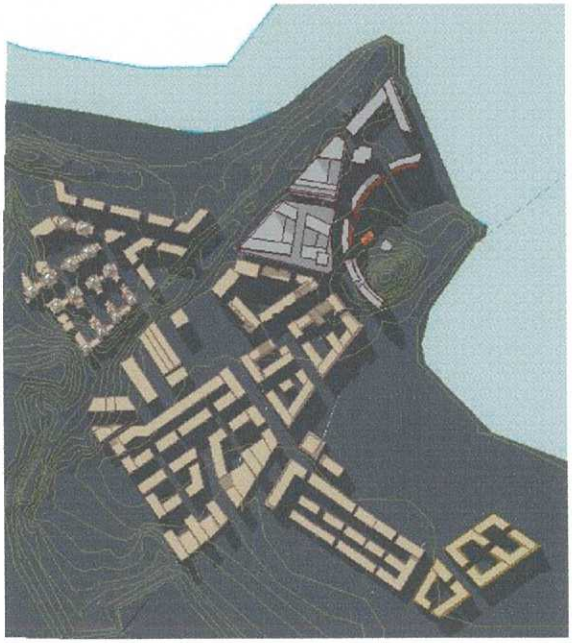
|urban|design|ADVISORY SERVICE

Urban Form & Densities
Wolli Creek Redevelopment Area



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Urban Design Advisory Service

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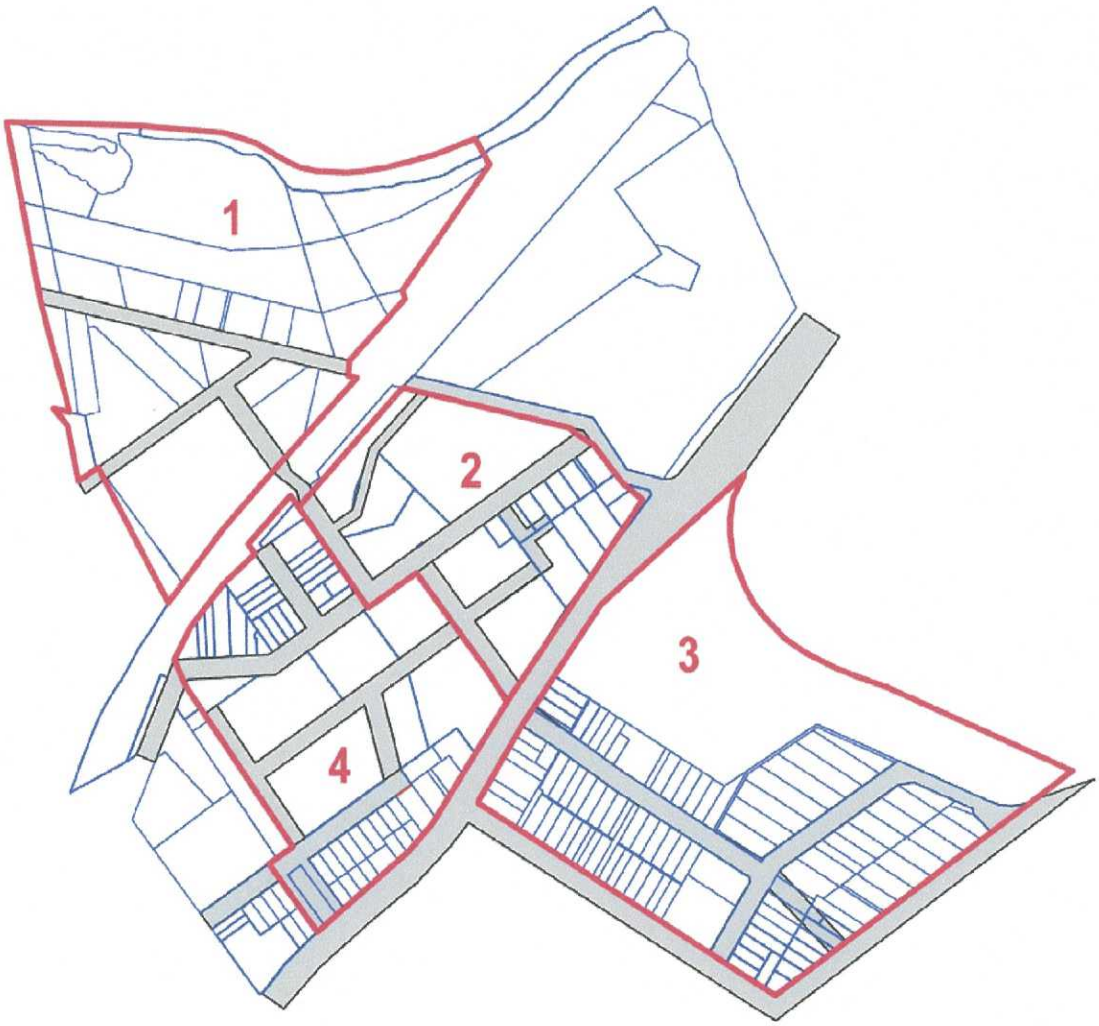
Contents

1 Introduction

1.1 BACKGROUND

UDAS has been commissioned by Rockdale City Council to determine building envelopes for 4 precincts in Wolli Creek which can deliver optimum outcomes for built form, and which will provide information to Council for establishing FSR controls for the precincts. This information will inform the draft LEP and DCP for the subject area.

It is not the purpose of this study to maximise development density but to optimise it, guided by sound urban design principles and strategies.



1.2 REVIEW OF EXISTING DOCUMENTS

The following documents were reviewed:

- Draft Rockdale Local Environmental Plan 2000 Amendment no. 13 – Wolli Creek
- Draft Wolli Creek Development Control Plan no. 62, 2001
- North Arncliffe Masterplan, dem gillespies May 2001
- North Arncliffe Streetscape masterplan, Cloustons November 2001

Additional information supplied by Rockdale Council necessary to the design resolution and recommendations comprised:

- Cadastral base
- Plan showing minimum habitable floor levels at 12 locations and for sites fronting Arncliffe and Lusty Streets
- Contour information (hard copy and digital; discrepancies noted and discussed with Council)
- Plans of approved developments

This study recommends a number of changes to the draft LEP and DCP, and also differs from the Streetscape masterplan. These proposed changes are covered in detail in Part 2, Urban Structure. In summary they are:

	Other documents	**This document**
FSR	LEP: generally maximum of 3:1 Masterplan: commercial 3:1, residential 2:1	• Maximum of 2.85:1 in precincts 2 & 4 with one development site-specific control of 3:1 • Maximum of 2.2:1 in precinct 3 with four site-specific controls of 2.85:1
Upper level setbacks	• DCP and streetscape masterplan: height of buildings on Arncliffe Street maximum 3 storeys at street edge with setback to higher storeys • DCP recommends 'nil setback' on active street frontages	• All levels above bottom storey to follow build-to line at the street edge • Define as 'build to' line
Café zone front & upper level setbacks	Streetscape masterplan: 5 metres front setback for bottom 2 storeys with upper levels setback of 2 metres.	Ground floor active frontages set back 5 metres & nominated corner buildings set back 3 metres; setback to articulation zone for upper levels 3 metres (= build-to line for residential balconies). *Note: this applies to the straight section of Arncliffe Street only*
Heights	LEP, DCP: heights defined by AHD	Heights defined by no. of storeys
Landmark buildings	DCP: 19 landmark buildings up to 51AHD and the remainder up to 23.5 AHD	A range of building heights, generally between 5 & 8 storeys, with a limited number of sites where 9-10 storeys is achievable

Views & vistas	DCP: generally close vistas with landmark buildings	Seldom close vistas: retain through-views to help 'read' the topography
Corners	DCP: "Corners may be higher than the general height of buildings in the street. Buildings on corner sites should be erected on street boundaries and should allow for splays at intersections"	Corners are not equally important: not all to be higher or built to boundary.

1.3 VISION FOR WOLLI CREEK

The draft DCP identifies Wolli Creek as a future urban activity 'hub' with a sustainable mixture of uses. To support increased residential, commercial and retail density Wolli Creek will offer increased amenity, with "distinctive and high quality urban spaces," and high quality development. The area will be attractive to and used by residents, workers and visitors.

Precinct 1 is envisaged as predominantly residential. Its unique characteristic is the Wolli Creek wetland area and the potential for views through to the Cooks River. Precinct 1 will contain a new linear 'park' connecting the wetland area to Bonar Street.

Precinct 2 will be a "high quality urban mixed use precinct" whose combination of elements – proximity to the railway station and Interciti, the Arncliffe Street major spine, and a new park – will make it the focus of the area. The aim for this precinct is that it will be intensively used much of the time.

Precinct 3 will be a mixed use area which is intended to respect and integrate with the existing residential context; this means it will be in part a transitional precinct. The aim is for new development on Innesdale Road to be residential, home offices or small-scale professional offices. The precinct edges on the Princes Highway and Marsh Road are highly visible, and commercial or hotel uses would be appropriate in these locations.

Precinct 4 will be limited to employment uses. This precinct is intended to continue to support existing uses, and over time to become the focus for alternative employment opportunities. The SWSOOS is a highly significant heritage item and important defining feature of Wolli Creek which will be enhanced by developing it as a pedestrian link.

2 Urban structure

2.1 ANALYSIS: CONSTRAINTS & OPPORTUNITIES

2.1.1 Flood affectation

Flooding constraints are the major determinant of the public domain interface. The requirement for a second, higher-level footpath to access new development at habitable floor level puts significant pressure both on the potential development yield of sites and on the amenity and intensity of use of the pedestrian network. The urban strategy which deals with this issue is not a 'catch-all' guide for the whole Wolli Creek area but is targeted to the topography, relationship to street hierarchy and intended use the buildings in each development site. Thus controls and guidelines will deliver different urban form for different parts of each precinct.

2.1.2 SWSOOS

The SWSOOS is a significant heritage item which also marks the boundary between the proposed employment precinct and a residential area. Buildings step down in height to the SWSOOS so as not to dominate it visually.

2.1.3 Princes Highway

The Princes Highway offers the opportunity for high-visibility for employment and commercial uses. At the same time there is considerable noise generated by very high traffic usage throughout the day and, in addition, by heavy vehicles causing vibration as well as noise at night). Opportunities are to set buildings back on a podium or range them so that their shorter dimension rather than their whole length fronts onto the Highway. Car showroom uses are likely to remain at least in the medium term.

2.1.3 Railway line

The railway line is also a noise generator. Buildings which are adjacent to the line, where there is no overshadowing of other development, may be up to 10 storeys. Buildings should be oriented so that their shorter dimension rather than their whole length fronts onto the railway. This is particularly important for residential uses where occupants should be able to use outdoor private space (eg. balconies and terraces) and where buildings are designed for natural ventilation.

2.1.4 Street pattern – block size

The street layout proposed for Wolli Creek significantly increases the connectivity and legibility of the area and increases the opportunity for development which benefits from good street frontage and at the same time improves the activity and safety of the public domain.

The block depth between Wolli Creek Street and the proposed Bonnie Doon Channel is narrow, when the required extra footpath and café zone on Arncliffe Street is taken into account. Buildings on these blocks will need to demonstrate that there is adequate open space separation for privacy and solar access.

2.2 URBAN STRATEGY FOR BUILDING ENVELOPES

Urban design principles used in the preparation of recommended building envelopes are:

- Respond to the undulating topography of the area in terms of building height, building type, setbacks, and building massing
- Retain views and vistas of significant natural and built elements (eg. hills, water, open space & landscape, the horizon, the SWSOOS)
- Manage the transition between high density development and surrounding lower scale residential uses by reducing building height
- Allow higher buildings along the railway line where they will not overshadow others and at key landmark sites
- Build to the street alignment to promote activity, casual overlooking and to spatially define the edges of the public realm
- Orient buildings 'end on' rather than aligned with noise-generating areas where possible (Railway line, Princes Highway) to minimise noise impact
- Maximise solar access to all buildings as well as for the open space zones.
- Minimise building depths and maximise consolidated open space areas
- Allow deep soil zones within blocks for mature trees
- Maximise the potential for apartments to overlook communal open space
- Break up building bulk along the Bonnie Doon Channel with significant landscaped areas to integrate with the streetscape proposed in the Streetscape Masterplan

2.2.1 Heights

Controls resulting in buildings with a uniform AHD and a proliferation of towers twice the height of the lower buildings would make it difficult to 'read' the topography. This approach is *not* recommended.

In Wolli Creek, consideration of the variety of uses, the different size and shape of blocks, the location of development sites in relation to roads, rail and landscape, variations in road width and the need to consider building orientation and user amenity, has resulted in different development footprints and different building heights.

In general a 6 storey building height is appropriate to define but not dominate public open space. Higher buildings are proposed for different reasons: as orientation points, markers, and to enrich the street silhouette at key corners and changing alignments of streets.

Heights of buildings within development sites are set out more fully in Part 3 Built Form. In general, the guidelines for the whole precinct are:

- Building height is defined in storeys (to encourage generous floor to ceiling heights)
- Heights range from 4-10 storeys with most buildings in the 6 storey height range, to promote an urban scale which works for the pedestrian as well as the person in the building.
- Landmark sites are at the intersections of Princes Highway and: Gertrude Street; the new entry road; and the SWSOOS. A landmark tower at the northern end of the SWSOOS both identifies this significant item and crowns the high point of Arncliffe Street
- Buildings along the railway line may be up to 10 storeys so long as they satisfy other design criteria
- Buildings which make a transition from higher-density development within the precinct to existing low-scale residential areas are lower in height.
- Buildings adjacent to heritage items are lower in height.

- The maximum height for showroom buildings which have large footprints is 10 metres, to accommodate 2 generous internal floors.

2.2.2 Floor to ceiling heights

The height of internal spaces relates to three things:

- Solar access. Higher ceilings allow more daylight penetration. This is particularly important on lower floors where neighbouring buildings may overshadow window openings
- Building adaptability. Buildings which have minimum 3 metre floor to floor heights can be adapted to carry services / ducting which allows them to be used for either residential or commercial uses
- Good proportions. Rooms with higher ceilings contribute to a sense that they are more generously proportioned and spacious, thus increasing residents' and occupants' enjoyment of their environment

In addition, there are particular demands on new development fronting Arncliffe Street, where the design of the interface between buildings and public open space is crucial. This report makes a strong recommendation for enforcing a very generous floor to floor height at the access level, in order to ensure that under-awning space will be well proportioned. This also serves the purpose of accommodating large service ducts necessary for restaurant and café uses.

Arncliffe Street:

- For the **ground floor** of all buildings fronting the café zone, provide a minimum floor to ceiling height of 3.6 metres

Mixed use precincts:

- For all buildings, irrespective of their intended use, provide a minimum floor to ceiling height of 3.3 metres for the ground and first floors.
- Provide a minimum floor to ceiling height of 2.7 metres for habitable rooms in all floors above the first two floors

Residential precinct:

- For residential buildings, provide a minimum floor to ceiling height of 3.3 metres for habitable rooms on the ground floor
- Provide a minimum floor to ceiling height of 3 metres in all floors above the ground floor

Employment precinct:

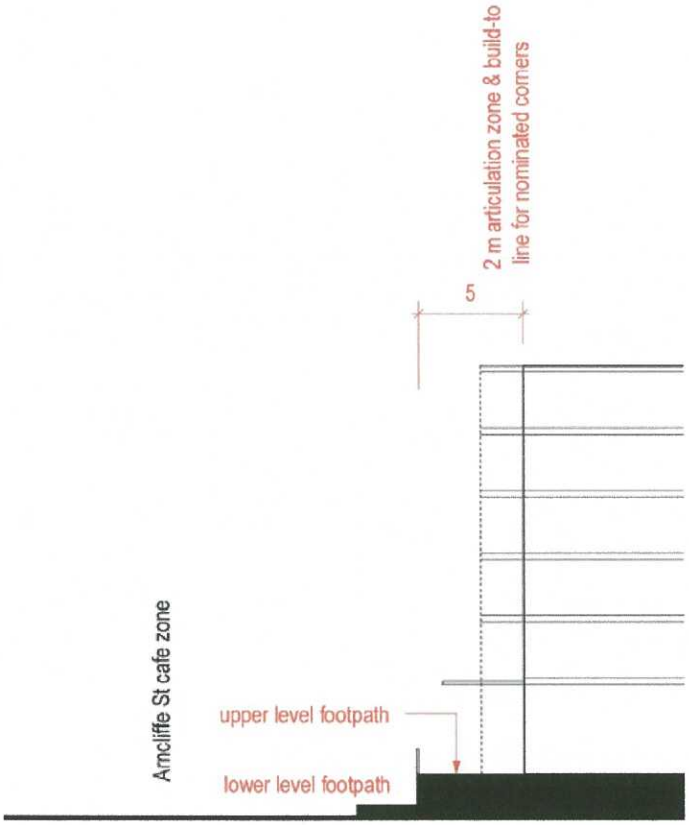
- For commercial buildings, provide a minimum floor to ceiling height of 3.6 metres for all floors

2.2.3 Streets and setbacks

All streets in flood-constrained areas will require a higher-level walkway to be constructed within development sites.

- This is effected by establishing a minimum 3 metre setback, which is also a build-to line, for all streets except for Lusty Street and Arncliffe Street.
- Lusty Street has a 5 metre setback on the south to relate to the approved Meriton development and to ensure sun access to lower levels of residential buildings. UDAS recommends a 5 metre setback for the northern side of the street with an upper level setback over 2 storeys of a minimum additional 2 metres (ie. a 7 metre setback for upper floors).

- Arncliffe Street, as a designated café zone, will provide a walkway / promenade area sufficiently wide to allow pedestrian access and outdoor dining. It has a widened setback / build-to line of 5 metres at [raised] ground level, with an upper level setback of an additional 3 metres to the edge of the [2m] articulation zone. Corner buildings are to be built to the 3 metre setback to frame the walkways, orient the pedestrian and reduce the apparent width of the footpath (important when outdoor commercial spaces are not in use).



NOTE: the upper level footpath, currently expressed as part of a building setback, is within private space.

- *The benefit of this is that basement and sub-basement car parking can be located under this footpath, which is efficient.*
- *The disadvantage is that the upper footpath is not properly in the public domain – even though it will 'read' as if it is – which may give rise to confusion about access, designing, paying for and maintaining the café zone.*
- *FSRs for the building envelopes have been calculated on the basis of existing development sites.*

- The western portion of Arncliffe Street, where the road angles, has a 3 metre setback (landmark tower excepted)
- Princes Highway will have a range of uses. All uses at ground and first floor level have a minimum 3 metre setback. This is a build-to line north of the new entry road.
- Upper level setbacks above the first floor of an additional 3 metres are required to residential uses on the Princes Highway
- The 4th (top) storey of residential buildings on Innesdale Road is to be set back by a minimum of 2 metres to give the appearance of 'stepping down' to the existing residential scale.
- The highest storey of buildings over 6 storeys should step in to give a 'top' to the development.

2.2.4 Building types

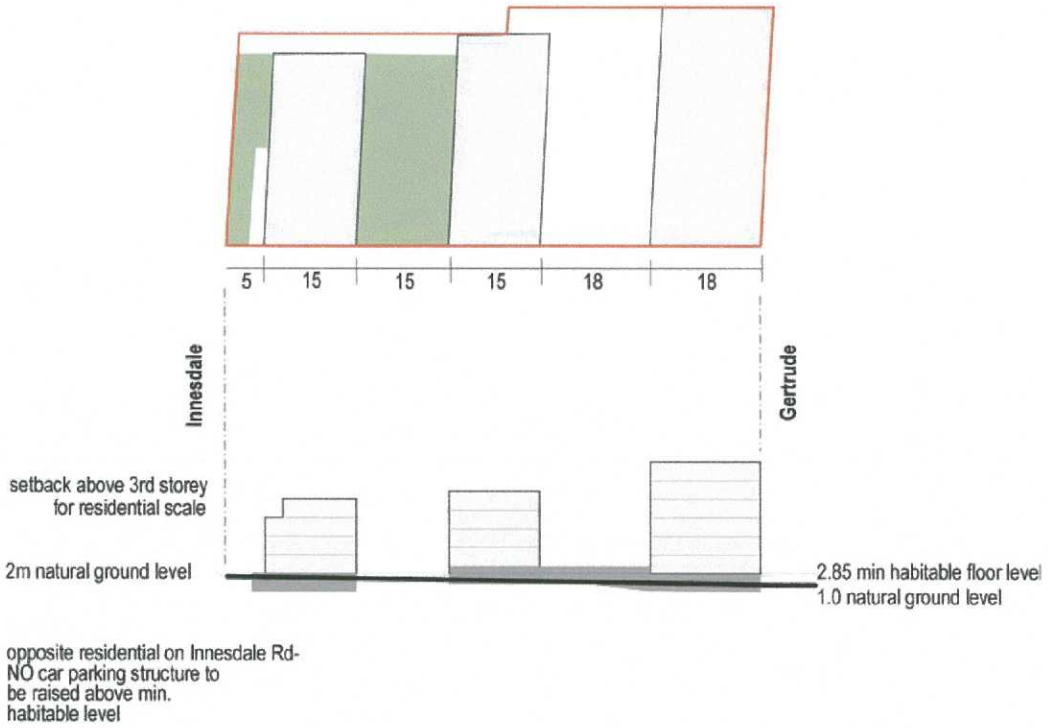
Rockdale Council is keen to promote a vibrant new town centre for Wolli Creek. This means enforcing a 60:40 mix of residential:commercial uses in Precinct 2 and Precinct 3, supported by employment uses in Precinct 4 and predominantly residential uses in Precinct 1.

- Mixed use precincts are encouraged to be developed with long life, loose fit buildings: footprints which can comfortably accommodate commercial uses at ground and first floor level and residential apartments above. Both commercial and residential development will benefit from the application of best-practice sustainability measures: slender building depth for maximum natural light penetration and through-ventilation, with building separation adequate to provide useable open space in the centre of blocks as well as visual and acoustic privacy.
- In general maximum commercial building depth is 18 metres and maximum residential building depth is 12 metres.
- Showroom uses in large footprint buildings are permitted along the Princes Highway in Precinct 4
- Commercial buildings may be integrated with showroom uses, above the showroom podium.
- In the employment zone only, where narrow blocks make it difficult to have two buildings with a street frontage, an atrium building whose atrium is minimum 10m wide is recommended
- Landmark towers are limited in width and depth to minimise visual bulk. Refer to controls for specific development sites.

2.2.5 Open space and deep soil zones

Spaces where people feel safe, and where interaction and a range of activity can occur, are encouraged. This is achieved by buildings forming the edges of streets and spaces, to provide a sense of containment and visual connection between the public areas and the development. Spaces between buildings are vital for access to winter sun and to create a sense of openness towards the sky.

- Minimum building separation 12 metres
- Recommended minimum building separation for buildings over 4 storeys: distance apart = height of building (for proportion and scale of open space as well as amenity)
- For all development sites with the exception of site 19, minimum deep soil zone of 15% of total site area.
- Continuous street fronting buildings are recommended on Arncliffe Street. On other streets, as shown in the block plans, views through blocks and into internal courtyards are encouraged.

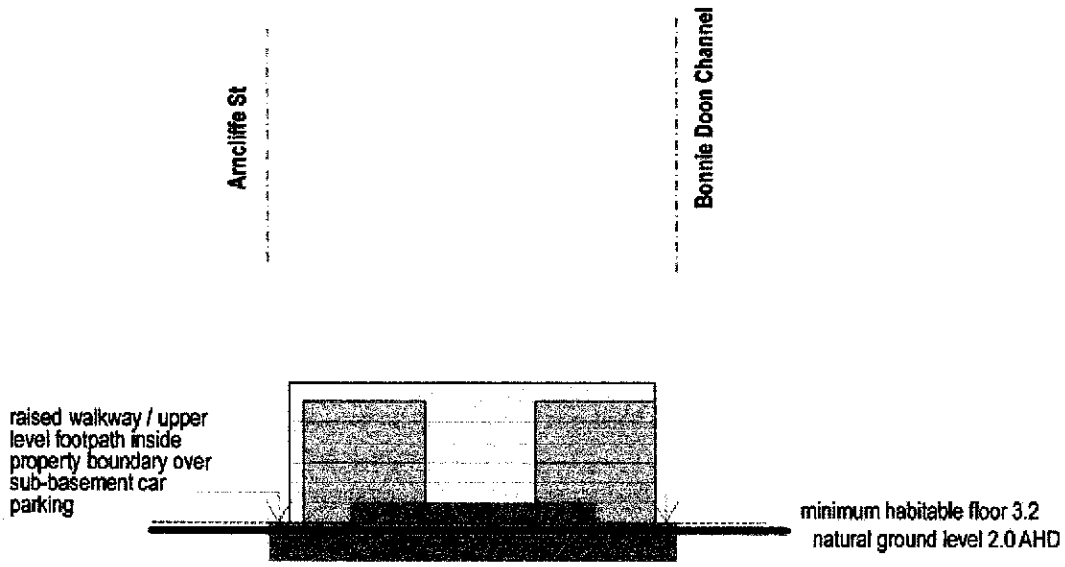


2.2.6 Car parking

The distance between natural ground level and habitable floor level throughout much of Wolli Creek provides an opportunity to use sub basement car parking levels to manage the change in level. Car parking numbers and layouts have been tested on typical sites (Gertrude / Innedsale and Arncliffe / Bonnie Doon). UDAS strongly recommends the retention of deep soil areas for mature tree planting and stormwater efficiency.

In general the following principles should guide the design of car parking:

- Generally locate car parking within the building footprints.
- Basement and sub basement levels may take up part of the central area of the development site SO LONG AS
- There is a minimum 15% deep soil zone retained.
- One level of basement parking and one of sub basement parking is generally adequate to service the buildings. An internal podium of maximum one level may be possible within employment and mixed use zones SO LONG AS
- Active uses are 'wrapped around' the outside, fronting the street.



2.3 3D BUILT FORM

The vision for Wolli Creek has been translated into a measured and tested model of the urban structure and proposed building envelopes. Approved developments for Interciti, Meriton and Multiplex sites are included. See bird's eye perspective drawings overleaf.

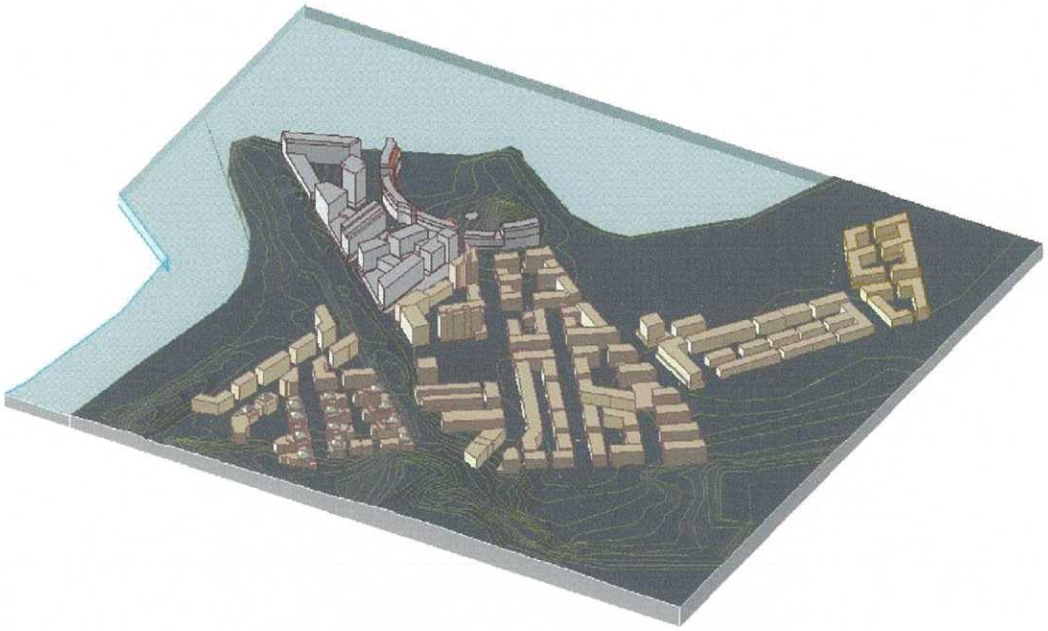
2.4 FLOOR SPACE RATIO (FSR)

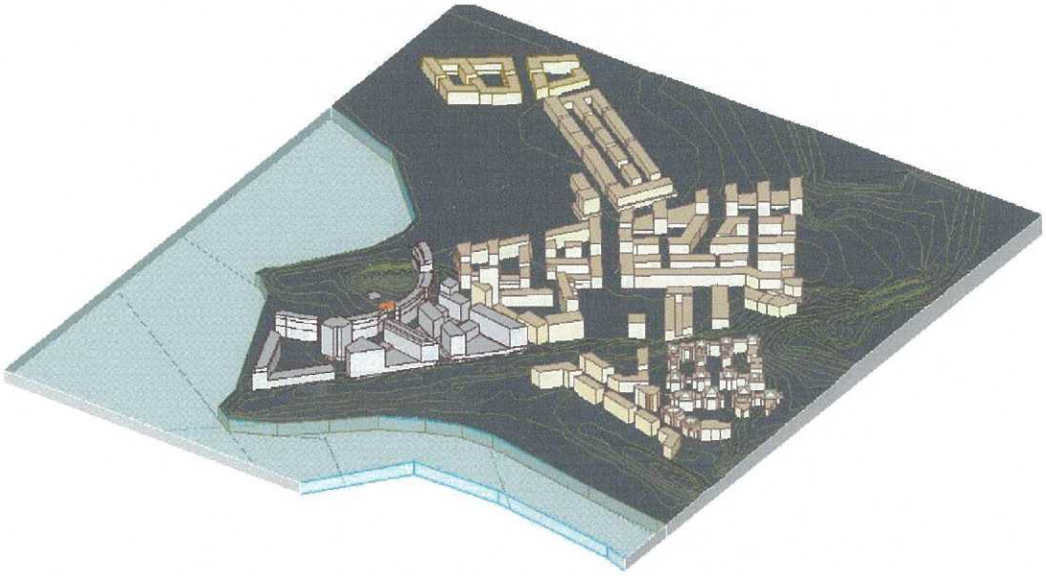
Floor space ratio is not the key determinant of urban form. Recommended FSRs for the Wolli Creek redevelopment area are based on testing of building yields for different building uses on different development sites.

- Precinct 1 2:1
- Precinct 2 2.85:1
- Precinct 3 2.2:1
- Precinct 4 2.85:1

Exceptions are:

Within Precinct 3, development sites 8 and 9 fronting the Princes Highway & sites 15 & 16 fronting Marsh Road	2.85:1
Within Precinct 4, development site 22 fronting Arncliffe, Bonnie Doon & new street	3:1



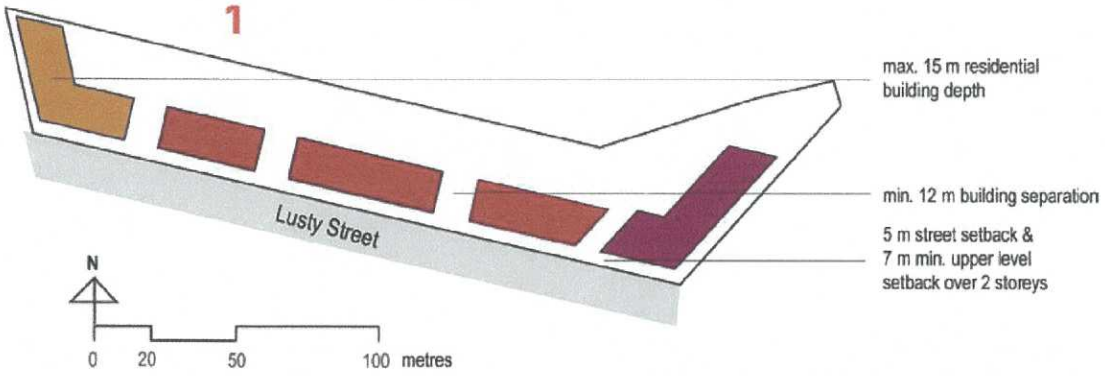


3 Built form

The building envelopes in this section are based on the urban design analysis and strategy and are intended to deliver a design solution consistent with sound urban design principles and the aims and objectives of Council. UDAS recommends *as a minimum* that height, setback, building depth in mixed use zones and deep soil zone ratio should be seen as controls rather than guidelines.

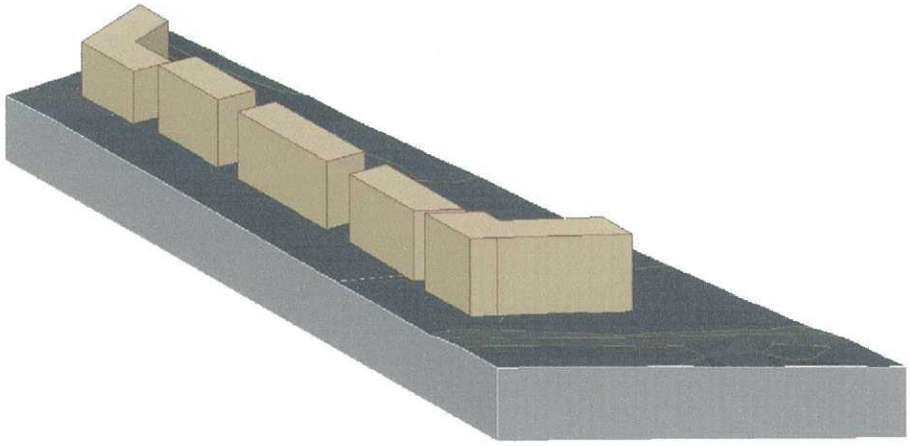
The map below shows the relationship between development precincts, development sites and building envelopes. Numbers in red refer to development sites within blocks.

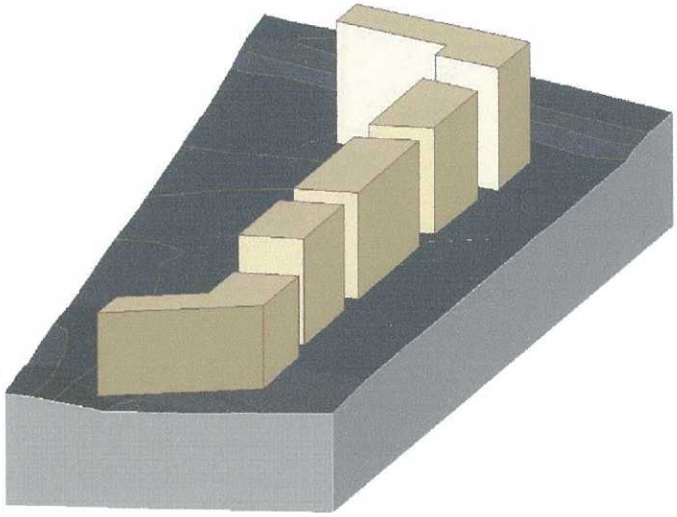
3.1 BLOCK 1 – Lusty Street & Cooks River



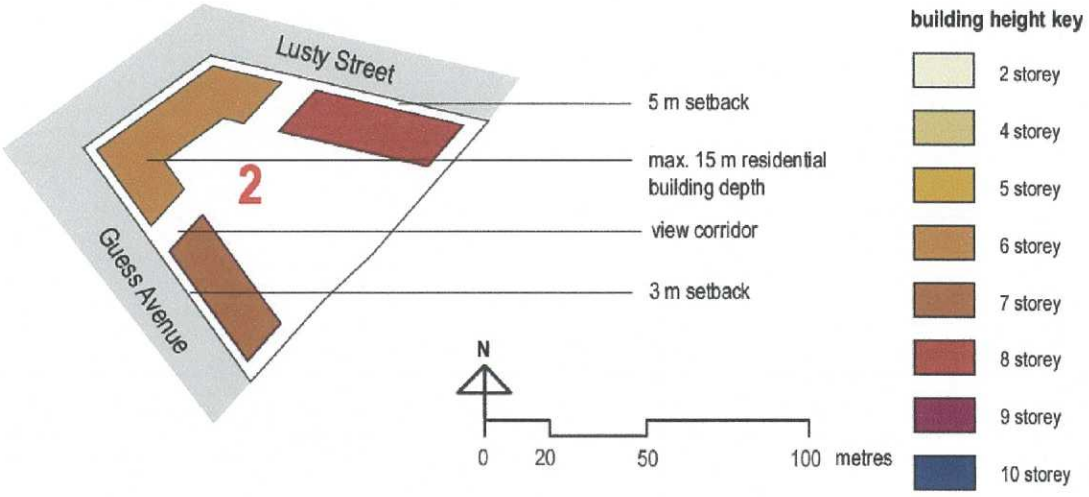
building height key

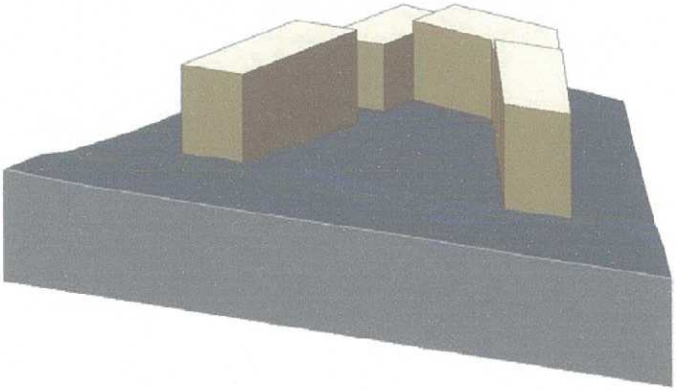
- 2 storey
- 4 storey
- 5 storey
- 6 storey
- 7 storey
- 8 storey
- 9 storey
- 10 storey

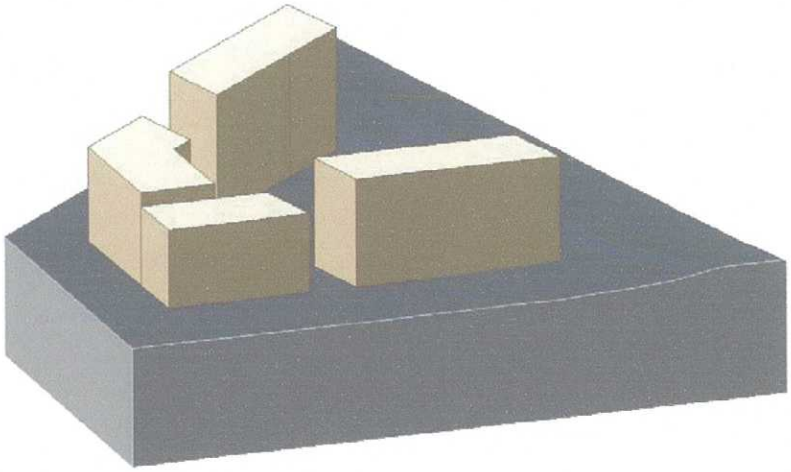




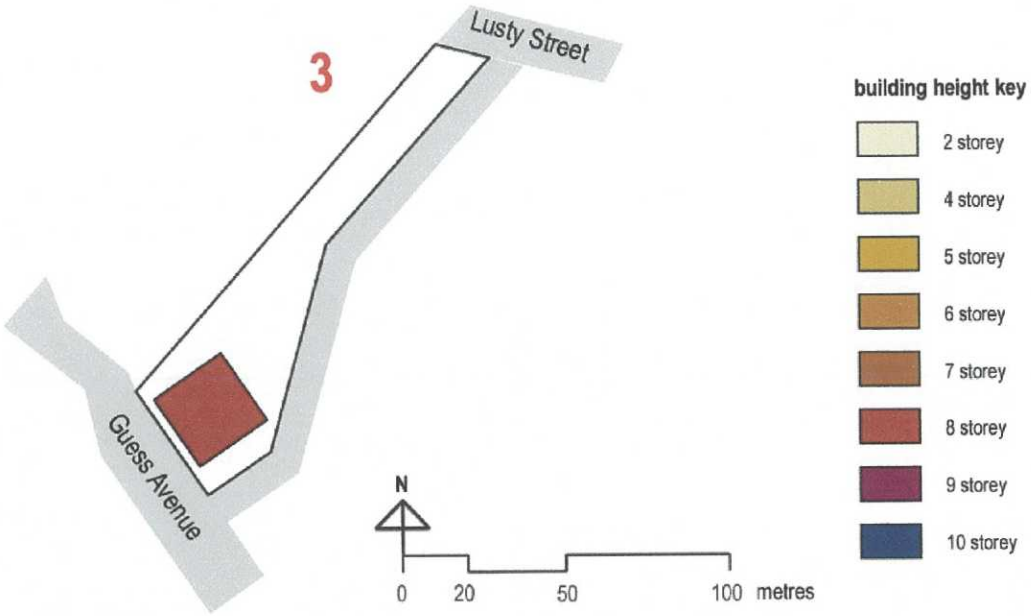
3.2 BLOCK 2 – bounded by Lusty St, Guess Avenue & the railway line

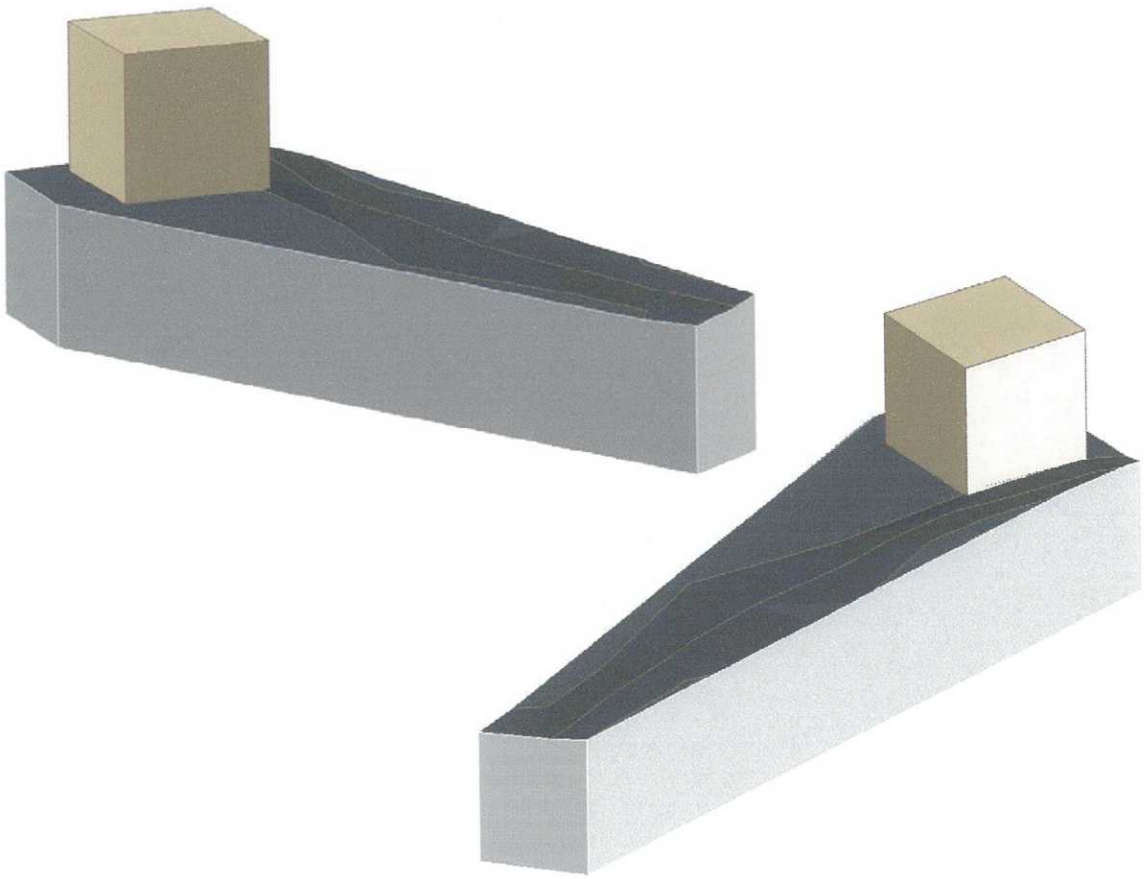




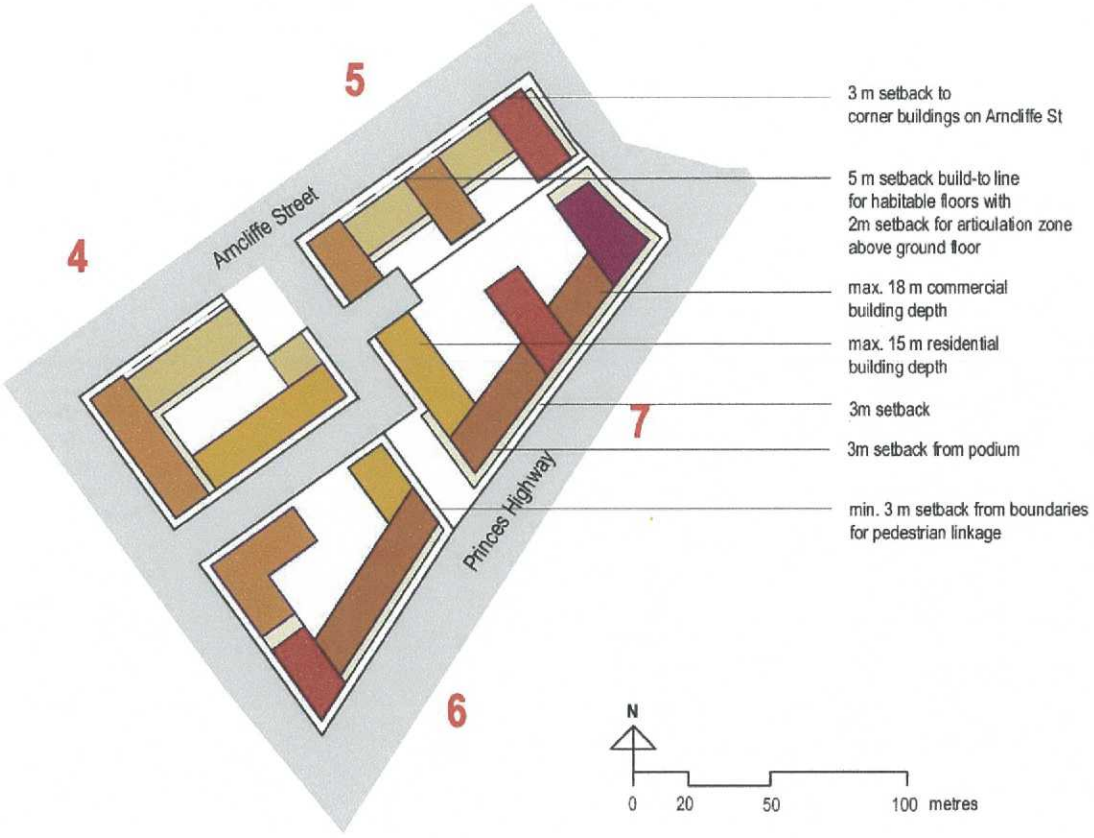


3.3 BLOCK 3 – bounded by Lusty St, Guess Avenue, future lane connection and the rail line





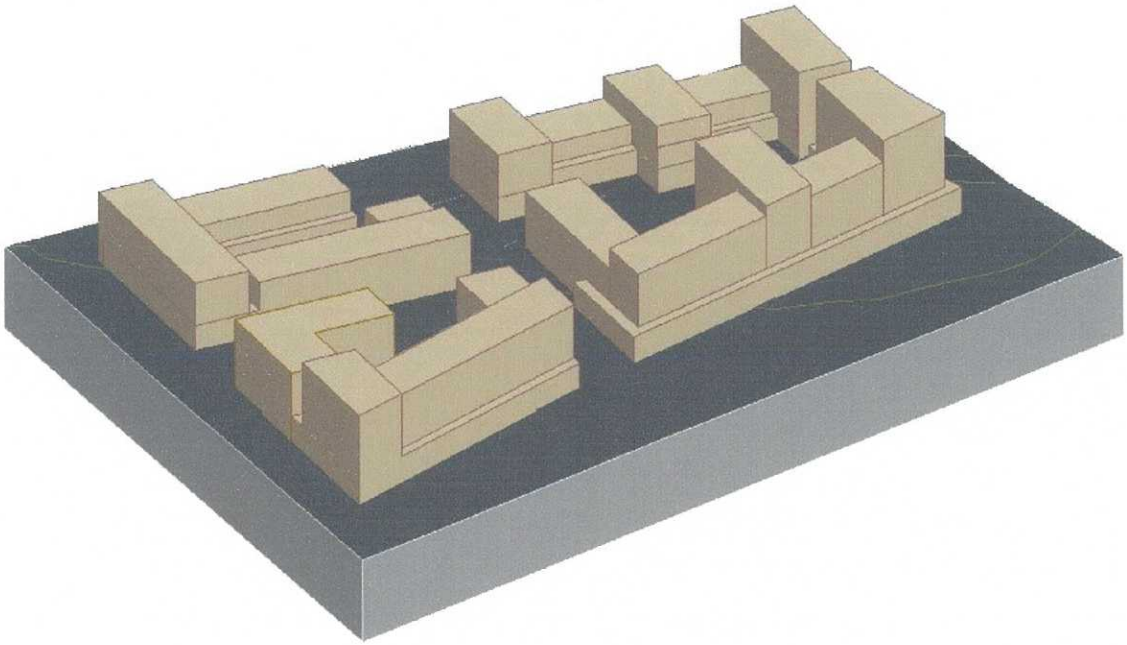
3.4 BLOCK 4 – bounded by the new connection street, Arncliffe Street, Brodie Spark Drive and the Princes Highway

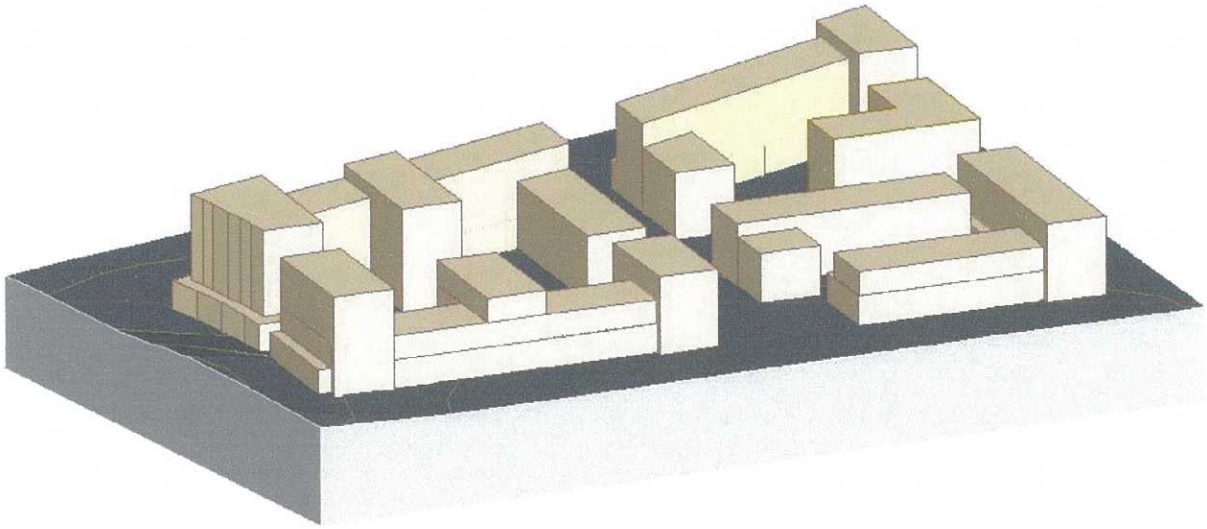


building height key

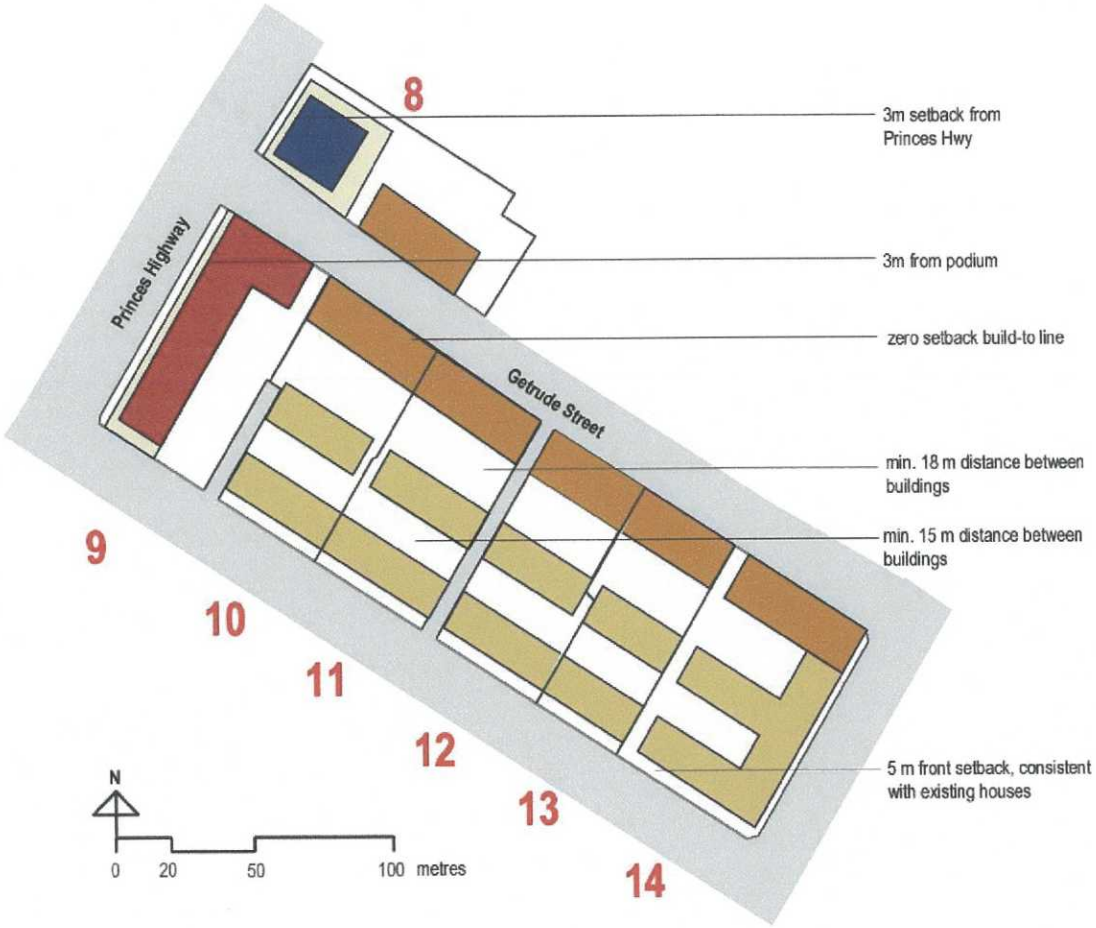
- 2 storey
- 4 storey
- 5 storey
- 6 storey
- 7 storey
- 8 storey
- 9 storey
- 10 storey

3.4 BLOCK 4 – bounded by the new connection street, Arncliffe Street, Brodie Spark Drive and the Princes Highway (cont.)





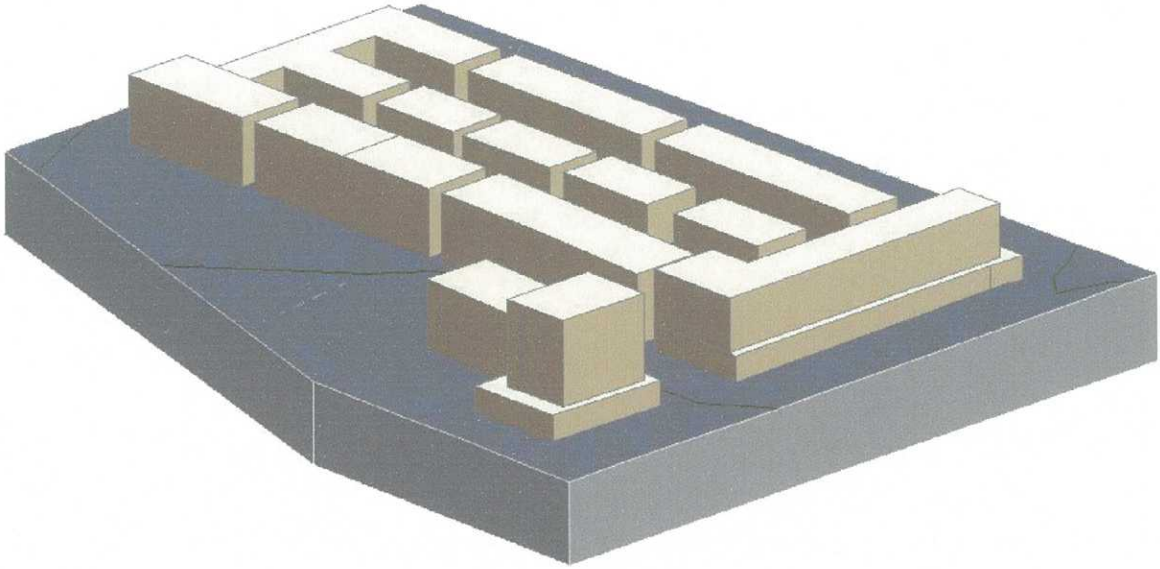
3.5 BLOCK 5 - bounded by the Princes Highway, Innesdale Road, Gertrude Street and Levey Street

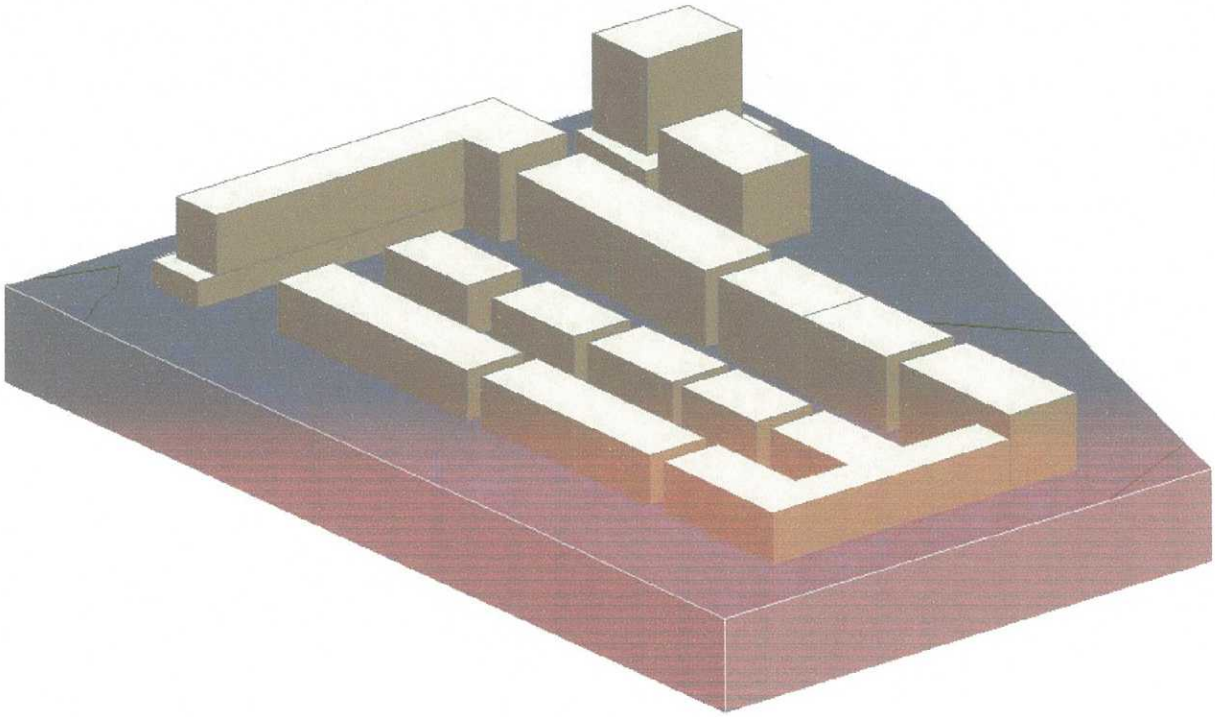


building height key

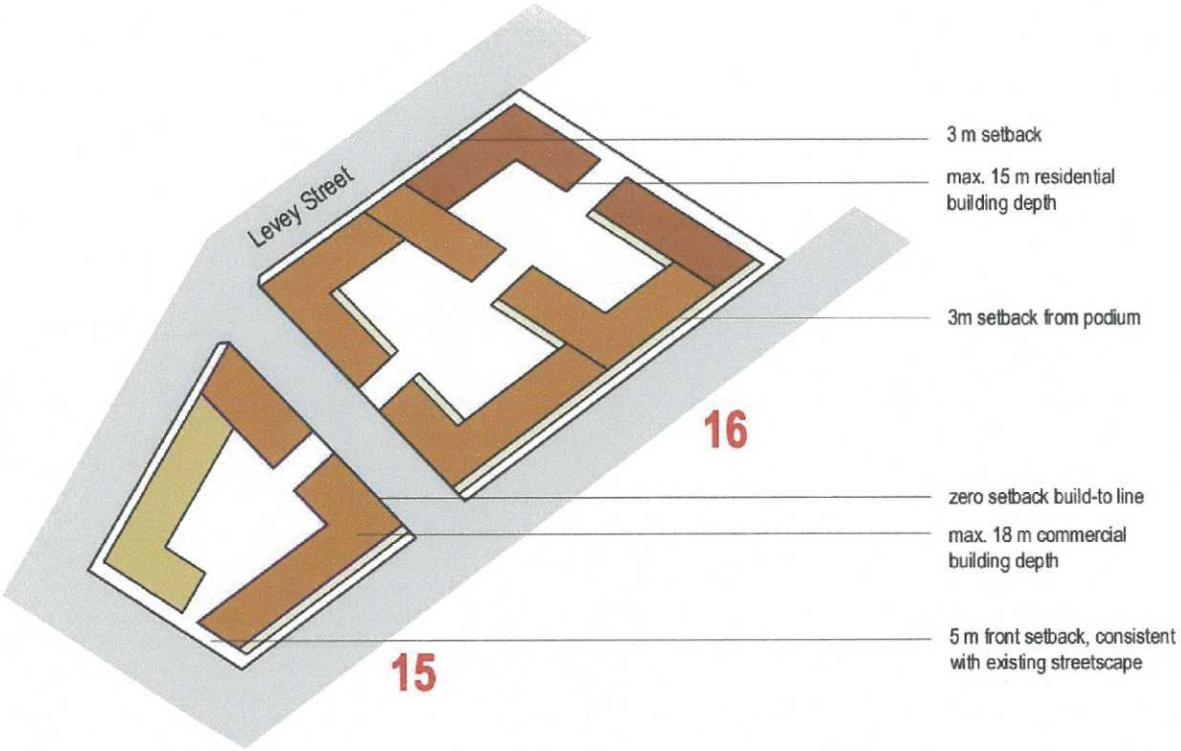
- 2 storey
- 4 storey
- 5 storey
- 6 storey
- 7 storey
- 8 storey
- 9 storey
- 10 storey

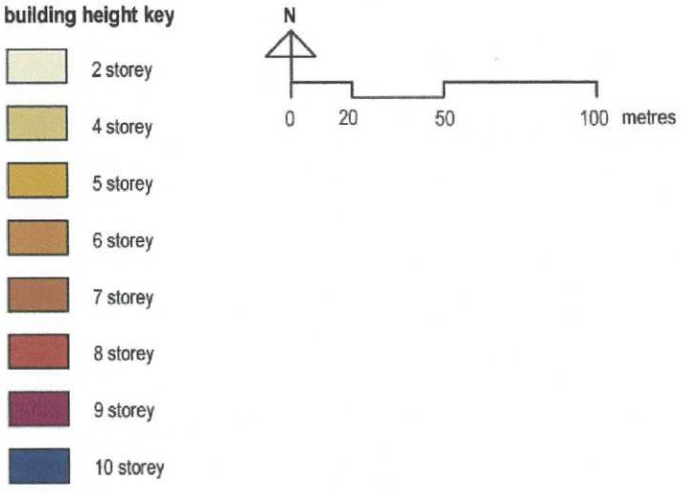
3.5 BLOCK 5 – bounded by the Princes Highway, Innesdale Road, Gertrude Street and Levey Street (cont.)



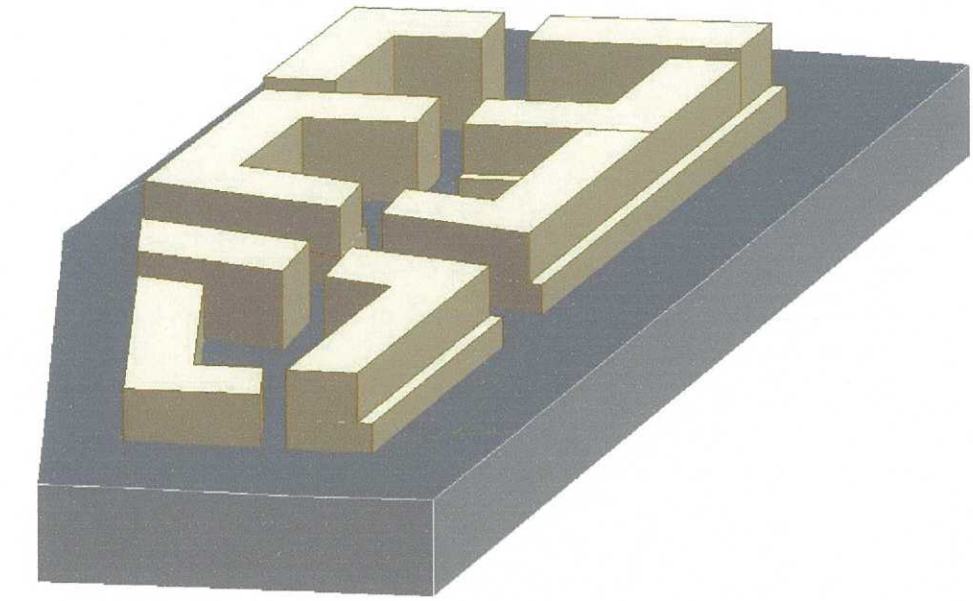


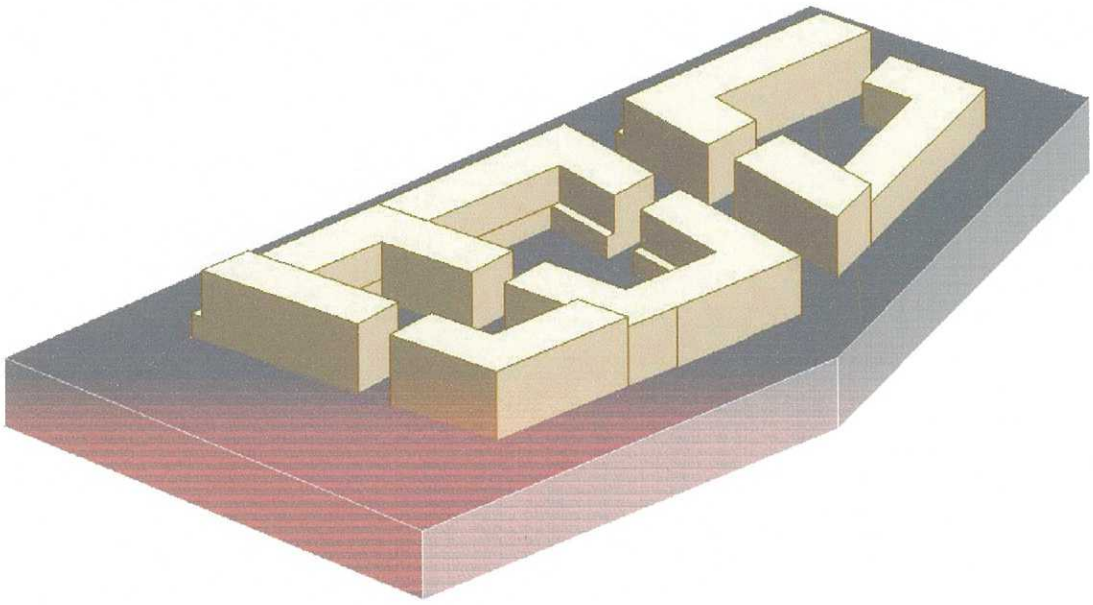
3.6 BLOCK 6 – bounded by Levey Street, Marsh Road and the park



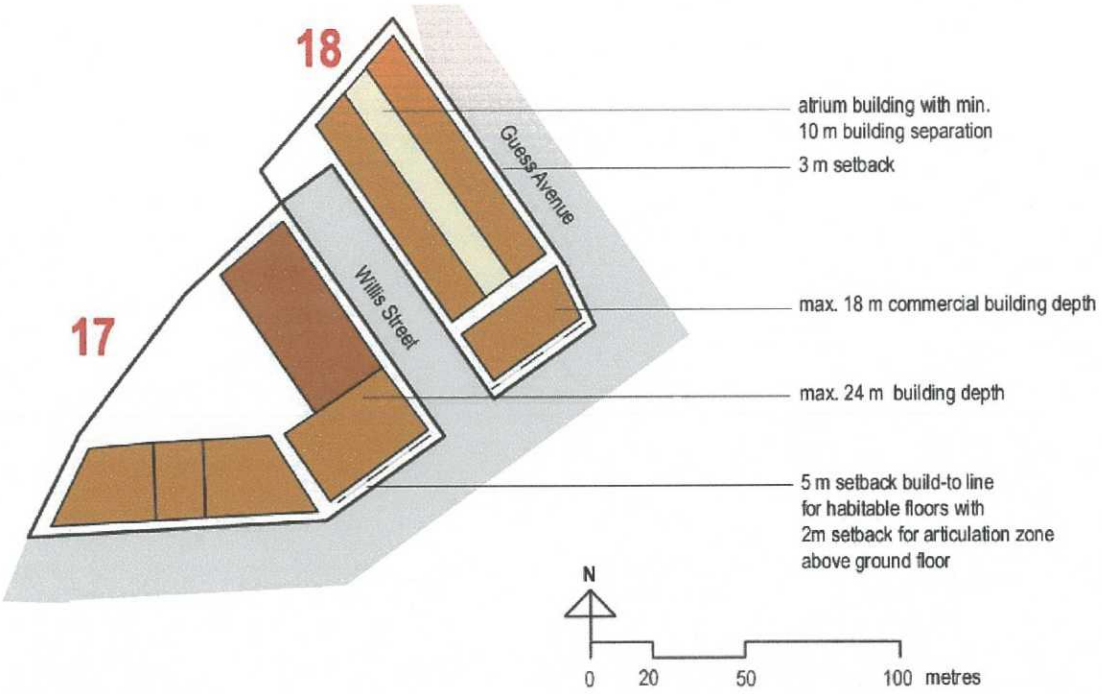


3.6 BLOCK 6 – bounded by Levey Street, Marsh Road and the park (cont.)



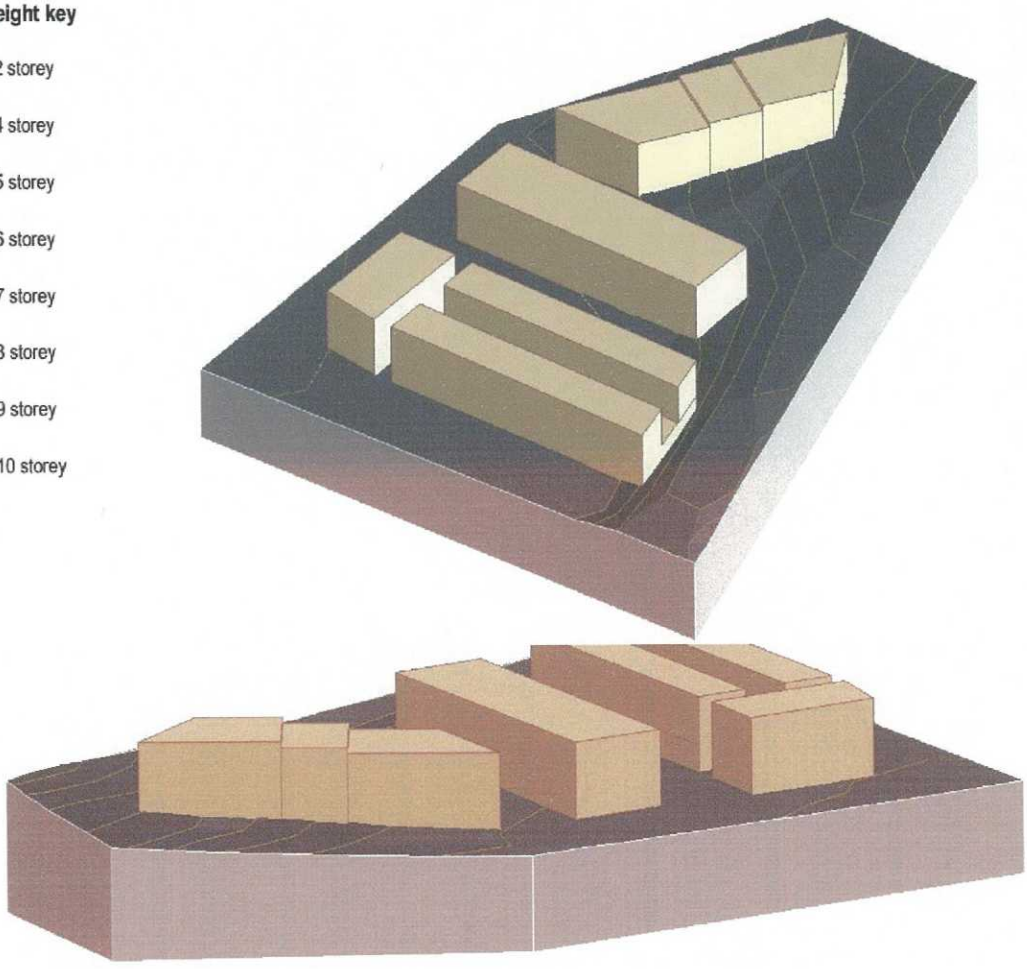


3.7 BLOCK 7 – bounded by Arncliffe Street, Guess Avenue & the rail line

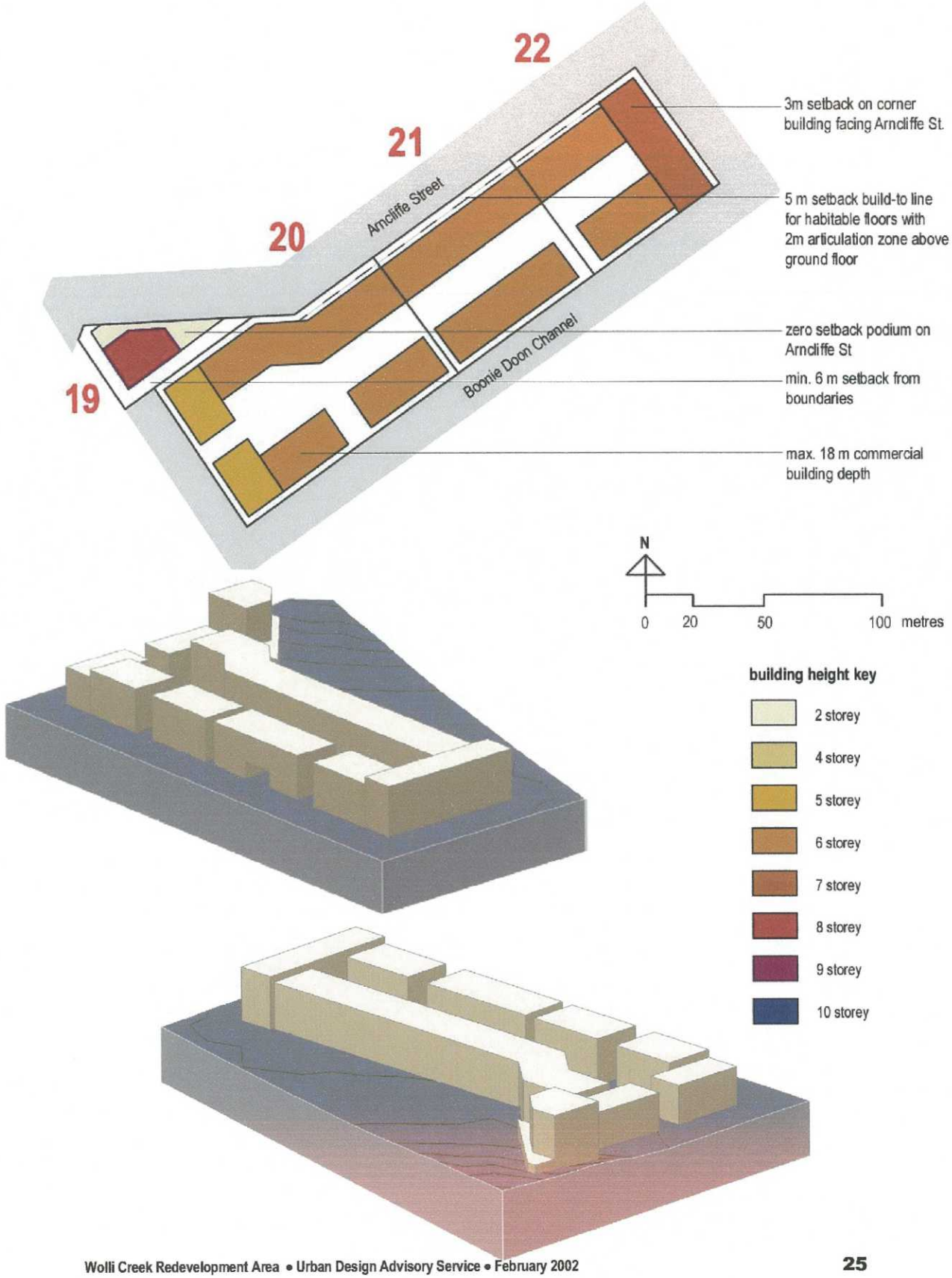


building height key

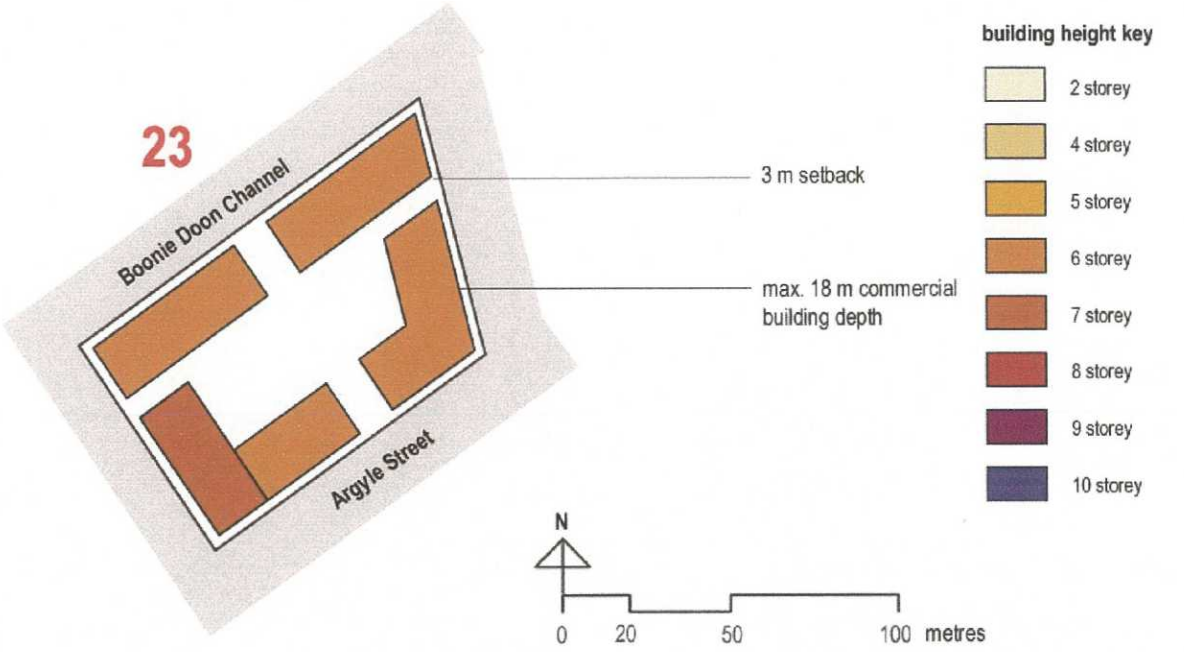
- 2 storey
- 4 storey
- 5 storey
- 6 storey
- 7 storey
- 8 storey
- 9 storey
- 10 storey

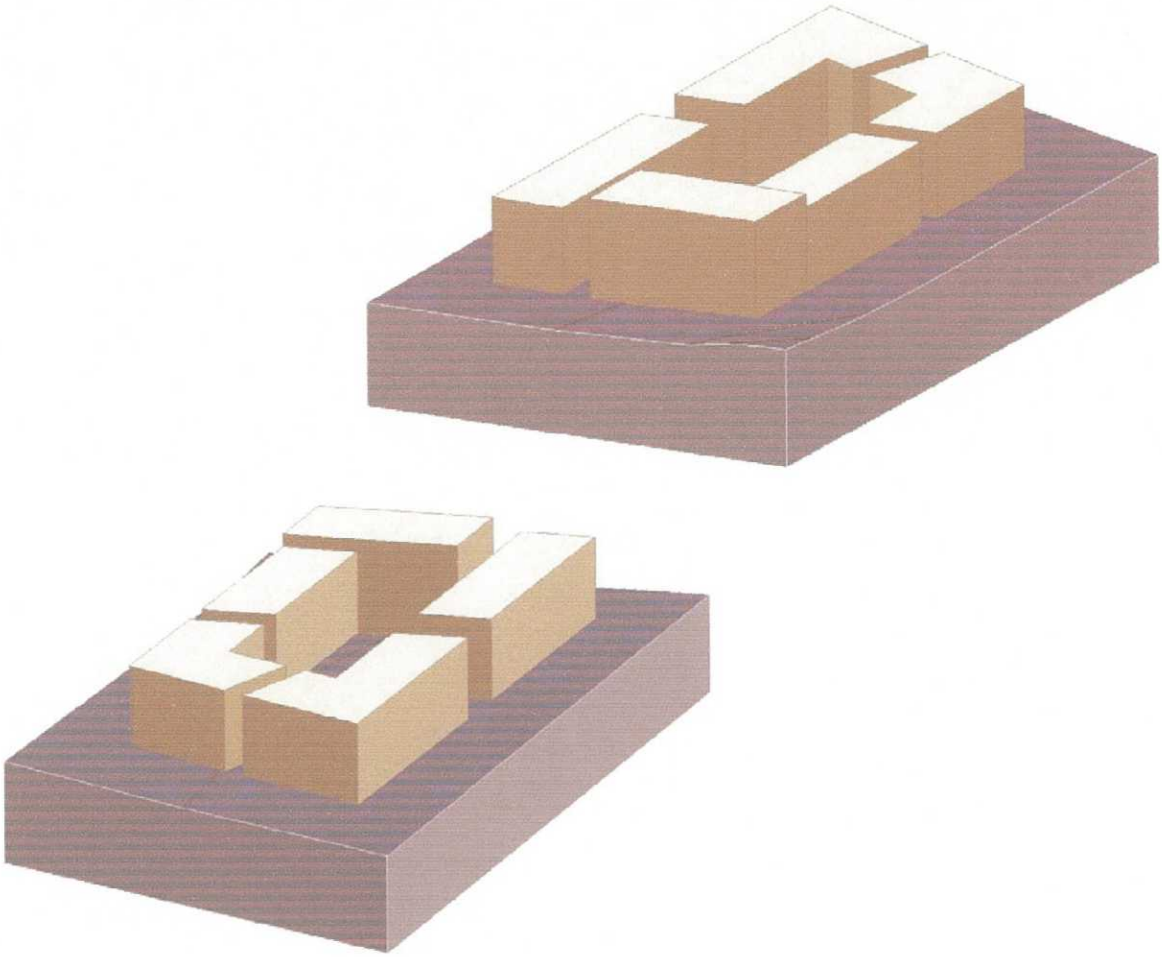


3.8 BLOCK 8 – bounded by the SWSOOS, Arncliffe St , Bonnie Doon channel & the new connection street

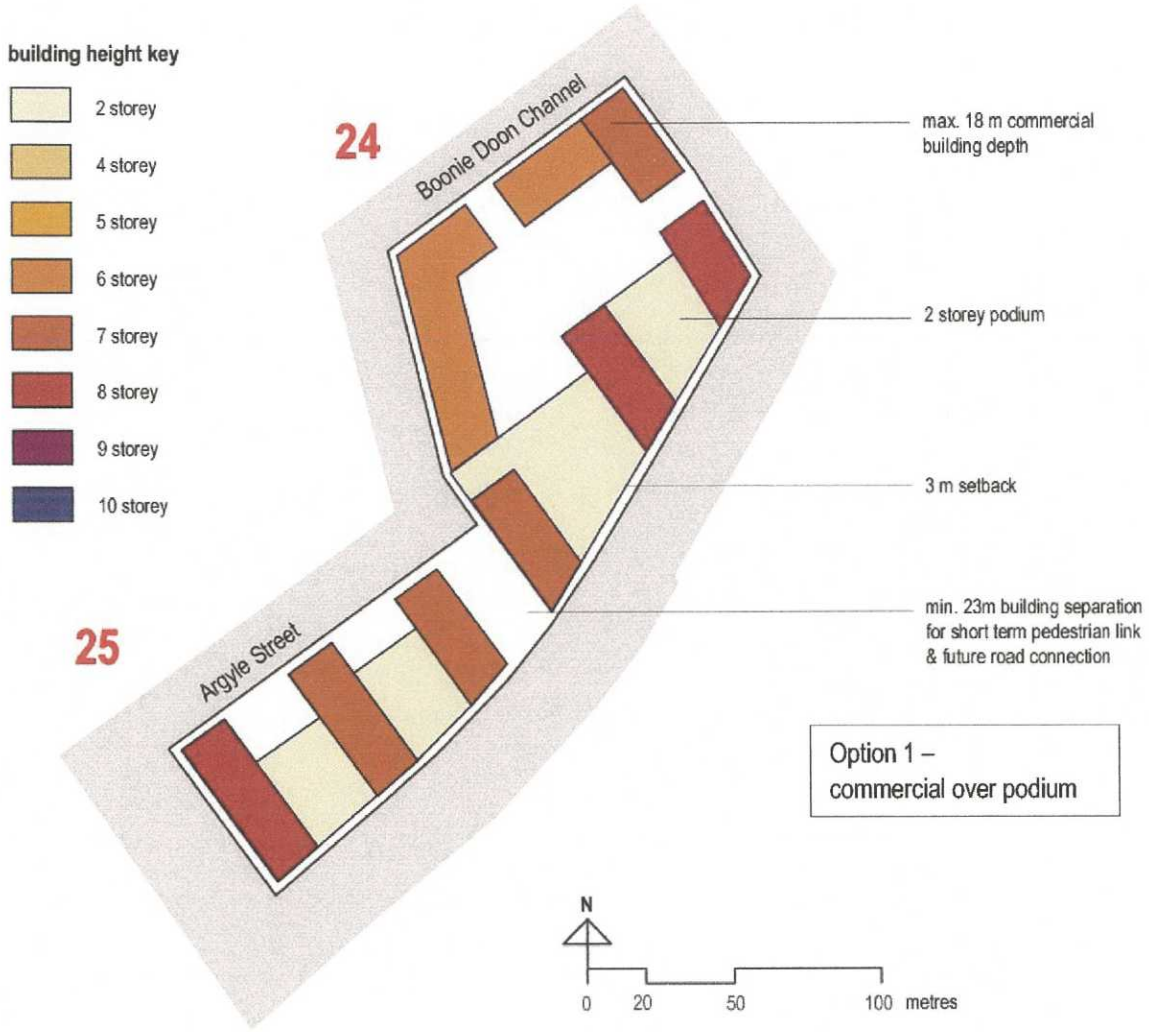


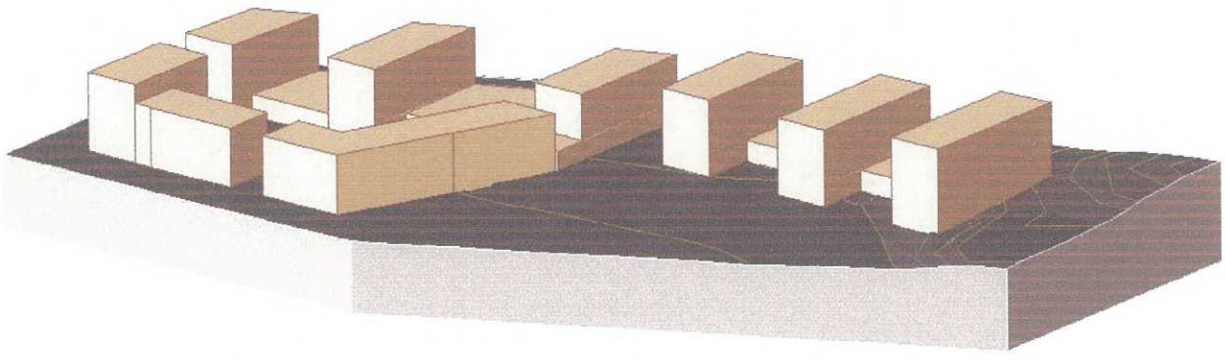
3.9 BLOCK 9 – bounded by SWSOOS, Bonnie Doon Channel & Argyle Street





3.10 BLOCK 10 – bounded by the SWSOOS, Princes Highway, Bonnie Doon Channel and new connection street





3.10BLOCK 10 – bounded by the SWSOOS, Princes Highway, Bonnie Doon Channel and new connection street (cont.)