings or colonnades providing pedestrian shelter. Primary active edges with all windows and doors opening onto the street. Balconies should define each corner building. Refer to Retail Street for guidance on the typical active frontage for Ellen Stirling Boulevard and the Commercial Street diagram and text for Stephenson Avenue on page 71.

On secondary streets, commercial and residential activity is still to be located on the ground floor whilst car parking is to be located behind the building either at-grade or decked.

ACCESS

Buildings should be located as close to the street as possible to minimise the visual impact of vehicle entry points. Car parking should be located at the rear of buildings where possible, or mid-block on the secondary streets that run between Stephenson Avenue and Ellen Stirling Boulevard. Laneways will create a permeable urban form that provides access through the city and to the living stream while also creating highly activated building frontages.

COLOURS

The 'living stream' forms the core of the city centre and should therefore inspire the colour palette.

3 storey mixed used town centre built form concept.

Elements of this building relevant for Stirling City Centre:
3 storey development.
Upper level balconies for residential apartments.
Active ground floor retail
Balconies cut into the building emphasise the street wall.
Green wall planting adds interest to the facade.
Vertical timber elements unite upper levels.
Identifiable break between ground floor and upper floors.
Permeable frontage provides internal views.
Timber awning creates a public space adjacent to high quality retail space.

A landscaped podium with residential above. Public functions including a shopping centre and car parking are located in the levels below. Sydney, NSW

10.5 CITY CENTRE HEART

The palette below is a sample of materials that are envisaged for City Centre Heart. A complete palette guide will be provided within the Design Guidelines for each precinct.

WALL MATERIALS


render


face brick


concrete


cladding

FEATURE MATERIALS


relief brickwork


timber, baked enamel steel panels


mosaic tiles


highlight painted feature

Quality retail on the ground level with offices above. Residential tower above the podium is set back from the street. Melbourne, VIC.

The use high quality building materials such as this patterned brickwork can create a highly interesting facade and reflect the importance of the City of Stirling. Extensive glazing in office buildings is to be avoided. Amsterdam, Netherlands.

10.5 CITY CENTRE HEART

MATERIALS

Materials should be of a masonry character and selected for their long life. They should be of a quality that can be appreciated both at a distance at an intimate level. The walls of the upper levels may be painted or rendered.

CITY CENTRE HEART –TRAIN AREA

DESIGN INTENT

Buildings surrounding the freeway will need to pay particular attention to acoustic levels and sound isolation.

Through careful planning, views through to public open space could be maximised whilst views of the freeway are reduced to a minimum.

FORM, FAÇADE, ARTICULATION, DISPOSITION

The street wall facade should be vertically articulated, with different treatments applied its base, middle and top sections. The upper portions of each building should be distinguished and thought given to how it meets the sky'.

Layering should be created through variation and accent, using architectural features such as balconies or fenestration to create an interesting pattern of projections and recesses.

Awnings to provide shelter along street fronts.

LIFESTYLE

Apartments on levels above 8 storeys are to feature spacious recessed balconies.

Lower level apartments are to offer a range of balcony types and sizes.

The design of single loaded apartments is to be encouraged as they maximise the number of apartments with a northern aspect whilst providing dual aspect views.

It's preferable to locate commercial activity on mid-levels in order to provide a physical and sound buffer for the residents of the upper levels.

LANDSCAPE

On sites dominated by the built form vertical planting should be incorporated into the design and communal areas provided on podium roofs.

Once again, the 'living stream' is the dominant feature of this zone and should be visible from through clear sightlines and able to be enjoyed and accessed easily.

PUBLIC OPEN SPACE

Various public squares with public thoroughfares to provide connections between the retail and commercial activity centres and the 'living stream'.

A built form appropriate for the Stephenson Avenue interface: Buildings with ground level retail and a mixture of residential and commercial uses in the levels above create a well defined street space. Balconies facing the street activate facades and give visual interest whilst also providing passive surveillance and avoiding extensive glazing. It is important to note that Stephenson Avenue will be a wider road than that pictured.

10.6 **CIVIC IDENTITY**

The civic identity zone takes the form of multiple civic squares located throughout the city centre core zone and the current administration and chambers site.

OVERVIEW

Currently, the council chambers and city administration building is located towards the northern edge of the city centre. A long term goal should be to relocate these key urban spaces to be adjacent to the 'living stream' and closer to the retail and commercial hub of the city.

Consolidating the existing community infrastructure such as the library, community centre, chambers, offices will create a definite civic heart and will activate the city core.

Each city core area should contain a raft of public and civic space. These shared spaces should run in parallel to the 'living stream' and provide an alternative route for moving through the city core.

DESIGN INTENT

Buildings shall aim for a "timeless design", with an identifiable architectural language typically associated with public buildings.

FORM, FACADE, ARTICULATION, DISPOSITION

As this zone is mostly comprised of small pockets within the city centre core, the built form will need to respond to adjacent built form rather than forming an autonomous architectural language.

MATERIALS

The materials selected here should be exemplary and provide an example for which development in the rest of the city could follow.

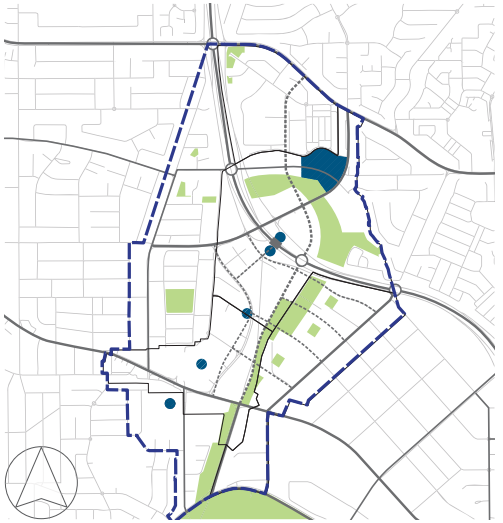
They should be hard-wearing and selected for their suggestion of permanence.

LANDSCAPE

High quality, hard and soft landscaping of a formal nature offering high amenity.

PUBLIC OPEN SPACE

Civic buildings should be located near key urban squares in which public events could be held. Public squares should provide the public with opportunities to engage with the 'living stream'.



CIVIC IDENTITY

10.6 CIVIC IDENTITY

DISTINGUISHING BETWEEN CIVIC AND PRIVATE BUILDINGS

A civic building is by definition a communal building, funded and run by local or regional authorities. The aspirations of the community can be embodied in its form. This is how civic buildings differ from privately owned and operated buildings, which express commercial or residential requirements of only one particular section of a community. There are opportunities for civic buildings to relate differently to the street, to provide more interesting interface between public and private areas, to innovate with new technologies and invigorate social interactions.

The highly articulated facade of Council House 2 located within the Melbourne city centre. The character of the building itself is a conscious attempt to reflect the attitudes of the City of Melbourne, namely in supporting sustainable and environmentally friendly practices.

11.0

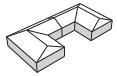
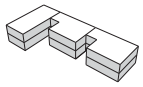
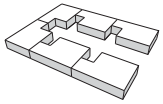
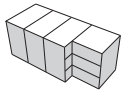
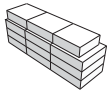
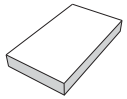
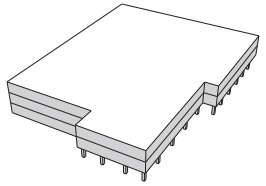
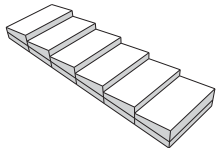
Building Typologies

11.1 BUILDING TYPOLOGY COMPARISON

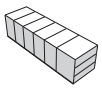
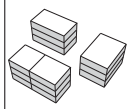
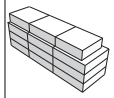
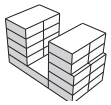
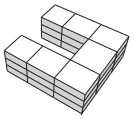
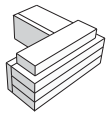
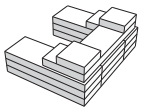
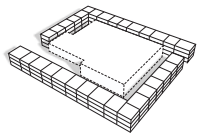
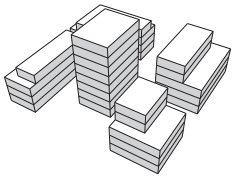
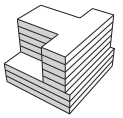
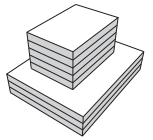
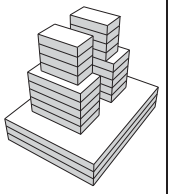
In this section, Building Typologies, provides specific detail and guidance for the development of each new building type. It does this through a combination of text, 3D drawings, plans and section diagrams. Included in each typology sheet are examples of overseas, interstate and Perth-based precedents.

The tables below graphically compare the existing building typologies currently found in Stirling City Centre with the building typologies proposed. A notable difference is the increase and different building types required to meet the Stirling City vision.

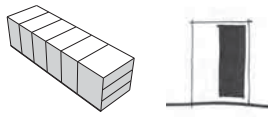
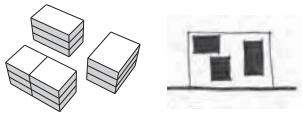
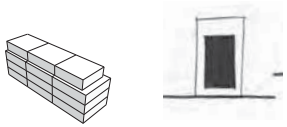
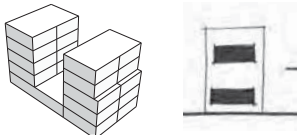
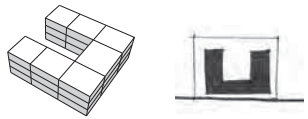
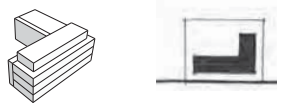
EXISTING BUILDING TYPES

BUILDING USE	Single Detached	Duplex	Triplex	Grouped Dwelling	Rowhouse	Central Block	Standalone Commercial	Large Format Retail	Warehouse&Showroom
									
Residential									
Commercial									
Industrial									

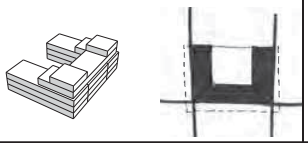
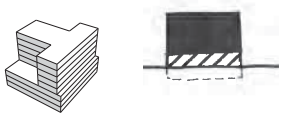
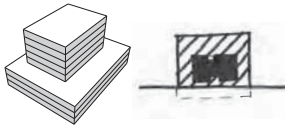
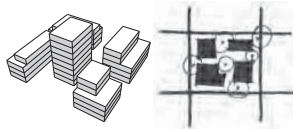
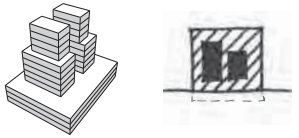
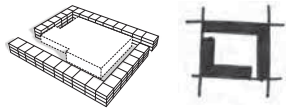
PROPOSED BUILDING TYPES

BUILDING USE	Group House	Pavillion Cluster	Central Block	Double Block	Courtyard	Partial Courtyard	Perimeter	Sleeve	Cluster	Wall	5-8 Podium	8-15 Podium
												
Residential												
Commercial												
Mixed Use												

BUILDING TYPOLOGY COMPARISON

	3 STOREY GROUP HOUSE	3 STOREY PAVILION CLUSTER	3-4 STOREY CENTRAL BLOCK	3-5 STOREY DOUBLE BLOCK	3 4 STOREY COURTYARD	3- 4 STOREY PARTIAL COURTYARD
						
INNALOO						
WOODLANDS						
NORTHERN						
SOUTHERN						
OSBORNE PARK						
STATION						

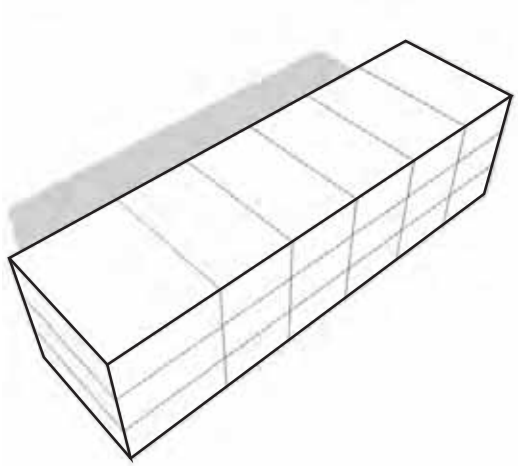
11.2 PRECINCT TYPOLOGY MATRIX

3-5 STOREY PERIMETER	5-8 STOREY T BLOCK	5-8 STOREY PODIUM	4-8 STOREY CLUSTER	8-15 PODIUM/ TOWER	3-4 STOREY LINER BUILDING
					
					
					
					
					
					

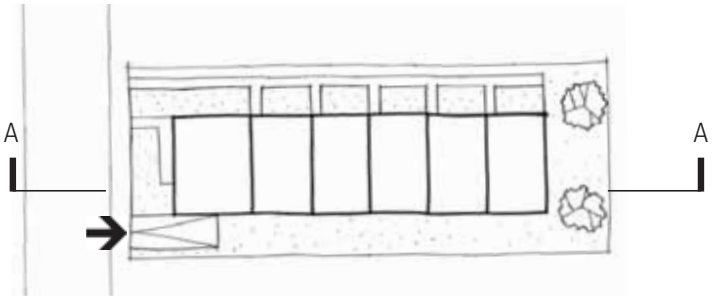
11.3 BUILDING TYPOLOGY 1

Building Typology 1
3 Storey Group House

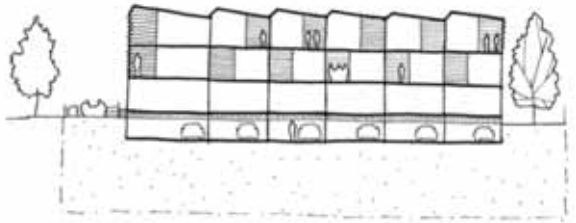
A similar building type to townhouse developments already existing in the city centre; attached multi-level residences with individual ground floor access. All street facing houses will have their major entrances and habitable rooms facing the street to activate the street. Semi-basement parking is the preferred parking option as it provides for greater outdoor amenity as well as the opportunity for larger habitable floor area.



Massing Diagram



Site Plan- semi basement parking



Section AA- semi basement parking

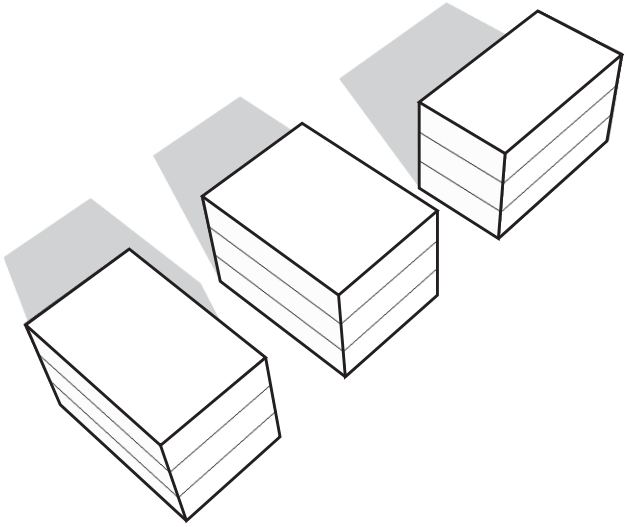
0 1 2 5 10

Use	Residential
Min Site Size	500-1500 m2
Setback	2-6m Front, 3m min Side, 6m min Rear
Optimum Lot Orientation	E-W
Carpark Option	Under Main Building, Semi-Basement
Relevant Precincts	Innaloo, Northern, Woodlands, Station
Character Zone	Residential Transition

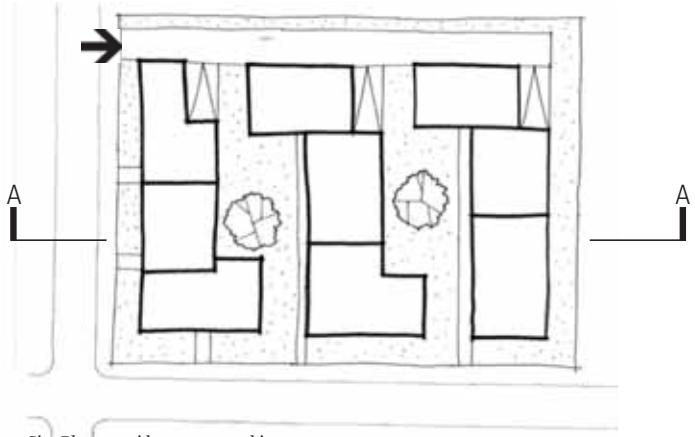
11.4 BUILDING TYPOLOGY 2

Building Typology 2
3 Storey Pavilion Cluster

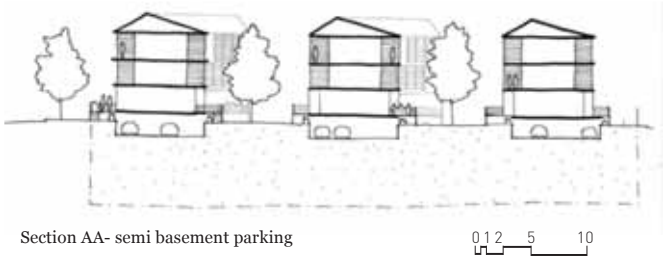
Typical lot sizes for this type will be equivalent to a two or three lot amalgamation, located within areas in which visual integration with existing low density housing is important. Residences are split into multiple separate pavilions, which relate in scale to surrounding houses, each containing multiple apartments. Interstitial spaces between the pavilions will provide for generous private and communal spaces. Vehicle parking will ideally be located in semi basements beneath each building.



Massing Diagram



Site Plan- semi basement parking



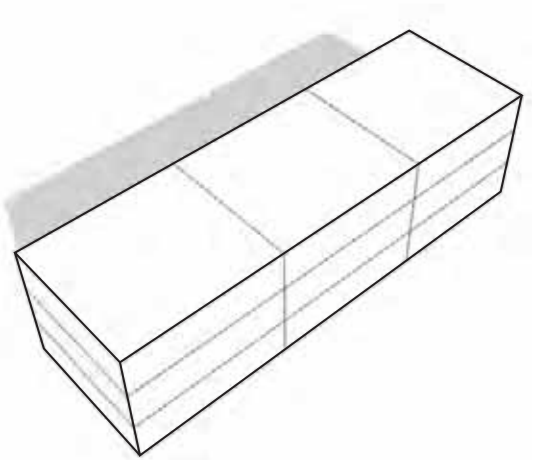
Section AA- semi basement parking 0 1 2 5 10

Use	Residential
Min Site Size	1600 m2 (2 lot amalgamation)
Setback	2-6m Front, 3m min Side, 6m min Rear
Optimum Lot Orientation	Design Specific
Carpark Option	On Grade, Under Main Building, Semi-Basement
Relevant Precincts	Innaloo, Northern, Woodlands, Station
Character Zone	Residential Transition

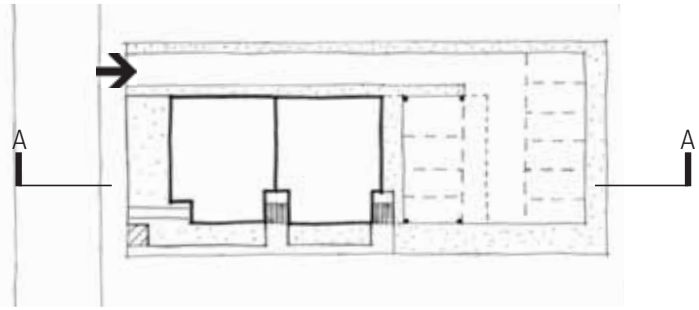
11.5 BUILDING TYPOLOGY 3

Building Typology 3
3-4 Storey Central Block

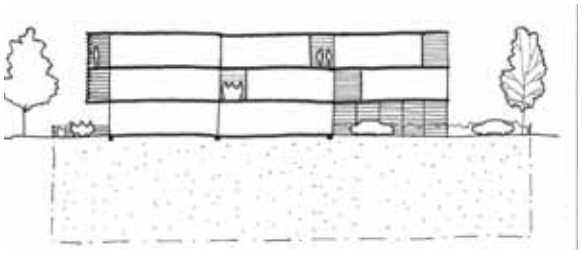
Apartments are concentrated in a single built form, centralised within the site. Front apartments will locate primary habitable rooms towards the street while rear apartment layouts will depend upon individual lot orientation. Side setbacks provide for private and communal open space as well as pedestrian and vehicle access. Semi-basement is the preferred parking option as it allows for a larger outdoor communal area and thereby enhances resident amenity.



Massing Diagram



Site Plan- on grade parking



Section AA- on grade parking with undercroft

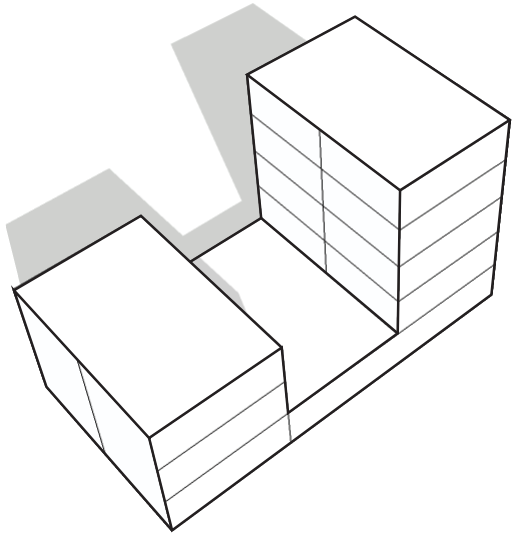
0 1 2 5 10

Use	Residential
Min Site Size	700m2
Setback	2-6m Front, 3m min Side, 6m min Rear
Optimum Lot Orientation	E-W
Carpark Option	On Grade, Semi-Basement
Relevant Precincts	Innaloo, Northern, Woodlands, Station
Character Zone	Residential Transition

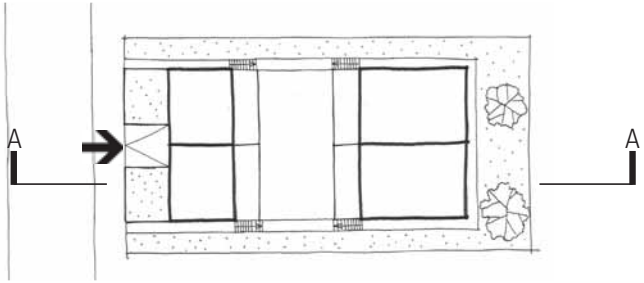
11.6 BUILDING TYPOLOGY 4

Building Typology 4
3-5 Storey Double Block

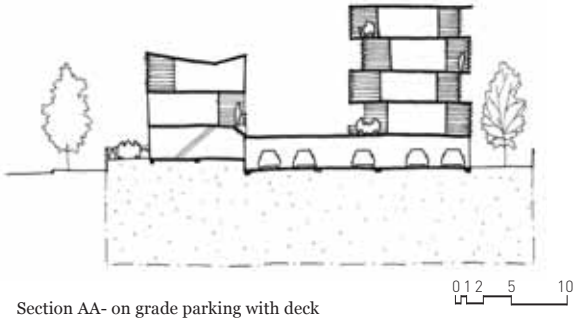
Apartments are separated into two main building forms towards the front and rear of the site, allowing optimum solar access on N-S orientated lots, as well as providing a centralised outdoor space for residents. The front block directly addresses the street and in areas where building integration is important responds in height to adjacent buildings. Rear setbacks provide space for deep root planting. Parking is located behind the building fronting the street, under the centralised outdoor area and on the ground level of the rear building.



Massing Diagram



Site Plan- Deck level



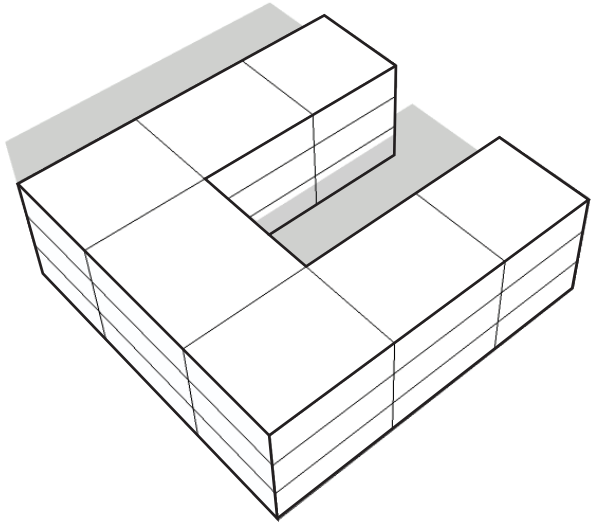
Section AA- on grade parking with deck

Use	Residential, Mixed-Use
Min site size	1600 m2
Setback	Refer to FBC
Optimum Lot Orientation	N-S
Carpark Option	On Grade, Under Main Building, Semi-Basement
Relevant Precincts	Innaloo,Station, Southern, Woodlands
Character Zone	Residential Transition, Mixed-Use

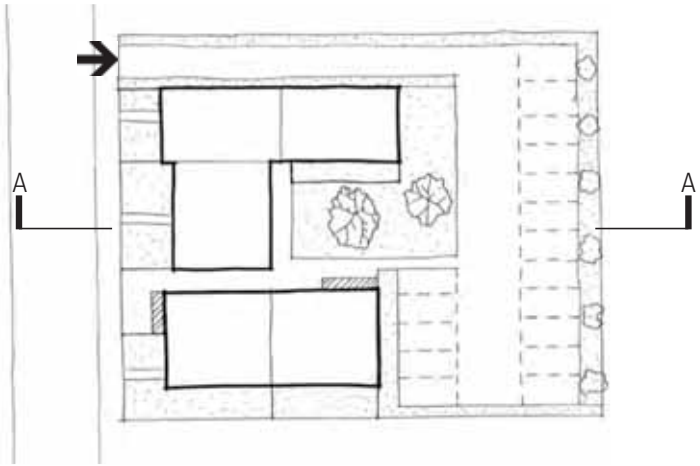
11.7 BUILDING TYPOLOGY 5

Building Typology 5
3-4 Storey Courtyard

A strongly defined built edge is presented to the street, activated by direct entry residences at ground level and large windows and balconies to habitable rooms in the apartments above. An open space defined by the built form provides a central communal outdoor area for residents. This typology is feasible with on-grade parking, however semi-basement parking offers more area for landscaping and potential increase in dwelling numbers.



Massing Diagram



Site Plan- on grade parking

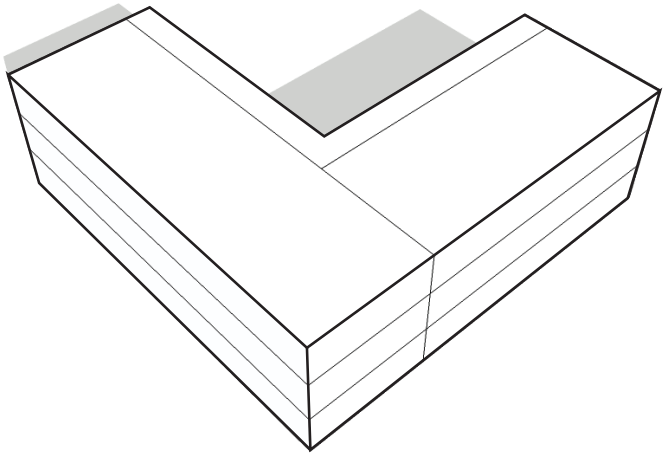
Section AA- on grade parking with undercroft

Use	Residential
Min Site Size	1600 m2
Setback	2-6m Front, 3m min Side, 6m min Rear
Optimum Lot Orientation	E-W
Carpark Option	On Grade, Under Main Building Rear, Semi-Basement
Relevant Precincts	Innaloo, Woodlands
Character Zone	Residential Transition

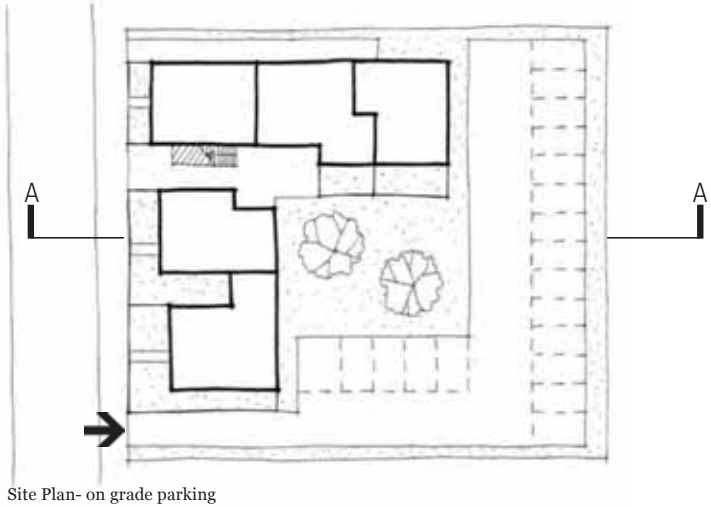
11.8 BUILDING TYPOLOGY 6

Building Typology 6
3-4 Storey Partial Courtyard

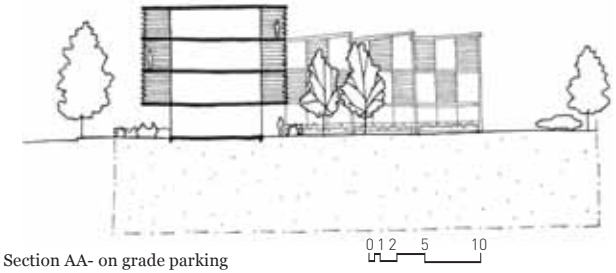
The partial courtyard is possible with both single lot developments and multiple lot amalgamations. All street front apartments directly address the street. The communal area is centrally located within close proximity to all apartments. Solar access to outdoor areas and ground floor apartments is maximised, which allows this typology to be used in a variety of orientations without detrimental effect to northern light access to each apartment.



Massing Diagram



Site Plan- on grade parking



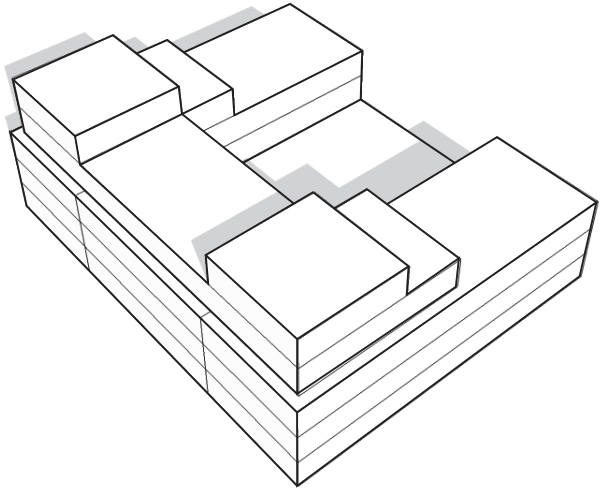
Section AA- on grade parking

Use	Residential
Min Site Size	800 m2
Setback	2-6m Front, 3m min Side, 6m min Rear
Optimum Lot Orientation	Any
Carpark Option	On Grade, Under Main Building Rear, Semi-Basement
Relevant Precincts	Innaloo, Northern, Woodlands
Character Zone	Residential Transition Mixed-Use

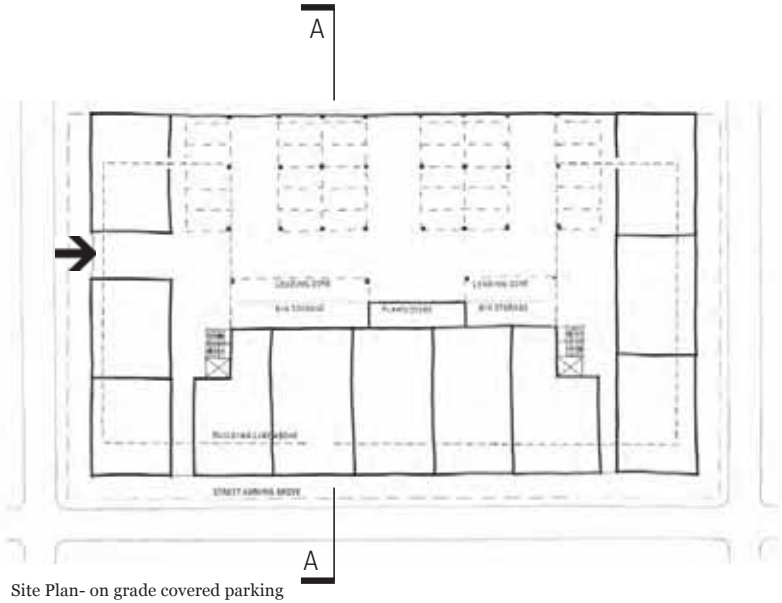
11.9 BUILDING TYPOLOGY 7

Building Typology 7
3-5 Storey Perimeter

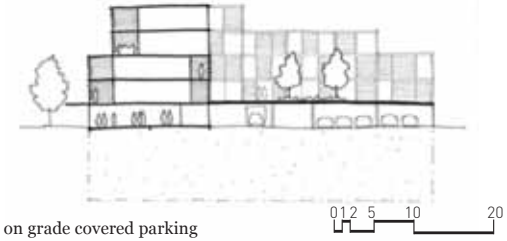
Ground floor active uses front key retail streets with commercial or live work units on the minor secondary streets. Commercial and residential uses are located on the upper levels. The balconies of residential units address the street. Communal outdoor space for building occupants is centralised within the site. Modulation of the building height aids in defining the streetscape and anchoring corners. Discrete vehicle access is located on secondary access roads, with options that include multiple level deck parking sleeved behind commercial and live work units.



Massing Diagram



Site Plan- on grade covered parking



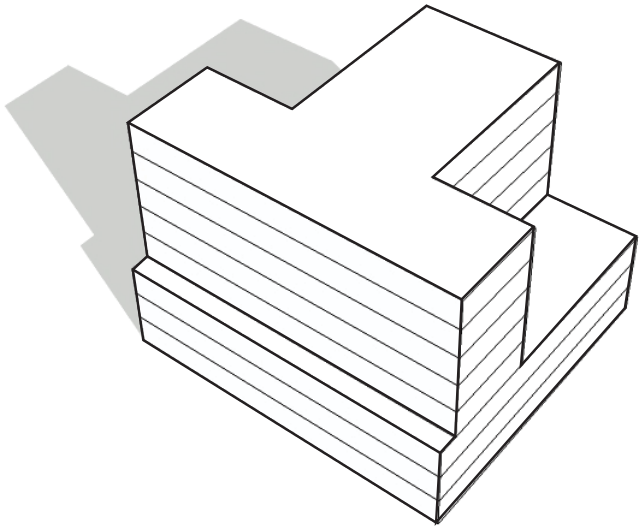
Section AA- on grade covered parking

Use	Residential, Mixed-Use
Min Site Size	1600 m2
Setback	Refer to FBC
Optimum Lot Orientation	E-W
Carpark Option	Deck, Under Main Building, Semi-Basement
Relevant Precincts	Station, Southern, Woodlands, Osborne Park
Character Zone	Residential Urban, Mixed-Use, City Centre, Civic/Public, Commercial

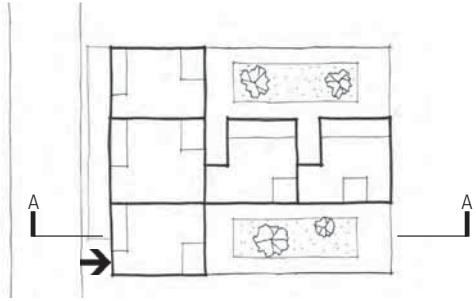
11.10 BUILDING TYPOLOGY 8

Building Typology 8
5-8 Storey T Block

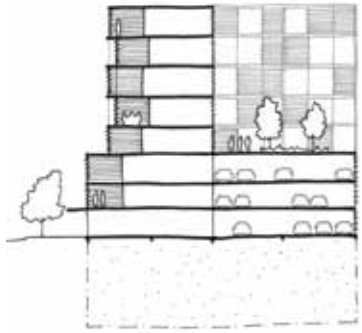
Lower levels utillise a full site build out with party walls between adjacent developments. Minimal front setbacks reinforce the spatial definition of the street. The datum level is reinforced at the third or fourth storey with building punctuation or minor setbacks. Residential uses are located on the upper levels, in which the building form changes to define open spaces for residents and maximise access to northern light. Vehicle parking is either located in a basement or within a multiple level decked parking structure at the rear of the site, sleeved by commercial/retail uses activating the street.



Massing Diagram



Plan at podium level



Section AA- decked parking

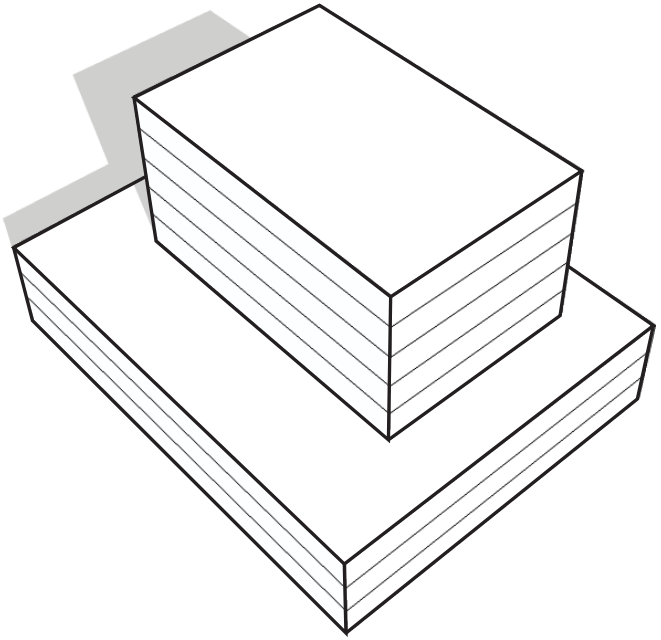
0 1 2 5 10 20

Use	Residential, Mixed-Use
Min Site Size	1200 m2
Setback	Refer to FBC
Optimum Lot Orientation	Any
Carpark Option	Deck, Basement
Relevant Precincts	Southern, Station, Osborne Park, Woodlands
Character Zone	Residential Urban, Mixed-Use, City Centre, Civic/Public, Commercial

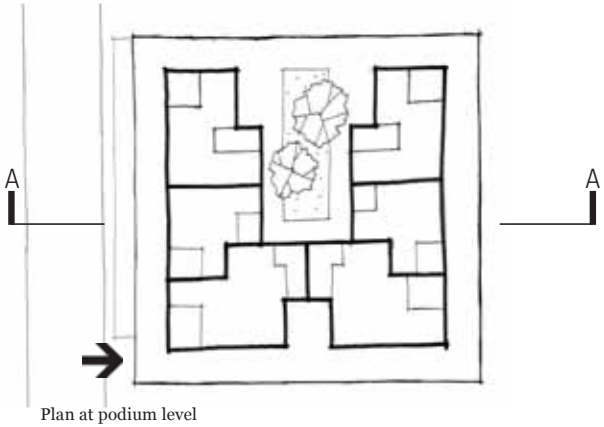
11.11 BUILDING TYPOLOGY 9

Building Typology 9
5-8 Storey Podium

A podium level between three and four storeys creates a well proportioned human scale streetscape. Retail and commercial uses address the active street edge with decked carparking sleeved behind. Residential apartments or offices are located within the tower. Tower setbacks minimise visual and physical presence from the street as well as providing generous communal outdoor space for residents on the podium roof.



Massing Diagram



Plan at podium level

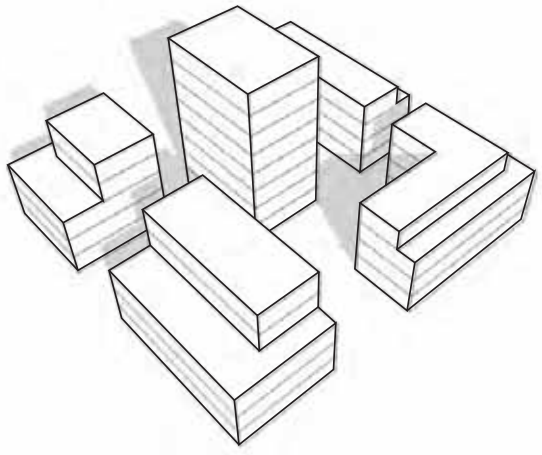
Section AA- decked parking

Use	Residential, Mixed-Use
Min site size	2000 m2
Setback	Refer to FBC
Optimum Lot Orientation	-
Carpark Option	Deck, Semi-basement, Basement
Relevant Precincts	Station, Southern, Osborne Park
Character Zone	Residential Urban, Mixed-Use, City Centre- Civic/Pubic, Commercial

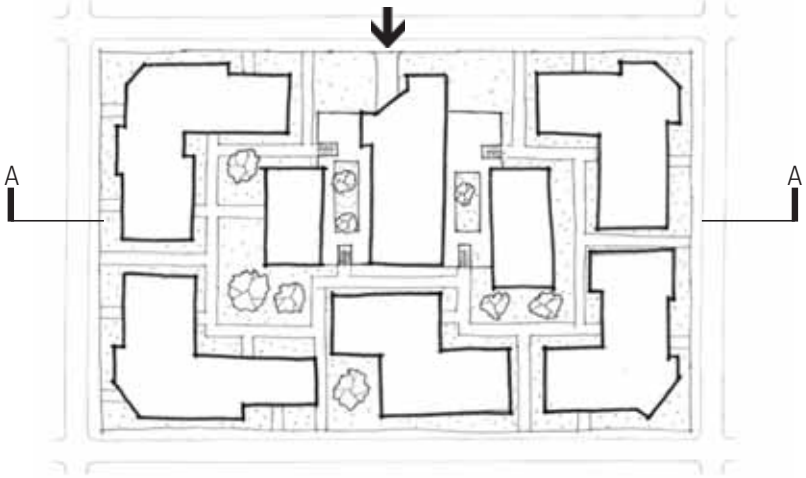
11.12 BUILDING TYPOLOGY 10

Building Typology 10
4-8 Storey Cluster

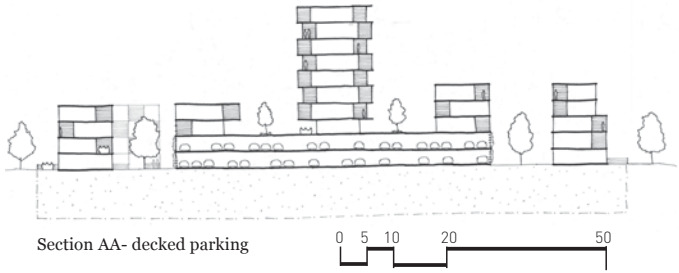
Development comprises of a number of separate buildings on a large site that define a series of pedestrian friendly walkways and outdoor communal courtyards This building type provides high levels of cross ventilation and northern light access throughout the site. Reduced building heights around the site periphery will aid in integration with surrounding lower scale development.



Massing Diagram



Site Plan



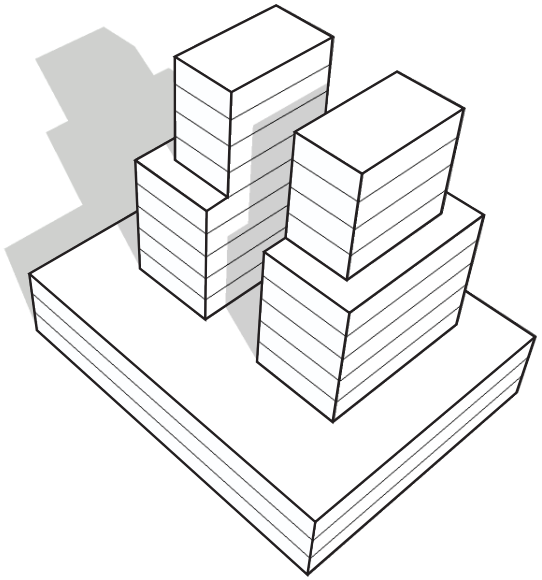
Section AA- decked parking

Use	Residential
Min site size	2000 m2
Setback	Refer to FBC
Optimum Lot Orientation	Design Specific
Carpark Option	Deck, Semi- Basement
Relevant Precincts	Station, Woodlands, Osborne Park
Character Zone	Residential Urban, Civic/Public

11.13 BUILDING TYPOLOGY 11

Building Typology 11
8-15 Storey Podium/Tower

Applicable to medium sized lots in high density areas where taller buildings are permissible. The podium/tower form mitigates unwanted wind effects, such as ground level wind turbulence. A built street edge of 3-4 stories is created by the podium, which contains the buildings retail and commercial functions. Residential or commercial uses within towers. Setbacks between towers in residential buildings enable natural ventilation and northern light access to living areas. The tower layout defines podium level communal outdoor spaces for residents. Car parking is generally be limited to a decked structure sleeved within the podium.



Massing Diagram

Plan at podium level

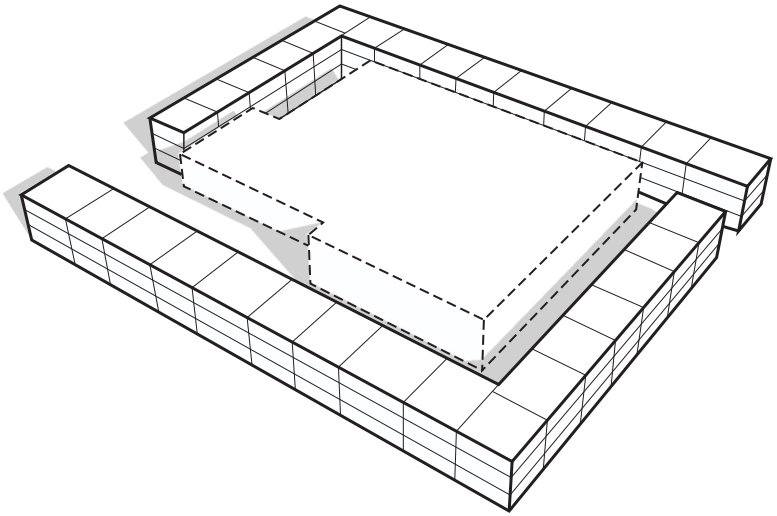
Section AA- decked parking 0 1 2 5 10 20

Use	Residential, Mixed-Use
Min site size	2000 m2
Setback	0m-2m
Optimum Lot Orientation	-
Carpark Option	Deck, Basement
Relevant Precincts	Station
Character Zone	Residential Urban, Mixed-Use, City Centre, Civic/Public

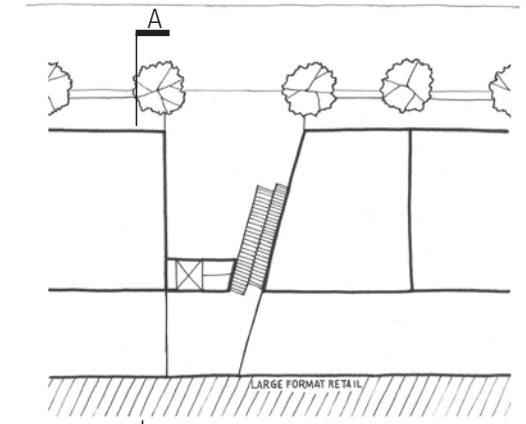
11.14 BUILDING TYPOLOGY 12

Building Typology 12
3-4 Storey Liner Building

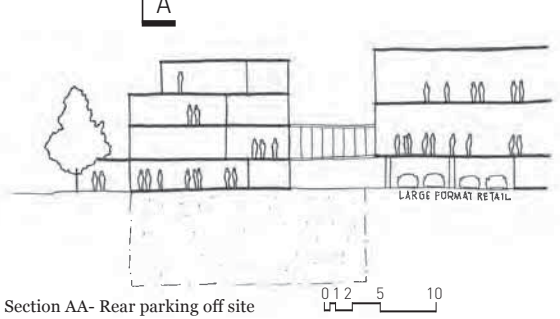
Liner buildings with a minimum 12 metre floorplate sleeve pre-existing large format retail buildings and on-grade carparks to provide an active built street edge containing ground floor retail with upper level commercial use. Vehicle access is provided between new and existing buildings to carpark and service vehicles.



Massing Diagram

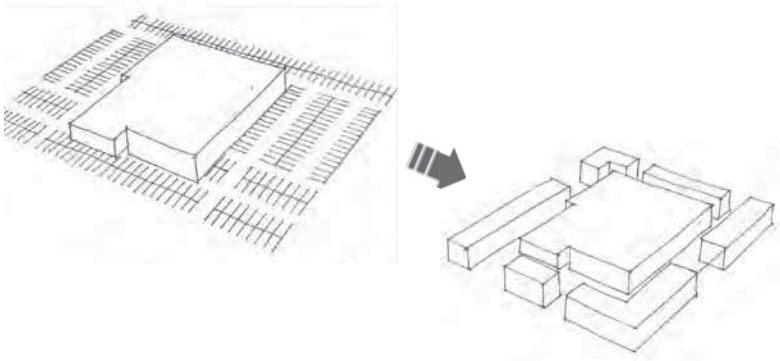


Partial Site Plan



Section AA- Rear parking off site

Use	Retail, Commercial
Min site size	N/A
Setback	0m-2m
Optimum Lot Orientation	-
Carpark Option	Sleeved, either on-grade or deck
Relevant Precincts	Station, Southern
Character Zone	Mixed-Use, City Centre



Appendices

PRECEDENTS

CASTLE STREET- Residential only

Architect / Builder	• Najman Architects
Location	• 45 Castle Street, Kedron, Queensland
Client	
Key Statistics	• 2 attached courtyard houses • 437 m2 total site- 237 m2 and 200 m2 individual lots
Building Form	• 2 storey with undercroft garage which can be adapted as a living space • Roof line responds to adjacent buildings • Potential for income generation as interchangeable spaces have access to the street.
Description	Two attached house with a focus on sustainability through adaptive design.
Comments	Upper market townhouse development which could easily interface with pre-existing recent residential development around the perimeter of the precinct.

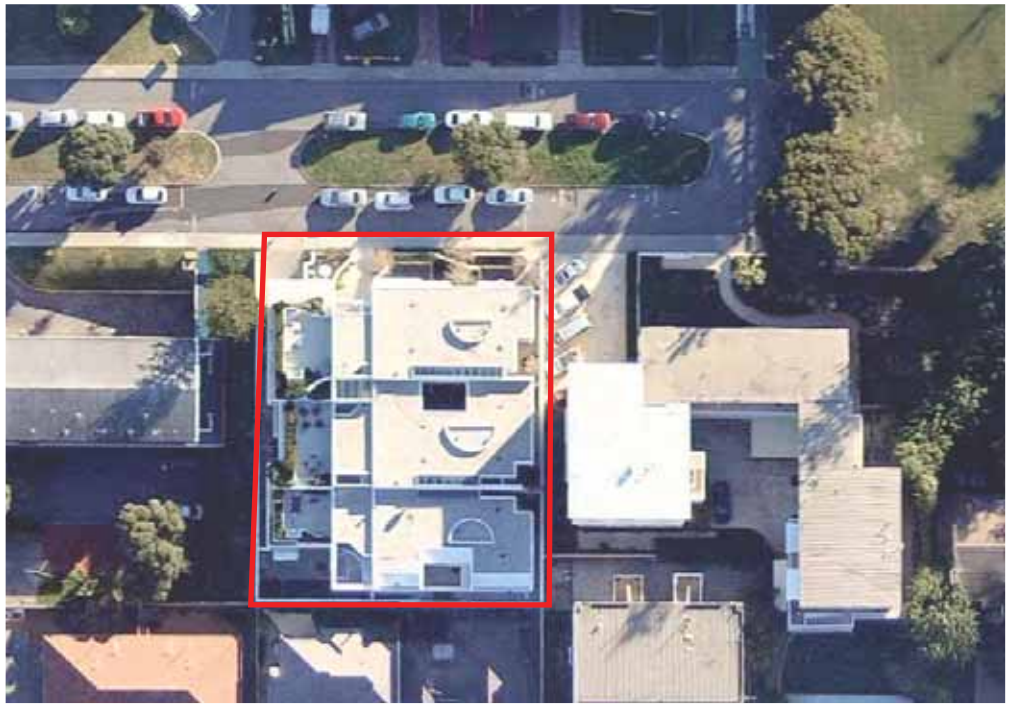
www.najman.com.au

PRECEDENTS

APARTMENTS IN COTTESLOE- Residential Only

Architect / Builder	• Blane Brackenridge
Location	• Cottesloe, Western Australia
Client	
Key Statistics	• 4 attached two storey apartments • 1100 m2 site • underground basement parking- 12 carbays service areas store rooms
Building Form	• 2 storey building on sloping site • 3 apartments configured in East-West arrangement on East side of site • 1 apartment configured in North-South arrangement on west side of site • roof of western apartment forms communal garden terrace for other three • each apartment has private entry with lift to access levels above • living areas and main bedroom are on first floor, facing out to the ocean • main entry, study and two other bedroom s on ground floor • common walkway through site gives public access to each dwelling
Comments	low rise uppermarket apartments which take advantage of sloping topography reads as one large building from the street so as to not interrupt the streetscape. Could be used on Precinct boundary at articulation with existing development

http://blanebrackenridge.com/



PRECEDENTS

BUTCHER, BAKER, CANDLESTICK MAKER- MIXED USE

Architect / Builder	• alsoCAN Architecture
Location	• Victoria
Client	
Key Statistics	• 4 attached two storey residences • front unit contains street level store front for possible commercial use • Small site (approx.400m2)
Building Form	• 2 storey building • each unit has individual entrance and garage at ground level, but interlock vertically • main outlook east-west
Description	The interiors of each unit make use of volume, verticality and connections between indoor spaces and outdoor terraces to provide a sense of space within a relatively small footprint
Comments	Suitable for low rise mixed use areas, or where live-work units have been deemed appropriate.

http://www.alsocan.com.au/

PRECEDENTS

9 JAMIESON STREET APARTMENTS - Residential only

Architect / Builder	• Arco Eco Architects; Munro Group
Location	• Near Oxford Street, Bulimba, Brisbane
Client	Developer
Key Statistics	• 610m2 with 60% GFA permitted. 70%GFA (107m2 plus roof terraces were achieved) • 15m frontage • Upmarket development • 4 apartments • 152m2 per dwelling density
Building Form	• 3 storey apartments with 3 bedrooms • 250m2 total area (GFA 107m2) • North facing balconies • Ground Floor: Double garage, store, laundry, 3000L water tank, below ground pool, 93m2 courtyard • Roof terrace 55m2 • Separate vehicle and pedestrian entries
Description	The aim was to create a more urban set of dwellings than usually found in Brisbane's suburbs. Raising the standards of living in a typical multiple residential development. Achieving a character of building associated with Brisbane and its climate. Design clues also taken from the adjoining church such as the verticality, the lead light windows and high internal spaces. The urban context is heightened through activity both on the north facing decks and the roof terraces. Achieved an additional 4 carparks.
Comments	This type of development explores what may be possible with a higher density solution on a smaller site without requiring lot amalgamation. This example could be applied to the La Grange Dongara area on sites that have views to the reserve.

http://www.arcoeco.com/

PRECEDENTS

ESSENCE APARTMENTS

Architect / Builder	• Psaros Builders
Location	• Coneflower Corner
Client	
Key Statistics	• 1500 m2 site • Higher quality apartment development • 15 apartments • 100m2 dwelling density
Building Form	• 3 storey double loaded apartments with 5 apartments per level • 3 bedroom 2.5 bathroom • Semi-basement parking • Apartments centred around open living and kitchen areas which spill out into balcony spaces overlooking adjacent parkland. • Central circulation core on the northern side accesses all apartments • Pitched roof
Description	High end apartment building $995, 000- 1, 100, 000 per apartment Rendered brick with pitched colorbond roof Double loaded unitslook outwards to adjacent bush/ parkland
Comments	This type of development will require lot amalgamation of 2 full 750m2 lots.

http://www.essenceapartments.com.au

PRECEDENTS

CARRINGTON ROAD AFFORDABLE HOUSING - Residential only

Architect / Builder	• Marsh Cashman Koolloss Architects; Winterton Constructions
Location	• Cnr Carrington Road and Macpherson Street, Bondi Junction, NSW
Client	Initiated by Waverly Council as part of their Affordable Housing Program
Key Statistics	• 450m2 corner site • 5 one bedroom apartments • 1 two bedroom apartment • Common courtyard facilities • 75m2 per dwelling density
Building Form	• 3 storey apartments • Apartments are single level with ground floor apartments accessed on grade from street level via a courtyard. • The first floor units are accessed via a wheelchair accessible ramp eliminating the need for a lift. • All apartments have been designed to meet access standards and kitchens designed to be easily modified for wheelchair accessibility.
Description	$1.3 million build cost - $216,000 per unit (estimated 2006-8) Overlooking Queens Park and the site has a natural fall on site. Mix of building typologies adjacent to the site and the surrounding area. The northern and western facades step in section and plan to give depth to the building, blurring the delineation between the site and the public domain. Use of rendered masonry, dark and red brick tie it back to the adjoining context. Provide housing for elderly and access impaired residents.
Comments	Suitable for busy roads where mixed use is not proposed and low rise residential development is required to interface with surrounding suburbs.

http://mckarchitects.com/

PRECEDENTS

COOPERS PEAK RESIDENTIAL DEVELOPMENT

Architect / Builder	• Melocco and Moore Architects
Location	• Bellevue Hill NSW
Client	
Key Statistics	• amalgamation of 4 lots • 9 x 200 m2 apartments • basement parking
Building Form	• 3 separate 3 storey pavillions in a cluster formation • each apartment occupies one floor of each pavillion • shared open spaces between each building
Description	The three pavillions are sited within abundantly landscaped gardens of both a private and common nature. With strongly articulated face brick bases, lightweight upper levels and broad eaves, each pavillion presents to the street as a large house rather than as a block of apartments.
Comments	Suitable in already established residential areas in which the integration of new higher density housing with pre existing residential is important.

http://www.meloccomoore.com.au/

PRECEDENTS

7-13 DOVER ROAD Mixed Use

Architect / Builder	• Hill Thalis
Location	• Rose Bay, NSW
Client	
Key Statistics	• 610 m2 site • 11 residential units; 4 one-bedroom, 5 two-bedroom, 2 3-bedroomw • 2 retail tenancies • basement carpark • FSR: 2.0:1
Comments	Applicable in areas that require low rise mixed use buildings

http://www.hillthalis.com.au/

PRECEDENTS

MIDLAND HOUSING- Mixed use

Architect / Builder	• Jonathon Lake Architects
Location	• Foundry Road Midland
Client	Foundation Housing
Key Statistics	• 3250 m2 site • Affordable housing • 29 units- 10 apartments targeted at key service workers such as police and medical staff • 4 commercial spaces • $9.85 m construction cost (approximately 2010)
Building Form	• 3 storey apartments • 7 one-bedroom, 19 two-bedroom, 3 three-bedroom • Internal open ground level parking
Description	'The location within the Railway Workshop Precinct provided significant inspiration for the project. Ideas of robustness and mass were explored through the material detailing and formal composition of the scheme. Pre cast concrete panels were utilised as robust screens and make a connection to the tradition of casting that was done in the workshops. Wrought iron balustrades and fencing were used throughout, bringing weight and texture to the external skin of the building.' - Jonathon Lake Architects
Comments	Applicable in areas that require low rise mixed use buildings

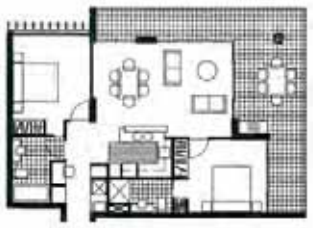
http://lakearchitects.com.au/

PRECEDENTS

RAMSGATE RESIDENCES - Residential only

Architect / Builder	• Mode Design Corp
Location	• Kelvin Grove, QLD
Client	Developer: The Brisbane Housing Company is a not-for-profit organisation developed by the Queensland Government and Brisbane City Council to expand the availability of affordable housing, particularly in inner and near-city areas. Rents in Brisbane Housing Company properties are set at not more than 75% of the market rate.
Key Statistics	• Estimated 7200m2 corner site • 32 apartments • 225m2 per dwelling density • Surrounded by private residential projects • Affordable Housing • 16 studio units, eight one-bedroom unit and eight two-bedroom units. Two of the two-bedroom units on the ground floor are fully accessible to people with disabilities or special physical needs. For aged and family.
Building Form	• 4 storey • Clusters of units in groups of 8, interconnected with pedestrian links • West facing with deep verandahs to screen the sun and address the street • Cost effective design quality • Swimming pool, central courtyard
Description	$5 million build cost ($156,000 median cost per unit) Cross ventilation and opportunities for natural light. Masonry support walls clad with lightweight sheeting on north and east facing units (reverse brick veneer?). Bonded panel roof system and extended eaves. Essential design strategy of fragmentation of the built form the 'village' within the 'village'. Use of low maintenance and pre-finished materials externally. Low-wattage light bulbs, a gas-fired central hot water system with individual meters to each apartment, bike racks, two 3,000 litre water tanks, and sun shades, louvres and lockable timber entry shutters to maximise air flow through all units. The building is extremely cost effective with two stairs servicing all units in each building.
Comments	Suitable in sites where pockets of high density residential is required. Affordable housing is also a primary consideration. Requires a large lot.

http://modedesign.com.au/



PRECEDENTS

REDFERN EAST SOCIAL HOUSING PROJECT - Residential only

Architect / Builder	• LFA (Pacific) Pty Ltd
Location	• Morehead Street, bounded by Kettle and Walker streets, Redfern NSW
Client	Housing NSW
Key Statistics	• 9709m2 • Public Housing • 66 Seniors apartments, including 18 adaptable • 40 townhouses (family size) • 91.5m2 per dwelling density • 5 Green star rating
Building Form	• 3-4 storey apartments with 1-2 bedrooms • 3 storey townhouses
Description	The apartments anchor the corners of the site while the low rise townhouses address the longer street frontages. Good layout of buildings on a difficult site. Designed to maximise solar exposure and natural ventilation. The design incorporates an innovative open gallery which provides vertical circulation and opportunities for social interaction. Sustainable design features include gas boosted solar hot water heating, grey water irrigation, rainwater re-use and photo voltaic cells for common area lighting.
Comments	Would require lot amalgamation in existing residential areas or a larger lot in new residential areas.

http://www.lfa.com.au/

PRECEDENTS

WATERLOO STREET DeNode - Mixed-Use

Architect / Builder	• Candalepas Associates
Location	• 52 Waterloo Street, Surrey Hills Sydney NW
Client	Developer Haralambis Management
Key Statistics	• 1900m2 site (estimate) • 54 apartments • 9 retail tenancies, 3 levels of basement parking for 81 cars • 35m2 per dwelling density
Building Form	• 6 storey apartments, with 3 bedroom over 3 levels
Description	$45 million project Value: $18 million construction cost: 14 month build time Variety of apartment sizes and layouts have been fitted into the L-shaped plan on the rectangular site. Access to the apartments is generally along open-air corridors, allowing residents to have "front doors" within the building. In the northern wing, the length of the access corridor is broken by the introduction of a horizontal atrium that allows light and air to circulate through the block. Both wings provide street wall profiles to the Surry Hills grid and free up space in the rear of the site for a courtyard. This move naturally benefits the residents of Waterloo Street, but also provides amenity for the rest of this crowded neighbourhood. Heavy timber screens, smooth concrete and straightforward brickwork all come from the honest materiality of the semi-industrial nature of this part of Sydney. The building itself steps back slightly at the corner in a counter-intuitive gesture that actually emphasizes the public domain. It is fitting that a restaurant has taken the corner space and colonized this outdoor plaza. www.architectureau.com/articles/waterloo-street/ The residential spaces are organised into a hierarchy of smallest to largest, with studio apartments located on the first level, then four bedroom sky terraces on the second, third and fourth levels. This is readable on the Waterloo Street facade where the width and height of each external room increases the higher the level.

http://www.candalepas.com.au/

PRECEDENTS

THE POINT- Residential only

Architect / Builder	• Allen Jack + Cottier Architects Pty Ltd; Ware Building
Location	• Town Beach, Port Macquarie NSW
Client	Developer
Key Statistics	• 1720m2 (40 x43m2) • Higher quality apartment development aimed at retirees and families • 20 apartments • 86m2 per dwelling density
Building Form	• 7 storey apartments • Includes 2 level of basement parking and store entry from secondary street • 3 bedrooms x 2 bathroom
Description	$9.1 million build cost - $455,000 per apartment. No maintenance brickwork is mainly used, with rendered masonry accents where easy access is possible. Full height glazing only used where occupants area able to access for easy cleaning. Acoustic separation between units is higher than required to meet regulations. Large balconies. 5 star NaTHERS rating. Cross ventilation to all apartments due to the multiple core design.
Comments	Large family size apartments

http://www.architectsajc.com/

PRECEDENTS

VERVE- Residential

Architect / Builder	• Turner and Associates Architects
Location	• 2-4 Coulson Drive, Erskinville, NSW
Client	Developer AV Jennings
Key Statistics	• 4858m2 • GFA 8500m2 • 102 apartments • 48m2 per dwelling density • Includes new public park and through-site link
Building Form	• 6-7 storey apartments, • L shaped buildings
Description	Most apartments are cross-ventilated and dual aspect. The corner is an important compositional node, as well as the turning point into the new public park and termination of a future street.
Comments	Example residential development that includes the provision of a public park Building form successfully references the existing commercial showroom buildings. Similar industrial / showroom context as Osborne Park

http://turnerstudio.com.au/

PRECEDENTS

BONDI APARTMENTS- Residential Only

Architect / Builder	• BRIAN MEYERSON ARCHITECTS
Location	• 48 Penkivil St, Rose Bay, New South Wales
Client	
Key Statistics	• 8 storey • 18 apartments; 1 one-bedroom, 11 two-bedroom, 6 three-bedroom • 2 level basement parking with 27 carbays • 1084 m2 site • 48% site coverage • FSR 1.84:1
Building Form	• 8 storey building with 4 storey podium • Large building setbacks
Description	the 4 storey podium responds to the lower street wall buildings while the more slender tower proportion is set back from the street. The plan is based on a twin-core design, where splitting the circulation and lifts into 2 seperate cores obviates the need for corridors. This allows for full through units whith excellent cross ventilation and north facing living rooms and balconies. The provision of affordable housing has allowed the building to exceed the FSR beyond that which is normally permissible in the area.
Comments	Large side and rear setbacks Provision of a deep root unincumbered land zone

http://www.mprdg.com/

PRECEDENTS

SPHERE RESIDENTIAL COMMUNITY - Residential only

Architect / Builder	• BDA Architecture
Location	• Southport, Queensland
Client	Developer
Key Statistics	• 7.5 ha site with 68 dwellings per hectare • Medium density residential development of affordable housing for a mixed demographic of families, couples, students and seniors. • Consists of a mixture of detached dwellings, attached townhouses and low to medium rise apartments. • 510 dwellings • 147 m2 per dwelling
Building Form	• An integrated mix of 2-6 storey residential buildings . • A simple hierarchy of streets, lanes, pocket parks and open space provides legible circulation and recreational opportunities, promoting access to amenity which is integral to the success of high density development. • Apartments overlooking central recreational facility, providing a high level of passive surveillance over the development's communal amenity. • The highest building has been provided with a green roof terrace. • Natural block, painted concrete aluminium screens and metal cladding are the most prevalent building materials.
Description	Residential Community built on the edge of a rapidly growing education and medical precinct. Staged construction
Comments	Affordable housing Suitable building type (detached dwellings) for the interface with existing single detached housing Cinema site 6.8 ha Aged persons site 4.6 ha

http://www.bda-architects.com.au/

PRECEDENTS

EDGEWATER APARTMENTS - Mixed use

Architect / Builder	• Fender Katsalidis
Location	• Geelong, Vic
Client	Solid Investments Australia
Key Statistics	• 2400 m2 site • $32 million construction cost • 7 storey • 36 apartments • 3 levels basement parking • 9 tenancies ground floor retail
Building Form	• 7 storey. plus 3 levels of basement = 10 levels • $32 Mill (100% site cover = $1333 per M2 - 0ver 10 levels)
Description	The building form responds to the predetermined building envelope constraints. Careful placement of the tower maintains existing view lines for adjoining buildings. A range of apartments from laneway Mews type to penthouses, with sweeping bay views has provided a range of price points fro purchasers. A key element of the project is the landscaping of the main roof level, the area was conceived to provide a communal amenity for residents include a vegetable garden.
Comments	Podium provides communal area with vegetable gardens and mixed use development

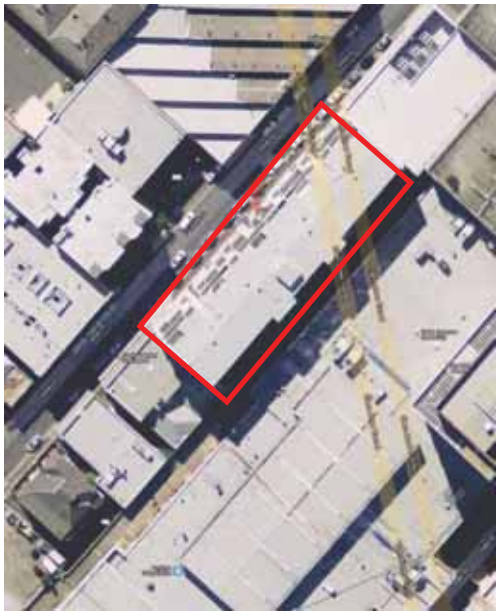
http://www.bda-architects.com.au/

PRECEDENTS

V HUMAN SPACE APARTMENTS - Residential

Architect / Builder	• Bligh Voller Neild
Location	• 82 Alfred Street, Fortitude Valley, Brisbane
Client	
Key Statistics	• 2500m2 site • 80 apartments • One, two and three bed apartments • 31 m2 per dwelling density
Building Form	• 7 storey apartments, plus 2 levels of basement and a mezzanine • Extremely low cost project - Affordable Housing • Dual Key apartments • Basement Parking • Designed for maximum visual and acoustic privacy, avoiding overlooking between apartments • Nil setback with ground floor residential with a small setback for a courtyard
Description	Aimed at the 18-35 year olds Long frontage of around 80m with narrow depth of approximately 38m has influenced a simple double loaded corridor plan. 4 metre structural module to enable flexibility in changing apartment plans between levels. Located in Brisbane's entertainment precinct.
Comments	Gritty residential development that can effectively function in a commercial area

http://www.bvn.com.au/



PRECEDENTS

FIVE DOCK MIXED USE DEVELOPMENT - Mixed-Use

Architect / Builder	• Bates Smart
Location	• Five Dock, Sydney NSW
Client	Kouadouris Group
Key Statistics	• Estimated 26.9 ha • 102 apartments • 264 m2 per dwelling density • Ground floor retail (tenancies) • Mlx of 1, 2 ,3 bed apartments • Supermarket • Neighbourhood public library
Building Form	• 8 storey. plus + 2 levels of basement • Range of types - 2 storey maisonettes terraces, garden apartments, 2 storey penthouses
Description	The project includes a wide range of apartment types including 2 storey maisonettes, terraces, garden apartmentsand two storey penthouses in addition to 1, 2 and 3 bedroom apartments, to create a diverse social mix. Large balconies with glazed balustrades run the full length of each apartment, with both the living areas and bedrooms opening on to them.

http://www.batessmart.com.au/

PRECEDENTS

401 St Kilda Rd.- Mixed-Use

Architect / Builder	• Elenberg Frasier
Location	• St Kilda, Victoria
Client	
Key Statistics	• 7 storey mixed use development • 17 apartments- 117 m2 per apartment $3 m range • $40 million • 2000 m2 site with 8750 m2 Gross Floor Area • 0m setback on ground level • Average apartment space 300 m2
Building Form	• High end retail fronting st Kilda rd. • Three levels of curved office space above • Further three levels apartments set back from street to lower visibility
Description	The rigid form of the street level retail is visually distinct from the curving facade of three levels of office space above. Seperate still is the building's top three levels of high end residential apartments which are even further setback to greatly reduce their visual presence on the street, as well as strengthening the pre-existing datum level set by the roof line of adjacent buildings.

http://elenbergfraser.com/

PRECEDENTS

7-9 JACOBS STREET APARTMENTS - Mixed-Use

Architect / Builder	• Hill Thalis Architecture
Location	• Bankstown, NSW
Client	Developer - JSN Hanna
Key Statistics	• 2400m2 site • 7200GFAm2 • Apartments • 43m2 per dwelling density
Building Form	• 9 storey apartments, • 2 retail/home office units • Single and cross-over units • Floor space ratio of 3.0:1 (plus above ground commercial parking) • Large scale precast concrete walls are overlaid with finely scaled aluminium frames and mesh sun shading
Description	In this example, Hill Thalis and Redshift applied a broad range of design principles to the site and building, beginning with an urban response: wrapping parking with multi-storey live/work units to provide an active streetscape, separating the mass into multiple blocks, and articulating the elements based on orientation. More complex principles focus on the spatial resolution of individual units and access spaces: maximizing natural light and ventilation to corridors, bathrooms and kitchens via a series of recesses cut into the building, and creating multiple external faces for living spaces and kitchens. www.architectureau.com/articles/western-sydney-apartments/ Built in 2009 budget: $8million

http://www.hillthalis.com.au/

PRECEDENTS

THE VILLAGE BALGOWLAH

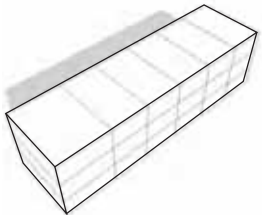
Architect / Builder	• Allen Jack + Cottier
Location	• Balgowlah, Sydney
Client	
Key Statistics	• $345 million cost • 2.12 ha site • Retail Floor Area: 17, 709 m2 • GFA: 45, 715 m2 • FSR: 2.1:1 • 239 apartments, 25 townhouses, 60 specialty shops • underground parking for 1000 vehicles
Building Form	• 6 storey buildings in a cluster formation with open spaces for the public and residents in the spaces between buildings. • retail is at ground level with parking below and residential in the 5 storeys above.
Description	The visible bulk of the shopping centre and car park is reduced by lowering them mostly below ground level and exploiting the slope across the site to separate retail, carpark and loading dock entries from the residential development. A variety of external spaces, including residential gardens, a swimming pool, a plaza and pedestrian thoroughfares provide both private and public amenity.

http://www.architectsajc.com/

COMPARING R-CODES TO INNALOO DESIGN GUIDELINES

1. We used the narrowest lot along Liege St
Lot size: 810m2: Lot width: 18m: Lot depth: 45m
2. All at-grade carparking options

R CODES
A. If your lot was re-zoned to R60 with RCodes
- 3 storey
- Setbacks – min 2m side setback
- Front setback 2m
- Up to 2 bays per dwelling



STRATA GROUPED development:
5 dwellings, 10 carbays plus visitor

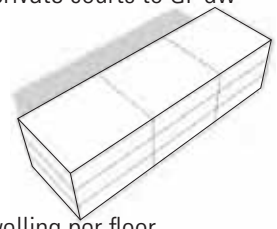
MULTIPLE UNITS : Maximum plot ratio is 567m2 ; at-grade or under the main building parking
Divided by 5dw = 113m2 max
Divided by 7dw = 81m2 max
Divided by 9dw = 63m2 max

B. If your lot was re-zoned to R80 with RCodes
- 3-4 storey
- Setbacks – min 4m side setback
- Front setback 2m

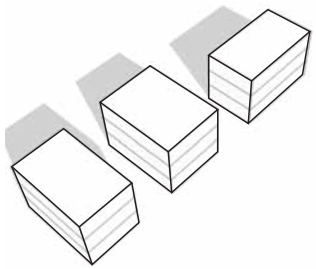
STRATA GROUPED development: NOT PERMITTED
MULTIPLE UNITS: Maximum plot ratio is 810m2; rear at-grade parking
Divided by 7dw = 115m2 max
Divided by 9dw = 90m2 max

INNALOO DESIGN GUIDELINES
- Residential only
- 3 storey
- Setbacks – min 3m side setback
- Front setback 2-4m
- 6m rear setback (12m on third level for some areas)
- At-grade carparking
- 1 bay per dwelling

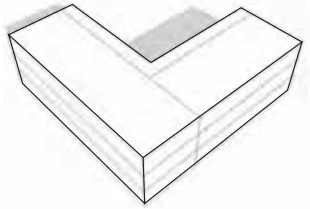
SINGLE BLOCK TYPE:
GFA 720m2
Divided by 7dw = 102m2
Divided by 9dw = 80m2
Negative: minimum communal area if car-park is double-loaded
Positive: generous private courts to GF dw



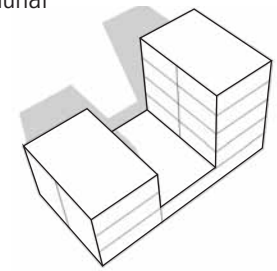
CLUSTER TYPE:
GFA 480m2; one dwelling per floor
Divided by 6dw = 80m2
Negative: lower yield
Positive: generous communal areas, more house-like



PARTIAL COURYARD:
GFA 600m2-730m2;
Divided by 6dw = 100m2 -121m2
Divided by 9dw = 66m2 – 81m2
Negative: Cost to build over car bays to increase GFA
Positive: well located and generous communal area

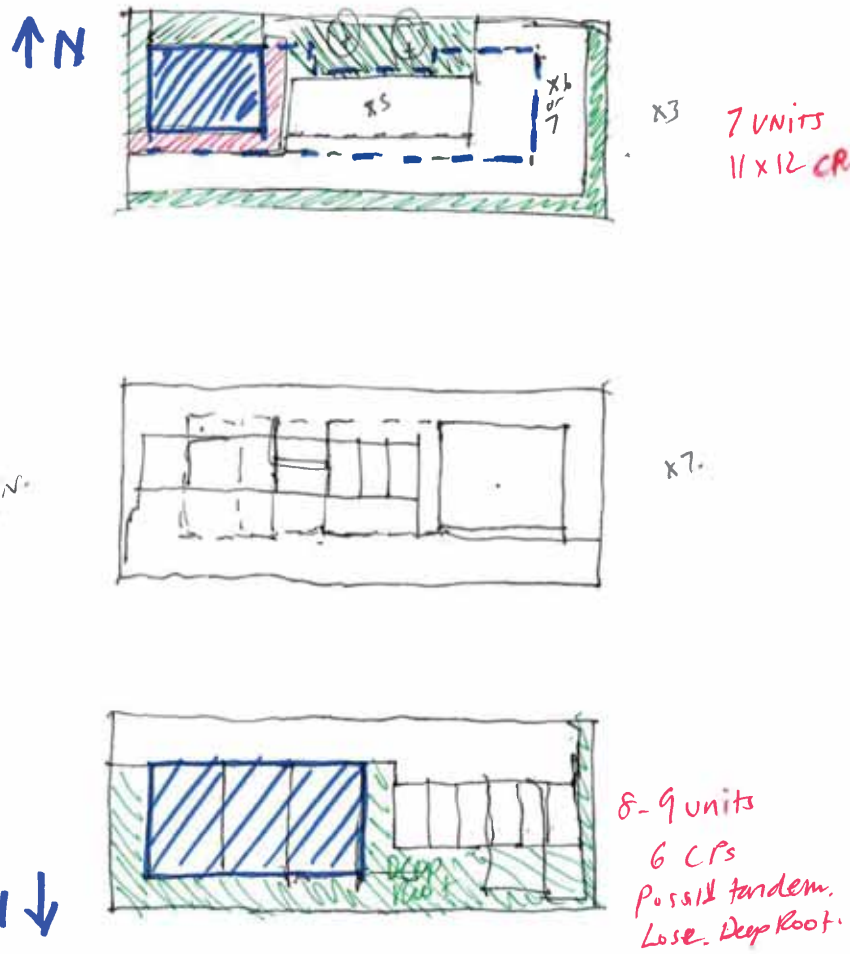


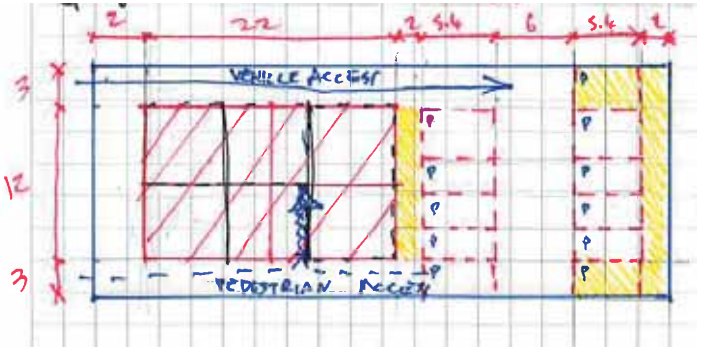
DOUBLE BLOCK:
GFA 750m2;
Divided by 8dw = 93m2
Divided by 10dw =75m2
Negative: Cost to build over car bays
Positive: generous central communal area, upper decked communal



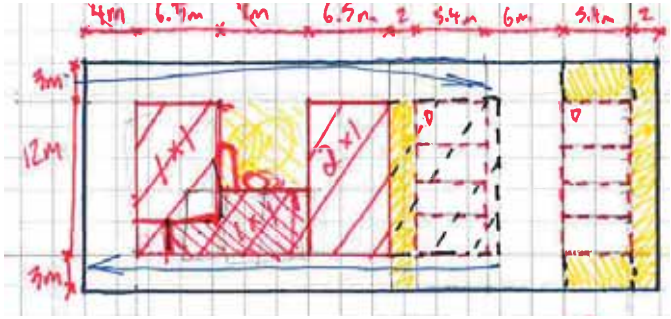
LOT TESTING

Single Lot 810m^2: 18m x 45m- Liege Street
Pavilion Cluster
At grade parking

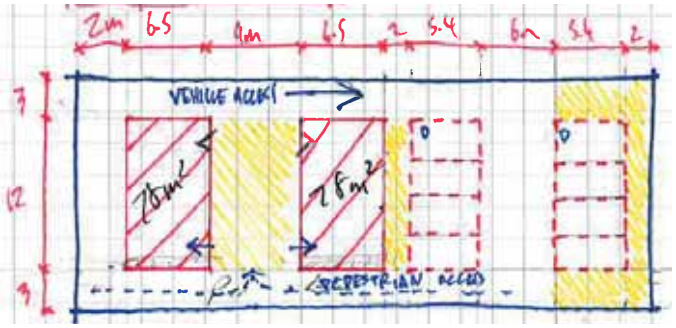




240 m^2 per floor
9 apartments: 3 x 2 bed per floor
11 carbays (9+2 visitor)
0m^2 communal outdoor space
30%site cover
Upper levels may cantilever over parking to provide greater floor space.



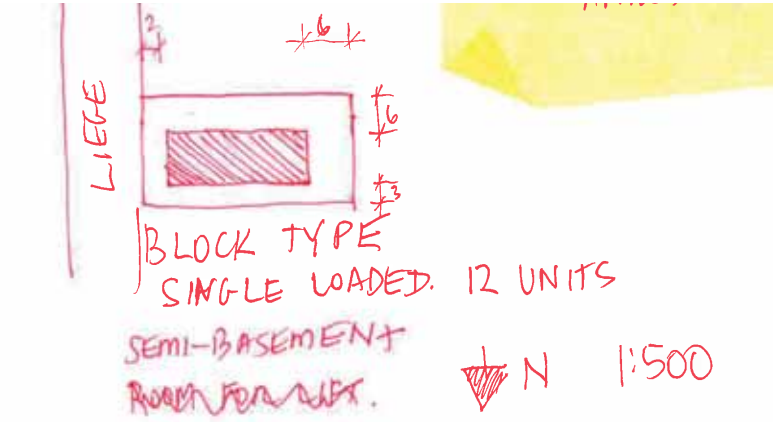
191 m^2 per floor
8 apartments:
Ground Floor: 2 x 1 bed, 1 x 2 bed
First Floor: 2 x 1 bed, 1 x 2 bed
Second Floor: 2 x 2 bed
8 carbays (6+2 visitor)
63m^2 communal outdoor space
24% site cover
Upper levels may cantilever over parking to provide greater floor space.

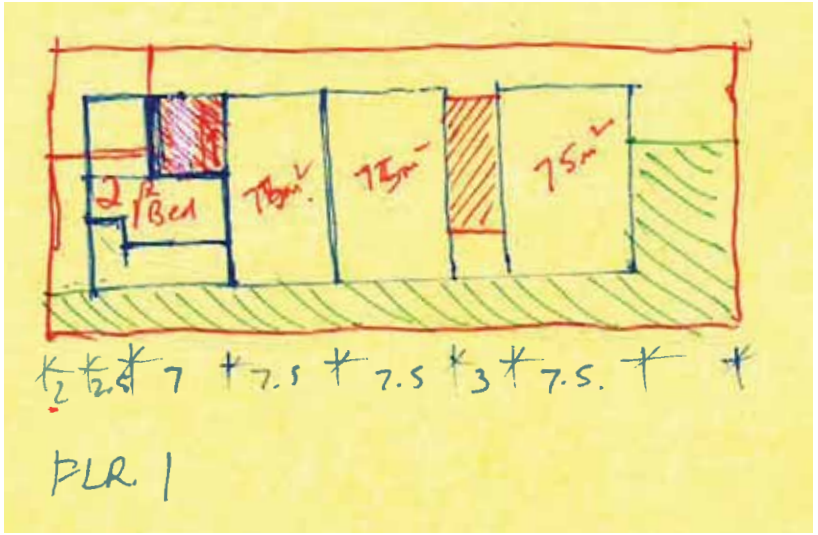


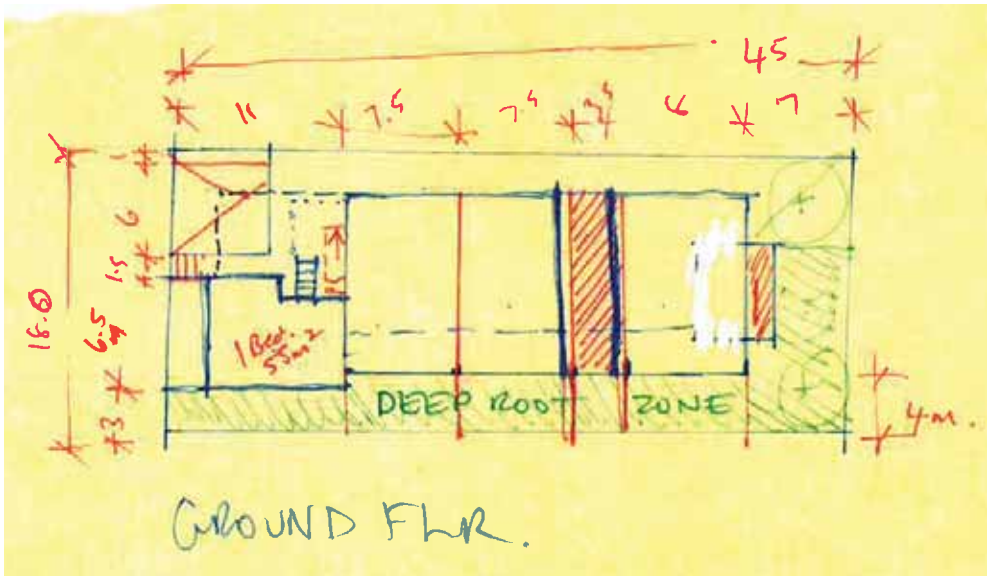
156 m^2 per floor
6 apartments: 2 x 2 bed per floor
8 carbays (6+2 visitor)
108m^2 communal outdoor space
18% site cover
Upper levels may cantilever over parking to provide greater floor space.

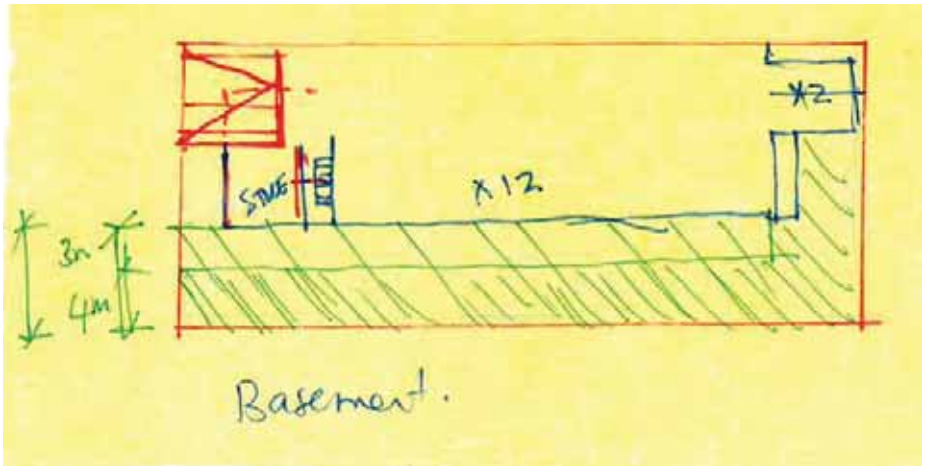
LOT TESTING

Single Lot 810m^2: 18m x 45m- Liege Street
Central Block Type
Semi-basement parking



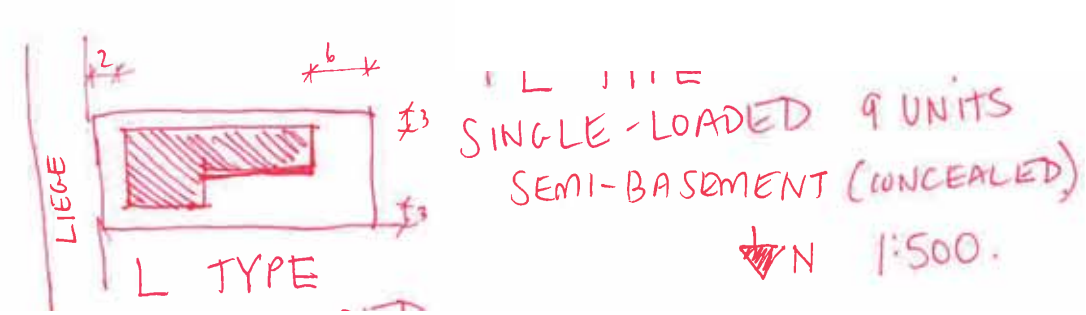


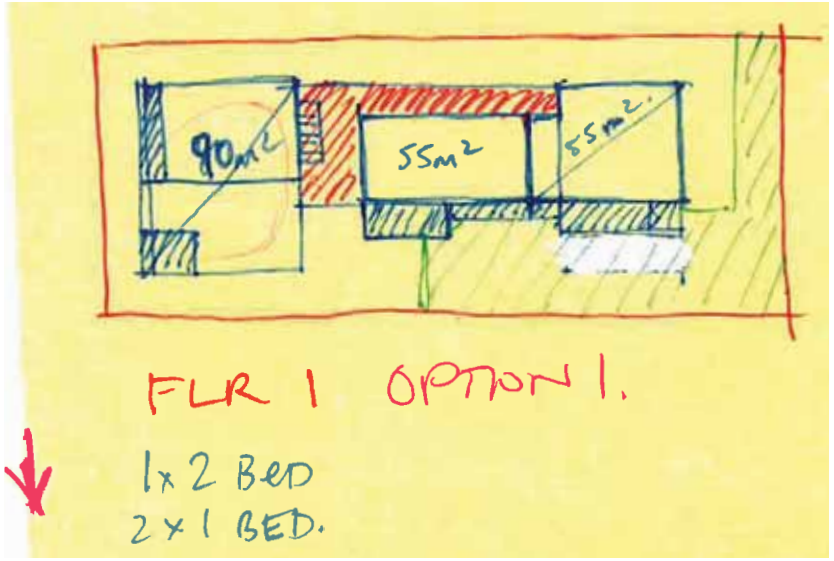


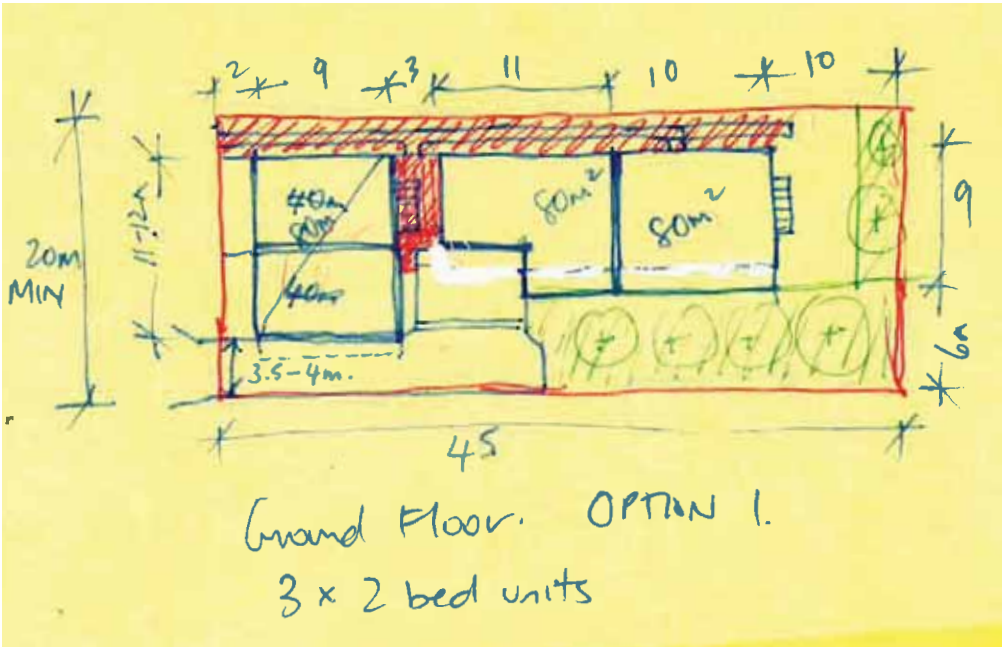


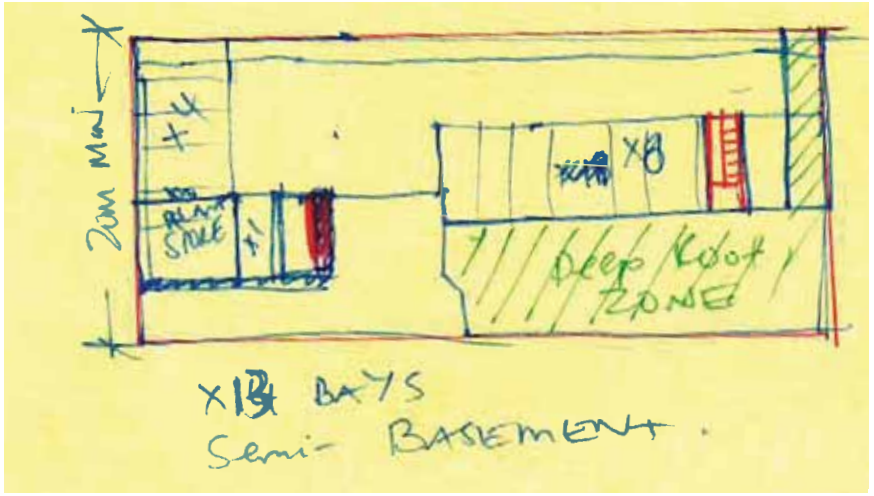
LOT TESTING

Single Lot 810m²: 18m x 45m- Liege Street
Partial Courtyard Type
Semi-basement parking



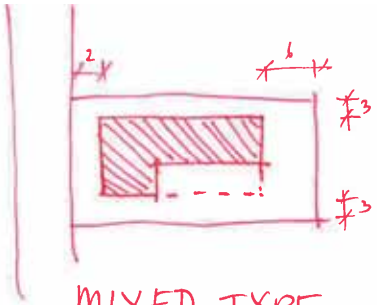






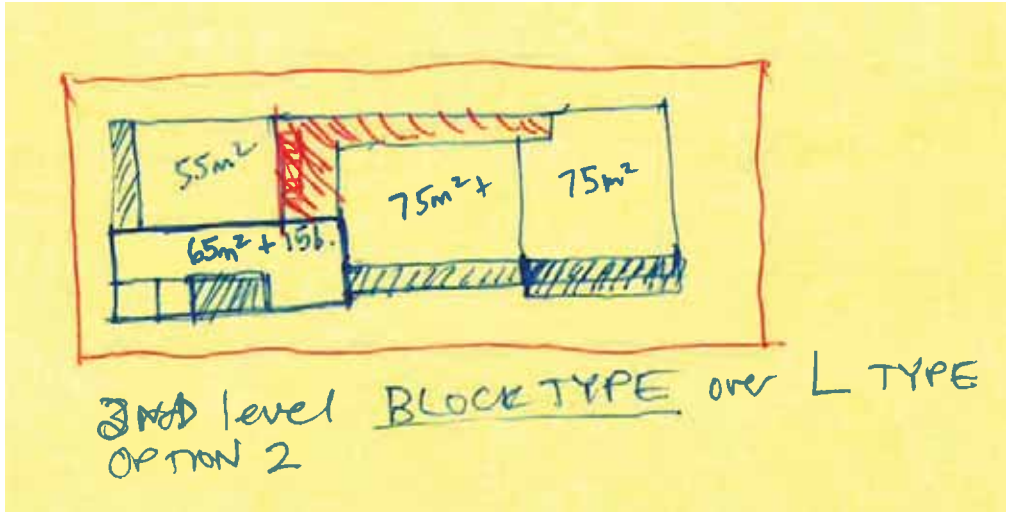
LOT TESTING

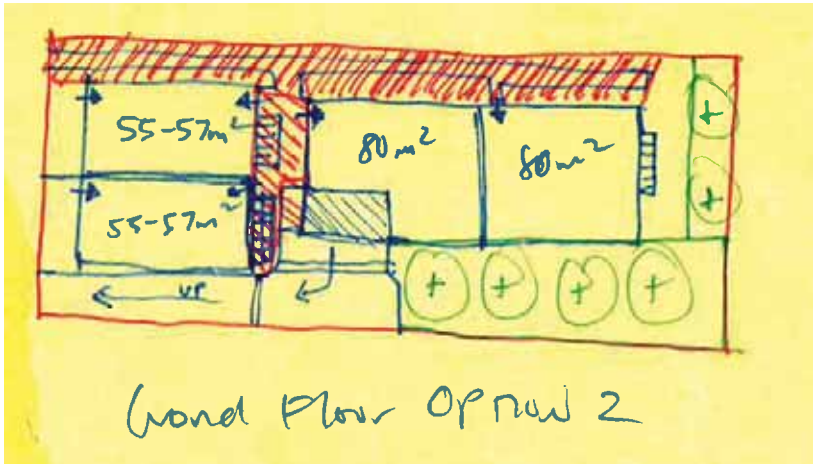
Single Lot 810m²: 18m x 45m- Liege Street
Partial Courtyard Type with Block Type on upper levels
Semi-basement parking

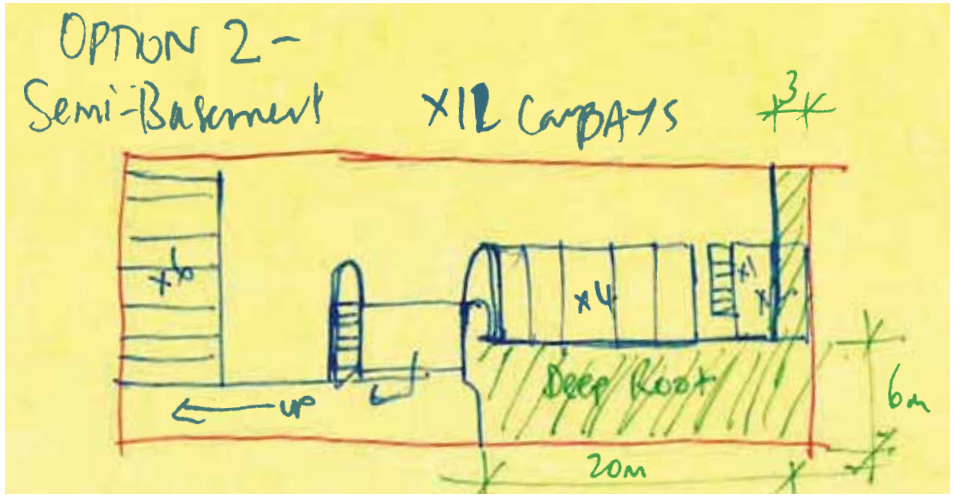


MIXED TYPE
L TYPE BASE
BLOCK UPPER LEVEL
SINGLE LOADED 11 UNITS
SEMI-BASEMENT CONCEALED.

N 1:560.

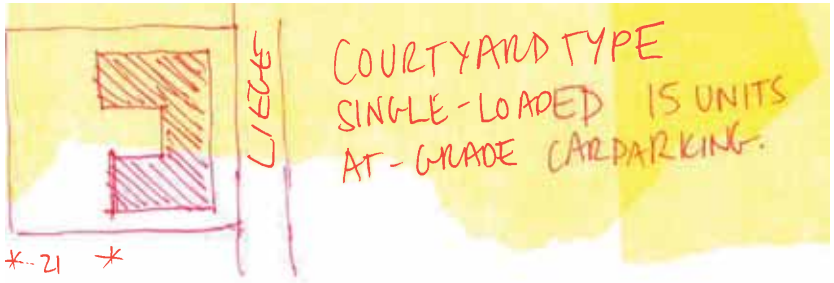


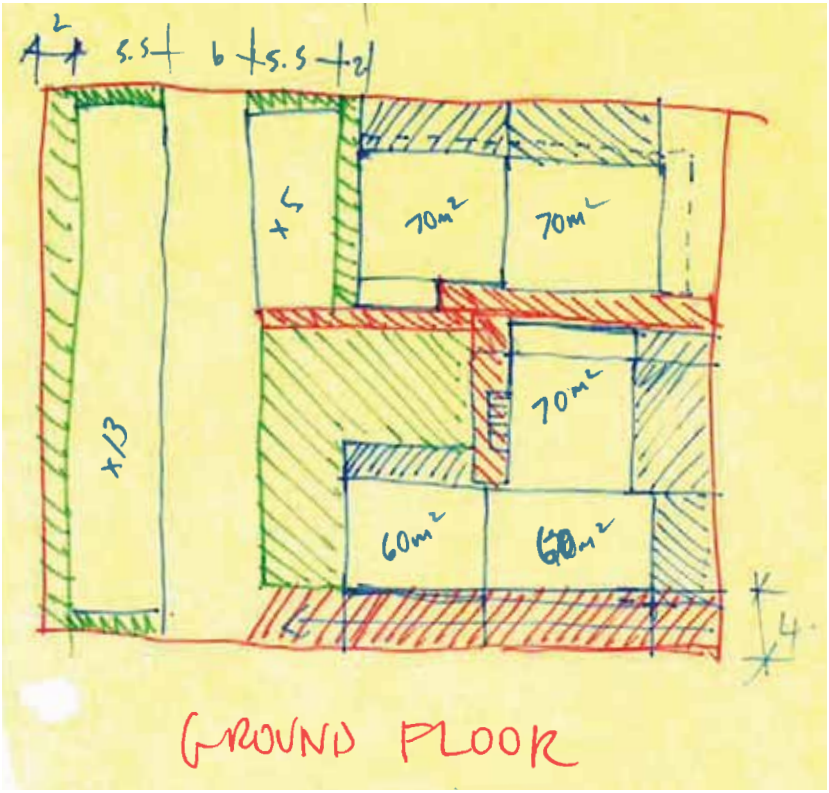


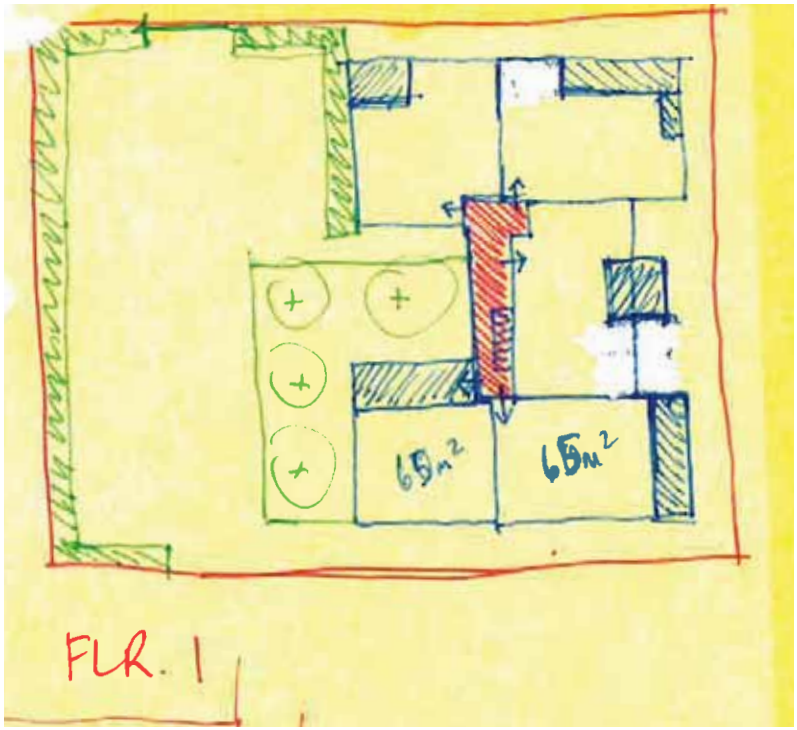


LOT TESTING

Two lot amalgamation 1620m^2: 36m x 45m- Liege Street
Courtyard Type
At grade parking

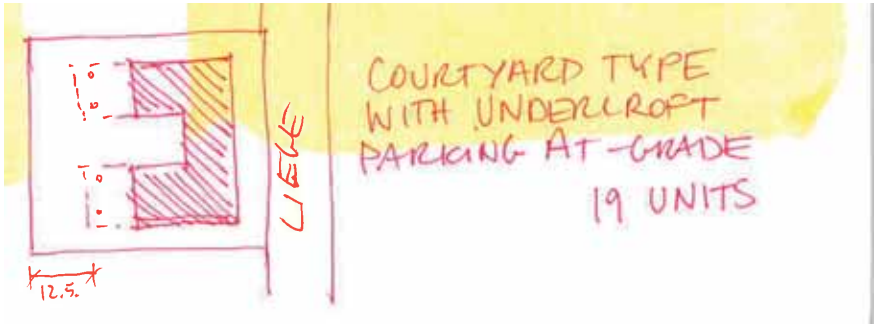


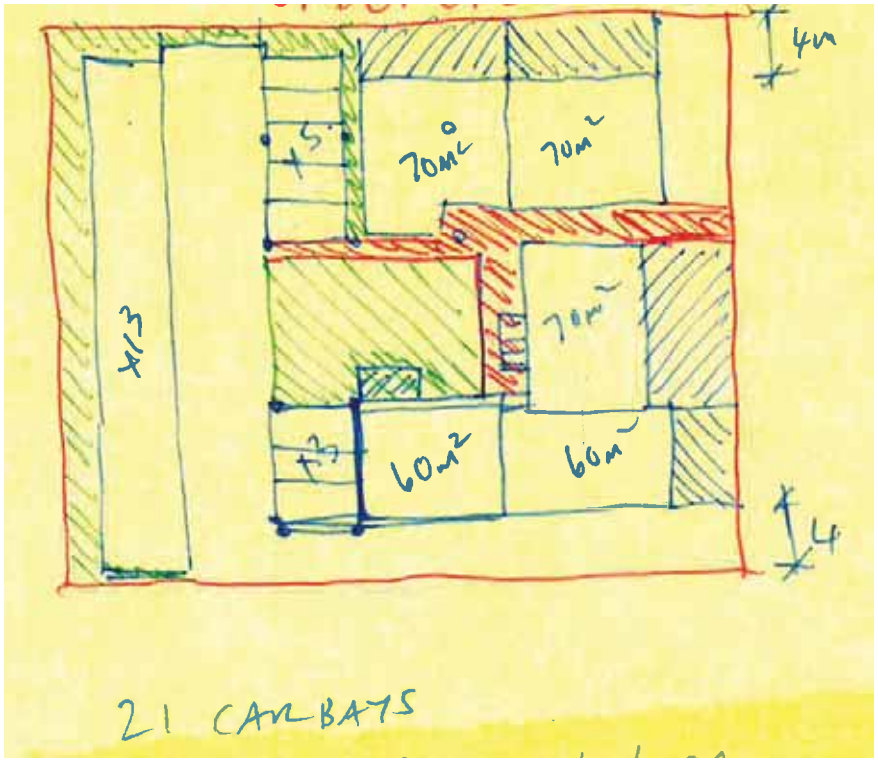


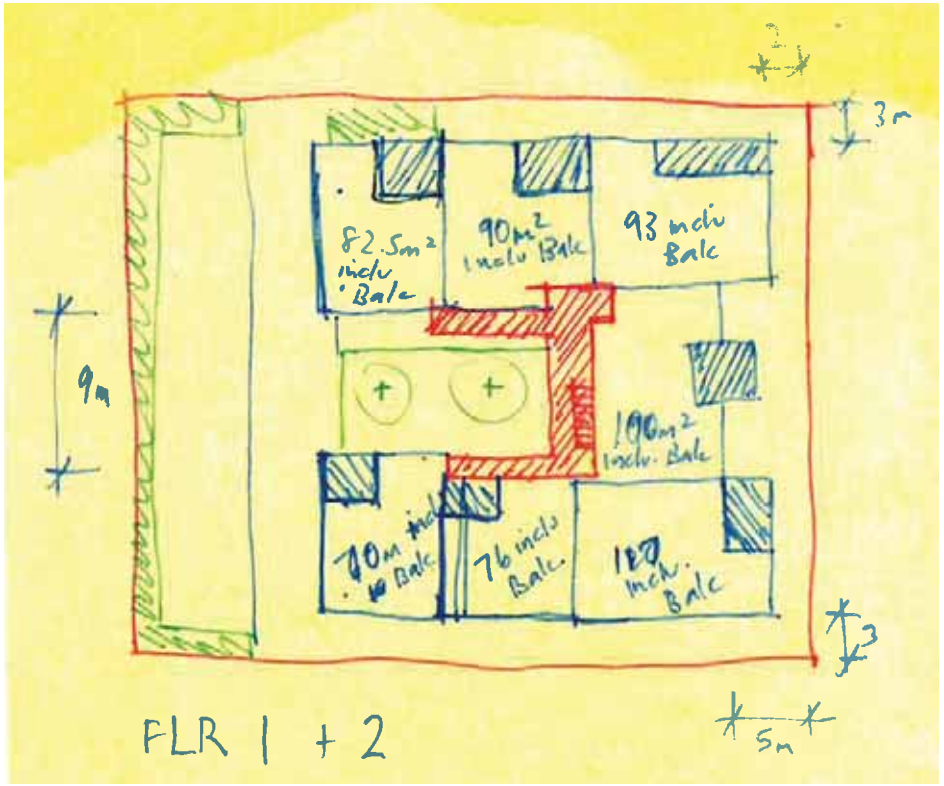


LOT TESTING

Two lot amalgamation 1620m^2: 36m x 45m- Liege Street
Courtyard Type
At grade undercroft parking

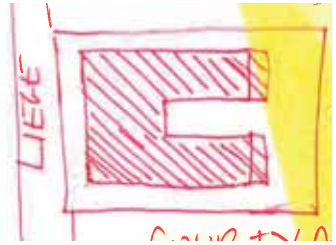


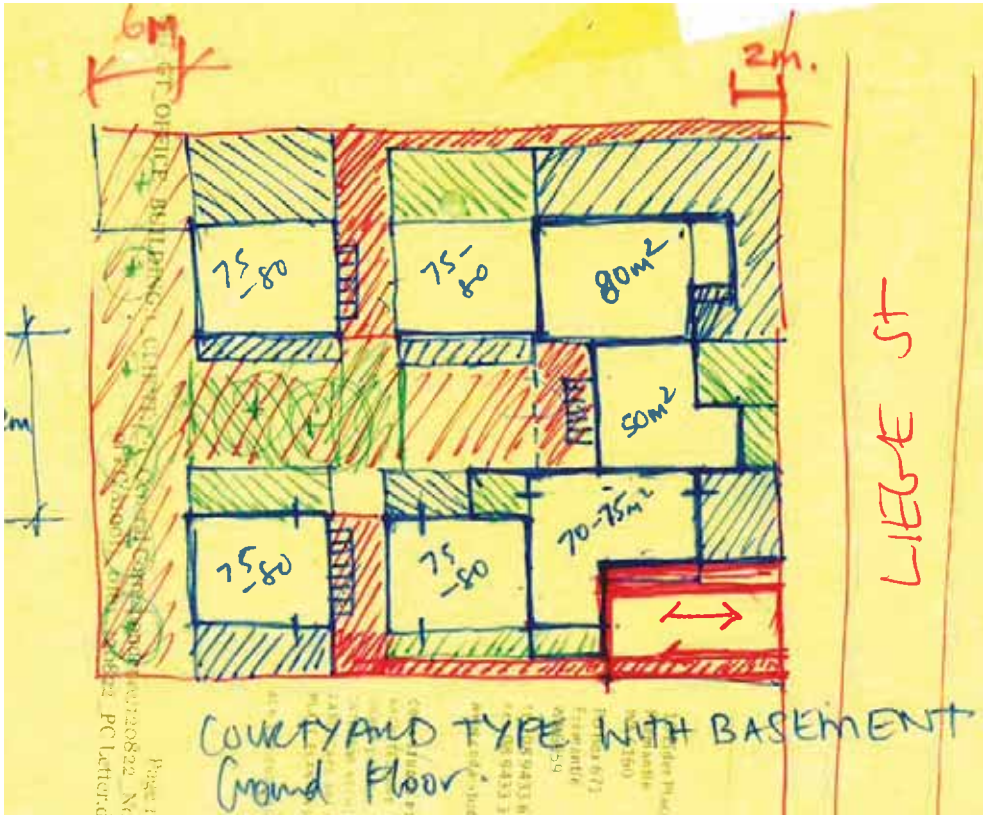


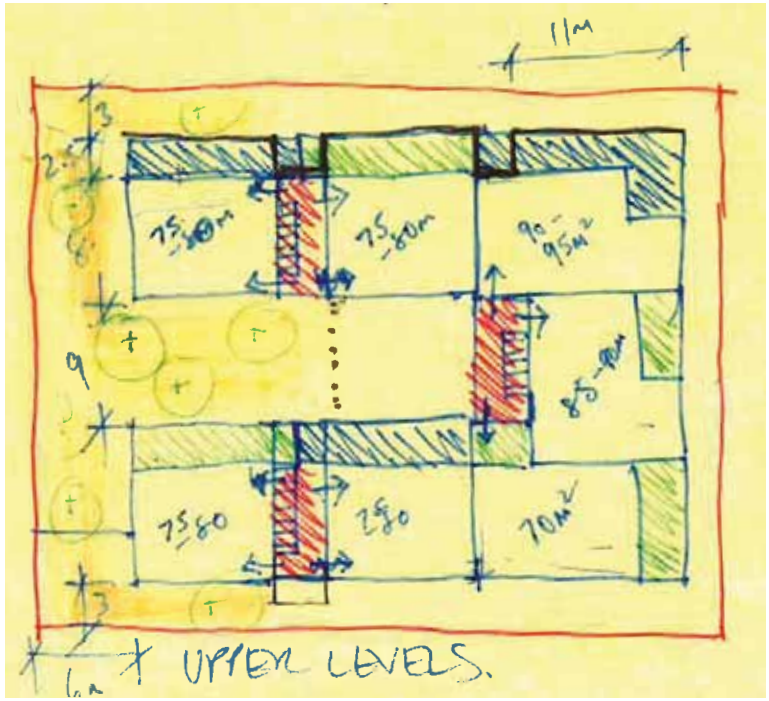


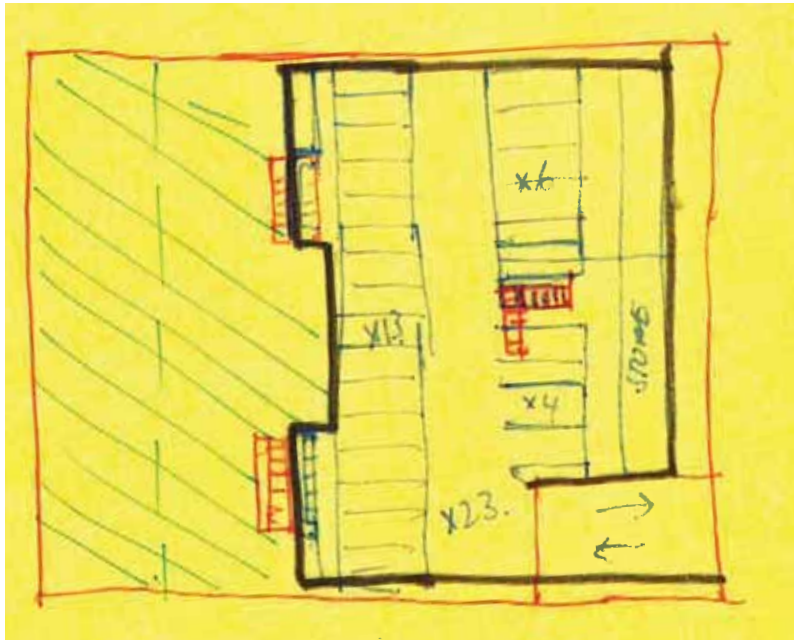
LOT TESTING

Two lot amalgamation 1620m^2: 36m x 45m- Liege Street
Courtyard Type
Semi basement parking



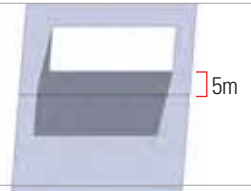
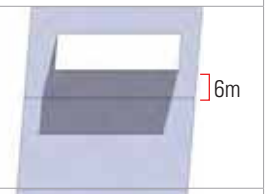
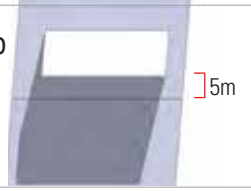






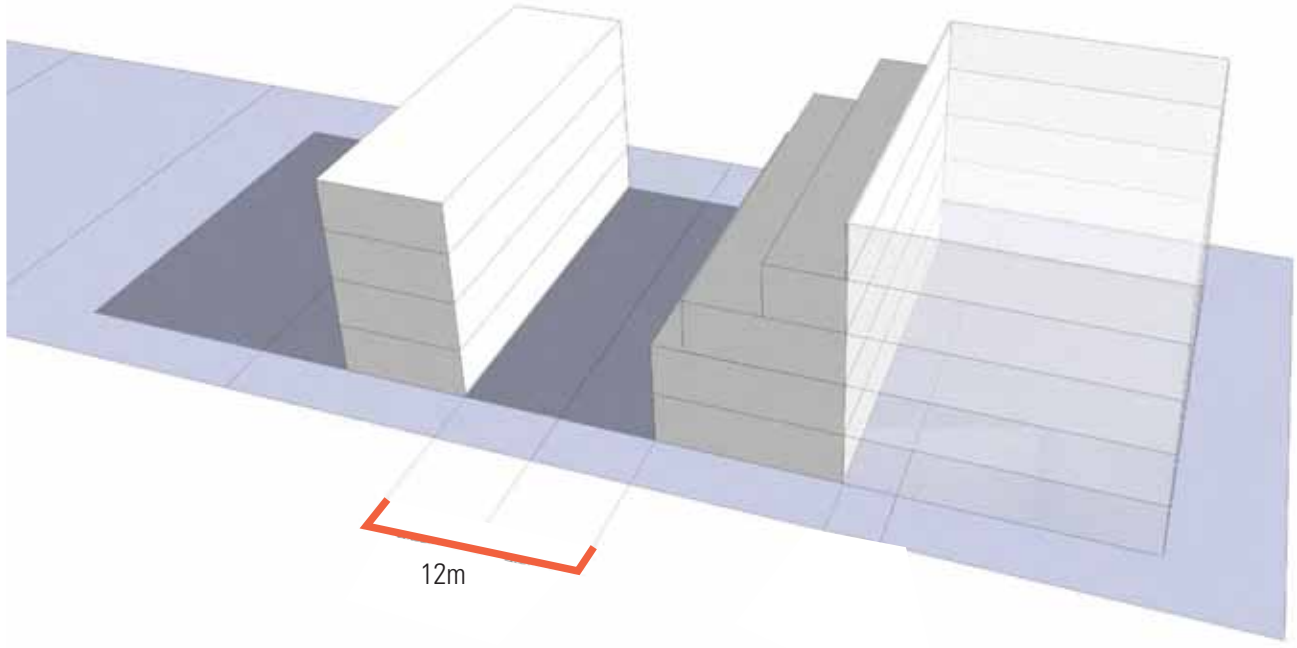
ADJACENT LOT OVERSHADOWING

IMPACT OF SIDE SETBACKS AND BUILDING HEIGHTS ON THE OVERSHADOWING OF ADJACENT SINGLE LOTS IN EAST-WEST ORIENTED LOTS

	• 3m SIDE SETBACK	• 4m SIDE SETBACK	• 5m SIDE SETBACK	• 6m SIDE SETBACK
3 STOREY	40% 	35% 	30% 	27% 
4 STOREY	58% 	51% 	48% 	44% 
5 STOREY	75% 	72% 	68% 	61% 

Note: Overshadowing percentage will be greatly reduced if adjacent lot is a multiple lot amalgamation

BUILT FORM OVERSHADOWING



Maximum building envelope achieving no overshadowing of adjacent building with 6m side setbacks.

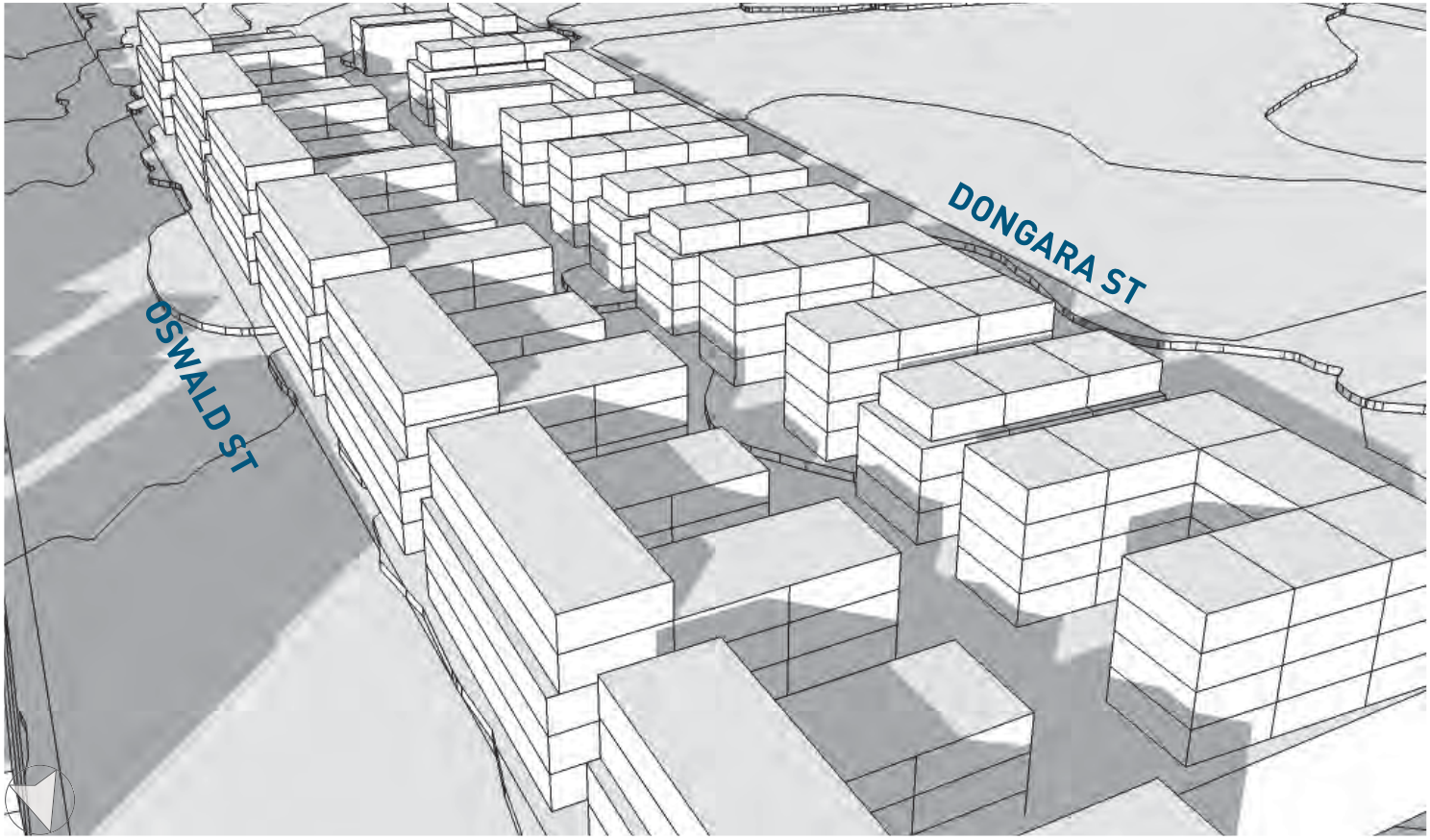
A two lot amalgamation is required to achieve 5 storeys with 0% overshadowing of built form.

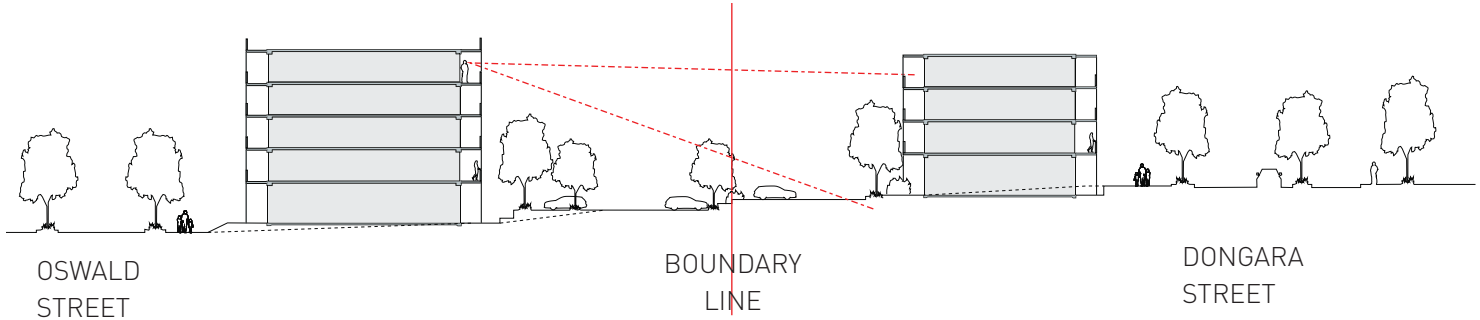
BUILT FORM OVERSHADOWING

Analysis of built form outcome with 5 storey development on Oswald Street and 4 storey development on Dongara Street.

6 m rear setbacks for lots on Oswald and Dongara minimise impact of overshadowing. on either. It is most noteable at 9am but even at this time it is not significant.

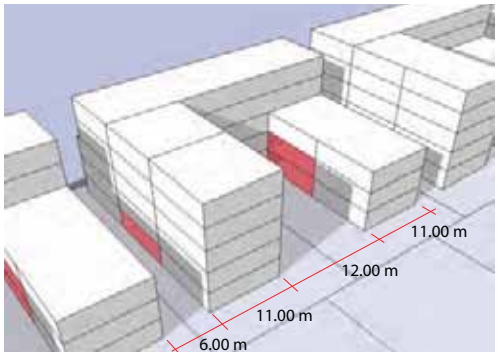
Ground level changes between front boundary of the two streets mean that 4 storey buildings on Dongara Street are comparable in height to the 5 storey buildings on Oswald.





BUILT FORM OVERSHADOWING

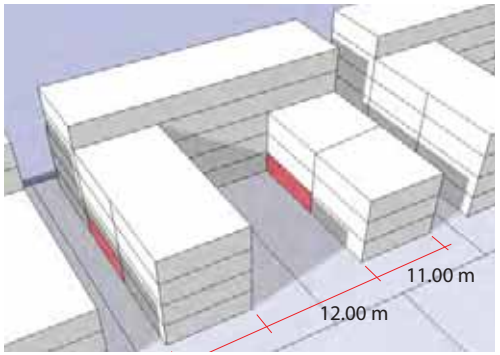
5 Storey residential & mixed use Oswald St, Twyford Place, Staveley Place
3 metre side setback
Typologies proposed: Courtyard, Partial Courtyard, Double Block



Oswald Street
Courtyard
5 storeys north wing
3 storeys south wing

3 apartments do not receive 3 hours sunlight

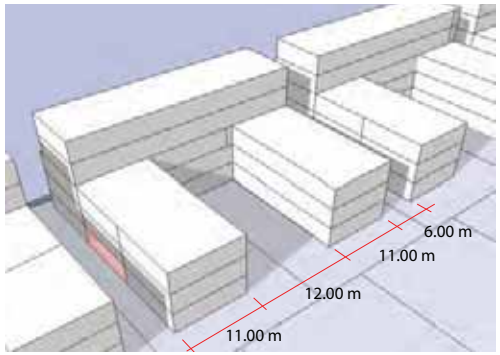
31 apartments
10% of apartments do not receive adequate natural light



Oswald street
Courtyard
4 storeys north wing
3 storeys south wing

2 apartments do not receive 3 hours sunlight

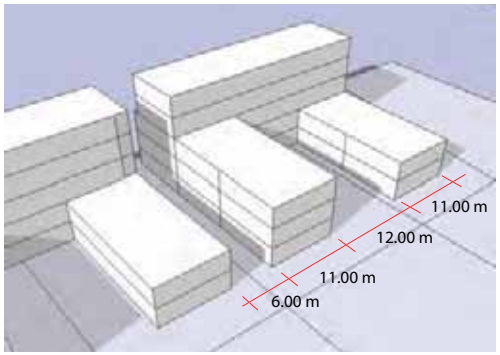
29 apartments
7% of apartments do not receive adequate natural light



Oswald Street
Courtyard
3 storeys north wing
3 storeys south wing

1 apartments does not receive 3 hours sunlight

27 apartments
4%of apartments do not receive adequate natural light



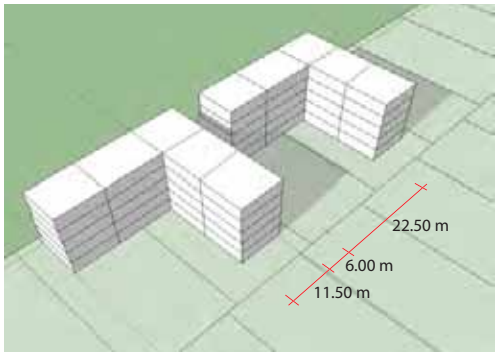
Oswald Street
Courtyard
3 storeys north wing
2 storeys south wing

all apartments receive 3 hours of sunlight

25 apartments
0% of apartments do not receive adequate natural light

BUILT FORM OVERSHADOWING

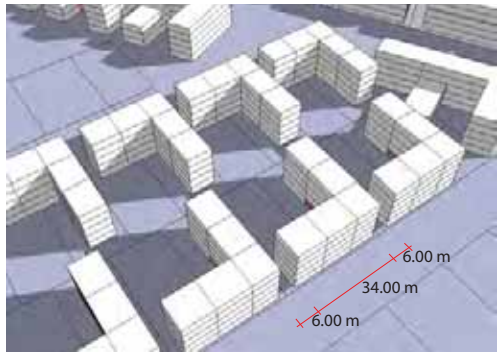
5 Storey residential & mixed use Oswald St, Twyford Place, Staveley Place
3 metre side setback
Typologies proposed: Courtyard, Partial Courtyard, Double Block



Oswald Street
Partial Coutyard
All 5 storey

all apartments receive 3 hours sunlight

25 apartments
0% of apartments do not receive adequate natural light

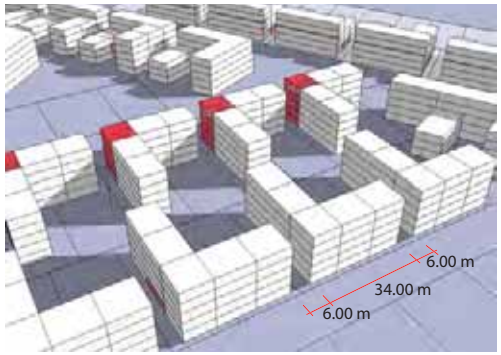


Twyford/Staveley Place
Partial Courtyard
Western wing

Buildings facing Staveley(Northeast) contain 1 apartment which does not receive 3 hours sunlight

25 apartments
4% of apartments do not receive adequate natural light
- all apartments in building facing Twyford (southeast) receive 3 hours sunlight

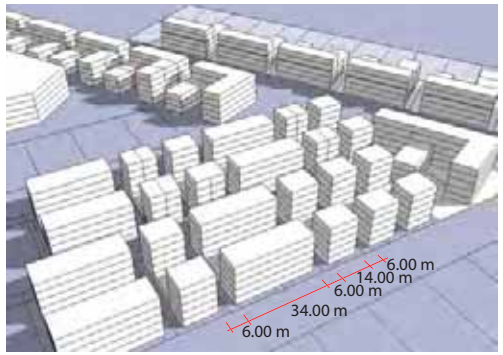
25 apartments
0% of apartments do not receive adequate natural light



Twyford/Staveley Place
Partial Courtyard
Eastern wing

Buildings facing Staveley (Northeast) contain 1 apartment which does not receive 3 hours sunlight
25 apartments
4% of apartments do not receive adequate natural light

Building facing Twyford contains 5 apartments which do not receive 3 hours sunlight
25 apartments
20% of apartments do not receive adequate natural light



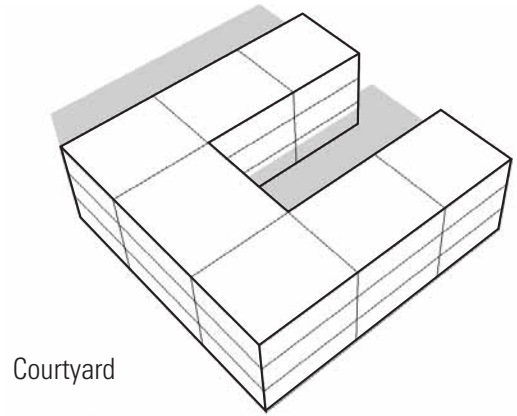
Twyford/Staveley
Double Block
Single lot and 2 lot amalgations

all apartments receive 3 hours of sunlight

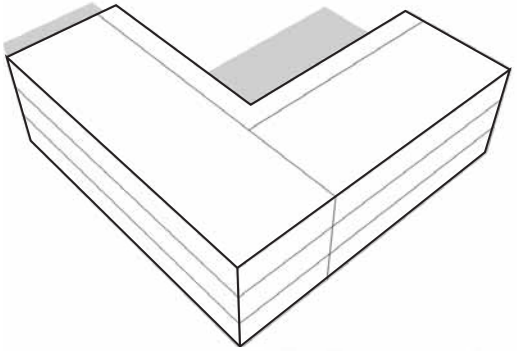
16 apartments(single lot)
32 apartments(double lot)

0% of apartments do not receive adequate natural light

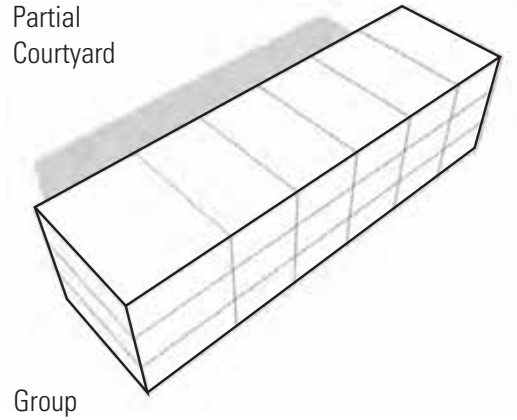
APPLYING TYPOLOGIES-WOODLANDS



Courtyard



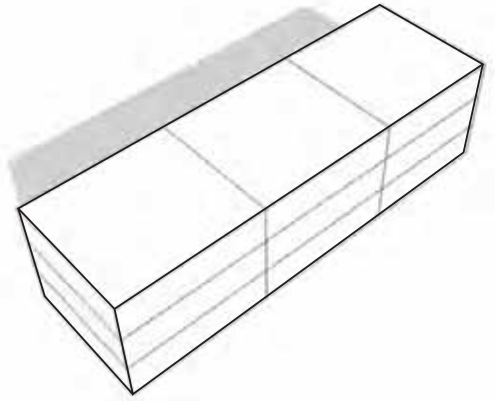
Partial Courtyard



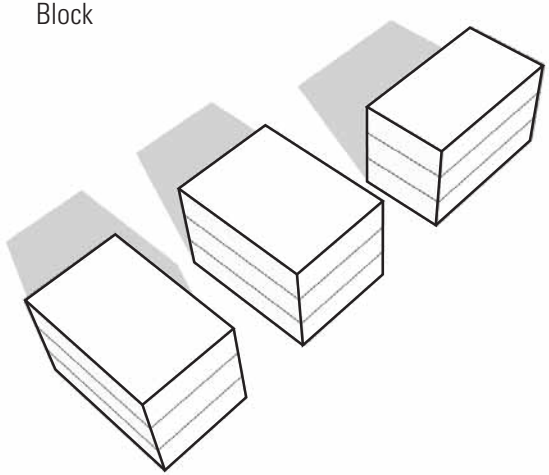
Group House

RESIDENTIAL APARTMENTS

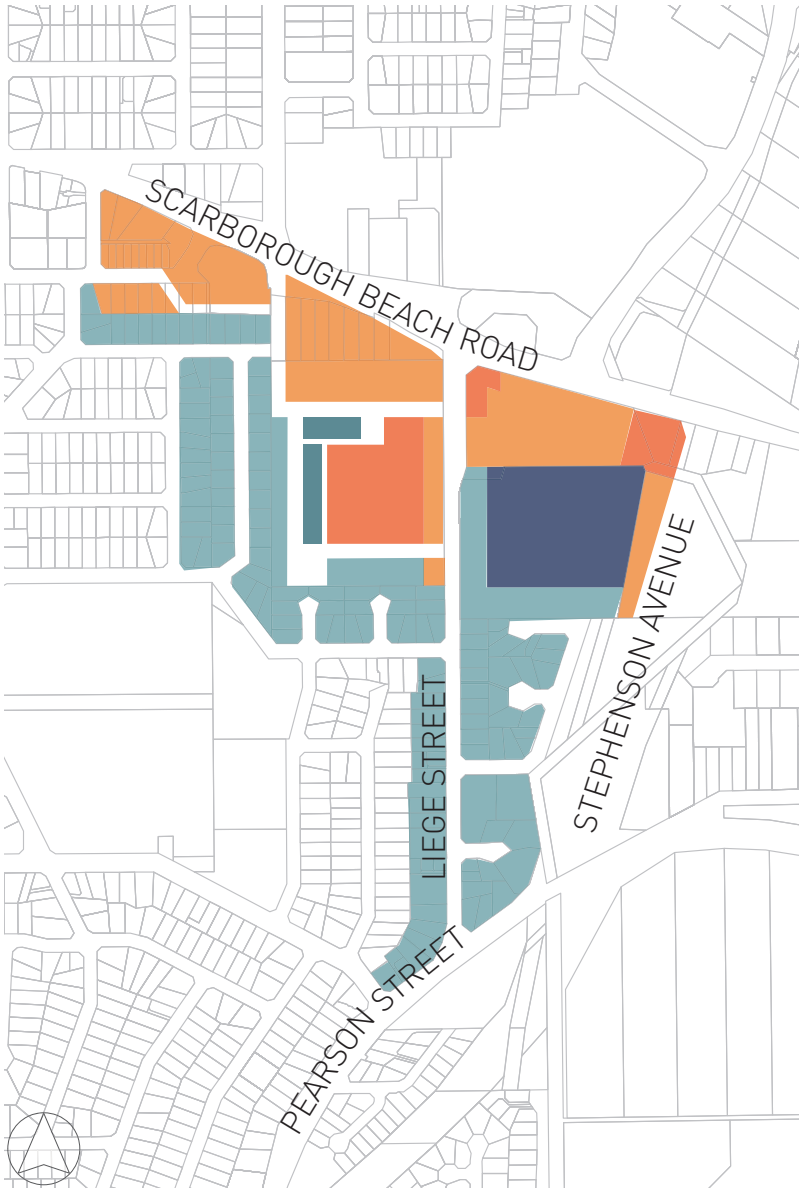
3 STOREY
4M FRONT SETBACK



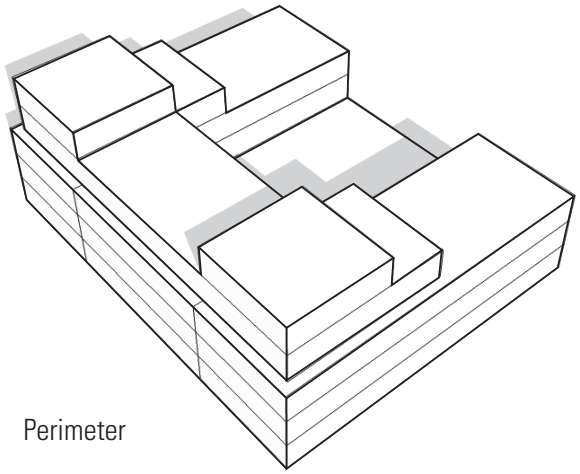
Central Block



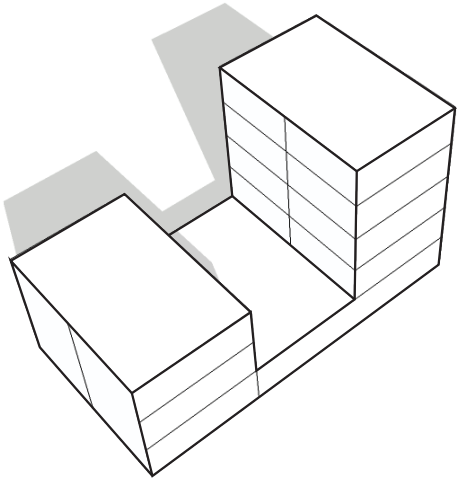
Pavilion Cluster



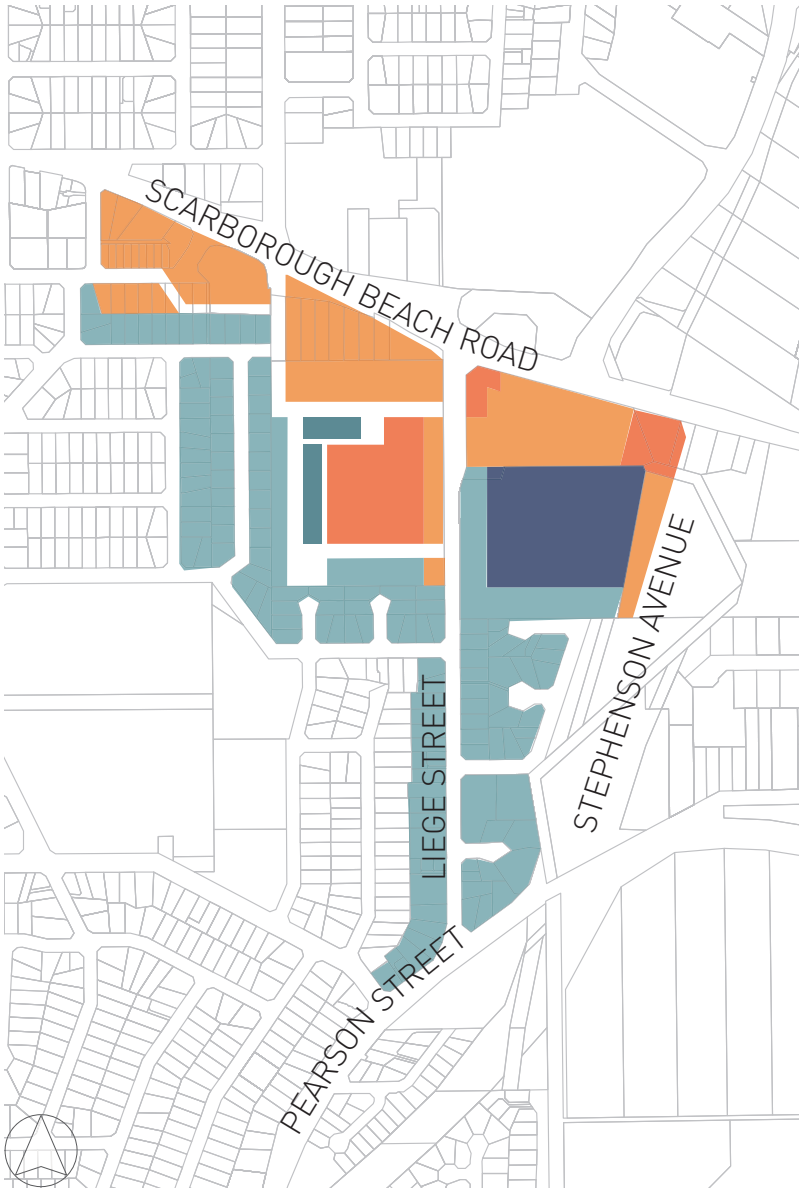
APPLYING TYPOLOGIES-WOODLANDS



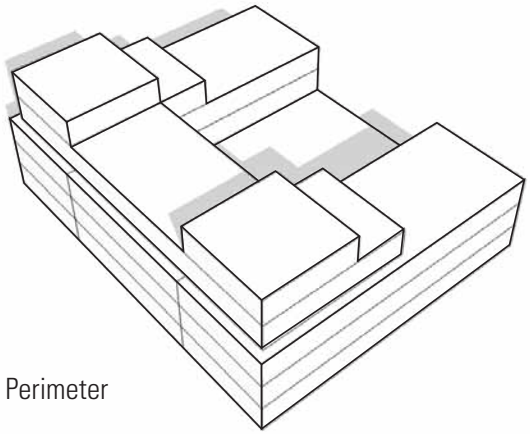
Perimeter



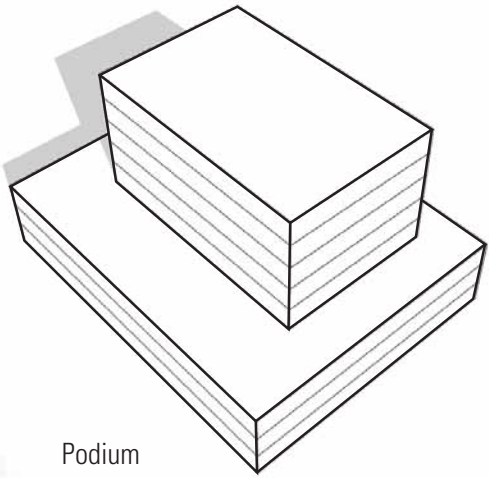
Double
Block



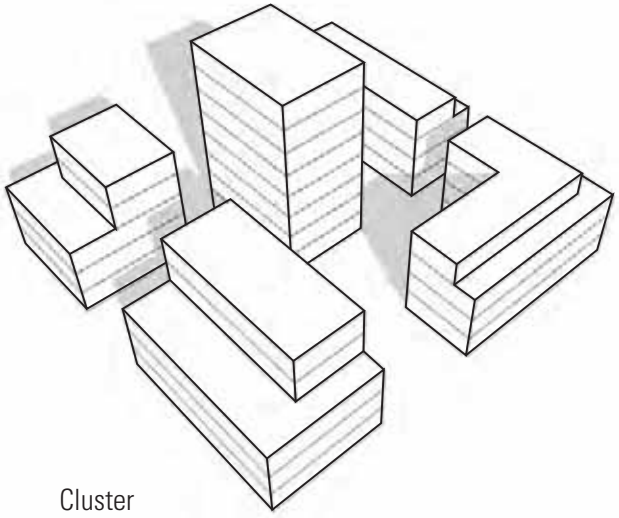
APPLYING TYPOLOGIES-WOODLANDS



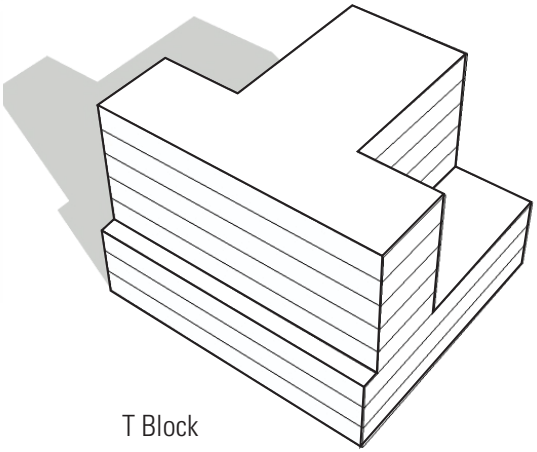
Perimeter



Podium



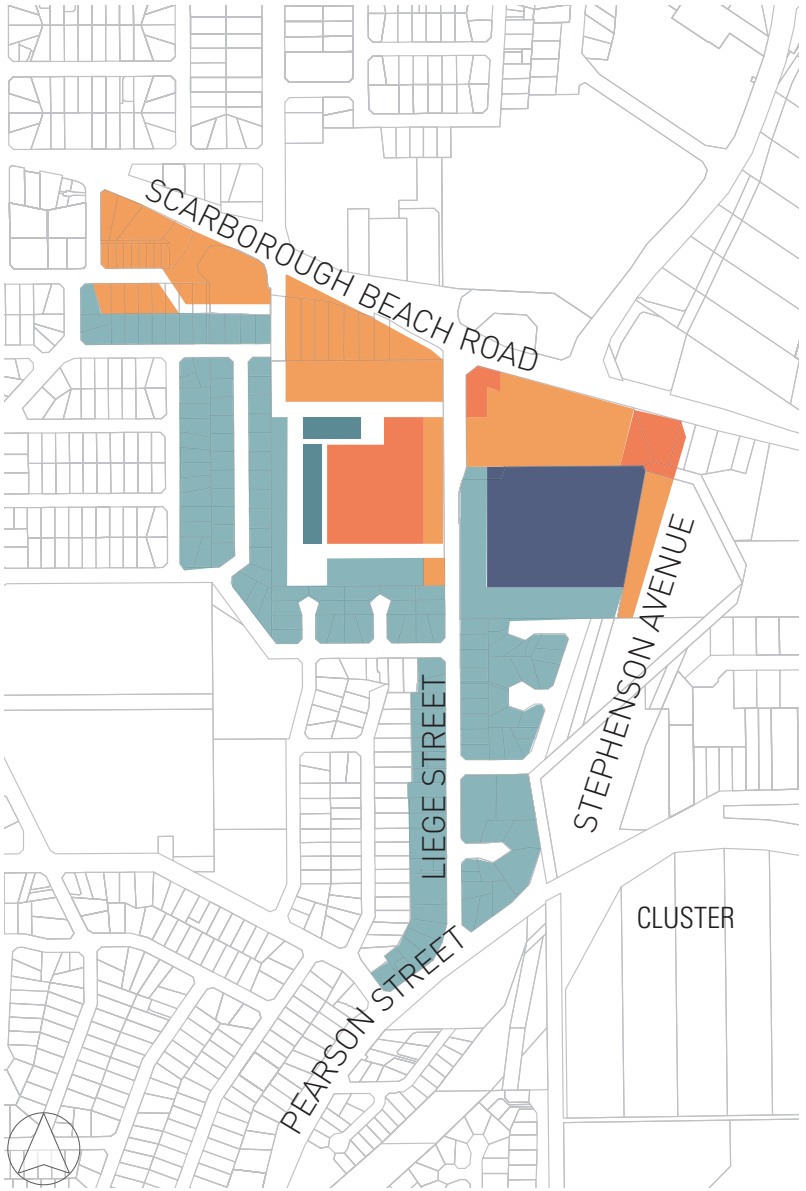
Cluster



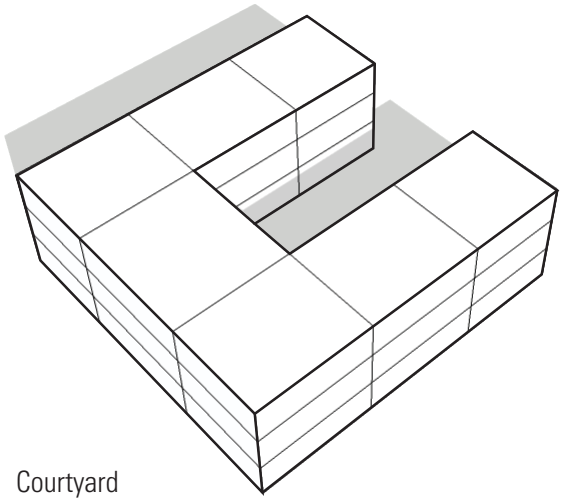
T Block

CINEMA SITE (INNER)

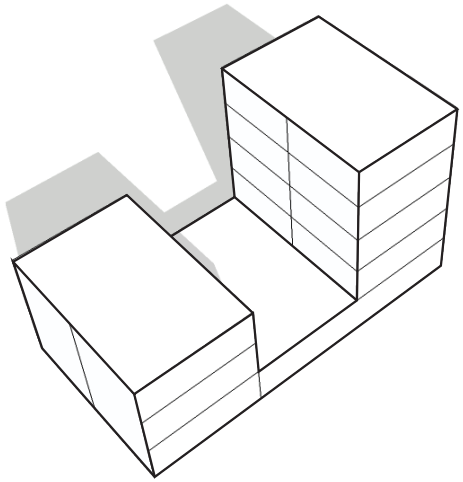
7 STOREYS
MIXED USE



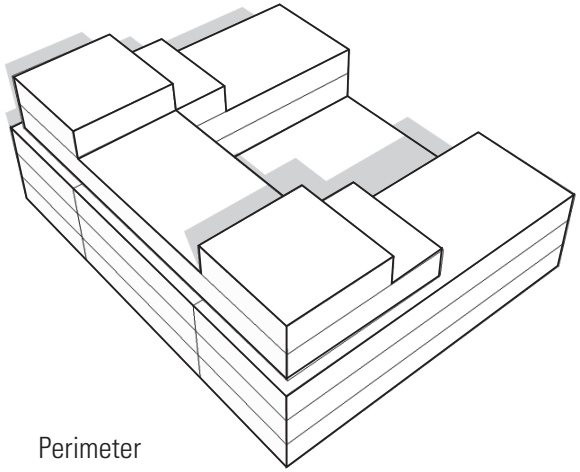
APPLYING TYPOLOGIES-WOODLANDS



Courtyard



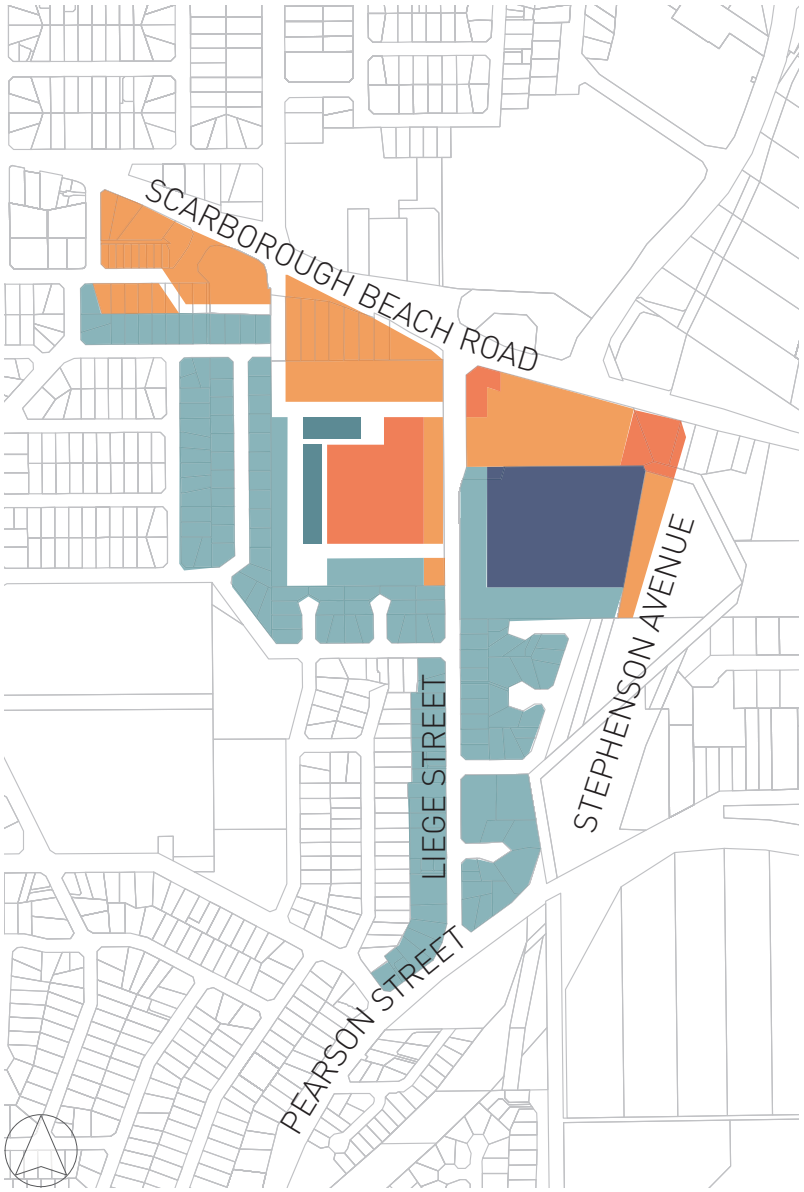
Double
Block



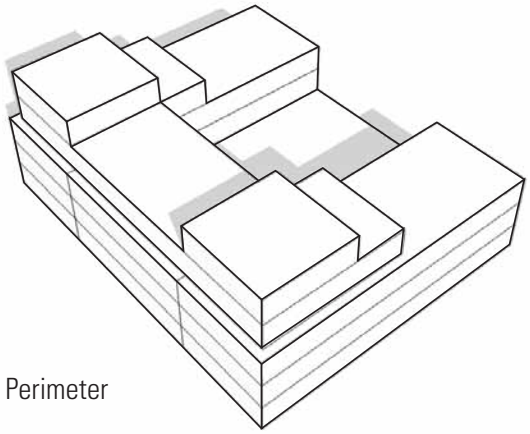
Perimeter

CINEMA SITE (PERIMETER)

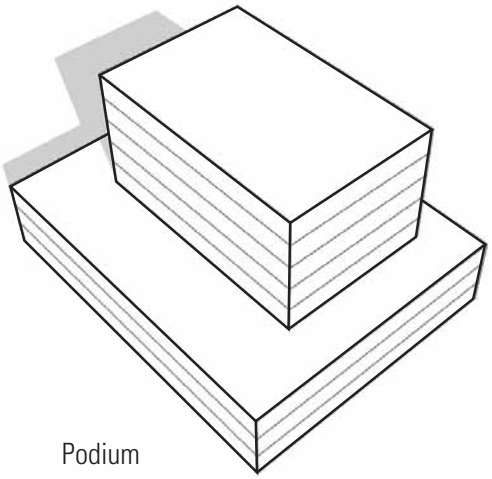
5 STOREY



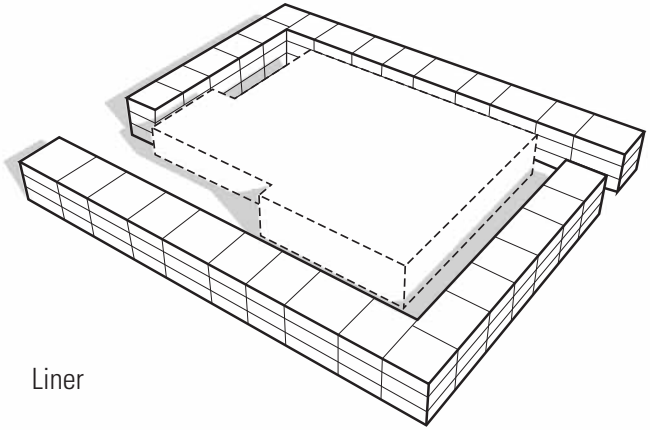
APPLYING TYPOLOGIES-WOODLANDS



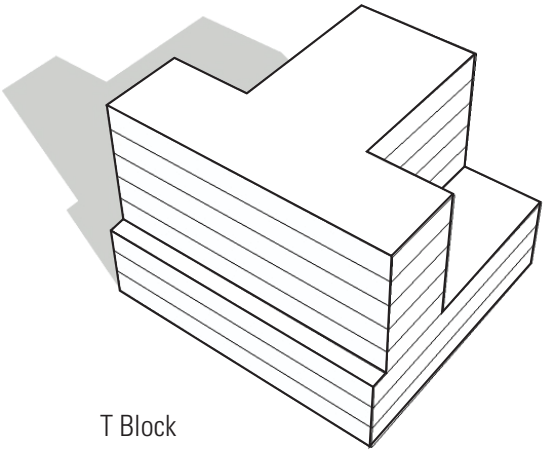
Perimeter



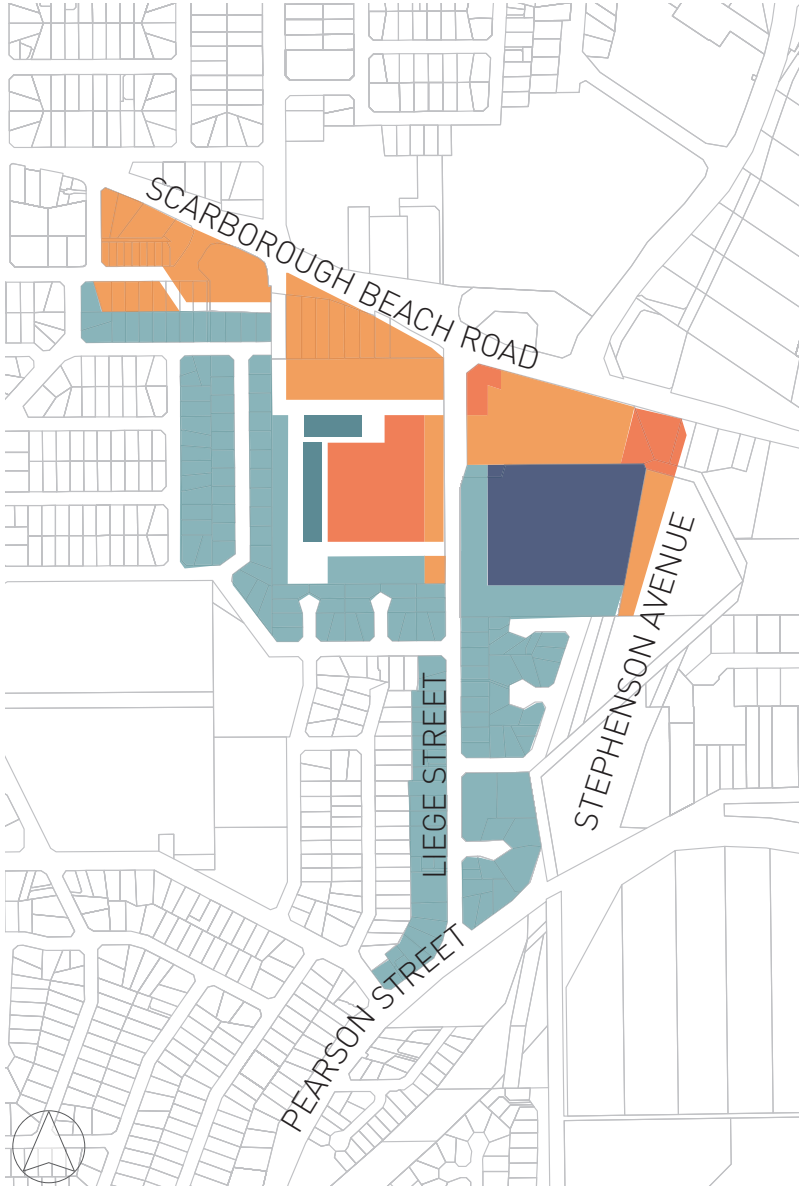
Podium



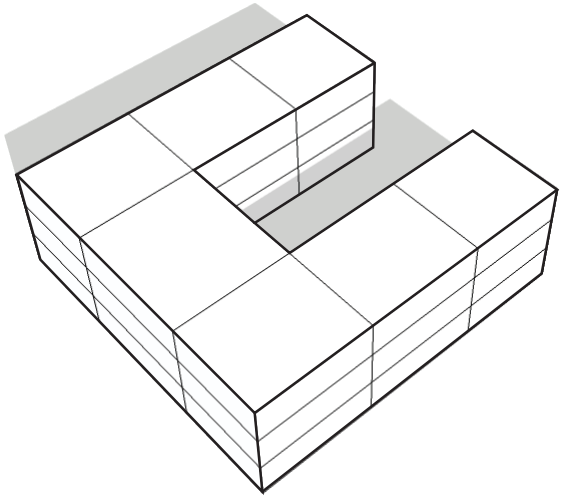
Liner



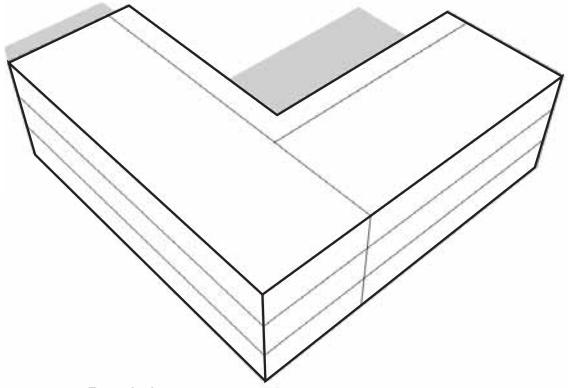
T Block



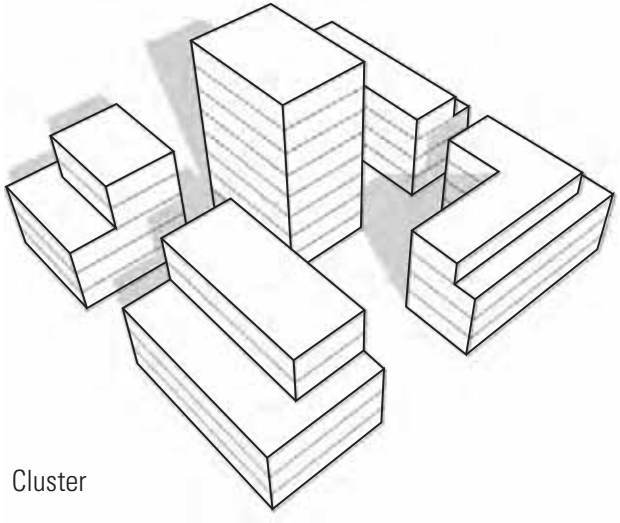
APPLYING TYPOLOGIES-WOODLANDS



Courtyard



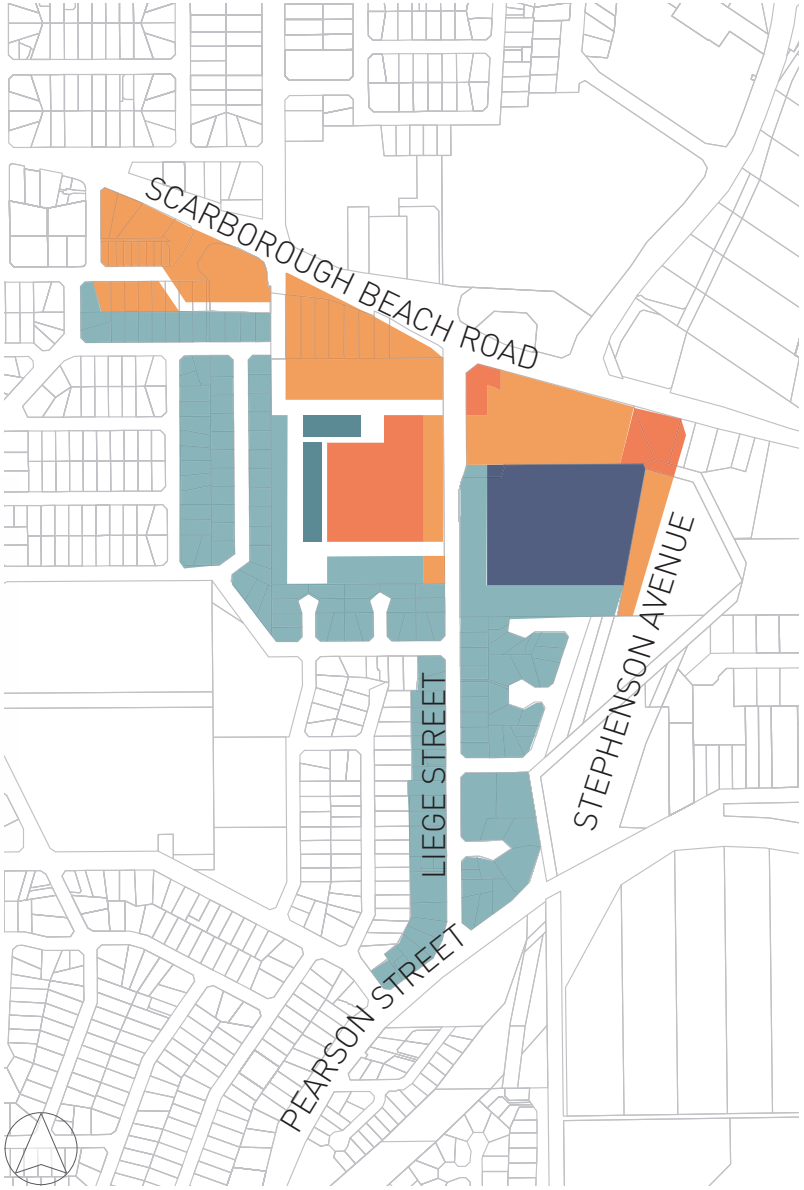
Partial
Courtyard



Cluster

PARKLAND VILLAS (INNER)

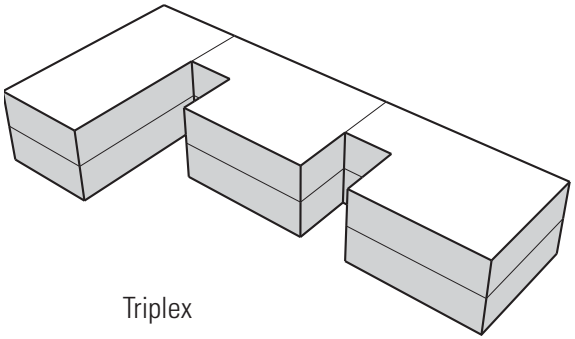
5 STOREY
RESIDENTIAL



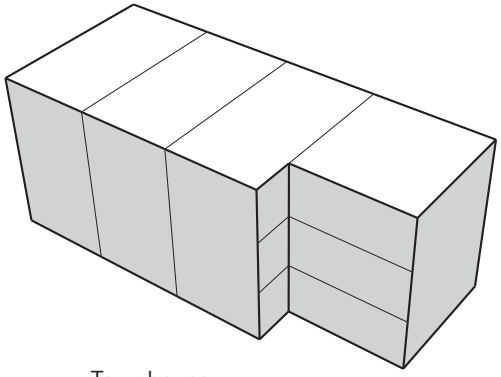
APPLYING TYPOLOGIES-INNALOO

NOT WITHIN THE SCOPE OF THIS REPORT

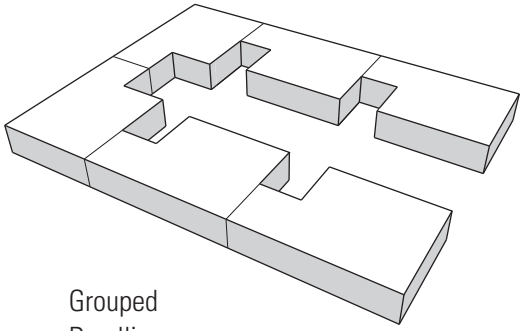
EXISTING BUILDING TYPOLOGIES:



Triplex



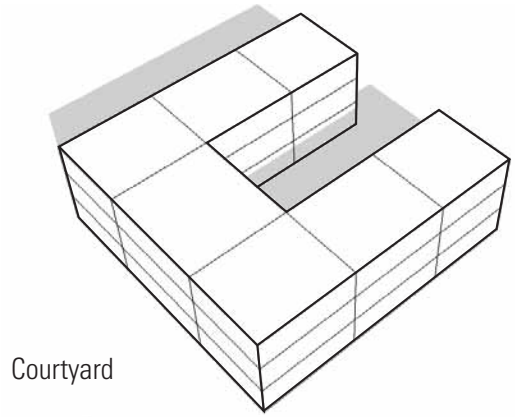
Townhouse



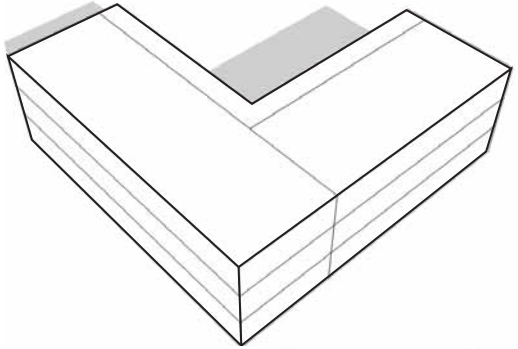
Grouped
Dwellings

R40

APPLYING TYPOLOGIES-INNALOO



Courtyard



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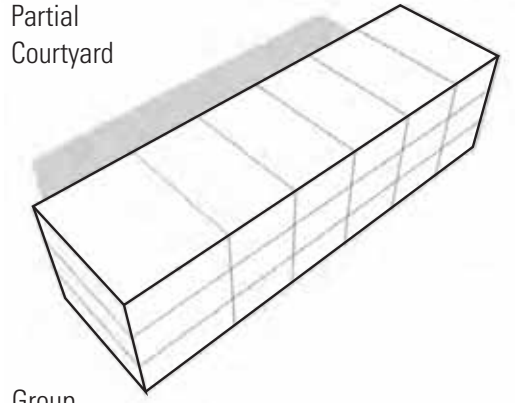
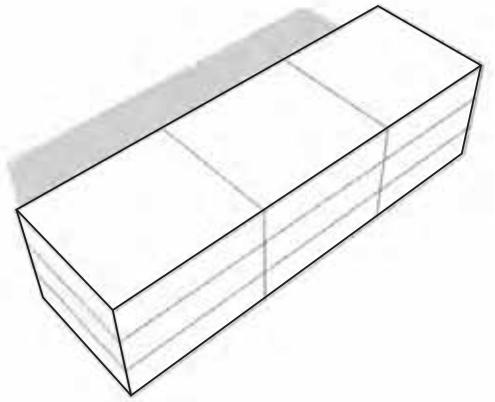
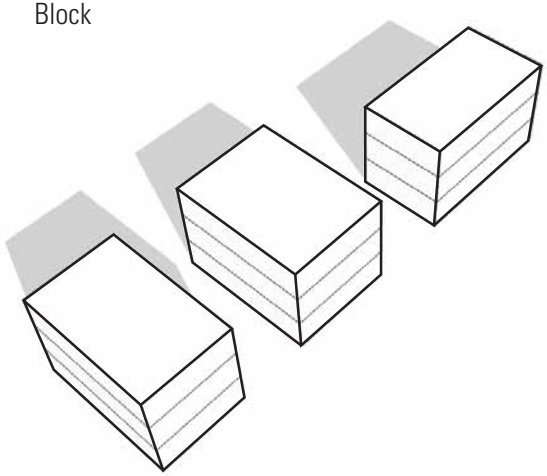


Group House



Central Block

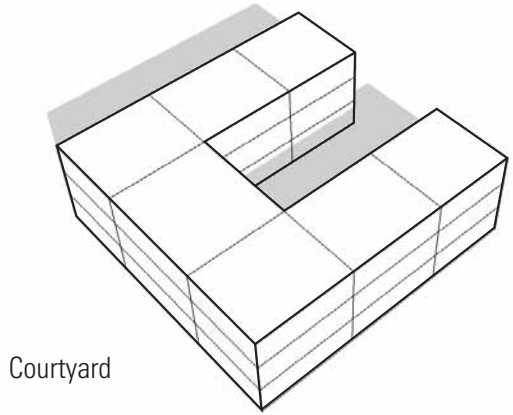


Pavilion Cluster

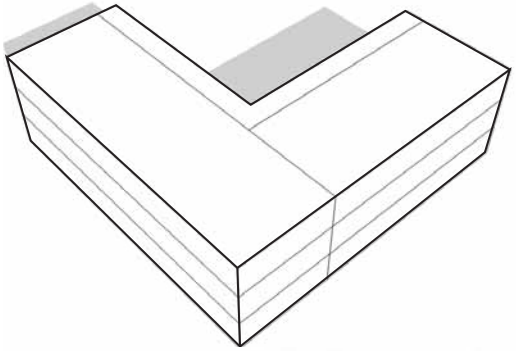
CENTRAL BLOCK LOTS

3 STOREY

APPLYING TYPOLOGIES-INNALOO



Courtyard



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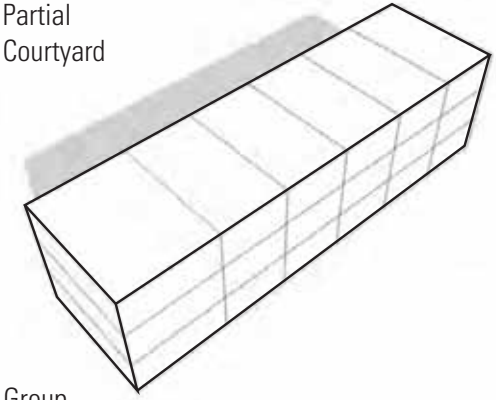
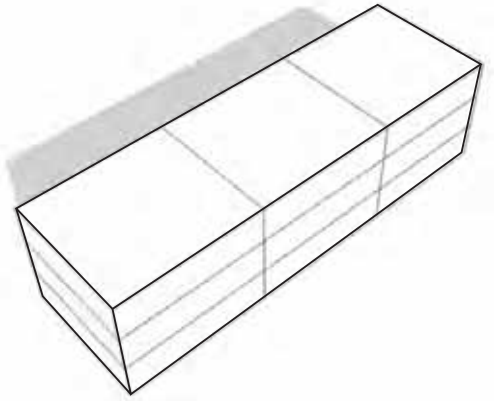
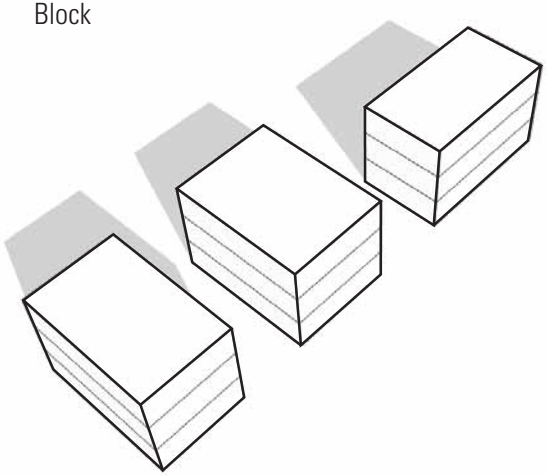


Group House



Central Block



Pavilion Cluster

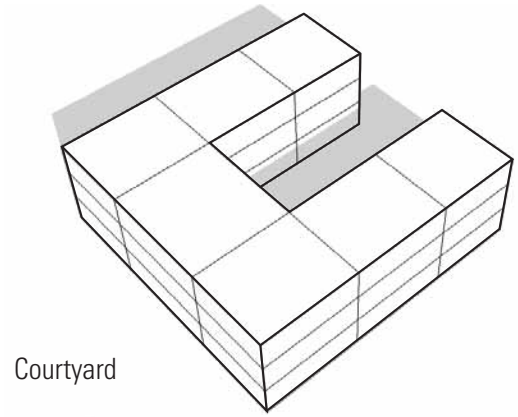
PERIMETER BLOCK LOTS

4 STOREY

APPLYING TYPOLOGIES-INNALOO

LA GRANGE DONGARA PARKLAND LOTS

4 STOREY
1.5 M REAR SETBACK



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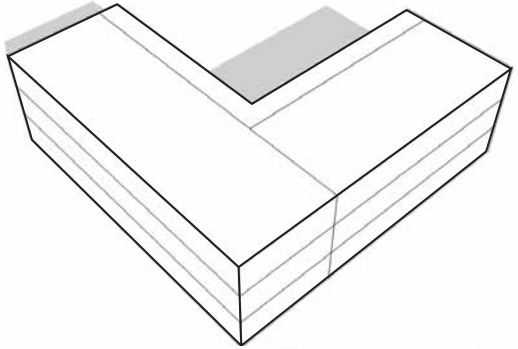
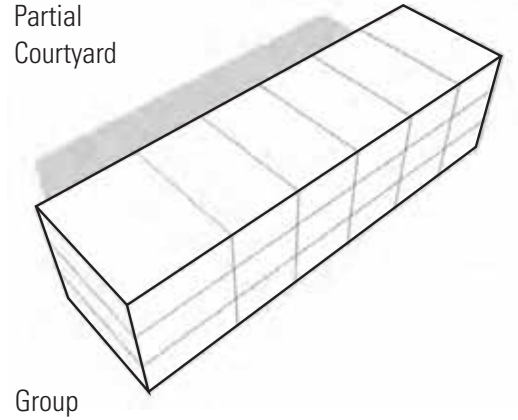
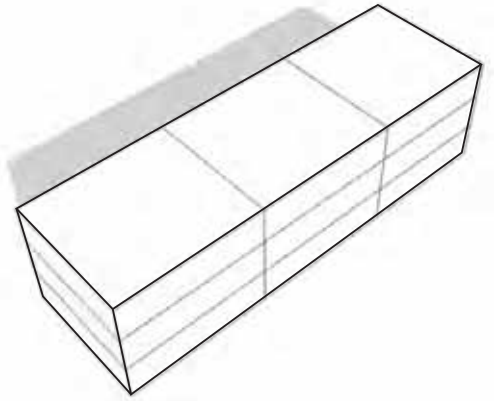


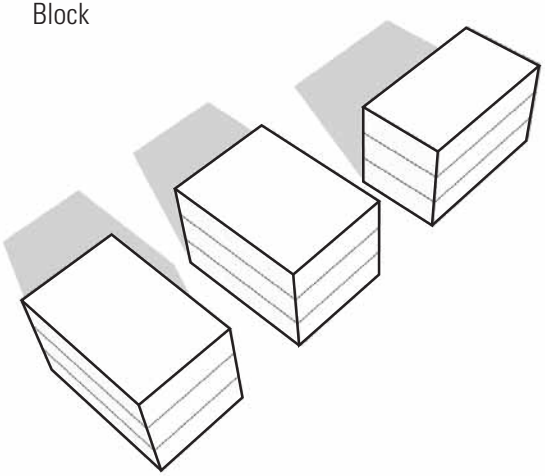
Partial
Courtyard



Group
House



Central
Block

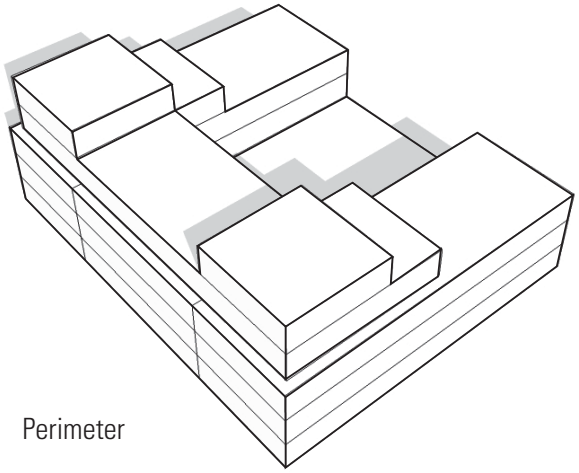


Pavilion
Cluster

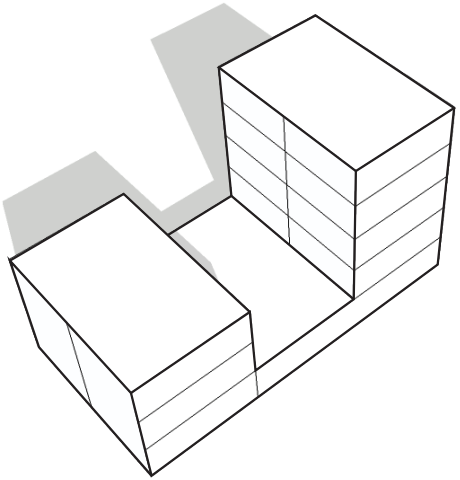
APPLYING TYPOLOGIES-INNALOO

OSWALD STREET LOTS

5 STOREY



Perimeter

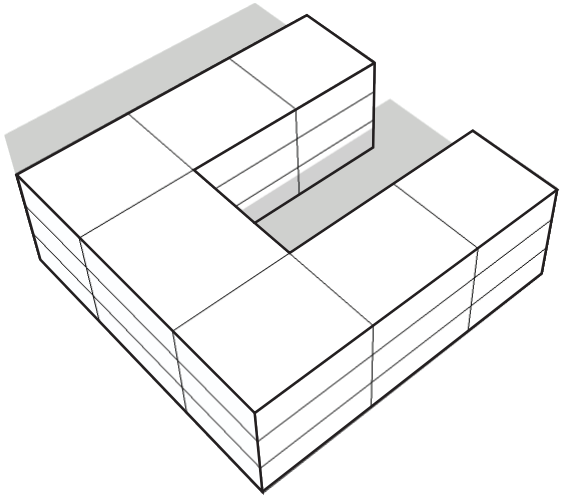


Double
Block

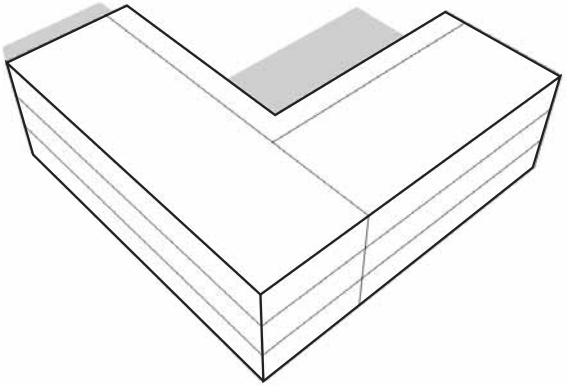
APPLYING TYPOLOGIES-INNALOO

GENEFF VILLAGE LOTS

4 STOREY



Courtyard



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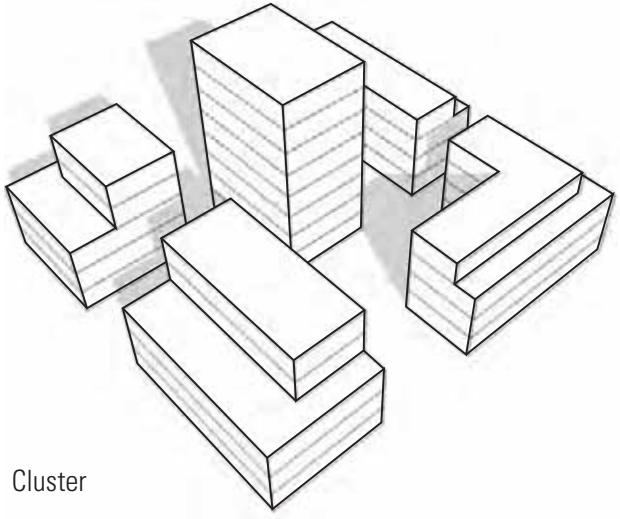
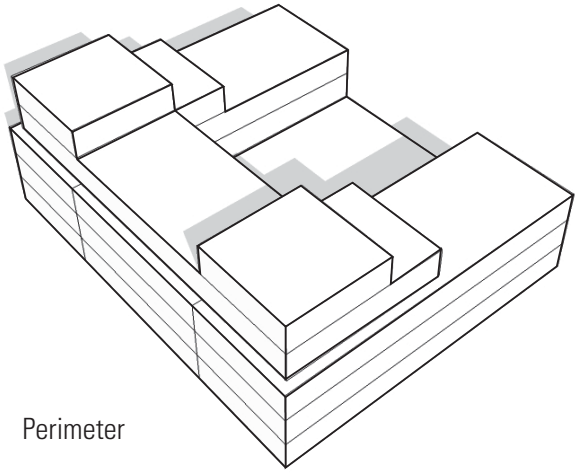


Cluster

APPLYING TYPOLOGIES-INNALOO

CLOATES STREET & ODIN ROAD MIXED USE

4 STOREY



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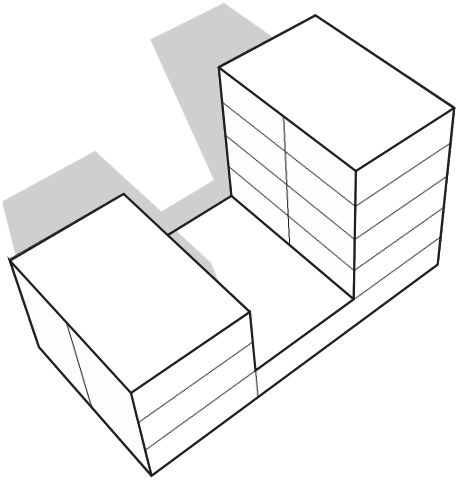
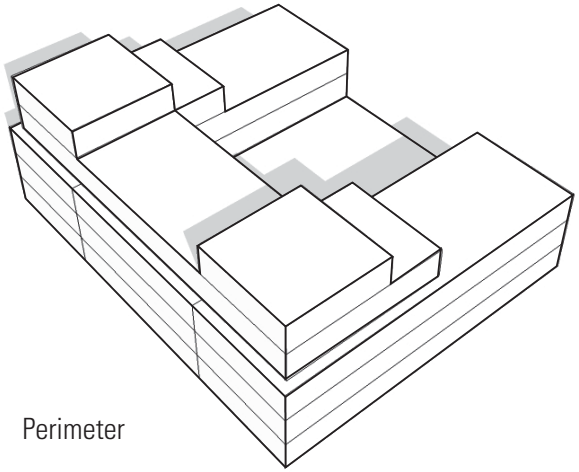


Double
Block

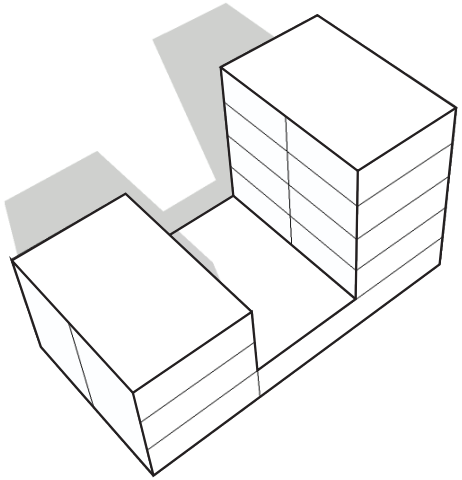
APPLYING TYPOLOGIES-INNALOO

ODIN ROAD MIXED USE

3 STOREY



Perimeter

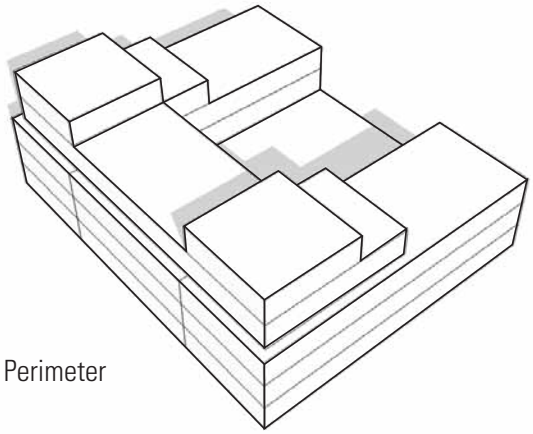


Double
Block

APPLYING TYPOLOGIES-INNALOO

CEDRIC STREET MIXED USE LOTS

6 STOREY



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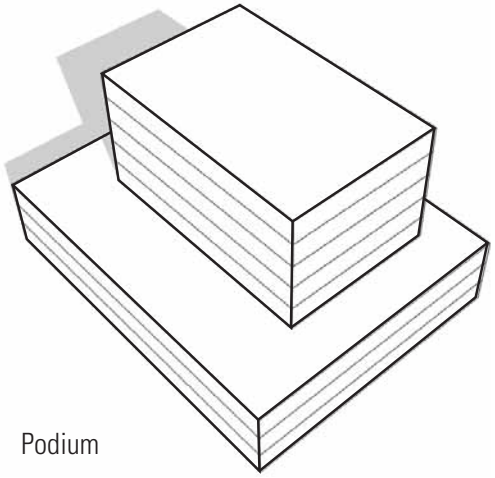
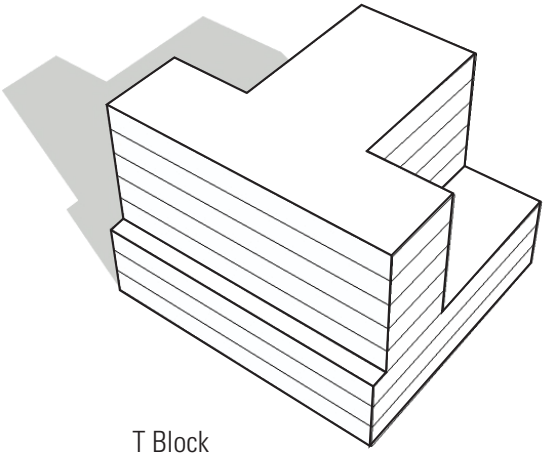


Podium

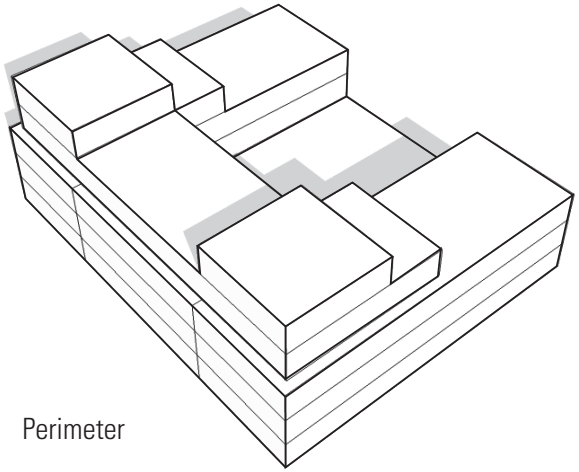


T Block

APPLYING TYPOLOGIES-SOUTHERN/STATION

OSWALD RESIDENTIAL

5 STOREY



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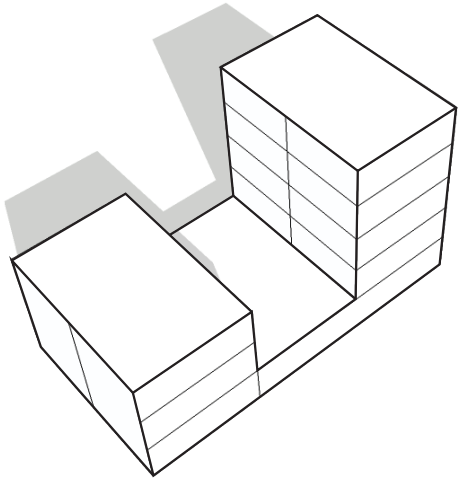
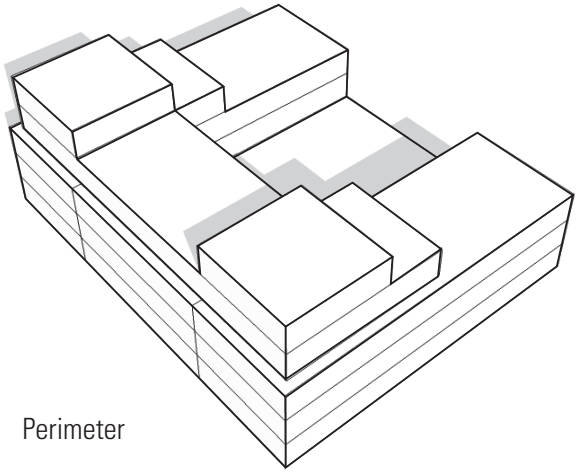


Double
Block

APPLYING TYPOLOGIES-SOUTHERN/STATION

TWYFORD/STAVELEY RESIDENTIAL

6 STOREY



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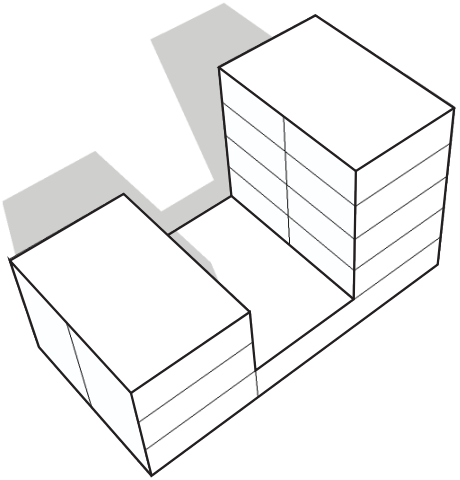
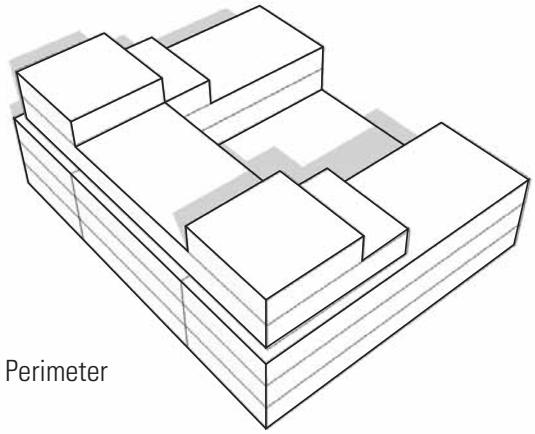


Double
Block

APPLYING TYPOLOGIES-SOUTHERN/STATION

TWYFORD/STAVELEY/ELLEN STIRLING BOULEVARD MIXED USE

6 STOREY



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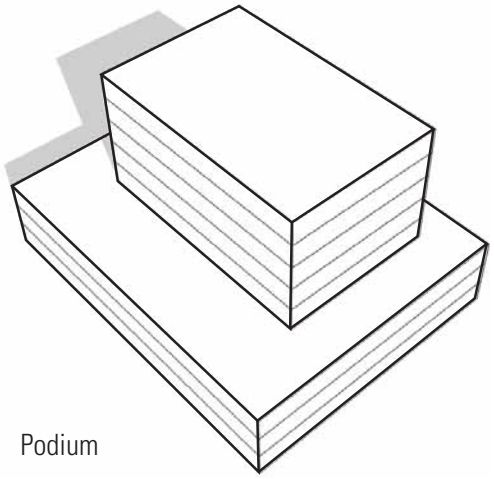
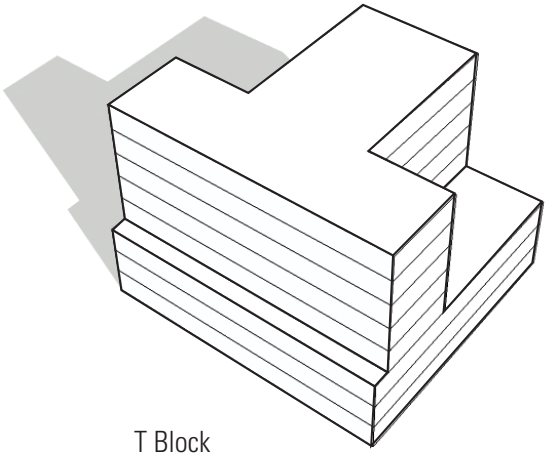


Podium



T Block

GLOSSARY

Amenity: The 'liveability' or quality of a place which makes it pleasant and agreeable to be in for individuals and the community. Amenity is important in both the public and private domain and includes the enjoyment of sunlight, views, privacy and quiet.

Building Form: The shape or configuration of a building as opposed to its colour or texture.

Cardinal Orientation: Oriented with the major axis running in line with the four major points of the compass; ie. North-South or East-West

Communal open Space: Space provided for dwellings located above ground level and which is shared with more than one dwelling and is not publicly accessible.

Cross-over: An access point from a public road, over a verge or footpath into private property.

Datum Line: A significant point or line in space established by the existing or desired context, such as the roof line of pre-existing buildings.

Deck: An external platform, usually elevated, located alongside and accesible from a building.

Double loaded corridor: Corridor with apartments off both sides, generally associated with single aspect apartments.

Dual aspect apartment: Apartments which have at least two major external walls facing in different directions.

Facade: External face of a building.

Habitable room: Any room or area used for normal domestic activities, including living, dining, family, lounge, bedrooms, study and kitchen.

Green Wall: A wall, either free-standing or part of a building, that is partially or completely covered with vegetation and, in some cases, soil or an inorganic growing medium.

Land Use: The purpose for which land and / or buildingsare used; or activities that are undertaken.

Mixed Use: Means buildings containing two or more unrelated land uses, e.g. residential and offices.

Non-Cardinal Orientation: An orientation in which the main axis is not running in line with with the four major points of the compass; ie not North-South or East-West.

Non-habitable room: Spaces of a specialised nature not occupied frequently or for extended periods, including bathrooms, toilets, pantries, walk-in wardrobes, corridors and lobbies.

On-grade Carparking: Parking that is on the ground level but not within or under the building.

POS: Public open space

Single aspect apartment: Apartments which have all the eternal walls facing the same way, providing occupants with views and light access from only one direction.

Undercroft Parking: Open on-grade parking located beneath the main building.

PHOTO CREDITS

All photos by CODA unless otherwise indicated below:

	Location	Source
7	1	2006 Peter Katz and Steve Price—Urban Advantage
16	1	National Climate Centre, Bureau of Meteorology, www.bom.gov.au
	2	National Climate Centre, Bureau of Meteorology, www.bom.gov.au
	3	National Climate Centre, Bureau of Meteorology, www.bom.gov.au
25	2	www.arcoeco.com
35	1	http://lakearchitects.com.au
	2	www.meloccomoore.com.au
40	2	maps.google.com.au
41	1	www.mprdg.com
	2	www.najman.com.au
47	1	www.stanisic.com.au
	2	www.arkhefield.com.au
	3	www.stanisic.com.au
53	1	www.batessmart.com.au
	3	http://ellenbergfraser.com
57	1	http://wealthruproperty.com/Blog/2009/12/verve-erskineville-a-quality-development-in-a-strategic-location/
	2	www.candelpas.com.au
	3	www.hillthalis.com.au
61	1	
62	1	http://www.sunmaxxsolar.com/sunmaxx-installs-solar-thermal-at-delta-house-brooklyn.php
	2	www.zedfactory.com
	3	
	4	
63	1	
64	1	http://www.jvr.ee/
	2	http://cozyhome.com.au/Australian-Double-Glazing
	3	http://www.roldanberengue.com/

All photos by CODA unless otherwise indicated below:

	Location	Source
65	1	www.arkhefield.com.au
	2	www.arkhefield.com.au
	3	http://www.unitisedbuilding.com.au
	4	http://www.greensharecar.com.au
66	1	
	2	http://www.architectsajc.com
	5	
67	1	
	2	http://www.squareoneliving.com/
	4	www.mprdg.com
	6	
	7	
68	1	http://www.foxjohnston.com.au
	2	http://www.foxjohnston.com.au
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	5	
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	7	
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69	1	http://www.squareoneliving.com/
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	3	www.candelpas.com.au
	4	http://fkaustralia.com/
	5	
71	4	maps.google.com.au
	5	http://www.chc.com.au/
72	1	

PHOTO CREDITS

All photos by CODA unless otherwise indicated below:

	Location	Source
72	2	
	3	
	4	http://www.hillthalis.com.au
	5	http://www.hillthalis.com.au
	6	http://www.urbanschool.org/
	7	
73	2	http://www.loharchitects.com/
	3	http://www.loharchitects.com/
74	1	http://webarchive.nationalarchives.gov.uk/20110118095356/http:/www.cabe.org.uk/case-studies/old-market-square?photos=true&viewing=6703
	2	http://www.flickr.com/photos/jmtimages/2121578576/
	3	
	4	http://www.preservenet.com/freeways/FreewaysCheonggye.html
	5	http://www.boisedailyphoto.com/2008/08/grove-fountain.html
	6	http://makkamappa.com/maps/905
75	1	http://www.flickr.com/photos/wattsbw2004/3975747507/
	2	http://www.perthculturalcentre.com.au/
	3	
	4	http://www.flickr.com/photos/auxo/6288211626/
76	2	http://www.taylorsouth.com.au/
	3	http://aussiewatt.blogspot.com.au/2007/12/jacaranda-festival-applecross.html
77	1	www.arkhefield.com.au
	2	http://designyoutrust.com/2010/10/landlines-urban-art/
81	1	http://www.meloccomoore.com.au
	2	http://www.meloccomoore.com.au
82	3	www.mprdg.com
	5	http://www.aleksandarsavikin.rs/
84	2	http://www.atelioerdupont.com/

All photos by CODA unless otherwise indicated below:

	Location	Source
85	1	http://www.arthitectural.com/camenzind-evolution-seewurfel/seewyt-514/
86	1	http://sixdegrees.com.au/
87	2	http://www.vandeneeckhoudtcreyf.be/
88	1	www.arkhefield.com.au
	2	www.hillthalis.com.au
	3	www.mprdg.com
89	1	www.arkhefield.com.au
	2	www.stanisic.com.au
	4	www.hillthalis.com.au
90	1	www.stanisic.com.au
91	1	http://www.woodsbagot.com
	2	www.arkhefield.com.au
92	1	http://www.chc.com.au/
	2	http://www.chc.com.au/
	3	http://www.chc.com.au/
	4	http://www.boddamwhetham.com
93	1	http://www.chc.com.au/
	2	http://www.chc.com.au/
94	2	http://www.flickr.com/photos/jmtimages/2121578576/
	3	http://www.flickr.com/photos/auxo/6288211626/
	4	http://elenbergfraser.com/
	6	http://www.dickvangameren.nl/
96	1	
	2	
	3	http://www.flickr.com/photos/roryrory/2799210178/
97	1	
	2	
	3	www.arkhefield.com.au

PHOTO CREDITS

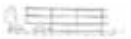
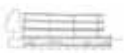
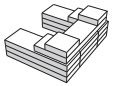
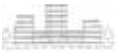
All photos by CODA unless otherwise indicated below:

	3Location	Source
97	4	http://www.flickr.com/photos/ngocminh_le/2516061172/
102	1	www.mprdg.com
	2	http://www.blp.com.au/projects.php
	3	www.mprdg.com
103	1	http://www.meloccomoore.com.au
	2	
	3	www.nearmap.com
104	1	http://www.loharchitects.com/
105	1	www.hillthalis.com.au
	2	
106	1	
	2	
	3	http://www.loharchitects.com/
107	1	www.mprdg.com
	2	
	3	

All photos by CODA unless otherwise indicated below:

3Location	Source

CITY OF STIRLING URBAN TYPOLOGY MATRIX

	TYPE	MIN LOT SIZE	OPTIMUM LOT ORIENTATION	CARPARK OPTION	USE	LOCATION DETAIL (x)=max storey	PRECINCT	CHARACTER ZONE	MASSING MODEL	BUILDING FOOTPRINT	SECTION: ON-GRADE	SECTION: BASEMENT	SECTION: UMB/DECK PARKING
1	3 storey GROUP HOUSE	500 m^2-1500m^2	E-W	UNDER MAIN BUILDING SEMI-BASEMENT	RES	Tip site – edge Sth hospital All Innaloo Woodlands – edge Cinema edge	STATION NORTHERN INNALOO WOODLANDS	RESIDENTIAL GARDENS					
2	3 storey PAVILION CLUSTER	700 m^2	DESIGN SPECIFIC	UNDER MAIN BUILDING ON GRADE REAR SEMI-BASEMENT	RES	Tip site – edge Sth hospital All innaloo Woodlands - edge	STATION NORTHERN INNALOO WOODLANDS	RESIDENTIAL GARDENS					
3	3-4 storey CENTRAL BLOCK	800 m^2	E-W	UNDER MAIN BUILDING ON GRADE REAR SEMI-BASEMENT	RES	Around La Dongara (4) All innaloo (3) Sth hospital(3) Liege st (3) Woodlands–edge(3)	INNALOO NORTHERN WOODLANDS	RESIDENTIAL GARDENS					
4	3-5 storey DOUBLE BLOCK	800 m^2	N-S	UNDER MAIN BUILDING ON GRADE REAR SEMI-BASEMENT	RES MIX	Oswald,Twyford Stavely. Betw Step + Ellen stirling mid-blk. Cinema edge	STATION SOUTHERN WOODLANDS	RESIDENTIAL GARDENS MIXED-USE LIFESTYLE					
5	3-4 storey COURTYARD	1600 m^2	E-W	UNDER MAIN BUILDING ON GRADE REAR SEMI-BASEMENT	RES	Liege. Cinema edge. Woodlands–edge Innaloo (3) Parkland Villas	WOODLANDS INNALOO	RESIDENTIAL GARDENS					
6	3-4 storey PARTIAL COURTYARD	700 m^2	ANY	UNDER MAIN BUILDING ON GRADE REAR SEMI-BASEMENT	RES	Around La Dongara (4) All innaloo (3) Sth hospital(3) Woodlands–edge(3) Liege st (3) Parkland Villas	INNALOO NORTHERN WOODLANDS	RESIDENTIAL GARDENS					
7	3-5 storey PERIMETER	1600 m^2	E-W	UNDER MAIN BUILDING ON GRADE REAR SEMI-BASEMENT DECK	MIX RES	Oswald/Twy/Stav Tip site , Cedric Ellen stirling Stephenson Cin nth(4) Parkland Sch Bch King Edw	STATION SOUTHERN WOODLANDS OSBORNE PARK	RESIDENTIAL COMMUNAL MIXED-USE LIFESTYLE CITY CENTRE CIVIC IDENTITY					
8	5-8 storey T BLOCK	1200 m^2	-	BASEMENT DECK	MIX RES	Stephenson Sch Bch (5) Cedric (5) Oswd/Twy/Stav(5) King Edw (5) Cinema –inner (7)	SOUTHERN STATION OSBORNE PARK WOODLAND	RESIDENTIAL COMMUNAL MIXED-USE LIFESTYLE CITY CENTRE HEART CIVIC IDENTITY					
9	5-8 storey PODIUM	2000 m^2	-	BASEMENT SEMI-BASEMENT DECK	MIX RES	Tip site Station area Sand patch Stephenson Sch Bch (5) Cnr(7) King Edw (5)	SOUTHERN STATION OSBORNE PARK WOODLAND	RESIDENTIAL COMMUNAL MIXED-USE LIFESTYLE CITY CENTRE HEART CIVIC IDENTITY					
10	4-8 storey CLUSTER	4000 m^2	DESIGN SPECIFIC	BASEMENT SEMI-BASEMENT DECK	RES	Tip site – inner Cinema – inner (7) Parkland villa (5) Inner area	STATION WOODLANDS OSBORNE PARK	RESIDENTIAL COMMUNAL					
11	8-15 storey PODIUM/TOWER	2000 m^2	-	BASEMENT DECK	MIX RES	Station area Sand patch	STATION	CITY CENTRE HEART					
12	3-4 storey LINER BUILDING	500 m^2	N-S	ON GRADE REAR OFF SITE	COMM	Ellen Stirling Boulevard Scarborough Beach Road Sand Patch(IKEA)	STATION SOUTHERN	CITY CENTRE HEART