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PROPOSED RESIDENTIAL DEVELOPMENT

102-108 Jeffcott Street, West Melbourne

**SUSTAINABLE MANAGEMENT PLAN &
WATER SENSITIVE URBAN DESIGN RESPONSE**

**FOR
BLUE EARTH GROUP**

15 March 2021

File 701BU

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1 Executive Summary

The proposed residential development at 102-108 Jeffcott Street, West Melbourne has been designed to meet the objectives of the City of Melbourne's Energy, Water & Waste Efficiency and Water Sensitive Urban Design Policies (Clauses 22.19 and 22.23 of the Planning Scheme).

The analysis set out in this report demonstrates that the proposed development achieves a Best Practice environmental design standard and is consistent with the City of Melbourne's Eco City goals for residents in relation to the reduction of operational greenhouse emissions & water consumption.

This report confirms that a combination of sustainable building management practices, design initiatives, fixtures, systems, appliances, materials and finishes will be integrated into the building in order to attain a 5 star Green Star Design & As Built performance standard.

The standard achieved is defined as Australian Excellence in terms of environmental design and is consistent with the City of Melbourne's Eco City goals for residents in relation to the reduction of operational greenhouse emissions & water consumption.

The development also meets the Best Practice standard for Urban Stormwater Quality and is therefore also consistent with the City of Melbourne's Water Sensitive Urban Design objectives.

The performance outcomes achieved by the proposed development demonstrate that the proposed development meets the sustainable design objectives of Clauses 22.19 and 22.23 of the Melbourne Planning Scheme.

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102-108 Jeffcott Street, West Melbourne

Sustainable Management Plan

2 Introduction

Ark Resources has been engaged by Blue Earth Group to provide advice in relation to environmentally sustainable development outcomes from the proposed mixed-use development at 102-108 Jeffcott Street, West Melbourne.

This report contains a summary of:

- Environmental objectives adopted for the development; and
- Sustainable design initiatives integrated into the design of the project.

Performance outcomes in this report are based on:

- Architectural plans prepared by CHT Architects set out below:

Description	Drawing No.	Revision	Date
Cover Page	TP0.000	P1	
Development Summary	TP0.001	P1	
Development Summary	TP0.002	P1	
Site Conditions - Existing	TP0.101	P1	
Existing & Demolition Plan - Basement 01-03	TP1.001	P1	
Existing & Demolition Plan - Ground Floor	TP1.003	P1	
Overall Plan - Basement 03	TP1.101	P1	
Overall Plan - Basement 02	TP1.102	P1	
Overall Plan - Basement 01	TP1.103	P1	
Overall Plan - Ground	TP1.104	P1	
Overall Plan - Loft Level	TP1.104	P1	
Overall Plan - Level 01	TP1.105	P1	
Overall Plan - Level 02	TP1.106	P1	
Overall Plan - Level 03	TP1.107	P1	
Overall Plan - Level 04	TP1.108	P1	
Overall Plan - Level 05	TP1.109	P1	
Overall Plan - Level 06	TP1.110	P1	
Overall Plan - Level 07	TP1.111	P1	
Overall Plan - Level 08	TP1.112	P1	
Overall Plan - Level 09	TP1.113	P1	
Overall Plan - Level 10	TP1.114	P1	
Overall Plan - Level 11	TP1.115	P1	
Overall Plan - Level 12	TP1.116	P1	
Overall Plan - Level 13	TP1.117	P1	
Overall Plan - Level 14	TP1.118	P1	
Overall Plan - Level 15	TP1.119	P1	
Overall Plan - Level 16	TP1.120	P1	

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Overall Plan - Level 17	TP1.121	P1	
Overall Plan - Level 18	TP1.122	P1	
Overall Plan - Roof Level	TP1.127	P1	
Heritage Elevations - South P1	TP2.001	P1	
Heritage Elevations - North P1	TP2.002	P1	
Heritage Elevations - East P1	TP2.003	P1	
Heritage Elevations - West P1	TP2.004	P1	
Building Elevations P1	TP2.101	P1	
Building Elevations P1	TP2.102	P1	
Building Elevations P1	TP2.103	P1	
Building Sections P1	TP3.101	P1	
Building Sections P1	TP3.106	P1	
Overall Section - Indicating Views into Prison Courtyard	TP. 117	P1	
Detailed Sections - Indicating Views into Prison Courtyard	TP. 118	P1	

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102-108 Jeffcott Street, West Melbourne

Sustainable Management Plan

15 March 2021

3. Relevant Policy Requirements

Clause 22.19 Energy, Water and Waste Efficiency of the Melbourne Planning Scheme is applicable to permit applications that propose the construction of new residential buildings. Clause 22.19-2 cites the following relevant policy objectives:

- *To ensure buildings achieve high environmental performance standards at the design, construction and operation phases.*
- *To minimise the city's contribution to climate change impacts by reducing greenhouse gas emissions.*
- *To improve the water efficiency of buildings and encourage the use of alternative water sources.*
- *To minimise the quantity of waste going to landfill and maximise the recycling and reuse of materials.*
- *To minimise the impacts of waste on the community.*
- *To encourage the connection of buildings to available or planned district energy, water and waste systems in urban renewal areas on order to achieve additional energy, water and waste efficiency arising from a precinct-wide approach to infrastructure where appropriate.*

In the context of these objectives, Clause 22.19-3 states that it is policy to:

- *Minimise greenhouse gas emissions and maximise energy efficiency.*
- *Minimise mains potable water consumption and encourage the use of alternative water sources, such as rainwater and grey water.*
- *Provide the facilities that will enable building users and occupants to reduce waste sent to landfill maximise the recycling and reuse of materials and support the municipality's progress towards becoming a resource and material-efficient city.*

Clause 22.19-5 also states that it is policy to assess proposals against a suite of performance measures. In relation to proposals for accommodation over 5,000m² of gross floor area, the performance measures are the same minimum energy, water and waste requirements as for a building under 5,000m² and a 5 star rating under a current version of Green Star – Multi Unit Residential rating tool or equivalent.

The supporting notes in Clause 22.19 also state that:

- *Applications for development may use alternative rating tools or assessment methods provide that equivalence of the development to the performance measures listed in the table can be demonstrated.*

And that:

- *Proposals that do not meet these performance measures may still meet the objectives of this policy.*

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102-108 Jeffcott Street, West Melbourne

Sustainable Management Plan

4 Site Description

The proposed development comprises:

- 113 residential apartments with 160 bedrooms;
- Ground floor Food and Drink retail tenancy with a total NLA of 38.5m²; and
- Communal residents' facilities and amenities.

The building comprises the following uses:

Level	Use
Basement 01 - 03	• Carparking, services, dog wash, rainwater tank, storage
Ground Floor	• Entry, Café tenancy, carpark entry, bin room, 3 Apartments (5 bedrooms)
Loft level	• Coworking space, 2 Apartments (4 bedrooms)
Level 1	• 6 Apartments (10 bedrooms)
Level 2	• 6 Apartments (8 bedrooms)
Level 3	• 6 Apartments (8 bedrooms)
Level 4	• 6 Apartments (8 bedrooms)
Level 5	• 6 Apartments (8 bedrooms)
Level 6	• 6 Apartments (8 bedrooms)
Level 7	• 6 Apartments (8 bedrooms)
Level 8	• 6 Apartments (8 bedrooms)
Level 9	• 6 Apartments (8 bedrooms)
Level 10	• 6 Apartments (8 bedrooms)
Level 11	• 6 Apartments (8 bedrooms)
Level 12	• 6 Apartments (8 bedrooms)
Level 13	• 6 Apartments (8 bedrooms)
Level 14	• 6 Apartments (9 bedrooms)
Level 15	• 6 Apartments (9 bedrooms)
Level 16	• 6 Apartments (9 bedrooms)
Level 17	• 6 Apartments (9 bedrooms)
Level 18	• 6 Apartments (9 bedrooms)
Roof	• Roof deck and dining, plant areas, solar PV system

The site is located within the Melbourne City Council.

The development has a site area of approximately 926.4m² and currently contains a double-storey commercial building. The site overlooks the Melbourne Assessment Prison and surrounding buildings are mainly for commercial use.

An image of the site and the surrounding locale is shown below.

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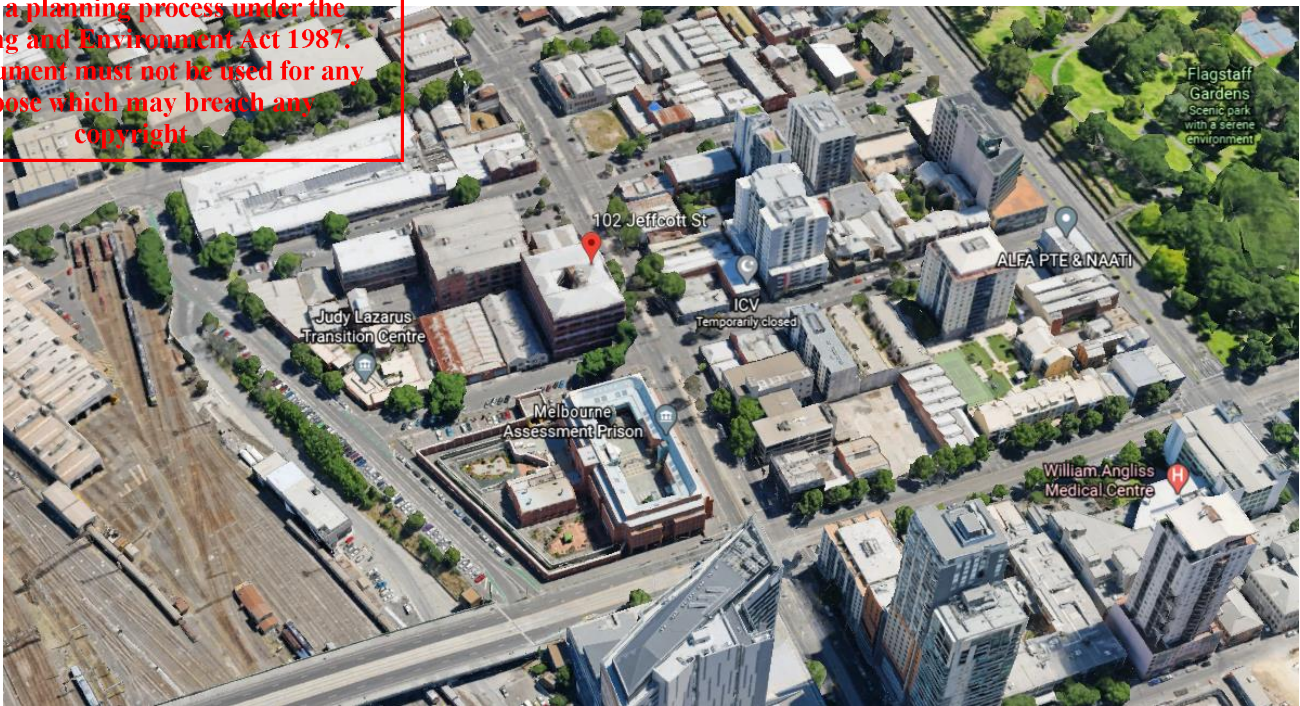


Image ©Google Earth™ (accessed January 2021)

5. Summary of Key ESD Initiatives

The following key sustainable design initiatives have been incorporated into this development:

- 19.5 kWp rooftop solar photovoltaic system;
- Rainwater harvesting system for toilet flushing and irrigation;
- Sustainable transport options;
- Communal spaces;
- High-performance glazing and energy efficient building services, appliances and fixtures; and
- Environmentally preferable internal finishes.

An assessment of sustainable design outcomes of the proposed development has been undertaken with Green Star Design & As Built, STORM and FirstRate 5 benchmarking tools based on the proposed architectural design and building services initiatives considered feasible at this stage of the design process.

The information presented in this report demonstrates that:

- The development will achieve a minimum average NatHERS energy rating of 6.5 stars
- The development achieves 1 point in the Green Star Multi Residential Wat-1 credit;
- The development meets the Best Practice standard for stormwater quality.

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6 Energy Rating Results

FirstRate5 version 5.3.0a (3.21) energy ratings have been undertaken for a representative sample of the apartments and are summarised in the table below.

Apartment	Star Rating	Energy Demand (MJ/m ²)		
		Total	Heating	Cooling
L1.1	6.5	97.0	80.8	16.2
L1.2	6.5	97.3	74.3	23.0
L1.3	6.3	102.8	81.8	21.0
L1.4	6.9	86.2	63.6	22.6
L1.5	6.6	94.7	84.3	10.4
L1.6	6.1	110.6	100.3	10.3
L9.1	7.2	75.7	48.9	26.8
L9.2	6.6	94.1	84.8	9.3
L9.3	6.2	107.4	93.9	13.5
L9.4	6.4	101.6	88.2	13.4
L9.5	6.6	94.0	80.2	13.8
L9.6	6.9	87.3	63.7	23.6
L18.1	5.6	129.3	101.4	27.9
L18.2	5.6	129.2	106.0	23.2
L18.3	5.5	129.4	105.3	24.1
L18.4	5.6	126.0	102.5	24.1
L18.5	6.2	108.7	86.9	21.8
L18.6	5.9	118.8	91.4	27.4
Estimated Development Average	6.5	95.3	78.7	17.0

The results of the modelling confirm that a cooling load average of less than 30 MJ/m² has been met [NatHERS Climate Zone 21 Melbourne] and therefore meet the energy efficiency objectives set out in clause 58.03-1 of the Planning Scheme.

The results of the modelling confirm that the average heating load of less than 88 MJ/m² and the average cooling load of less than 36 MJ/m² for the development has been met [NatHERS Climate Zone 21 Melbourne]. The heating load does not exceed 120 MJ/m² and the cooling load does not exceed 62 MJ/m² for each apartment. Therefore, the development meets the energy efficiency objectives set out in NCC 2019 for Class 2 dwellings.

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7. Green Star

The Green Star Design & As Built (Version 1.3) tool has been used as a benchmarking framework for the proposed scheme and demonstrates that the development has the preliminary design potential to achieve a 5 star standard¹.

A detailed Green Star assessment has been undertaken to confirm the credits achievable by the proposed scheme.

Please note that this analysis is based on the best information currently available in relation to the technical and commercial feasibility of the initiatives proposed. Further investigation will be undertaken during design development which may result in change to the package of initiatives specified in order to meet the 5 star Green Star standard.

The initiatives which contribute to the 5 star Green Star rating are detailed in Section 7.1 below.

7.1. Green Star Criteria

The key design elements and processes which underpin the preliminary Green Star rating are summarised in the table below. The design attributes will be incorporated into the design in accordance with the technical criteria for each credit set out in the Green Star Design & As Built v1.3 Technical Manual.

Further information in relation to key performance outcomes is provided in the Appendices to this report as referenced in the right hand column of the table.

Green Star Element	Design Attribute	Reference
Management	<ul style="list-style-type: none"> • Design Intent Report prepared • Provide floor-by-floor metering; plus independent metering for all loads >5% of annual building energy use or 100kW; and metering for common water use consuming 10% of development's water use • Comprehensive project-specific environmental management plan implemented during construction 	Conditional Requirements

¹ Note that a minimum of 60 points must be achieved for a 5 star Green Star rating to be achieved. The development will attain a 5 star Green Star standard however certification of the rating with the Green Building Council will not be undertaken.

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Green Star Element	Contribute	Reference
	<ul style="list-style-type: none"> • Green Star Accredited Professional involved from outset to completion • Services and Maintainability Review undertaken during design stage • Comprehensive commissioning and tuning of building systems • Comprehensive tuning of building systems • Independent commissioning agent directly engaged by client for review, advise, monitoring and verification roles commencing from schematic design stage. • Climate adaptation plan prepared • Detailed Operations and Maintenance Manual prepared • Measurement and reporting of energy and water consumption for at least 80% of GFA by Owners Corporation/property manager • Contractual agreement to reduce demolition waste at end of fitout life • Monitoring systems in accordance with CIBSE TM39 including metering schedule with load estimates • Head contractor to have current ISO 14001 certification • Operational Waste Management Plan prepared including targets and monitoring 	
Indoor Environmental Quality	<ul style="list-style-type: none"> • Lighting systems comprise flicker free luminaires and a Colour Rendering Index (CRI) greater than 80 • Strategies to reduce glare incorporated into the design 	Conditional Requirements
Energy	<ul style="list-style-type: none"> • Attain a development NatHERS area-weighted energy rating average of 6.5 stars and a minimum individual NatHERS energy rating of 5.5 stars for each apartment 	Conditional Requirement

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Green Star Element	Description	Reference
	<ul style="list-style-type: none"> • "Lighting power density reduced by 10% • Room lighting controlled by independent switches • Common area lighting to be controlled by motion detectors and daylight sensors (as appropriate)" • Reverse cycle heat pumps with minimum energy rating of 3* heating & 3* cooling and rated capacities within 15%/20% of design capacities • Energy efficient appliances within 1 star of best available at time of tender • Lift energy efficiency is class A or B and idle energy and standby energy is Level 1 according to ISO 25745-2 • Embedded network energy provider selected to supply 50% of power through offsite renewables 	Appendix 1
Transport	<ul style="list-style-type: none"> • Accessible public transport options • Reduced car parking - 152 residential spaces and 44 non-residential spaces provided • Electric vehicle charging infrastructure for 10% of car-parking spaces (20 spaces). Chargers will be 3-phase 22kW IEC 62196 Type 2 Mode 3 with energy metering and remote comms capability (WiFi /Ethernet/4G). • 128 resident, staff and visitor bicycle racks. 20% horizontal racks, installed at grade (29 spaces = 15 hoops). End-of-trip facilities including residents bike maintenance/repair rack and floor pump, accessible only by permanent building occupants via secure key pass • End of trip cyclist facilities for staff including 5 showers and 12 lockers • Local amenities within walking distance 	

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Green Star Element	Contribution	Reference
Water	<ul style="list-style-type: none"> • Water efficient fixtures and appliances with WELS ratings: <ul style="list-style-type: none"> ○ Taps 5 star ○ Toilets 4 star ○ Showers 3 star (<= 7.5 l/m) ○ Washing machines 4 star ○ Dishwashers 5 star • A rainwater harvesting system will be installed comprising: <ul style="list-style-type: none"> ○ Rainwater harvesting from all roof and Level 1 terrace areas (catchment area of approx. 787m2); ○ Filtration and treatment of all rainwater prior to draining into the tank; ○ A total storage volume of 8,000 litres; ○ Re-use of water for toilet flushing to apartments from ground to level 4 • Cooling towers not used • Water efficient sub-soil drip irrigation system with moisture sensors and timers using harvested rainwater • Fire test system water storage and re-use 	
Materials	<ul style="list-style-type: none"> • Structural timber using FSC or PEFC certified timber • Steel fabricator to be member of the ASI Environmental Sustainability Charter Group • Waste contractor and processing facility comply with Green Star reporting criteria 	Conditional Requirements
	<ul style="list-style-type: none"> • Concrete mixes to incorporate at least 30% reduction in Portland cement • Concrete mixes to incorporate at least 50% reclaimed water • Concrete mixes to incorporate at least 40% replacement of coarse aggregate with slag • 60% of steel reinforcement manufactured using energy reducing process • Specification of sustainable sourced timber (FSC or PEFC) • Specification of common use PVC products that meet Best Practice Guidelines for PVC in the Built Environment • Documentation provided on product sustainability credentials for 3% of materials used on the project • Divert 90% of demolition and construction waste from landfill. Waste contractors to have compliance measures audited 	
Land Use & Ecology	<ul style="list-style-type: none"> • No endangered or vulnerable species on site at time of purchase • Site does not contain old growth forest or wetland of High National Importance 	Conditional Requirements

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Green Star Element	Describe Attribute	Reference
	<ul style="list-style-type: none"> Native planting used on at least 2½% of the site Site has been previously developed At least 75% of the total project site area comprises building or landscaping elements that reduce impact of heat island effect. 	
Emissions	<ul style="list-style-type: none"> All outdoor lighting to comply with AS4282:1997 for light spill to inhabited boundaries. 	Conditional Requirement
	<ul style="list-style-type: none"> No increase in stormwater discharge to result from re-development STORM modelling has been undertaken to confirm the development attains the Best Practice standard for urban stormwater quality External lighting design to have an upward light output ratio <5% Strategies to minimise Legionella impacts from cooling systems implemented 	
Innovation	<p>Particularly subject to design development but may include:</p> <ul style="list-style-type: none"> Credit 30B: Provision of 4 electric pedal-assist utility bikes for use by residents, bike maintenance stand and electronic booking system Credit 30C: 50% of internal paints to be ultra-low VOC type (<5g/litre). Innovation point targeted for Exceeding Green Star Benchmarks – Ultra Low VOC Paints (refer to Credit 13: Indoor Pollutants for further details) Credit 30C: Air tightness testing of representative spaces before handover. Air tightness testing to be carried out in accordance with the requirements set out in AS/NZS ISO 9972:2015 Thermal performance of buildings – Determination of air permeability of buildings – Fan pressurisation method. (GBCA Innovation Challenge 2020 approved) Credit 30C: Electric vehicle charging infrastructure for 10% of car-parking spaces. Credit 30D: Main contractor provides high performance site office (GBCA Innovation Challenge 2020 approved) 	

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102-108 Jeffcott Street, West Melbourne

Sustainable Management Plan

7.2 Green Star Preliminary Design Rating

Based on the design attributes and performance outcomes set out above, the following Green Star pathway has been prepared which confirms that the development has the preliminary design potential to achieve a 5 star Green Star standard.

Green Star - Design & As Built Scorecard v1.3

Project: 108 Jeffcott Street, East Melbourne	TP permit stage	Points Available	Total Score Targeted
Targeted Rating: 5 Star - Australian Excellence	3/02/2021	100	60.0

CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA	Points Available	5* pathway
Management				14	
Green Star Accredited Professional	Appointment and active involvement of a Green Star AP to ensure that the rating tool is applied effectively and as intended.	1.1	Accredited Professional	1	1
Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	2.0	Environmental Performance Targets	-	Complies
		2.1	Services and Maintainability Review	1	1
		2.2	Building Commissioning	1	1
		2.3	Building Systems Tuning	1	1
		2.4	Independent Commissioning Agent	1	1
Adaptation and Resilience	To encourage and recognise projects resilient to the impacts of a changing climate and natural disasters.	3.1	Implementation of a Climate Adaptation Plan	2	2
Building Information	Info facilitating understanding of systems, O&M requirements and targets to optimise performance.	4.1	Building Information	1	1
Commitment to Performance	Practices that encourage building owners, building occupants and FM teams to set targets and monitor environmental performance in a collaborative way.	5.1	Environmental Building Performance	1	1
		5.2	End of Life Waste Performance	A. Contractual Agreements	1
Metering and Monitoring	To recognise the implementation of effective energy and water metering and monitoring systems.	6.0	Metering	-	Complies
		6.1	Monitoring Systems	1	1
Responsible Construction Practices	To reward projects that use best practice formal environmental management procedures during construction.	7.0	Environmental Management Plan	-	Complies
		7.1	Environmental Management System	1	1
Operational Waste (PCA requirement)	A. Performance Pathway	8A	Performance Pathway: Specialist Plan	1	1
Total				14	13

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Indoor Environment Quality			17			
Indoor Air Quality	To recognise projects that provide high air quality to occupants.	9.1	Ventilation System Attributes	1	1	
		9.3	Exhaust or Elimination of Pollutants	1	1	
			A. Removing the Source of Pollutants B. Exhausting the Pollutants Directly to the Outside			
Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	10.2	Reverberation	1	1	
Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	11.0	Minimum Lighting Comfort	-	Complies	
		11.1.1 General Illuminance and Glare Reduction	11.1.1 General Illuminance	A. Non Residential Spaces B. Residential Spaces	1	1
			11.1.2 Glare Reduction	A. Prescriptive Method 1 B. Prescriptive Method 2 C. Performance Method		
		11.2	Surface Illuminance	A. Prescriptive Method B. Performance Method	1	1
				C. Residential Spaces (Prescriptive Method)		
11.3	Localised Lighting Control	1	1			
Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	12.0	Glare Reduction	A. Fixed Shading Devices B. Blinds or Screens C. Daylight Glare Model	-	Complies
		12.2	Views	1	1	
Indoor Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.	13.1.1 Paints, Adhesives, Sealants and Carpets	13.1.1 Paints, Adhesives and Sealants	A. Product Certification B. Laboratory Testing C. No Paints, Adhesives or Sealants	1	1
			13.1.2 Carpets	A. Product Certification B. Laboratory Testing C. No Carpets		
		13.2	Engineered Wood Products	A. Product Certification B. Laboratory Testing	1	1
Total				17	9	

Energy			22			
Greenhouse Gas Emissions	B. NatHERS Rating Pathway	15B.0	Conditional Requirement: NatHERS Pathway	-	Complies	
		15B.1	Thermal and Energy Performance	6	1	
		15B.2 Building Services and Appliances	15B.2.1 Lighting	1	1	
			15B.2.2 Ventilation and Air Conditioning	A. Mechanically Conditioned Spaces B. Spaces With Mechanical C. Naturally Ventilated Spaces	2	2
			15B.2.4 Appliances & Equipment	1	1	
			15B.2.7 Vertical Transportation	1	1	
			15B.2.10 Off-Site Renewables	5	2	
Total			17	8		

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Transport				10	
Sustainable Transport	B. Prescriptive Pathway	17B.1	Access by Public Transport	3	2
		17B.2	Reduced Car Parking Provision	1	1
		17B.3	Low Emission Vehicle Infrastr. B. Parking for Electric Vehicles	1	1
		17B.4	Active Transport Facilities	1	1
		17B.5	Walkable Neighbourhoods A. Proximity to Amenities	1	1
Total				7	6

Water				12	
Potable Water	B. Prescriptive Pathway	18B.1	Sanitary Fixture Efficiency	1	1
		18B.3	Heat Rejection	2	2
		18B.4	Landscape Irrigation	1	1
		18B.5	Fire Protection System Test Water	1	1
Total				6	5

Materials				14		
Life Cycle Impacts	B. Prescriptive Pathway - Life Cycle Impacts	19B.1 Concrete	19B.1.1 Portland Cement Reduction	2	1	
			19B.1.2 Water Reduction	0.5	0.5	
			19B.1.3 Aggregates Reduction A. Course Aggregate Reduction	0.5	0.5	
		19B.4	Structural Timber	19B.4.0 Responsible Sourcing	-	Complies
Responsible Building Materials	To reward projects that include materials that are responsibly sourced or have a sustainable supply chain.	20.1	Structural and Reinforcing Steel	20.1.0 Responsible Steel Maker	-	Complies
			A. Responsible Steel Fabricator	1	1	
		20.2	Timber	A. Certified Timber B. Reused Timber	1	1
Sustainable Products	To encourage sustainability and transparency in product specification.	20.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables	A. Products That Do Not Contain PVC	1	1
				21.1	Product Transparency and Sustainability	A. Reused Products
B. Recycled Content Products						
C. Environmental Product Declarations (EPDs)						
D. Third Party Certification						
E. Stewardship Programs						
Construction and Demolition Waste	A. Fixed Benchmark	22.0	Reporting Accuracy	A. Compliance Verification Summary	-	Complies
		22A	Fixed Benchmark		1	1
Total				12	7	

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				6		
Ecological Value	To reward projects that improve the ecological value of their site.	23.0	Endangered, Threatened or Vulnerable Species	A. EPBC	-	Complies
		23.1	Ecological Value		3	1
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously	24.0	Conditional Requirement		-	Complies
		24.1	Reuse of Land	A. Previously Developed Land	1	1
Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	25.1	Heat Island Effect Reduction		1	1
Total				6	3	

Emissions				5		
Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	26.1	Stormwater Peak Discharge		1	1
		26.2	Stormwater Pollution Targets		1	1
Light Pollution	To reward projects that minimise light pollution.	27.0	Light Pollution to Neighbouring Bodies		-	Complies
		27.1	Light Pollution to Night Sky	A. Control of Upward Light Output Ratio (ULOR)	1	1
Microbial Control	Minimising impacts associated with harmful microbes in building systems.	28	Legionella Impacts from Cooling Systems	B. Waterless Heat Rejection Systems	1	1
Total				5	4	

Innovation				10		
Market Transformation	Sustainability initiatives that substantially contributes to the broader market transformation towards sustainable development in Australia or in the world.	30B	Market Transformation		1	
Improving on Green Star Benchmarks	Demonstrates a substantial improvement on the benchmark required to achieve full points on existing credit.	30C	Improving on Green Star Benchmarks		10	3
Innovation Challenge	Addresses an sustainability issue not included within any of the Credits in the existing Green Star rating tools.	30D	Innovation Challenge			1
Total				10	5	



5* pathway	
TOTAL SCORE TARGETED	60.0
Green Star rating	5 Star

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8 Conclusion

This report provides details of a comprehensive package of sustainable design features which will be integrated into the design and specification of the proposed development in order to improve environmental outcomes during occupation.

In terms of performance outcomes, the analysis presented in this report demonstrates that the proposed development will:

- attain a 5 star Green Star standard based on the Design & As Built v1.3 rating tool;
- Achieve 1 point for the potable water calculator (equivalent to the Green Star Multi Residential Wat-1 credit);
- attain the *Best Practice* standard for urban stormwater quality; and
- attain a minimum development NatHERS energy rating of 6.5 stars.

Please note that this analysis is based on the best information currently available in relation to the technical and commercial feasibility of the initiatives proposed. Further investigation will be undertaken during design development which may result in change to the package of initiatives specified in order to meet the 5 star Green Star standard (60 points minimum).

The performance outcomes set out above confirm that the proposed development meets the relevant performance measures set out in Clauses 22.19 and 22.23 of the Melbourne Planning Scheme.

Accordingly, the sustainable design outcomes from the proposed development are considered to be consistent with the objectives of the City of Melbourne's Energy Water and Waste Efficiency and Water Sensitive Urban Design Policies (Clauses 22.19 & 22.23 of the Melbourne Planning Scheme).



Jan Talacko
Director

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Appendix A. Energy Rating Assumptions

Building Materials

Element	Description	Added R Value
Floor Type	Suspended concrete slab	
Floor Insulation	Bulk Insulation: Underside of ground level floors shared with car park and unconditioned spaces	R 2.5
	Bulk Insulation: Underside of floors shared with outside below	R 2.5
Wall Insulation	Lightweight party walls: Insulation R 1.5	R 1.5
	Lightweight corridor walls: Insulation R 1.5	R 1.5
	Precast concrete Lift & stairwell walls: Insulation R1.5	R 1.5
	Precast concrete external walls: Insulation R 1.55	R 1.55
	Lightweight clad walls: Insulation R 2.5	R 2.5
	Glass spandrel walls: Insulation R 2.5	R 2.5
Roof Insulation	Concrete roof: R 4.0 insulation	R 4.0
	All apartment concrete ceilings shared with terraces above: R 2.5 insulation	R 2.5
Window Frames	Aluminium thermally broken frames	
External Blinds	Screens and shading as per elevations	

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Glazing values

Glazing Type	Description	Whole of Window Value		Location
Capral – Thermally Broken Futureline 46D Series Hinged Door		U	SHGC	
Specified Glazing	CAP-115-03 Double glazed 24mm Insulglass Max 564 - Air	2.90	0.24	All apartments
Capral – Thermally Broken Futureline 440 Series Fixed		U	SHGC	
Specified Glazing	CAP-113-03 Double glazed 24mm Insulglass Max 564 - Air	2.00	0.25	All apartments
Energy Rating Software Equivalent	THC-050-09 Series EC75TB Fixed Double glazed 6mm Performa/12mm Argon gap/6mm Clear	2.08	0.26	
Capral – Thermally Broken Futureline 54W Series Awning		U	SHGC	
Specified Glazing	CAP-116-03 Double glazed 24mm Insulglass Max 564 - Air	2.90	0.19	All apartments
Capral – Thermally Broken Futureline Lift & Slide Door		U	SHGC	
Specified Glazing	CAP-133-03 Double glazed 24mm Insulglass Max 564 - Air	2.40	0.19	All apartments
Energy Rating Software Equivalent	GJA-068-10 GJames Type 448 TB AL door DG 6mm DLE55(S2)Azur/12mm Air gap/6m Clear	2.46	0.19	

NOTES

The energy rating software accredited by the Australian Building Codes Board contains a relatively limited library of window systems. When the glazing systems specified are not available in the software, the protocol requires that the glazing type which most closely matches the specified glazing is selected for the purpose of calculating the energy rating.

The table above sets out the glazing specified on the architectural drawings together with the glazing input for the purposes of calculating the energy rating.

The whole of window U – Value must be equal or lower than the energy rating software value and the whole of window SHGC – Value must be within +/-5% of the energy rating software value.

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Spandrel location

The energy ratings have been undertaken using spandrels in the following locations. Note that these are for typical floor plates.

Level 9 (typical to level 2 to 17)



Level 18



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General Rating Assumptions

Item	Details
Floor Coverings	<ul style="list-style-type: none"> • Tiles to bathrooms & entry, • Carpet to bedrooms, • Timber boards to kitchen, living and all other areas
Window Coverings	<ul style="list-style-type: none"> • Holland blinds to all windows. (Regulation Mode)²
Draught Proofing	<ul style="list-style-type: none"> • Weather strips to all entry & external doors and windows. • Seal / self-closing to all exhaust fans.
Down lights	<ul style="list-style-type: none"> • Recessed down lights in ceiling /roof space to be sealed type / IC 4 rated to provide air tightness and contact with insulation
General	<ul style="list-style-type: none"> • All party walls are classed as neighbour walls.
Shading	<ul style="list-style-type: none"> • Overshadowing from adjoining buildings has been incorporated into the energy ratings

NOTES

1. Changes to any of the above stated specifications may affect energy performance and invalidate the energy ratings detailed in this report.
2. Sealing of gaps and cracks: inadequate sealing of gaps and cracks can negatively affect the energy performance of a dwelling. Provide sealing in accordance with NCC 2016 Part J3.

² Holland blinds are assumed as required by VBA Practice Note 55 (Clause 5.2). This assumption is for regulatory purposes only.

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102-108 Jeffcott Street, West Melbourne

Sustainable Management Plan

Appendix B: Green Star Wat-1 Calculators

Note that these legacy calculators are from withdrawn Green Star rating tools and therefore do not form part of the Green Star pathway for this project. They are included to demonstrate compliance with the performance measures stated within Clause 22.19 Energy, Water and Waste Efficiency of the Melbourne Planning Scheme.

Green Star - Multi Unit Residential v1

Potable Water Calculator

Points Achieved (efficient fixtures and fittings)	1
Points Achieved (non-potable water use)	0
TOTAL Points Achieved	1

Go to Water Category

Refer to the **Green Star Potable Water Calculator Guide** for instructions on how to use the calculator and details on how the points are calculated. The **Green Star Potable Water Calculator Guide** is available from the GBCA website.

Building Information

Dwelling type	Number of dwellings	Assumed occupancy (persons)
Studio/1 bedroom	66	132
2 bedroom	47	141
3 bedroom		0
4 bedroom		0
5+ bedroom		0
Total	113	273

Part 1 : Efficient Fixtures and Fittings

	Water Efficiency (Enter manually OR nominate WELS star rating)		Resulting water efficiency used in calculator (l/min, except for toilets, l/flush)	Percentage of Each Type	Calculated Water Consumption (L/day)
	Manual entry from Manufacturer's data sheet (l/min, except for toilets, l/flush)	WELS Star rating selection			
Toilets					
<enter description>		4 Star	3.5	100%	
<enter description>		Select star rating			
<enter description>		Select star rating			
<enter description>		Select star rating			
Total				100%	3822.0
Bathroom Taps					
<enter description>		4 Star	7.5	100%	
<enter description>		Select star rating			
<enter description>		Select star rating			
<enter description>		Select star rating			
Total				100%	2149.9
Kitchen Taps					
<enter description>		4 Star	7.5	100%	
<enter description>		Select star rating			
<enter description>		Select star rating			
<enter description>		Select star rating			
Total				100%	4095.0
Showerheads					
<enter description>	7.5		7.5	100%	
<enter description>		Select star rating			
<enter description>		Select star rating			
<enter description>		Select star rating			
Total				100%	16380.0
Total Project Water Consumption (L/day)					26446.9
Benchmark for total water consumption (L/day) to achieve 1 point					29019.9
Benchmark for total water consumption (L/day) to achieve 2 points					23948.9
Points achieved		1			

NB: Zero points will be displayed until above table is complete (100% of each fixture/fitting)

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Appendix C. STORM Report



STORM Rating Report

TransactionID: 1061639
Municipality: MELBOURNE
Rainfall Station: MELBOURNE
Address: 102-108 Jeffcott Street

West Melbourne
VIC 3003

Assessor: Broderick Jacobs
Development Type: Residential - Multiunit
Allotment Site (m2): 926.00
STORM Rating %: 105

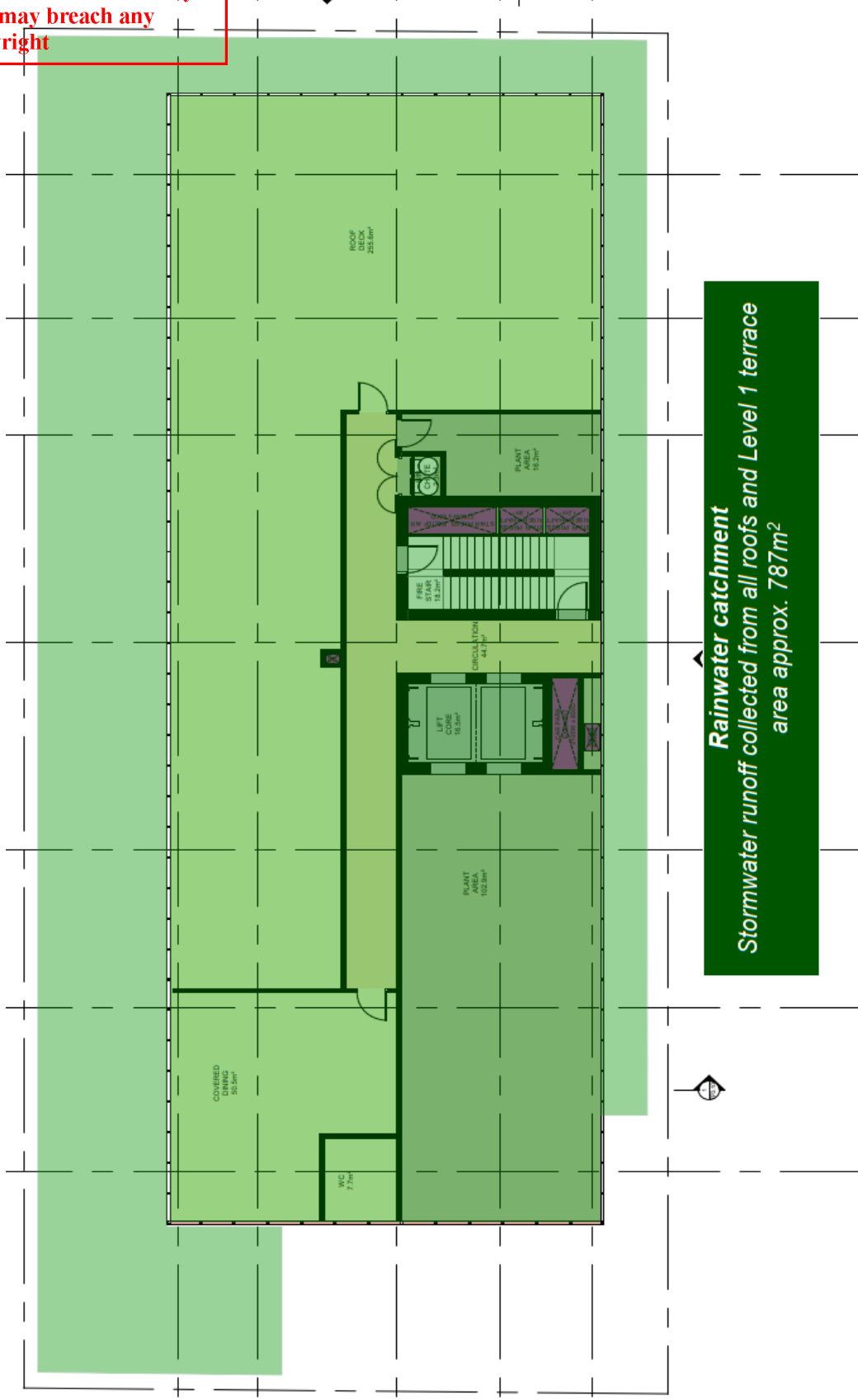
Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Roof	511.00	Rainwater Tank	5,000.00	25	122.50	62.00
L1 Terrace	275.00	Rainwater Tank	3,000.00	15	127.50	62.00
Ground Terrace	64.00	None	0.00	0	0.00	0.00
Untreated	76.00	None	0.00	0	0.00	0.00

Date Generated: 12-Nov-2020

Program Version: 1.0.0

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C.1 Rainwater Catchment Areas

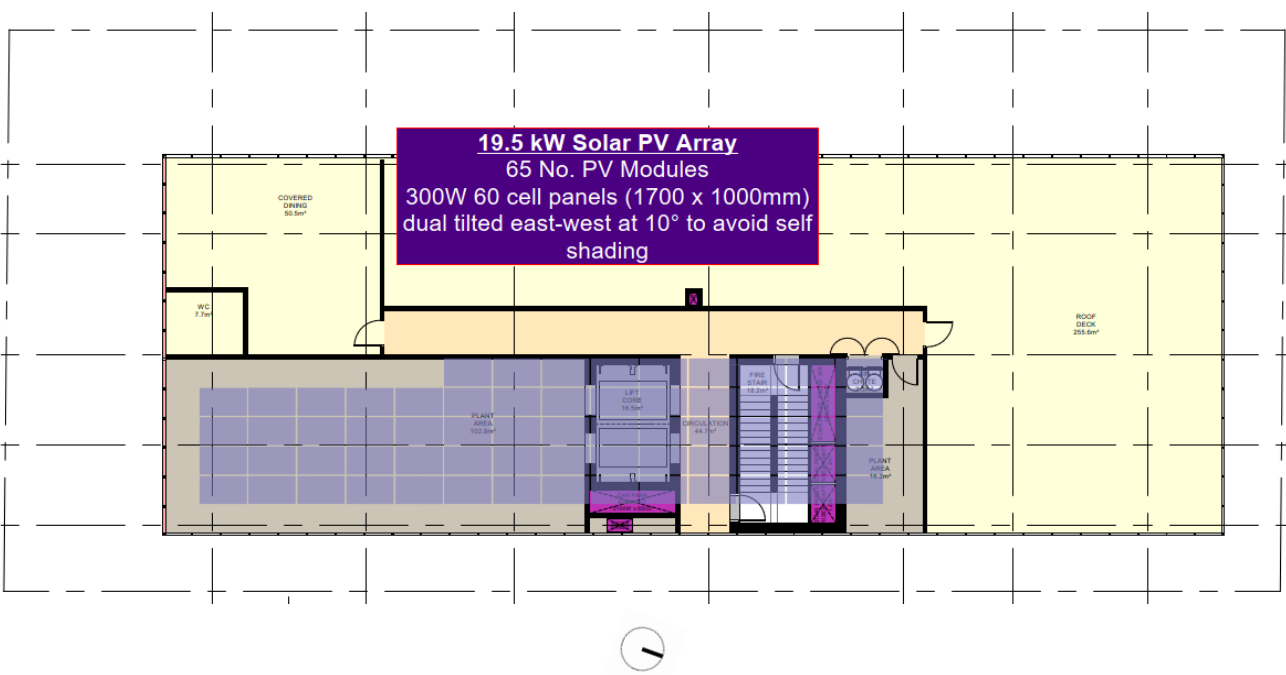


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Appendix D. Solar Photovoltaic System

High-efficiency solar PV modules with a total capacity of 19.5 kWp will be installed at roof level as per the preliminary layout indicated below.

PV modules will be oriented in pairs to the east and west at 10-15° tilt and have at least 300Wp capacity (i.e. over 20% more efficient than traditional 250Wp 60-cell modules). High-efficiency modules deliver more compact arrays with inherently lower embodied ecological impact per unit of generation than standard efficiency modules.



Indicative Solar Photovoltaic array layout

The undulating east-west configuration prevents self-shadowing of the array and provides a low-profile installation with maximised packing factor. It also helps maximise self-consumption due to its flatter and broader power output yield profile.



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15 March 2021

Total yield of this array will be approximately 7.3 MWh per annum equating to an estimated annual carbon emissions offset of 30.5 tonnes CO_{2-e} per annum.

~~102-108 Jeffcott Street, West Melbourne~~

Photovoltaic System

PV Melbourne energy delivery	MWh/y per kWe	1.40	13° tilt, East/West
PV capacity required	kWe	19.5	
Proposed PV module rating	Wp	300	
Efficiency improvement over traditional 250W module		20.0%	
Typical dimensions for 60-cell module	Width (m) x length (m)	1.0 x 1.7	
Number of panels required	rounded up	65	
Expected electricity produced	kWh/day	74.8	
Annual expected electricity produced	MWh/yr	27.3	

Electricity gas emissions factor, NG	kg_CO2-e/kWh	1.12	Scope 2 and 3
Greenhouse gas emissions reduction	tonnes_CO _{2-e} /yr	30.58	

[2] National Greenhouse Accounts (NGA) Factors, August 2019, table 44 "Latest", "Victoria"