

**PROPOSED MIXED USE DEVELOPMENT,
29-35 CAMPBELL STREET, BOWEN HILLS**

SUSTAINABILITY REPORT

PLANS AND DOCUMENTS
referred to in the ULDA
APPROVAL dated 15 / 4 / 11

Prepared For:



EXECUTIVE SUMMARY

This Sustainability Report has been prepared as part of the Development Application for the proposed residential development located on the corner of Campbell Street & Mayne Road, Bowen Hills.

The report is based upon the Brisbane City Councils (BCC) Guidelines for Sustainable Development and addresses each of the 15 Principles incorporated therein.

Various meetings have been conducted with the ULDA prior to the lodgement of the Development Application. At one of these meetings it was agreed that this approach would be considered as an acceptable means of quantifying the proposed developments Green Credentials for review and approval.

During the meeting the design teams approach to the incorporation of sustainability into the critical conceptual design phase of the project was discussed and favourably received with particular attention paid to the following subjects:

- Energy efficiency
- Water efficiency
- Residential cyclist facilities

Many sustainability features have been considered during the design process and subjected to cost evaluation. A primary focus of this development has been affordability. By building and delivering to market an affordable housing

product which is also a quality product the design has included many standard sustainable practices because these have become cost effective due to wide market use. New and innovative sustainable solutions are expensive and as such have not been included in the design to maintain the affordable nature of the product.

The report clearly demonstrates that the proposed development successfully considers and responds to these items and the intent of the following BCC 15 Principles, in a variety of ways.

- Establish Agreed Sustainable Design Values
- Apply an Integrated and Collaborative Design and Construction Process
- Design for Our Subtropical Place
- Protect and Restore the Natural Ecosystems
- Utilise Land Appropriately
- Apply Integrated Water Management
- Manage Energy Use
- Select Appropriate Building Materials
- Manage Waste
- Consider Cost Efficiency
- Create Healthy Indoor Environments
- Support Green Transport
- Develop Adaptable Buildings and Spaces
- Build a Safe and Diverse Community
- Inform the End Owner and User

Principle 01 – Establish Agreed Sustainable Design Values

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Integrated design	
	The design process is to embrace efficiencies in water consumption, energy consumption and materials use, and will achieve a reduction in waste and emissions generated in the construction and use of the building. The apartments will achieve a minimum NatHERS Rating of 5 Stars.
	The design team will consider life-cycle issues throughout the design process, recognizing that all decisions from site planning to selection of materials and services impact on the overall cost of a project in both capital and operational terms.
Communication and engagement with design team, Council, community and end users	
	An accredited sustainability consultant will be engaged for the project.
	Sustainability workshops have commenced thru the schematic and design to DA phase of the project and will be continuing and facilitated during the design development stages of the project.
	Managers, owners, residents, tenants and other users will be informed of the sustainable measures incorporated in the project through the following documentation: - Comprehensive handover manuals will be issued to individual Residential/Retail owners which highlight the sustainable features and operating requirements of their unit/tenancy. - Comprehensive maintenance and operating manuals will be issued to the Body Corporate and Building Managers noting the sustainable features of the development and the specific operating and maintenance requirements pertaining to them, so as to ensure that the benefits provided by these features are enjoyed by all occupants. - The sustainability performance of the entire development will be monitored by measuring mains utility consumption and displaying the results in the main foyer and/or the building manager's office.

Principle 01 – Establish Agreed Sustainable Design Values	
<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
	This will enable the building manager to monitor the performance of the building against targets, establish trends and identify periods of inconsistent consumption.

Principle 02 – Apply An Integrated And Collaborative Design And Construction Process

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Design team	Sustainability has been and will continue to be included on the agenda for all design team meetings with members reporting on activities against the guidelines. A meeting has already taken place with ULDA where Sustainability was one of the main topics on the agenda. In addition, it was agreed that an assessment of the proposed development against the 15 Principles incorporated within the BCC's Guidelines for Sustainable Development would be an appropriate means of quantifying the developments Green Credentials for review and approval.
	Review meetings will be conducted between the sustainability consultant and team members to review design issues against the requirements for achieving the desired sustainability outcomes.
Design materials	
	Consultants will issue their documentation via electronic copy with paper copies kept to a minimum.
	Where it is necessary to issue paper copies, they will generally be printed at A4 and A3.
	Recycle paper will be used for all printing activities to the maximum extent possible.
	Paper will be recycled.

Principle 03 – Design For Our Subtropical Place

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Site Analysis	
Choosing a site with consideration to orientation, access and topography	The site is elevated within the Bowen Hills precinct, providing good opportunity access to both prevailing breezes and views. With the site located on a corner its configuration encourages both north / south orientation for the residential elements on Campbell Street and east / west orientation for the residential elements on Mayne Road. Pedestrian access is via Campbell Street and Mayne Road, whilst all vehicular access is via Hazelmount Street, providing clearly segregated and improved pedestrian / vehicular access.
Orientating the development towards the streets or open space to improve casual surveillance and amenity	The ground floor retail tenancies and main entry node into the development affront Campbell Street and Mayne Road, providing an activated frontage improving both casual surveillance and amenity. All the apartments on both street frontages have either alfresco balconies or traditional balconies that view to the street that will provide both casual surveillance and amenity.
Orientating for passive heating and cooling	The site's configuration accommodates predominantly east / west orientation for the residential elements. Therefore the passive design of the development, in particular the glass performance, will be to ensure that a minimum NatHERS Rating of 5 stars is achieved for any apartment.
Site processes	
Limit clearing outside the building footprint	The site is currently built on and entirely cleared. The proposed development will not result in clearing of any significance.
Built environment	
Express sustainable subtropical design elements (eg, energy, water and waste minimization) in the building form and detailing by:	
Supplying large overhangs / eaves to shade building and create a comfortable indoor / outdoor edge	A balcony is provided to each apartment that affords some shaded external space can be open / closed to the outdoor environment, enabling tenants to passively control the transition of private space between the external and internal environments year round.

Principle 03 – Design For Our Subtropical Place

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Connecting living areas directly with generous balcony space or indoor / outdoor areas	All apartments incorporate a balcony area which has the ability to be 'opened-up', linking the internal living areas with the outdoors to take advantage of Brisbane's Sub-Tropical Environment.
Maximising breeze and light	In all apartments the balcony areas have the ability to be 'opened up' to the adjoining living areas to provide maximum access to both daylight and breezes.
Using varied materials, roof forms and building setbacks in light colours	The façade of the building incorporates a variation of tones, shades and textures, supporting the key element of the iconic tower. Colour is to be used in a minimal but complimentary manner to accentuate the major elements, but also to provide a recognisable and subtle signature to the project. External materials, including lightly coloured honed / polished precast panels accentuated with an array of vertical incised lines across solid core and accent surfaces, combination of clear and frosted glazing elements, metal and glazed balustrades, prefinished sunshades and screening elements and paving units have been chosen not only for their durability and low maintenance characteristics, but also to portray, in a contemporary sense, the gritty and grainy 'feel' of materials and character traditional to the Bowen Hills urban environs. The residential tower is essentially 'L'-shaped in plan form and fronting the street alignments and view corridors along the southern and eastern boundaries, the tower is rebated above the podium level to provide variation in the setbacks in response to form and function of the podium level external spaces. Roof forms incorporate 'sky terraces' at different levels to provide elevated communal recreation spaces.
Considering high or raked ceilings	Ceilings to living areas and Alfresco Dining Balconies will be set at a minimum of 2600mm, enabling the installation of ceiling fans and maximizing the benefit of natural ventilation.
Setting garages and carports away from the house frontage to minimise their visual impact	Car parking is located on both basement levels and podium with a singular entry/exit point positioned at the eastern (Hazelmount Street) entry to the site, well away from the main pedestrian entry which is provided from Mayne Road, the pedestrian-centred boulevard located on the western side of the building.

Principle 03 – Design For Our Subtropical Place

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
• Include awnings, active frontages and pedestrian amenities.	Both the Mayne Road and Campbell Street frontages of the development will be activated through the inclusion of retail tenancies which will have a street canopy over them and the footpath.
• Respecting your neighbour's privacy, sunlight and views	The tower is set back minimum of - 6.0m from the Campbell St and Mayne Rd frontages, - 4.5m from the Hazelmount St frontage, - 4.5m from the southern side boundary of the adjacent commercial property, and - 6.5m from the western rear boundary of the adjacent commercial property.
• Incorporating water recycling opportunities and on site water sensitive urban design	Rainwater harvesting will be incorporated into the development to provide recycled water for irrigation, swimming pool make-up, retail tenancy toilet flushing and potentially basement tenant car washing bays.
• Using insulation with the highest R-value available (the higher the R-value	The development will incorporate insulation to meet or exceed the requirements of Section J of the BCA to achieve a minimum 5 Star NatHERS rating for the apartments.
Natural environment	
• Considering plant species selection, utilising appropriate locally occurring native species	The streetscape/public land planting will comply with and reinforce the most recent precinct designs established by Brisbane City Council preferred plant palette schedule. The private landscape zones will be predominately a mix of hardy native tree and low grasses / groundcover species selected for aspect, shade, surveillance and local context etc.
• Investigating water requirements for plants to minimise water requirements	To minimise the amount of water required to maintain healthy plant life, predominately Australian native drought tolerant plants will be used. Light weight soil mixes will be enhanced with soil moisture retaining agents, along with deep organic and pebble mulches.

Principle 03 – Design For Our Subtropical Place

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Retain water on site to reduce run-off to stormwater through decreasing hard surfaces, using rainwater tank, rain gardens and porous paving	Rainwater harvesting will be incorporated into the development for the following purposes: - Irrigation - Swimming pool make-up - Retail tenancy toilet flushing
Providing appropriate seasonable shade and passive cooling/heating throughout the year to outdoor areas	The inclusion of balconies into the apartment designs provide a transition zone in summer where the windows are opened up to allow the incoming external air the opportunity to be cooled by the building structure (thermal mass) before entering the apartment PLUS in winter they can be closed up when required to enable the enclosed air to be heated by the more direct solar radiation. Where balconies have been provided they are covered to provide a further transition zone between external and internal areas.
Protecting and planting street trees to enhance the quality of the street	Selected Australian native street trees will be planted as advanced specimens and be underplanted with low strappy leaf species as a textural massing. Trees will be staked and guyed and will provide clear sight lines via clean trunk forms for pedestrian and vehicle movements.
Installing an automatic watering system	Water efficient subsoil, drip irrigation systems will be provided to all planters and be installed complete with automatic controls including rainwater detection and soil moisture sensing to avoid over-watering. Water will be sourced from on-site storage tanks.

Principle 04 – Protect And Restore The Natural Ecosystems

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Protecting and restoring ecological processes	
Recognising and protecting existing ecological process	This not relevant to the development because the site is presently fully developed without vegetation of any significance and is generally bordered by other commercial/industrial premises and public roads. There are no on-site ecological processes of significant value that will be impacted by the proposed development.
Restoring ecological process appropriate to the site	The proposed development will incorporate landscaping, as described in the previous Principal and the Landscape Report, prepared by Trevor Lynch, Landscape Architect. This will provide some improvement to the ecological value of the site.
Low impact construction techniques	Appropriate erosion and/or sediment controls will be implemented throughout the construction phase to further minimize the impact on the environment.
Biodiversity	
Incorporate water sensitive urban design	The development incorporates the major elements of water sensitive urban design including; rainwater harvesting, the use of efficient fixtures, the use of efficient irrigation systems and the treatment of storm water run-off as described in the Site Based Stormwater Management Plan prepared by Robert Bird Group.
Employ selective and minimal clearing	This is not relevant to the development because the site is presently fully developed and cleared.
Plant native locally occurring vegetation	Predominately local occurring native species will be adopted for all landscaping implemented throughout the development in accordance with BCC's Centres Detail Design Manual preferred plant palette schedule. Predominantly Australian native tree species have been selected and reflect earlier and current BCC designs for the precinct. Refer to Landscape Concept Plans prepared by Trevor Lynch Landscape Architect.

Principle 04 – Protect And Restore The Natural Ecosystems

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Landscape design	
Minimise water use with gardening practices	Low water use species together with drip irrigation systems controlled by automatic timers will be adopted to minimize landscape water consumption. Deep organic and pebble mulches, along with soil moisture retention agents will add to water efficiency.
Provide opportunities to shade public and private spaces	Shaded and private spaces are provided for each apartment via the openable balcony areas. Extensive external shading (street canopy) is provided to the continuous length of the retail space affronting Mayne Road and Campbell Street. The podium level BBQ recreational facilities and the sky terrace areas are provided with pergolas and appropriate plantings to provide shaded recreational areas.
Utilise on-site water recycling opportunities to irrigate landscape	Rainwater will be harvested, stored and reused for the purpose of landscape irrigation, as described elsewhere in this report.
Scenic amenity	
Promoting or framing views and vistas	The location of the development toward the top of a local high point provides various view corridors for the residential apartments, and in particular , Breakfast Creek to the North, Newstead and the Brisbane River to the East, Exhibition Grounds and the CBD to the South, and Mt Coot-tha and beyond to the West.
Protecting and enhancing streetscape amenity	No protection is required of the existing Mayne Road and Campbell Street streetscape. The subject site is generally comprised of a used car yard located on the site of old service station. The proposed development will incorporate a clearly defined pedestrian entry off Mayne Road at the frontage alignment, retail facilities together with substantial street trees, to create an active street frontage and vastly improved amenity.

Principle 05 – Utilise Land Appropriately

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Land use transport integration	
Provide direct, safe and attractive movement networks to public transport stops.	The proposed development is situated approximately between two major public transport facilities, the RBWH (Royal Brisbane Women's Hospital) Bus Way Station (800 metres travel distance) and the Bowen Hills Railway Station (300 metres travel distance), both of which provide frequent services to all parts of Brisbane and the surrounding environs. The route to the RBWH bus station includes travel via O'Connell Terrace which we understand will be revitalised as part of the RNA site redevelopment, providing a safe and attractive route. The manager's reception desk will have available all public transport timetables and route maps as well as information on the latest public transport initiatives available to residents.
Provide safe access for non-vehicular traffic	The main pedestrian and vehicular entries to the development are totally separated on opposing frontages, with vehicles entering off Hazelmount Street and pedestrians entering off Mayne Road.
Encourage casual surveillance and amenity of pedestrian and cycle paths by having active frontages	The active retail frontage on Mayne Road and Campbell Street provides good opportunity for casual surveillance of pedestrian and cycle traffic passing the site, whilst the large open central entry / lobby which incorporates the reception desk will encourage casual surveillance of those entering and leaving the building.
Site planning and analysis	
Use cleared areas rather than clearing vegetated spaces	This not relevant to the development as the site is currently fully developed.
Avoid ecological and waterway corridors	This is not relevant to the development as the existing site does not encroach upon any ecological or waterway corridors
Consider passive design to minimize mechanical cooling and heating	The development will achieve a minimum NatHERS Rating of 5 stars for all apartments. Refer to the Section on Principle 7.

Principle 05 – Utilise Land Appropriately

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Consider solar and breeze access to public open spaces, private living and outdoor spaces	The flexible open / closed balcony areas together with the sliding doors to the adjoining living areas provide maximum access to both daylight and breezes. The podium level external recreation facilities (pool, BBQ, landscaped gardens and podium plaza) have been positioned on the desirable north-eastern side of the residential tower to take advantage of the Brisbane sub-tropical climate. The elevated communal sky terraces provide various locales and opportunities for all the residents to access and enjoy the external environment.
Design to reduce car use and increase use of public transport, walking and cycling.	Ample bicycle (approx 249 parks) and motorbike / moped parking (approx. 10 parks) is provided within the development for residents to further encourage the use of alternative means of transport.
Contamination	
Materials imported to site are free from contamination and pests and landscape materials are certified to AS4454-2003.	The methodology implemented during the construction phase will be undertaken in accordance with a Standard Environment Management Plan.
Cut and Fill	
Buildings are designed to maintain the topography and minimise the extent and duration of disturbance.	The site is currently fully developed with a car yard operating from on old service station site. Following demolition, the site will be excavated to remove the anticipated contamination resulting from the service station use and provide for the 2 levels of basement car parking. Building orientation and access ways (pedestrian and vehicular) have been designed to maintain the existing relationships to Mayne Road, Campbell Street and Hazelmount Street.
Topsoil Protection	
Retain and reuse topsoil on site.	This is not relevant to the development as the site is fully developed which means there would be little if any existing top soil that would be suitable for retention and reuse.

Principle 06 – Apply Integrated Water Management

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Integrated water management strategy	
Develop an integrated water management strategy which considers waterways, rainwater, stormwater, greywater, blackwater, the highest available ratings for appliances and fittings.	The development incorporates rain water harvesting, storm water treatment and water efficient fixtures and appliances. Refer to the Site Based Stormwater Management Plan prepared by Robert Bird Group. Blackwater treatment systems are cost prohibitive for a project with an affordability focus. It is not economically feasible to implement a complete greywater treatment and reticulation system or beneficial due to economic cost analysis to provide partial greywater recycling on this project.
Rainwater collection and reuse	
Rainwater tanks should:	
Be of an appropriate capacity and connected to suitable uses.	A tank with a capacity of 35kL will be provided for the capture and re-use of rainwater.
Include the collection of condensate from air-conditioning plant	Condensate from air-conditioning fan coil units will be collected and discharged into the rainwater downpipes, where possible, for collection in the storage tanks for reuse.
Stormwater	
Minimise the amount of stormwater leaving the site by:	
Using gravel paths, soakwells, well mulched garden areas, infiltration trenches and swales.	The proposed development provides a net reduction in peak flows as a result of the site's size reduction following lot reconfiguration allowing for future road widening, such that post development flows will not exceed pre-development stormwater flows as described in the Site Based Stormwater Management Plan, prepared by Robert Bird Group.
Using podium and/or roof top gardens to minimise run off, provide greywater reuse and thermal insulation.	The skygardens provide opportunities for both green and recreation functions. Lightweight pergolas will support Australian native vine species to cover portions of these spaces, which will shade and cool the skygarden areas. Perimeter planters will be irrigated from on-site water sources and provide a medium for the plant growth and viability.

Principle 05 – Utilise Land Appropriately

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Landscape design	
Use locally occurring native species	Predominately local Queensland occurring native species will be adopted for all landscaping implemented throughout the development in accordance with accordance with BCC's Centres Detail Design Manual preferred plant palette schedule. These native tree species have been selected to reflect earlier and current BCC designs for the precinct. Refer to Landscape Concept Plans prepared by Trevor Lynch Landscape Architect Refer to Landscape Concept Plans prepared by Trevor Lynch Landscape Architects.
Retain or incorporate deep-rooted trees.	Deep rooted trees will be provided in the Mayne Road and Campbell Street footpaths.
Reduce the area of lawn to reduce the requirement for water, fertilizer, herbicides and pesticides.	There are no areas of lawn incorporated in the development. Refer to the Landscape Concept Plans prepared by Trevor Lynch Landscape Architects.
Where necessary, include an underground irrigation system connected to the rainwater harvesting system with timing and/or moisture/rain sensor controls.	Areas vegetated with species that will require irrigation, will be provided with automatic sub-soil drip irrigation systems complete with rain sensors. Refer to the Landscape Concept Plans prepared by Trevor Lynch Landscape Architects.
Water efficient fittings and appliances	
Provide tap aerators in kitchens, laundries and hand basins	Aerators will be provided in all taps.
Provide water efficient fittings and appliances	Dishwashers with a minimum 4 Star WELS rating and tapware with a minimum 6 Star WELS rating will be used throughout, with the exception of showers which will have a 3 Star WELS rating incorporating a 7.5 L/min flow restrictor. The 6 Star WELS rated tapware is a significant improvement above the QWC minimum requirements.
Provide insulated covers to outdoor pools.	A Pool Cover will be provided as part of the development including O+M manuals to the Body Corporate at handover.

Principle 07 – Manage Energy Use	
<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Alternative / renewable energy	
The development should consider less greenhouse intensive energy sources other than traditional coal-generated electricity by:	
Connecting gas to dwelling units to enable use of gas appliances.	Natural gas will be provided to each apartment for the cook tops.
Hot water systems	
Consider alternatives to electric hot water systems such as gas, solar or heat pump.	A central gas fired hot water plant will be installed.
Hot water systems location	
Locate hot water systems close to kitchens, bathrooms and laundries to minimize the amount of hot water wasted. Also insulate hot water pipes.	The hot water distribution system will be designed such that vertical trunk mains are installed in dedicated hydraulic risers located in close proximity to apartment wet areas to minimize the length of horizontal branches (dead legs) and therefore hot water wastage. A hot water re-circulating system in conjunction with limited heat trace (only installed on longer branches) will also be implemented to further improve the energy efficiency of the system. All hot water pipe work will be insulated.
Passive design	
The building should incorporate passive design measures to capitalise on the sun's energy, breezes, topography, vegetation and other elements, by:	The passive design of the development will ensure that a minimum NatHERS rating of 5 stars is achieved for all apartments.

Principle 07 – Manage Energy Use

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
• Orientating for optimum passive cooling and solar heating.	Where the site has allowed, a wing of the building has been orientated to face the units north/south, with minimum exposure on the eastern and western ends.
• Choosing colour and building materials to enhance heat reflectivity.	The building façade will be finished predominantly in light colours to reduce heat absorption.
• Allow for ceilings at 2.7m rather than 2.4m enabling space for greater air ventilation and space for ceiling fans.	Ceilings within the apartments will be predominately at 2600mm with clear lines from the balcony areas back into the apartment. This additional height has been maintained to the project to provide greater natural ventilation opportunities. Ceiling fans will be provided in all apartments.
• Providing opportunities for occupants to adjust indoor climate (eg adjustable shading)	The balcony areas have the ability to be opened-up or fully enclosed externally to permit residents the opportunity to control the microclimates of sun and breeze passively.
• Providing shading to glass and walls to reduce heat gain especially on west façade.	Awnings and sun shading devices, along with balconies are integrated into west-facing units addressing Mayne Road to temper the direct sun / glare / heat gain.
• Insulating walls, floors and ceilings to minimise heat gain and loss	Concrete construction of not only floors but extensively for walls as well has provided thermal mass for the stabilisation of internal temperatures. Insulation will be provided as required to achieve a 5 Star NatHERS energy rating.
• Protecting windows from rain	Glazed elements contained within the eastern and western facades are articulated with a combination of horizontal / vertical sun shading elements to assist with the protection of weathering (rain).

Principle 07 – Manage Energy Use

Brisbane City Council Guidelines

Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response

Heating and cooling

- Ensure air conditioning units are energy efficient

The development will be served by a central air-cooled chilled water plant incorporating three chillers, one of which will be sized for low load operation. This ensures that the capacity of plant being required to operate at any particular time is accurately matched to the cooling demand ensuring minimum possible energy consumption.

In addition, all AC equipment will comply with the minimum energy performance requirements set out in AS/NZS 3823.2.2003, as appropriate.

- Where cooling towers are installed ensure they are water efficient and use non-potable water

Air-cooled AC plant will be employed in the development to eliminate the requirement for cooling towers and to minimize water consumption.

- Ensure temperature controls are installed in individual dwellings/tenancies so occupants are able to adjust the temperature to suit themselves.

Apartments will be provided with individual temperature controls for each room/space. All areas will be able to be operated and controlled simultaneously as opposed to the day/night systems normally installed in affordable projects.

Each retail tenancy will also be provided with a dedicated air-conditioning system for individual temperature control.

Thermal performance rating system

- Buildings should be designed and constructed to achieve the maximum thermal performance possible. Thermal performance can be estimated using one of a number of different rating schemes.

The thermal performance of the apartments will be modelled and rated using NatHERS.

Under current legislation the development is required to achieve a minimum NatHERS rating of 4 Stars for any individual apartment and an average apartment NatHERS rating of 5 Stars for the entire development.

All apartments will be designed and constructed to achieve a minimum NatHERS rating of 5 Stars which exceeds current requirements by 25%.

Principle 07 – Manage Energy Use

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Energy efficient lighting	
Provide high efficiency lamps rather than traditional incandescent bulbs.	Eighty percent of the lamps installed in the residential apartments will be other than incandescent with a minimum efficacy of 27 lumens/watt in accordance with the requirements of the Queensland Development Code (QDC). External landscape and/or security luminaries shall utilise fluorescent and or metal halide lamps.
Provide sensors, time switches, dimmers, two-way switching, etc, to control internal lighting.	Lighting to internal common areas will be controlled by time switch operation in conjunction with motion sensors for after hours operation in order to minimize unnecessary energy consumption. Lighting to infrequently occupied spaces such as store rooms, etc. will be motion sensor controlled to avoid luminaries being left turned on. Two-way switching will be provided within apartments where appropriate. All rooms within apartments will be locally switched.
Provide time switches, daylight sensors and/or motion sensors to control external lighting.	External landscape and security lighting will be controlled by a photoelectric cell and time switch to minimise unnecessary hours of operation and energy consumption. External lighting to the sky terraces and pool deck area will be controlled by push buttons (to turn on lights) and motion sensors (to turn lights off). This approach ensures lighting to these areas is only turned on as required and is automatically turned off once the space is unoccupied, providing further energy savings.

Principle 07 – Manage Energy Use

Brisbane City Council Guidelines

Daylighting

- Orientate the development to maximize daylight in habitable areas, whilst minimizing heat and glare.

Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response

Balcony projections will provide a degree of glare protection to those northern facing areas in the hotter summer months.

Internal apartment layouts area also arranged with habitable areas having greatest access to daylight, by ensuring bathrooms, laundries, etc, are not positioned on external walls.

Principle 08 – Select Appropriate Building Materials

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Local materials	
Use local materials to reduce transport costs and associated greenhouse gas emissions.	Selection of materials and services will be investigated within the design development stages taking into consideration the following: - Energy use in manufacturing and transportation - Longevity and maintenance requirements - Insulative/passive design properties.
Renewable / recycled materials	
Use renewable or recycled materials to reduce the overall impact of the development on the environment.	Steel reinforcement will contain a minimum post-consumer content of 60%. Concrete will contain an average minimum amount of 25% of industrial waste products (fly ash) as a substitute for portland cement A construction waste management plan that addresses the demolition and construction phases of the development, will be prepared, approved and adopted prior to the commencement of site works. The management of waste during the operational phase of the development will be in accordance with the Waste Management Procedures to be developed and incorporated within the Hanover Manuals issued to individual apartment owners and the Operating and Maintenance Manuals issued to the Body Corporate.
Manufacturing process	
Use standard material sizes and components to reduce waste and improve assembly and disassembly.	The proposed designs consciously incorporate a high degree of modulation + repetition, and utilises materials and products from manufacturers standard ranges to the maximum extent possible.
PVC minimisation	
Utilise PVC alternatives to reduce the extent of emitted toxic compounds.	The use of PVC materials will be minimised where practical and investigated during the design development phase.

Principle 08 – Select Appropriate Building Materials

Brisbane City Council Guidelines

Sustainable timber

- Utilise timber products from forests and/or plantations that have certified environmentally responsible forest management practices.

Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response

The project will use timber from sustainable sources.

Principle 09 – Manage Waste

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Waste management plan – construction, operation and demolition Implement a waste management/avoidance plan for the construction and operation of the building.	A construction waste management plan that addresses the demolition and construction phases of the development, will be prepared, approved and adopted prior to the commencement of site works. The management of waste during the operational phase of the development will be in accordance with the Waste Management Procedures to be developed and incorporated within the Hanover Manuals issued to individual apartment owners and the Operating and Maintenance Manuals issued to the Body Corporate.
Construction and demolition Minimise construction waste.	A construction waste management plan that addresses the demolition and construction phases of the development, will be prepared, approved and adopted prior to the commencement of site works. The demolition contractors will be required to report on the reuse and recycling of the demolished materials when they clear the site. The waste management plan will require that monthly waste reports are generated identifying the percentage of construction waste that is recycled and the percentage that goes to landfill. The minimum target for recycling of construction waste is 80%.

Principle 09 – Manage Waste

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Operation Provide clearly identifiable and distinct facilities for recycling and general waste.	Specific refuse facilities are set aside in Ground Level for recycling of waste, which are readily accessible to all occupants via the lifts. Recycle bins for comingled recyclable waste are provided on every level of the development and a refuse chute is provided for general waste. These facilities and operational procedures will be incorporated in the Waste Management Procedures to be developed and incorporated within the Hanover Manuals issued to individual apartment owners and the Operating and Maintenance Manuals issued to the Body Corporate
Locate waste facilities to allow easy access by collectors and protect residents from odour, views and collection noise.	The main refuse room is located in close proximity to the loading dock from where waste will be collected. This area is completely isolated from the residential apartments to avoid any odour/noise issues.
Promote green waste recycling by not installing insinkerators	Insinkerators will not be installed in the development.

Principle 10 – Consider Cost Efficiency

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Cost efficiency in construction	
Specify standard sizes	Products from manufacturer's standard modules + ranges will be utilized to the maximum extent possible. In addition the design philosophy is to also standardize the designs and layouts of apartment types + spatials within bedrooms, kitchens, bathrooms, etc.
Use locally available materials	Selection of materials and services will be investigated within the design development stages taking into consideration the following: - Energy use in manufacturing and transportation - Longevity and maintenance requirements - Insulative/passive design properties.
Use recycled materials	Materials have been selected to maximise the opportunity for recycled content or utilization of waste product as part of its production (e.g. concrete, structural steel, reinforcing steel, aluminium, precast and reconstituted stone.)
Operation costs	
Reduce ongoing operational costs by implementing water conservation practices and utilising energy efficient appliances.	Rainwater harvesting will be implemented along with the use of energy efficient air-conditioning systems, hot water systems, light fittings, appliances, etc (as described elsewhere in this report) to reduce both water and energy consumption.
Reduce long term maintenance and repair costs by using self-finished materials rather than painted external walls.	External materials, including lightly coloured honed / polished precast panels accentuated with an array of vertical incised lines across solid core and accent surfaces, combination of clear and frosted glazing elements, metal and glazed balustrades, prefinished sunshades and screening elements and paving units have been chosen for their durability and low maintenance characteristics.
Reduce ongoing operational costs through positioning high water-use areas (kitchens/bathrooms/laundry) together.	All kitchens/bathrooms and laundries are generally located within close proximity to each other inside each apartments and additionally, positioned back to back between the apartments.

Principle 11 – Create Healthy Indoor Environments

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Natural lighting / glare control Indoor environments should receive good natural lighting with minimal glare or heat penetration.	North facing Edgar Street units incorporate deep 'Alfresco' style dining balconies. These are 'environmentally flexible' spaces within the unit plan that can be opened / closed to the outdoor environment, enabling residents to passively control the 'transition' space between the external and internal environments year round whilst 'linking' the internal living areas with the outdoors to take advantage of Brisbane's sub-tropical environment. Awnings and sun shading devices, along with balconies are integrated into west-facing units addressing Mayne Rd which in turn provide a visual complexity to the dominant façade. With no such solar constraints, the south-facing units also utilise balconies though without screening, to create a strong sensory connection with the dynamic view aspect and internal spaces.
Natural ventilation Provide cross ventilation in the building design.	There are "corner" units providing the opportunity to achieve cross ventilation through adjoining living and sleeping areas.
Provide natural ventilation in the kitchen and living areas to reduce harmful indoor pollutants.	All apartment layouts incorporate open plan kitchen/living areas which link to the outdoors via the balcony spaces.
Provide windows in all habitable rooms to allow for views and visual connection to the outdoors.	All habitable rooms within the apartments are provided with windows.
Separate car parks from habitable or communal areas.	The entry into the car park at Ground Level is located off Hazelmount Street, well removed from the apartments and pedestrian thoroughfares so as not to impact on their use of natural ventilation.
Access to outdoors Provide a strong indoor-outdoor connection to facilitate an outdoor, subtropical lifestyle and maximise natural ventilation by:	

Principle 11 – Create Healthy Indoor Environments

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Providing an indoor/outdoor room such as a sun room if the development is subject to air or noise pollution.	The balconies are flexible, and have the ability to be opened-up or fully enclosed to the exterior, linking through to living areas via sliding doors, providing a desirable indoor-outdoor connection to maximise Brisbane's sub-tropical lifestyle.
Locating private/communal open spaces where they will not be exposed to traffic noise levels higher than 58dBLA10 (1 hour)	Predicted traffic noise levels are lower than this value at both the podium level pool deck area and the sky terrace areas. As noted in the Environmental Noise Impact Assessment Report prepared by TTM Acoustics.
Indoor air pollutants	
Utilise low VOC products.	Low VOC paints, adhesives, floorings, etc will be specified during the design process for the construction of the building.
Maximise floor surfaces such as ceramic tiles that inhibit parasites.	Hard floor finishes will be used throughout the apartments, with the possible exception of the living rooms and bedrooms.
Utilise mechanical fixings rather than adhesives as a means of reducing VOCs.	Where feasible, mechanical fixings will be incorporated during the design process for the construction of the building.

Principle 12 – Support Green Transport

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Pedestrian and Cycle Networks and Facilities	
Ensure that cyclists are given a high priority in the development in terms of facilities.	A total of 249 dedicated secure bicycle storage spaces will be provided within the car parking levels of the development. In addition to these, tenant storage rooms located in the car parking levels afford the opportunity for further bike storage capacities.
Provide access to existing and proposed bicycle and pedestrian networks.	The development is located approximately 750m from an established on road bikeway which crosses O'Connell Terrace and travels through Victoria Park to a point which links to bicycle lanes on major roads feeding into the CBD. Similarly, the development is located approximately 750m from an established on road bikeway which travels through Newstead Riverpark to a point which links to off-road bicycle paths that follow the river into the CBD.
Ensure that pedestrian networks are uninterrupted, continuous paths of travel that do not exclude people with disabilities from using all services and amenities available.	Accessible pedestrian access from the Mayne Road street frontage through into the main entry foyer, and the main lift lobby is provided. There are an accessible (PWD) car parks provided on the basement level car parks as well as the podium level 2 car park with an accessible continuous path of travel to the lift lobbies. Accessible lifts are provided serving all levels of the development ensuring that people with disabilities have full access to all communal facilities.

Principle 12 – Support Green Transport

Brisbane City Council Guidelines

Public Transport Stops

- Ensure that the design of the development provides direct and safe access for pedestrian and cyclists to public transport stops.

Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response

The proposed development is situated between two major public transport facilities, the RBWH (Royal Brisbane Women's Hospital) Bus Way Station (800 meters travel distance) and the Bowen Hills Railway Station (300 metres travel distance), both of which provide frequent services to all parts of Brisbane and the surrounding environs. The route to the RBWH bus station is via O'Connell Terrace which we understand will be revitalised as part of the RNA site redevelopment, providing a safe and attractive route.

A bus stop is located just 350 meters from the site on the corner of Brookes Street and O'Connell Terrace. This stop is served by Route 345 which terminates at the Normanby Bus Way providing a connection to numerous other bus services.

It should also be noted that the RNA Train Station may also be upgraded as part of the site redevelopment and or the Cross River Rail Link further complementing the existing public transport facilities.

The development is located approximately 750m from the an established on road bikeway which crosses O'Connell Terrace and travels through Victoria Park to a point which links to bicycle lanes on major roads feeding into the CBD. It is also located approximately 750m from an established on road bikeway which travels through Newstead Riverpark to a point which links to off-road bicycle paths that follow the river into the CBD.

The development will actively promote public transport patronage by having up to date timetables and maps located at reception for use by the residents and their visitors.

Principle 13 – Develop Adaptable Buildings And Spaces

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Building and landscape design Ensure public spaces are located for appropriate shade and surveillance, appropriately screened or sheltered from any wind-tunnelling effects, equipped with appropriate light and furniture. They should be made attractive and safe through plant selection, water features and public art.	A communal pool recreation area with adjoining shelter and BBQ facilities will be provided on the north-eastern side of the site at podium level 4 providing ideal casual surveillance opportunities from the various uses. The landscape design and plant selection is based on providing both shade (via trees and pergola structures with vines) and clear sight lines. Clean trunk native trees and palms will form the basis of the higher canopy while allowing surveillance throughout the landscape with low grasses and groundcovers forming a matting texture to the garden surface. Fencing details will allow a minimum of 50% transparency. In addition, sky terraces creating further elevated communal gathering spaces and casual surveillance opportunities, equipped with appropriate landscaping, seating and shelter facilities. The BBQ area will be afforded shade from the pergola and adjacent landscape garden areas.
Design all communal/public areas to comply with disability discrimination legislation and Australian Standard 1428.	The proposed development will comply with the appropriate guidelines.
Development size and connectivity Provide distinct, walkable and well-defined neighbourhoods, incorporating a mix of uses and activities.	The development incorporates a gymnasium, multipurpose room, swimming pool and associated landscape and terraces, sky terraces and BBQ facilities, providing residents with numerous locales and opportunities for social interaction and a sense of community.
Ensure safe, attractive and direct movement networks are not dominated by cars.	Car movements are entirely restricted to a single entry/exit off Hazelmount Street and do not impact upon pedestrian / resident movements (off Mayne Road and Campbell Street) between their apartments, the retail outlet(s) and the communal areas located on the ground level and above.

Principle 13 – Develop Adaptable Buildings And Spaces

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Internal Universal and Safe Design	
Ensure the development can be used by people of different abilities and ages with minimal risk of injury by incorporating:	
Hot water taps with thermostatic mixing valves	Thermostatic mixing valves will be incorporated in the event that a hot water circulation system is provided in lieu of a warm water solution. In either case measures will be provided to ensure residents are not exposed to scalding.
A child proof cupboard for all poisons, medications and household cleaners.	A child proof cupboard for all household cleaners, poisons and medications will be provided in the Laundry. In addition high level cupboards will also be provided in the kitchen for the storage of potentially harmful household items.
Slip resistant flooring where appropriate.	Where required, slip resistant flooring will be provided.
Sensor lights at entries.	Security lighting will be provided to all common areas (eg, car parks, lift lobbies, corridors, etc) to provide safe access for residents after hours.
Driveways and play areas which are as widely separated as follows.	There are no apartment play areas or communal facilities located in the vicinity of the car park entry.
Pools with sun protection shade, appropriate fencing and self latching child-proof gate.	The community pool on the ground floor level will be provided with appropriate fencing and gate in accordance with statutory requirements. Adjacent to the pool is the BBQ facility incorporating amenities, seating and shade.
Services	
Provide adaptable conduits and cabling in all new buildings to allow for connection to multiple providers.	The development will incorporate multiple underground conduits to permit telecommunication connections by a number of different service providers. A dedicated communications riser cupboard will be provided within the tower with provision for various communications infrastructure back bone cabling systems.

Principle 14 – Build A Safe And Diverse Community

Brisbane City Council Guidelines

Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response

Social Connectivity and Diversity

- Provide buildings and spaces that allow people to meet and gather, build those connections and form “social capital” that underpins communities.

The communal facilities described above, together with the Retail Zone fronting Mayne Road and Campbell Street will combine to create numerous locations + opportunities for social interaction.

Public Safety – Crime Prevention Through Environmental Design (CPTED)

Consider CPTED elements during the design process by providing:

- Casual surveillance opportunities and sightlines

On the ground floor, the retail zone and pedestrian entry, combined with the entry lobby lounge and adjoining reception, provide ideal casual surveillance opportunities for those entering and leaving the site / building.

In addition, the podium level 3 gymnasium located on the Mayne Road frontage as well as the podium level 4 outdoor recreation areas are creating further elevated communal gathering spaces and casual surveillance opportunities.

The landscape design and plant selection is based on providing both shade (via trees and pergola structures with vines) and clear sight lines. Clean trunk native trees and palms will form the basis of the higher canopy while allowing surveillance throughout the landscape with low grasses and groundcovers forming a matting texture to the garden surface. Fencing details will allow a minimum of 50% transparency.

- Exterior building design which reduces entrapment, concealment and vandalism.

The street frontage of the development at the ground is primarily comprised of the retail zone shop fronts, permeable and solid walls, presenting little or no opportunity for concealment. Furthermore, these faces incorporate a mixture of materials and finishes which deter graffiti and vandalism.

Pedestrian entry to the site will be via an “Access Controlled” lobby located off Mayne Road, minimising the risk of vandalism and entry by unauthorised persons. In a similar manner, vehicular entry into the car park will be via “Access Controlled” roller doors.

Principle 14 – Build A Safe And Diverse Community

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Lighting	All external public spaces will be illuminated in accordance with the requirements of AS1158, in particular, Part 3.1, Pedestrian Area Lighting.
Wayfinding	Clear information, directional and way finding signage will be installed on the site for Residents and Visitors alike.
Personal Safety and Security	
Provide non-slip flooring and child-proof chemical cupboards.	A child proof cupboard for all household cleaners, poisons and medications will be provided in the Laundry. In addition high level cupboards will also be provided in the kitchen for the storage of potentially harmful household items. Where required, slip resistant flooring will be provided.
Provide wide angle viewers at front entry doors.	Security for residents is provided by an access control system, an intruder detection system and a closed circuit television (CCTV) system Access to residential floors is controlled via card readers installed at the main entry doors to the central entry lobby, and in the lift car entrances. Access to the car park is controlled via car readers installed on the entry/exit roller shutters. Residents will only be able to access their floor, sky garden communal areas, podium level 3 gymnasium, podium level 4 pool deck and recreation facilities. Furthermore, an audio intercom system will ensure that only welcome visitors are provided access to the appropriate residential floor.

Principle 14 – Build A Safe And Diverse Community

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
Valued Features Protect, integrate and reuse important site features such as views.	The orientation of the residential building development provides various view cones / corridors, and in particular , Breakfast Creek to the North, the Brisbane Exhibition Grounds and the CBD to the South , Newstead and the Bulimba Reach of the Brisbane River to the East, and Mt Coot-tha and beyond to the West.
Links with Existing Community Facilities The development should promote integration with existing communities by: Equitable access to facilities	Equitable access is provided to the building entry and common public facilities.
Creating a sense of place by planting trees and providing clearly identifiable spaces within the development to facilitate/encourage social interaction.	A communal pool recreation area with adjoining shelter and BBQ facilities will be provided on the north-eastern side of the site at podium level 4 providing ideal casual surveillance opportunities. In addition, sky terraces creating further elevated communal gathering spaces and casual surveillance opportunities, equipped with appropriate landscaping, seating and shelter facilities. The BBQ area will be afforded shade from the pergola and adjacent landscape garden areas.

Principle 15 – Inform The End Owner And User

<i>Brisbane City Council Guidelines</i>	<i>Proposed Mixed Use Development, 29-35 Campbell Street, Bowen Hills Response</i>
User guide / body corporate induction	
Convey information pertaining to the development's sustainable features to the end owner/users through body corporate induction, user guides, etc.	A building user's guide or operation and maintenance manual will be provided to the Body Corporate and On Site Manager. All Apartment and Retail Owners will receive a User's Guide/Welcome Guide noting the sustainable features and how they are to operate and be maintained for their particular unit.