PORTSIDE EAST – BUILDING 16A & 16B
HAMILTON

Project

DA – SUPERIOR DESIGN OUTCOMES REPORT

BROOKFIELD RESIDENTIAL PROPERTIES
ON BEHALF OF
MULTIPLEX PORTSIDE EAST PTY LTD

Client

EMF GRIFFITHS

SUSTAINABILITY CONSULTANTS

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EXECUTIVE SUMMARY

The proposed development, Portside East Buildings 16A & 16B, comprises of two towers 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 high performance integrated façade that incorporates extensive private balconies that provide passive shading and shelter from wind and intense sunlight. Brief requirements have been incorporated that include study and analysis of daylight levels and natural ventilation to inform the design process.
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 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.
Water	Stormwater is to be harvested to meet the site's irrigation demands.
Transport	The development features secure bicycle parking spaces for each dwelling and for retail visitors. Small car bays are provided to encourage low emitting vehicles.
Waste and materials	As a brief requirement, materials shall be selected which minimise the use of materials that deplete natural resources or create toxic pollution in their manufacture. Materials with potential for end of life recycling or that contain or are manufactured with high levels of recycled or waste materials are encouraged. Dedicated recycling collection bins will be provided within garbage chute rooms on each level.

SECTION 1.0 INTRODUCTION

EMF Griffiths has been engaged by Brookfield Residential Properties on behalf of Multiplex Portside East Pty Ltd to report on Superior Design Outcomes (SDO's) required by the Department of State Development, infrastructure and planning (DSDIP) at Portside East Buildings 16A & 16B.

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 specific targeted measures that contribute to a sustainable development.

The development has set real and attainable goals to achieve a superior design outcome. The project focuses on the following:-

- A commitment to passive design principles, including energy efficiency and thermal comfort as well as integration of daylight and natural ventilation.
- Project requirements for responsible materials selection and waste reduction
- Water use reduction through rainwater harvesting and efficiency measures
- Transport initiatives such as encouraging cleaner modes of transport

1.1 BUILDING DESCRIPTION

The building consists of 2 levels of basement car parking, ground floor retail and an additional level of podium car parking. The residential towers extend from levels 01 to 19 and consist of 1, 2, 3 bed apartments and penthouses. The podium level includes a recreation deck with residents' pool.

SECTION 2.0 SUPERIOR DESIGN OUTCOMES

The following sections illustrates the targeted outcomes by the development to responsibly impacts upon the local environment. This addresses environmental, social and economic sustainability aspects for the buildings' occupants, users and the wider community.

2.1 FACADE AMENITY

Deliverable	Development Strategy
Daylight	The building is designed with consideration for solar access to each apartment. The apartments designed to allow the high levels of natural lighting and direct sunlight in particular. At least 70% of apartments private open spaces receive a minimum of 3 hours direct sunlight between 9am and 3pm on 22 June (mid- winter). This is achieved by approximately 40% of apartments in lining areas. A solar access study has been undertaken and will continue to the next stage to inform the design.
Glare Control	Glare from direct sunlight is considered in apartment design. Glare is a function of contrast against surrounding surfaces and angle of incidence and can cause discomfort to occupants. Provision for blinds is made as part of the base building. Blinds are an optional extra as part of the sales package and experience is that they are generally installed by the tenant.
Natural Ventilation	Window openings and sliding doors to living areas and bedrooms have openings to allow for cross-flow ventilation. To maximise the number of apartments with natural cross ventilation apartments are located on the corner of the floor plates, or jutting out sections of the apartment to allow for multiple external walls for a single room. Size and location of operable areas of windows are being explored to maximise availability of natural ventilation. As the design of the buildings do not allow for cross ventilation or two storey apartments, simple measures such as door catches are being explored to facilitate internal airflow between rooms in the apartments. As a design brief requirement, design for cross ventilation is part of the ESD scope of works and will be studied throughout the design phases to achieve an acceptable ventilation outcome.
Internal Noise Levels	Building services noise is required to meet the satisfactory design sound levels provided in Table 1 of AS/NZS 2107:2000; 30 L_{Aeq}dB (A) for sleeping areas and 45 L_{Aeq}dB (A) for common areas.
Private External Space	Private open space (balcony /terrace) is targeted at a minimum of 12% of the NSA for each apartment. All balconies are currently approximately 2.4m width, which is capable of taking an external table setting. The private open space is generally directly accessible from the primary living area. The master bedroom of higher standard apartments generally also has access to a private balcony. By providing flexible indoor - outdoor type rooms that can be comfortably used during all seasons internal living spaces can be reduced significantly. The majority of the private open space on all apartments is shaded for at least 3 hours during mid-summer.
Universal Design	10% of dwellings have provision to be converted to comply with the Class "C" requirements of AS4299 *Adaptable Housing* being the highest level of compliance for dwellings suitable for people with disabilities.

2.2 ENERGY MANAGEMENT

Deliverable	Development 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 will target;** **-Individually achieve an energy rating of not less than 5 stars and,** **-Collectively achieve an average energy rating of not less than 6 stars**
Thermal Comfort	All dwellings are required to have a heating and cooling load of maximum 55 MJ/m^2
Energy Sub-metering	Sub-metering is targeted for substantive energy uses within the building (greater than 10kVa) and to monitor light and general power consumption for common areas. A minimum of check metering is to be provided that allows monitoring of changing trends.
Lux Levels	A minimum of 320Lux and a maximum of 400 lux is to fall on the surface (nominally 900mm above floor level) of the following: Kitchen Sink; Cook top or Stove; and Vanity Basins in Bathrooms and Ensuites.
Unoccupied Spaces	Occupancy controls are included 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 common areas.
Energy Efficient Appliances	Project team to explore the preferential specification of high star rated energy efficient appliances for refrigerators, clothes washers, clothes dryers and dishwashers and other installed appliances as part of the base building works. Ratings are to be included in returnable schedules.
Energy Efficient Lighting	LED lighting to be used as standard in apartments. Excludes a heat lamp used in a bathroom for the purpose of radiating heat.
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 can cut lift energy consumption by 20-35% on average, depending on building height and lift speed. Regenerative drives are included in proposed lift design.
Efficient Appliances	Gas hobs to be included as standard for apartments as a more efficient method of cooking than electric hobs.
Peaksmart AC	A peaksmart signal receiver is proposed to be installed on compatible air conditioners which will be activated by Energex in a peak demand event. This will cap the cooling capacity of the system during the peak demand event. Conventional residential VRF systems as proposed are standard peaksmart and this technology is being considered for inclusion pending compatibility with mechanical and other service design.
Efficient Ventilation Systems	Demand based ventilation systems are included preferentially over large centralised systems. Individual toilet exhausts are to be provided for apartments so that a demand based system is provided rather than a 24/7 central system for the whole building. CO monitoring is to be provided on car park exhausts so ventilation will match demand from the space. The car park also has natural air intakes which save energy on supply air fans.

2.3 WATER

Deliverable	Development Strategy
Rainwater Collection and Re-Use	Water requirement for landscape irrigation is to be sourced from non-potable water (e.g., rainwater). This is also included for stormwater design to reduce peak flows during a stormwater event.
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 4.5 litres per flush full flush and 3 litres per flush half flush, and are compatible with the size of the toilet bowl to allow for proper functioning of the toilet.
Water Conservation	Current Queensland Development Code (QDC) Performance Criteria P8 requires that; All tap ware have a minimum 4-star Water Efficiency Labelling and Standards rating, 6.5 to 7.5 litres per minute with tap aerator.
Water Efficient Appliances	Dishwashers and washing machines are to be supplied as part of the base building works. High WELS rated fixtures are being explored for the project and the rating will be included in returnable schedules.
Water Meters	Water meters are required on all major water uses in the project and in each dwelling and a practical mechanism for data monitoring is identified.
Fire System Water Consumption	Fire pump test water is proposed to be recovered at a minimum. The project is exploring the inclusion of hydrant test water reuse. Sprinkler water is not considered acceptable for reuse.
Fire System Water Consumption	Each floor or section of a building fitted with a sprinkler system is to have isolation valves or shut-off points for floor-by-floor testing.

2.4 TRANSPORT

Deliverable	Development Strategy
Electric Car Charging	Parking bay nomination for future retrofit of an electric car charging bay.
Bicycle Facilities - Residents	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. Intended to be located in storage cages and racks.
Bicycle Facilities - Visitors	10 visitor bike spaces are to be provided to retail level in an accessible on-grade location, signposted and near a major public entrance.
Small Car Bays	Small car bays are provided to encourage the use of low emitting vehicles.

2.5 WASTE AND MATERIALS

Deliverable	Criteria
Sustainable Supplier	**It is a brief requirement that** the design should demonstrate innovation in the selection and use of construction materials and products, which minimise the use of materials that deplete natural resources or create toxic pollution in their manufacture. Materials with potential for end of life recycling or that contain or are manufactured with high levels of recycled or waste materials should be encouraged. The following strategies are to be considered for materials selection:- • Timber and composite timber products used in the building and construction works are required to be sourced from either or a combination of post-consumer re-used timber; or Forest Stewardship Council (FSC) certified Timber. • 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) • The project will, where appropriate, source their manufactured materials from suppliers with ISO14001 certification and EMPs in place. • The development will use materials sourced locally where practical. • Other materials can also be reused (from the existing building or any other building) for example joinery, windows and doors, or have a post-consumer recycled content of at least 20%, such as carpet and underlay, ceilings, and vehicle stops. • Reduction of Portland cement in all concrete mixes across the project.
Recycling Waste Collection and Storage	Recycling waste collection area to be included as a minimum adjacent to waste chutes on each floor.

2.6 MANAGEMENT

Deliverable	Criteria
Environmental Management Plan.	A comprehensive, site specific Environmental Management Plan is to be provided
Building Users' Guide	A Comprehensive Building User's Guide is to be provided, based on information from all design consultants and incorporating operating instructions and benchmarks for consumption and usage.
Waste Management Plan	Waste Management Plan is to be provided, outlining benchmarks for recycling and waste management both during construction and on an ongoing basis.
Commissioning, Data Collection and Monitoring	Design team are required to monitor and verify the commissioning of services in the development. Design team to review commissioning results as part of 12 month defects liability period.

SECTION 3.0 SUMMARY OF PASSIVE DESIGN MODELLING

3.1 RESIDENTIAL NATHERS MODELLING

3.1.1 Compliance Requirements

The following preliminary modelling inputs, required by AccuRate as part of the modelling process, have been entered for all apartments, in order to obtain a preliminary QDC compliant analysis.

Minimum requirements		Performance Value
External walls	100mm Concrete/ 13mm Plasterboard	R-value: 0.30 m^2K/W Colour: Medium
Internal walls between apartments	13mm Plasterboard/ 200mm Concrete/ 13mm Plasterboard	R-value: 0.45 m^2K/W Colour: Medium
Internal walls within apartments	Plasterboard on Studs	R-value: 0.44 m^2K/W Colour: Not Specified
Floor to ceiling height	2650mm	
Windows properties	Aluminum Frame Single Glazed	System U-value: 6.70 W/m^2K System SHGC: 0.70
	Aluminum Frame high performance Glazed	System U-value: 4.60 W/m^2K System SHGC: 0.36
	Aluminum Frame high performance Double Glazed (Building 16a L19_P.0C Apartment Only)	System U-value: 2.50 W/m^2K System SHGC: 0.28
	Draught seals	
Window width	As per drawings	
Floor between apartments	Carpet + Felt Underlay/ 200mm Concrete	R-value: 0.57 m^2K/W
	Ceramic Tile/ 200mm Concrete	R-value: 0.30 m^2K/W
Ceiling fans	Yes	
Downlights (Sealed)	Yes	
Exhaust fans (Sealed)	Yes	
Eaves	Balcony overhangs as noted on the drawings	

3.1.2 Results – Targeted Minimum Rating 5 Stars Average 6 Stars

The following additional sustainable strategies which have been incorporated targeted in order to achieve a minimum 5 star rating per apartment and 6 star average;

- Ceiling fans with a 1200mm diameter in the living/kitchen and bedroom.
- Aluminium frame with laminated glazing with an indicative performance System U-value (glass and frame) 6.70 W/m^2K, SHGC 0.70,
- Performance laminated glazing for specified apartments (refer below table) with an indicative system performance System U-value (glass and frame) 4.60 W/m^2K, SHGC 0.36.
- Performance double glazing for Building 16a L19_P.0C apartment only (refer below table) with an indicative system performance System U-value (glass and frame) 2.50 W/m^2K, SHGC 0.28.

Apartment	No.	Results	Compliance
Building 16A			
L2_A.01, L3_A.01, L4_A.01, L5_A.01, L6_A.01, L7_A.01, L8_A.01, L9_A.01, L10_A.01, L11_A.01, L12_A.01, L13_A.01, L14_A.01, L15_A.01, L16_A.01, L17_A.01	16	8.3	✓
L2_A.02, L3_A.02, L4_A.02, L5_A.02, L6_A.02, L7_A.02, L8_A.02, L9_A.02, L10_A.02, L11_A.02, L12_A.02, L13_A.02, L14_A.02, L15_A.02, L16_A.02, L17_A.02	16	9.4	✓
L2_A.03, L3_A.03, L4_A.03, L5_A.03, L6_A.03, L7_A.03, L8_A.03, L9_A.03, L10_A.03, L11_A.03, L12_A.03, L13_A.03, L14_A.03, L15_A.03, L16_A.03, L17_A.03	16	7.9	✓

Apartment	No.	Results	Compliance
Building 16A			
L2_A.04, L3_A.04, L4_A.04, L5_A.04, L6_A.04, L7_A.04, L8_A.04, L9_A.04, L10_A.04, L11_A.04, L12_A.04, L13_A.04, L14_A.04, L15_A.04, L16_A.04, L17_A.04	16	5.4	✓
L2_A.05, L3_A.05, L4_A.05	3	8.6	✓
L1_Sleeve2, L1_Sleeve3, L2_B.01, L3_B.01, L4_B.01, L5_B.01, L6_B.01, L7_B.01, L8_B.01, L9_B.01, L10_B.01, L11_B.01, L12_B.01, L13_B.01, L14_B.01	15	5.8	✓
L2_B.02, L3_B.02, L4_B.02, L5_B.02, L6_B.02, L7_B.02, L8_B.02, L9_B.02, L10_B.02, L11_B.02, L12_B.02, L13_B.02, L14_B.02	13	6.8	✓
L2_B.03, L3_B.03, L4_B.03	3	7.2	✓
L2_B.04, L3_B.04, L4_B.04, L5_B.04, L6_B.04, L7_B.04, L8_B.04, L9_B.04, L10_B.04, L11_B.04, L12_B.04, L13_B.04, L14_B.04, L15_B.04, L16_B.04, L17_B.04	16	7.3	✓
L2_B.05	1	6.4	✓
L3_C.01, L4_C.01, L5_C.01, L6_C.01, L7_C.01, L8_C.01, L9_C.01, L10_C.01, L11_C.01, L12_C.01, L13_C.01, L14_C.01	12	6.5	✓
L1_Sleeve1, L2_C.02, L3_C.02, L4_C.02, L5_C.02, L6_C.02, L7_C.02, L8_C.02, L9_C.02, L10_C.02, L11_C.02, L12_C.02, L13_C.02, L14_C.02	14	5.4*	✓
L15_C.03, L16_C.03, L17_C.03	3	5.9	✓
L15_C.04, L16_C.04, L17_C.04	3	7.7	✓
L15_C.05, L16_C.05, L17_C.05	3	5.2	✓
L5_C.06, L6_C.06, L7_C.06, L8_C.06, L9_C.06, L10_C.06, L11_C.06, L12_C.06, L13_C.06, L14_C.06, L15_C.06, L16_C.06, L17_C.06	13	7.6	✓
L18_P.0A	1	7.4	✓
L18_P.0B	1	5.9*	✓
L18_P.0C	1	6.1*	✓
L19_P.0A	1	5.9	✓
L19_P.0B	1	5.1*	✓
L19_P.0C	1	6.1**	✓
Building 16B			
L2_A.01, L3_A.01, L4_A.01, L5_A.01, L6_A.01, L7_A.01, L8_A.01, L9_A.01, L10_A.01, L11_A.01, L12_A.01, L13_A.01, L14_A.01, L15_A.01, L16_A.01, L17_A.01	16	9.2	✓
L2_A.02, L3_A.02, L4_A.02, L5_A.02, L6_A.02, L7_A.02, L8_A.02, L9_A.02, L10_A.02, L11_A.02, L12_A.02, L13_A.02, L14_A.02, L15_A.02, L16_A.02, L17_A.02	16	8.1	✓
L2_A.03, L3_A.03, L4_A.03, L5_A.03, L6_A.03, L7_A.03, L8_A.03, L9_A.03, L10_A.03, L11_A.03, L12_A.03, L13_A.03, L14_A.03, L15_A.03, L16_A.03, L17_A.03	16	9.2	✓
L2_A.04, L3_A.04, L4_A.04, L5_A.04, L6_A.04, L7_A.04, L8_A.04, L9_A.04, L10_A.04, L11_A.04, L12_A.04, L13_A.04, L14_A.04, L15_A.04, L16_A.04, L17_A.04	16	6.1	✓
L2_A.05, L3_A.05, L4_A.05	3	8.3	✓
L2_B.01, L3_B.01, L4_B.01, L5_B.01, L6_B.01, L7_B.01, L8_B.01, L9_B.01, L10_B.01, L11_B.01, L12_B.01, L13_B.01, L14_B.01	13	6.3	✓
L2_B.02, L3_B.02, L4_B.02, L5_B.02, L6_B.02, L7_B.02, L8_B.02, L9_B.02, L10_B.02, L11_B.02, L12_B.02, L13_B.02, L14_B.02	13	6.8	✓
L2_B.03, L3_B.03, L4_B.03	3	6.0	✓
L2_B.04, L3_B.04, L4_B.04, L5_B.04, L6_B.04, L7_B.04, L8_B.04, L9_B.04, L10_B.04, L11_B.04, L12_B.04, L13_B.04, L14_B.04, L15_B.04, L16_B.04, L17_B.04	16	6.2	✓
L1_Sleeve4, L1_Sleeve5, L1_Sleeve6, L1_Sleeve7, L2_B.05	5	5.4	✓
L3_C.01, L4_C.01, L5_C.01, L6_C.01, L7_C.01, L8_C.01, L9_C.01, L10_C.01, L11_C.01, L12_C.01, L13_C.01, L14_C.01	12	5.4	✓
L1_Sleeve1, L1_Sleeve2, L1_Sleeve3, L2_C.02, L3_C.02, L4_C.02, L5_C.02, L6_C.02, L7_C.02, L8_C.02, L9_C.02, L10_C.02, L11_C.02, L12_C.02, L13_C.02, L14_C.02	16	5.2	✓

Apartment	No.	Results	Compliance
Building 16A			
L15_C.03, L16_C.03, L17_C.03	3	5.5	✓
L15_C.04, L16_C.04, L17_C.04	3	7.8	✓
L15_C.05, L16_C.05, L17_C.05	3	6.1	✓
L5_C.06, L6_C.06, L7_C.06, L8_C.06, L9_C.06, L10_C.06, L11_C.06, L12_C.06, L13_C.06, L14_C.06, L15_C.06, L16_C.06, L17_C.06	13	6.5*	✓
L18_P.0A	1	8.0	✓
L18_P.0B	1	5.3	✓
L18_P.0C	1	5.9	✓
L19_P.0A	1	6.7	✓
L19_P.0B	1	5.4*	✓
L19_P.0C	1	5.3*	✓
AVERAGE ENERGY RATING	332	**7.0**	✓

* Curtain wall glazing require performance laminated glazing
** Curtain wall and balcony glazing require performance double glazing for Building 16a L19_P.0C apartment only

3.2 NON RESIDENTIAL AREAS

A Section J-JV3 modelling approach is to be adopted for non-residential areas of the project. 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 lightweight sheet metal Zincalume	R_{TOTAL}=3.7 Solar Absorbtance≤0.6	Possible insulation material:- Bradford Gold Ceiling Batts R3.0 + reflective foil (0.9 outer, 0.05 inner emittence)
Shading	As per current architectural scheme	Minimum 2m awning recommended to Gym East and West Glazing.
All Glazing (Windows and Doors)	Anticipated Glazing Whole of window performance U=4.5 (or lower); SHGC=0.44 (or lower)	Example Glazing type: GJames 450 Series 6.38mm Comfortplus Neutral Low-E Laminate (U:4.6; SHGC:0.44)