

IN
COLLABORATION
WITH



BUREAU
BUREAU OF URBAN ARCHITECTURE



4 MITCHELL STREET, ENFIELD
ADG (SEPP65) COMPLIANCE SUMMARY (SUPPORTING INFORMATION)

BURWOOD COUNCIL PLANNING PROPOSAL SUBMISSION (ADDENDUM)

PREPARED BY: BUREAU OF URBAN ARCHITECTURE
ON BEHALF OF: TIAN AN AUSTRALIA



3 SEPTEMBER 2018

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Bureau-17121-Henley Park Apartments, Enfield-ADG (SEPP65) Compliance Summary
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BUREAU OF URBAN ARCHITECTURE

General Manager
Burwood Council
Suite 1, Level 2,
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Dear Sir/Madam,

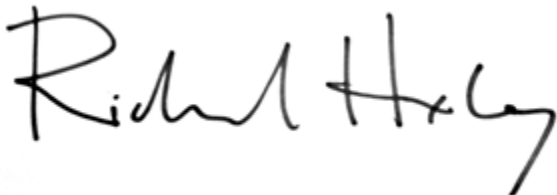
RESIDENTIAL DEVELOPMENT - 4 MITCHELL STREET, ENFIELD
PLANNING PROPOSAL SUPPORTING INFORMATION FOR TIAN AN AUSTRALIA PTY LTD

DESIGN VERIFICATION STATEMENT

In accordance with Clause 50(1A) of the Environmental Planning and Assessment Regulations 2000, I, Richard Huxley, am a qualified architect for the purposes of State Environmental Policy No.65 – Design Quality of Residential Flat Development.

I verify that the proposed residential flat development, as shown in Bureau of Urban Architecture's Planning Proposal Addendum, Urban Design + Architecture report dated 21 May 2018 was designed under my instruction with regard to Part 3 and 4 of the Apartment Design Guide (ADG). The following ADG compliance summary confirms that the proposed scheme complies or has the ability to comply through further design development.

Yours faithfully,



RICHARD HUXLEY
MANAGING DIRECTOR + PRINCIPAL ARCHITECT

B.Arch M.Arch RAlA Chartered Architect NSW Registration No.5711

DESIGN INTENT

Bureau of Urban Architecture (Bureau) have worked collaboratively with our client, Tian An Australia, Cardno and Burwood Council staff through a series of design workshops and presentations to create an Amended Planning Proposal submission to improve upon the original Planning Proposal submission design by the previous architectural firm. Bureau's scheme creates 2 x U-shaped buildings that allow the largest number of apartments possible to have either frontal or oblique views of Henley Park.

By creating 2 buildings on the site separated by a 18m wide landscape space in the middle each building has a Henley Park address as well as a street address, either Mitchell Street or Baker Street. These 2 buildings are much lower than the previous heights of buildings proposed for the site and they fit comfortably within the new 18m height limit. Each building is also conceived around a communal open space courtyard that is circa 25m x 28m so that non-park facing apartments can enjoy a generous landscape outlook. This design strategy has the added benefit of creating a circa 40m setback to the rear boundaries. Setback distances from the north, south and eastern boundaries are circa 12m and 14m whilst adopting a more typical setback from the western or Henley Park boundary.

We have designed the Mitchell Street frontage in a stepped form to diminish its bulk and scale having the added benefit of not creating new sun-shadows that would affect any Mitchell Street properties. Forming an affiliative relationship between built form and Henley Park was a high priority so we created a curved all the corners of the buildings, created a continuous 1m deep balcony planter detail wrapping around every floor plate and created a completely landscaped roof garden so that each building would take on an organic appearance. Our courtyard apartment design typology increases both amenity and environmental standards for the benefits of the residents. Landscaped courtyard entries are combined with natural light and ventilated lift lobbies. Oversized and fire engineered glazed fire stairs with central light well design and skylight provide the ability to access natural light at each level encourage the use of stairs in the building.

ADG (SEPP65) DESIGN PRINCIPLES

STATEMENT OF COMPLIANCE WITH SEPP 65 PRINCIPLES
PREPARED BY RICHARD HUXLEY, MANAGING DIRECTOR + PRINCIPAL ARCHITECT
BUREAU OF URBAN ARCHITECTURE

Clause 50 of the NSW Environment Planning and Assessment Regulation (2000) cl 50 (1A) and cl 50 (1AB).

PRINCIPLE 1: CONTEXT AND NEIGHBOURHOOD CHARACTER

“Good design responds and contributes to its context. Context is the key natural and built features of an area, their relationship and the character they create when combined. It also includes social, economic, health and environmental conditions. Responding to context involves identifying the desirable elements of an area’s existing or future character.

Well-designed buildings respond to and enhance the qualities and identity of the area including the adjacent sites, street scape and neighbourhood. Consideration of local context is important for all sites, including sites in established areas, those undergoing change or identified for change.”

This Planning Proposal is made in relation to the site at 4 Mitchell Street, Enfield. The legal description of the site is Lot 3 DP 585664 and its total area is some 12,620sqm. The site is in a single ownership. The site is located west of Burwood Road, and between the Hume Highway (Liverpool Road) to the north and Georges River Road to the South. It is approximately 2km south of Burwood CBD and 900m west of Croydon Park local shopping centre. The site is within 100m of a high frequency bus stop on Burwood Road, where the Route 400 and Route M41 buses connect the site with destinations including the Burwood Town Centre, Bondi Junction, Sydney Airport, Hurstville and Macquarie Park. The NSW Head Office of Vision Australia was formerly located on the site, in a large-scale building, varying in height from one to three commercial storeys. This is equivalent to approximately two to five residential storeys. The existing building is a concrete monolithic structure that has little or no architectural merit.

The site is located within a predominately residential area, characterised by detached single, two and three storey dwellings. Within this context there is also a two-storey apartment building at 93-95 Burwood Road, which lies beyond the north-east corner of the site, and there is a new terrace house development under construction at 116-118 Burwood Road (opposite Mitchell Street). An extensive area of recreational open space, Henley Park, is located immediately to the west of the site. The proposed building ranges from two to five levels and will only be slightly taller than the local context, is low in scale and therefore responds to the scale of the local built environment. The park incorporates cricket wickets, an amenity building, barbeques and picnic facilities, play equipment, a bicycle and walking track, exercise equipment and large areas of passive open space. Enfield Aquatic Centre is also located at the northern edge of Henley Park. There are two bus stops situated in close proximity to the site on Burwood Road, close to the junction with Mitchell Street. These stops are less than 200m walk from the site, and offer services from Burwood to Bondi Junction, and Hurstville to Macquarie Park. Two primary schools and three early learning centres are located between 800m and 1km of the site.

The site is located prominently on Henley Park with a 200 metres frontage which is heavily screened by a strong existing planting of trees to the Western edge of Henley Park. In acknowledging the local context the building has been designed to fit below the existing canopy of trees on Henley Park and provides generous setbacks to the North, South and West boundaries. The building has been stepped on the Southern boundary to ensure it has an appropriate height to Mitchell Street and minimise overshadowing. The proposed development will contribute to the identity of the area by creating a high quality building and provide much needed amenity / retail to the local area.

PRINCIPLE 2: BUILT FORM AND SCALE

“Good design achieves a scale, bulk and height appropriate to the existing or desired future character of the street and surrounding buildings.

Good design also achieves an appropriate built form for a site and the building’s purpose in terms of building alignments, proportions, building type, articulation and the manipulation of building elements. Appropriate built form defines the public domain, contributes to the character of streetscapes and parks, including their views and vistas, and provides internal amenity and outlook.”

The Burwood’s LEP and DCP controls for this site outline a 8.5m height control, and an FSR of 0.85:1. The existing building height already exceeds this control with heights between 6.47m-16.34m. The proposed development is 4 levels in principle with a lower ground level of retail meaning a 5 level building at Henley Park edge, however the buildings ranges from two to five levels with stepping at boundaries and upper levels. The proposed major setbacks and building separation are outlined below:

DESIGN PROPOSAL SETBACKS:

- 12m (to glassline) to principle road, Mitchell Street.
- 12m (to glassline) to back of properties on Burwood Road.
- 12m (to glassline) to back of properties on Llangollan Street.
- 3m (to glassline) along Henley Park frontage.
- 1.1m incursion is allowed for perimeter planting.

ADG BUILDING SEPARATION:

- 18m (glassline to glassline) separation between buildings 1 and 2 (central landscaped corridor).

The site is located prominently on Henley Park with a 200 metres frontage which is heavily screened by a strong existing planting of trees to the Western edge of Henley Park. In acknowledging the local context the building has been designed to fit below the existing canopy of trees on Henley Park and provides generous setbacks to the North, South and West boundaries. The building has been stepped on the Southern boundary to ensure it has an appropriate height to Mitchell Street and minimise overshadowing. The proposed development will contribute to the identity of the area by creating a high quality building and provide much needed amenity / retail to the local area.

Bureau’s scheme creates two U-shaped buildings that allow the largest number of apartments possible to have either frontal or oblique views of Henley Park. By creating two buildings on the site separated by a 18m wide landscape space in the centre of the site, each building has a Henley Park address as well as a street address, either Mitchell Street or Baker Street. This design strategy has the added benefit of creating a circa 40m setback to the rear boundaries measured through the courtyards. Setback distances from the north, south and eastern boundaries are circa 12m and 14m whilst adopting a more typical setback from the western or Henley Park boundary.

The building form is an “U” shape in plan, so as to minimise the impact on the Burwood Road properties, and to create a communal open space to the East of the site. The setbacks are generously landscaped to benefit both inhabitants of the building and the streetscape. Perimeter planting has been proposed to the entire perimeter of the building to provide additional and generous amenity for the residents and to provide a green edge to Henley Park.

PRINCIPLE 3: DENSITY

“Good design achieves a high level of amenity for residents and each apartment, resulting in a density appropriate to the site and its context.

Appropriate densities are consistent with the area’s existing or projected population. Appropriate densities can be sustained by existing or proposed infrastructure, public transport, access to jobs, community facilities and the environment.”

The proximity of the site to Burwood town centre affords the site the opportunity to support high density residential and the increase of housing near this strategic centre, with development at an appropriate scale and that carefully manages the response to the existing built form context.

The site has good links to employment opportunities, public transport and entertainment. The new development does not maximise the density potential of the site but allows a balance for the residents of the proposed development and neighbours, not overcrowding the site and minimising the effect on surrounding traffic conditions while providing a well designed and high quality density living offering that this unique site deserves.

PRINCIPLE 4: SUSTAINABILITY

“Good design combines positive environmental, social and economic outcomes. Good sustainable design includes use of natural cross ventilation and sunlight for the amenity and livability of residents and passive thermal design for ventilation, heating and cooling reducing reliance on technology and operation costs. Other elements include recycling and reuse of materials and waste, use of sustainable materials, and deep soil zones for groundwater recharge and vegetation.”

The design was established using sustainability first principles with consideration given to site location and orientation. This analysis led to the development of 2 “U” shaped buildings which responds the sites orientation and achieves the maximum number of apartments with North, North-East and North-West orientations as possible. This building form also maximises the amount of apartments that get an outlook to the Henley Park.

The architectural detailing of the building and addition of user operable sliding screens protects the building glazing from overheating on the North and West facades while allowing for generous window operability, and skylights designed with high efficiency glazing to minimise the need for artificial heating/cooling. Double glazing and insulation further mitigates the thermal requirements of the building and minimises need for artificial temperature control. The glazed ground floor atrium is provided with natural lighting to increase amenity. The development utilises roof areas to capture rain water for collection in a rain water tank for use in the landscaped area. These design strategies together with the environmental strategies structured with the development’s BASIX proposal will ensure both a high level of innovation in energy use and consumption for the building. There is potential to include photovoltaic panels on the roof to assist in powering common areas of the building. Given the relative low height of the building the design intention is to finish the fire stair to a high quality finish to encourage occupants to use the stairs as an alternative to the lift as part of an attempt to reduce power consumption by lift use and promote health & fitness by using stairs as daily exercise, also creating ‘chance meetings’ between neighbours which will assist in the creation of true community within the building.

Deep soil on the site exceeds the ADG minimum requirement.

PRINCIPLE 5: LANDSCAPE

“Good design recognises that together landscape and buildings operate as an integrated and sustainable system, resulting in attractive developments with good amenity. A positive image and contextual fit of well-designed developments is achieved by contributing to the landscape character of the streetscape and neighbourhood.

Good landscape design enhances the development’s environmental performance by retaining positive natural features which contribute to the local context, co-ordinating water and soil management, solar access, micro-climate, tree canopy, habitat values, and preserving green networks. Good landscape design optimises usability, privacy and opportunities for social interaction, equitable access, respect for neighbours’ amenity, provides for practical establishment and long term management.”

There are four principal open space areas and a series of more intimate courtyard and undercroft spaces. The spaces between the building are generous in scale and provide opportunity for a range of amenity from passive seating / gathering and reflection areas, to a playground and allied family seating. The linear open space along the eastern boundary provides opportunity for a range of lawn and seating areas. The central space has switch-back ramps to provide for equitable access to all three courtyards. The undercroft space has feature shaded seating areas, with tree ferns and fern gardens, and up lit shallow water features. The perimeter deep soil area is minimum three metres width and is located to allow effective screen planting and canopy shade trees to the interface with neighbouring properties.

Screened by the adjacent berm and existing park trees, the embankment is to have groundcover and tree planting to present landscape back into the site courtyard areas adjacent. The meandering path adjacent connects all areas. Feature water features are to be very shallow water, but providing high visual impact. Undercroft planting is to be shade tolerant tree ferns and similar lowlight tolerant accent planting.

The central courtyard space connecting the site East-West is more activate in character with a playground, lawn and adjacent family seating areas. The design character is to remain formal and creates a grand avenue of tree planting framing views up and down the space, with feature sculptures at each end. A level change stair and ramp system provides access and a visual feature and outlook across the lower lawns.

The two rooftop amenity areas are each approximately 40 x 15 metres, and being divided up into a series of smaller amenity spaces providing a broad range of uses. Uses will be refined in the detailed design, but can include barbeque areas, community gardens, outdoor exercise equipment and exercise decks, sun lounge and table and chairs / lounges as different types of seating areas. The greening of the rooftops towards the east is to provide attractive outlook, with these areas being generally non-access areas. The rooftop amenity areas are to be designed to complement the amenity provided on the ground floor and sheltered undercroft areas.

The proposal will retain the majority of existing trees that front Mitchell Street in the South and Henley Park to the West. Hard paving areas are used to access the main entry zone and egress paths. The car park entries are integrated into the building form and surrounded by landscaping to minimise the visual impact. Landscaping is used to create privacy barriers between the private and communal spaces.

PRINCIPLE 6: AMENITY

“Good design positively influences internal and external amenity for residents and neighbours. Achieving good amenity contributes to positive living environments and resident well-being.

Good amenity combines appropriate room dimensions and shapes, access to sunlight, natural ventilation, outlook, visual and acoustic privacy, storage, indoor and outdoor space, efficient layouts and service areas, and ease of access for all age groups and degrees of mobility.”

The buildings footprint allows the proposal to achieve the requirement for communal open space solely on the ground plane, this allows the entire roof space to be offered as an additional amenity for the residents. Additionally perimeter planting is proposed around the entire building footprint at all levels, which extends the already generously sized balcony and terrace areas.

The Mitchell Street frontage has been designed in a stepped form to diminish its bulk and scale having the added benefit of not creating new sun-shadows that would affect any Mitchell Street properties. The form of the building contains stepping and building breaks to divide the building and create privacy while allowing for openings. The building breaks and stepping also shape the views so apartments do not face one another, while maximising north facing living and balcony spaces.

For mobility and accessibility entry ramps are provided from Mitchell Street. The central space has switch-back ramps to provide for equitable access to all three courtyards. Each building has 2 lobby entries at ground level, located off the Eastern connection ensuring generous entries and legible wayfinding. Each building core allows for a common entry space on ground and then individual residential lobbies on the upper residential levels which allows for circa. 8 apartments per lift lobby. All apartments have lift access to the basement parking levels.

Wherever possible minimum room dimensions are exceeded and open plan living is prioritised with design enhancements where possible such as storage solutions and study nooks.

All units have natural ventilation, and ADG (SEPP65) cross-ventilation requirements are exceeded. A range of apartment sizes are provided to accommodate for project market demands. Large street setbacks are maintained, and shared boundaries are divided by communal open space and landscaped zones.

Garbage chutes are to be installed for the benefit and amenity of the development as a whole, providing a clean, efficient and convenient means of waste management. The waste compactor rooms are to be designed well in excess of current standards, and other plant rooms will be painted white internally for improved useability and serviceability.

The apartments have been designed in accordance with ADG (SEPP65) design guidelines as follows:

1) Solar and Daylight Access

Performance Criteria: 70% of apartments in a building to receive a minimum of 2 hours direct sunlight between 9am and 3pm at mid-winter.

Proposed Design Performance: The building is compliant as 80% of apartment living rooms or (148 of 183 units) would receive direct sun penetration for a minimum 2 hours per day between 9 am and 3pm. See solar diagrams in urban design report.

Performance Criteria: A maximum of 15% of apartments in a building receive no sunlight between 9am and 3pm at mid-winter.

Proposed Design Performance: The building is compliant as 15% of the units will not receive direct sunlight in winter.

Performance Criteria: A window should be visible from all habitable rooms.

Proposed Design Performance: The building is compliant as a window is visible from all habitable rooms.

2) Natural Ventilation

Performance Criteria: 60% of units should be naturally cross ventilated. The rear of single aspect unit kitchens/open plan layouts to be maximum of 8m from glazing.

Proposed Design Performance: The building is compliant as 70% or (129 of 183 units) are naturally cross ventilated.

Performance Criteria: The area of window openings should be at least 5% of floor area served.

Proposed Design Performance: The building is compliant as area of window openings is greater than 5% of floor area served.

Performance Criteria: The maximum depth of through units should be 18m.

Proposed Design Performance: The building has the ability to comply to 18m glassline to glassline.

3) Ceiling heights

Performance Criteria: The minimum ceiling height for habitable areas is 2700mm.

Proposed Design Performance: The building is compliant as all units have 2700mm ceilings in habitable areas

Performance Criteria: The minimum ceiling height for ground floor retail areas is areas is 3300mm.

Proposed Design Performance: The building is compliant as the retail ceiling is in excess of 3300mm.

4) Apartment Size and Layout

Performance Criteria: Apartments are required to have the following minimum internal areas: Studio 35sqm/1 Bedroom 50sqm/ 2 Bedroom 70sqm / 3 Bedrooms 90sqm.

Proposed Design Performance: The building is compliant as all units have the minimum required internal areas according to ADG (SEPP 65).

5) Apartment Depth

Performance Criteria: Preferred maximum internal building depth should be 18m. Habitable room depths are limited to a maximum of 2.5 X the ceiling height. In open plan layout (where the living, dining and kitchen are combined) the maximum habitable room depth is 8m from a window.

Proposed Design Performance: The building has the ability to comply to 18m glassline to glassline, no living dining area exceeds 8m in depth and due to large areas of glazing no habitable room depth exceed 2.5 X the ceiling height.

6) Private Open Space and Balconies

Performance Criteria: All apartments are required to have primary balconies as follows: Studios 4sqm; 1 Bedroom 8sqm; 2 Bedroom 10sqm; 3 Bedroom 12sqm.

Proposed Design Performance: The building is compliant as all apartment balconies have the minimum required size.

Performance Criteria: The minimum depth of balconies is 2m for studios, 1 bed, 2 bed and 2.4m for 3 bed.

Proposed Design Performance: The building is compliant as all apartment balconies have the minimum required depth.

8) Common Circulation and Spaces

Performance Criteria: The maximum number of apartments off a circulation core on a single level is 8.

Proposed Design Performance: The building is compliant as the maximum number of apartments off a circulation core on a single level is in the order of 8.

9) Storage

Performance Criteria: The minimum requirements for storage are as following: Studio 4sqm/ 1 Bedroom 6sqm/ 2 Bedroom 8sqm/ 3 Bedroom 10sqm. And at least 50% of the required storage is to be located within the apartment.

Proposed Design Performance: All units have a minimum storage size and are compliant as they have the capability of providing the storage requirement with at least 50% of storage within the unit and 50% within the basement.

10) Ground Floor and Lobbies

Performance Criteria: Direct Access should be provided for ground floor apartments.

Proposed Design Performance: Currently there are no planned ground level apartments in the proposal

Performance Criteria: Retail or home office should be located along ground floor frontages.

Proposed Design Performance: Retail is located on lower ground level to activate the Henley Park frontage.

PRINCIPLE 7: SAFETY

“Good design optimises safety and security, within the development and the public domain. It provides for quality public and private spaces that are clearly defined and fit for the intended purpose. Opportunities to maximise passive surveillance of public and communal areas promote safety.

A positive relationship between public and private spaces is achieved through clearly defined secure access points and well-lit and visible areas that are easily maintained and appropriate to the location and purpose.”

The proposal includes a retail strip along the Henley Park frontage. The retail use has a clearly defined security line between the public retail offering and the private courtyards and residential entries. There will be secure access to the residential entries from Mitchell and Baker Street.

The building is set back a minimum of 12 meters from street / back of property boundaries and are elevated and surrounded by planting buffers to achieve privacy. The main building entries are clearly visible and easily accessed from Mitchell Street and Henley Park. All communal open spaces are large and open with clear site lines and connectivity. The design will incorporate sophisticated CCTV and recording system, with cameras located at strategic locations such as entries, viewing letter boxes to deter identity theft, common lobbies, garbage chutes to deter problematic practices, lift, basement car park levels and main car

park. Intention is to also paint car park soffits white for improved safety and higher level of cost effective illumination.

PRINCIPLE 8: HOUSING DIVERSITY AND SOCIAL INTERACTION

“Good design achieves a mix of apartment sizes, providing housing choice for different demographics, living needs and household budgets.

Well-designed apartment developments respond to social context by providing housing and facilities to suit the existing and future social mix. Good design involves practical and flexible features, including different types of communal spaces for a broad range of people, providing opportunities for social interaction amongst residents.”

We have designed a large range of 1 bedroom, 2 bedroom and 3 bedroom apartment types to respond to market demand. We have large apartments to compact apartments and a range of sizes to increase affordability. The apartment range and types will ensure social mix and a vibrant occupant outcome for the building.

The proposal responds to the social context and needs of the community, by providing:

- A range of apartment sizes of 1, 2 and 3 bed units which reflects the minimum affordable housing sizes identified by the ADG (SEPP 65);
- Apartment sizes that respond to the social mix and demand in the area;
- Establishing residential housing stock in an area which is suitably situated proximate to travel opportunities (along main road routes and proximate to public transport options).

The development also intends to include a proportion of affordable rental housing consistent with the Metroplis of Three Cities by the Greater Sydney Commission.

PRINCIPLE 9: AESTHETICS

“Good design achieves a built form that has good proportions and a balanced composition of elements, reflecting the internal layout and structure. Good design uses a variety of materials, colours and textures.

The visual appearance of well-designed apartment development responds to the existing or future local context, particularly desirable elements and repetitions of the streetscape.”

The proposals material palette will be built from glass, natural colours and dark materials. The building is low in scale and has a horizontal proportion which is reinforced by the perimeter planting. The fully landscaped roof area allows the building to present itself as an extension of Henley Park.

The building responds to its unique park fronting location to create a benchmark for high density residential apartment buildings for the area. The material palette responds to the context and aims to minimise the building bulk and create an inviting atmosphere. The “U” shape of the building envelope further minimised building bulk and creates opportunities for landscaping to benefit inhabitants of the building and the streetscape. Design features such as frameless glazed balustrades add to diminish the building bulk and create a clean streamlined aesthetic.

ADG (SEPP65) COMPLIANCE SUMMARY

Apartment Design Guide - Tools for improving the design of residential apartment development

CLAUSE	OBJECTIVES	COMPLIANCE	COMMENTS
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PART 2 DEVELOPING THE CONTROLS

PRIMARY CONTROLS	2A	The rationale for setting primary controls needs to be explained to the community, applicants and practitioners.	COMPLIES	Refer to Urban Design report for further detail.
BUILDING ENVELOPES	2B	Building envelopes set the appropriate scale of future development in terms of bulk and height relative to the streetscape, public and private open spaces, and block and lot sizes in a particular location. Envelopes are appropriate when determining and controlling the desired urban form in town centres, brownfield sites, precinct plan sites and special sites such as those with heritage, significant views or extreme topography.	COMPLIES	Refer to Urban Design report for further detail.
BUILDING HEIGHT	2C	Building height helps shape the desired future character of a place relative to its setting and topography. It defines the proportion and scale of streets and public spaces and has a relationship to the physical and visual amenity of both the public and private realms. Height controls should be informed by decisions about daylight and solar access, roof design and use, wind protection, residential amenity and in response to landform and heritage.	COMPLIES	The principal justifications for greater height are; 1) Greater height should be permitted where adverse impacts such as overshadowing of existing residences can be minimised. 2) The height is necessary to support a set of public benefits. These include: improved pedestrian access network, catalyst for improvements on surrounding sites, improved public open space and access to Henley Park.
		Ensure that building height controls respond to the desired number of storeys, the minimum floor to floor heights required for future building uses and include generous ground floor heights	COMPLIES	Retail floor to floor height are set at 4.5m. All residential levels are set at 3.1m floor to floor. The above floor-to-floor height allow compliance to required ceiling heights.
FLOOR SPACE RATIO	2D	Ensure that development aligns with the optimum capacity of the site and the desired density of the local area.	COMPLIES	Subject to ratification of Planning Proposal.
		Provide opportunities for building articulation and creativity within a building envelope by carefully setting the allowable floor space.	COMPLIES	Room for building articulation has been taken into account as part of the concept design.
BUILDING DEPTH	2E	Ensure that the bulk of the development relates to the scale of the desired future context	COMPLIES	Refer to Urban Design report for further detail.
		Ensure building depths support apartment layouts that meet the objectives, design criteria and design guidance within the Apartment Design Guide.	COMPLIES	Preliminary apartment allocations comply with ADG (SEPP65) objectives of depth and design, and allow for further refinement at design development stage.
		Use a range of appropriate maximum apartment depths of 12-18m from glass line to glass line when precinct planning and testing development controls. This will ensure that apartments receive adequate daylight and natural ventilation and optimise natural cross ventilation	ACHIEVABLE	Maximum apartment depths of 18 metres from glass line to glass line are achievable. 70% of apartments are cross-ventilated.
		Test building depths against indicative floor plate and apartment layouts to ensure they can meet natural ventilation and sunlight requirements	COMPLIES	All ceiling heights comply with ADG (SEPP65), applied with indicative apartment allocations will achieve natural ventilation and sunlight requirements.
BUILDING SEPARATION	2F	Test building separation controls in plan and section	COMPLIES	Yes.
		Up to four storeys (approximately 12m): • 12m between habitable rooms/balconies • 9m between habitable and non-habitable rooms • 6m between non-habitable rooms	COMPLIES	The proposal provides adequate building separation in accordance with this standard. Separation between all buildings on site complies with ADG requirements. Separation and privacy is further enhanced by perimeter planting and extensive landscaping which provides a welcome, landscaped separation between the buildings. The proposal satisfies the underlying objectives primarily relating to residential privacy through adequate building separation distances, and provides publically accessible spaces throughout the development.
		Increase building separation proportionally to the building height to achieve amenity and privacy for building occupants and a desirable urban form.	COMPLIES	Sufficient open space and setbacks are dedicated as space to develop a successful and engaging landscaping masterplan.
STREET SETBACKS	2G	Determine street setback controls relative to the desired streetscape and building forms, for example: • define a future streetscape with the front building line • match existing development, • step back from special buildings, • retain significant trees, • in centres the street setback may need to be consistent to reinforce the street edge, • consider articulation zones accommodating balconies, landscaping etc. within the street setback, • use a setback range where the desired character is for variation within overall consistency, or where subdivision is at an angle to the street, • manage corner sites and secondary road frontages	COMPLIES COMPLIES COMPLIES COMPLIES COMPLIES COMPLIES COMPLIES	The proposal been designed to provide adequate street and site boundary set-backs.
		Identify the quality, type and use of open spaces and landscaped areas facing the street so setbacks can accommodate landscaping and private open space	COMPLIES	Sufficient setbacks are dedicated as space to develop landscaping.

ADG (SEPP65) COMPLIANCE SUMMARY

Apartment Design Guide - Tools for improving the design of residential apartment development

CLAUSE	OBJECTIVES	COMPLIANCE	COMMENTS
SIDE AND REAR SETBACKS	2H Test side and rear setbacks with height controls for overshadowing of the site, adjoining properties and open spaces	COMPLIES	Side set-backs have been tested against the existing prevailing setbacks on Mitchell Street, with setbacks established to minimise overshadowing on Mitchell Street properties.

PART 3 SITING THE DEVELOPMENT

SITE ANALYSIS	3A-1	Site analysis illustrates that design decisions have been based on opportunities and constraints of the site conditions and their relationship to the surrounding context. Each element in the Site Analysis Checklist should be addressed.	COMPLIES	The scheme is sensitive to the constraints and opportunities of the site. Complete compliance to the Site Analysis Checklist would be completed for a DA stage design.
ORIENTATION	3B-1	Building types and layouts respond to the streetscape and site while optimising solar access within the development.	COMPLIES	Lower building forms are located to the Eastern boundaries to provide the solar access in accordance with sections 3D. Communal and public open space and 4A Solar and daylight access. The south facade is stepped to prevent overshadowing to neighbouring Southern properties along Mitchell Street.
	3B-2	Overshadowing of neighbouring properties is minimised during mid winter	COMPLIES	Overshadowing of sites to the south is an important constraint of this site, so the building is stepped in the facade to Mitchell Street to avoid overshadowing. In this way it is achieved that there is no shadowing beyond the property lines from 9 a.m. to 3 p.m. on the winter solstice. The shadow diagrams show the extent of overshadowing on Mitchell Street and that even at Winter Solstice the shadows does not exceed the limit of the opposite properties at any time.
PUBLIC DOMAIN INTERFACE	3C-1	Transition between private and public domain is achieved without compromising safety and security.	COMPLIES	It is provided a separation between communal open spaces and the retail.
	3C-2	Amenity of the public domain is retained and enhanced.	COMPLIES	The scheme enhances public amenity through pedestrian and visual connections to Henley Park.
COMMUNAL AND PUBLIC OPEN SPACE	3D-1	An adequate area of communal open space is provided to enhance residential amenity and to provide opportunities for landscaping.	COMPLIES	Multiple interstitial spaces are provided throughout the proposed masterplan, allowing differing characters of space and use.
	3D-1	Communal open space has a minimum area equal to 25% of the site (see figure 3D.3)	COMPLIES	Communal open space area is approx. 5,000 m ² - 30% of the site area. This figure excludes roads, footpaths, setbacks etc. This exceeds the minimum range requirement for open space.
	3D-1	Developments achieve a minimum of 50% direct sunlight to the principal usable part of the communal open space for a minimum of 2 hours between 9 am and 3 pm on 21 June (mid winter)	COMPLIES	Principal communal Open Space is located in the two courtyard of buildings, more than 50% of Communal Open Space receives 3 hours direct sunlight during Winter Solstice, getting more than the requirements.
	3D-2	Communal open space is designed to allow for a range of activities, respond to site conditions and be attractive and inviting	COMPLIES	Sufficient space provided to make achievable with design development.
	3D-3	Communal open space is designed to maximise safety.	COMPLIES	Yes
	3D-4	Public open space, where provided, is responsive to the existing pattern and uses of the neighbourhood.	COMPLIES	Yes
DEEP SOIL ZONES	3 E-1	Deep soil zones provide areas on the site that allow for and support healthy plant and tree growth. They improve residential amenity and promote management of water and air quality	COMPLIES	Deep soil landscaped area is provided
	3 E-2	Deep soil zones are to meet the following minimum requirements: Area greater than 1,500m ² Minimum dimension 6m 7% of site deep soil	COMPLIES	Deep Soil area is approximately 1,000 m ² - 8% of the site area. This exceeds the minimum requirement for Deep Soil.
VISUAL PRIVACY	3F-1	Adequate building separation distances are shared equitably between neighbouring sites, to achieve reasonable levels of external and internal visual privacy.	COMPLIES	Where site boundaries back onto residential properties the set back is a minimum of 12 metres from the site boundary - this allows shared setbacks to comply with separation distance requirements. Refer to Urban Design report for further detail.

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CLAUSE	OBJECTIVES			COMPLIANCE	COMMENTS											
	3F-1	Separation between windows and balconies is provided to ensure visual privacy is achieved. Minimum required separation distances from buildings to the side and rear boundaries are as follows: <table><tr><th>Building height</th><th>Habitable rooms and balconies</th><th>Non-habitable rooms</th></tr><tr><td>up to 12m (4 storeys)</td><td>6m</td><td>3m</td></tr><tr><td>up to 25m (5-8 storeys)</td><td>9m</td><td>4.5m</td></tr><tr><td>over 25m (9+ storeys)</td><td>12m</td><td>6m</td></tr></table>	Building height	Habitable rooms and balconies	Non-habitable rooms	up to 12m (4 storeys)	6m	3m	up to 25m (5-8 storeys)	9m	4.5m	over 25m (9+ storeys)	12m	6m	COMPLIES	The proposal comply with the minimum building separation control.
Building height	Habitable rooms and balconies	Non-habitable rooms														
up to 12m (4 storeys)	6m	3m														
up to 25m (5-8 storeys)	9m	4.5m														
over 25m (9+ storeys)	12m	6m														
	3F-2	Site and building design elements increase privacy without compromising access to light and air and balance outlook and views from habitable rooms and private open space.	COMPLIES	Initial apartment allocations provide open aspect to all apartments, without directly looking onto other apartments.												
PEDESTRIAN ACCESS AND ENTRIES	3G-1	Building entries and pedestrian access connects to and addresses the public domain.	COMPLIES	Links provided through site, street frontage provided, access to public domain provided.												
	3G-2	Access, entries and pathways are accessible and easy to identify.	COMPLIES	Refer to objective 3G-1												
	3G-3	Large sites provide pedestrian links for access to streets and connection to destinations	COMPLIES	Refer to objective 3G-1												
VEHICLE ACCESS	3H	Vehicle access points are designed and located to achieve safety, minimise conflicts between pedestrians and vehicles and create high quality streetscapes.	COMPLIES	<ul style="list-style-type: none">• Driveway widths are set at a maximum of 6m.• The location of pedestrian entrances away from the vehicular driveway has been maximised.• Clearly defined separation of vehicular and pedestrian entries.												
BICYCLE AND CAR PARKING	3J-1	Car parking is provided based on proximity to public transport in metropolitan Sydney and centres in regional areas.	ACHIEVABLE	Achievable through further design development.												
	3J-2	Parking and facilities are provided for other modes of transport	COMPLIES	It is provided.												
	3J-3	Car park design and access is safe and secure	COMPLIES	The access into common circulation areas is direct and clearly visible.												
	3J-4	Visual and environmental impacts of underground car parking are minimised	COMPLIES	Yes												
	3J-5	Visual and environmental impacts of on-grade car parking are minimised	COMPLIES	It is not provided on-grade car parking												
	3J-6	Visual and environmental impacts of above ground enclosed car parking are minimised	COMPLIES	The car parking is on the basement, so it does not impact in the facade.												

PART 4 DESIGNING THE BUILDING

SOLAR AND DAYLIGHT ACCESS	4A-1	Living rooms and private open spaces of at least 70% of apartments in a building receive a minimum of 2 hours direct sunlight between 9 am and 3 pm at mid-winter in the Sydney Metropolitan Area and in the Newcastle and Wollongong local government areas	COMPLIES	Currently 80% of units have a North, East or West orientation and achieve in excess of 2 hours direct sunlight during mid-winter.
		A maximum of 15% of apartments in a building receive no direct sunlight between 9 am and 3 pm at mid-winter	COMPLIES	Just 15% of units do not receive direct sunlight between 9 am and 3 pm at mid-winter. To achieve the 85% skylights will be provide in the highest level.
		To maximise the benefit to residents of direct sunlight within living rooms and private open spaces, a minimum of 1m ² of direct sunlight, measured at 1m above floor level, is achieved for at least 15 minutes	COMPLIES	85% of units receive direct sunlight receive more than 1m ² , measured at 1 m above floor level, at least 15 min.
		Design incorporates shading and glare control, particularly for warmer months	ACHIEVABLE	Building articulation, shading devices etc not yet developed
	4A-2	Daylight access is maximised where sunlight is limited	ACHIEVABLE	Building articulation, shading devices etc not yet developed
	4A-3	Design incorporates shading and glare control, particularly for warmer months.	ACHIEVABLE	Building articulation, shading devices etc not yet developed
NATURAL	4B-1	All habitable rooms are naturally ventilated	COMPLIES	Yes
	4B-2	The layout and design of single aspect apartments maximises natural ventilation.	COMPLIES	The open plan unit layouts have been designed to maximise natural ventilation.
	4B-3	At least 60% of apartments are naturally cross ventilated in the first nine storeys of the building. Apartments at ten storeys or greater are deemed to be cross ventilated only if any enclosure of the balconies at these levels allows adequate natural ventilation and cannot be fully enclosed	COMPLIES	The development achieves 70% natural cross ventilation.
	4B-3	Overall depth of a cross-over or cross-through apartment does not exceed 18m, measured glass line to glass line	ACHIEVABLE	All apartments have the ability not to exceed 18m in depth.

ADG (SEPP65) COMPLIANCE SUMMARY

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CLAUSe	OBJECTIVES	COMPLIANCE	COMMENTS												
CEILING HEIGHTS	<div>4C-1</div> <div>Measured from finished floor level to finished ceiling level, minimum ceiling heights are:</div> <div><table><tr><th colspan="2">Minimum ceiling height for apartment and mixed use buildings</th></tr><tr><td>Habitable rooms</td><td>2.7m</td></tr><tr><td>Non-habitable</td><td>2.4m</td></tr><tr><td>For 2 storey apartments</td><td>2.7m for main living area floor 2.4m for second floor, where its area does not exceed 50% of the apartment area</td></tr><tr><td>Attic spaces</td><td>1.8m at edge of room with a 30 degree minimum ceiling slope</td></tr><tr><td>If located in mixed used areas</td><td>3.3m for ground and first floor to promote future flexibility of use</td></tr></table></div>	Minimum ceiling height for apartment and mixed use buildings		Habitable rooms	2.7m	Non-habitable	2.4m	For 2 storey apartments	2.7m for main living area floor 2.4m for second floor, where its area does not exceed 50% of the apartment area	Attic spaces	1.8m at edge of room with a 30 degree minimum ceiling slope	If located in mixed used areas	3.3m for ground and first floor to promote future flexibility of use	COMPLIES	<div>All habitable areas have minimum floor to floor of 3.1m, sufficient to provide minimum ceiling heights of 2.7 metres.</div> <div>The proposal complies with the minimum standards for floor to ceiling heights.</div>
Minimum ceiling height for apartment and mixed use buildings															
Habitable rooms	2.7m														
Non-habitable	2.4m														
For 2 storey apartments	2.7m for main living area floor 2.4m for second floor, where its area does not exceed 50% of the apartment area														
Attic spaces	1.8m at edge of room with a 30 degree minimum ceiling slope														
If located in mixed used areas	3.3m for ground and first floor to promote future flexibility of use														
	<div>4C-2</div> <div>Ceiling height increases the sense of space in apartments and provides for well proportioned rooms.</div>	COMPLIES	2.7 metres achieved throughout all apartments												
	<div>4C-3</div> <div>Ceiling heights contribute to the flexibility of building use over the life of the building.</div>	COMPLIES	Yes												
APARTMENT SIZE AND LAYOUT	<div>4D-1</div> <div>Apartments are required to have the following minimum internal areas:<ul style="list-style-type: none">• Studio = 35m²• 1 bedroom = 50m²• 2 bedroom = 70m²• 3 bedroom = 90m²The minimum internal areas include only one bathroom. Additional bathrooms increase the minimum internal area by 5m² each. A fourth bedroom and further additional bedrooms increase the minimum internal area by 12m² each.</div>	COMPLIES	All apartments will comply to minimum sizes												
	<div>4D-1</div> <div>Every habitable room must have a window in an external wall with a total minimum glass area of not less than 10% of the floor area of the room. Daylight and air may not be borrowed from other rooms.</div>	COMPLIES	Building breaks provide opportunity for all habitable rooms to have direct access to daylight.												
	<div>4D-2</div> <div>Habitable room depths are limited to a maximum of 2.5 x the ceiling height.</div>	COMPLIES	The maximum depth would be approximately 6.75 m. It is achieved in all rooms.												
	<div>4D-2</div> <div>In open plan layouts (where the living, dining and kitchen are combined) the maximum habitable room depth is 8m from a window.</div>	COMPLIES	All the units where the living, dining and kitchen are combined do not exceed 8m.												
	<div>4D-3</div> <div>Master bedrooms have a minimum area of 10m² and other bedrooms 9m² (excluding wardrobe space).</div>	COMPLIES	All master bedrooms have a minimum area of 10m².												
	<div>4D-3</div> <div>Bedrooms have a minimum dimension of 3m (excluding wardrobe space).</div>	ACHIEVABLE	Achievable												
	<div>4D-3</div> <div>Living rooms or combined living/dining rooms have a minimum width of:<ul style="list-style-type: none">• 3.6m for studio and 1 bedroom apartments• 4m for 2 and 3 bedroom apartments.</div>	COMPLIES	It is achieved.												
	<div>4D-3</div> <div>The width of cross-over or cross-through apartments are at least 4m internally to avoid deep narrow apartment layouts.</div>	COMPLIES	It is achieved.												
PRIVATE OPEN SPACE AND BALCONIES	<div>4 E-1</div> <div>All apartments are required to have primary balconies as follows:<ul style="list-style-type: none">• Studio apartments = Area = 4m²• 1 bedroom apartments = Area - 8m², Depth - 2m• 2 bedroom apartments = Area - 10m², Depth - 2m• 3+ bedroom apartments = Area - 12m², Depth - 2.4mThe minimum balcony depth to be counted as contributing to the balcony area is 1m</div>	COMPLIES	All balconies comply to minimum sizes												
	<div>4 E-1</div> <div>For apartments at ground level or on a podium or similar structure, a private open space is provided instead of a balcony. It must have a minimum area of 15m² and a minimum depth of 3m.</div>	ACHIEVABLE	Achievable through further design development at later stage.												
	<div>4 E-2</div> <div>Primary private open space and balconies are appropriately located to enhance liveability for residents.</div>	COMPLIES	All balconies are located adjacent to the living room to extend the living space.												
	<div>4 E-3</div> <div>Private open space and balcony design is integrated into and contributes to the overall architectural form and detail of the building.</div>	COMPLIES	They are designed to allow views and passive surveillance of the street.												
	<div>4 E-4</div> <div>Private open space and balcony design maximises safety</div>	COMPLIES	Yes												
COMMON CIRCULATION AND SPACES	<div>4F-1</div> <div>The maximum number of apartments off a circulation core on a single level is eight</div>	COMPLIES	It is achieved. The maximum number of apartments off a circulation core is in the order of 8.												
	<div>4F-1</div> <div>For buildings of 10 storeys and over, the maximum number of apartments sharing a single lift is 40.</div>	COMPLIES	Yes												
	<div>4F-2</div> <div>Common circulation spaces promote safety and provide for social interaction between residents.</div>	COMPLIES	Yes												

ADG (SEPP65) COMPLIANCE SUMMARY

Apartment Design Guide - Tools for improving the design of residential apartment development

CLAUSE	OBJECTIVES	COMPLIANCE	COMMENTS
STORAGE	4G-1 In addition to storage in kitchens, bathrooms and bedrooms, the following storage is provided: <ul style="list-style-type: none"> • Studio apartments = 4m3 • 1 bedroom apartments = 6m3 • 2 bedroom apartments = 8m3 • 3+ bedroom apartments = 10m3 At least 50% of the required storage is to be located within the apartment.	ACHIEVABLE	Achievable through further design development at later stage.
	4G-2 Additional storage is conveniently located, accessible and nominated for individual apartments.	COMPLIES	Yes
ACOUSTIC PRIVACY	4H-1 Noise transfer is minimised through the siting of buildings and building layout	COMPLIES	As discussed in response to 'Building Separation' (Part 2 Developing the Controls, Objective 2F), the proposal complies with the minimum building separation control being at least 6 m between habitable rooms/balconies for developments. The proposed separation satisfies the underlying objective to ensure acoustic privacy is maintained across the development.
	4H-2 Noise impacts are mitigated within apartments through layout and acoustic treatments.	COMPLIES	Internal apartment layouts separates noisy space from quiet spaces, rooms with similar noise are grouped together, doors separate different zones, wardrobes in bedrooms are colocated to act as sound buffers.
NOISE AND POLLUTION	4J-1 In noisy or hostile environments the impacts of external noise and pollution are minimised through the careful siting and layout of buildings.	COMPLIES	It has been follow design solutions to minimise impacts: non-residential buildings at lower level separating the residential component from the noise or pollution source, landscape design in Mitchell street reduces the perception of noise, etc.
	4J-2 Appropriate noise shielding or attenuation techniques for the building design, construction and choice of materials are used to mitigate noise transmission.	ACHIEVABLE	Achievable through further design development at later stage.
APARTMENT MIX	4K-1 A range of apartment types and sizes is provided to cater for different household types now and into the future.	COMPLIES	A range of unit sizes have been used to achieve a well-balanced unit mix including 1 bed, 2 bed and 3 bed apartments.
	4K-2 The apartment mix is distributed to suitable locations within the building.	COMPLIES	Yes
GROUND FLOOR APARTMENTS	4L-1 Street frontage activity is maximised where ground floor apartments are located	ACHIEVABLE	Achievable through further design development at later stage.
	4L-2 Design of ground floor apartments delivers amenity and safety for residents	ACHIEVABLE	Achievable through further design development at later stage.
FACADES	4M-1 Building facades provide visual interest along the street while respecting the character of the local area.	COMPLIES	It is achieved.
	4M-2 Building functions are expressed by the façade.	COMPLIES	It is achieved.
ROOF DESIGN	4N Roof treatments are integrated into the building design and positively respond to the street.	COMPLIES	It is achieved.
	4N-2 Opportunities to use roof space for residential accommodation and open space are maximised.	COMPLIES	It is provided communal open space on the roof.
	4N-3 Roof design incorporates sustainability features.	COMPLIES	It is achieved.
LANDSCAPE DESIGN	4O-1 Landscape design is viable and sustainable.	COMPLIES	It is achieved.
	4O-2 Landscape design contributes to the streetscape and amenity.	COMPLIES	It is achieved, it responds to the existing site conditions continuing with the park topography, paths, etc.
PLANTING ON STRUCTURES	4P-1 Appropriate soil profiles are provided.	ACHIEVABLE	Achievable through further design development at later stage.
	4P-2 Plant growth is optimised with appropriate selection and maintenance.	ACHIEVABLE	Achievable through further design development at later stage.
	4P-3 Planting on structures contributes to the quality and amenity of communal and public open spaces.	ACHIEVABLE	Achievable through further design development at later stage.
UNIVERSAL DESIGN	4Q-1 Developments achieve a benchmark of 20% of the total apartments incorporating the Liveable Housing Guideline's silver level universal design features.	ACHIEVABLE	Achievable through further design development at later stage.
	4Q-2 A variety of apartments with adaptable designs are provided.	ACHIEVABLE	Achievable through further design development at later stage.
	4Q-3 Apartment layouts are flexible and accommodate a range of lifestyle needs.	ACHIEVABLE	Achievable through further design development at later stage.
ADAPTIVE REUSE	4R n/a	n/a	n/a
MIXED USE	4S-1 Mixed use developments are provided in appropriate locations and provide active street frontages that encourage pedestrian movement.	COMPLIES	The retail is provided in the lower ground level, fronting and activating Henley Park.
	4S-2 Residential levels of the building are integrated within the development, and safety and amenity is maximised for residents.	COMPLIES	There are different entries to residential and retail. The retail entry is accessible from the street and it is separated from the residential components.
AWNINGS AND SIGNAGE	4T-1 Awnings are well located and complement and integrate with the building design.	ACHIEVABLE	Achievable through further design development at later stage.
	4T-2 Signage responds to the context and desired streetscape character.	ACHIEVABLE	Achievable through further design development at later stage.
ENERGY EFFICIENCY	4U-1 Development incorporates passive environmental design.	COMPLIES	Yes.

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CLAUSE	OBJECTIVES	COMPLIANCE	COMMENTS
	4U-2 Development incorporates passive solar design to optimise heat storage in winter and reduce heat transfer in summer.	ACHIEVABLE	Achievable through further design development at later stage.
	4U-3 Adequate natural ventilation minimises the need for mechanical ventilation.	COMPLIES	Approximately 70% of apartments are naturally cross ventilation. All habitable rooms have natural ventilation.
WATER MANAGEMENT AND CONSERVATION	4V-1 Potable water use is minimised.	ACHIEVABLE	Achievable through further design development at later stage.
	4V-2 Urban stormwater is treated on site before being discharged to receiving waters.	ACHIEVABLE	Achievable through further design development at later stage.
	4V-3 Flood management systems are integrated into site design.	ACHIEVABLE	Achievable through further design development at later stage.
WASTE MANAGEMENT	4W-1 Waste storage facilities are designed to minimise impacts on the streetscape, building entry and amenity of residents.	COMPLIES	There are adequately sized storage areas located discreetly in the lower ground. They are well ventilated.
	4W-2 Domestic waste is minimised by providing safe and convenient source separation and recycling.	ACHIEVABLE	Achievable through further design development at later stage.
BUILDING MAINTENANCE	4X-1 Building design detail provides protection from weathering.	ACHIEVABLE	Achievable through further design development at later stage.
	4X-2 Systems and access enable ease of maintenance.	ACHIEVABLE	Achievable through further design development at later stage.
	4X-3 Material selection reduces ongoing maintenance costs.	ACHIEVABLE	Achievable through further design development at later stage.

