

ATTACHMENT 'G'
SUPPORTING DOCUMENTS

- Sustainable Management Plan prepared by *Ark Resources*.

PROPOSED MIXED USE DEVELOPMENT

28-32 Albert Road, South Melbourne

SUSTAINABLE MANAGEMENT PLAN

&

WATER SENSITIVE URBAN DESIGN RESPONSE

FOR

**DCF DEVELOPING ENTITY 28 ALBERT ROAD SOUTH
MELBOURNE PTY LTD**

20 December 2019

File 1099A



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1. Executive Summary

The proposed mixed-use development at 28-32 Albert Road, South Melbourne has been designed to meet the objectives of the City of Port Phillip's Water Sensitive Urban Design and Environmentally Sustainable Development Policies (Clauses 22.12 and 22.13 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 10 Key Sustainable Building Categories outlined in City of Port Phillip's Sustainable Design Assessment in the Planning Process (SDAPP).

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 **4 star Green Star Design & As Built** performance standard. The standard achieved is defined as *Australian Best Practice* in terms of environmental design.

The development also meets the *Best Practice* standard for Urban Stormwater Quality and is therefore also consistent with the City of Port Phillip'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 22.12 and 22.13 of the Port Phillip Planning Scheme.

2. Introduction

Ark Resources has been engaged by DCF Developing Entity 28 Albert Road South Melbourne Pty Ltd to provide advice in relation to environmentally sustainable development outcomes from the proposed mixed-use development at 28-32 Albert Road, South 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 Elenberg Fraser Architects set out below:

Description	Drawing No.	Revision	Date
Development Summary	TP-S86A	A	12/12/2019
Site Plan	A001	A	12/12/2019
Survey Plan	A010	A	12/12/2019
Basement Plan B1	A0490	A	12/12/2019
Basement Plan B2	A0491	A	12/12/2019
Basement Plan B3	A0492	A	12/12/2019
Basement Plan B4	A0494	A	12/12/2019
Ground Level	A0500	A	12/12/2019
Hotel & Resi Facilities Level L01	A501	A	12/12/2019
Hotel Podium Level L02-L05	A502	A	12/12/2019
Hotel Tower Level L06	A506	A	12/12/2019
Hotel Tower Level L07-09	A507	A	12/12/2019
Typical Low-Rise Level L10	A510	A	12/12/2019
Typical Low-Rise Level L11-14	A511	A	12/12/2019
Typical High-Rise Level L15-19	A515	A	12/12/2019
Sub-Penthouse Level L20-21	A520	A	12/12/2019
Sub-Penthouse Level L22	A522	A	12/12/2019
Typical High-Rise Level L23	A523	A	12/12/2019
Level 24 Penthouse	A524	A	12/12/2019
Level 25 Roof	A525	A	12/12/2019
Elevation – East	A900	A	12/12/2019
Elevation – South	A901	A	12/12/2019
Elevation – West	A902	A	12/12/2019
Elevation – North	A903	A	12/12/2019
Section A-A	A950	A	12/12/2019
Section B-B	A951	A	12/12/2019
Section C-C	A952	A	12/12/2019
Section D-D	A953	A	12/12/2019

3. Relevant Policy Requirements

Clause 22.13 Environmentally Sustainable Development of the Port Phillip Planning Scheme is applicable to new residential and non-residential developments.

The overarching objective of the policy is that development should achieve best practice in environmentally sustainable development from the design stage through to construction and operation.

Clause 22.13-2 cites the following relevant policy objectives in relation to specific elements of sustainable design:

Energy performance

- *To improve the efficient use of energy, by ensuring development demonstrates design potential for ESD initiatives at the planning stage.*
- *To reduce total operating greenhouse gas emissions.*
- *To reduce energy peak demand through particular design measures (e.g. Appropriate building orientation, shading to glazed surfaces, optimise glazing to exposed surfaces, space allocation for solar panels and external heating and cooling systems).*

Water resources

- *To improve water efficiency.*
- *To reduce total operating potable water use.*
- *To encourage the collection and reuse of stormwater.*
- *To encourage the appropriate use of alternative water sources (e.g. greywater).*

Indoor Environment Quality

- *To achieve a healthy indoor environment quality for the wellbeing of building occupants, including the provision of fresh air intake, cross ventilation, and natural daylight.*
- *To achieve thermal comfort levels with minimised need for mechanical heating, ventilation and cooling.*
- *To reduce indoor air pollutants by encouraging use of materials with low toxic chemicals.*
- *To reduce reliance on mechanical heating, ventilation, cooling and lighting systems.*
- *To minimise noise levels and noise transfer within and between buildings and associated external areas.*

Stormwater Management

- *To reduce the impact of stormwater run-off.*
- *To improve the water quality of stormwater run-off.*
- *To achieve best practice stormwater quality outcomes.*
- *To incorporate the use of water sensitive urban design, including stormwater re-use.*

Transport

- *To ensure that the built environment is designed to promote the use of walking, cycling and public transport, in that order.*
- *To minimise car dependency.*
- *To promote the use of low emissions vehicle technologies and supporting infrastructure.*

Waste management

- *To promote waste avoidance, reuse and recycling during the design, construction and operation stages of development.*
- *To ensure durability and long-term reusability of building materials.*
- *To ensure sufficient space is allocated for future change in waste management needs, including (where possible) composting and green waste facilities.*

Urban Ecology

- *To protect and enhance biodiversity within the municipality.*
- *To provide environmentally sustainable landscapes and natural habitats, and minimise the urban heat island effect*
- *To encourage the retention of significant trees.*
- *To encourage the planting of indigenous vegetation.*
- *To encourage the provision of space for productive gardens, particularly in larger residential developments*

4. Site Description

The proposed development comprises a restaurant/bar, communal facilities, eleven levels with 88 hotel rooms and 44 residential apartments with a total of 108 bedrooms across 15 levels.

The building comprises the following uses:

Level	Use
Basement B5 – B2	<ul style="list-style-type: none"> Car stackers, rainwater tank, storage facilities, and bin store
Basement B1	<ul style="list-style-type: none"> Car lifts, entry lobby, fire tanks, and bike store
Ground level	<ul style="list-style-type: none"> Residential lobby, hotel lobby, restaurant
Level 1	<ul style="list-style-type: none"> Hotel and residential lounge, bar and gym
Levels 2 to 9	<ul style="list-style-type: none"> 88 hotel rooms
Levels 10 to 24	<ul style="list-style-type: none"> 44 apartments (108 bedrooms)
Rooftop	<ul style="list-style-type: none"> Solar photovoltaic array, services and plant

The site is located within the City of Port Phillip.

The development site has an area of approximately 1,010m² and currently contains a multi-storey office building. The surrounding buildings are a mix of residential and commercial uses.

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



Image taken 31 August 2019 – Nearmap©

5. Summary of Key ESD Initiatives

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

- Rainwater harvesting system for toilet flushing and irrigation;
- 15kWp rooftop solar photovoltaic array;
- Integrated planter boxes;
- High-performance glazing and energy efficient building services, appliances and fixtures;
- 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 (Version 5) benchmarking tools based on the proposed architectural design and the building services and materials initiatives considered feasible at this stage of the design process.

The information presented in this report demonstrates that:

- The development will achieve a 4 star Green Star Design & As Built rating;
- For non-residential areas, the building envelope performance will result in at least a 10% reduction in annual energy demand relative to a NCC J1 – J3 compliant reference building envelope.
- The development will achieve a minimum NatHERS energy rating of 6.5 stars;
- The development meets the *Best Practice* standard for stormwater quality.

6. Green Star

The Green Star Design & As Built (Version 1.2) 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 **4 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 **4 star** Green Star standard.

The initiatives which contribute to the **4 star** Green Star rating are detailed in Section 6.1 below.

¹ Note that a minimum of 45 points must be achieved for a 4 star Green Star rating to be achieved. The development will attain a 4 star Green Star standard however certification of the rating with the Green Building Council will not be undertaken.

6.1. 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 v1.2 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 including a Site Management Plan 	Conditional Requirements Appendix 2
	<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 • Detailed Operations and Maintenance Manual prepared • Head contractor to have current ISO 14001 certification • Measurement and reporting of building performance metrics by Owners Corporation/Building Management 	
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
	<ul style="list-style-type: none"> • Ventilation systems to comply with ASHRAE 62.1, and pre-cleaned prior to handover • Exhaust systems to directly exhaust pollutants to exterior • Lighting systems designed to meet best practice illuminance levels • Apartments to have wall mount or wall wash fittings to one wall in each living and bedroom space • Lighting systems designed for task lighting • 60% of primary spaces to have high quality views • Specification of low VOC paints, adhesives, sealants and carpets • Specification of low formaldehyde engineered wood products 	

Green Star Element	Design Attribute	Reference
Energy	<ul style="list-style-type: none"> • NCC J1 and J2 performance requirements to improve by 5% • Attain apartment NatHERS energy rating average of 6.5 stars and a minimum individual NatHERS energy rating of 5.5 stars for each apartment. • Achieve minimum 10% improvement over NCC Section J DTS provisions 	Conditional Requirements
	<ul style="list-style-type: none"> • Development NatHERS energy rating average 6.5 stars • Reverse cycle heat pumps with minimum energy rating of 3* heating & 3* cooling and rated capacities within 10%/20% of design capacities. • 15kWp rooftop mounted photovoltaic system serving common area power. <ul style="list-style-type: none"> ○ Embodied ecological impacts of PV array and support racking will be reduced by over 20% through use of 300Wp 60-cell modules with efficiency over 20% greater than standard PV modules. ○ Embodied impacts of PV modules will be further reduced by procurement from a manufacturer with an <i>above average</i> rating on the current version Silicon Valley Toxics Coalition Solar Scorecard. • Energy efficient lighting systems with 10% improvement on NCC requirements • Energy efficient gas domestic hot water system • Energy efficient appliances within 1 star of best available at time of tender. 	<p>Appendix 1</p> <p>Appendix 5</p>
Sustainable Transport	<ul style="list-style-type: none"> • A total of 19 vertical racks and 4 horizontal bike racks located on basement level B1 • Accessible public transport options • A Walk Score® of 97 out of 100 points – defined as 'Walker's Paradise' and a Transit Score® of 95 out of 100 points – defined as 'Rider's Paradise'. 	

Water	<ul style="list-style-type: none">Water efficient fixtures and appliances within 1 star of the WELS ratings scheduled below:<table><tr><th>Fixture / Equipment Type</th><th>WELS Rating</th></tr><tr><td>Taps</td><td>6 Star</td></tr><tr><td>Urinals</td><td>6 Star</td></tr><tr><td>Toilet</td><td>5 Star</td></tr><tr><td>Showers</td><td>3 Star (> 4.5 but <= 6.0)</td></tr><tr><td>Clothes Washing Machines</td><td>5 Star</td></tr><tr><td>Dishwashers</td><td>6 Star</td></tr></table>Water efficient sub-soil drip irrigation system with moisture sensors and timersRainwater harvesting:<ul style="list-style-type: none">Stormwater catchment from level 25 + level 4 roofsTotal storage volume of 20kL rainwater tanksRe-use of captured water for WC flushing in apartments with a combined total of 25 bedroomsRe-use of captured water for irrigation using sub-soil drip irrigation system with moisture sensors and timersCooling towers not usedFire test system water storage and re-use	Fixture / Equipment Type	WELS Rating	Taps	6 Star	Urinals	6 Star	Toilet	5 Star	Showers	3 Star (> 4.5 but <= 6.0)	Clothes Washing Machines	5 Star	Dishwashers	6 Star	Appendix 3 & 4
Fixture / Equipment Type	WELS Rating															
Taps	6 Star															
Urinals	6 Star															
Toilet	5 Star															
Showers	3 Star (> 4.5 but <= 6.0)															
Clothes Washing Machines	5 Star															
Dishwashers	6 Star															
Materials	<ul style="list-style-type: none">Concrete mixes to incorporate at least 50% reclaimed water60% of steel reinforcement manufactured using energy reducing processSpecification of common use PVC products that meet Best Practice Guidelines for PVC in the Built EnvironmentDivert 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 purchaseSite does not contain old growth forest or wetland of High National Importance	Conditional Requirements														
	<ul style="list-style-type: none">Site has been previously developedAt least 75% of the total project site area comprises building or landscaping elements that reduce impact of heat island effect.All non-trafficable roofs to have initial solar reflectance index of 82.															

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 with a STORM score of 109% • External lighting design to have an upward light output ratio <5% • Strategies to minimise Legionella impacts from cooling systems implemented 	Appendix 3
Innovation	<p>Particularly subject to design development but may include:</p> <ul style="list-style-type: none"> • Visually-differentiated master switches installed in apartments and hotel rooms to facilitate turning off non-essential power upon departure for lighting, air-conditioning (soft-shut-down) and non-essential power sockets. • Site-wide leak detection system installed to prevent risk of ongoing potable water wastage • Dematerialisation via procurement of rooftop PV high-efficiency modules (>300Wp) & best-practice embodied ecological impacts - above average Solar Scorecard ranking. • 50% of internal paints to be ultra-low VOC type (<5g/litre) • Contractor education on core concepts of sustainability, climate change and global warming 	

6.2. 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 4 star Green Star standard.

Green Star - Design & As Built v1.2

Project:	28-32 Albert Road, South Melbourne	TP stage - Preliminary Rev B 26/11/2019	Points Available	Total Score Targeted
Current Rating:	4 Star - Best Practice		100	45.0

CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA	Points Available	4* pathway
Management				14	
Green Star Accredited Professional	To recognise appointment and active involvement of Green Star AP to ensure rating tool is applied effectively and as intended.	1.0	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
Building Information	Information facilitating understanding of building systems, O&M requirements and targets to optimise performance.	4.1	Building Information	1	1
Commitment to Performance	To recognise practices that encourage building owners, building occupants and FM teams to set targets and monitor.	5.1	Environmental Building Performance	1	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 Building Practices	To reward projects that use best practice formal environmental management procedures during construction.	7.0	Environmental Management Plan	-	Complies
		7.1	Formalised Environmental Management System	1	1
Total				14	8

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
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	General Illuminance and Glare Reduction	1	1
		11.2	Surface Illuminance	1	1
		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	-	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	Paints, Adhesives, Sealants and Carpets	1	1
		13.2	Engineered Wood Products	1	1
Total				17	8

Energy					22
Greenhouse Gas Emissions		15B.0	Conditional Requirement: NatHERS Pathway	-	Complies
		15B.1	NatHERS Pathway	16	5.5
Max.5pts achievable via Credit 15A - Prescriptive Pathway.	B. NatHERS Pathway				
Total				17	5.5

Transport					10	
Sustainable Transport	Prescriptive Pathway	17B.1	Access by Public Transport	3	2	
		17B.5	Walkable Neighbourhoods	1	1	
Total					7	3

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

Materials				14
Life Cycle Impacts	Prescriptive Pathway - Life Cycle Impacts	19B.1 Concrete	3	0.5
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	1	1
		20.3 Permanent Formwork, Pipes, Flooring, Blinds and Cables	1	1
Construction and Demolition Waste	Fixed Benchmark	22A Fixed Benchmark	1	1
Total			12	3.5

Land Use & Ecology					6
Ecological Value	To reward projects that improve the ecological value of their site.	23.0	Endangered, Threatened or Vulnerable Species	-	Complies
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	24.0	Conditional Requirement	-	Complies
		24.1	Reuse of Land	1	1
Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	25.0	Heat Island Effect Reduction	1	1
Total				6	2

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	1	1
Microbial Control	To recognise implementation of systems to minimise impacts associated with harmful microbes in building systems.	28.0	Legionella Impacts from Cooling Systems	1	1
Total				5	4

Innovation				10
Innovative Technology or Process	The project meets the aims of an existing credit using a technology or process that is considered innovative in Australia or the world.	30A	Innovative Technology or Process	3
Market Transformation	The project has undertaken a sustainability initiative 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	The project has achieved full points in a Green Star credit and demonstrates a substantial improvement on benchmark required to achieve full points.	30C	Improving on Green Star Benchmarks	1
Innovation Challenge	Where the project addresses an sustainability issue not included within any of the Credits in the existing Green Star rating tools.	30D	Innovation Challenge	1
Total				10



4* pathway		
CORE POINTS	100	39.0
CATEGORY PERCENTAGE SCORE		39.0
INNOVATION POINTS	10	6.0
TOTAL SCORE TARGETED		45.0
Green Star rating		4 Star

7. 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 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 4 star Green Star standard based on the Design & As Built v1.2 rating tool
- Attain the *Best Practice* standard for urban stormwater quality
- Attain a minimum development NatHERS energy rating of 6.5 stars
- Attain an annual energy performance of the building envelope 10% better than the minimum permitted by NCC 2016

The performance outcomes set out above confirm that the proposed development meets the relevant performance measures set out in Clauses 22.12 & 22.13 of the Port Phillip Planning Scheme.

Accordingly, the sustainable design outcomes from the proposed development are consistent with the objectives of the City of Port Phillip's Environmentally Sustainable Development and Water Sensitive Urban Design Policies (Clauses 22.12 and 22.13 of the Port Phillip Planning Scheme).



Jan Talacko
Director

Appendix 1: NatHERS Energy Ratings

FirstRate5 (Version 5.2.11 (3.13)) 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/m2)		
		Total	Heating	Cooling
11.01	5.8	119.6	99.7	19.9
11.02	6.1	110.2	98.1	12.1
15.01	6.5	97.1	84.4	12.7
15.02	6.7	93.1	86.2	6.9
15.03	6.5	97.7	83.2	14.5
21.01	6.9	86.8	73.5	13.3
21.02	7.2	78.4	65.5	12.9
22.01	6.7	92.3	75.6	16.7
23.01	6.6	94.8	79.9	14.9
24.01	6.0	112.8	96.1	16.8
Estimated Development Average	6.5	98.3	84.2	14.1

BUILDING MATERIALS ASSUMPTIONS

Element	Description	Added R Value
Floor Type	Suspended concrete slab	
Floor Insulation		NIL
Wall Insulation	External precast walls: 90mm R 2.5 bulk insulation	R 2.5
	Insulated spandrel panels: 90mm R 2.5 bulk insulation	R 2.5
	Light weight party & corridor walls: 75mm R 1.5 bulk insulation	R 1.5
	Precast concrete lift/stairs walls: 30mm R 0.7 bulk insulation	R 0.7
Roof Insulation	60mm Kingspan Kooltherm K10 soffit board: Underside of concrete ceiling/roof sections shared with terrace above	R 3.0
	80mm Kingspan Kooltherm K10 soffit board: Underside of concrete ceiling/roof to apartment 24.01	R 4.0

Element	Description	Added R Value
Window Frames	Thermally broken frames windows and glazed doors. Refer to glazing schedule	
Sky Lights	Nil	
External Screens	Nil	

GLAZING VALUES

Glazing Type	Description	Whole of Window Value		
Thermally Broken Sliding Door		U	SHGC	LOCATION
	Capral Futureline SD Series Green Double Glazed Low-e 6ET GN / 12mm argon / 6	2.51	0.22	All apartment sliding doors
NatHERS Software Equivalent	CAP-133-11 A Capral Futureline Lift & Slide Door DG 6EcAdGy-12Ar-6			
Thermally Broken Fixed Glazing		U	SHGC	LOCATION
	Capral Futureline 440 Series Green Double Glazed Low-e 6ET GN / 12mm argon / 6	2.00	0.24	All apartment glazing
NatHERS Software Equivalent	CAP-148-03 B Capral Futureline 440 TB Fixed Resid Wind DG 6HP564-12-6			
Thermally Broken Awning Window		U	SHGC	LOCATION
	Capral Futureline 54W Series Green Double Glazed Low-e 6ET GN / 12mm argon / 6	2.72	0.21	All apartment glazing
NatHERS Software Equivalent	CAP-116-17 B Capral Futureline 54W Awning Window DG 6CLSKN163_II-12Ar-6			

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 to 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.

GENERAL RATING ASSUMPTIONS

Item	Details
Floor Coverings	<ul style="list-style-type: none"> • Tiles to bathrooms, laundries • 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 all exhaust fans.
Down lights	<ul style="list-style-type: none"> • Recessed down lights in ceiling /roof space to be fitted with fire proof unvented down light covers (external roof areas only) 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
Ceiling Calculation	<ul style="list-style-type: none"> • Calculation for loss of ceiling insulation due to down lights, exhaust fans, ceiling speakers etc. have been incorporated into the energy rating where applicable

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.

Appendix 2: Site Management Plan

The objective of this Site Management Plan is to minimise the risks and impacts of stormwater pollution on nearby waterways during construction works.

The key pollutants at risk of entering the stormwater system during the construction phase include:

- Sediments such as soil, sand, gravel, mud and concrete washings;
- Oil, foam, scum, grease, and other chemicals; and
- Litter, stones, debris etc.

These pollutants arise from several factors such as dirt from construction vehicles, erodible stockpiles located close to surface runoff flow paths, and surface runoff from disturbed areas during earthmoving and construction works. It is therefore important to integrate measures that minimise the pollutant loads entering stormwater system during construction.

The following stormwater management strategies will be implemented during the construction phase to mitigate the impacts of the pollutants above on the stormwater system:

- A project specific Erosion and Sediment control plan will be prepared in accordance with the guidelines set out in:
 - Best Practice Erosion and Sediment Control (*International Erosion Control Association Australasia, 2008*); and
 - Reducing Stormwater Pollution from Construction Sites (*EPA Victoria, 2005*).
- The Erosion and Sediment plan will form part of the Environmental Management Plan described in Section 6.1 of this report. This initiative will reduce the impacts of sediments on the stormwater system during construction works upon implementation.
- Installation of appropriate onsite erosion and sediment control measures. All installed control measures shall be regularly inspected & maintained to ensure their effectiveness. Such measures may include (but not limited to):
 - Silt fences
 - sediment traps
 - hay bales
 - geotextile fabrics
- Where possible, waste bins or skips with a lid or cover will be used to prevent litter from getting blown away and potentially entering stormwater drains.

Additionally, the following work practices shall be adopted to reduce stormwater pollution:

- Site induction to make personnel aware of stormwater management measures in place;
- Employ measures to reduce mud being carried off-site into the roadways such as installing a rumble grid/ gravel/ crushed-rock driveway (or equivalent measure) to provide clean access for delivery vehicles, removing mud from vehicle tyres with a shovel etc.;
- Safe handling and storage of chemicals, paints, oils and other elements that could wash off site to prevent them from entering stormwater drains; and
- Where practicable, stockpiles will be covered, located within the site's fence and away from the lowest point of the site where surface runoff will drain to. This initiative will minimise erosion.

Accordingly, the measures presented above are considered appropriate for the proposed development at this stage of the project. The measures will reduce the pollutants entering stormwater system from the site during construction works thereby protecting waterways.

Furthermore, the initiatives above are consistent with the Application Requirements set out in the WSUD Policy of the Port Phillip Planning Scheme.

Appendix 3: STORM Rating



STORM Rating Report

TransactionID: 887422
Municipality: PORT PHILLIP
Rainfall Station: PORT PHILLIP
Address: 28-32 Albert Road

South Melbourne
VIC 3205

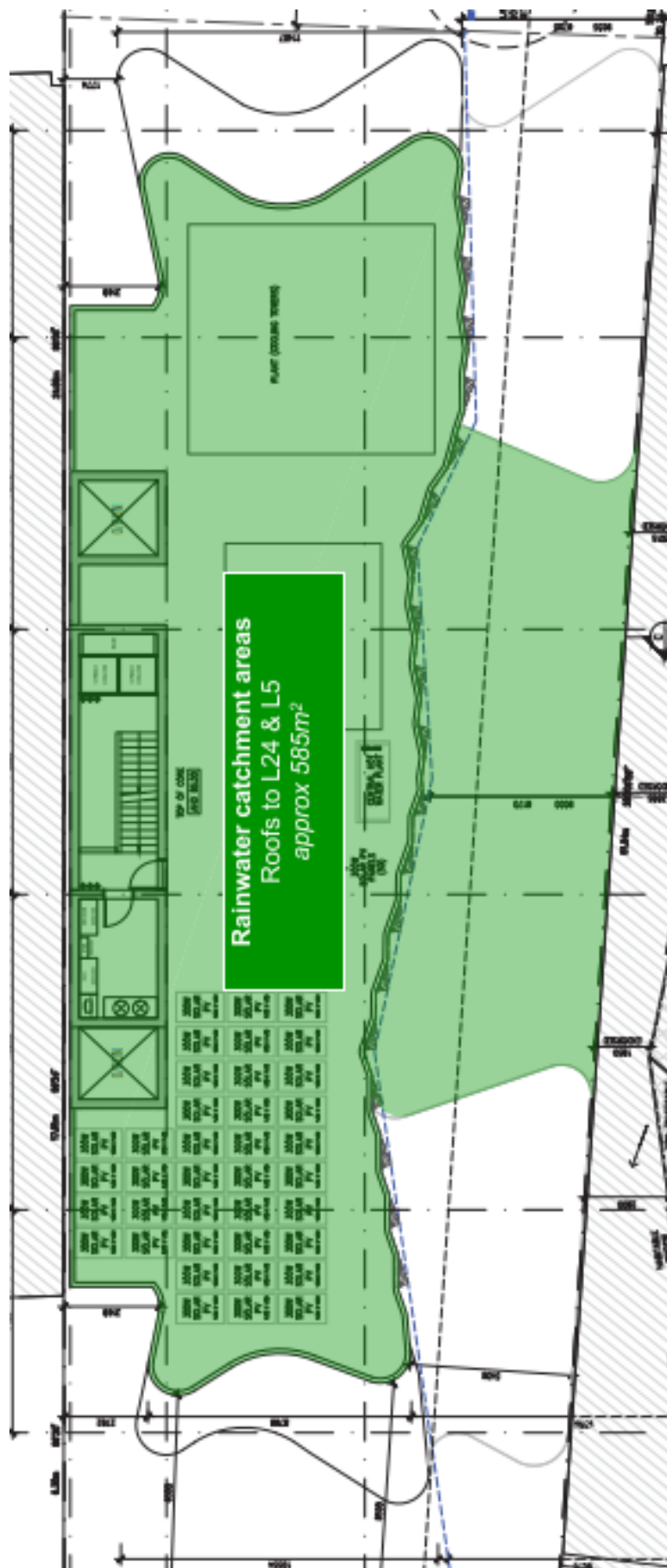
Assessor: Helen Maas
Development Type: Residential - Mixed Use
Allotment Site (m2): 1,010.00
STORM Rating %: 109

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Roofs L24 + L5	585.00	Rainwater Tank	20,000.00	25	168.00	82.80
Remaining Impervious	318.00	None	0.00	0	0.00	0.00

Date Generated: 17-Dec-2019

Program Version: 1.0.0

RAINWATER CATCHMENT AREA



Appendix 4: WSUD Maintenance Manual

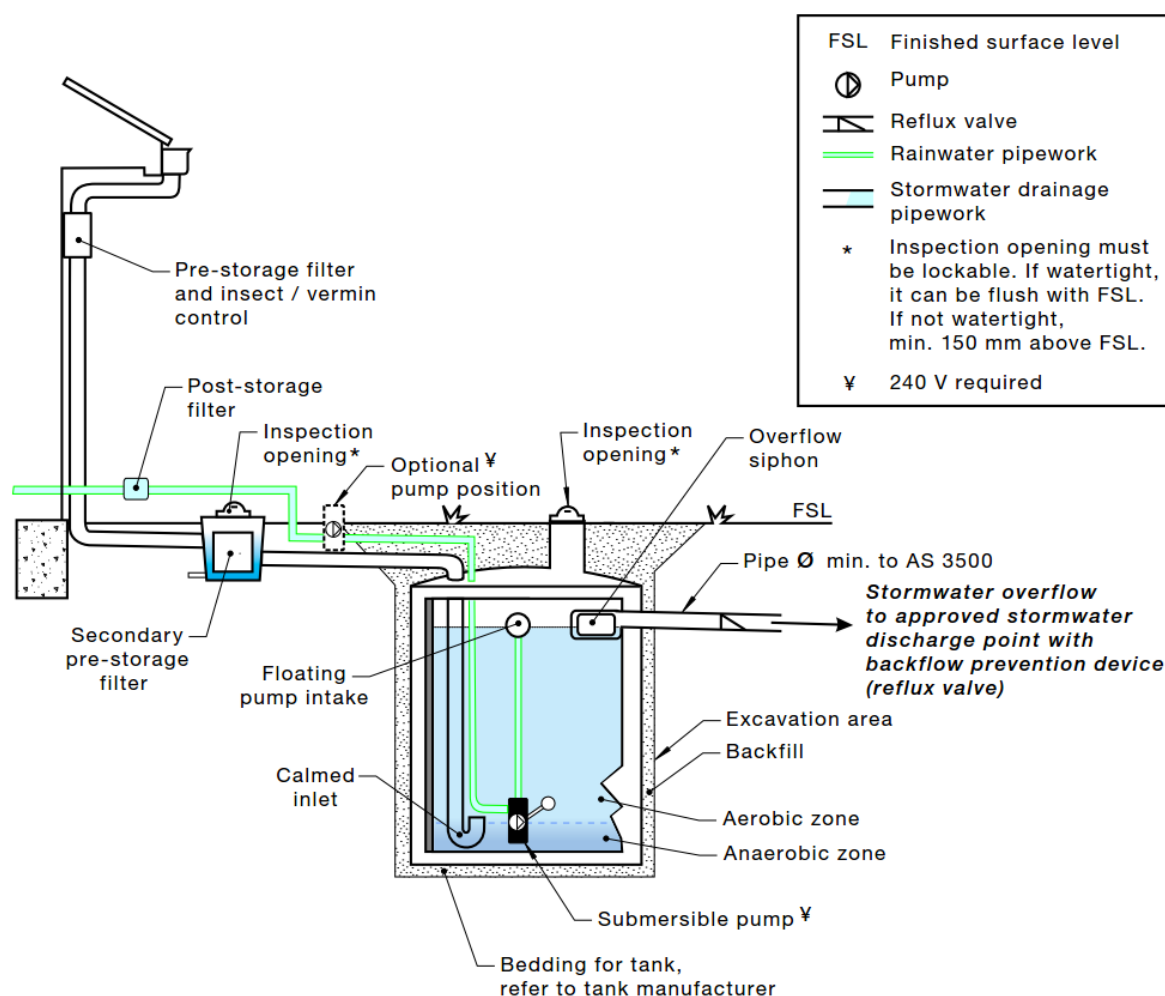
Rainwater Harvesting System Maintenance Program

Once installed, a systematic maintenance program will be implemented by the owners' corporation maintenance contractor to ensure the rainwater harvesting system operates as designed and water quality is maintained. The scope of the maintenance program will include inspection and rectification of issues associated with:

- Roof gutters and downpipes
- First flush screens and filtration devices
- Pumps
- Distribution pipework and reticulation systems
- Overflow systems

Inspections of the system and any maintenance works required will be undertaken on a quarterly basis.

The rainwater harvesting system will be installed in accordance with the guidelines set out in the Rainwater Design & Installation Handbook published by the National Water Commission³. A schematic diagram of the rainwater tank installation is provided below.

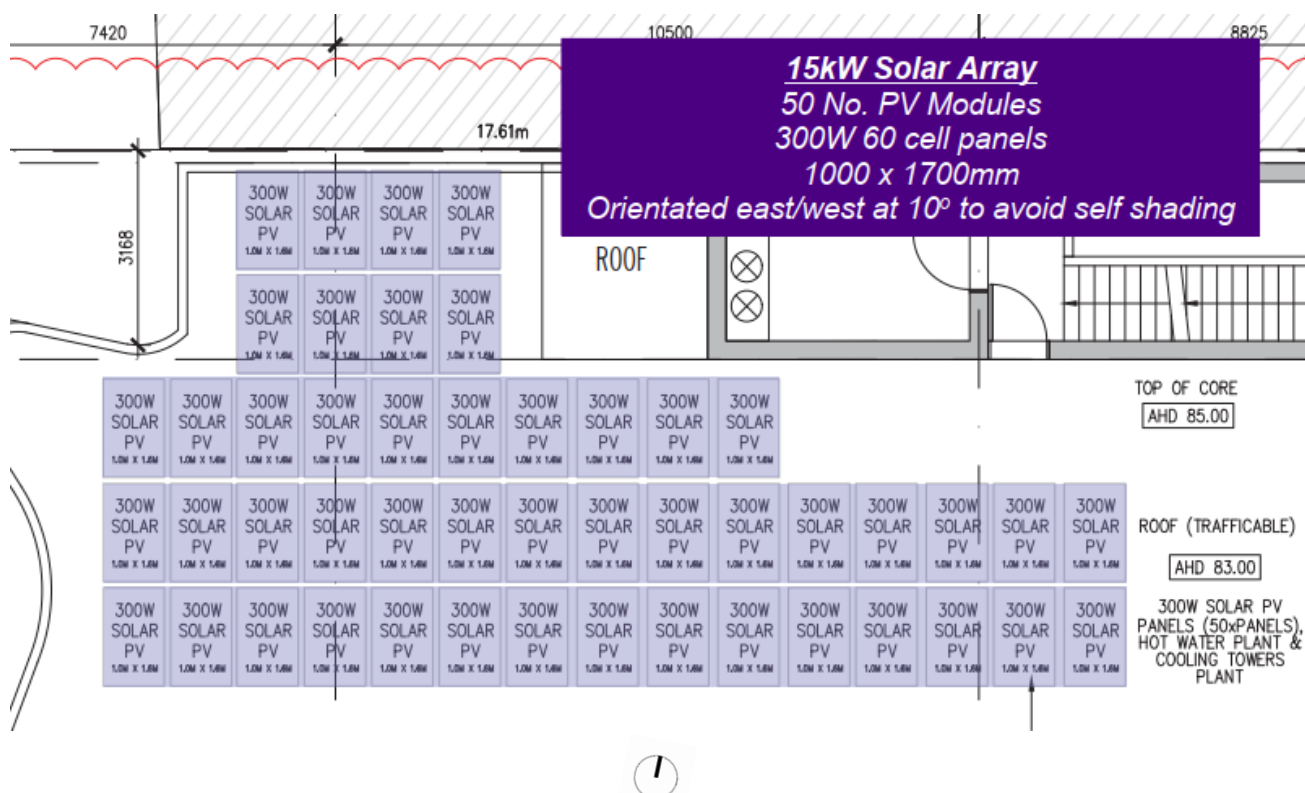


³ Rainwater Design & Installation Handbook, National Water Commission, 2008

Appendix 5: Solar Photovoltaic System

High-efficiency solar PV modules with a total capacity of 50 kWp will be installed at roof level as per the preliminary layout indicated below.

Each PV module will be oriented northwards 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

Total yield of this array will be approximately 21 MWh per annum equating to an estimated annual carbon emissions offset of 23.4 tonnes CO_{2-e} per annum.

28-32 Albert Road, South Melbourne

Input
Calculated
Step Control
Copied data

Photovoltaic System			Scope 2 and 3 10° tilt, East/West
Electricity gas emissions factor, NG [2]	kg_CO2-e/kWh	1.12	
PV Melbourne energy delivery	MWh/y per kWe	1.40	
PV capacity required	kWe	15.0	
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	50	
Expected electricity produced	kWh/day	57.5	
Annual expected electricity produced	MWh/yr	21.0	

Annual expected solar energy contribution	GJ/y	317.7	Scope 1 and 3
Natural gas use reduction from solar	GJ/y	423.5	
Greenhouse gas emissions factor, NG [1]	kg_CO2-e/GJ	55.43	
Greenhouse gas emissions reduction	tonnes_CO2-e/yr	23.48	

[1] National Greenhouse Accounts (NGA) Factors, August 2019, tables 2 and 41

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