

DESIGN VERIFICATION STATEMENT

RESIDENTIAL DEVELOPMENT FOR
AT 65-67 RAILWAY STREET, GRIFFITH
TO ACCOMPANY DA SUBMISSION
CLIENT: JOSS GROUP
PREPARED BY GRA DESIGN PTY LTD &
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DESIGN QUALITY PRINCIPLES

In all design principle matters the objectives of The Apartment Design Guide (ADG) have been incorporated within the body of the DA document. As such these responses are intended as a summary.

PRINCIPLE NO.1: CONTEXT

Good design responds and contributes to its context. Context can be defined as the key natural and built features of an area.

Responding to context involves identifying the desirable elements of a location's current character or, in the case of precincts undergoing a transition, the desired future character as stated in planning and design policies. New buildings will thereby contribute to the quality and identity of the area.

Located close to the main business area of Griffith, the proposal responds to both the existing character of the area and addresses the need to deliver high quality residential dwellings. Its unique position in a developed setting provides the opportunity to create a building that adds to the character of the area; it forms a punctuation point to the northern edge of the town centre and Memorial Park, creating a framing and closure element.

Visual glimpses from the town through the existing building fabric are maintained and distant views of the hills beyond are provided for residents and the public.

In addition to responding to the existing context, the proposal aims to create a high standard of building quality and

amenity. The existing Quest apartment building to the east sets the scene for the nature of this precinct. The proposal will continue the scale and massing now established.



1 View from Memorial Park

PRINCIPLE NO.2: SCALE

Good design provides an appropriate scale in terms of the bulk and height that suits the scale of the street and the surrounding buildings.

Establishing an appropriate scale requires a considered response to the scale of existing development. In precincts undergoing a transition, proposed bulk and height needs to achieve the scale identified for the desired future character of the area.

The site is located on a distinctive rectangle of land bound on 3 sides by public streets and on the north side by a railway precinct that is in current use. Lot 1, the proposed development is bound by

a public carpark to the west and the Quest Serviced Apartments to the east. The Quest is the only significant structure within this area and has set the tone for scale and bulk.

The proposal will match the height of the Quest, both being 4 storeys, ie ground plus three floors.

We consider this massing to be a good fit for the scale of this precinct.



2 South East corner of proposal

PRINCIPLE NO.3: BUILT FORM

Good design achieves an appropriate built form for a site and the building's purpose, in terms of building alignments, proportions, building type 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 building form proposed is a simple and directly readable form. It is essentially a 3 floor rectangle sitting over a ground floor base, mainly in colour backed glass. The long extent of this façade, some 52 metres, is divided into 3 smaller elements to soften and modulate its effect. The 2 lobbies serve as a dark patterned divider of the 3 white residential elements. This establishes a good proportion for the main presentation façade.

While the south façade is the street side mostly seen, it is also the south side which does not produce winter sunshine for the residents. The majority of apartments therefore face the north side which provides the required winter sun. This is a good outcome for apartment design.

As a result of the northerly aspect, generous balconies are provided with a part concrete and part glass balustrade. This is a dominant element in the north & south facades. These balconies are angled and have a curved corner, and provide the main visual character of the facades. The rhythm set up by the repetition of the balconies provides a pleasing division in a long façade. Large glass elements at the lobbies, facing south punctuate the walls deriving the benefit of good controlled light.

The selected materials were selected to provide a harmonious and balanced palette to complement the design form. Walls are mainly in precast or in-situ concrete painted with a hi-build screen with a highlight panels in copper coloured metal panels between windows. The provision of these masonry materials balance the effects of glass in modern buildings, thus reducing reflectivity and glare.



3 View of vehicular entry to west of site

While the building form is relatively large, because of its location, next to the railway zone, it does not overshadow any existing properties. It is sufficiently detached from residential or business properties around Banna Avenue to have any negative effect.. Long winter shadows will fall mainly on Memorial Park to the south.

Apartment layouts are carefully considered to embrace the following:

- *Sensitive separation of public and private spaces*
- *Avoidance of waste spaces in planning*
- *Avoidance of living/bedroom conflicts*
- *Large balconies with maximum daylight*
- *Cores with natural light*
- *Northerly aspect to most apartments*
- *Garbage collection via chutes directly to basement collection*

In summary, these apartments are a high quality characterised by generous floor spaces and large balconies, north orientation and lobbies that are naturally lit and ventilated.

Parking for residents is provided in excess of the required rate, whereby all apartments have at least 1 designated car space. These will be under cover, mainly located to the northern boundary, in line with the Quest parking next door. Other cars are provided under the building at the east and west ends. Note that the road way is a one way circuit from east to west.

The northerly parking (for about 22 cars) is located over a sewer easement. We maintain that access to the underground sewer is feasible and adequate. In a worst case, the metal rood cladding can be easily removed, as can the purlins. The 2 manholes on site are freely accessible. This situation duplicates the Quest arrangement next door which also parks over the same sewer easement.

Garbage collection is provided via a chute accessed from the main corridors. The chute will take 2 types of refuse, garbage and recyclable, which will divert at the ground floor collection room. From there the bins, 660l (or 1100l) are wheeled out to the carpark yard and placed in the Garbage room awaiting collection. A small garbage collector will come past, travelling in a forward direction to collect these bins, probably once a week. A Garbage collection enclosure is provided in the north-east corner, also constructed of metal fencing material and not built as a standard building.

The ground floor contains a mix of

apartments and services. To the north side 4 garden apartments will have generous courtyards and access to the apartments' public open space. The remainder of the ground floor contains, lobbies, stairs, service rooms, stores and private store boxes for the residents.

PRINCIPLE NO.4: DENSITY

Good design has a density appropriate for a site and its context, in terms of floor space yields (or number of units or residents).

Appropriate densities are sustainable and consistent with the existing density in an area or, in precincts undergoing a transition, are consistent with the stated desired future density. Sustainable densities respond to the regional context, availability of infrastructure, public transport, community facilities and environmental quality.

While density, with FSR controls is not applicable, this development would be considered low to medium density. Despite the multi storeyed nature of this building the notional FSR translates to approximately 1:1.2 which is not considered high for medium density housing. This indicates that a useable open space is available for the benefit of the residents.

PRINCIPLE NO.5: RESOURCE, ENERGY AND WATER EFFICIENCY

Good design makes efficient use of natural resources, energy and water throughout its full life cycle, including construction.

Sustainability is integral to the design process. Aspects include demolition of existing structures, recycling of materials, selection of appropriate and sustainable materials, adaptability and reuse of buildings, layouts and built form, passive solar design principles, efficient appliances and mechanical services, soil zones for vegetation and reuse of water.

The proposal aims to set desirable benchmarks in sustainability, both in construction and in the continuing life of the building. A combination of passive design and active sustainable systems are proposed to minimise the environmental impact of the building while maximising the amenity of the occupants. Refer to all attached engineering reports on mechanical, electrical, structural, hydraulic & fire.



4 View of entry & side parking

These Include meeting the requirements of Basix, provision of substantial areas of soil and planting to assist in natural water absorption and runoff and planting of appropriate water hardy species.

Features of the ESD inclusions are

- *laundry facilities in each apartment and generous balconies for drying of clothes.*
- *passive solar design enhances*

natural heating and cooling,

- *apartments provide good natural ventilation, reducing electrical output*
- *solar collection devices contribute to energy input from natural sources*
- *generous window sizes promote natural light usage, rather than electrical.*



5 North private open space courtyard

PRINCIPLE NO.6: LANDSCAPING

Good design recognises that together landscape and buildings operate as an integrated and sustainable system, resulting in greater aesthetic quality and amenity for both occupants and the adjoining public domain.

Landscape design builds on the existing site's natural and cultural features in responsible and creative ways. It enhances the development's natural environmental performance by coordinating water and soil management, solar access, micro-climate, tree canopy and habitat values. It contributes to the positive image and

contextual fit of development through respect for streetscape and neighbourhood character, or desired future character.

Landscape design should optimise useability, privacy and social opportunity, equitable access and respect for neighbours' amenity, and provide for practical establishment and long term management.

The landscape design is appropriate for the Griffith micro climate and ensures local native species are planted in natural and generous ways.

Outdoor areas are set up for the recreational aspirations of the residents. At the rear courtyard which contains picnic facilities, seating and attractive landscaping, generous and enjoyable outdoor activities are possible for the residents.

Landscaping provides privacy and amenity to the occupants and integrates the building with its surroundings. In keeping with the sustainable goals of the development, the landscaping proposed improves the amount of vegetation on the site. The landscape plans show the extent and type of species as well as the external living areas.

PRINCIPLE NO.7: AMENITY

Good design provides amenity through the physical, spatial and environmental quality of a development.

Optimising amenity requires appropriate room dimensions and shapes, access to sunlight, natural ventilation, visual and

acoustic privacy, storage, indoor and outdoor space, efficient layouts and service areas, outlook and ease of access for all age groups and degrees of mobility.

The proposal provides a high quality environment which takes advantage of the north facing building, the uninterrupted views, the location next to Memorial Park, the privacy of the locality and the strong identity of the site. These in combination with generous landscaped settings and well-designed apartments provide good amenity for the residents.

Pedestrian entry to the development is via a single lobby located at the south-eastern corner off Railway Street. Vehicular access is via a 1-way circuit entered at the western end. All access is secured and the vehicular entry and exit are fenced in.

The open spaces to the north include:

- *a garbage collection space in line with the rear carparking*
- *a sprinkler pump and 2 off 25000 litre water tanks*
- *a garbage collection room from a chute*
- *a cleaner's room*
- *a store room*
- *private storage boxes for all apartments*

Refer to appendix 1 for an analysis of ADG issues.

PRINCIPLE NO.8: SAFETY AND SECURITY

Good design optimises safety and security, both internal to the development and for the public domain.

This is achieved by maximising overlooking of public and communal

spaces while maintaining internal privacy, avoiding dark and non visible areas, maximising activity on streets, providing clear, safe access points, providing quality public spaces that cater for desired recreational uses, providing lighting appropriate to the location and desired activities, and clear definition between public and private spaces.

The location of the site calls for the consideration of security for residents and the public.

Being located near the town proper, with a moderate level of pedestrian activity there will be a need to maintain security from the public and other users for the development.

All ground floor apartments have their own outdoor space attached, all adequately secured with 1800mm fence. Sightlines from all parts of the building allow for good views of semi obscured spaces.

Lighting design is of particular significance in maintaining safety at night times. This must be balanced with privacy issues.

All carparking is located securely under cover with good sightlines within this space.

PRINCIPLE NO.9: SOCIAL DIMENSIONS

Good design responds to the social context and needs of the local community in terms of lifestyles, affordability, and access to social facilities.

New developments should optimise the provision of housing to suit the social mix and needs in the neighbourhood or, in the

case of precincts undergoing transition, provide for the desired future community.

New developments should address housing affordability by optimising the provision of economic housing choices and providing a mix of housing types to cater for different budgets and housing needs.

The development is responding to a need in Griffith for apartment style accommodation. It allows a selection of housing that caters to all social contexts within this growth area. A good mix of apartment types is provided, with the majority, 67% 2 bedrooms, 11% 1 bedroom and 22% 3 bedrooms.

PRINCIPLE NO.10: AESTHETICS

Quality aesthetics require the appropriate composition of building elements, textures, materials and colours and reflect the use, internal design and structure of the development. Aesthetics should respond to the environment and context, particularly to desirable elements of the existing streetscape or, in precincts undergoing transition, contribute to the desired future character of the area.

Located on a prominent site, exposed to 4 directions and from distance, the development can be said to be significant.

It has been carefully considered for viewing and location from all directions and attempts to achieve a well proportioned, diverse and balanced spatial construct.

As a punctuation for the Town Centre, it will form a book end to frame the commercial activities to its south.

Individualised aspects of the building will give it its own character and identity and be recognisable to the surrounding area.

The building form aims to create a robust and continuous statement, setting the tone for the precinct with a highly articulated and strong design. Colour forms an integral part of the architectural statement in providing variation, diversity and contrast.

Proportions are carefully considered creating attractive rectangular shaped contrasts. The curvilinear element at walls and balconies will soften the strict rectilinear forms.

APARTMENT DESIGN GUIDE

The Apartment Design Guide (ADG) is a publication produced by The Planning & Environment Department of the NSW Government. It has been produced as a tool for improving the design of residential apartment development. While termed as a guide, it is nevertheless considered as a base standard for apartment design in NSW and this project, in Griffith has aimed to abide by these standards. The principles contained within this document are used in conjunction with State Environmental Planning Policy No 65, known as SEPP 65.

The main issues that determine the character and quality of a development are:

3A. Site Analysis: The site shape is a rectangle with the long dimension running east/west. This is a fortuitous arrangement in that the majority of the site can face north (and south). The SEPP analysis as shown in Appendix 1 shows that a majority of apartments have a northerly orientation. The lowest sun angle on June 21 still allows for sun to penetrate the ground floor apartments. The railway lines to the north of the site will create no overshadowing. With judicious landscaping, the railway precinct will be visually screened from the apartments, while the sound insulation will comply with the Acoustic recommendations by the Consultant.

The site is next to the 4 storeyed Quest Apartment building to the east and will be of similar height and massing. The setbacks to the site are generous with a 23m setback on the north side, 7.2m to

the east & west and 6m to the south; this indicates that the proposal is not maximising footprint or FSR and provides pleasant, landscaped edges to the building.

There are no significant trees on the site which would require retention.

The entry is an important part of the proposed design. All entries will be secured and will require permission from the residents for access; this applies to pedestrians, car drivers and deliveries.

Street parking is available for these visitors, but they must also request permission to enter.

Car parking has been an important part of the design process. There are 2 points of access to the site; entry at the west side and exit to the west. The traffic flow is one-way. Note that entry will be left in only and exit will be left out only. A median strip in Railway Street will prevent right hand turns. Resident parking will be under cover. Visitor spaces are provided as per the DPC guidelines.

3B Orientation; it is considered advantageous for apartments in Australia generally to have a northerly orientation because summer sun position is high and winter sun position is low. This orientation provides the maximum benefits and the development has been designed around this feature, whereby a majority of apartments face north. Please note that normal apartment design must distribute main external walls with orientations of North, East and West. South facing apartments are to be

avoided although a certain portion are allowed under the ADG & SEPP 65. Refer to Appendix 1.

Views of the surrounding topography and distant hills will be a feature of this proposal. Most apartments, ie from level 1 up will have views either to north or south. This will be a highly desirable aspect of the apartments.

3C Public Domain Interface. The main building fabric is set back significantly from streets and boundaries. This area will be attractively landscaped, providing a very attractive transitional zone. All ground floor apartments have generous courtyards, fenced in and well over the minimum depths and areas required. Refer to appendix 1 for details. Servicing has been located to integrate seamlessly with the development with most rooms located away from street public view.

3D Communal Open Space. As discussed above in the introduction, open space as private or communal is an integral part of the design and has been very generously allocated. The rear private open space features prominently for all residents who will have easy access to this space. The ADG requires a minimum of 25% of the site to have communal open space for the benefit of residents . The proposal satisfies this criteria with the following:

1. Site Area 3304m²
2. Open Space on ground: 838m²
3. That is 25.3% of the site
4. Deep soil is required for 7% of the site. This is satisfied with approximately 600m² of deep soil (18%)

The rear courtyard will be of particular benefit to the residents as it is readily accessible and also visually satisfying as a verdant landscaped outlook. Privacy is not compromised due to the visual separation created between upper level balconies and eyeline level fences on ground level. Safety of users is also assured as the ground is generally level.

3E Deep Soil Zones. As stated, this development provides well in excess of the minimum requirement. Deep soil is located throughout the site, thereby ensuring that major trees will be possible on the site.

3F Visual Privacy. This issue has been a fundamental inclusion during the design process. The following features are embedded within the design:

1. Ground floor apartments have 1.8 high walls around their private open spaces
2. Balustrades at upper levels are solid up to 400mm and glazed above
3. Screens are provided between adjoining balconies, avoiding visual intrusion by neighbours
4. Bedrooms are grouped adjacent to neighbours' bedroom for acoustic privacy.
5. Heka steel frames 300 deep surround windows thereby providing visual privacy from angled views.
6. East facing windows will look onto the Quest west façade which does not include room windows. Only a corridor window is located there.

3G Pedestrian Access & Entries. There is one pedestrian access point facing Railway Street. This is a secure entry point requiring tenant approval to enter. Access to the side roads is via secure gates. Cars

will also require security clearance to enter as the building is strategically fenced all round.

3H Vehicle Access. Vehicles, which are integral to the proper workings of a residential development have been fully integrated within the design. The following features are included:

1. *The façade does not have any vehicular penetrations. This ensures that all elements are at human scale.*
2. *Access points are kept to a minimum with 2 entries in a one-way circuit.*
3. *Garbage collection is clearly set up to occur at ground level.*

3J Bicycle & car parking. Car parking has been provided in line with the Griffith guidelines. Refer to appendix 1 for details of requirements. All parking conforms with the Australian Standard 2890 and comprises:

1. *Layout is simple and direct. Lobby is clearly identified.*
2. *Visitor parking generally located at non covered spaces.*
3. *Bicycle parking is located in a specific zone near the entry ramp.*
4. *Motor bike parking is located in a specific zone at the base of the main ramp.*

4A Solar & Daylight Access. This criteria is one of the most determining issues for apartment design. The base guideline is for apartments to have a minimum of 3 hours of direct sunlight on June 21 (mid-winter) between 9am & 3pm, and a maximum of 15% receiving no sun at all. With most of the apartments having a northerly orientation and a small proportion with east or west, the project achieves 78% of compliant apartments

with a minimum of 70% required. The remaining 22% achieve a rating of 0 hours. These 6 apartments face the Memorial Park which is considered a strong and positive alternative. While sun and daylight access is important, protection from excess sun is also needed to reduce energy usage. Sun protection devices are provided in accordance with the orientation of the facades. These are provided by means of balcony overhangs and protruding window frames.

4B Natural Ventilation This criteria attempts to create natural through-ventilation by having openings within an apartment on opposite or contiguous sides. We have put forward a proposal that we consider satisfies the ADG guidelines. This design is outlined on drawing DA17. This proposal provides natural cross ventilation by means of the front doors being opened and fitted with a "Crimsafe" screen door which can remain shut and allows for air to pass through the apartments and into the lobby corridor. The 2 lobbies have louvred openings to the outside which will maintain cross ventilation. With this design, a majority of 71% of apartments are cross-through and achieve this. The minimum requirement is 60%.

4C Ceiling Heights. The minimum ceiling height required in habitable rooms is 2.7m. This is achieved uniformly in the whole complex, with a floor-to-floor height of 3.2m. This is considered a comfortable height to incorporate structure and servicing. Some zones, such as bathrooms and servicing areas can have a 2.4m ceiling height. This may occur

where air conditioning air handling units are located

4D Apartment Size and Layout. The sizes of apartments provided are well in excess of the minimum requirements which are Studio: 35m², 1 bedroom: 50m², 2 bedroom 70m² and 3 bedroom 90m². Refer to appendix 2 for details. Further, all rooms have external wall access and windows. Apartment design has been carefully considered to provide:

1. *Living rooms with balcony access to sunlight and outlook*
2. *Separation of living and sleeping zones*
3. *Main bedroom with en-suite and walk-in-robe. .*
4. *A minimum of 1.5m wardrobe length in all bedrooms*
5. *Minimal circulation space and corridors.*

4E Private Open Space & Balconies. All apartments are provided with private open spaces, either at ground level or on upper levels. All these conform with

1. *The minimum spatial requirements of studios 4m², 1 bedroom 8 m², 2 bedroom 10 m² & 3 bedroom 12 m². The areas provided are well in excess of these.*
2. *The minimum depths of balconies, as per item 1 above are also conforming*
3. *Balconies combine solid and transparent edging to optimise privacy and transparency*

4F Common Circulation & Spaces. The maximum number of apartments per core on a level is eight. Lobbies provide natural light and are louvred to provide natural ventilation. The spaces are direct and easily read.

4G Storage. Minimum volumes of storage are proscribed for apartments as follows; Studio 4m³, 1 bedroom 6m³, 2 bedroom 8m³ and 3 bedroom 10m³. At least 50% of this volume to be provided within the apartment. The development provides this. An area on the ground floor has been allocated for this storage, with a minimum 7.5m³ provided in each storage cage, in excess of the minimum. A special store room is also provided for large item storage such as beds, TV's etc.

4H Acoustic Privacy. This is a most important issue in providing comfortable living conditions for residents. There are 2 aspects to this:

1. *Acoustic privacy between apartments and*
2. *Noise insulation from the railway line to the north.*

To achieve these outcomes, an acoustic consultant is on the team to advise. It is essential that these minimum levels of insulation are achieved. Refer to the consultant's report for details of treatment.

4J Noise & pollution. There are 2 sources of noise pollution on this site:

1. *Railway Street to the south and*
2. *Railway corridor to the north*

Railway Street carries light traffic volumes and is not considered a high level of noise discomfort. The south façade of the building is set back 6 metres from the kerb which is a good distance to alleviate any noise.

The Railway Corridor is a specific noise pollutant, occurring at regular times but infrequently. This has been considered a major design factor for the north

elevation. Basic design methods for this include:

1. *Window openings to bedrooms have been limited and reduced in size*
2. *Windows are glazed and sealed in accordance with noise insulation guidelines.*
3. *The main walls are in concrete, which has mass and good sound absorption*

A report has been prepared by the Acoustic Engineer which specifies the means taken to alleviate this important issue.

4K Apartment Mix. The client brief has generated the mix of apartments, generally based on the needs of the current market & community. The apartment mix for Stages 1 & 2 is as follows:

1. *1 Bed....3*
2. *2 Bed....19*
3. *3 Bed....6*
4. *Total....28*

A substantial proportion of apartments are 2 bedrooms (67%). The apartments are also slightly larger than would be found typically. The level of amenity provided in this development is considered high and above average condition.

4L Ground Floor Apartments. There are 4 apartments located on the ground floor. These have the following positive features:

1. *All have a northerly aspect*
2. *All ground floor apartments have a generous private open spaces (refer to appendix 2)*
3. *All apartments are fenced to 1.8m height*

4. *All apartments have gates to the public space*
5. *A good mix of landscaping & paving is provided*

The above features indicate that a high level of amenity is provided for these ground floor apartments.

4M Facades. The design of the facades is a vital and fundamental part of the design process. The nature and scale of this building will have a significant effect on the Griffith urban fabric and will be seen from many viewpoints. Design features that have been integrated in the design include:

1. *A balanced composition of building elements.*
2. *Well considered textures, materials & colours*
3. *Reflection of the interior layout in the external appearance.*
4. *Establishing a rhythm in the shapes in order to produce a human scale.*
5. *Detailed design of façade elements.*
6. *Horizontal & vertical variance in treatment*
7. *Integration of building services within the design; avoid the prominence of service items such as mechanical, electrical or hydraulic items on the façade.*
8. *Prominence of building entry*



6 Part South Elevation

The design process has utilised several repetitive elements to achieve a balanced and inspiring sculptural construct:

1. *Balconies have a specific shape, not parallel to the façade and include a radial corner. These will be a major element of delight.*
2. *The materials are sharply contrasted with the use of pre-finished concrete and metallic panels*
3. *Judicial use of glazing on different facades.*
4. *Well-proportioned walls that are divided by grooves and metal frames.*

In summary, the design proposed is a unique and site-appropriate combination of forms and materials that will provide a landmark for Griffith.



7 West Elevation

4N Roof Design. Quality roof design provides a positive addition to the character of an area and forms an important element in the skyline. The roof line reflects a flat concrete roof and well-finished louvred fencing to the mechanical and services plant area. The roof area is non-accessible and provides access for servicing to plant and PV cells.

4O Landscape Design. The proposed landscape plan is integral to the design and an important element in the overall concept. The large rear courtyard is the central feature of the whole concept and will be accessible to all residents. It will also provide an outlook for the residents on the north side. Features include:

1. *Shading trees provided all around the site.*
2. *Diversity in planting species.*
3. *Activity zones delineated throughout such as barbeques, quiet rest areas,*
4. *Diversity of materials*
5. *The north courtyard has not only been designed to serve as an amenity for all residents, but as an outlook to the upper level apartments. The pattern and rhythm of design with overlapping rectangles serves as an artistic beautiful work of art to contemplate.*

Refer to the Landscape Architects drawings for full details.

4P Planting on Structures. Planting will be provided by the residents on balconies in private planters. No upper level planting is included in the proposal.

4Q Universal Design. This philosophy allows for apartments to change in time adapting to the needs of occupants. The features included in this development that conform with this desired outcome are:

1. *Allows for a variation in use of certain rooms.*
2. *Has convenient access to the communal and public areas*
3. *Minimal structural changes when an apartments needs to be adapted because of the large spans and few*

columns provided in the structural design

4. *All car parking spaces will be allocated and clearly visible.*

4R Adaptive re-use. The site is a greenfield zone and contains no existing buildings that need to be considered for this purpose.

4S Mixed Use. The project is designated as a fully residential project and mixed use is not relevant.

4T Awnings & Signage. These are a minor element in this context as there is no urban street frontage. The Entry is provided with an awning. The following criteria have been included:

1. *Protection from sun and rain are provided at entry and at balconies.*
2. *Awning provides a clear instance of entry location*
3. *Gutters and downpipes will be concealed , as for the whole design.*
4. *Good lighting is to be provided for safety at night times.*
5. *Minor signage will be provided to identify the apartment locations at entry*
6. *Way finding will be integrated in the design by appropriate signage.*

4U Energy efficiency. The aim of the technological energy approach to this proposal is to manage thermal performance and daylight access, thereby producing increased amenity to residents and reducing energy usage. The means to achieve these is, in part:

1. *Good natural light provided to all habitable rooms*

2. *High quality glass use on all elevations, but especially to the west side.*
3. *Well insulated walls, roof & good door and window seals.*
4. *Overhang and screen protection to windows on all elevations.*
5. *Heating & cooling infrastructure is located in predetermined locations on the roof.*
6. *Rooms with similar usage are grouped together.*
7. *Natural cross-ventilation is available in order to reduce the use of mechanical equipment.*
8. *The BASIX report which accompanies this report comes to the following project scores:*
 - a. *Water: Target: 20, Score achieved*
 - b. *Thermal: Target: pass, score: pass*
 - c. *Energy: Target 35, score: achieved*
9. *Refer to the Multi-disciplinary Services Brief prepared by Engineering Consultants for a complete description of all services to be applied to this project.*

4V Water Management & Conservation.

The details of water management are outlined in the BASIX Report as well as the Engineering Services report. General features include:

1. *The integrated management of water in all its usage such as potable, rainwater, wastewater, stormwater & ground water.*
2. *The means employed ensure that systems employed minimise potable water use and reduce energy wastage.*
3. *Water efficient fittings are applied*
4. *Apartments are individually metered*
5. *Rainwater is collected and reused on site*

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| <ol style="list-style-type: none"> 6. <i>Appropriate plant selections made in relation to water usage.</i> 7. <i>Porous and open paving materials</i> 8. <i>Detention tanks utilised</i> 9. <i>BASIX water target use is 20 & this project achieves that.</i> | <ol style="list-style-type: none"> 4. <i>Natural materials that take into account the ageing process.</i> 5. <i>Ground level surface that are easily cleaned and graffiti resistant</i> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

4W Waste Management. The waste management of the project has been carefully considered in order to contribute to positive physical amenity of the building as well as minimising any harmful effects on the environment. The collection of waste has been made safe and convenient and is fully integrated in the building design.

Chutes are provided in garbage rooms that are located at the lobby, adjacent to the lifts. These are mechanically ventilated and fire protected. The chute directs waste to the garbage room on the ground floor where large bins are located to collect both normal garbage and recycled goods. From there the maintenance crew relocates and replaces the bins; they are taken to the collection area in the rear carpark garbage room and from there collected weekly by the garbage contractor.

Overall, garbage is handled in a way that is separated from the main residential activities; it has been fully integrated within the design.

4X Building Maintenance. The design has aimed to achieve longevity by the selection of quality materials and good detailing. Some features that will enhance the life cycle of the project are:

1. *Roof or awning overhangs above windows*
2. *Drip lines to horizontal edges*
3. *Methods for window cleaning are proscribed within the design*

APPENDIX 1 APARTMENT DESIGN GUIDE- MAIN MEASURABLE BUILDING ELEMENTS

APT	LEVEL	BEDS	GFA m ²	PARKING	DAYLIGHT ¹	X-VENT ²	SIZE ³	OPEN-S ⁴	STORAGE ⁵
GROUND									
G01	G	2	85	1	✓	✓	✓	✓	✓
G02	G	2	85	1	✓	X	✓	✓	✓
G03	G	2	85	1	✓	X	✓	✓	✓
G04	G	2	85	1	✓	✓	✓	✓	✓
LEVEL 1									
101	1	3	111	2	✓	✓	✓	✓	✓
102	1	2	85	1	✓	✓	✓	✓	✓
103	1	2	85	1	✓	✓	✓	✓	✓
104	1	2	85	1	✓	✓	✓	✓	✓
105	1	2	85	1	✓	✓	✓	✓	✓
106	1	3	111	2	✓	✓	✓	✓	✓
107	1	2	85	1	X	X	✓	✓	✓
108	1	1	60	½	X	X	✓	✓	✓
LEVEL 2									
201	1	3	111	2	✓	✓	✓	✓	✓
202	1	2	85	1	✓	✓	✓	✓	✓
203	1	2	85	1	✓	✓	✓	✓	✓
204	1	2	85	1	✓	✓	✓	✓	✓
205	1	2	85	1	✓	✓	✓	✓	✓
206	1	3	111	2	✓	✓	✓	✓	✓
207	1	2	85	1	X	X	✓	✓	✓
208	1	1	60	½	X	X	✓	✓	✓
LEVEL 3									
301	1	3	111	2	✓	✓	✓	✓	✓
302	1	2	85	1	✓	✓	✓	✓	✓
303	1	2	85	1	✓	✓	✓	✓	✓
304	1	2	85	1	✓	✓	✓	✓	✓
305	1	2	85	1	✓	✓	✓	✓	✓
306	1	3	111	2	✓	✓	✓	✓	✓
307	1	2	85	1	X	X	✓	✓	✓
308	1	1	60	½	X	X	✓	✓	✓
TOTALS	28 Aptmts	19x2B 6x3B 3x1B	100% Above Min'	32.5 REQU'D + 5 Visitors 39 Provided	22 78%	20 71%	100%	100%	100%

65-67 RAILWAY ST GRIFFITH RESIDENTIAL DEVELOPMENT

LEGEND	ISSUE	ADG COMPLIANCE REQUIREMENTS	RESULT	PERCENTAGE COMPLIANCE
1	DAYLIGHT & SUNLIGHT	<i>Daylight provided as per 4a of ADG; 3 hours minimum on 22 June</i>	22 apartments achieve the 3 hour minimum on 22 June. This is mainly due to the northerly orientation of these apartments. (70% minimum required)	78%
2	NATURAL CROSS VENTILATION	<i>Cross ventilation as per 4b of ADG</i>	20 apartments have cross ventilation. (60% minimum). Refer to DA 20 for cross ventilation methodology	71%
3	APARTMENT SIZE	Minimum Requirements (m ²): Studio 35 1 Bedroom 50 2 Bedroom 70 3 Bedroom 90	Based on these minimums, all apartments are above this base level.	100%
4	BALCONY & PRIVATE OPEN SPACE	Ground: 15m ² + 3m depth 1 Bedroom: 8m ² + 2m depth 2 Bedroom: 10m ² + 2m depth 3 Bedroom: 12m ² + 2.4m depth	Based on these minimums, all apartments are above this base level.	100%
5	STORAGE	Studio: 4m ³ 1 Bedroom: 3m ³ 2 Bedroom: 8m ³ 3 Bedroom: 10m ³	All apartments have allocated storage in ground floor level. All apartments have storage facilities within. Cage volumes: 8m ³ minimum; 12m ³ maximum.	100%
6	LANDSCAPING PUBLIC OPEN SPACE	20% of the Lot size Site Area: 3304m ² Required Landscape area: 838m ²	Landscape area provided (excluding roads: 838m ² (approx.)	25.3%

APPENDIX 2 APARTMENT BREAKDOWN

Level	1 Bedroom	2 Bedroom	3 Bedroom	Total
Ground	-	4	-	4
Level 1	1	5	2	8
Level 2	1	5	2	8
Level 3	1	5	2	8
TOTAL	3	19	6	28
Cars requ'd	1.5	19	12	32.5
Visitors				5
Total Requ'd				37.5
Provided				39