

07.12.2023
File No. 1681A

Sustainable Management Plan

Coles
158-162 High Street, Belmont

Ark Resources

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright



Coles
158-162 High Street, Belmont

© Ark Resources 2023

The information contained in this document that has been produced by Ark Resources Pty Ltd is solely for the use of Ark Resources' Client for the purpose for which it has been prepared and Ark Resources undertakes no duty to or accepts any responsibility to any third party who may rely upon this document.

All material contained in this report is subject to Australian copyright law. Copyright in the document is owned by Ark Resources Pty Ltd. No material from this document may, in any form or by any means, be reproduced, stored in a retrieval system or transmitted, without prior written permission from Ark Resources.

Any enquiries regarding the use of this report should be directed to:

Ark Resources Pty Ltd
ABN 29 086 461 369
Suite 8, 10 Northumberland Street
South Melbourne VIC 3205 Australia
+61 3 9636 0280
info@arkresources.com.au
arkresources.com.au

Issue	Date	Prepared	Checked	Status
A	20.04.2023	MT/LD	MR	TP Draft
B	09.05.2023	MT/LD	MR	TP
c	07.12.2023	MT/LD	MR	TP RFI

Contents

1.0	Introduction	3
2.0	Site Description	5
3.0	Sustainable Design Principles	7
4.0	Performance Standards	8
5.0	Built Environment Sustainability Scorecard (BESS)	9
6.0	MUSIC Modelling	10
7.0	Key ESD Attributes of the Proposed Development	11
8.0	Implementation Plan	15
9.0	Conclusion	16

Appendices

Appendix A.	BESS Results	17
Appendix B.	MUSIC Modelling	25
Appendix C.	Solar Photovoltaics	34
Appendix D.	Site Management Plan	36

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

1.0 Introduction

Ark Resources has been engaged by Coles Group Property Developments to provide advice in relation to environmentally sustainable development outcomes from the proposed development at 158-162 High Street, Belmont.

The proposed commercial development at 158-162 High Street, Belmont has been designed to meet Clauses 15.01-2L (Environmentally Sustainable Development) and 53.18 (Stormwater Management) of the Greater Geelong Planning Scheme.

This report contains the following information:

- Environmentally sustainable design principles adopted to guide the preparation of the scheme for the development.
- Performance standards adopted for the development.
- Initiatives adopted to achieve the targets for key sustainable design issues.
- Implementation details

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

Architectural drawings prepared by Clarke Hopkins
Clarke set out below.

EXISTING CONDITIONS & DEMOLITION PLAN	TP001	-	08.11.2023
GROUND FLOOR PLAN	TP200	-	08.11.2023
BASEMENT FLOOR PLAN	TP201	-	08.11.2023
MEZZANINE FLOOR PLAN	TP202	-	08.11.2023
ROOF PLAN	TP203	-	08.11.2023
BUILDING ELEVATIONS (SHEET 1 OF 2)	TP400	-	08.11.2023
BUILDING ELEVATIONS (SHEET 2 OF 2)	TP401	-	08.11.2023
BUILDING SECTIONS (SHEET 1 OF 2)	TP450	-	08.11.2023
BUILDING SECTIONS (SHEET 2 OF 2)	TP451	-	08.11.2023
SHADOW DIAGRAMS	TP500		08.11.2023
SIGNAGE - FLOOR PLAN	TP920	-	08.11.2023
SIGNAGE - BUILDING ELEVATIONS	TP921	-	08.11.2023
SIGNAGE - DETAILS	TP922	-	08.11.2023
MATERIAL SCHEDULE		-	08.11.2023

**This copied document to be made available
for the sole purpose of enabling
its consideration and review as
part of a planning process under the
Planning and Environment Act 1987.
The document must not be used for any
purpose which may breach any
copyright**

2.0 Site Description

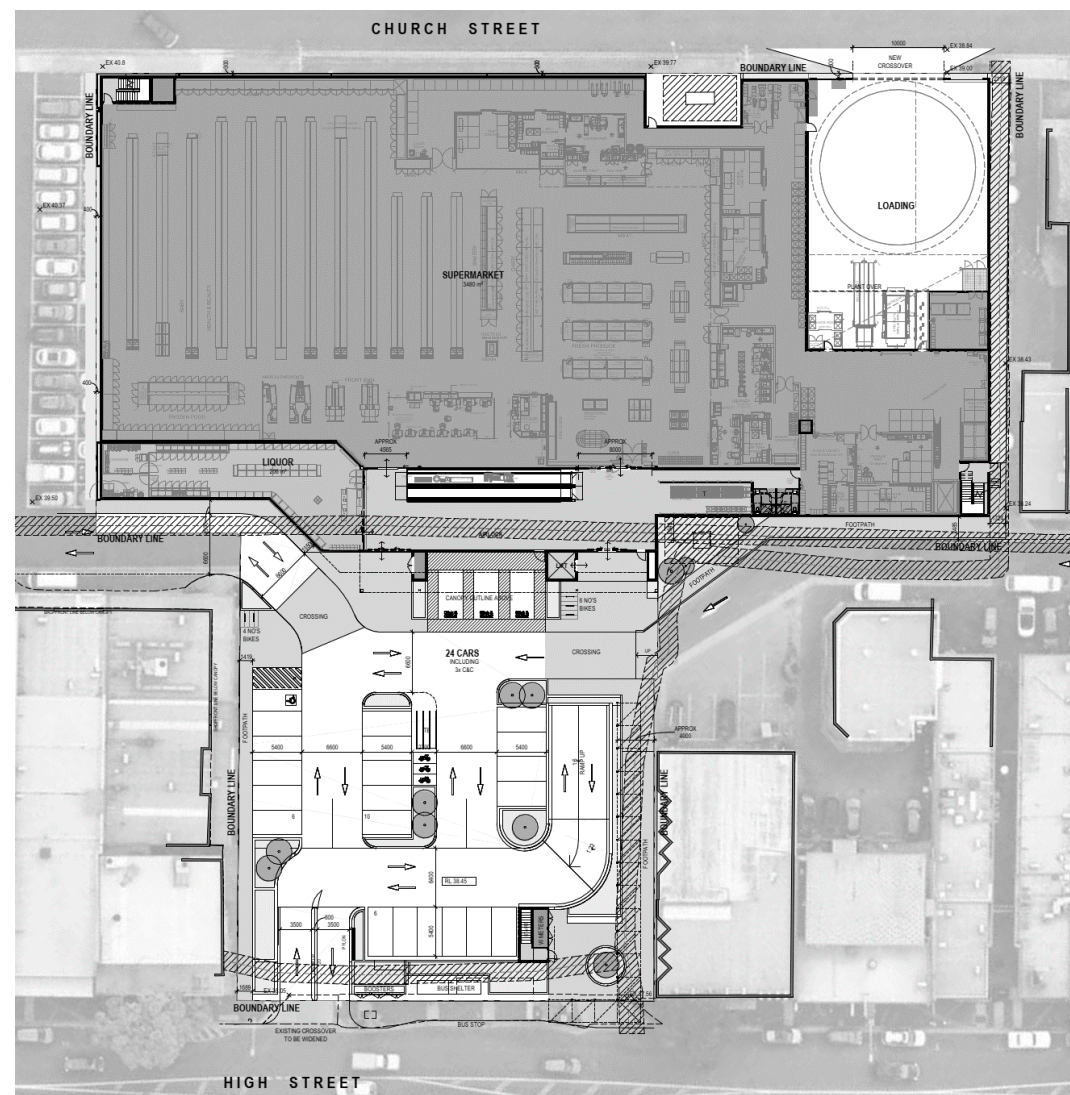
The building comprises the following uses:

- Supermarket and liquor store 3842m² (plus BOH)
- Located within City of Greater Geelong
- Site area 7634 m² (approximately)
- Surrounds commercial use

A plan of the proposed development is provided below.

An image of the site and the surrounding locale is provided on the following page.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright



This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright



3.0 Sustainable Design Principles

The Development Plan for the site and the design of the proposed buildings has been prepared with the objective of ensuring that the development achieves industry best practice benchmarks for sustainable design, exceeds the minimum energy efficiency standards in the Building Code and achieves the sustainable design objectives enunciated in the Geelong Planning Scheme.

Key environmentally sustainable design principles which have guided the development of the master plan are set out below:

- Minimise greenhouse emissions associated with building energy use.
- Minimise greenhouse emissions associated with energy systems and energy supply.
- Manage solar access to public open spaces to enhance amenity and function throughout the year.
- Achieve sustainable water cycle management through:
 - Efficient use of potable water supplies.
 - Recycling and re-use of alternative water sources.
 - Integration of stormwater treatment into the design of the car park.
- Optimise indoor environmental quality in all buildings and structures.
- Reduce the use of material resources during construction and throughout occupancy.
- Provide landscaping which enhances amenity and contributes to biodiversity.

The initiatives and performance targets selected to deliver the strategic objectives set out above are detailed in section 4 of this report.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

4.0 Performance Standards

The development will be designed to meet the following ESD performance standards:

- Retail buildings will exceed National Construction Code 2019 Section J requirements by a minimum of 10%.
- The project will meet the standard required for water, energy, stormwater and Indoor Environment Quality. The project meets the 50% BESS Score required to demonstrate Best Practice.
- Stormwater runoff from the development will meet the best practice performance objective set out in the Urban Stormwater Best Practice Environmental Management Guideline, CSIRO 1999.

**This copied document to be made available
for the sole purpose of enabling
its consideration and review as
part of a planning process under the
Planning and Environment Act 1987.
The document must not be used for any
purpose which may breach any
copyright**

5.0 Built Environment Sustainability Scorecard (BESS)

The BESS assessment tool for new projects was developed by the Council Alliance for a Sustainable Built Environment (CASBE).

The BESS tool provides an objective performance based analysis of nine key sustainable building design categories at the planning permit stage of the building lifecycle.

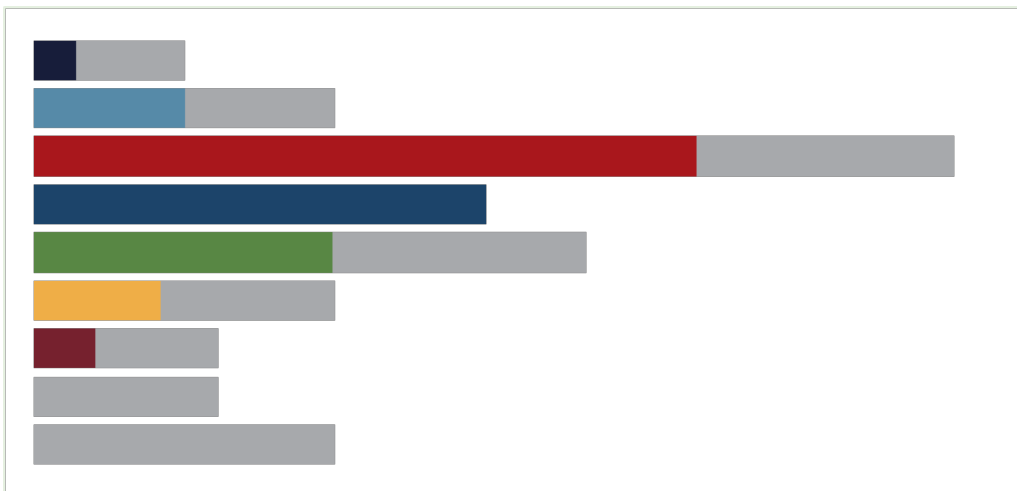
BESS is widely regarded as an appropriate sustainability assessment tool for both residential and non-residential development projects. Since its launch, 29 Victorian councils including Geelong have adopted BESS. The BESS tool builds on the NCC energy efficiency measures and provides a framework for assessing building performance outcomes in relation to:

- Management
- Water
- Energy
- Stormwater
- Indoor Environment Quality
- Transport
- Waste
- Urban Ecology
- Innovation

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

BESS scores for the development are summarised in the following table.

Element	Required Score	Project Score	Pass
Management	0%	28%	Yes
Water	50%	50%	Yes
Energy	50%	72%	Yes
Stormwater	100%	100%	Yes
Indoor Environment Quality	50%	54%	Yes
Transport	0%	42%	Yes
Waste	0%	33%	Yes
Urban Ecology	0%	0%	Yes
Innovation	0%	0%	Yes
Project BESS Score	50%	53%	Yes



Please refer Appendix A for the BESS Report.

6.0 MUSIC Modelling

The development will incorporate measures to meet the best practice performance objective set out in the Urban Stormwater Best Practice Environmental Management Guidelines, (CSIRO 1999) adopted by Melbourne Water.

In order to address water sensitive urban design principles, an integrated approach has been adopted to the management of water to:

- Encourage minimal water consumption and conserve potable water supplies.
- Ensure high quality urban stormwater discharges which maintain ecosystem health.
- Integrate stormwater management measures into the design of open spaces and streetscapes.

Initiatives that will be implemented to meet these objectives are summarised below.

The proposed development exceeds the pollutant load reduction targets set out in the Best Practice Environmental Management Guidelines (BPEMG)

Reduction in Total Suspended Solids (TSS) load:	Reduction in Total Phosphorus (TP) load:
96.8%	56.7%
Reduction in Total Nitrogen (TN) load:	Reduction in Gross Pollutants (GP) load:
51.1%	98.5%

The results indicate that the project meets the requirements of Planning Scheme Clause 58.13 as the post development stormwater peak discharge does not exceed the pre-development peak.

Refer to Appendix D for the MUSIC rating results, Appendix D.5 for rainwater harvesting and reliability results and Appendix E for the WSUD Maintenance Manual.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

7.0 Key ESD Attributes of the Proposed Development

This section provides an overview of the key ESD initiatives integrated into the proposed development and the performance standard attained.

7.1 Energy Efficient Building Design

The orientation and architectural form of buildings is a significant factor in determining the operating energy consumption and hence greenhouse emissions arising from the development throughout its life.

The objective of reducing lifecycle greenhouse emissions has been addressed during the design development process and has resulted in the following energy efficient architectural initiatives:

- Minimisation of western and northern glazing to mitigate unwanted solar heat gain to retail shops.
- High level glazing will be integrated into the entry façade to provide daylight to the mall to minimise the need for artificial lighting and improve the amenity of the space for shoppers.
- Green walls incorporated in the southern façade to improve the street level landscape.

7.2 Energy Efficient Building Systems Initiatives

The architectural initiatives set out above will be complemented by a package of energy efficient building services initiatives with the objective of reducing greenhouse emissions by 10% compared to a conventional retail development. The initiatives will be specified during design development following comprehensive performance based computer simulation including analysis of thermal, daylight, comfort, ventilation and energy consumption.

Energy efficient building services initiatives which will be adopted for the development are set out in the following table.

**This copied document to be made available
for the sole purpose of enabling
its consideration and review as
part of a planning process under the
Planning and Environment Act 1987.
The document must not be used for any
purpose which may breach any
copyright**

Issue	Initiative	Comments
Heating & Cooling	<ul style="list-style-type: none"> - Outside air mechanical ventilation rates in the Coles supermarket will be optimised to align with number of occupants. - Pre-conditioning of the outside air intake to improve efficiency of the air handing units in the Coles supermarket. - Recovery of waste heat from the refrigeration system to heat the building. - Variable speed drives will be specified on all primary ventilation fans. - Combined refrigeration and air conditioning plant to optimise efficiency and reduce overall plant capacity in the Coles supermarket. - Direct digital control (DDC) system for the Coles HVAC system. - Integrated exhaust systems used for the Bakery ovens and Deli ovens to reduce the exhaust air rate by more than 50% compared with conventional exhaust canopies (with corresponding reduction in the volume of unconditioned make-up air required). - Waste heat will be recovered from the Coles supermarket refrigeration plant and will be used to preheat domestic hot water and augment space heating in winter. 	<p>These initiatives ensure that all cost effective energy savings from mechanical system are captured.</p> <div style="border: 2px solid red; padding: 10px; text-align: center; color: red; font-weight: bold;"> <p>This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright</p> </div>
Refrigeration	Energy efficient refrigeration cabinets with high efficiency fans and high performance glazing to minimise heat transfer.	
Lighting	<p>The following energy efficient lighting systems will be installed throughout the development including:</p> <ul style="list-style-type: none"> - The maximum illumination power density of 14W/m² will be met in at least 90% of the total floor area - LED lighting where appropriate within the supermarket including in the Fresh Food area. - An automated lighting control system to retail areas. - Lighting to other areas to be LED type controlled according to daylight levels where appropriate - Infrequently used back of house zones will have lights controlled according to occupancy. - Street and car park lighting to be energy efficient LED type controlled with photo-switches. - All external illuminated signage to be efficient LED type. 	Best practice energy efficient lighting systems will be installed.
Renewable energy	To reduce ongoing greenhouse gas emissions and minimise operating costs, a 100kWp rooftop solar photovoltaic will be installed to displace grid electricity.	
Domestic Hot Water	Domestic hot water will be provided by heat pump electric hot water units.	
Carpark Ventilation	To reduce energy use and greenhouse emissions from the basement car park mechanical ventilation system, energy use will be minimised by the use of a variable speed fan motor and appropriate controls including CO monitoring.	

7.3 Stormwater Management

A rainwater harvesting system will be installed comprising:

- Rainwater harvesting from roof (approx. 1000m²):
- Total storage volume of 10kL rainwater tanks
- Re-use of captured water for flushing of all toilets and irrigation

In addition to the harvesting and re-use of rainwater, the following features will be incorporated into the proposed design to facilitate treatment of stormwater runoff:

- Landscape areas that promote infiltration and reduce runoff during storm events.
- An Ocean Protect Ocean Save gross pollutant trap (or equivalent primary treatment device) to capture generated onsite
- An Ocean Protect Jellyfish Filter system (or equivalent filtration device) for removing the remaining gross pollutants, nitrogen, phosphorous and suspended solids located near stormwater Legal Point of Discharge.

7.4 Water Conservation

Water efficient fittings and fixtures will be installed throughout the development to minimise wastage of potable water.

Water using fittings will meet the following performance standards based on the Commonwealth Government Water Efficiency Labelling and Standards Scheme (WELS):

- WELS 4 star toilets (4.5/3 litre flush)
- WELS 3 star shower (<6.5 litre/minute)
- WELS 5 star kitchen & cleaners sink taps and public toilet wash hand basins (5 litres/minute)
- WELS 6 star staff & drivers wash hand basin taps (4.5 litres/minute)
- WELS 5 star urinals for public toilets

7.5 Sustainable Transport

The following facilities will be provided within the development to facilitate access for alternative travel options other than conventional car travel.

- 7 bike racks provided in secure area for retail and supermarket staff, as well as shower and end of trip facilities
- Accessible bicycle racks located at the entrance to the shopping mall providing parking for 10 bikes for shoppers.
- Four car parking bays fitted with electric vehicle chargers within the basement car park.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

7.6 Materials and Waste Management

7.6.1 Environmentally Preferable Materials

The following environmentally preferable materials will be specified with the objective of reducing off-site environmental impacts and improving indoor environmental quality for staffs and customers:

- In situ and precast concrete mixes will incorporate industrial waste product to reduce embodied energy (subject to meeting structural requirements and project management constraints).
- Kingspan insulated roof panels will be specified for the supermarket roof thus avoiding the need for a suspended ceiling and reducing materials used in construction.
- All engineered wood products will be specified to have low formaldehyde emissions in accordance with the emission limits set out the Green Star Design & As Built v1.2 Credit 13.2, or alternative green product certification such as GECA or Green Tag.
- Low VOC paints will be specified for internal walls in accordance with the VOC limits set out in the Green Star Design & As Built v1.2 Credit 13.1, or alternative green product certification such as GECA or Green Tag.

7.6.2 Construction Waste Management

A target recycling rate of 80% of construction waste may be adopted for the construction phase of the development to minimise the volume of waste to landfill.

This will be achieved by the development of a comprehensive waste minimisation strategy including:

- Separation of all commercially viable recyclable waste streams.
- Training in waste minimisation for all site staff and contractors to form part of site induction training.
- Record keeping of landfill waste and recyclable stream volumes to track performance against the 80% recyclable target.
- Quarterly reporting of volumes and percentages for each waste stream.

A dedicated recycling contractor will be engaged to facilitate separation of commercially viable recyclable waste streams in accordance with the target adopted above.

7.6.3 Operational Waste Management

Operational waste management will be undertaken in accordance with Coles corporate waste minimisation strategy.

8.0 Implementation Plan

The ESD initiatives set out in this report will be coordinated by the Project Manager in conjunction with the following project design team members:

- - Architect
- - Thermal Performance Assessor
- - Building Services Consultant
- - Waste Management Consultant

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

An implementation schedule is set out in the following table.

ESD Initiative Implementation Schedule

#	Initiative	Requirement	Responsibility	Stage
	Coordination of Initiatives	Full implementation	Project Manager	All
1	Coordination of Initiatives	Full implementation.	Project Manager	All
2	Energy Management and Control	Specification of automated building management system	Building Services Engineer	Design Development
3	Heating & Cooling	Specification of energy efficient HVAC and refrigeration systems	Building Services Engineer	Design Development
4	Renewable Energy	Specification of 100kWp solar PV system	Building Services Engineer	Design Development
5	Lighting	Specification of nominated energy efficient lighting types and automated controls	Building Services Engineer	Design Development
6	Water Efficiency	Specify fixtures in accordance with nominated WELS star ratings	Architect	Design Development
7	Bicycle Facilities	Specify bike racks and end of trip facilities	Architect	Design Development
8	Operational Waste Management	Provide layout waste storage areas Specify bins and associated waste management equipment	Coles Brief	Design Development
9	Construction Waste Minimisation	Prepare construction waste minimisation plan	Builder	Construction
10	Environmentally Preferable Materials	Specify materials in accordance with nominated schedule	Architect	Design Development
11	Commissioning & Maintenance	Commission & tune all equipment in accordance with performance standards & targets	Builder	Construction/occupancy
12	Stormwater Management	Design and specify rainwater harvesting system including water tanks, toilet flushing and raingardens to meet MUSIC modelling specifications	Engineer	Design Development

9.0 Conclusion

The principles and initiatives presented in this report demonstrate that the proposed development of the Belmont Coles has been planned in accordance with best practice environmentally sustainable design principles.

This report contains commitments to implementing a range of sustainable building design initiatives which will ensure that the environmental footprint of the development will be reduced when compared to conventional retail developments.

In terms of performance outcomes, the analysis presented in this report confirms that the proposed development will exceed the standard of building envelope energy efficiency required to satisfy the Building Code of Australia.

The initiatives presented in this report demonstrate that sustainable design outcomes have been a consideration during the design and specification of the proposed Coles supermarket and retail development.

The initiatives and performance outcomes achieved are considered to be consistent with the sustainable design objectives of the Geelong Planning Scheme.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

Appendix A. BESS Results

BESS, 158-162 High St, Belmont VIC 3216, Australia 158-162 High St, Belmont 3...

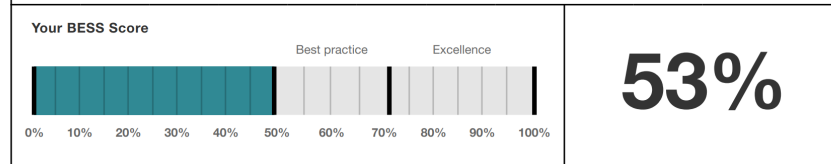
BESS Report

Built Environment Sustainability Scorecard



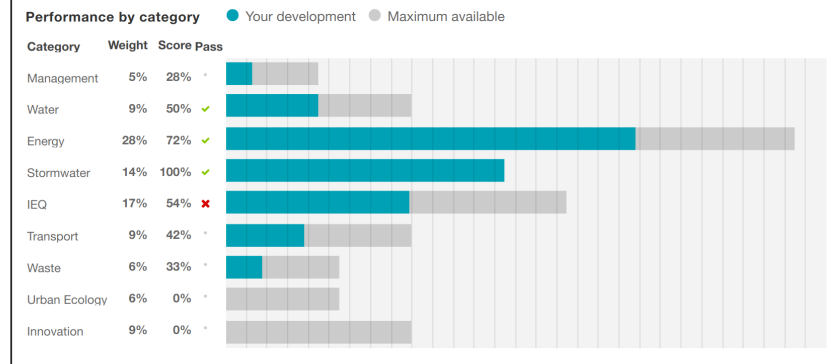
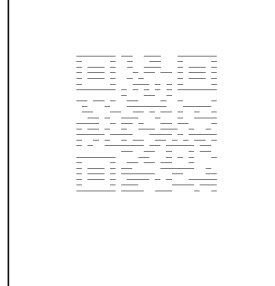
This BESS report outlines the sustainable design commitments of the proposed development at 158-162 High St Belmont Victoria 3216. The BESS report and accompanying documents and evidence are submitted in response to the requirement for a Sustainable Design Assessment or Sustainability Management Plan at Greater Geelong City Council.

Note that where a Sustainability Management Plan is required, the BESS report must be accompanied by a report that further demonstrates the development's potential to achieve the relevant environmental performance outcomes and documents the means by which the performance outcomes can be achieved.



Project details

Address	158-162 High St Belmont Victoria 3216
Project no	4695562F-R2
BESS Version	BESS-7
Site type	Non-residential development
Account	info@arkresources.com.au
Application no.	
Site area	7,634.00 m ²
Building floor area	3,482.00 m ²
Date	07 December 2023
Software version	1.8.0-B.405



The Built Environment Sustainability Scorecard is an initiative of the Council Alliance for a Sustainable Built Environment (CASBE). For more details see www.bess.net.au

Page 1 of 16

BESS, 158-162 High St, Belmont VIC 3216, Australia 158-162 High St, Belmont 3...

Buildings

Name	Height	Footprint	% of total footprint
B1	1	4,456 m ²	100%

Dwellings & Non Res Spaces

Non-Res Spaces

Name	Quantity	Area	Building	% of total area
Shop				
Retail	1	3,482 m ²	B1	100%
Total	1	3,482 m²	100%	

Supporting information

Floorplans & elevation notes

Credit	Requirement	Response	Status
Management 3.2	Annotation: Individual utility meters to be provided to all individual commercial tenancies		-
Energy 3.1	Carpark with natural ventilation or CO monitoring system		-
Energy 4.2	Location and size of solar photovoltaic system		-
Stormwater 1.1	Location of any stormwater management systems (rainwater tanks, raingardens, buffer strips)		-
Transport 1.5	Location of non-residential visitor bicycle parking spaces		-
Transport 2.1	Location of electric vehicle charging infrastructure		-
Waste 2.2	Location of recycling facilities		-

Supporting evidence

Credit	Requirement	Response	Status
Management 2.3a	Section J glazing assessment		-
Energy 1.1	Energy Report showing calculations of reference case and proposed buildings		-
Energy 3.1	Details of either the fully natural carpark ventilation or CO monitoring system proposed		-
Energy 3.7	Average lighting power density and lighting type(s) to be used		-
Energy 4.2	Specifications of the solar photovoltaic system(s)		-
Stormwater 1.1	STORM report or MUSIC model		-

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

The Built Environment Sustainability Scorecard is an initiative of the Council Alliance for a Sustainable Built Environment (CASBE). For more details see www.bess.net.au

Page 2 of 16

Credit summary

Management Overall contribution 4.5%

		28%
1.1 Pre-Application Meeting		0%
2.3 Thermal Performance Modelling - Non-Residential		50%
3.2 Metering - Non-Residential		100%
3.3 Metering - Common Areas		N/A ✦ Scoped Out
NA		
4.1 Building Users Guide		0%

Water Overall contribution 9.0%

		Minimum required 50%	50%	✔ Pass
1.1 Potable Water Use Reduction			60%	
3.1 Water Efficient Landscaping			N/A ✦ Scoped Out	
Irrigation connected				
4.1 Building Systems Water Use Reduction			0%	

Energy Overall contribution 27.5%

		Minimum required 50%	72%	✔ Pass
1.1 Thermal Performance Rating - Non-Residential			37%	
2.1 Greenhouse Gas Emissions			100%	
2.2 Peak Demand			100%	
2.3 Electricity Consumption			100%	
2.4 Gas Consumption			N/A ✦ Scoped Out	
No gas connection in use				
2.6 Electrification			100%	
3.1 Carpark Ventilation			100%	
3.2 Hot Water			100%	
3.7 Internal Lighting - Non-Residential			100%	
4.1 Combined Heat and Power (cogeneration / trigeneration)			N/A ✦ Scoped Out	
No cogeneration or trigeneration system in use.				
4.2 Renewable Energy Systems - Solar			100%	
4.4 Renewable Energy Systems - Other			0%	⊘ Disabled
No other (non-solar PV) renewable energy is in use.				

Stormwater Overall contribution 13.5%

		Minimum required 100%	100%	✔ Pass
1.1 Stormwater Treatment			100%	

IEQ Overall contribution 16.5%

		Minimum required 50%	54%	✔ Pass
1.4 Daylight Access - Non-Residential			N/A ✦ Scoped Out	
Requirement for daylight not appropriate in large scale supermarket				
2.3 Ventilation - Non-Residential			33%	✔ Achieved
3.4 Thermal comfort - Shading - Non-Residential			100%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential			0%	
4.1 Air Quality - Non-Residential			100%	

Transport Overall contribution 9.0%

		42%	
1.4 Bicycle Parking - Non-Residential		0%	
1.5 Bicycle Parking - Non-Residential Visitor		100%	
1.6 End of Trip Facilities - Non-Residential		0%	⊘ Disabled
Credit 1.4 must be complete first.			
2.1 Electric Vehicle Infrastructure		100%	
2.3 Motorbikes / Mopeds		0%	

Waste Overall contribution 5.5%

		33%
1.1 - Construction Waste - Building Re-Use		0%
2.1 - Operational Waste - Food & Garden Waste		0%
2.2 - Operational Waste - Convenience of Recycling		100%

Urban Ecology Overall contribution 5.5%

		0%
1.1 Communal Spaces		0%
2.1 Vegetation		0%
2.2 Green Roofs		0%
2.3 Green Walls and Facades		0%
3.2 Food Production - Non-Residential		0%

This copied document to be made available
 for the sole purpose of enabling
 its consideration and review as
 part of a planning process under the
Planning and Environment Act 1987.
 The document must not be used for any
 purpose which may breach any
 copyright

Innovation Overall contribution 9.0%

	0%
1.1 Innovation	0% <input type="checkbox"/> Disabled
A minimum project score of 50% is required before an Innovation Credit can be used.	

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

Credit breakdown

Management Overall contribution 1%

1.1 Pre-Application Meeting		0%
Score Contribution	This credit contributes 42.9% towards the category score.	
Criteria	Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?	
Question	Criteria Achieved ?	
Project	-	
2.3 Thermal Performance Modelling - Non-Residential		50%
Score Contribution	This credit contributes 28.6% towards the category score.	
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2019 Section J1.5?	
Question	Criteria Achieved ?	
Shop	Yes	
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2019 Section J (Energy Efficiency), NABERS or Green Star?	
Question	Criteria Achieved ?	
Shop	-	
3.2 Metering - Non-Residential		100%
Score Contribution	This credit contributes 14.3% towards the category score.	
Criteria	Have utility meters been provided for all individual commercial tenants?	
Question	Criteria Achieved ?	
Shop	Yes	
3.3 Metering - Common Areas		N/A <input type="checkbox"/> Scoped Out
This credit was scoped out	NA	
4.1 Building Users Guide		0%
Score Contribution	This credit contributes 14.3% towards the category score.	
Criteria	Will a building users guide be produced and issued to occupants?	
Question	Criteria Achieved ?	
Project	-	

Water Overall contribution 4% Minimum required 50%

Water Approach	
What approach do you want to use for Water?:	Use the built in calculation tools
Project Water Profile Question	
Do you have a reticulated third pipe or an on-site water recycling system?:	No
Are you installing a swimming pool?:	No
Are you installing a rainwater tank?:	Yes
Water fixtures, fittings and connections	
Showerhead:	4 Star WELS (>= 6.0 but <= 7.5)
Bath:	Scope out
Kitchen Taps:	>= 5 Star WELS rating
Bathroom Taps:	>= 6 Star WELS rating
Dishwashers:	Scope out
WC:	>= 4 Star WELS rating
Urinals:	>= 4 Star WELS rating
Washing Machine Water Efficiency:	Scope out
Which non-potable water source is the dwelling/space connected to?:	RWT
Non-potable water source connected to Toilets:	Yes
Non-potable water source connected to Laundry (washing machine):	No
Non-potable water source connected to Hot Water System:	No
Rainwater Tank	
What is the total roof area connected to the rainwater tank?: RWT	1,000 m ²
Tank Size: RWT	10,000 Litres
Irrigation area connected to tank: RWT	156 m ²
Is connected irrigation area a water efficient garden?: RWT	Yes
Other external water demand connected to tank?: RWT	-

1.1 Potable Water Use Reduction		60%
Score Contribution	This credit contributes 83.3% towards the category score.	
Criteria	What is the reduction in total potable water use due to efficient fixtures, appliances, rainwater use and recycled water use? To achieve points in this credit there must be >25% potable water reduction.	
Output	Reference	
Project	6143 kL	
Output	Proposed (excluding rainwater and recycled water use)	
Project	4151 kL	
Output	Proposed (including rainwater and recycled water use)	
Project	3678 kL	
Output	% Reduction in Potable Water Consumption	
Project	40 %	
Output	% of connected demand met by rainwater	
Project	44 %	
Output	How often does the tank overflow?	
Project	Never / Rarely	
Output	Opportunity for additional rainwater connection	
Project	929 kL	
3.1 Water Efficient Landscaping		N/A ✦ Scoped Out
This credit was scoped out	Irrigation connected	
4.1 Building Systems Water Use Reduction		0%
Score Contribution	This credit contributes 16.7% towards the category score.	
Criteria	Where applicable, have measures been taken to reduce potable water consumption by >80% in the buildings air-conditioning chillers and when testing fire safety systems?	
Question	Criteria Achieved ?	
Project	No	

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

Energy Overall contribution 20% Minimum required 50%

Use the BESS Deem to Satisfy (DtS) method for Energy?:	Yes
Do all exposed floors and ceilings (forming part of the envelope) demonstrate a minimum 10% improvement in required NCC2019 insulation levels (total R-value upwards and downwards)?:	Yes
Does all wall and glazing demonstrate meeting the required NCC2019 facade calculator (or better than the total allowance)?:	Yes
Are heating and cooling systems within one Star of the most efficient equivalent capacity unit available, or Coefficient of Performance (CoP) & Energy Efficiency Ratios (EER) not less than 85% of the CoP & EER of the most efficient equivalent capacity unit available?:	Yes
Are water heating systems within one star of the best available, or 85% or better than the most efficient equivalent capacity unit?:	Yes
Non-Residential Building Energy Profile	
Heating, Cooling & Comfort Ventilation - Electricity Reference fabric & services:	-
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and reference services:	-
Heating, Cooling & Comfort Ventilation - Electricity Proposed fabric & services:	-
Heating - Wood - reference fabric and services:	-
Heating - Wood - proposed fabric and reference services:	-
Heating - Wood - proposed fabric and services:	-
Hot Water - Electricity - Reference:	-
Hot Water - Electricity - Proposed:	-
Lighting - Reference:	-
Lighting - Proposed:	-
Peak Thermal Cooling Load - Reference:	-
Peak Thermal Cooling Load - Proposed:	-
Solar Photovoltaic system	
System Size (lesser of inverter and panel capacity): PV	100 kW peak
Orientation (which way is the system facing)?: PV	North-West
Inclination (angle from horizontal): PV	13.0 Angle (degrees)
1.1 Thermal Performance Rating - Non-Residential	37%
Score Contribution	This credit contributes 36.4% towards the category score.
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC 2019 Section J)?
2.1 Greenhouse Gas Emissions	100%
Score Contribution	This credit contributes 9.1% towards the category score.
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?

2.2 Peak Demand	100%
Score Contribution	This credit contributes 4.5% towards the category score.
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?
2.3 Electricity Consumption	100%
Score Contribution	This credit contributes 9.1% towards the category score.
Criteria	What is the % reduction in annual electricity consumption against the benchmark?
2.4 Gas Consumption	N/A ✦ Scoped Out
This credit was scoped out	No gas connection in use
2.6 Electrification	100%
Score Contribution	This credit contributes 9.1% towards the category score.
Criteria	Is the development all-electric?
Question	Criteria Achieved?
Project	Yes
3.1 Carpark Ventilation	100%
Score Contribution	This credit contributes 9.1% towards the category score.
Criteria	If you have an enclosed carpark, is it: (a) fully naturally ventilated (no mechanical ventilation system) or (b) 40 car spaces or less with Carbon Monoxide monitoring to control the operation and speed of the ventilation fans?
Question	Criteria Achieved ?
Project	Yes
3.2 Hot Water	100%
Score Contribution	This credit contributes 4.5% towards the category score.
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?
3.7 Internal Lighting - Non-Residential	100%
Score Contribution	This credit contributes 9.1% towards the category score.
Criteria	Does the maximum illumination power density (W/m2) in at least 90% of the area of the relevant building class meet the requirements in Table J6.2a of the NCC 2019 Vol 1?
Question	Criteria Achieved ?
Shop	Yes
4.1 Combined Heat and Power (cogeneration / trigeneration)	N/A ✦ Scoped Out
This credit was scoped out	No cogeneration or trigeneration system in use.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

4.2 Renewable Energy Systems - Solar	100%
Score Contribution	This credit contributes 4.5% towards the category score.
Criteria	What % of the estimated energy consumption of the building class it supplies does the solar power system provide?
Output	Solar Power - Energy Generation per year
Shop	120,402 kWh
Output	% of Building's Energy
Shop	30 %
4.4 Renewable Energy Systems - Other	0% Disabled
This credit is disabled	No other (non-solar PV) renewable energy is in use.

Stormwater Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using?:	MUSIC or other modelling software
1.1 Stormwater Treatment	100%
Score Contribution	This credit contributes 100.0% towards the category score.
Criteria	Has best practice stormwater management been demonstrated?
Question	Flow (ML/year)
Project	4.5 % Reduction
Question	Total Suspended Solids (kg/year)
Project	96.8 % Reduction
Question	Total Phosphorus (kg/year)
Project	56.7 % Reduction
Question	Total Nitrogen (kg/year)
Project	51.1 % Reduction

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

IEQ Overall contribution 9% Minimum required 50%

1.4 Daylight Access - Non-Residential	N/A	Scoped Out
This credit was scoped out	Requirement for daylight not appropriate in large scale supermarket	
2.3 Ventilation - Non-Residential	33%	Achieved
Score Contribution	This credit contributes 54.5% towards the category score.	
Criteria	What % of the regular use areas are effectively naturally ventilated?	
Question	Percentage Achieved?	
Shop	-	
Criteria	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2:2012?	
Question	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668:2012?	
Shop	50 %	
Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?	
Question	Value	
Shop	-	
3.4 Thermal comfort - Shading - Non-Residential	100%	
Score Contribution	This credit contributes 27.3% towards the category score.	
Criteria	What percentage of east, north and west glazing to regular use areas is effectively shaded?	
Question	Percentage Achieved?	
Shop	100 %	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential	0%	
Score Contribution	This credit contributes 9.1% towards the category score.	
Criteria	What percentage of regular use areas in tenancies have ceiling fans?	
Question	Percentage Achieved?	
Shop	-	
4.1 Air Quality - Non-Residential	100%	
Score Contribution	This credit contributes 9.1% towards the category score.	
Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?	
Question	Criteria Achieved ?	
Shop	Yes	
Criteria	Does all carpet meet the maximum total indoor pollutant emission limits?	
Question	Criteria Achieved ?	
Shop	No carpet	

Criteria	Does all engineered wood meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Shop	Yes

Transport Overall contribution 4%

1.4 Bicycle Parking - Non-Residential	0%
Score Contribution	This credit contributes 28.6% towards the category score.
Criteria	Have the planning scheme requirements for employee bicycle parking been exceeded by at least 50% (or a minimum of 2 where there is no planning scheme requirement)?
Question	Criteria Achieved ?
Shop	No
Question	Bicycle Spaces Provided ?
Shop	7
1.5 Bicycle Parking - Non-Residential Visitor	100%
Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Have the planning scheme requirements for visitor bicycle parking been exceeded by at least 50% (or a minimum of 1 where there is no planning scheme requirement)?
Question	Criteria Achieved ?
Shop	Yes
Question	Bicycle Spaces Provided ?
Shop	10
1.6 End of Trip Facilities - Non-Residential	0% <input type="checkbox"/> Disabled
This credit is disabled	Credit 1.4 must be complete first.
2.1 Electric Vehicle Infrastructure	100%
Score Contribution	This credit contributes 28.6% towards the category score.
Criteria	Are facilities provided for the charging of electric vehicles?
Question	Criteria Achieved ?
Project	Yes
2.3 Motorbikes / Mopeds	0%
Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Are a minimum of 5% of vehicle parking spaces designed and labelled for motorbikes (must be at least 5 motorbike spaces)?
Question	Criteria Achieved ?
Project	-

Waste Overall contribution 2%

1.1 - Construction Waste - Building Re-Use	0%
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used?
Question	Criteria Achieved ?
Project	-
2.1 - Operational Waste - Food & Garden Waste	0%
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	Are facilities provided for on-site management of food and garden waste?
Question	Criteria Achieved ?
Project	-
2.2 - Operational Waste - Convenience of Recycling	100%
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	Are the recycling facilities at least as convenient for occupants as facilities for general waste?
Question	Criteria Achieved ?
Project	Yes

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

Urban Ecology Overall contribution 0%

1.1 Communal Spaces		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Is there at least the following amount of common space measured in square meters : * 1m ² for each of the first 50 occupants * Additional 0.5m ² for each occupant between 51 and 250 * Additional 0.25m ² for each occupant above 251?	
Question	Common space provided	
Shop	-	
Output	Minimum Common Space Required	
Shop	224 m ²	
2.1 Vegetation		0%
Score Contribution	This credit contributes 50.0% towards the category score.	
Criteria	How much of the site is covered with vegetation, expressed as a percentage of the total site area?	
Question	Percentage Achieved ?	
Project	-	
2.2 Green Roofs		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Does the development incorporate a green roof?	
Question	Criteria Achieved ?	
Project	-	
2.3 Green Walls and Facades		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Does the development incorporate a green wall or green façade?	
Question	Criteria Achieved ?	
Project	-	
3.2 Food Production - Non-Residential		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	What area of space per occupant is dedicated to food production?	
Question	Food Production Area	
Shop	-	
Output	Min Food Production Area	
Shop	88 m ²	

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

Innovation Overall contribution 0%

1.1 Innovation		0%	⊘ Disabled
This credit is disabled	A minimum project score of 50% is required before an Innovation Credit can be used.		

Appendix B. NCC Section J1.5 Glazing Calculator

A preliminary NCC J1.5 façade calculator has been completed demonstrating that the project will meet NCC standards. Detailed JV3 modelling will be undertaken during design development.

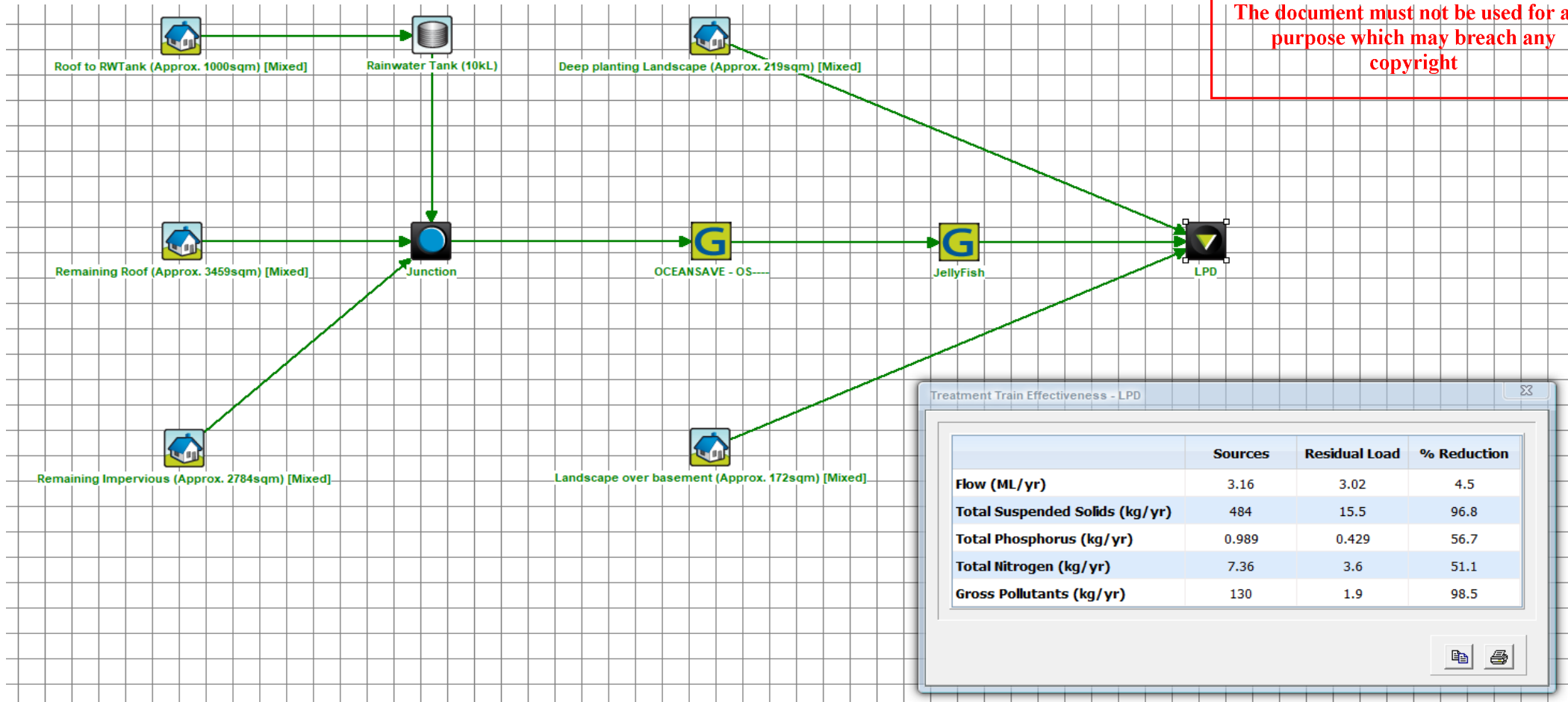
NCC 2019 Wall-Glazing Calculator v3.0											
Wall and glazing energy efficiency in Class 2-9 buildings - Method 2 of Specification J1.5a, NCC 2019											
Building name and description					Classification			Climate Zone			
Coles Belmont					Other			6			
Calculated Area-Weighted U-Value		0.73		Calculated Representative Air-Conditioning Energy Value		0.0		Allowable Representative Air-Conditioning Energy Value		0.0	
Allowable Area-Weighted U-Value		2.00		Building total U-Value allowance met		37%		Building total SHGC allowance met		-	
Check Values		Wall Element Requirements		Display Glazing Element Requirements		Met		Met		Met	
Visible											
Use of this calculator does not guarantee compliance with the NCC. The disclaimer and a version update check are available at the bottom of the page.											
Element Description					U-Value		SHGC and Shading				
ID	Description (optional)	Element Type	Facing Sector	Area (m ²)	U-Value	U-Value Element share of allowance used	SHGC	Glazing Height (m)	Shading Height (m)	Shading Projection (m)	SHGC Element share of allowance used
1		Wall	North	210.78	0.71	12% of building total					Not counted
2		Wall	East	576.56	0.71	32% of building total					Not counted
3		Wall	South	579.08	0.71	32% of building total					Not counted
4		Wall	West	370.66	0.71	21% of building total					Not counted
1		Wall	Internal	0.00		0% of building total					Not counted
2		Glazing	East	6.38	5.80	3% of building total	0.81	1.45	1.45	0.45	0% of building total
3		Display Glazing	North	0.00	5.80	Not counted	0.81	1.45	1.45	0.45	Not counted
4		Display Glazing	East	153.78	5.80	Not counted	0.81				Not counted
5		Display Glazing	South	27.36	5.80	Not counted	0.81				Not counted
6		Display Glazing	West	13.64	5.80	Not counted	0.81				Not counted
7						Not counted					Not counted
Disclaimer:											
This calculator has been developed to assist in developing a better understanding of the glazing energy efficiency parameters of NCC 2019. While the author believes that the calculator, if used correctly, is likely to produce accurate results, it is provided "as is" and without any representation or warranty of any kind, including that it is fit for any purpose or of merchantable quality, or functions as intended or at all. Your use of this calculator is entirely at your own risk and the author accepts no liability of any kind.											
Made by Alex Zeller											
Email alex.wallglazingcalculator@gmail.com with any suggestions for improvement										Check for version update	

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

Appendix C. MUSIC Modelling

C.1 MUSIC Schematic

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright



Note that biological treatment is not feasible for this project as the basement extends to the boundaries and raingardens over basements can be a flood risk during periods of extended rainfall.

C.3 Site Catchment and Permeability



This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

C.4 MUSIC Modelling Assumptions and Inputs

Area Name	Area [m ²]
Roof Area to Rainwater Tank	1,000
Remaining Roof Areas to primary/secondary treatment	3,459
Deep planting Landscape Areas	219
Landscaping over structure	172
Remaining Area	2,784
Total Site Area	7,634

Treatment Devices Features	
RWT	10 kL
Total RWT Capacity	0 kL
Est. daily water demand for TF	0.212 kL/day
All toilets throughout development	
Est. annual demand for irrigation	99 kL/yr
**Primary Treatment System (GPT)	Ocean Protect Ocean Save (or equivalent)
***Secondary/Tertiary Treatment System	Ocean Protect Jellyfish Filter system (or equivalent)

NOTES:	
**Nutrient reduction (Phosphorous and Nitrogen) not attributed to GPT as per Melbourne Water MUSIC guidelines.	
*** Sizing to be further specified during Detailed Design.	

Acronyms

RWT: Rain Water Tank

TF: Toilet Flushing

GPT: Gross Pollutant Trap

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

Rainfall data	
Rainfall Range & Station Name	G - Geelong North
10 Year Period	G - 1971-1980
Mean annual rainfall	G - 526mm
Evapotranspiration	G - 1217
Time step	6 minutes
Estimation method	Stochastically generated

Soil properties - Geelong	
Soil store capacity	120mm
Field capacity	50mm

Oceansave GPT Pollutant Removal Rates	
Total Suspended Solids	70%
Total Phosphorous	0%
Total Nitrogen	0%
Gross Pollutants	98%
Validation report	CRC for Catchment Hydrology

Jellyfish Pollutant Removal Rates	
Total Suspended Solids	93%
Total Phosphorous	57%
Total Nitrogen	50%
Gross Pollutants	99%
Validation report	NJCAT Technology Verification

C.5 MUSIC Results

Pollutant	MUSIC Model Results	Melbourne Water Targets
Reduction in Total Suspended Solids (TSS)	96.8%	80.0%
Reduction in Total Phosphorus (TP)	56.7%	45.0%
Reduction in Total Nitrogen (TN)	51.1%	45.0%
Reduction in Total Gross Pollutants	98.5%	70.0%
<i>Compliance with Melbourne Water targets</i>	YES	

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

C.6 Rainwater Harvesting and Tank Reliability

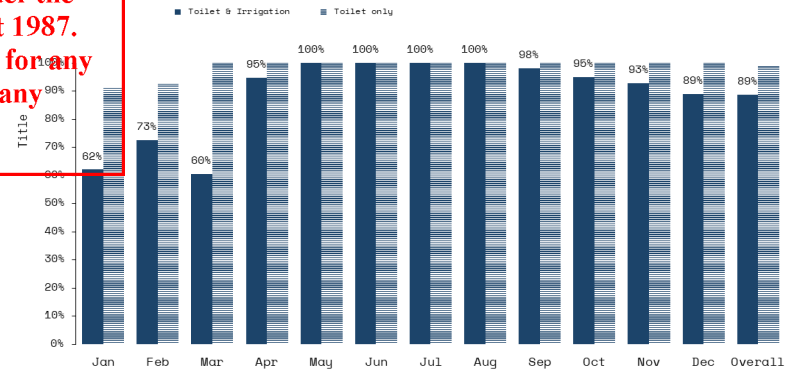
This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

Property: Coles, 158-162 High Street, Belmont
Version: 1.0

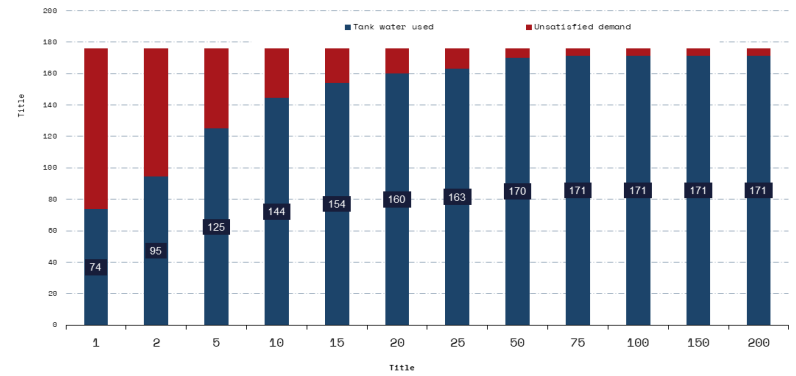
Category	Item	Value	Notes
Commercial	Floor Area - NLA (m ²)	4000	
	PPL (M / F)	20 / 20	
	Flush/Person/Day (M - Urinal)	2	
	Flush/Person/Day (M / F - Toilet)	0.3 / 2.3	
	Litres/Flush (Urinal / WC)	1 / 3.3	
Residential	Total Daily usage (litres)	212	
	PPL	0	
	Flush/Person/Day	5	
	Litres/Flush	4	
	Total Daily usage (litres)	0	
Development	Total Daily usage (litres)	212	
	Roof area (m ²)	1000	
	Collection Evaporation	5%	Recalc, update photos, table and graphs
	Tank Capacity (litres)	10000	
	Irrigation Area (m ²)	266	
T'off if Total Rain (mm) in the last 5 days		10	5 days

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1 /m2	10	10	10	5	5	5	5	5	5	5	10	10
S												
M		y										
T						y						
W							y					
Th								y				
Fr									y			

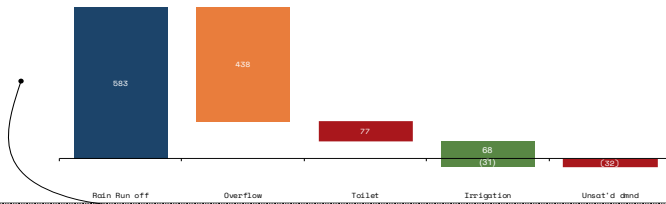
Graph 2 - Reliability of supply from tank (average across 12 years)



Graph 3 - Tank water used (per year) V Tank size Kls per year



System components (kls per year)



System components (kls per year) based on 12 years of actual historical daily rainfall

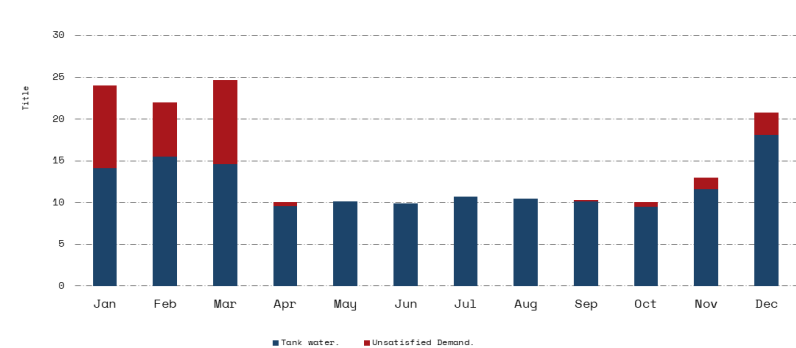
Component	12 years of Averages (k l)												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Rain Run off	39	41	36	61	49	50	45	51	49	45	63	54	583
Overflow	(25)	(25)	(21)	(47)	(38)	(42)	(33)	(40)	(39)	(35)	(52)	(40)	(438)
Rain Water saved	14	15	15	13	11	8	12	10	9	10	11	16	145
Toilet	(7)	(6)	(7)	(6)	(7)	(6)	(7)	(6)	(6)	(7)	(6)	(7)	(77)
(Shortfall)/Surplus before Irrigation	8	9	9	7	4	2	5	4	3	4	5	8	68
Irrigation	(17)	(16)	(18)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(7)	(14)	(99.0)
Unsatisfied Demand	(10)	(7)	(10)	3	1	(1)	(0)	(1)	(0)	(2)	(6)	(6)	(31)

Component	Actual Years (k l)												Total
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Rain Run off	476	741	736	598	644	450	463	641	593	531	397	724	6,994
Overflow	(322)	(600)	(587)	(439)	(510)	(314)	(304)	(488)	(427)	(379)	(265)	(579)	(8,254)
Rain Water saved	134	142	149	158	134	136	159	152	146	152	132	142	1,740
Toilet	(77)	(77)	(77)	(77)	(77)	(77)	(77)	(77)	(77)	(77)	(77)	(77)	(827)
(Shortfall)/Surplus before Irrigation	57	64	72	81	57	59	82	75	69	75	55	68	813
Irrigation	(109)	(90)	(92)	(87)	(96)	(104)	(95)	(96)	(96)	(106)	(120)	(83)	(1,188)
Unsatisfied Demand	(82)	(25)	(21)	(16)	(38)	(44)	(18)	(20)	(27)	(32)	(68)	(19)	(376)

Reliability of supply (daily demand met) - Tank size what ifs

Tank	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Overall
1k	34%	35%	33%	58%	72%	69%	74%	77%	65%	64%	52%	50%	57%
2k	37%	40%	37%	66%	84%	84%	87%	87%	76%	76%	59%	55%	66%
5k	60%	57%	51%	86%	98%	100%	98%	99%	92%	90%	75%	77%	81%
10k	73%	73%	69%	93%	100%	100%	100%	100%	93%	93%	89%	89%	89%
20k	80%	83%	78%	97%	100%	100%	100%	100%	100%	100%	100%	98%	95%
50k	92%	92%	93%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
100k	92%	92%	93%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99%
200k	92%	92%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99%

Graph 4 - Tank water used v unsatisfied demand by month (kls per month)



C.7 WSUD Maintenance Manual

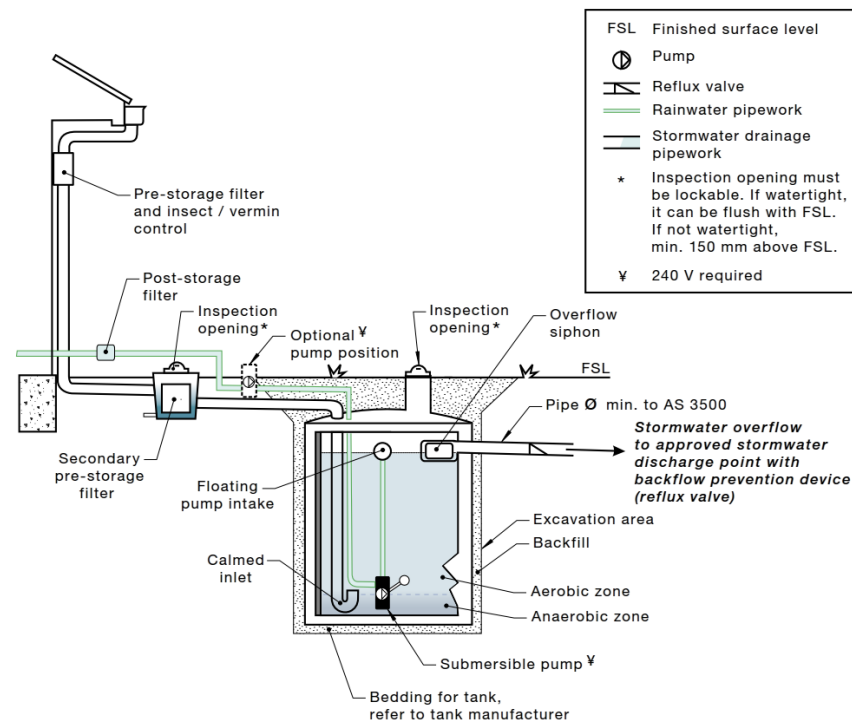
Once installed, a systematic maintenance program will be implemented by the owner's corporation maintenance contractor to ensure the rainwater harvesting system operates as designed and water quality is maintained.

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 or as per manufacturers guidelines.

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 Commission¹. A schematic diagram of the rainwater tank installation is provided below.



This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

Rainwater Tank Element	Inspection Item	Y/N	Likely Maintenance Task
Roof gutters and downpipes	Is there leaf litter or debris in the gutters?		Remove by hand and dispose responsibly
First flush diverter	Is there anything blocking the first flush diverter (Leaves etc.)?		Remove by hand and dispose responsibly
Potable mains back up device	Is the potable mains back up switch operating correctly?		Repair or replace device. Consider a manual switching device.
Mesh cover	Has the mesh cover deteriorated or have any holes in it?		Replace mesh cover.
Tank volume	Is there large amounts of sediment or debris sitting in the bottom of the tank, reducing the volume available in the tank to store water?		Remove sediment and dispose responsibly.
Pump	Is the pump working effectively? Have you heard it on a regular basis?		Check the potable mains back up is not permanently on. Repair or replace pump.
Pipes and taps	Are pipes and taps leaking?		Repair as needed.
Overflow	Is the overflow clear and connected to the storm water network?		Remove blockages and/or restore connections to stormwater network.

Maintenance Frequency												
	J	F	M	A	M	J	J	A	S	O	N	D
All tasks	X			X			X			X		

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

Appendix D. Solar Photovoltaics

During the construction phase, high-efficiency solar PV modules with a total capacity of 100kWp will be installed at roof level as per the preliminary layout indicated below.

PV modules will be mounted flush to roof sheeting and comprise modules of at least 400Wp capacity. -

Total yield of this array will be approximately 130 MWh per annum equating to an estimated annual carbon emissions offset of 119 tonnes CO₂-e per annum.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

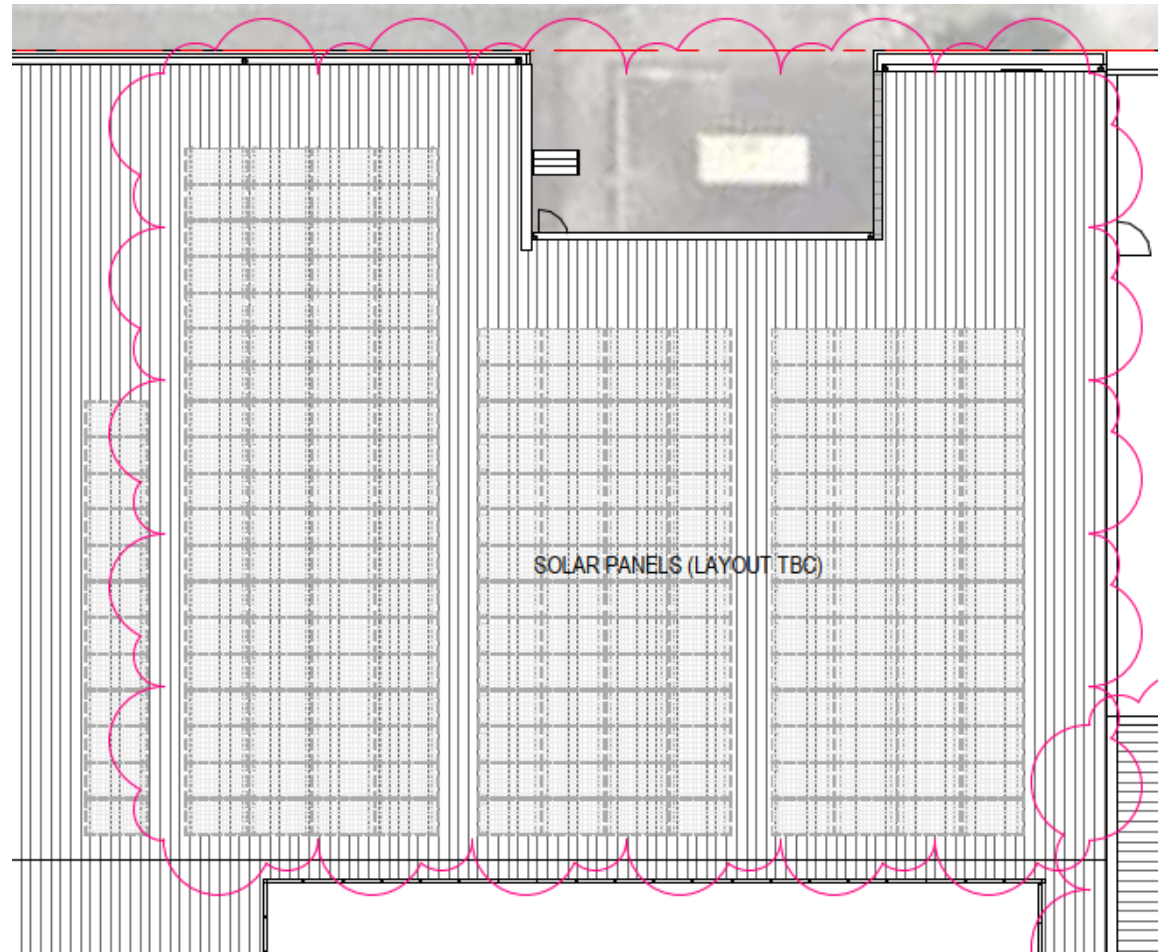


Figure 1 Indicative Solar Photovoltaic array layout

Northwest facing array output

RESULTS

 Print Results

130,399 kWh/Year*

Month	Solar Radiation (kWh / m ² / day)	AC Energy (kWh)
January	7.09	16,612
February	6.41	13,763
March	5.01	11,944
April	4.12	9,689
May	2.55	6,304
June	2.43	5,863
July	2.33	5,829
August	3.13	7,715
September	4.30	10,275
October	5.48	13,279
November	5.85	13,633
December	6.56	15,493
Annual	4.61	130,399

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

Appendix E. Site Management Plan

During the construction phase, the key pollutants at risk of entering the stormwater system include:

- Sediments (soil, sand, gravel and concrete washings); and
- Litter, debris etc.

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

In order to mitigate the impacts of the above pollutants on the stormwater system, the following stormwater management strategies will be implemented during the construction phase as appropriate:

- Installation of 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, litter bins with a lid 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 by the head contractor/ builder to make personnel aware of stormwater management measures in place
- Employ suitable 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.
- 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.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

Appendix F. RFI Response

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any

copyright

BESS Section	Comments	Actions
1. Management		
Thermal Performance Rating – Non-Residential	National Construction Code façade calculator is not visible in the submitted ESD report, although the energy section was completed on the basis that the buildings comply with the wall-glazing requirement of the National Construction Code 2019 Section J. Preliminary façade calculator should be included in the submitted ESD report, and detailed NCC section J report should be provided prior construction.	A preliminary NCC J1.5 Façade calculator has been provided in Appendix B. A detailed JV3 assessment will be undertaken during design development.
2. Water		
4.1 Building Systems Water Use Reduction	Points are allocated by the water calculator based upon an estimated reduction in potable (mains) water consumption due to the recycling of water used for fire testing and building systems such as evaporative cooling or air conditioning chillers. Estimated reductions are to be at least 80%.	This credit has been removed from BESS.
3. Energy		
3.1 Internal Lighting – Non-Residential	The Internal Lighting – Non-Residential credit has been claimed in BESS. The Applicant needs to clearly annotate on the plans with a note to say what will be the maximum illumination power density of this development.	The SMP has been updated to include the maximum power density applicable to this development (p.12).
4. IEQ		
3.4 – Thermal Comfort –shading- non-Residential	Credits have been claimed in BESS for IEQ 3.4 – Thermal Comfort shading-non-Residential, but this is not visible in the plans. It needs to be clearly stated on the plans that external shading will be used for all east, west and north facing glazing of the office. This note should be littered throughout the floor plans and elevations (add a 'external shading' to all east, west and north facing glazing of the office) and should also appear on the materials schedule.	Shade hoods have been added to the eastern office windows. Refer to elevations.
2.3 Ventilation	It has been claimed in the submitted BESS report that 50% of the regularly occupied spaces of shops are naturally ventilated. No further details or evidence has been given towards which areas and how it is achieving the ventilation. Elevation drawings do not show that any of the windows are operable and therefore, this credit cannot be claimed unless supported by detailed evidence.	This is incorrect. The BESS credit for increase in outdoor air through the mechanical ventilation system has been claimed.
5. Stormwater		
5. Stormwater	Within BESS 107% has been entered as the STORM score however the STORM Rating details a score of 103%.	BESS will be updated to reflect the revised STORM rating assessment. (Ark)

BESS Section	Comments	Actions
Stormwater	The development does not adequately respond to the stormwater management requirements objectives of 53.18 and generally lacks in sustainability initiatives beyond the minimum mandatory. The total rainwater tank size for the catchment must be consistent with the Architectural plan, SMP and BESS report. It also requires MUSIC report to support the consistency of the tank size and BESS assumption. BESS report showing that 10 litres rainwater tank but MUSIC report showing 10000 litres.	The rainwater tank capacity entered into BESS was incorrect. This has been corrected to align with the MUSIC report, architectural drawings and SMP.
	For info only, proprietary devices (mechanical stormwater treatment) such as Ocean protect are generally not accepted in the city. City always encourage sustainability options such as raingarden, swale, buffer strips instead of proprietary devices.	Raingardens are not feasible for this development due to the extent of the basement and the restriction in viable locations for the raingardens which could result in flooding risk at times of heavy rainfall due to the proximity to the building. Unfortunately proprietary devices are unavoidable in this instance to meet Melbourne Water targets.
	For MUSIC report, the applicant will need to submit the revised MUSIC report (stormwater management strategy) which should highlight the appropriate treatment measures used in MUSIC model. It will also be needed the MUSIC file (.sqz) for validation so that the modelling assumptions and treatment measures is reasonably right.	The MUSIC sqz file has been provided.
	A complete response to the stormwater management requirements involves the preparation and submission of a site layout plan showing the different catchment areas size and the proposed stormwater treatment measures consistent with the MUSIC report, plans and the BESS report.	A catchment and permeability markup has been included in Appendix C.3.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright



Suite 8/10 Northumberland Street
South Melbourne VIC 3205 Australia

+61 3 9636 0280
info@arkresources.com.au

arkresources.com.au

Ark Resources