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CENTRAL VILLAGE, PHASE 2 STAGES 4 AND 5

CANTERBURY TOWERS

FORTITUDE VALLEY

Project

DA – SUPERIOR DESIGN OUTCOMES REPORT

METRO PROPERTY DEVELOPMENT

Client

EMF GRIFFITHS

SUSTAINABILITY CONSULTANTS

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EXECUTIVE SUMMARY

The proposed development, Central Village, Phase 2 Stage 4 and 5, comprises three buildings that rise from a podium level.

EMF Griffiths are the project's sustainability consultants. This report outlines the project's commitment to superior design outcomes 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 that incorporates extensive private balconies that provide passive shading and shelter from wind and intense sunlight.
Energy management & Lifecycle impacts	The buildings 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.
Water	Stormwater is to be harvested to meet the site's irrigation demands, pool and water feature top up. 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 features secure bicycle parking spaces provided in the common areas. The parking areas will include charging bays for electric cars, car pool/car share and bikes. Parcel receiving facilities will be incorporated in order to reduce trips to pick up from the post office.
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 Metro Property Development to report on Superior Design Outcomes (SDO's) required by the Department of State Development, infrastructure and planning (DSDIP) at Central Village, Phase 2 Stage 4 and 5.

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 built form will be highly articulated providing a diverse design response incorporating variety in form though the use of different architects for Stages 4 and 5 – while cognisant of a coherent vision for the development. The design approach articulates the form into a series of diverse buildings each of which responds to their particular location and orientation.

Phase 2 adopts a range of building heights and forms across the balance of the site:

- A tower and podium design is maintained with the upper podium level forming an open landscape setting for residents.
- Lower height buildings along the main frontages of Brunswick and Water Street both activating the frontage and screening the form beyond.
- Tower elements setback from the prominent Brunswick and Water Street intersection.
- Stage 5 Water Street tower matches the form and setback of Stages 1 and 2 for continuity of scale.
- Stage 4 tower is significantly setback from the Brunswick Street corridor to protect gateway view corridors.

Figure 1 below illustrates the proposed landscape podium plan.



Figure 1: Landscape Podium Plan

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 Central Village, Phase 2 Stage 4 and 5 are described as follows:-

Vision				
To create a sustainable urban community				
Principles	Promoting and maintaining a livable 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 FACADE 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 well being 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. 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. At upper levels selected exposed balconies are fully enclosable to allow for breeze control. Tower Level corridors are naturally ventilated at both ends.
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.	The project is targeting a 7.5 Star average (6 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. The project passive design features to achieve this level of performance are detailed in section 3.

2.2 ENERGY MANAGEMENT

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: Collectively achieve an average energy rating of not less than 7.5 stars. Achieve a minimum unit rating of 6 stars.	High performance glazing has been installed to control solar loads where required. Deep balcony projections or shading devices inhibits the radiant heating effect, hence reduces the peak cooling loads Reduced full height glazing to include a 1000mm opaque, insulated spandrel panel where required. Ceiling fans with a 1400mm diameter in the living/kitchen and bedroom. Downlights to roof level apartments to be sealed.
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 per cent of total fixed artificial lighting. The Superior Design Outcome will target; An energy efficient lighting for a minimum of 100 per cent 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. Linear CFL/LED/Metal Halide for common areas.
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.	3 Star clothes dryers and 3.5 star dishwashers. 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 at least 10% more efficient than NCC section J5 code compliant system.
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.	Select apartments may be identified as a testbed for this technology.
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.

Deliverable	Criteria	Strategy
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.

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 non-potable water (e.g., rainwater or recycled water collected on site) and 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. Water requirement for landscape irrigation is to be sourced from non-potable water (e.g., rainwater or recycled water collected on site) and irrigation system is to be water efficient, comprising subsoil drip systems and automatic timers with rainwater or soil moisture sensor control override.
Water Conservation	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	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	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.

Deliverable	Criteria	Strategy
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.	GPT's incorporated into design as follows:- • 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
Electric Car Charging	Electrical design to allow for future proofing with installation a retrofit option.	Provision of base building infrastructure to allow for car charging outlet to approx 50% of phase 2 stage 4 & 5 parking bays. Schematic distribution scheme allows for bays in any location to be serviced.
Car Sharing Scheme	Parking bay nomination for car sharing scheme. Car sharing is popular in cities around the world because it is cost-effective for members and it benefits our environment. Sharing cars reduces demand for new cars and encourages more sustainable travel patterns, as members use public transport and walk and cycle more than people who don't share a car. A single car share vehicle can replace up to 12 private vehicles that would otherwise compete for local parking spaces.	6 Nominated car sharing parking spaces.
Bicycle Facilities	To encourage cycling as a mode of transport, provision of resident bicycle parking spaces will be provided in the common areas	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 provided.

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 product 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 Water Street Phase 2 Stage 4 and 5 development.

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 star and average 7.5 star NatHERS rating.

All apartments were modelled with the following:-

- 1400mm ceiling fans in living rooms and bedrooms.
- R1.5 external wall insulation.
- R1.0 insulation to walls adjacent to the internal undercover carpark, corridors, stairwells and lift cores.
- R2.5 Anticon insulation to the underside of any metal roof or exposed roof slab above apartments.
- R1.0 insulation to the underside of any exposed floor slab.

Stage 4 & 5 Apartments

All apartments were modelled with the following:-

- Glazing: U-value 4.68; SHGC 0.44, e.g. 6.38mm Solex Green.
- 1400mm ceiling fans in living rooms and bedrooms.
- R1.5 external wall insulation; total wall R-value of 1.71.
- R1.5 insulation to walls adjacent to undercover car parks, corridors and neighbouring apartments; total R-value of 1.86.
- R2.5 insulation to the underside of concrete roof; total R-value of 2.89.
- R1.0 insulation to the underside of any exposed floor slab; total R-value of 1.47.

The following is an outline of the preliminary modelling results and details the treatments to be incorporated achieve the targets noted above:-

Unit Name	Level	Adjusted Total MJ.m ²	Stars	Treatment Type	Detail of Treatment Required
1B	1	41.2	6	Wall	Solid wall panels required in the façade of the western bedroom.
				Shading	Vertical screen required adjacent to kitchen/living room.
1B	2	41.2	6	Wall	Solid wall panels required in the façade of the western bedroom.
				Shading	Vertical screen required adjacent to kitchen/living room.
4A	1	25	8	-	No additional treatments required.
4A	2	25	8	-	No additional treatments required.
5A	1	41.8	6	Insulation	Solid wall panels required in kitchen/living room areas with R2.0 insulation. R1.0 insulation required beneath exposed floor.

Unit Name	Level	Adjusted Total MJ.m ²	Stars	Treatment Type	Detail of Treatment Required
5A	2	42.3	6	Insulation	Solid wall panels required in kitchen/living room areas with R2.0 insulation.
6A	1	37.5	6.5	-	No additional treatments required.
6A	2	37.5	6.5	-	No additional treatments required.
5B	3	26.7	7.5	Wall	Solid wall panels required in the façade of the eastern bedroom and living room.
15A	3	32.5	7	Shading	Vertical screen required for the length of the façade.
4C	3	41.9	6	Insulation	R1.0 insulation required beneath exposed floor.
				Shading	Vertical screen required for the length of the façade.
19A	3	24.1	8	-	No additional treatments required.
2B	3	39.5	6	Wall	Solid wall panels required in the façade of the bedrooms and living room.
				Insulation	R1.0 insulation required beneath exposed floor.
				Shading	Vertical screen required for the length of the façade.
6C	7	41.7	6	Wall	Solid wall panels required in the façade of the bedrooms.
7C	7	35.1	6.5	Wall	Solid wall panels required in the façade of the eastern bedroom and living room.
				Shading	Vertical screen required for the length of the eastern façade.
9C	7	32.7	7	Wall	Solid wall panel required in the southern façade of the corridor.
34A	7	16.4	9	-	No additional treatments required.
9B	7	38.9	6	Wall	Solid wall panel required in the façade of the northern bedroom.
5C	7	38.4	6	Wall	Solid wall panels required in the façade of each room.
25A	7	20.2	8.5	-	No additional treatments required.
46C	28	37.8	6.5	Wall	Solid wall panels required in the façade of the eastern bedroom, the living room and kitchen.

In summary, the apartments modelled are able to achieve the minimum 6 stars with the proposed building fabric. These are the worst case units.

The average of 7.5 stars across the development will be achieved.

3.2 NON RESIDENTIAL AREAS

Below are listed the thermal properties for the building fabric elements expected to be required for the Class 2 common areas, Class 9b and Class 6 areas of the building to provide an improvement above the Deemed to Satisfy requirements of the BCA for passive design.

DESCRIPTION	PROPOSED CONSTRUCTION VALUE	Note
Roof: Assumed green Roof /landscaping	$R_{TOTAL}=4.2$	Possible insulation material Kingspan Kooltherm K10 FM Soffit Board 80mm R4.0
Shading	~2m awning to all glazed areas. Gym and Western Lobby are unshaded.	As indicated on current DA set of drawings
All Glazing (Windows and Doors)	Anticipated Glazing Whole of window performance $U=4.9$ (or lower); $SHGC=0.5$ (or lower)	Example Glazing type: GJames 450 Series 6.38mm Sunergy Clear Low-E Laminate ($U:4.9$; $SHGC:0.5$)

