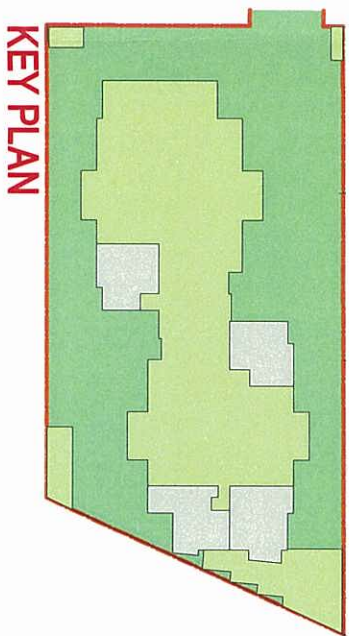
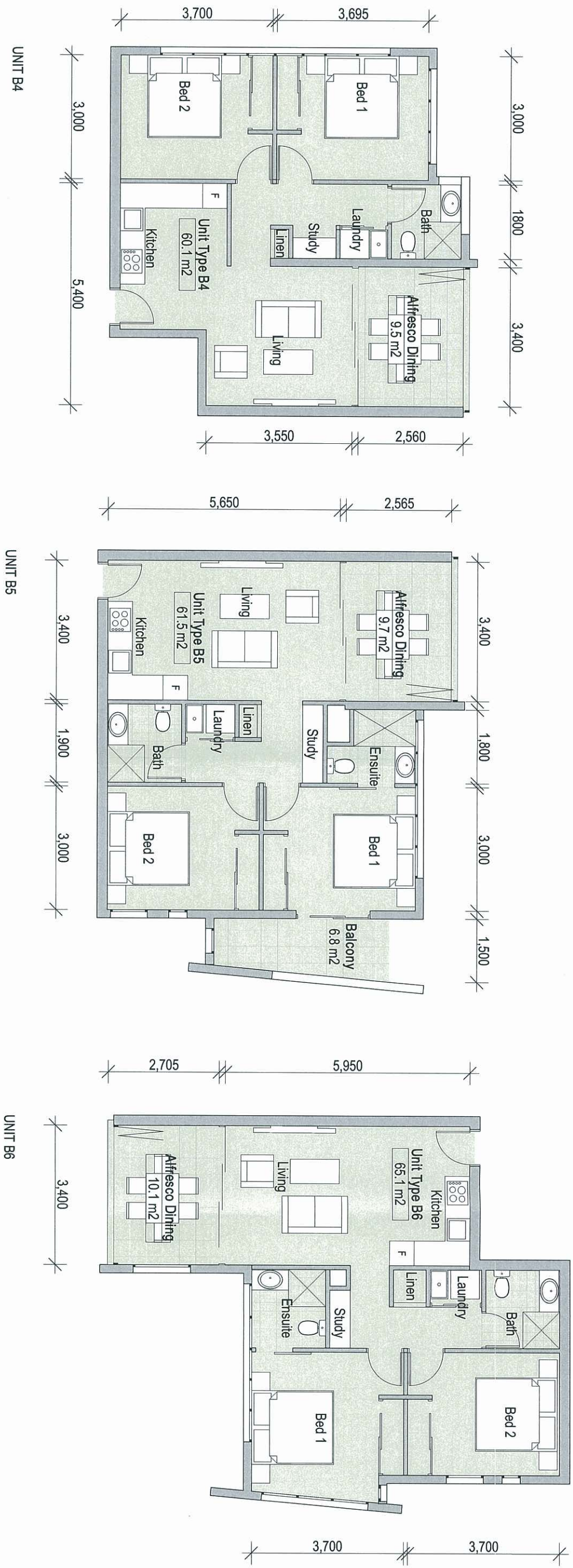


PLANS AND DOCUMENTS
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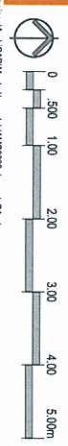


NOTE:
xx m² = Alfresco / Balcony not included in GFA BHUDA

PROPOSED RESIDENTIAL DEVELOPMENT, 16 HAMILTON PLACE, BOWEN HILLS

TYP. UNIT PLANS - SHEET 7

METRO PROPERTY DEVELOPMENT PTY LTD



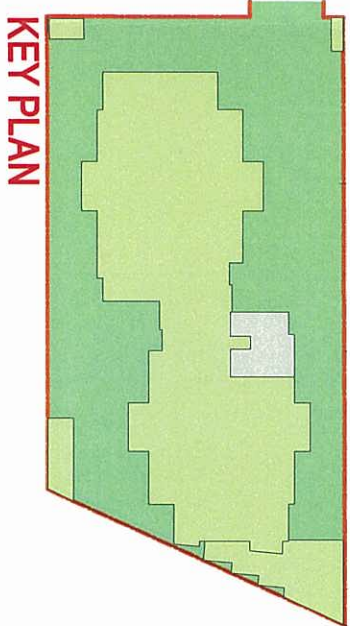
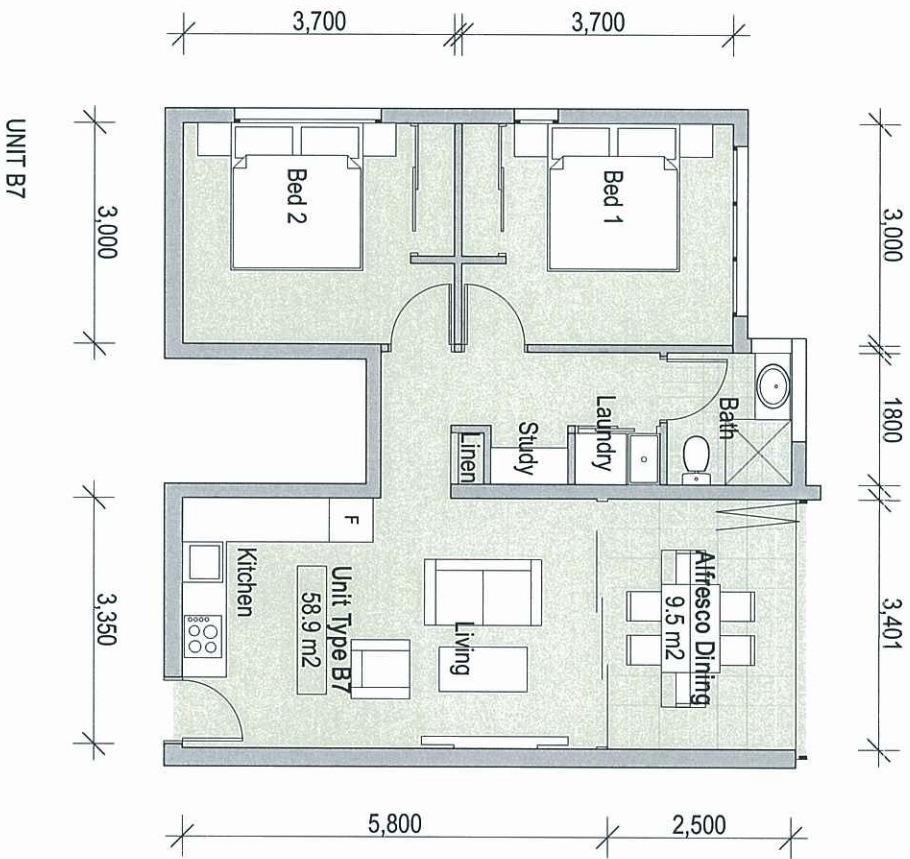
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NOTE:
xx m² = Alfresco / Balcony not included in GFA BHUDA

PROPOSED RESIDENTIAL DEVELOPMENT, 16 HAMILTON PLACE, BOWEN HILLS

TYP. UNIT PLANS - SHEET 8

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DA-037-A

JOB NO: METR0003

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corner campbell street & hamilton place

PROPOSED RESIDENTIAL DEVELOPMENT, 16 HAMILTON PLACE, BOWEN HILLS

PHOTOMONTAGE - Sheet 1

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DA-001-B

JOB NO: METR0003

M. Design Pty Ltd
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ABN 59 09 246 268
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PLANS AND DOCUMENTS
referred to in the ULDA
APPROVAL dated 21/10/10

PROPOSED RESIDENTIAL DEVELOPMENT, 16 HAMILTON PLACE, BOWEN HILLS

■ PHOTOMONTAGE - Sheet 2

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DA-030-B JOB NO: METR0003

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corner Hamilton Place & Campbell Street



hamilton place tower sky terrace render



tufton street tower sky terrace render

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APPROVAL dated 21 /10 /10

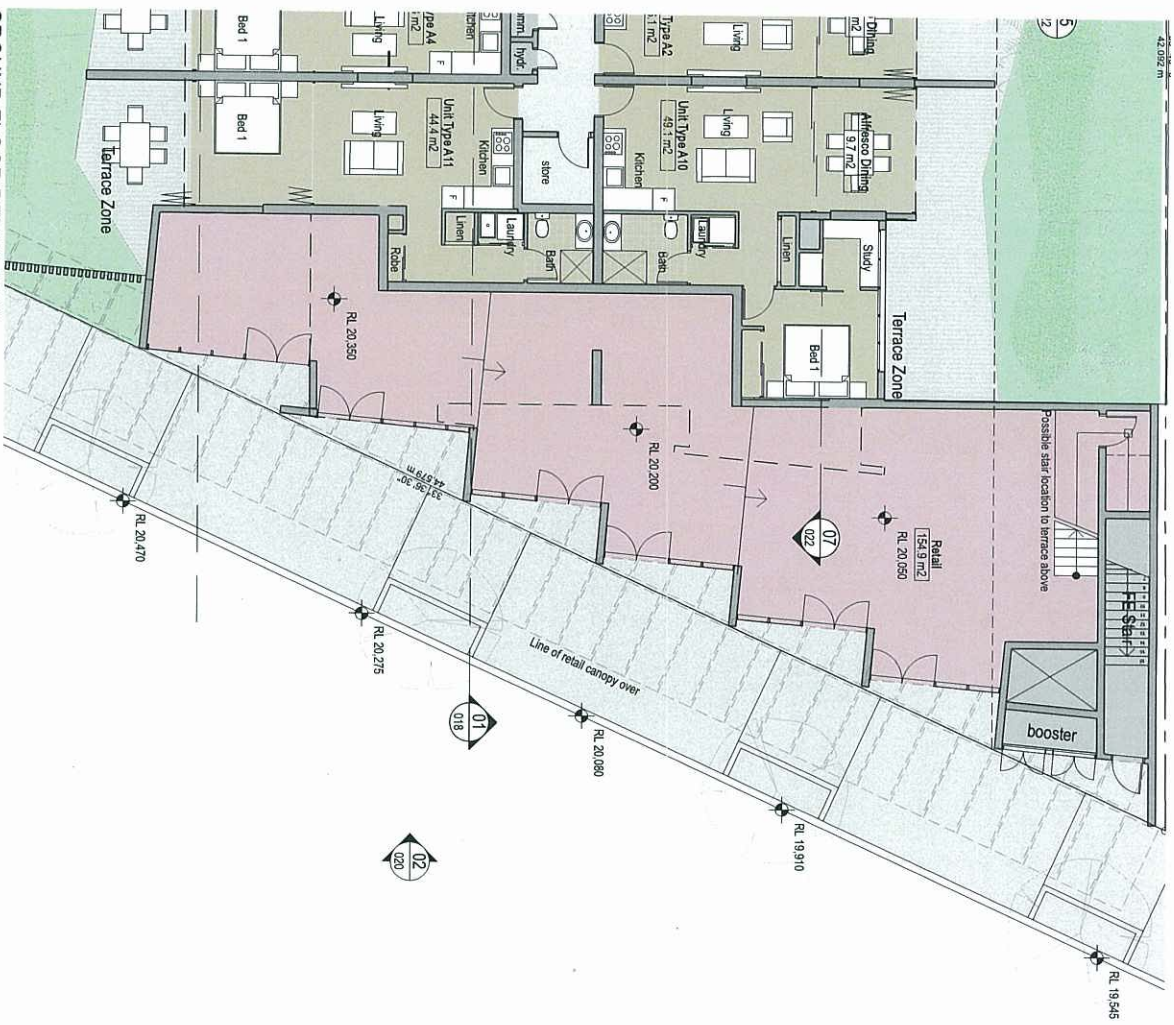
PROPOSED RESIDENTIAL DEVELOPMENT, 16 HAMILTON PLACE, BOWEN HILLS

PHOTOMONTAGE - Sheet 3

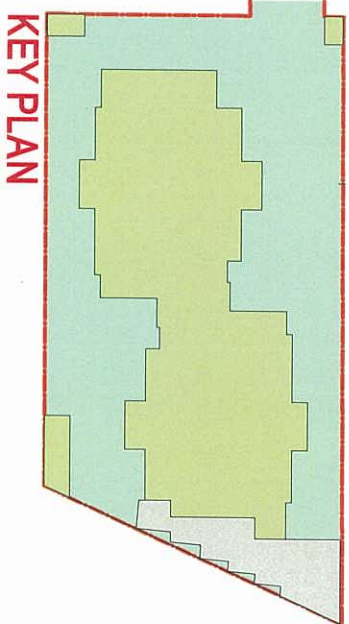
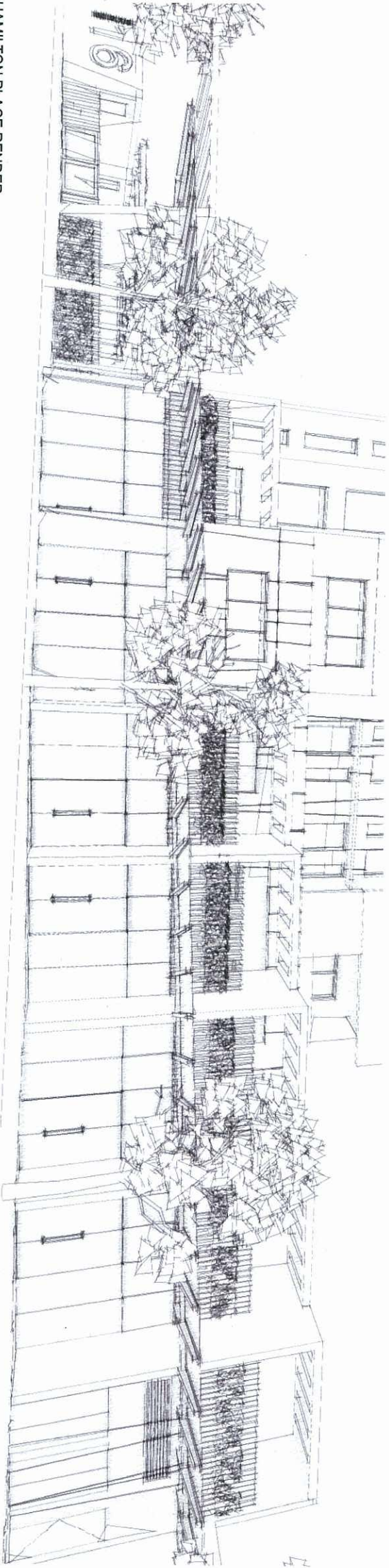
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PROPOSED RESIDENTIAL DEVELOPMENT, 16 HAMILTON PLACE, BOWEN HILLS

HAMILTON PLACE STREETSCAPE - SHEET 1

METRO PROPERTY DEVELOPMENT PTY LTD



SCALE: 1:100 @ A1

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DA-038-B JOB NO: METR0003

M. Design Pty Ltd
ACN 604 022 234
ABN 55 559 292 523
P.O. Box 141020
P.O. Box 141020, 16 Hamilton Place Bowen Hills
Drawing No: DA-038-B, Project No: METR0003, Layout: Urban



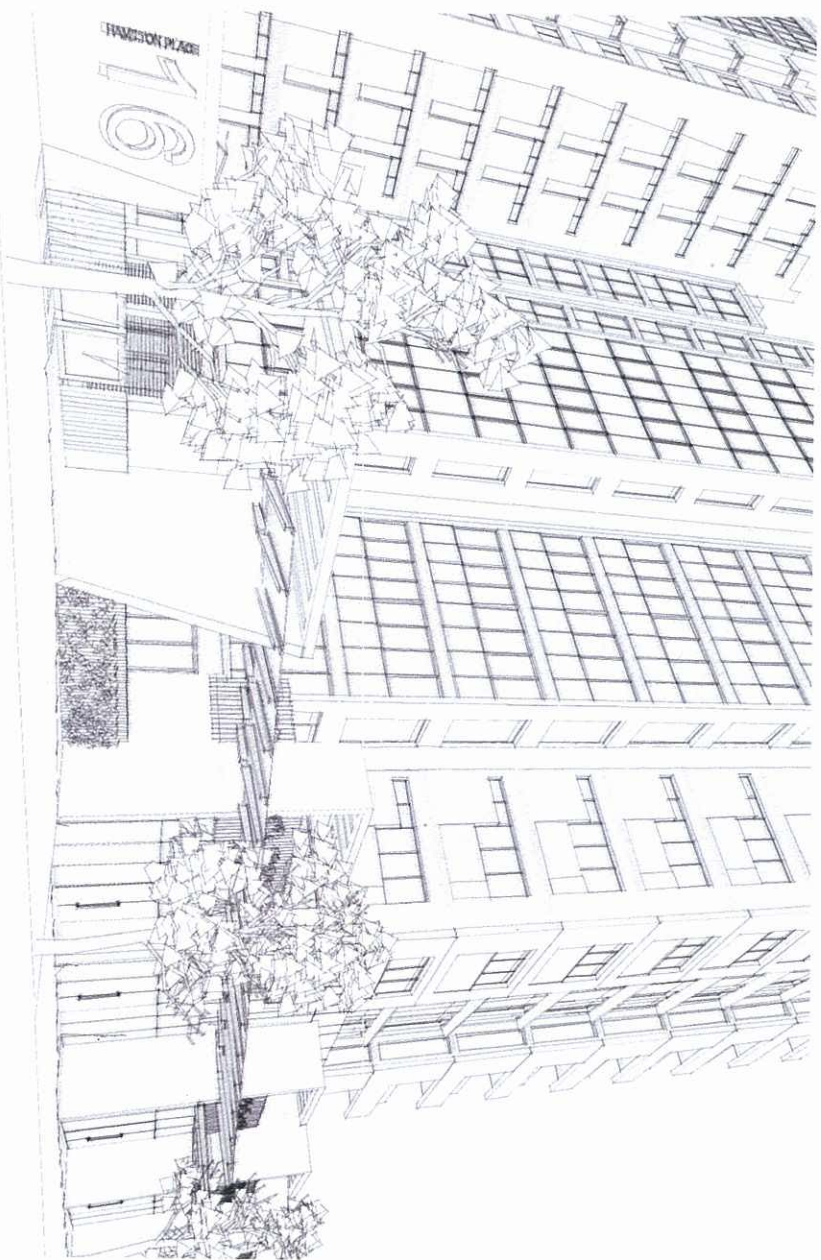


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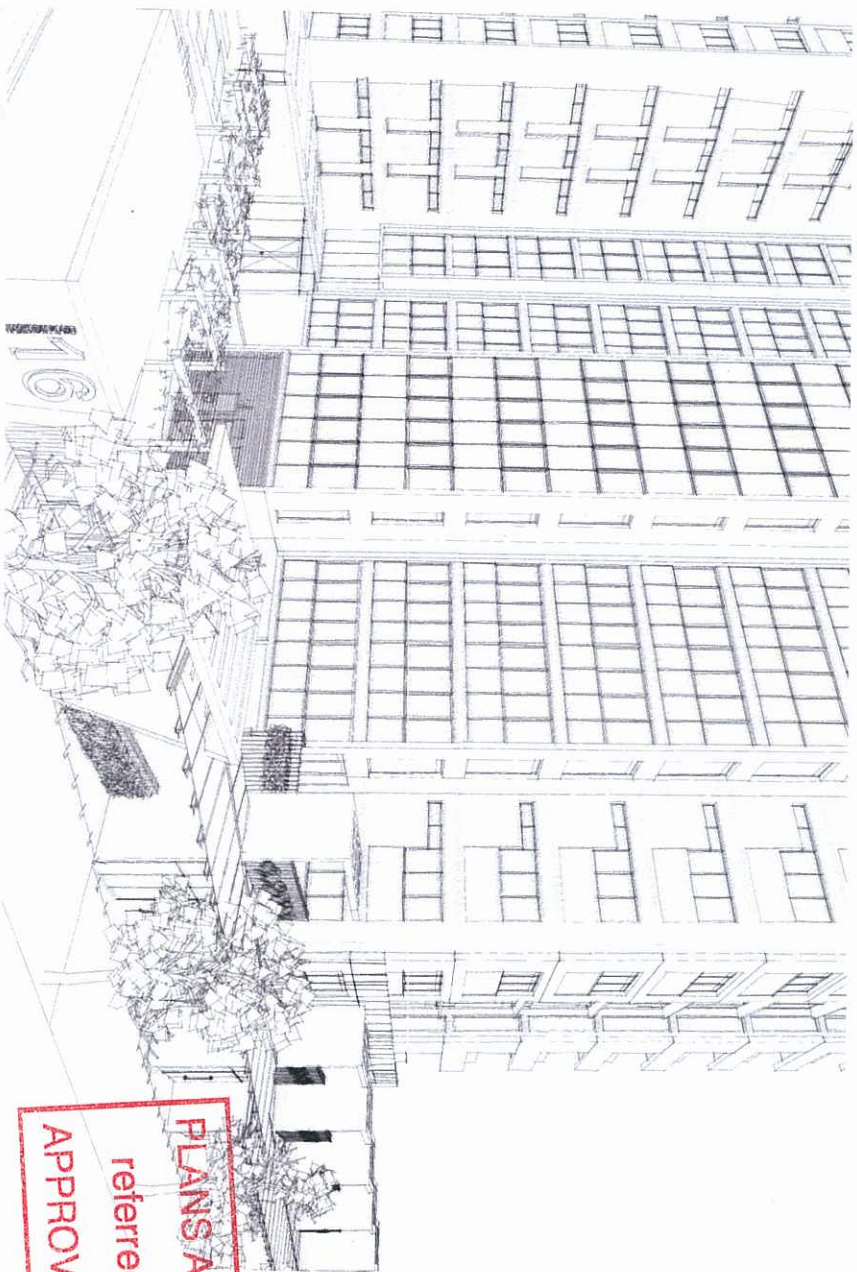


image 2

PLANS AND DOCUMENTS
referred to in the ULDA
APPROVAL dated 21/10/10

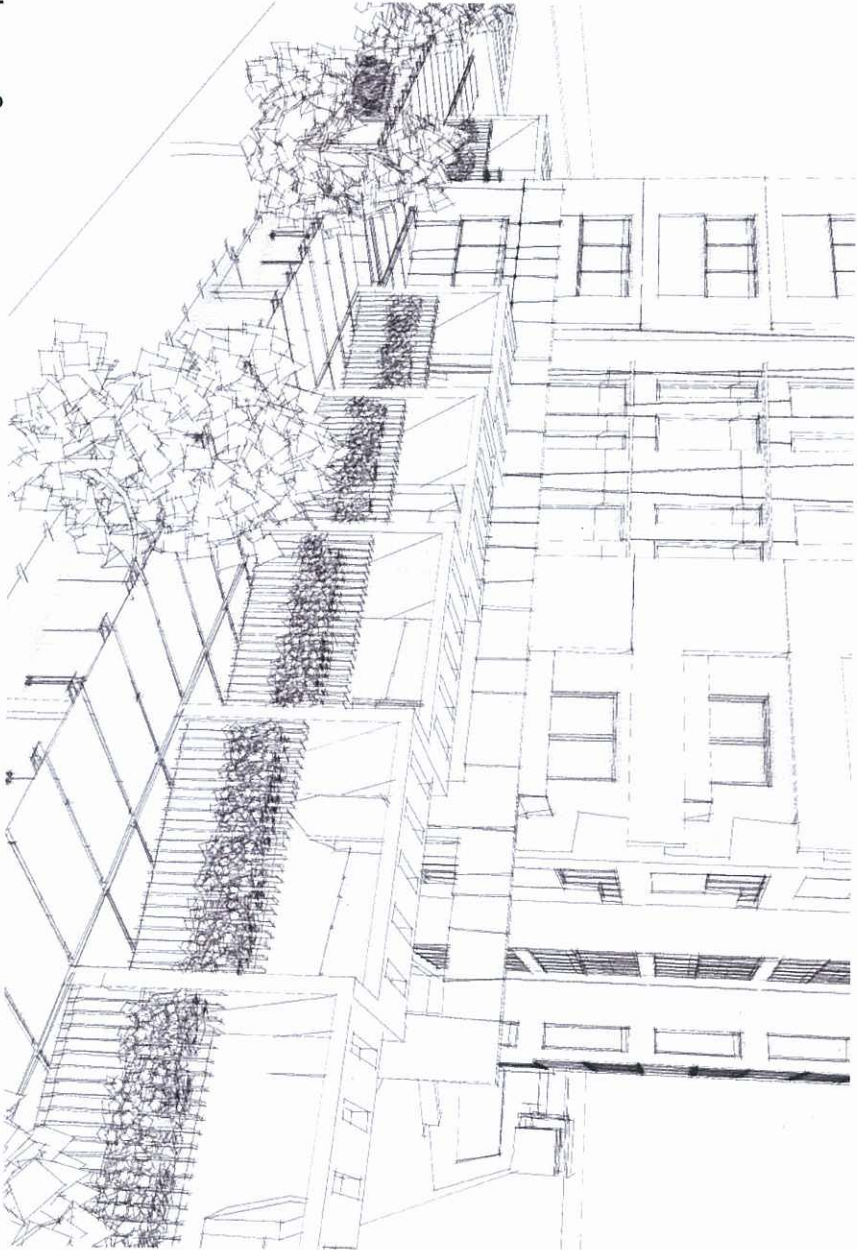


image 3



image 4

PROPOSED RESIDENTIAL DEVELOPMENT, 16 HAMILTON PLACE, BOWEN HILLS

HAMILTON PLACE STREETSCAPE - SHEET 2

METRO PROPERTY DEVELOPMENT PTY LTD

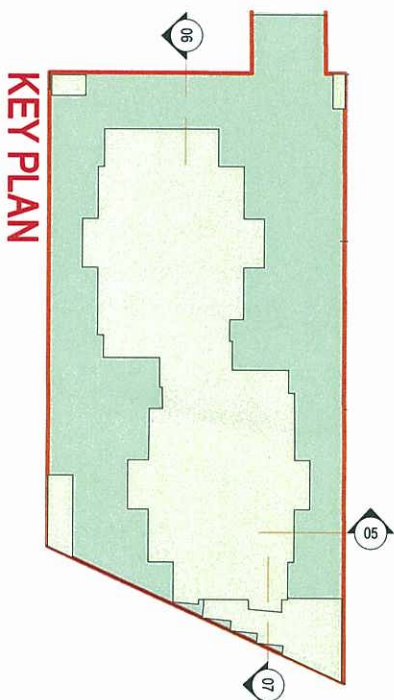
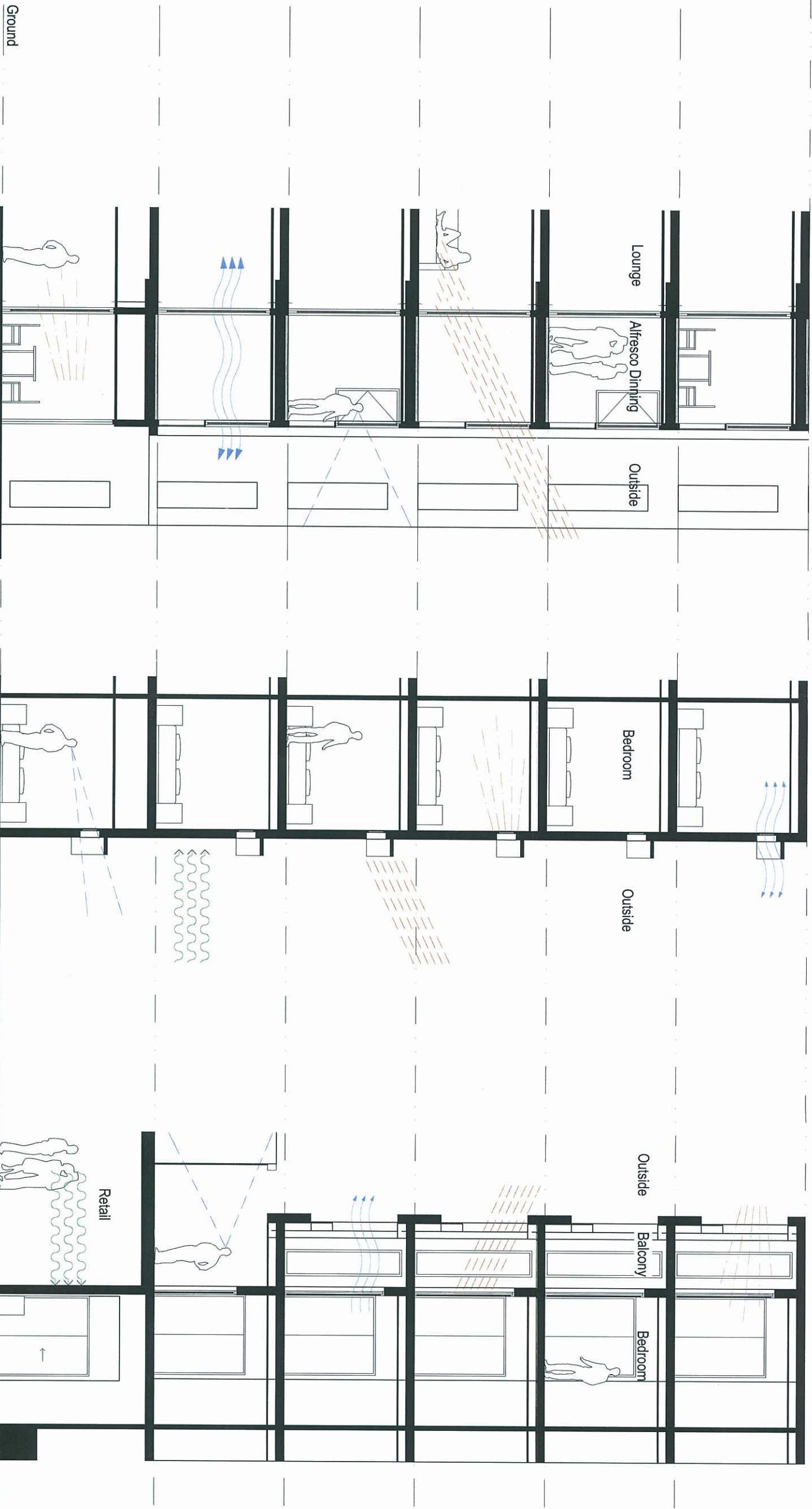
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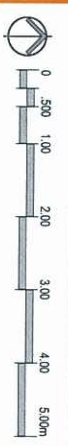
Legend

- Sun protection
- Acoustic protection
- Natural ventilation
- Line of sight
- Natural light



KEY PLAN

FACADE CONCEPTS - SHEET 1



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PROPOSED RESIDENTIAL DEVELOPMENT, 16 HAMILTON PLACE, BOWEN HILLS

METRO PROPERTY DEVELOPMENT PTY LTD

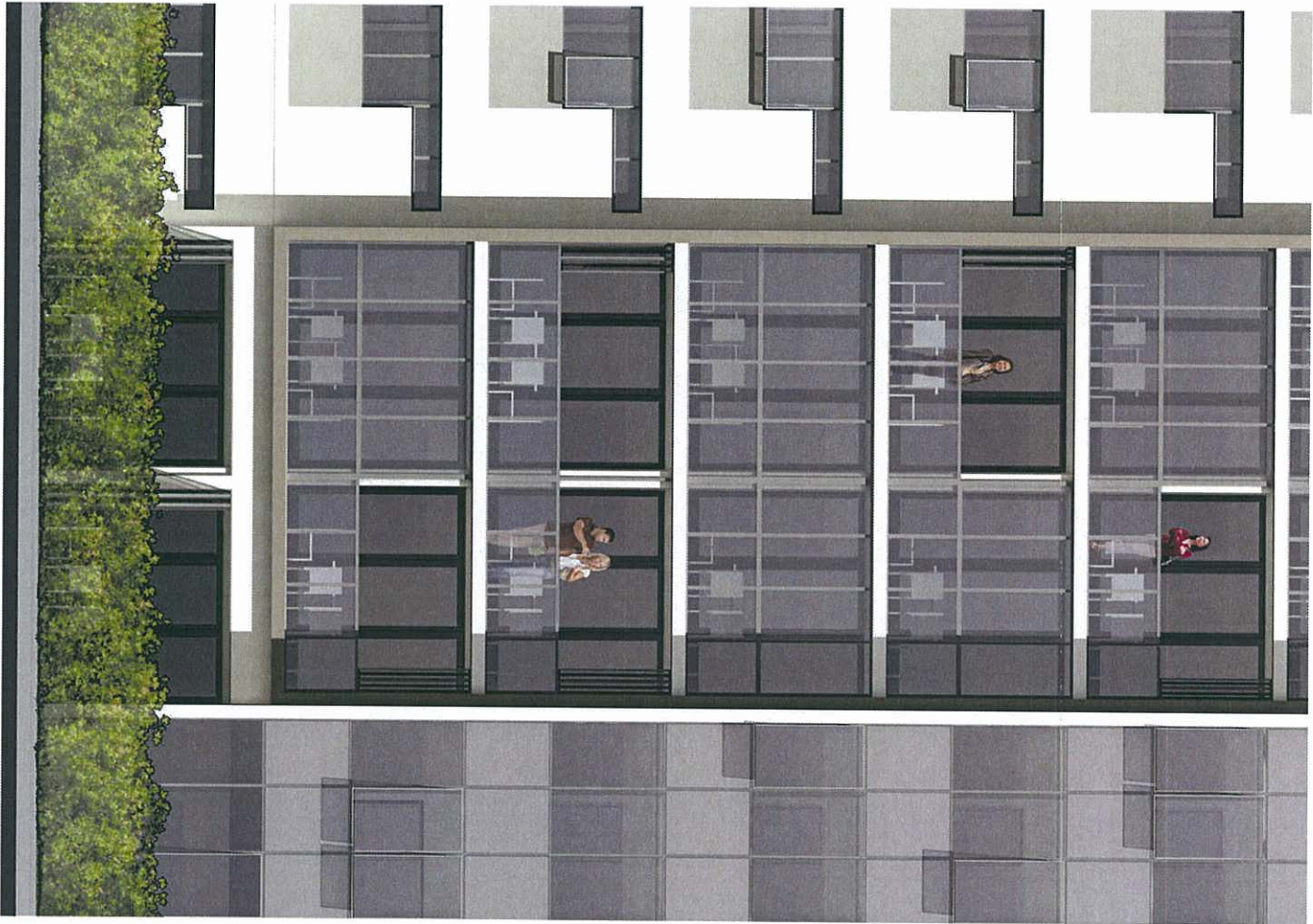
Metro Property Ltd
16 Hamilton Place
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Phone: 07 5500 228
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Email: metro@metro.com.au
Website: www.metro.com.au

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DA-022-B JOB NO: METR0003

LA (Facade section) DOCUMENTS
referred to in the ULDA
APPROVAL dated 21/10/10

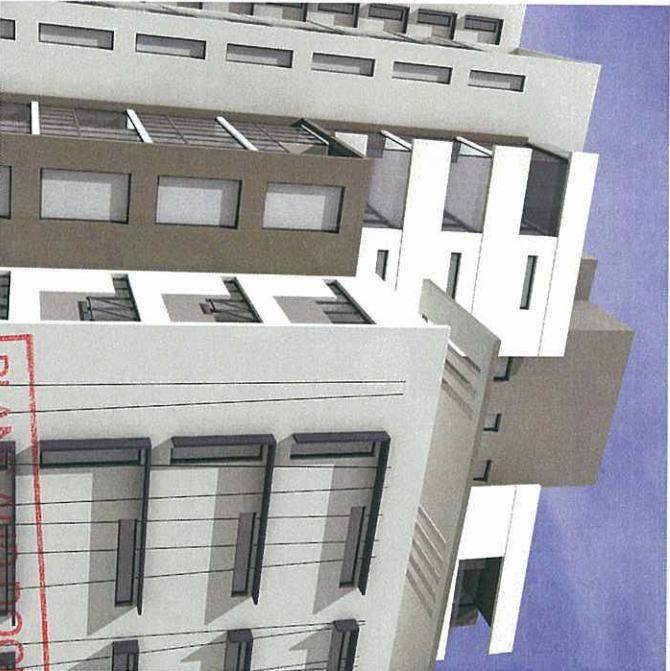




PART NORTH ELEVATION



FACADE STUDY RENDERS



PLANS AND DOCUMENTS
referred to in the ULDA
APPROVAL dated 24/10/10

PROPOSED RESIDENTIAL DEVELOPMENT, 16 HAMILTON PLACE, BOWEN HILLS

FACADE CONCEPTS - SHEET 2

METRO PROPERTY DEVELOPMENT PTY LTD

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DA-023-B JOB NO: METR0003

METRO – 16 HAMILTON PLACE, BOWEN HILLS
SUSTAINABILITY REPORT

PLANS AND DOCUMENTS
referred to in the ULDA
APPROVAL dated 21 / 10 / 10

Prepared For:

METRO 
PROPERTY DEVELOPMENT

*Project No: 10768
Issue No: E
Date: 2nd September 2010*

www.floth.com.au
SYDNEY BRISBANE JAKARTA

EXECUTIVE SUMMARY

This Sustainability Report has been prepared as part of the Development Application for the proposed residential development located at 16 Hamilton Place, 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. One such meeting conducted on the 25th May and attended by Mr. Phillip Kohn included Sustainability as a main topic on the agenda, where 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:

- Safe access (site lighting)
- Car parking spaces
- Energy efficiency measures (heat recovery)
- Recycled materials
- Recycled water
- Innovation

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>16 Hamilton Place, 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 managers office. 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>16 Hamilton Place, 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 the main topic on the agenda. The teams approach to the incorporation of sustainable principles into the design was discussed and generally well received by ULDA representatives. 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>16 Hamilton Place 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. The site's configuration encourages predominantly north / south orientation for the residential elements with limited exposure to the east and west. The site has frontages on two streets; Hamilton Place + Tufton Street. All pedestrian access is via Hamilton Place, whilst all vehicular access is via Tufton 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 tenancy (combined with its external terraces) and main entry node into the development affront Hamilton Place, providing an activated frontage improving both casual surveillance and amenity. All the apartments on the Hamilton Place frontage have balconies that view to the street that will provide both casual surveillance and amenity. The orientation of the building on the site with its setbacks and the separate entry pod enable casual surveillance of visitors entering the residential foyer from a number of apartments.
Orientating for passive heating and cooling	The site's configuration encourages predominantly north / south orientation for the residential elements. The passive design of the development will 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:	

Principle 03 – Design For Our Subtropical Place	
<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place Bowen Hills Response</i>
Supplying large overhangs / eaves to shade building and create a comfortable indoor / outdoor edge	The Alfresco Dining Balcony provided to each apartment 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. Vertical and horizontal sun shading devices are provided to a majority of the eastern and western elevation glazed areas to provide passive shading.
Connecting living areas directly with generous balcony space or indoor / outdoor areas	All apartments incorporate Alfresco Dining Balcony areas which have 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 Alfresco Dining Balcony areas have the ability to be 'opened up'; and combined with the full width sliding doors to the adjoining living areas provide maximum access to both daylight and breezes. In addition, due to the typical floor plate arrangement it effectively provides 44% of apartments with the improved opportunity for natural cross ventilation through adjoining living and sleeping spaces.
Using varied materials, roof forms and building setbacks in light colours	The building mass has been carefully sculptured in both the horizontal (unit move in / out along the facade lines) and vertical planes (tower masses step down towards Hamilton Place). The linkage between the towers is permeated with voids between unit accommodation and external terraces. Roof forms to both towers incorporate 'sky terraces' to provide elevated communal recreation spaces. The building façade is predominantly composed of a palette containing aluminium framed glazing units, light coloured polished precast and prefinished aluminium composite wall panels.
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 basement levels with a singular entry/exit point positioned at the western (Tufton Street) end of the site, well away from the main pedestrian entry which is provided on a separate level from the eastern (Hamilton Place) end of the site.
Include awnings, active frontages and pedestrian amenities.	The Hamilton Place frontage of the development will be activated through the inclusion of a retail tenancy(s) incorporating external terrace spaces which will have a canopy over them and the footpath. The main pedestrian entry from Hamilton Place passes 3 ground floor apartments to get to the main entry lobby of the building.

Principle 03 – Design For Our Subtropical Place	
Brisbane City Council Guidelines	16 Hamilton Place Bowen Hills Response
Respecting your neighbour's privacy, sunlight and views	The building footprints have an average setback of more than 6 metres from the northern / southern boundary alignments, promoting sunlight to enter into the recreation podiums and landscape garden 'privacy buffers' and preserving critical view corridors.
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 (sky terraces and ground floor podium), swimming pool make-up and potentially basement tenant car washing bays, as described in the Integrated Water Management Plan prepared by Floth Sustainable Building Consultants.
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. This is a 25% improvement on the QDC requirement will result in 40,000kgCO ₂ /annum less in emissions by the development.
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.
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 as described in the Integrated Water Management Report prepared Floth. - Irrigation - Swimming Pool Make-Up

Principle 03 – Design For Our Subtropical Place	
Brisbane City Council Guidelines	16 Hamilton Place Bowen Hills Response
Providing appropriate seasonable shade and passive cooling/heating throughout the year to outdoor areas	The inclusion of Alfresco Dining 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. The main entry lobby on the ground floor is a large double storey area with covered roof and ventilation openings to both sides which will provide good cross natural ventilation for passive cooling in summer when open.
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.
Superior Design Outcome	
	The minimum NatHERS rating for any apartment will be 5 Stars.
	44% of all apartments being "corner" apartments allowing cross ventilation through these apartments.
	2600mm minimum ceiling height throughout the living, alfresco dining balconies and bedrooms to maximise the natural ventilation potential of the apartments.

Principle 04 – Protect And Restore The Natural Ecosystems	
<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place 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 Integrated Water Management Report prepared by Floth Sustainable Building Consultants, and 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>16 Hamilton Place 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 open-able Alfresco Dining Balcony areas. Extensive External Shading (street canopy) is also provided to the continuous length of the retail space affronting Hamilton Place, public spaces through the incorporation of a landscaped 'arbour' to the central entry foyer off Hamilton Place, ground floor BBQ recreational facilities and to the 2 separate sky terrace areas. Shade trees will also be incorporated into the vehicle / pedestrian entry off Tufton Street.
Utilise on-site water recycling opportunities to irrigate landscape	Rainwater will be harvested, stored and recycled for the purpose of landscape irrigation, as described elsewhere in this report and in the Integrated Water Management Report prepared by Floth Sustainable Building Consultants.
Scenic amenity	
Promoting or framing views and vistas	The predominantly north / south orientation of the residential buildings development provides various view cones / corridors, and in particular , Breakfast Creek to the North, Newstead and the Brisbane Exhibition Grounds and the CBD to the South , Bulimba Reach of the Brisbane River to the East, and Mt Coot-tha and beyond to the West.
Protecting and enhancing streetscape amenity	No protection is required of the existing Hamilton Place streetscape. The subject site is generally comprised of a glass shop front affronting the existing warehouse facility, and a car park entry and some off street parking. The proposed development will incorporate a clearly defined pedestrian entry node off Hamilton Place at the frontage alignment, retail facility and associated landscaped open terraces together with substantial street trees, to create an active street frontage and vastly improved amenity. The clearly defined entry structure and arbor leading to the recessed lobby entry provide a human scale and add interest to the streetscape.

Principle 05 – Utilise Land Appropriately	
<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place 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 mid way between two major public transport facilities, the RBWH (Royal Brisbane Women's Hospital) Bus Way Station (600 meters travel distance) and the Bowen Hills Railway Station (550 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 almost entirely 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 Tufton Street at Basement 1 Level and pedestrians entering off Hamilton Place at Ground Level. Pedestrian and Cyclists may also enter off Tufton Street, utilising a dedicated footpath/cycle way.
Encourage casual surveillance and amenity of pedestrian and cycle paths by having active frontages	The active retail frontage on Hamilton Place provides good opportunity for casual surveillance of pedestrian and cycle traffic entering and leaving the site, whilst the large open central entry / lobby which is flanked by the reception, meeting room, gym and mail room 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 fully built on.
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

Principle 05 – Utilise Land Appropriately	
<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place Bowen Hills Response</i>
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. The main entry lobby, gym and meeting room have been designed to provide good natural cross flow ventilation to enable passive cooling to these areas. They also have large overhanging roofs and are recessed back to provide shading in order to minimise the requirement for mechanical cooling.
Consider solar and breeze access to public open spaces, private living and outdoor spaces	The flexible open / closed Alfresco Dining Balcony areas together with the full width sliding doors to the adjoining living areas provide maximum access to both daylight and breezes. Ground Floor external recreation facilities (pool, BBQ, landscaped gardens and podium plaza) have been positioned on the desirable northern side of the residential towers to take advantage of the Brisbane sub-tropical climate. Communal external terraces within the 'link' between the towers, combined with the elevated communal sky terraces to each tower 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.	The development is located just 50 meters from a bus stop on Route 345 which terminates at the Normanby Bus Way and within 500 to 600 meters of a major busway station and a train station providing numerous services to a diverse range of destinations throughout Brisbane. In addition, ample bicycle (approx 195 parks and motorbike / moped parking (approx. 25 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.

Principle 05 – Utilise Land Appropriately	
<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place Bowen Hills Response</i>
Cut and Fill	
Buildings are designed to maintain the topography and minimise the extent and duration of disturbance.	The site is currently developed with a warehouse; with its lowest level floor aprox. 2 metres below the Hamilton Place frontage levels. Following demolition, it is envisaged that the site will be excavated a further 2.0 – 3.5 metres approximately to provide for the basement 2 carparking.levels. Building orientation and access ways (pedestrian and vehicular) have been designed to maintain the existing relationship to both Hamilton Place and Tufton Street.
Topsoil Protection	
Retain and reuse topsoil on site.	This is not relevant to the development a the site is almost entirely built-on 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>16 Hamilton Place, 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 Integrated Water Management Plan prepared by Floth Sustainable Building Consultants and 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 50kL will be provided for the capture and re-use of rainwater in accordance with the Integrated Water Management Plan prepared by Floth Sustainable Building Consultants.
Include the collection of condensate from air-conditioning plant	Condensate from air-conditioning fan coil units will be collected and discharged into the water storage tanks for recycling.
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 the extent of impervious surfaces over the site, 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.	Roof top gardens provide opportunities for both green and recreation functions. Lightweight arbors and pergolas will support Australian native vine species to cover large areas of these spaces, which will shade and cool the roof garden areas. Perimeter planters will be irrigated from on-site water sources and provide a medium for the plant growth and viability.

Principle 06 – Apply Integrated Water Management	
<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place, 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 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 Hamilton Place footpath. On-site, deep rooted trees will be incorporated in the Tufton Street entry. Deep soil to mounded planters will allow advanced native tree and palm plantings throughout the ground level.
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. Four hot water risers from the central hot water plant will be located to reduce horizontal pipe runs to apartments minimising water being wasted by residents waiting for hot water.
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.
Superior Design Outcomes	

Principle 06 – Apply Integrated Water Management

<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place, Bowen Hills Response</i>
•	The minimum WELS rating for any tapware except showers will be 6 Stars.
•	Four hot water risers per floor to minimise horizontal hot water pipe runs and wasted hot water.

Principle 07 – Manage Energy Use	
<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place, 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, or heat pump, 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 two 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>16 Hamilton Place, Bowen Hills Response</i>
• Orientating for optimum passive cooling and solar heating.	The building has been consciously 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 are predominately at 2600mm with clear lines from the Alfresco Dining areas back into the apartment. This additional height has been maintained at considerable expense, circa \$300K, to the project to provide a sense of openness superior outcomes and greater natural ventilation opportunities. Ceiling fans will be provided in all apartments.
• Providing opportunities for occupants to adjust indoor climate (eg adjustable shading)	The Alfresco Dining 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. It has been estimated that this could save \$250 in air conditioning costs per annum per apartment and reduce 210,825kg of CO₂ emissions across all apartments. The use of the Alfresco Dining Balcony with the indoor/outdoor focus comes at a considerable cost penalty, circa \$2.4M, to the project over the provision of an open balcony.
• Providing shading to glass and walls to reduce heat gain especially on west façade.	A superior architectural design has ensured that the maximum number of units are orientated towards the desirable northern / southern aspects, there are some glazed elements contained within the less bulky eastern and western facades, and it is proposed that these will be articulated with a combination of horizontal / vertical sun shading elements 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 less 'bulky' eastern and western facades are articulated with a combination of horizontal / vertical sun shading elements to assist with the protection of weathering (rain). The Alfresco Dining Balconies will be provided with drainage points should the resident leave the windows open when it rains.

Principle 07 – Manage Energy Use	
Brisbane City Council Guidelines	16 Hamilton Place, 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. This system must be considered a superior design outcome by removing air cooled condensers from apartment balconies and their associated noise issues. It also reduces the amount of equipment in the air conditioning of the project which reduces material and its associated embodied energy. This has been provided to the development at a cost penalty of circa \$500K.
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 cheaper 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 building 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	
Brisbane City Council Guidelines	16 Hamilton Place, Bowen Hills Response
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. This initiative has added an estimated additional \$10K to the cost of the development. 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 PE (Photo Electric) 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	16 Hamilton Place, Bowen Hills Response
Daylighting Orientate the development to maximize daylight in habitable areas, whilst minimizing heat and glare.	The apartments have a predominantly northerly or southerly aspect, maximizing daylight and minimising the heat and glare issues associated with the early morning and late afternoon sun. In addition, Alfresco Dining 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.
Superior Design Outcomes	In addition to the measures described above, the energy efficiency of the proposed development will be further improved through the recovery of waste heat from the air-conditioning chillers for the purpose of preheating water for domestic hot water consumption. This will be done by rejecting the heat directly from the refrigerant gas via a heat exchanger to a water storage vessel. The cold water supply pipe work passes through this storage vessel (similar to a shell and tube heat exchanger) to the central plant hot water system. This technology will reduce the energy associated with the central hot water plant providing a corresponding decrease in the developments CO₂ emissions (carbon footprint) by an estimated 41,000kgCO₂/annum and operating costs. This initiative has added an estimated additional \$80K to the cost of the development.

Principle 08 – Select Appropriate Building Materials	
<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place, 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 scrap 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 minimized where practical and investigated during the design development phase.
Sustainable timber	
Utilise timber products from forests and/or plantations that have certified environmentally responsible forest management practices.	The project will use timber from sustainable sources.

Principle 09 – Manage Waste	
<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place, 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	
Brisbane City Council Guidelines	16 Hamilton Place, Bowen Hills Response
Operation	
Provide clearly identifiable and distinct facilities for recycling and general waste.	Specific refuse facilities are set aside in Basement Level 1 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 Handover 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 insinkers	Insinkers will not be installed in the development.

Principle 10 – Consider Cost Efficiency	
<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place, 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.	Rain water 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.	The building façade is predominantly composed of a palette of prefinished and 'honest' materials (including aluminium framed glazing units, light coloured precast and prefinished aluminium composite wall cladding panels) that will naturally age and weather.
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>16 Hamilton Place, Bowen Hills Response</i>
Natural lighting / glare control	
Indoor environments should receive good natural lighting with minimal glare or heat penetration.	The north/south orientation of the apartments ensures maximum natural daylight penetration to the majority of internal spaces. Glazed elements contained within the less 'bulky' eastern and western facades permit controlled natural daylight, and are articulated with a combination of horizontal / vertical sun shading elements.
Natural ventilation	
Provide cross ventilation in the building design.	In addition to the 'flexible' Alfresco Dining Balconies, the typical tower floor plate arrangement effectively creates eight "corner" apartments, or 44% of all apartments, 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 Alfresco Dining 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 Basement 1 is located off Tufton St, 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:	
Providing an indoor/outdoor room such as a sun room if the development is subject to air or noise pollution.	The Alfresco Dining Balconies area are flexible, and have the ability to be opened-up or fully enclosed to the exterior, linking thru to living areas via full width 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 ground level pool deck area and the level 12 sky terrace area. As noted in the Environmental Noise Impact Assessment Report prepared by TTM Acoustics.

Principle 11 – Create Healthy Indoor Environments	
<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place, Bowen Hills Response</i>
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.
Superior Design Outcome	
	44% of all apartments being "corner" apartments allowing cross ventilation through these apartments.

Principle 12 – Support Green Transport	
<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place, 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 195 dedicated secure bicycle storage spaces will be provided within the basement levels of the development. In addition to these, tenant storage rooms located at the end of basement car bays afford the opportunity for further bike storage capacities. This number of bicycle storage spaces is 270% of the spaces determined in accordance with the requirements of the Austroads Guidelines.
Provide access to existing and proposed bicycle and pedestrian networks.	The development is located approximately 400m 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.
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 Hamilton Place street frontage thru into the main entry foyer, ground floor recreational facilities and the main lift lobbies are provided. There is an accessible (PWD) carpark provided within the basement 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

16 Hamilton Place, Bowen Hills Response

Public Transport Stops

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

The proposed development is situated approximately mid way between two major public transport facilities, the RBWH (Royal Brisbane Women's Hospital) Bus Way Station (600 meters travel distance) and the Bowen Hills Railway Station (550 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 almost entirely 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 50 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, further complementing the existing public transport facilities. The development is located approximately 400m 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.

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

Brisbane City Council Guidelines

16 Hamilton Place, Bowen Hills Response

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 gym, shelter and BBQ facilities will be provided on the northern side of the site at ground level directly accessible from the generous lobby providing ideal casual surveillance opportunities. The landscape design and plant selection is based on providing both shade (via trees and arbour/ pergola structures with vines) and clear sight lines. Clear 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 to each tower established on Levels 8 and 12 creating further elevated communal gathering spaces and casual surveillance opportunities, equipped with appropriate landscaping, seating, shelter and BBQ facilities.

All BBQ area will be afforded shade from their respective pergolas 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 Tufton Street and do not impact upon pedestrian / resident movements (off Hamilton Parade) 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>16 Hamilton Place, 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 each tower with provision for various communications infrastructure back bone cabling systems.

Principle 14 – Build A Safe And Diverse Community	
Brisbane City Council Guidelines	16 Hamilton Place, 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 Hamilton Place 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, pedestrian entry node, northern terrace pool and recreation areas, combined with the large open central entry lobby lounge, and adjoining reception, meeting and mail rooms, provide ideal casual surveillance opportunities for those entering and leaving the site / building. In addition, external sky terraces to each tower are (Levels 8 and 12) 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 arbor/ pergola structures with vines) and clear sight lines. Clear 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” access node located off Hamilton Place, minimising the risk of vandalism and entry by unauthorised persons. In a similar manner, vehicular entry into the car park will be via an “Access Controlled” roller door.
Lighting	All external public spaces will be illuminated in accordance with the requirements of AS1558, in particular, Part 3.1, Pedestrian Area Lighting.

Principle 14 – Build A Safe And Diverse Community	
<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place, Bowen Hills Response</i>
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 gate (off Hamilton Place), 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 shutter. Residents will only be able to access their floor, sky garden communal areas, ground podium level pool deck and recreation facilities. Furthermore, an audio intercom system will ensure that only welcome visitors are provided access to the appropriate residential floor
Valued Features	
Protect, integrate and reuse important site features such as views.	The predominantly north / south orientation of the residential buildings development provides various view cones / corridors, and in particular , Breakfast Creek to the North, Newstead and the Brisbane Exhibition Grounds and the CBD to the South , Bulimba Reach of the Brisbane River to the East, and Mt Coot-tha and beyond to the West.

Principle 14 – Build A Safe And Diverse Community	
<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place, Bowen Hills Response</i>
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 gym, shelter and BBQ facilities will be provided on the northern side of the site at ground level directly accessible from the generous lobby providing ideal casual surveillance opportunities. In addition, sky terraces to each tower established on Levels 8 and 12 creating further elevated communal gathering spaces and casual surveillance opportunities, equipped with appropriate landscaping, seating, shelter and BBQ facilities. All BBQ area will be afforded shade from their respective pergolas and adjacent landscape garden areas.

Principle 15 – Inform The End Owner And User	
<i>Brisbane City Council Guidelines</i>	<i>16 Hamilton Place, 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.

PRELIMINARY PLANTING SCHEDULE

SPECIES	COMMON NAME	DENSITIES
Alpinia species	Ginger	800mm
Archontophoenix species	Alex / Bungalow Palms	Feature Palms
Aspidistra elatior	Cast Iron Plant	400mm
Callistemon species	Bottlebrush	1.0m
Carpentaria acuminata	Carpentaria Palm	Feature Palms
Cissus Antarctica	Kangaroo Vine	Arbor Vine
Cordyline species	Palm Lily	Accent Plant
Cupaniopsis anacardioides	Tuckeroo	Street Tree
Dianella species	Flax Lily	300mm
Diets bicolor	Wild Iris	500mm
Elaeocarpus 'eumundii'	Eumundi Quandong	Street/Feature Tree
Grevillea baileyana	White Oak	Feature Tree
Harpullia pendula	Tulipwood	Shade Tree
Heliconia species	Lobster Claw	Accent Plant
Lepidozamia species	Cycad	Accent Plant
Liriope 'Evergreen Giant'	Liriope	400mm
Liriope muscari varieties	Liriope	400mm
Livistonia decipiens	Weeping Cabbage Palm	Feature Palm
Lomandra 'hybrid' species	Mat Rush	400mm
Myoporum parvifolium	Creeping Boobialla	500mm
Pandorea jasminoides	Bower of Beauty	Arbor Vine
Philodendron species	Philodendron	400mm
Pychosperma macarthurii	Grey Cluster Palm	Feature Palm
Randia fitzalanii	Yellow Mangosteen	Feature Shrub/Tree
Rhapis excelsa	Rhapis Palm	Feature Palm
Strelitzia reginae	Bird of Paradise	Accent Plant
Syzygium species	Lily Pili	1.0m
Waterhousia floribunda	Weeping Lily Pili	Street/Feature Tree
Westringia species	Coastal Rosemary	1.0m
Xanthostemon chrysanthus	Golden Penda	Shade Tree
Zamia species	Cycad	Accent plant

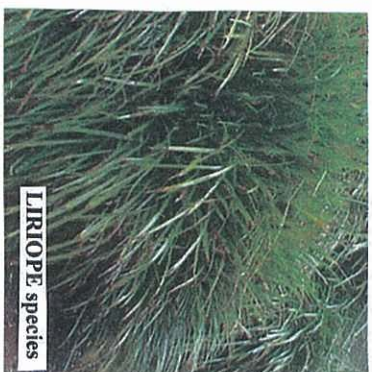
NOTE: All plants to be well hardened nursery stock.



DIANELLA species



DIANELLA variegata



LIRIOPE species



DIETS species



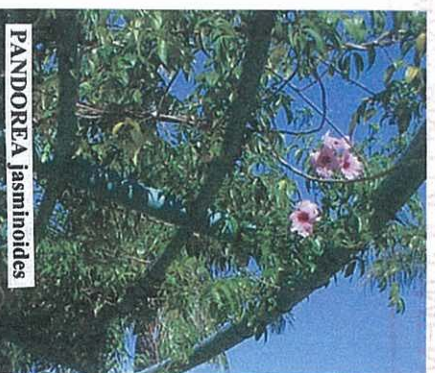
RANDIA fitzalanii



ALPINIA species
+ DIETS species



MYOPORUM parvifolium



PANDOREA jasminoides



CUPANIOPSIS anacardioides



ELAEOCARPUS eumundii



CARPENTARIA acuminata



ARCHONTOPHOENIX species



SYZYGIUM dwarf species
+ LIRIOPE evergreen giant



STRELITZIA reginae



CONCRETE PAVING
+ FLAGSTONE BANDING



TACTILE PAVING
+ FLAGSTONE BANDING

PLANS AND DOCUMENTS
referred to in the ULDA
APPROVAL dated 2/10/10

TREVOR LYNCH

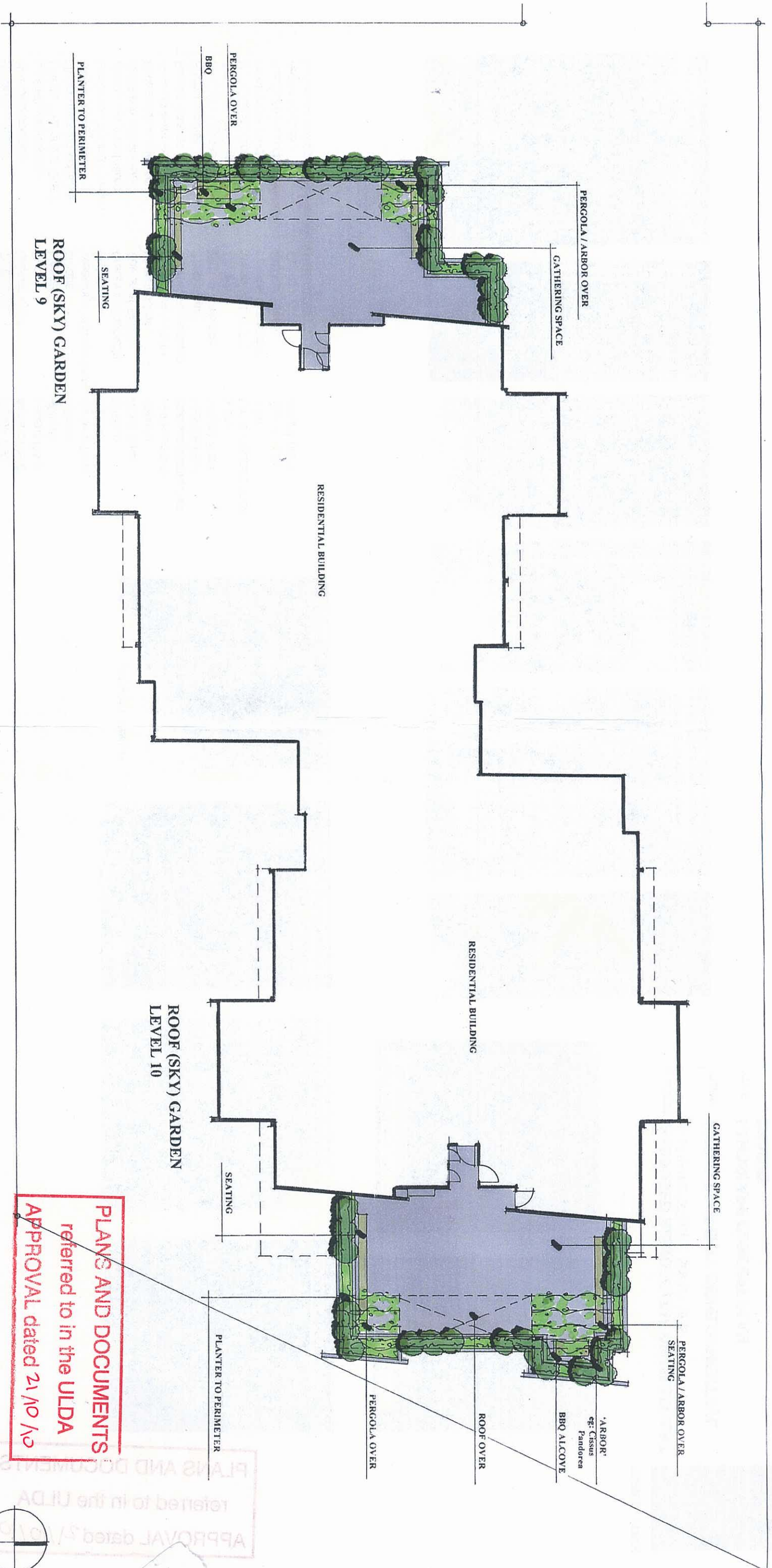
PROJECT
@ 16 HAMILTON PLACE, BOWEN HILLS

CLIENT
METRO PROPERTY DEVELOPMENT P/L

TITLE
LANDSCAPE CONCEPT PLAN

Scale: 1:200@A3 Date: JUNE 2010 Drg. No MET 03 /LP 03 B

LANDSCAPE
ARCHITECT



PROJECT **PROPOSED RESIDENTIAL DEVELOPMENT**
@ 16 HAMILTON PLACE, BOWEN HILLS

CLIENT **METRO PROPERTY DEVELOPMENT P/L**

TITLE **LANDSCAPE CONCEPT PLAN**
ROOF (SKY) GARDENS

Scale: 1:200@A3 Date: JUNE 2010 Drg. No MET 03 /LP 02 C

TREVOR LYNCH

LANDSCAPE
ARCHITECT

REFER INSET BELOW
FOR BBQ AREA +
DRIVEWAY ENTRY

'GREEN' WALL / TRELLIS

SELECTED PAVING
SEATING ALCOVES

PALM GROVES
eg: Archontophoenix
Carpentaria
Livistonia
Alpinia
Dianella etc

SUB-TROPICAL PLANTING
eg: Archontophoenix
Carpentaria
Grevillea
Leptodermis
Streptocarpus
Hibiscus etc

MOUNDED PLANTERS
nom. 500-900mm deep

LEVEL PLANTERS
TO TERRACES
eg: Cissus
Pandorea

LAP POOL

RESIDENTIAL BUILDING

LOBBY

ENTRY

RESIDENTIAL BUILDING

RETAIL

RETAIL

HAMILTON PLACE...

SELECTED CONCRETE
+ FLAGSTONE PAVING
TREATMENT

AWNING OVER
TO ARCH. DETAIL
50% TRANSPARENCY
FENCING - TO DETAIL

STREET TREES
eg: Cupressus
Elaeagnus
Waterhousea
+ UNDERPLANTING
eg: Dianella
Liriodendron
Dieris

MOUNDED PLANTERS
nom. 500-900mm deep

ENTRY FEATURE
eg: SCULPTURE

ENTRY 'ARBOR'
eg: Cissus
Pandorea

MOUNDED PLANTERS
nom. 500-900mm deep



TREE PLANTING (ALTERNATE SIDES)
eg: Hesperaloe parviflora
Grevillea banksiana etc

PEDESTRIAN
ENTRY PATH
TO LOWER LEVEL

DRIVEWAY

BBQ AREA
PERGOLA OVER

INSET: BBQ AREA / DRIVEWAY

PLANS AND DOCUMENTS
referred to in the ULDA

APPROVAL dated 10/10/10

PROJECT **PROPOSED RESIDENTIAL DEVELOPMENT**
@ 16 HAMILTON PLACE, BOWEN HILLS

CLIENT **METRO PROPERTY DEVELOPMENT P/L**
TITLE **LANDSCAPE CONCEPT PLAN**
GROUND LEVEL

TREVOR LYNCH

Scale: 1:200 @ A3 Date: SEPT 2010 Drg. No MET 03 / LP 01 F

LANDSCAPE
ARCHITECT



TUFTON STREET...

PLANS AND DOCUMENTS

referred to in the ULDA

APPROVAL dated / /

Proposed Residential Development

16 Hamilton Place

Bowen Hills

TRAFFIC ENGINEERING REPORT

Prepared for:

Metro Property Development Pty Ltd

7th July 2010

Reference: 26584Trep3

TRAFFIC • PARKING • ACOUSTICS

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- A Proposed Development Layout
- B Bicycle Storage

1. Background

1.1 Introduction

TTM Consulting has been engaged by Metro Property Development Pty Ltd to prepare a traffic engineering report investigating a proposed residential development within the Bowen Hills Urban Development Area (UDA). It is understood that a Development Application will be lodged with Urban Land Development Authority (ULDA).

The report has been prepared in accordance with the Bowen Hills Urban Development Area Development Scheme and other relevant traffic standards such as Australian Standard AS2890.1:2004.

1.2 Site Location

The site is located at Bowen Hills, near the Royal National Association (RNA) Showgrounds, as shown in Figure 1.1. The site has road frontages to Hamilton Place and Tufton Street, and is currently occupied by Australian Red Cross.

The existing land use currently has access driveways on both Tufton Street and Hamilton Street.

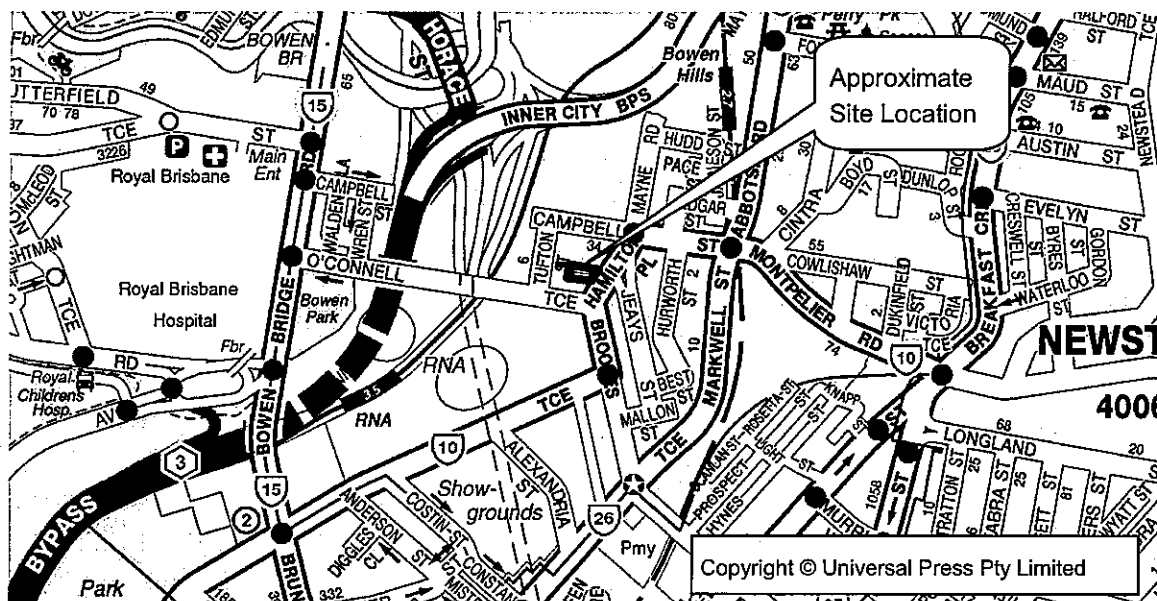


Figure 1.1: Site Location

2. The Proposed Development

The proposed development schedule is shown in Table 2.1:

Table 2.1: Proposed Development Schedule

Type	Quantity
Residential Units	
One Bedroom	133
Two Bedroom	61
Total	194
Retail	116.8m ² GFA

The development also includes:

- 128 resident parking spaces (incl. 1 x PWD space) and 10 visitor spaces
- 16 x motorcycle spaces
- 194 bicycle spaces
- Single vehicular access driveway (7.0m wide Type B2) located on Tufton Street (on the western boundary)
- On-site servicing for MRV / rear loading RCV

A copy of the development plans is included as Appendix A.

3. Existing Transport Infrastructure

3.1 The Road Network

All roads in the immediate vicinity of the site are administered by Brisbane City Council. The hierarchy and characteristics of roads in the immediate vicinity of the site are shown below in Table 3.1.

Table 3.1: Local Road Hierarchy

Road	Carriageway Width	Speed Limit	Lanes	Classification	Management
❖ Campbell Street	12m	60kph	4 (undivided)	Suburban Route	BCC
❖ Hamilton Place	12m	60kph	4 (undivided)	Suburban Route	BCC
❖ O'Connell Terrace	12m	60kph	2 (undivided)	Suburban Route	BCC
❖ Tufton Street	9m	50kph	2 (undivided)	Local Road	BCC

The intersection of Campbell Street / Hamilton Street and O'Connell Terrace / Hamilton Street are signalised, O'Connell Tce / Tufton Street is priority controlled.

3.2 Road Planning

Table 3.2 summarises infrastructure required to be delivered in order to achieve the ULDA's vision for the Bowen Hills Urban Development Area.

Table 3.2: Proposed infrastructure improvements

Proposed catalyst infrastructure	
Infrastructure	Description of works
❖ Bowen Hills Railway Station	Stage 1 upgrade to improve safety, amenity and visual and physical access from Hudd Street.
Proposed infrastructure improvements	
Infrastructure	Description of works
❖ Road and street improvements	Widening of O'Connell Terrace and public realm improvements.
	Widening of Campbell Street east of Mayne Road through to Abbotsford Road and public realm improvements.
	Widening of Tufton Street and public realm improvements.
	Extension of Tufton Street through to the junction of Mayne Road and Hudd Street.
	Public realm improvements to Brookes Street between Gregory and O'Connell Terraces
	Public realm improvements to Hamilton Place.
	Intersection modifications at the junction of Campbell Street, Hamilton Place and Mayne Road.
	Intersection modifications at the junction of O'Connell Terrace, Hamilton Place and Brookes Street to allow for both lanes from

	O'Connell Terrace to turn right into Brookes Street.
	Intersection signalisation at the junction of Tufton Street and O'Connell Terrace.
• Transport Infrastructure	Upgrades to Bowen Hills Railway Station.
	New bus station linking to the Bowen Hills Railway Station.

ULDA has advised of a 10m road widening on Tufton Street for pedestrian amenity and not carriageway width increase. Further, they have verbally advised the project architect that this widening is to be restricted to the eastern side of the road ie across the site frontage.

3.3 Public Transport and Pedestrian Facilities

Bowen Hills train station, is located approximately 400m to the north of the site. Services operate every 20-30 minutes (approximately) in all directions.

Brisbane Transport has bus routes that utilise Hamilton Place, with the nearest on-street bus stop in front of the site. Route 393 provides connection between QUT Kelvin Grove, Normanby, Tenerife Ferry Terminal and Bowen Hills Train Station operating every 15 - 20minutes (approximately).

The RBWH Busway station is located approximately 550m to the west of the site, which provides access to the wider busway network to the CBD, the South East Busway and the future Eastern & Northern Busway.

The subject site has a high level of public transport accessibility with train and busway stations within convenient walking distance.

Formal pedestrian footpaths are located on both sides of Tufton Street, O'Connell Terrace, Hamilton Place and Campbell Street.

4. Car Parking Arrangements

4.1 ULDA Requirement for Car Parking

The Bowen Hills Urban Development Area - Development Scheme specifies the following parking rate of an average parking provision of 1 space per unit including visitor parking. This relates to an average of 195 spaces.

The total proposed on-site parking supply for the development is 138 spaces (incl. 1 x PWD space) plus 16 x motorcycle spaces.

The proposed parking supply rate is based on constraining the commuter traffic generated by the subject site consistent with TOD principles. The UDA Development Criteria states:

"In support of TOD principles priority should be given to pedestrian, cycle and public transport modes, over private vehicle use".

As mentioned previously, the site is highly accessible to public transport, therefore it is considered appropriate in terms of travel demand management strategies to reduce the overall parking supply and encourage residents to use alternative modes of transport.

It is noted that the ULDA recently approved a similar residential development on Jeays Street (named CODE) with a parking rate of less than one space per unit (0.84 spaces per unit).

TTM consider the Brisbane City Council rate for CBD residential development appropriate for TOD sites such as Bowen Hills. The BCC rate is 0.5 spaces per bedroom plus 1 space per 20 units for visitors. The parking requirement based on the BCC CBD rates is shown in Table 3.3.

Table 4.1: Parking Provision – BCC CBD Rates

Use	Rate	Parking
Resident		
133 x 1 Bedroom units	0.5 spaces / unit	67 spaces
61 x 2 Bedroom units	1.0 space / unit	61 spaces
Sub total		128 spaces
Visitor		
194 units	1.0 space / 20 units	10 spaces
Total		138 spaces

The proposed parking supply of 138 spaces is considered acceptable on the basis of travel demand management principles required to encourage residents to use public transport or walk / cycle as opposed to travelling by private vehicle.

4.2 Proposed Car Park Design

Australian Standard AS2890.1:2001 is adopted as a reference for car parking design. The key design parameters in accordance with AS 2890.1 are as follows:

- Residential parking spaces to measure no less than 5.4m x 2.4m
- PWD parking spaces to measure no less than 5.4m x 3.2m.
- Motorcycle parking spaces to measure no less than 2.5m x 1.2m.
- Parking spaces located immediately adjacent to a wall should be 0.3m wider than standard.
- Minimum parking aisle width of 5.8m
- To allow manoeuvring from end spaces in terminated aisles, they should incorporate extensions of 1m, or have an effective aisle width of 8m.

The proposed parking arrangements have the following characteristics:

- Parking spaces measure no less than 5.4m x 2.5m - *Australian Standard requirements are satisfied.*
- Visitor parking spaces measure no less than 5.4m x 2.5m – *Australian Standard requirements are satisfied.*
- Motorcycle parking spaces measure no less than 2.5m x 1.4m – *Australian Standard requirements are satisfied.*
- Parking aisles are a minimum of 6.2m wide – *Australian Standard requirements are satisfied.*
- To allow manoeuvring from end spaces in the terminated aisle 2m extension is provided – *Australian Standard requirements are satisfied.*

Ramps are generally designed such that the ramp grades do not exceed 1in8, which satisfies AS 2890.1, the one exception being the ramp between levels B1 and BM which has a grade of 1in6 and includes transitions, which again satisfies AS 2890.1.

The proposed car park layout complies with Australian Standard Requirements.

5. Road Network Performance

5.1 Traffic Generation

The proposed development is expected to generate approximately 50 trips during the peak hour based on a trip generation rate of 0.25vph, which is typical for a high density dwelling in close proximity to the CBD with constrained parking. On distribution of the development traffic to the road network (Campbell Street, O'Connell Terrace, Markwell Street, Brooke Street, Hamilton Place, St Pauls Terrace) the impact will be negligible, thus not warranting a traffic impact assessment.

A majority of the proposed road improvement works summarised in Table 3.1 in the area has been devised to accommodate the traffic demands for development across the entire Bowen Hills UDA.

6. Site Access Arrangements

6.1 Access Design

The residential car park will be accessed via a driveway located on Tufton Street. The access will allow all movements which is considered acceptable given the minor traffic volumes on this route.

In accordance with AS2890.1, a driveway servicing a car park with capacity between 101 and 300 vehicles, located on a minor road requires a Category 2 driveway with a width between 6m to 9m. In this instance a driveway Category 2 – 7.0m is provided. The 7.0m width is required as the driveway will be catering for service vehicles of the size of MRV (medium rigid vehicle) and refuse trucks.

6.2 Access Ramp Design

The access ramp from Tufton Street is designed such that the grade does not exceed 1 in 20, which satisfies AS 2890.1.

7. Service Vehicle Arrangements

The development requires occasional access by a furniture trucks and Refuse Collection Vehicles. Considering the small size of units an MRV will be sufficient for furniture removal.

The refuse bins (both general and recycling) will be serviced by Brisbane City Council's refuse truck. On-site refuse collection will be undertaken by a rear loading truck that requires only 3.5m height clearance at the refuse collection point (MRV loading bay) on collection day. As such, the RCV will drive forward into the site along the driveway, reverse into the loading bay, collect the refuse and drive forward out on to Tufton Street. The swept path is shown on the basement plan contained in Appendix A.

It should be noted that discussions with Citywaste regarding the broader refuse storage and collection arrangements are ongoing.

8. Public Transport, Pedestrian and Bicycle Facilities

8.1 Public Transport

Existing bus stop in front of the proposed development is considered adequate for the needs of the development.

As part of Bowen Hills Urban Development Plan the Bowen Hills Train Station will be upgraded to improve safety, visual and physical access from Hudd Street.

In addition a new busway station linking to the Bowen Hills Train Station is also proposed as part of the urban development.

With all of these infrastructure upgrade works public transport services will be able to cater for the needs of the residents.

8.2 ULDA Requirements for Bicycle Facilities

The ULDA development criteria specifies bicycle facility targets for residential development, which are as follows :

Residents: One secure bicycle space per unit according to AS2890.3

Visitors: One space per 400m² GFA according to AS2890.3

In reviewing AS2890.3 it is noted that the standard does not specify parking rates for bicycles. Other aspects of this section of the ULDA development criteria are also somewhat confusing.

The generally accepted guide for determining bicycle facilities is the AustRoads Part 14 – Bicycles. Table 8.1 summarises the AustRoads bicycle parking requirement.

Table 8.1: Residential Bicycle Parking Requirements of AustRoads

Land Use	Category	Council's Rate	Spaces Required
Residential	Tenants	1 per 4 units	49
	Visitor	1 per 16 units	13
Total			72 spaces

The development plan currently proposes 194 bicycle spaces (ie 1 space per unit), which complies with the ULDA development criteria for residential bicycle parking provision, and is well in excess of the recommended parking supply in accordance with Austroads Part 14. In addition to this dedicated bicycle parking, considerable residential storage is provided, and it is anticipated that some residents will prefer to store the bicycles in these areas. Bicycle parking spaces freed-up in this way are expected to be able to satisfy the anticipated small residential visitor demands. Given the very small size of the retail component of the development, it is not considered necessary to provide any dedicated bicycle parking for this component.

To minimise the space utilised by the bicycle storage facility, and subsequently improve the efficiency of the building, a bicycle rack system utilising double height storage is being considered. An example of such a system is shown in Appendix B.

9. Recommendations

9.1 Impact on Surrounding Road Network

It is concluded that the traffic generated from the proposed development will have a negligible impact upon the adjacent road network, and as such, TTM do not believe that a detailed impact analysis is necessary.

9.2 Development Access

The proposal incorporates a single 7.0m wide vehicular access driveway located on Tufton Street, approximately midway to O'Connell Terrace and Campbell Street intersections.

The characteristics of the proposed access driveway comply with AS2890.1 requirements, in terms of width, grade and sight distance.

9.3 Car Parking Arrangements

The development proposal incorporates 138 parking spaces in total within the basement level car park of which 1 space is a designated PWD space. The proposed parking supply is based on constraining the commuter traffic generated by the subject site and is consistent with TOD principles.

The parking spaces and aisles satisfy all dimensional and geometric requirements specified in AS2890.1.

9.4 Service Vehicle Arrangements

The proposal allows RCVs and MRV based furniture-trucks to enter the site, load / unload, and then depart the site in a forward motion. The height clearance available in the service vehicle area is 4.5m. The proposed service vehicle facilities are considered acceptable for the proposed development.

9.5 Public Transport and Bicycle / Pedestrian Facilities

The site is well located in terms of providing a high level of accessibility to public transport, with the Bowen Hills Train Station and RBWH Busway station within walking distance of the site. This reinforces the proposal to constrain resident car parking and encourage residents to use public transport.

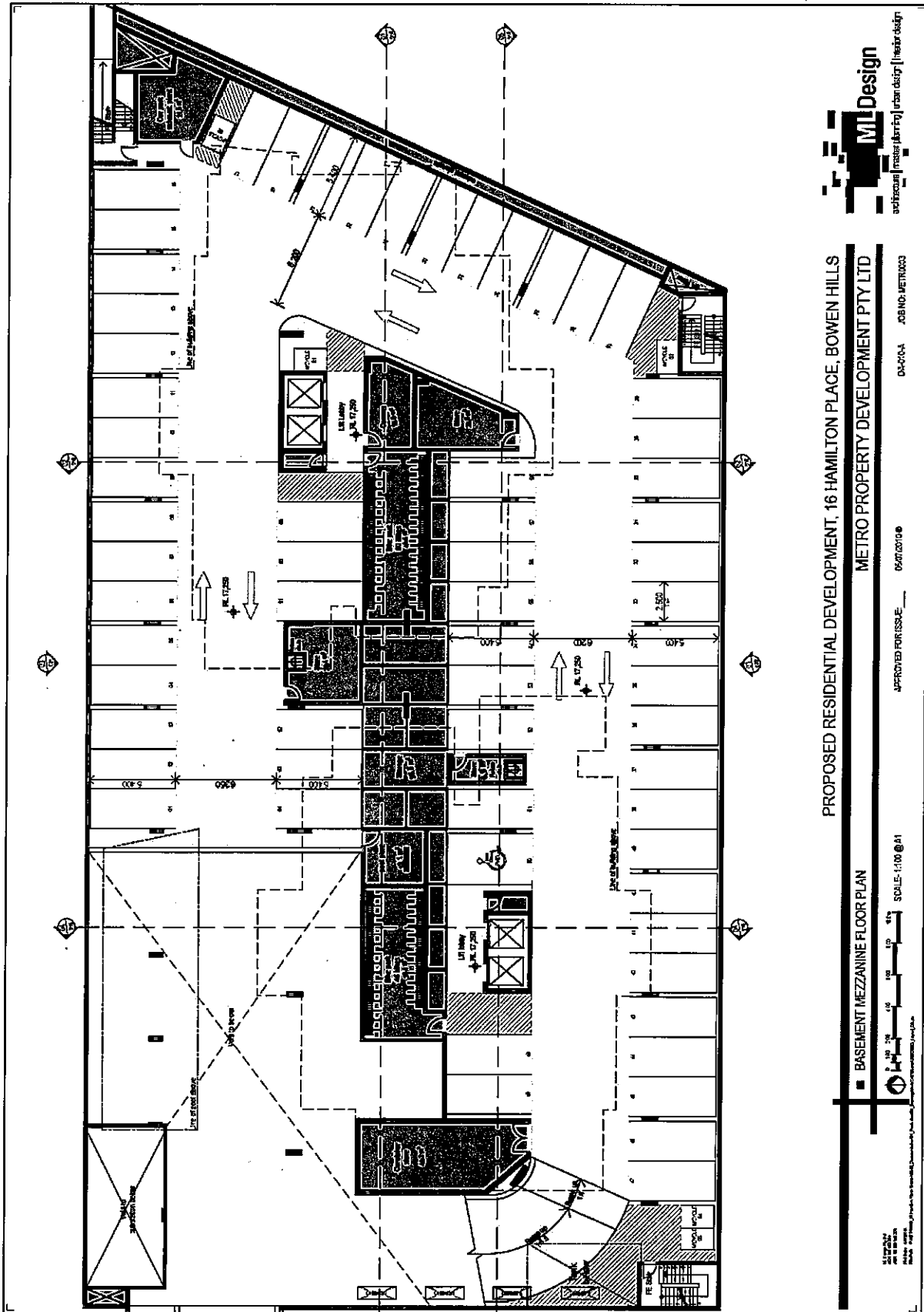
The residential bicycle facilities provided on-site comply with the ULDA development criteria for residential bicycle parking provision and are well in excess of the minimum requirements of the Austroads Part 14.

Appendix A

PROPOSED DEVELOPMENT LAYOUT







Appendix B

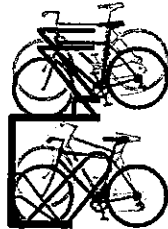
BICYCLE STORAGE

Product Range > Bicycle Racks

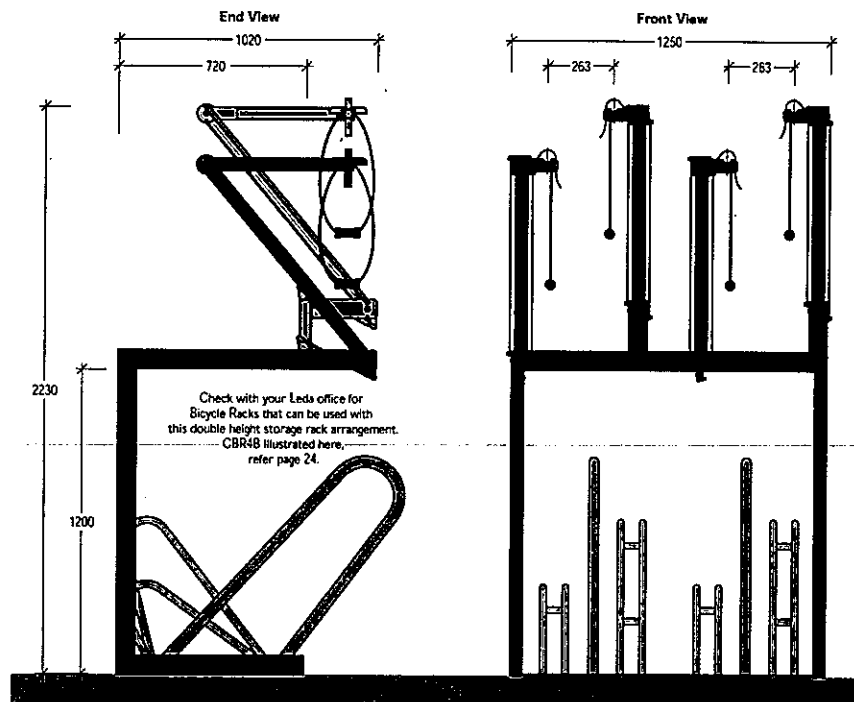
DOUBLE HEIGHT

CBR8GS

Material 75 x 50 x 3mm Frame / 50 x 50 x 2mm Extensions / Powder coated black



Double Height Storage
Maximise your bicycle storage with this double height rack.
To operate, simply pull down on the cord and attach your bike.
Pull again and gas strut assistance positions your bike securely out of the way on a second tier.



floth

SUSTAINABLE BUILDING CONSULTANTS

SYDNEY BRISBANE JAKARTA

**16 HAMILTON PLACE,
BOWEN HILLS**

PLANS AND DOCUMENTS

referred to in the ULDA

APPROVAL dated 21 / 10 / 10

INTEGRATED WATER MANAGEMENT PLAN

Prepared for



*Project No: 10768
Date: 07th July 2010
Issue No: P3*

16 HAMILTON PLACE INTEGRATED WATER MANAGEMENT PLAN

10768

This register identifies each issue of and each amendment to this document by Revision No, Page No, the details of each amendment and date of issue.

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1.0 EXECUTIVE SUMMARY

This site based Integrated Water (resource) Management Plan (IWMP) has been prepared as part of the Development Application for the proposed residential development situated at 16 Hamilton Place, Bowen Hills.

When implemented, the IWMP will minimise the impact of the urban development on the water cycle.

This objective will be achieved through the implementation of the following key principles:

- ☐ Reduction of the potable water supply to the site.
- ☐ Reduction of waste water discharge to the authority sewer infrastructure.
- ☐ Improving stormwater quality generated from the site before discharge to the authority infrastructure.

These key principles will be achieved through the application of the following measures:

- ☐ High water efficient WELS rated fixtures.
- ☐ Providing alternative water source a rainwater harvesting system for:
 - o Landscape irrigation.
 - o Swimming pool make-up.
 - o Toilet flushing to retail
 - o Car washing
 - o External water use

2.0 INTRODUCTION

The proposed residential development is located at 16 Hamilton Place, Bowen Hills as per Figure 2.1 below



Figure 2.1: Site Location

The proposed development consists of:

- ☐ 195 residential apartments including an 18 x 6m swimming pool.
- ☐ Approximately 580m² soft landscape area and
- ☐ 117m² retail space at ground level

3.0 INTEGRATED WATER MANAGEMENT PLAN

The site has existing town water supplies on Hamilton Place and Tufton Street. It is proposed to have two 100mm water connections from Hamilton Place to provide a grade 1 water supply for the fire sprinkler services and one 150mm connection from Tufton Street to service the domestic and fire hydrant services. There are existing sewer services along Hamilton Place and Tufton Street. There is an existing sewer connection servicing the site which connects to the sewer in Campbell Street. The proposed sewer connection point will be determined during detailed design. There is stormwater services in Tufton Street to which the stormwater connection is currently proposed to connect.

3.1 Potable Water Reduction Measures

Two measures have been identified in order to minimise the potable water consumption. These are:

- ☐ Water Efficient Fixtures
- ☐ Rainwater harvesting for irrigation, swimming pool make-up, some toilet flushing, car washing and external use.

3.1.1 Water Efficient Fixtures

At June 2010, South East Queensland is under "Permanent Water Conservation Level"¹ water restrictions which require the residents to have a water consumption of 230 litres or less per person per day including external use.

To achieve this objective, high water efficient fixtures are recommended. As such, the tapwares are proposed to have the following WELS rating:

- Basins taps : 6 Star WELS rating
- Shower taps : 3 Star WELS rating with flow restrictors to limit flow rate to 7.5 litres/mins
- WC : 4 Star WELS rating i.e. 4.5/3 litres dual flush

The table in appendix D provides a comparison between the high WELS rated fixtures and a standard WELS rated fixtures.

3.1.2 Non-Potable Water Supply

The non-potable water supply will be sourced from rainwater harvesting and will service:

- ☐ Irrigation.
- ☐ Swimming pool
- ☐ WC for the retail space, pool area
- ☐ External water use and
- ☐ Car washing

The site is proposed to contain approximately 580m² of soft landscaping and at 20mm weekly ongoing water requirement for an established landscaping irrigation, 12,000 Litres of water are required per week. A 50,000 Litre rainwater tank is proposed for servicing the irrigation demand.

The residential development has a swimming pool with a surface area of 108m² on ground level. The water loss from the swimming pool has been estimated at 900 litres per day during the summer period.

The retail space located on the ground level is relatively small i.e. 117m². The water consumption for the toilet can vary significantly depending on level of activities. At this stage the water consumption for toilet flushing has been estimated at 50litres per day.

A 20,000 litre tank including water treatment and pump is proposed for servicing:

- ☐ Swimming pool
- ☐ WC for the retail space,
- ☐ External water use and
- ☐ Car washing

¹ <http://www.gwc.qld.gov.au/water+restrictions> accessed on 22.06.2010

The location of the tanks will be finalised during detailed design. Current options for their locations include under the B1 carpark ramp and sky terraces.

3.1.3 Cooling Towers

There is no cooling tower on the project as an air cooled air conditioning system is currently proposed to service the residential apartments, commercial and retail spaces.

3.1.4 Monitoring and Leak Detection

The water requirement for the whole development including the commercial, residential and retail buildings would be in the order of 16.1 ML per annum which is quite significant. Therefore, it is important to monitor usage patterns and water sub meters will be installed for this purpose to:

- ☐ the retail space on ground level.
- ☐ each apartment.
- ☐ non-potable supply back – up for swimming pool and WC flushing.

All meters will have pulse outputs which will be wired back to a remote monitoring system located on the ground level accessible 24/7. The water usage of individual sub meters will then be added and compared with the master meter consumption to detect any leakage.

3.2 Water Sensitive Urban Design Measures

The objectives of Water Sensitive Urban Design (WSUD) principles are to:

- ☐ Reduce demand on the potable water requirement which has been addressed in section 3.1.
- ☐ Improve water quality of stormwater runoff from the site via source control.
- ☐ Minimise sewerage discharge from the site.

3.2.1 Water Quality of Stormwater Runoff

Urbanisation leads to changes to the quality of stormwater runoff discharged to the receiving waters. As such, the quality of stormwater runoff needs to be addressed prior to leaving the site in order to protect the environment. The Brisbane City Council (BCC) Stormwater Management and Water Quality Guidelines (Draft 2002) have been used for that purpose.

To achieve the quality of the stormwater run-off from the site, it is currently proposed to make use of the rainwater harvesting tank and gross pollutant traps to reduce the pollutants (Refer to Robert Bird Group report). Final location and quantity will be finalised during detailed design. The stormwater from these source nodes has been modelled using MUSIC software (Refer to Robert Bird Group report).

3.2.2 Quantity of Stormwater Runoff

A stormwater quantity modelling has been undertaken by Robert Bird Group. It has been determined that stormwater flow generated from the post development scenario would actually be lower compared to the pre-development situation. This is due to an increase in the soft landscaping area on the site and onsite rainwater harvesting system.

3.2.3 Reduction in Sewerage Discharges

Reduction in sewerage discharges will be achieved through:

- ☐ Water efficient fixtures

While reducing the potable water demand, water efficient fixtures will also reduce sewerage discharge e.g. a standard 11 litres single flush WC would discharge 11 litres per full flush where as 4.5/3 dual flush WC cistern would discharge only 4.5 litres per full flush. This is a reduction of approximately 59% in sewerage discharges.

Similar measures are proposed to be adopted on the project;

- ☐ 7.5 l/min shower heads compared to 9 L/mins
- ☐ 4.5 l/min basins tapwares compared to 6 L/min.

4.0 CONCLUSION

Implementation of the measures described in the IWMP which are:

- ☐ High Water efficient fixtures.
- ☐ Use of non-potable supply for landscaping.
- ☐ Use of non-potable supply for toilet flushing in the retail area.
- ☐ Best practice stormwater management.

will provide an Ecologically Sustainable Design for the development.

These measures will achieve the objectives being sought which are:

- ☐ Reduce the potable water consumption from the town water supply.
- ☐ Reduce the sewer discharge to Council sewer infrastructure.
- ☐ Treating the stormwater runoff to maintain healthy waterways.

5.0 BIBLIOGRAPHY

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APPENDIX A ESTIMATED POPULATION

Table A.1 - Residential - Estimation of Population

Bed type	Qty	Estimated No. of Residents per apartment	Total residents
1 bed Apartment	129	1	129
2 beds Apartment	66	2	132
Total Population - Residential			261

Table A.2 - Retail Precinct - Estimation of Population

Building	Net Lettable Area	Estimated No. of person per 10 m ²	Total residents
Retail	117		2
Total Population – Retail Space			2

APPENDIX B WATER DEMAND

Water Demand

The water demand for the whole development has been estimated and the chart below represents the percentage consumption for the residential tower and commercial & retail spaces, retails and outdoor usage i.e. landscaping irrigation and swimming pool. The figures on top of the percent figure are the estimated water consumptions in megalitres(ML) per annum.

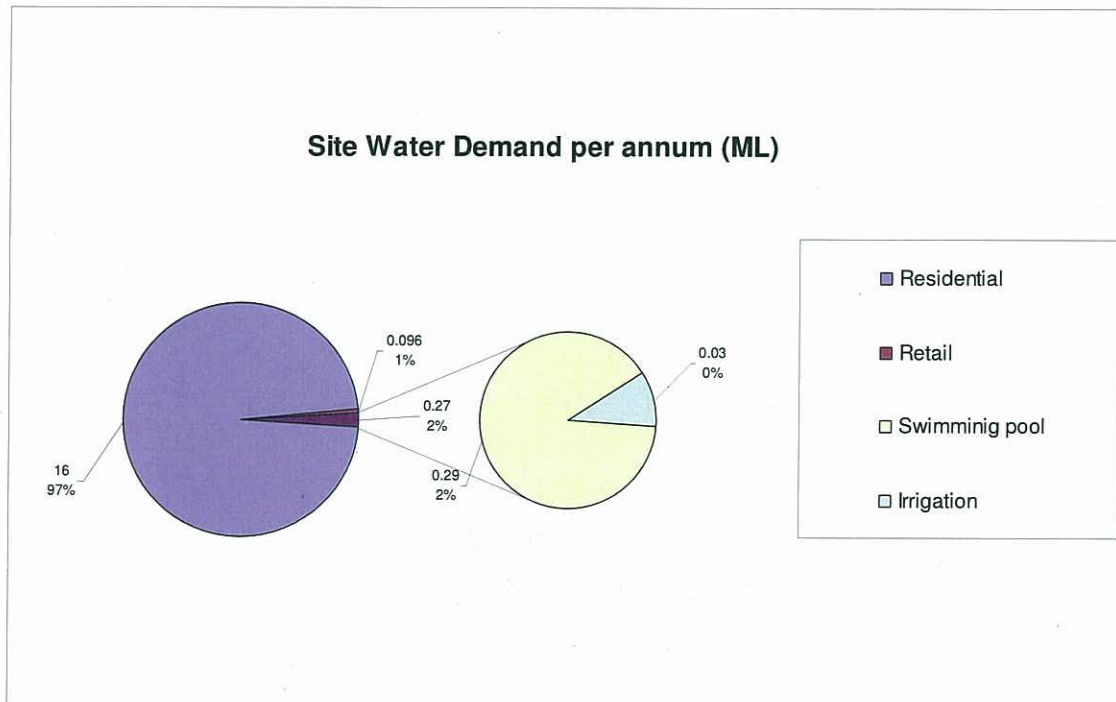


Chart 1- Yearly Site Water Demand in ML

The usage within the mixed used development has been estimated. The usage within the residential buildings has been subdivided into:

- ☐ Shower (average shower is 8 minutes)
- ☐ Bathroom tap
- ☐ Toilet Flushing
- ☐ Washing machine
- ☐ Dishwasher
- ☐ Other (cooking, drinking...)

APPENDIX C COMPARISON BETWEEN WATER EFFICIENT FIXTURES AND STANDARD FIXTURES

Table C.1 - Residential Apartments: Average Domestic Water

Usage

Fixtures	Type		Average flow rate (l/min) OR average consumption		Average total water used per day per person	
	Water Efficient	Normal fixtures	Water Efficient	Normal fixtures	Water Efficient	Standard fixtures
Shower (8 mins)	WELS rated 3 Star	Standard	7.5	15	60	120
Water Closet(WC)	WELS rated 4 Star	Standard(single flush)	4.5/3 dual flush	11	15	44
Washing Machine (per week)	Top Loading	Top Loading	150	150	11	21
Dishwasher	N/A	N/A	50	50	50	50
Bathroom basin's tap	WELS rated 5 Star	Standard	4	10	5	15
Other(Cooking, Drinking, ...)	N/A	N/A	20	20	15	15
Total average water consumption <i>with</i> and <i>without</i> water efficient fixtures					166	265

Table C.2 – Commercial + Retail: Average Domestic Water Usage

Fixtures	Type		Average flow rate (l/min) OR average consumption per flush	
	Water Efficient	Normal fixtures	Water Efficient	Normal fixtures
Water Closet(WC)	WELS rated 4 Star	Standard(single flush)	3.75	11
Urinals	Not Installed	Standard	0	2.5
Shower (4 mins)	WELS rated 3 Star	Standard	7.5	15
Wash hand basin	WELS rated 6 Star	Standard	7	9



Robert Bird Group

PLANS AND DOCUMENTS
referred to in the ULDA
APPROVAL dated 21/10/10

Site Based Stormwater Management Plan

For

Proposed Residential Development - at 16 Hamilton Place, Bowen Hills

Lot 1 and 4 on RP99817

Prepared For: Metro Property Development Pty Ltd

Revision: C

7th July 2010

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