emf griffiths

26 EDMONDSTONE ROAD

BOWEN HILLS QLD

Project

DA – SUPERIOR DESIGN OUTCOMES REPORT

26 EDMONDSTONE ROAD UNIT TRUST

Client

METIER3

Architect

EMF GRIFFITHS

SUSTAINABILITY CONSULTANTS

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EXECUTIVE SUMMARY

The proposed development, 26 Edmondstone Road Bowen Hills, comprises of a residential building with three (3) basement levels, (two (2) levels of carparking, one (1) level of services / storage) and Ground Floor retail and showroom and nine (9) residential levels including private pool and penthouse sky terrace on Level 10.

EMF Griffiths are the project's Sustainability Consultants. This report outlines the project's commitment to Superior Design Outcomes (SDO) with respect to ESD.

The key achievements which can be considered a superior design outcome with respect to ESD are as follows:-

Façade Amenity	A very high performance integrated façade with an operable screen façade on Levels 1 to 9, and extensive private balconies provide passive shading and shelter from wind and intense sunlight. Perimeter planter boxes to all apartment balconies will support vertical greenery which will assist in mitigating Heat Island Effects and external noise whilst contributing towards cleaner air, the creation of an urban habitat and occupant comfort. Green roof provided on Sky Terrace contributes to heat load reduction of apartments, as well as reduced noise, and creation of urban habitat for the tenants.
Energy Management and Lifecycle Impacts	The building will incorporate significant passive design initiatives that result in a reduction in annual cooling demand when compared to a standard deemed to satisfy outcome. The annual thermal energy load is 40% less than the code required levels. This results in direct reduction in energy to heat and cool the building with associated improvements in running costs, efficient resource use and less greenhouse gas emissions. The proposed systems provide the opportunity to inform the body corporate on their real-time use of electricity. NatHERS rating average will be greater than two (2) stars above the minimum QDC requirements which will reduce energy consumption associated with heating and cooling apartments. Photovoltaic panels will be installed on the building to reduce the base building energy consumption.
Water	Stormwater is to be harvested to assist the site's irrigation demands. Landscaping design will be low water use and largely native. The quality of water draining from urban development has been protected and associated drainage infrastructure costs have been minimised.
Transport	The development will feature secure bicycle parking spaces in the common areas located at Basement 1. Parcel receiving facilities will be incorporated in order to reduce trips to pick up from the post office. Two (2) electric charging station will be provided on Basement 2 with a dedicated parking bay for an electric vehicle. The development will have a car share scheme to provide shared car services for exclusive use of tenants.
Waste and Materials	Materials shall be selected on the basis of recycled content, low toxicity and minimisation of resource depletion. A dedicated storage area is to be provided for the separation, collection and recycling of waste.

SECTION 1.0 INTRODUCTION

EMF Griffiths has been engaged by METIER3 to report on Superior Design Outcomes (SDO's) required by the Department of State Development, Infrastructure and planning (DSDIP) at 26 Edmondstone Road Bowen Hills. To facilitate the creation of sustainable urban communities, the project focuses on the following key principles:-

1) Promoting and maintaining livable communities.
2) Providing economic benefit.
3) Protecting ecological values and optimising resource use.
4) Promoting planning and design excellence.

This report will demonstrate how the proposed development protects, manages and enhances natural systems and promotes the efficient use of materials, water and energy to minimise impacts on the environment. It will illustrate the project's compliance with the criteria noted and will focus on the specific measures that contribute to a sustainable development.

1.1 BUILDING DESCRIPTION

The proposed building is nine (9) storeys. It consists of:-

- Two (2) basement carparks with forty eight (48) parking spaces.
- 46 bike parks provided to Basement 1
- Ground Level retail, showroom and lobby.
- 342.06m^2 landscape.
- Forty two (42) apartment units.
- One (1) bed, two (2) bed and three (3) bed apartment units.

SECTION 2.0 SUPERIOR DESIGN OUTCOMES

Significant measures have been undertaken to ensure that this development responsibly impacts upon the local environment and addresses environmental, social and economic sustainability aspects for the buildings' occupants, users and the wider community.

The environmental vision, principles, goals and strategies for 26 Edmondstone Road, Bowen Hills, are described as follows:-

Vision	**To Create a Sustainable Urban Community**			
Principles	Promoting and maintaining a liveable community.	Providing economic benefit.	Protecting ecological values and optimising resource use.	Promoting planning and design excellence.
Goals	A community that is diverse, safe and healthy, has access to services, jobs and learning, that fosters active local participation and is a pleasant place to live, work and visit while integrating with and enhancing the value of existing neighbourhoods.	Economic benefit is maximised by facilitating the release of urban land, incorporating lifecycle costs including operational savings, long term employment opportunities, and creating partnering opportunities and long term value.	Protect, manage and enhance natural systems, habitats and biodiversity, and promote the innovative and efficient use and management of materials, water and energy to minimise impacts on the climate.	Develop a modern resilient and adaptable urban form that promotes connectivity, safety and accessibility whilst recognising existing local values and aspirations.
Strategies	• Housing affordability. • High quality of life. • High levels of community participation. • Healthy and safe communities. • Respect existing communities.	• Public benefit. • Lifecycle costs. • Land supply. • Partnerships. • Sustainability champion.	• Climate impact. • Water. • Energy and transport. • Materials and waste. • Habitats and biodiversity. • Pollution.	• Community and place. • Responsive urban form. • Quality public realm. • Infrastructure. • Connectivity, safety and accessibility. • Engagement and partnerships.

2.1 FAÇADE AMENITY

Deliverable	Criteria	Strategy
Daylight and Glare	Glare from sunlight, daylight and artificial lighting should be controlled. Glare is a function of contrast against surrounding surfaces and angle of incidence.	A high visual light transmission (VLT) allows for an abundant quantity of natural daylight to enter the space which in turn will offer substantial energy savings and at the same time improve the wellbeing of occupants. However, too much daylight, in conjunction with a high ultra violet transmission (UVT), will cause glare, overheating and fading issues within the space. As such a minimum 40% VLT is recommended for blinds. Blind pelmets are provided as standard. From previous experience around 95% of unit owners install blinds to add additional daylight control.
Natural Ventilation	Window openings and sliding doors to living areas and bedrooms to have openings to allow for cross-flow ventilation.	Window openings to balconies are to be either double or triple pane sliding doors. Window openings from bedrooms are to be maximised whilst complying with the BCA operability restrictions. Cross ventilation is incorporated into the design of 83% of units.
Passive Design	A very high performance integrated façade that incorporates extensive private balconies that provide passive shading and shelter from wind and intense sunlight. Deep balcony projection work to heavily shade the inner skin to the occupied spaces, whilst providing an outlook to views on all orientations.	This project is targeting a 6.1 Star minimum NatHERs rating which is a significant improvement on Building Code Passive Design requirements. A balance has been maintained between sheltered, enclosed spaces whilst encouraging natural ventilation and passive cooling. Balconies are provided with operable louvres. Selected exposed balconies can be manually enclosed and comfortably occupied when wind speeds are excessive, and opened to provide ventilation and passive cooling at other times. The external building colour is white to reduce excess solar heat gain through the thermal mass of the building exterior. The project passive design features to achieve this level of performance are detailed in section 3.
Green Roof and Walls	The green walls and roof improves aesthetic, façade amenity, reduces external glare, and provides connection to nature.	Green roof on Sky Terrace can reduce heat load on Level 9 apartments and create sustainable urban habitat for the tenants. Apartment balconies are provided with planter boxes and vertical greenery which will assist in mitigating Heat Island Effects and external noise whilst contributing towards cleaner air, the creation of an urban habitat and occupant comfort.

2.2 ENERGY MANAGEMENT AND LIFE CYCLE IMPACTS

Deliverable	Criteria	Strategy
Improved NatHERS Rating	Current Queensland Development Code (QDC) Performance Criteria P1 requires that each unit must: Individually achieve an energy rating of not less than 4 stars and Collectively achieve an average energy rating of not less than 5 stars. The Superior Design Outcome targets are:- Achieve a minimum energy rating of not less than 6.1 Stars for each unit (exceeding the QDC NatHERS requirements by more than two (2) stars).	High performance glazing will be installed to control solar loads where required. Deep balconies and shading devices inhibit the radiant heating effect, therefore reducing the peak cooling loads. Ceiling fans with a 1400mm diameter will be installed in the living/kitchen and bedroom. Two (2) 1400mm ceiling fans will be installed in the kitchen/living rooms of selective apartments (See Section 3.1). Downlights in apartments to be sealed. Exhaust fans to have non-return damper.
Energy Efficient Lighting	Current Queensland Development Code (QDC) Performance Criteria P4 requires that each unit must have; An energy efficient lighting for a minimum of 80% of total fixed artificial lighting. The Superior Design Outcome will target; An energy efficient lighting for a minimum of 100% of total fixed artificial lighting.	CFL and LED lighting with a minimum output of 27 lumens per Watt and excludes a heat lamp used in a bathroom for the purpose of radiating heat. Downlights to be installed at a rate of one (1) downlight per 4m^2 or greater. Linear CFL/LED/ for common areas. Kill switch will be provided at the front door to cut power to lighting and air conditioning.
Photovoltaic	Solar Panels allow reduction in the base building energy consumption.	10kW peak photovoltaic array to be installed on the building.
Energy Efficient Appliances	The high energy efficiency rating is required for clothes dryers and dishwashers and other installed appliances as part of the base building works.	2-Star clothes dryers and 3.5 star dishwashers. Units will be provided with either an internal clothes drying unit with venting or an external retractable clothes dryer unit.
Energy Efficient Climate Conditioning	The air conditioning system is required to exceed the minimum building code specifications for energy efficiency.	HVAC to be a centralised System either VRV with common multi-unit condensers OR chilled water with central air cooled chiller plant. • Chiller efficiency to be minimum of 20% more efficient than NCC section J5 requirements. • All others elements to be at least 10% more efficient than NCC section J5 code compliant system.

Deliverable	Criteria	Strategy
Energy Efficient Lifts	Regenerative drive converts the excess energy generated by a lift into electricity that can be reused elsewhere in the building. With conventional drives, this energy is converted into heat, which then needs to be removed from the building by air conditioning systems.	Regenerative drive to be considered to cut lift energy consumption.
Energy Monitoring Systems	Energy monitoring systems allow capabilities to track the performance of circuits and individual appliances.	A home energy monitoring system accessible to the unit occupier will be provided.
Unoccupied Spaces	Occupancy controls are required to ensure that energy is not wasted by air conditioning and lighting unoccupied spaces: at a minimum this would be an 'all off' switch near the main entry door of occupancy units to turn off all lighting and air conditioning, and motion sensors in each common area and shared facility.	Motion detectors in common areas distributed approximately every 5m to provide responsive, demand-controlled and energy efficient amenity.
Electricity Sub-metering	Current Queensland Development Code (QDC) Performance Criteria requires that; P9 – Each meterable premises has a supply authority electricity sub-meter installed which measures only the electricity supplied to that meterable premises. Sub-meters will allow for accurate billing to ensure owners or tenant's only pay for the amount of electricity they use. P10 – The supply authority electricity sub-meter is installed in a common area and free of hindrance or obstruction to a person authorised to read and/or maintain the electricity sub-meter.	Private submetering systems record energy consumption data.

2.3 WATER

Deliverable	Criteria	Strategy
Rainwater Collection and Re-Use	Collecting rainwater runoff for irrigation and water feature top up.	Water requirement for landscape irrigation is to be sourced from potable and non-potable water sources (e.g., rainwater stored and collected on site). Irrigation system is to be water efficient, comprising subsoil drip systems and automatic timers with rainwater or soil moisture sensor control override. Landscaping design will be low water use and largely native. See Appendix A for rainwater tank calculations.
Water Conservation - Showers	Current Queensland Development Code (QDC) Performance Criteria P6 requires that: All shower roses have a minimum 3-star Water Efficiency Labelling and Standards rating.	4.5 to 9 litres per minute.
Water Conservation - Toilets	Current Queensland Development Code (QDC) Performance Criteria P7 requires that: All toilet cisterns have a dual flush function and have a minimum 4-star Water Efficiency Labelling and Standards rating, and are compatible with the size of the toilet bowl to allow for proper functioning of the toilet.	4.5 litres per flush full flush and 3 litres per flush half flush
Water Conservation - Tapware	Current Queensland Development Code (QDC) Performance Criteria P8 requires that: All tap-ware have a minimum 5-star Water Efficiency Labelling and Standards rating.	6.5 to 7.5 litres per minute with tap aerator. Also all dishwashers to have a minimum 4 star WEL rating.
Discharge to Stormwater	Principals of water sensitive urban design to be incorporated into design using Queensland Urban Drainage Manual and Water Quality centres developed in accordance with DSDIP requirements.	Gross Pollutant Traps (GPT) incorporated into the design as follows:- • Five (5) by EnviroPod Series 200 filter fitted to field inlet or at inlet to SFMH. • 22L/s ZPG StormFilter. – 14 cartridges (690mm) Manhole StormFilter system – a passive, siphon-actuated, radial flow, self-cleaning media filtration cartridges or as per Stormwater Management Plan.

2.4 TRANSPORT

Deliverable	Criteria	Strategy
Bicycle Facilities	To encourage cycling as a mode of transport, provision of resident bicycle parking spaces will be provided in the common areas.	One (1) nominated secure bicycle parking space per apartment or as per DSDIP requirements.
Parcel Lockers	Parcel receiving facilities will be incorporated in order to reduce trips to pick up from the post office. It removes the frustration of coming home and discovering that the package couldn't be delivered because the resident wasn't there to sign for it.	Parcel lockers will be provided.
Car Parking Facilities	To encourage efficient means of transport.	One (1) dedicated active rapid EV point with two (2) dedicated parking bays for recharging an electric vehicle.
Car Share Scheme	To reduce emissions and congestion.	A car share scheme will be organised at the property to provide car sharing services for exclusive use of the building tenants. An alternative to hire a car share company with electric vehicle to be explored.

2.5 WASTE AND MATERIALS

Deliverable	Criteria	Strategy
Sustainable Supplier	The project will, where appropriate, source their manufactured materials from suppliers with ISO14001 certification and EMPs in place. Non-toxic and low emission materials will be used as standard. The development will use materials sourced locally where practical. The development will adopt a waste management plan during demolition and construction. Use of low energy embodied materials where possible. The development will use recycled and reused materials in construction and landscaping, such as fly ash in concrete, where practical.	Timber and composite timber products used in the building and construction works to be sourced from either or a combination of post-consumer re-used timber; or Forest Stewardship Council (FSC) certified Timber as appropriate for the project. Total cost of PVC content is to be reduced through replacement with alternative materials. Thermal insulants and refrigerants, where they are used are to avoid the use of ozone-depleting substances in both manufacture and composition. All wall, ceiling, carpet and floor finishes, and adhesives and sealants are to be low-VOC emitting (EN 13419). All composite wood products used, including joinery and loose furniture, is to be low emission formaldehyde (rated E0).
Recycling Waste Collection and Storage	A dedicated storage area is to be provided for the separation, collection and recycling of waste with good access for all building occupants and for collection by recycling companies.	Provide bins for recycling of different materials along with waste bins in common and public areas.

SECTION 3.0 SUMMARY OF PASSIVE DESIGN MODELLING

3.1 RESIDENTIAL AREAS

Preliminary modelling of units has been undertaken for the development located at 26 Edmondstone Street, Bowen Hills.

The models were assessed for the following:-

- Determine glazing requirements.
- Determine the additional treatments required to achieve the superior design outcome of a minimum 6.1 star NatHERS rating for each unit.
- 1400mm ceiling fans in all living rooms and bedrooms.
- Two (2) x 1400mm ceiling fans in the living rooms of units on Levels 7 to 9 and 1400mm ceiling fans in bedrooms.

All apartments were modelled with the following unless specified:-

- Single glazed Low-E tinted glazing system and double glazed Low-E tinted for selective units.
- 1400mm ceiling fans in all living rooms and bedrooms. Two (2) 1400mm ceiling fans in the living rooms for selective units.
- Wall insulation and roof insulation.
- Insulation to the underside of suspended concrete floor slabs.

The following is an outline of the preliminary modelling results:-

Level	Unit	Star Rating	Additional Requirements
1-3	SE-3Bed	7.4	
1-3	S-1Bed	6.1	
1-3	SW-1Bed	7.1	Glazing to be Low-E tinted double glazed.
1-3	SW-2Bed	6.3	
1-3	NW-2Bed	6.1	
1-3	N-2Bed	6.2	
1-3	E-2Bed	6.4	
4-6	SE-3Bed	7.4	
4-6	S-2Bed	6.3	
4-6	SW 2Bed	6.2	Two (2) ceiling fans in the kitchen/living room.
4-6	SW-1Bed	6.6	
4-6	W-2Bed	6.3	Two (2) ceiling fans in the kitchen/living room.
4-6	N-2B	6.1	
7-8	E-3Bed	7.4	
7-8	W-2Bed	7.4	Low-E tinted double glazed. Two (2) ceiling fans in the kitchen/living room.
7-8	N-2Bed	8.4	
9	Penthouse 1	6.1	Low-E tinted double glazed. Two (2) ceiling fans in the kitchen/living room.

Level	Unit	Star Rating	Additional Requirements
9	Penthouse 2	6.6	Low-E tinted double glazed. Two (2) ceiling fans in the kitchen/living room.
AVERAGE		6.6	
MINMUM		6.1	

In summary, the apartments modelled achieve the minimum 6.1 stars with the proposed building fabric.

APPENDIX A

PRELIMINARY RAINWATER TANK SIZE CALCULATIONS

An analyses of rainwater tank sizing was completed to determine an appropriate rainwater collection and supply system to serve the developments irrigation areas.

The graphs below illustrate the various rainwater tank levels calculated throughout the year based upon three different catchment areas 100m^2, 150m^2 and 200m^2. The results demonstrate that the best design solution for this development would be a 5kL rainwater tank placed on the sky terrace with gravity downpipes to feed into the subsoil drip irrigation of landscape areas.