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Sustainable Management Plan

607-623 Collins Street, Melbourne

Ark Resources

607-623 Collins Street
Melbourne

Contents

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Issue	Date	Prepared	Checked	Status
A	22.06.2022	JW/MT	MR	TP Draft
B	21.04.2023	LD/MT/LT	MR	TP Draft
C	28.04.2023	LD/MT/LT	MR	TP
D	17.10.2023	LD/MT/LT	MR	TP RFI Draft
E	19.10.2023	LD/MT/LT	MR	TP RFI

The proposed mixed-use development at 607-623 Collins St, Melbourne has been designed to meet the objectives of the Melbourne City Council's Policy Clauses 15.01-2S, 19-03-3S and the objectives of the City of Melbourne's Energy, Water & Waste Efficiency and Water Sensitive Urban Design Policies (Clauses 22.19 and 22.23 of the Planning Scheme).

This report confirms that a combination of sustainable building management practices, design initiatives, fixtures, systems, appliances, materials and finishes will be integrated into the building in order to attain a 5 star Green Star Buildings performance standard. The standard achieved is defined as 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 Melbourne City Council's Stormwater Management objectives.

Accordingly, the performance outcomes achieved by the proposed development considered to be appropriate for a mixed-use development of this scale.

Ark Resources has been engaged by Six Two Three Developments Pty Ltd to provide advice in relation to environmentally sustainable development outcomes from the proposed development at 607-623 Collins St, Melbourne.

This Sustainable Management Plan has been prepared to meet the objectives of Clauses 15.01-2S, 19.03-3S and the objectives of the City of Melbourne's Energy, Water & Waste Efficiency and Water Sensitive Urban Design Policies.

This report contains a summary of:

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

Performance outcomes in this report are based on:

- Discussions and correspondence with Bee Tean, Sterling Global

Architectural drawings prepared by Carr Architects set out below.

EXISTING SITE PLAN	TP-100	B
DEMOLITION PLAN	TP-101	B
FORMER STATE SAVINGS BANK - DEMOLITION DRAWINGS	TP-102	B
DEMOLITION ELEVATION - SPENCER STREET	TP-103	B
DEMOLITION ELEVATION - COLLINS STREET	TP-104	B
PROPOSED SITE PLAN	TP-105	B
STREETSCAPE ELEVATION - SPENCER STREET	TP-106	B
STREETSCAPE ELEVATION - COLLINS STREET	TP-107	B
FLOOR PLAN - BASEMENT LEVEL 1	TP-03B1	B
FLOOR PLAN - BASEMENT LEVEL 2	TP-03B2	B
FLOOR PLAN - BASEMENT LEVEL 3/4	TP-03B3	B
FLOOR PLAN - BASEMENT LEVEL 5	TP-03B5	B
FLOOR PLAN - GROUND FLOOR	TP-0300	B
FLOOR PLAN - GROUND FLOOR MEZZANINE	TP-0300M	B
FLOOR PLAN - LEVEL 1	TP-0301	B
FLOOR PLAN - LEVELS 2-3	TP-0302	B
FLOOR PLAN - LEVEL 4	TP-0304	B
FLOOR PLAN - LEVEL 5	TP-0305	B
FLOOR PLAN - LEVEL 6	TP-0306	B
FLOOR PLAN - LEVEL 7	TP-0307	B
FLOOR PLAN - LEVEL 8	TP-0308	B
FLOOR PLAN - LEVELS 9-11	TP-0309	B
FLOOR PLAN - LEVELS 12	TP-0312	B
FLOOR PLAN - LEVEL 13	TP-0313	B
FLOOR PLAN - LEVELS 14-15	TP-0314	B
FLOOR PLAN - LEVEL 16	TP-0316	B

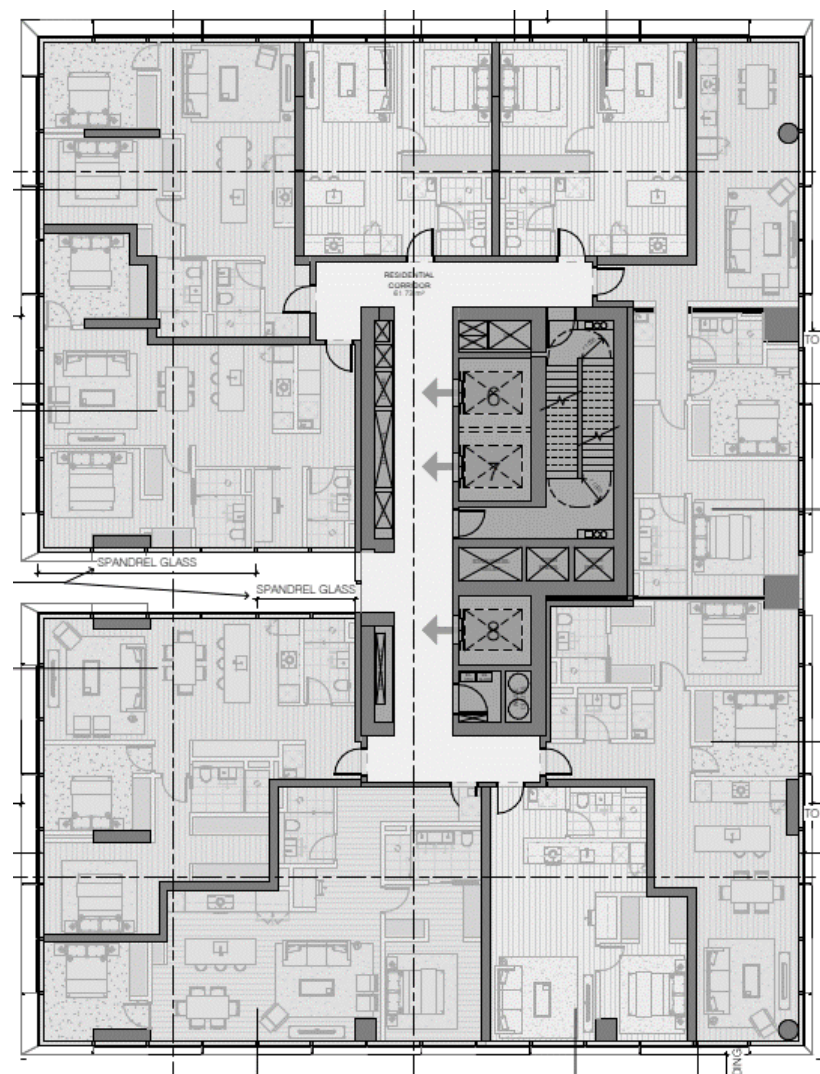
FLOOR PLAN - LEVEL 17	TP-0317	B
FLOOR PLANS_LEVEL 18-20	TP-0318	B
FLOOR PLANS_LEVEL 21-28	TP-0321	B
FLOOR PLANS_LEVEL 29-32	TP-0329	B
FLOOR PLAN - LEVELS 33-36	TP-0333	B
FLOOR PLAN - LEVEL 37	TP-0337	B
FLOOR PLAN - LEVEL 38-41	TP-0338	B
FLOOR PLAN - LEVEL 41 (ROOF PLANTS)	TP-0342	B
ROOF PLAN	TP-0343	B
ELEVATION - NORTH	TP-2000	B
ELEVATION - EAST	TP-2001	B
ELEVATION - SOUTH	TP-2002	B
ELEVATION - WEST	TP-2003	B
PODIUM PROPOSED ELEVATION - COLLINS STREET	TP-2004	B
PODIUM PROPOSED ELEVATION - LANEWAY COLLINS STREET	TP-2005	B
PODIUM PROPOSED ELEVATION - SPENCER STREET	TP-2006	B
PODIUM PROPOSED ELEVATION - LANEWAY SPENCER STREET	TP-2007	B
SECTION A	TP-3000	B
SECTION B	TP-3001	B
SECTION C	TP-3002	B
SECTION D	TP-3003	B
FACADE DETAILS - COLLINS STREET	TP-3004	B
FACADE DETAILS - COLLINS STREET	TP-3004A	B
VEHICLE RAMP SECTIONS	TP-3005	B
MATERIAL SCHEDULE	TP-8000	B

3.0 Site Description

The building comprises the following uses:

- Two retail / F&B tenancies on ground level
- 175 apartments/336 bedrooms (approximately 511 occupants)
- Hotel 229 bedrooms
- Office 2717m² NLA
- Located within the Melbourne City Council
- Site area 1973m² (approximately)
- Surrounds mainly commercial use

A plan of Apartment Levels 18-20 of the proposed development is provided below. An image of the site and the surrounding locale is provided on the following page.





4.0 Key ESD Initiatives

A detailed analysis has been undertaken in order to nominate the ESD initiatives required and confirm the performance outcomes achieved. The results of this analysis are set out in the remainder of this report.

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

- Rainwater harvesting system for toilet flushing and irrigation;
- 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 urban spaces and landscapes
- Rooftop photovoltaic systems with a peak capacity of 56.4kW distributed across all buildings.
- High-performance glazing and energy efficient building services, appliances and fixtures;
- Environmentally preferable internal finishes;
- Provide landscaping which enhances amenity and contributes to biodiversity; and
- Encourage walking and cycling to reduce the extent of private car use.

An assessment of sustainable design outcomes of the proposed development has been undertaken with Green Star Buildings and MUSIC benchmarking tools. The information presented in this report demonstrates that:

<p>Green Star Buildings</p> <p>The development achieve a 5 Star Green Star Buildings performance standard</p> <p>5.0</p> <p>star</p>	<p>NatHERS Energy Ratings</p> <p>The development will achieve a development average of</p> <p>7.0</p> <p>star</p>
	<p>Stormwater</p> <p>The development meets the Best Practice standard for stormwater quality.</p> 

5.0 MUSIC Modelling

To assess the quality of stormwater runoff from the site, an analysis has been undertaken using MUSIC Modelling software.

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:
96.0%	75.7%
Reduction in Total Nitrogen (TN) load:	Reduction in Gross Pollutants (GP) load:
76.0%	100.0%

The results indicate that the project meets both the flow reduction, and pollutant (particulate and nutrient) reduction requirements of Green Star Buildings credit 39 Waterway Protection.

Refer to Appendix B for the MUSIC rating results, Appendix B.4. for rainwater harvesting and reliability results and Appendix D for the WSUD Maintenance Manual.

A rainwater harvesting system will be installed comprising:

- Rainwater harvesting from all roof areas (approx. 1139m²);
- Total storage volume of 40kL rainwater tanks; and
- Re-use of captured water for flushing of all hotel toilets (Mezzanine – Level 12) and Level 13 & 14 Office toilets.

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
- A SPEL Vortceptor gross pollutant trap (or equivalent primary treatment device) to capture suspended solids and litter generated onsite
- A SPEL Hydrosystem (or equivalent upflow filtration device) for removing the remaining nitrogen, phosphorous and suspended solids located near stormwater Legal Point of Discharge.

6.0 NatHERS Energy Ratings

FirstRate5 (Version 5.3.1a (3.21)) energy ratings have been undertaken for a representative sample of the apartments.

The development achieves a 7.0 star average NatHERS rating which exceeds the Councils 'best practice' standard of 6.5 stars and represents a high standard of thermal efficiency.

Please refer to Appendix B for details of energy ratings and building construction assumptions.

NatHERS Rating The development average NatHERS rating will be 7.0star	
Average Heating Load 51.8 MJ / m²	Average Cooling Load 23.1 MJ / m²

The Green Star Buildings (v1 Rev B) tool has been used as a benchmarking framework for the proposed scheme and demonstrates that the development has the preliminary design potential to achieve a 5 Star standard.

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

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

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

Green Star Building Rating

5 star

Total Points Targeted

39 pts

Note that a minimum of 35 points must be achieved for a 5-star Green Star Buildings rating to be achieved. The development will attain a 5-star Green Star standard however certification of the rating with the Green Building Council will not be undertaken. A points margin of 10% has been incorporated into the pathway presented in this report as a contingency to allow for attrition which typically occurs during the detailed design and construction phases. This does not imply that the applicant commits to delivering more than the points required for the rating targeted.

7.1 Summary of Green Star Building credits targeted.

Credit	Target	Points
2 Responsible Construction	Credit Achievement	1
3 Verification and Handover	Credit Achievement	1
4 Operational Waste	Minimum Expectation	
5 Responsible Procurement	Credit Achievement	1
9 Responsible Finishes	Exceptional Performance	2
10 Clean Air	Credit Achievement	2
11 Light Quality	Credit Achievement	2
12 Acoustic Comfort	Minimum Expectation	
13 Exposure to Toxins	Credit Achievement	2
14 Amenity and Comfort	Credit Achievement	2
16 Climate Change Resilience	Credit Achievement	1
17 Operations Resilience	Credit Achievement	2
19 Heat Resilience	Credit Achievement	1
21 Upfront Carbon Emissions	Credit Achievement	3
22 Energy Use	Credit Achievement	3
23 Energy Source	Exceptional Performance	6
24 Other Carbon Emissions	Credit Achievement	2
25 Water Use	Minimum Expectation	
26 Life Cycle Impacts	Credit Achievement	2
27 Movement and Place	Credit Achievement	3
31 Inclusive Construction Practices	Credit Achievement	1
35 Impacts to Nature	Minimum Expectation	
39 Waterway Protection	Credit Achievement	2

Refer to Appendix A for details of credit requirements

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

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

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

- Attain a 5 star Green Star standard based on the Buildings rating tool (V1 Rev B);
- Achieve a 7.0 average star rating for the apartments; and
- Attain the Best Practice standard for urban stormwater quality

Accordingly, the sustainable design outcomes from the proposed development are considered to be consistent with the objectives of the City of Melbourne’s Energy and Resource Efficiency (Clause 15.02-1S) of the Melbourne Planning Scheme and the WSUD objectives stipulated in clause 53.18.

Green Star

The combination of design features and services initiatives meets all the standards for a Green Star Building Rating of:

5 star

NatHERS Energy Rating

The development will achieve an average NatHERS rating of:

7.0
star

Best Practice

The development meets the Best Practice standard for stormwater Quality



Appendix A. Green Star Building Pathway

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 Buildings Technical Manual (v1 Revision B, 10 December 2021).

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
2 Responsible Construction The builder's construction practices reduce impacts and promote opportunities for improved environmental and social outcomes	The builder must have an environmental management system (large builders will need to be ISO14001 accredited).	MINIMUM EXPECTATION	Tender Construction
	The site must have a project specific Environmental Management Plan (EMP). The EMP must be developed to cover the scope of construction activities to assist the head contractor and its service providers to manage environmental performance conditions and impacts arising from demolition, excavation, and construction. It must be implemented from the start of construction and include all works within the project scope.		
	80% of Construction and demolition waste must be recycled.		
	The builder must have an environmental management system (large builders will need to be ISO14001 accredited).		
	Sustainability training is provided to construction workers. The head contractor must provide the following training: <ul style="list-style-type: none"> - Information on the sustainable building certification(s) sought, including: <ul style="list-style-type: none"> · - the sustainability attributes of the building and their benefits · - the value of certification · - the role site worker(s) play in delivering a sustainable building 		
90% of construction and demolition waste is diverted from landfill, and waste contractors and facilities comply with the Green Star Construction and Demolition Waste Reporting Criteria	1		
3 Verification and Handover The building has been optimised and handed over to deliver a high level of performance in operation	The building is set up for optimum ongoing management due to its appropriate metering and monitoring systems. The building must have accessible energy and water metering for all common uses, major uses, and major sources. The meters must be connected to a monitoring system capable of capturing and processing the data produced by the meters. The monitoring system must accurately and clearly present the metered data and include reports on consumption trends for the automatic monitoring system.	MINIMUM EXPECTATION	Design Tender Construction Handover Use

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
	<p>The building has set environmental performance targets, designed and tested for airtightness, been commissioned, and will be tuned.</p> <p>The project team must perform the following:</p> <ul style="list-style-type: none"> - Prior to construction: <ul style="list-style-type: none"> · Set environmental performance targets · Perform a services and maintainability review · Design for airtightness - During construction and practical completion: <ul style="list-style-type: none"> · Commission the building · Engage building tuning service provider · Test for airtightness - After practical completion: <ul style="list-style-type: none"> · Tune the building over the next 12 months 		
	<p>The project team create and deliver operations and maintenance information to the facilities management team at the time of handover. Information is available to building users on how to best use the building.</p> <p>The project team must provide operations and maintenance information for all nominated building systems to the building owner (or designated representative). This means:</p> <ul style="list-style-type: none"> - Appropriate content for all nominated building systems has been developed and provided - The appropriate user group has access to the information they require to deliver best practice environmental outcomes - Guidance on keeping information up to date is provided to the facilities management team in these documents 		
	<p>An independent level of verification is provided to the commissioning and tuning activities through the involvement of an independent commissioning agent.</p> <p>or</p> <p>The project uses a soft landings approach that involves the future facilities management team.</p>	1	
4 Operational Waste	<p>The building is designed for the collection of separate waste streams.</p> <p>The building must provide bins or storage containers to building occupants to enable them to separate their waste. These bins must</p>	MINIMUM EXPECTATION	Design Handover Use

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
<p>Operational waste can be separated and recovered in a safe and efficient manner</p> <p>The building must have appropriate spaces for waste management and an appropriately sized loading dock</p>	<p>be labelled and easy to access, and evenly distributed throughout the building. They must also allow for separating the following as a minimum:</p> <ul style="list-style-type: none"> – General waste going to landfill – Recycling streams to be collected by the building’s waste collection service, including: <ul style="list-style-type: none"> · paper and cardboard · glass · plastic – One additional waste stream identified by the project team. This may include collecting any of the following waste types: <ul style="list-style-type: none"> · organics, e-waste, batteries etc. <p>The building provides a dedicated and adequately sized waste storage area.</p> <p>A dedicated area, or areas, for the storage and collection of the applicable waste streams must be provided. The storage area must be sized to accommodate all bins or containers, for all applicable waste streams, for at least one collection cycle.</p> <p>The building ensures safe and efficient access to waste storage areas for both occupants and waste collection contractors.</p> <p>A waste specialist and/or contractor must sign-off on the designs to confirm they are adequately sized and located for the safe and convenient storage and collection of the waste streams identified.</p>		
<p>5 Responsible Procurement</p> <p>The procurement process for key products, materials, and services for the building’s design and construction follows best practice environmental and social principles.</p>	<p>The project team must undertake a risk and opportunities assessment of 10 or more key items in the project’s supply chain (as selected by the project team) to identify environmental, social and human health risks, and opportunities following ISO 20400 Sustainable Procurement – Guidance.</p> <p>The project team must develop a plan for how the project will responsibly procure 10 or more key items mitigating risks and implementing opportunities identified in the Assessment following ISO 20400 Sustainable Procurement – Guidance as a guide to developing the plan.</p>	1	<p>Strategy</p> <p>Concept</p> <p>Design</p> <p>Tender</p> <p>Construction</p>
<p>9 Responsible Finishes</p>	<p>40% of all internal building finishes (by cost) meet a Responsible Products Value of at least 7.</p> <p>10% of all internal building finishes (by cost) meet a Responsible Products Value of at least 12.</p>	2	<p>Design</p> <p>Tender</p> <p>Construction</p>

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage	
The building's internal finishes are comprised of responsibly manufactured products	<p>Internal finishes include flooring, plasterboard, paints, ceilings, partitions, doors, internal windows or similar. Joinery used as part of a wall finish may be counted, e.g. wall panelling or fixed shelving/cupboards that make up a partition. Sealants and adhesives used for finishes are also included.</p> <p>Loose furniture is not included.</p>			
<p>10 Clean Air</p> <p>Pollutants entering the building are minimised, and a high level of fresh air is provided to ensure levels of indoor pollutants are maintained at acceptable levels</p>	<p>Non-residential building ventilation systems must be designed to comply with ASHRAE Standard 62.1:2013 or AS 1668:2012 (whichever is greater) regarding minimum separation distances between pollution sources and outdoor air intakes.</p> <p>All new and existing ductwork that serves the building must be cleaned prior to occupation in accordance with a recognised Standard.</p>	MINIMUM EXPECTATION	Design Tender Construction Handover Use	
	<p>The building must be provided with at an adequate amount of outside air.</p> <p>The regularly occupied areas must be provided with good access to outdoor air, appropriate for the activities and conditions by using one of the following options:</p> <p>Where ventilation is by mechanical means, the building must provide outdoor air as per AS1668.2:2012 for the default occupancy.</p> <p>Where ventilation is by natural means, the building must meet natural ventilation requirements as per AS1668.4:2012. Where active heating or cooling is provided, a dedicated and controlled outside air path must be constructed and commissioned at a rate of at least 2.5L/s per bedroom and living space, with a minimum of 5L/s per unit. Outside air must be provided to each space that is heated or cooled.</p>			
	<p>Point source pollutants must be exhausted directly outside (printers, kitchens).</p>			
	<p>The building's ventilation systems allow for easy maintenance.</p>			2
	<p>The building must provide a 100% improvement of outdoor air required by AS 1668.2:2012 to each space in the regularly occupied areas.</p> <p>OR</p> <p>The system must be capable of providing enough outdoor air to maintain carbon dioxide (CO₂) levels at or less than 700ppm within each space in the regularly occupied areas and must be equipped with CO₂ sensor</p>			

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
<p>11 Light Quality</p> <p>The building provides good daylight and its lighting is of high quality</p>	<p>Lighting within the building meets minimum comfort requirements.</p> <p>Lighting within the building must meet the following requirements:</p> <ul style="list-style-type: none"> - All LED lighting installed has no observable effect as per the standard IEEE 1789-2015 - Light sources must have a minimum Colour Rendering Index (CRI) 85 or higher - Light sources must meet best practice illuminance levels for each task within each space type with a maintained illuminance that meets the levels recommended in AS/NZS 1680.1:2006 - The maintained Illuminance values must achieve a uniformity of no less than that specified in Table 3.2 of AS/NZS 1680.1:2006, with a maintenance factor method as defined in AS/NZS 1680.4 - All light sources must have a maximum of 3 MacAdam Ellipses deviation. <p>Good lighting levels suitable for the typical tasks in each space are available.</p> <p>The building provides adequate levels of daylight.</p> <ul style="list-style-type: none"> - Ensures regularly occupied areas are in reasonable proximity to glazed façades, windows, or skylights - Maximises daylight to spaces that prioritise learning, healing, and living: <ul style="list-style-type: none"> · For apartments, how in 95% of all apartments, the living rooms and all bedrooms have access to a view and daylight. 	MINIMUM EXPECTATION	<p>Concept Design Tender</p>
<p>12 Acoustic Comfort</p> <p>The building provides acoustic comfort for building occupants</p>	<p>Internal noise levels from services and the outside is limited through an acoustic comfort strategy.</p> <p>The Acoustic Comfort Strategy is to include:</p> <ul style="list-style-type: none"> - A summary of the Standards, legislation, guidelines, and other requirements that apply to the project - The proposed performance metrics for each of the Acoustic Comfort criteria relevant to the different uses within the building and whether this exceeds minimum legislative or best practice guidelines - Description of how the design solution is intended to achieve the proposed performance metrics 	2	<p>Design Tender Construction Handover</p>

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage																															
<p>13 Exposure to Toxins</p> <p>The building's occupants are not directly exposed to toxins in the spaces they spend time in</p>	<p>The building's paints adhesives, sealants, and carpets are low in TVOC or non-toxic.</p> <p>At least 95% of internally applied paints, adhesives, sealants (by volume) and carpets (by area) must meet stipulated 'Total Volatile Organic Compounds (TVOC) Limits' below.</p> <p>Paints, Adhesives and Sealants</p> <table border="1" data-bbox="488 448 1160 1043"> <thead> <tr> <th data-bbox="488 512 846 539">Product category</th> <th data-bbox="846 480 1160 564">Max. Total Volatile Organic Compounds (TVOC) content in grams per litre (g/L) of ready to use product</th> </tr> </thead> <tbody> <tr> <td data-bbox="488 603 846 624">General purpose adhesives and sealants</td> <td data-bbox="846 603 1160 624">50</td> </tr> <tr> <td data-bbox="488 663 846 684">Interior wall and ceiling paint, all sheen levels</td> <td data-bbox="846 663 1160 684">16</td> </tr> <tr> <td data-bbox="488 724 846 745">Trim, varnishes, and wood stains</td> <td data-bbox="846 724 1160 745">75</td> </tr> <tr> <td data-bbox="488 785 846 805">Primers, sealers, and prep coats</td> <td data-bbox="846 785 1160 805">65</td> </tr> <tr> <td data-bbox="488 845 846 882">One and two pack performance coatings for floors</td> <td data-bbox="846 845 1160 866">140</td> </tr> <tr> <td data-bbox="488 914 846 971">Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives</td> <td data-bbox="846 914 1160 935">250</td> </tr> <tr> <td data-bbox="488 1003 846 1040">Structural glazing adhesive, wood flooring and laminate adhesives and sealants</td> <td data-bbox="846 1003 1160 1024">100</td> </tr> </tbody> </table> <p>Carpets</p> <table border="1" data-bbox="488 1094 1424 1394"> <thead> <tr> <th data-bbox="488 1094 808 1121">Compliance option</th> <th data-bbox="808 1094 1128 1121">Test protocol</th> <th data-bbox="1128 1094 1424 1121">Limit</th> </tr> </thead> <tbody> <tr> <td data-bbox="488 1182 808 1203">ASTM D5116</td> <td data-bbox="808 1145 1128 1166">ASTM D5116 - Total VOC limit*</td> <td data-bbox="1128 1145 1424 1166">limit* 0.5mg/m² per hour</td> </tr> <tr> <td data-bbox="488 1182 808 1203"></td> <td data-bbox="808 1198 1128 1235">ASTM D5116 - 4-PC (4-Phenylcyclohexene) *</td> <td data-bbox="1128 1198 1424 1219">0.05mg/m² per hour</td> </tr> <tr> <td data-bbox="488 1278 808 1299">ISO 16000 / EN 13419</td> <td data-bbox="808 1270 1128 1313">ISO 16000 / EN 13419 - TVOC at three days</td> <td data-bbox="1128 1278 1424 1299">0.5 mg/m² per hour</td> </tr> <tr> <td data-bbox="488 1350 808 1370">ISO 10580 / ISO/TC 219 (Document N238)</td> <td data-bbox="808 1342 1128 1385">ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours</td> <td data-bbox="1128 1350 1424 1370">0.5mg/m² per hour</td> </tr> </tbody> </table> <p>The building's engineered wood products are low in TVOC or non-toxic.</p>	Product category	Max. Total Volatile Organic Compounds (TVOC) content in grams per litre (g/L) of ready to use product	General purpose adhesives and sealants	50	Interior wall and ceiling paint, all sheen levels	16	Trim, varnishes, and wood stains	75	Primers, sealers, and prep coats	65	One and two pack performance coatings for floors	140	Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250	Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100	Compliance option	Test protocol	Limit	ASTM D5116	ASTM D5116 - Total VOC limit*	limit* 0.5mg/m ² per hour		ASTM D5116 - 4-PC (4-Phenylcyclohexene) *	0.05mg/m ² per hour	ISO 16000 / EN 13419	ISO 16000 / EN 13419 - TVOC at three days	0.5 mg/m ² per hour	ISO 10580 / ISO/TC 219 (Document N238)	ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5mg/m ² per hour	MINIMUM EXPECTATION	<p>Design</p> <p>Tender</p> <p>Construction</p> <p>Handover</p>
Product category	Max. Total Volatile Organic Compounds (TVOC) content in grams per litre (g/L) of ready to use product																																	
General purpose adhesives and sealants	50																																	
Interior wall and ceiling paint, all sheen levels	16																																	
Trim, varnishes, and wood stains	75																																	
Primers, sealers, and prep coats	65																																	
One and two pack performance coatings for floors	140																																	
Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250																																	
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100																																	
Compliance option	Test protocol	Limit																																
ASTM D5116	ASTM D5116 - Total VOC limit*	limit* 0.5mg/m ² per hour																																
	ASTM D5116 - 4-PC (4-Phenylcyclohexene) *	0.05mg/m ² per hour																																
ISO 16000 / EN 13419	ISO 16000 / EN 13419 - TVOC at three days	0.5 mg/m ² per hour																																
ISO 10580 / ISO/TC 219 (Document N238)	ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5mg/m ² per hour																																

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage																																										
	<p>Either no new engineered wood products are used in the building, or at least 95% (by area) of all engineered wood products meet specified formaldehyde emission limits, as per the following:</p> <table border="1" data-bbox="488 400 1718 871"> <thead> <tr> <th>Test protocol</th> <th>Emissions Limit / Unit of Measurement</th> <th>Test protocol</th> <th>Emissions Limit / Unit of Measurement</th> </tr> </thead> <tbody> <tr> <td>AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood</td> <td>≤1mg/L</td> <td>ASTM D5116 (applicable to high pressure laminates and compact laminates)</td> <td>≤0.1 mg/m³hr</td> </tr> <tr> <td>AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16</td> <td>≤1.5 mg/L</td> <td>ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates</td> <td>≤0.1 mg/m³hr (at 3 days)</td> </tr> <tr> <td>AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16</td> <td>≤1mg/L</td> <td>ASTM D6007</td> <td>≤0.12mg/m³hr</td> </tr> <tr> <td>AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)</td> <td>≤1mg/L</td> <td>ASTM E1333</td> <td>≤0.12mg/m³hr</td> </tr> <tr> <td>Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL</td> <td>≤1mg/L</td> <td>EN 717-1 (also known as DIN EN 717-1)</td> <td>≤0.12mg/m³hr</td> </tr> <tr> <td>JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460</td> <td>≤1mg/L</td> <td>EN 717-2 (also known as DIN EN 717-2)</td> <td>≤3.5mg/m³hr</td> </tr> <tr> <td>JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460</td> <td>≤1mg/L</td> <td></td> <td></td> </tr> <tr> <td>JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)</td> <td>≤0.1 mg/m³hr</td> <td></td> <td></td> </tr> </tbody> </table> <p>Occupants are not exposed to banned or highly toxic materials in the building. A comprehensive hazardous materials survey must be carried out on any existing buildings or structures on the project site, in accordance with the relevant Environmental and Work Health and Safety (WHS) legislation.</p> <p>On-site tests verify the building has low Volatile Organic Compounds (VOC) and formaldehyde levels as follows:</p> <table border="1" data-bbox="488 1034 900 1158"> <thead> <tr> <th>Element</th> <th>Concentration</th> </tr> </thead> <tbody> <tr> <td>TVOC</td> <td>0.27 ppm</td> </tr> <tr> <td>Formaldehyde</td> <td>0.02 ppm</td> </tr> </tbody> </table>	Test protocol	Emissions Limit / Unit of Measurement	Test protocol	Emissions Limit / Unit of Measurement	AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	≤1mg/L	ASTM D5116 (applicable to high pressure laminates and compact laminates)	≤0.1 mg/m ³ hr	AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.5 mg/L	ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	≤0.1 mg/m ³ hr (at 3 days)	AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1mg/L	ASTM D6007	≤0.12mg/m ³ hr	AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/L	ASTM E1333	≤0.12mg/m ³ hr	Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL	≤1mg/L	EN 717-1 (also known as DIN EN 717-1)	≤0.12mg/m ³ hr	JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460	≤1mg/L	EN 717-2 (also known as DIN EN 717-2)	≤3.5mg/m ³ hr	JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460	≤1mg/L			JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	≤0.1 mg/m ³ hr			Element	Concentration	TVOC	0.27 ppm	Formaldehyde	0.02 ppm	2	
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<p>14 Amenity and Comfort</p> <p>The building provides internal amenities that improve occupant experience of using the building</p>	<p>The building has dedicated amenity rooms to act as a parent room, relaxation room, or an exercise room. The room(s) must be accessible to all staff and occupants. The room must be separate from bathrooms, showers, lockers, and active facilities. All amenities and/or infrastructure necessary to use the room(s) for its intended purposes must be provided (for example, including a sink or bench for a parent room).</p>	2	<p>Brief Concept Design Tender Handover Use</p>																																										

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage		
<p>16 Climate Change Resilience</p> <p>The building has been built to respond to the direct and indirect impacts of climate change</p>	<p>The project team completes the climate change pre-screening checklist. The project team communicates the building's exposure to climate change risks to the applicant</p>	MINIMUM EXPECTATION	Strategy Brief Concept Design		
	<p>The project team develops a project-specific climate change risk and adaptation assessment for the building which aligns with the Australian Standard AS 5334:2013 Climate change adaptation for settlements and infrastructure.</p>			1	
	<p>Extreme and high risks are addressed.</p> <p>The project team must ensure risks are addressed as follows:</p> <ul style="list-style-type: none"> - All risks rated as 'Extreme' must be addressed through specific design responses - All risks rated as 'High' must be addressed through design or future operational responses - Regardless of risk rating, at least two risks identified in the assessment must be addressed by specific design responses. 				
<p>17 Operations Resilience</p> <p>The building can respond to acute shocks and chronic stresses that can affect its operations over time</p>	<p>The project team undertakes a comprehensive risk assessment of the acute shocks and chronic stresses likely to influence future building operations, including:</p> <ul style="list-style-type: none"> - Failure of critical infrastructure (power, water and digital) - Health pandemic - Water security - Geological hazards (landslides, earthquakes, tsunamis) - Direct attack (cyber and physical) - Ageing infrastructure - Rising cyber dependency - Increasing energy costs - Lack of transport accessibility and availability 	2	Strategy Brief Concept Design		
	<p>The building's design and future operational plan addresses any high or extreme system-level interdependency risks.</p>				

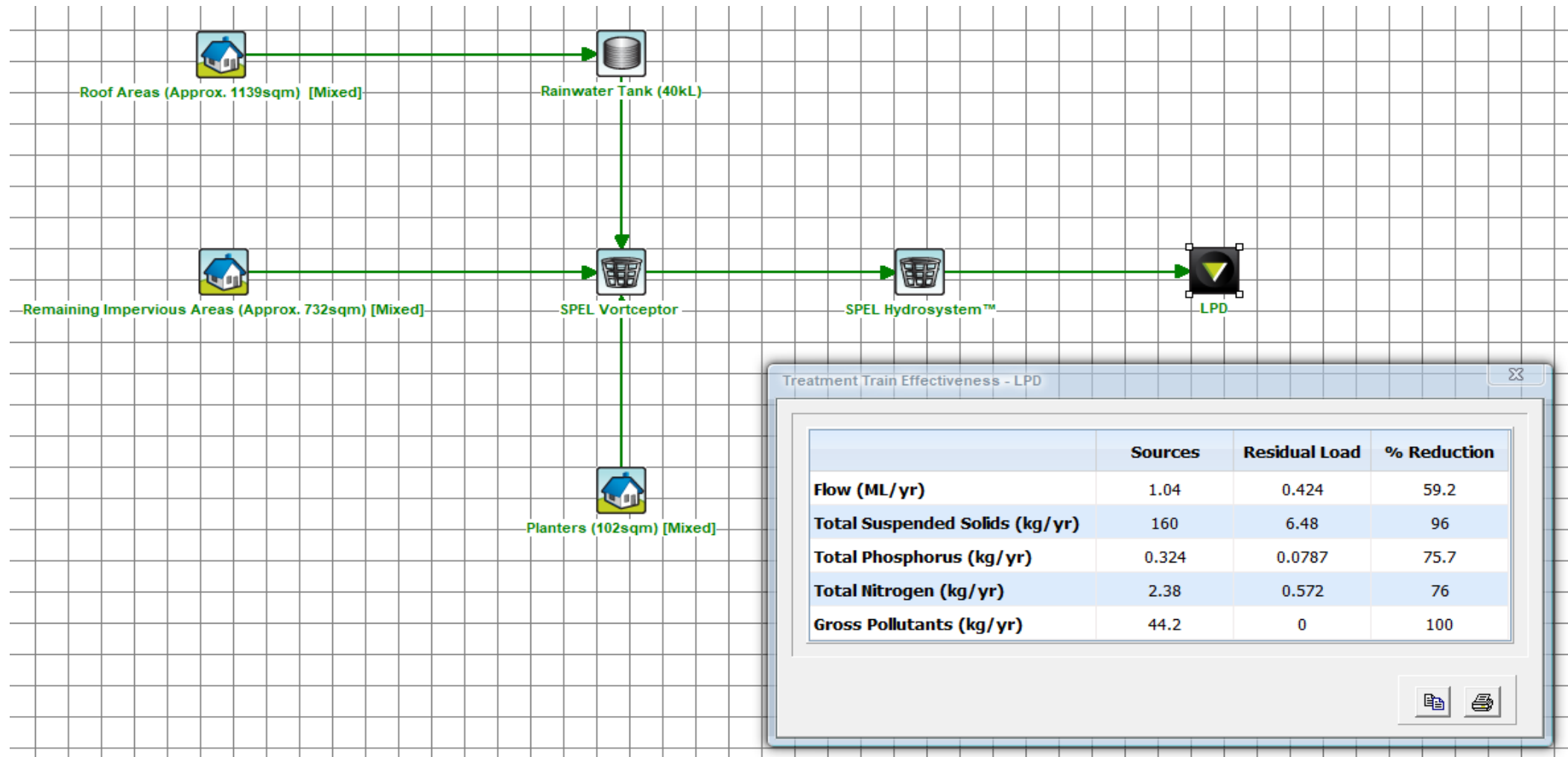
Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
	The building's design maintains a level of survivability and design purpose in a blackout. The building must then be designed to account for its design purpose and provide a measure of survivability for the likely occupants.		
19 Heat Resilience The building reduces its impact on heat island effect	At least 75% of the whole site area comprises of one or a combination of strategies that reduce the heat island effect. The strategies that can be used to reduce the heat island are: <ul style="list-style-type: none"> - Vegetation - Green roofs - Roofing materials, including shading structures, having the following: <ul style="list-style-type: none"> · For roof pitched <15°- a three-year SRI of minimum 64 · For roof pitched >15°- a three-year SRI of minimum 34 - Unshaded hard-scaping elements with a three-year SRI of minimum 34 or an initial SRI of minimum 39 - Hardscaping elements shaded by overhanging vegetation 	1	
21 Upfront Carbon Emissions The building's upfront carbon emissions from materials and products have been reduced and offset	The building's upfront carbon emissions are at least 10% less than those of a reference building, calculated using the Upfront Carbon Emissions calculator.	MINIMUM EXPECTATION	Strategy Brief Concept Design
	The building's energy use is at least 20% less than a reference building, calculated using the Upfront Carbon Emissions calculator.	3	
	Where an existing building less than 30 years old has been fully or partly demolished for construction, an embodied carbon calculation must be done for the demolished portion and these emissions offset. Where the existing building is between 30 to 50 years old, the contribution must be calculated and discounted at 10% for every two additional years past year 30.		

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage	
22 Energy Use (Reference Pathway) The building has low energy consumption	The building has at least a 10% lower energy consumption than one built to the National Construction Code 2019.	MINIMUM EXPECTATION	Brief Concept Design Tender	
	The building has at least a 20% lower energy consumption than one built to the National Construction Code 2019.			3
23 Energy Source The building's energy comes from renewables	The building provides a Zero Carbon Action Plan. The Zero Carbon Action Plan must include a target date by when the building is expected to operate as fossil fuel free. The Zero Carbon Action Plan must cover all energy consumption, procurement, and generation and cannot rely on procuring renewable fuels as its only solution. It must also include infrastructure provided for tenants or future occupants such as gas installations for cooking.	MINIMUM EXPECTATION	Brief Concept Design Tender	
	100% of the building's electricity comes from renewable electricity			3
	100% of the building's energy comes from renewables i.e. all-electric.			3
24 Other Carbon Emissions The building's emissions from refrigerants, upfront carbon, and remaining carbon sources are eliminated or offset	The building owner eliminates emissions from high global warming potential refrigerants. or The building owner offsets emissions from refrigerants.	2	Concept Design Tender Construction	
25 Water Use The building has low water use	The building installs efficient water fixtures: Taps 5 star Toilets 4 star Urinals 5 star Showers 3 star (<= 7.5 l/m) Dishwashers 5 star	MINIMUM EXPECTATION	Design Tender Construction Use	

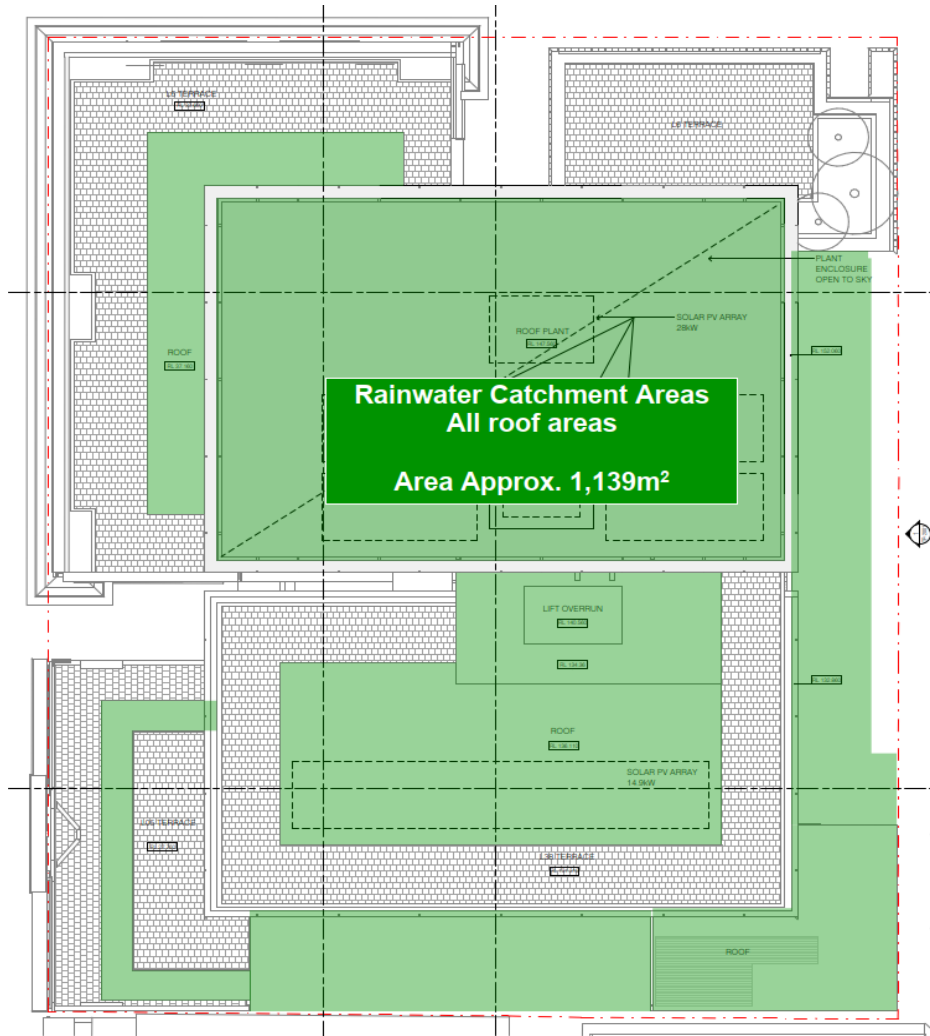
Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
<p>26 Life Cycle Impacts</p> <p>The building has lower environmental impacts from resource use over its lifespan than a typical building</p>	<p>The reduction in life cycle impacts must be demonstrated through a whole-of-building, whole-of-life (cradle to grave) comparative Life Cycle Assessment (LCA), as defined by EN 15978.</p> <p>The results of the LCA must be entered into the GBCA's Life Cycle Assessment calculator.</p>	2	<p>Strategy</p> <p>Brief</p> <p>Concept</p> <p>Design</p> <p>Tender</p> <p>Construction</p>
<p>27 Movement and Place</p> <p>The building's design and location encourage occupants and visitors to use active, low carbon, and public transport options instead of private vehicles</p>	<p>There are showers, lockers, and change rooms in the building</p>	MINIMUM EXPECTATION	<p>Strategy</p> <p>Brief</p> <p>Concept</p> <p>Design</p> <p>Tender</p> <p>Construction</p>
	<p>The facilities are accessible, inclusive, and located in a safe and protected space</p>		<p>Tender</p> <p>Construction</p>
	<p>The building's access prioritises cycling and includes bicycle parking facilities</p> <ul style="list-style-type: none"> - 269 cycle spaces i.e. 1.5 per apartment - Cycle maintenance rack and foot-pump - EoT facilities including: <ul style="list-style-type: none"> · 4 showers, · 25 lockers · changing area with benching & ironing facilities <p>Clear, safe and inclusive access to cyclist facilities via 2 lifts. 2-way ramp also provided (non-dedicated) – gradients of 1:10 or greater to incorporate minimum slip resistance classification of P5 in accordance with AS 4586.</p> <p>Refer to Appendix G for the preliminary Movement and Place calculations.</p>	3	
	<p>Sustainable Transport Plan to be prepared and implemented.</p>		
<p>EV charging infrastructure:</p> <ul style="list-style-type: none"> - Chargers to 5% of car spaces: 8 chargers (minimum 7kW capacity) - EV charging to include load management supervisor hardware 			

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
	<ul style="list-style-type: none"> Electrical containment e.g. trunking/conduit installed to facilitate future installation of cabling supplying a further 20% of car spaces (30 spaces) 		
	Transport options that reduce the need for private fossil fuel powered vehicles are prioritised.		
	Walkability encouraged via access to at least 10 amenities across 5 categories – Walkscore = 99		
31 Inclusive Construction Practices The builder's construction practices promote diversity and reduces physical and mental health impacts	There are provisions for providing gender appropriate facilities and personal protective equipment The head contractor also installs policies on-site to increase awareness and reduces instances of discrimination, racism, and bullying	MINIMUM EXPECTATION	Strategy Brief Tender Construction
	The head contractor must show that they have introduced programs and solutions to address Physical and Mental Health of potential site workers and sub-contractors based on a needs analysis. The project must provide an evaluation report to the client and sub-contractors on the effectiveness of the program.	1	
35 Impacts to Nature Ecological value is conserved and protected	The building was not built on, or significantly impacted, a site with a high ecological value	MINIMUM EXPECTATION	Strategy Brief Concept Design
	The building's light pollution has been minimised. All outdoor lighting on the project complies with AS/NZS4282:2019 Control of the obtrusive effects of outdoor lighting.		
39 Waterway Protection Local waterways are protected, and the impacts of flooding and drought are reduced	The project demonstrates a reduction in average annual stormwater discharge (ML/yr) of 40% across the whole site (Refer to Appendix B for discharge rates).	2	Concept Design Construction Handover
	Specified pollution reduction targets are met (Refer to Section 5.0 and Appendix B for MUSIC modelling results and assumptions)		
Total Green Star Points		39	
Green Star Rating		5 Star	

B.1 MUSIC Schematic



B.2 Rainwater Catchment Areas



B.3 MUSIC Modelling Assumptions and Inputs

Assumptions		
Area Name		Area [m ²]
Total Roof Areas to Rainwater Tank		1,139
All roofs		1,139
Pervious Landscape Areas		102
Remaining Impervious Area		732
Total Site Area		1,973

MUSIC Model 18/04/2023		
Treatment Devices Features		
RWT		40 kL
Est. daily water demand for TF (Hotel rooms Levels Mezzanine to 12)		2.39 kL/day
Est. daily water demand for TF (Offices Levels 13 & 14)		0.563 kL/day
**Primary Treatment System 1 (GPT)	SPEL Vortceptor (or equivalent)	
Treatment System 2	SPEL Hydrosystem (or equivalent)	

Pollutant	MUSIC Model Results	Green Star Building Targets (Credit Achievement)	Melbourne Water Targets
Reduction in Stormwater Discharge	59.2%	40.0%	-
Reduction in Total Suspended Solids (TSS)	96.0%	85.0%	80.0%
Reduction in Total Phosphorus (TP)	75.7%	65.0%	45.0%
Reduction in Total Nitrogen (TN)	76.0%	45.0%	45.0%
Reduction in Total Gross Pollutants	100.0%	90.0%	70.0%
<i>Compliance with Project Targets</i>		✓	✓

NOTES:

**Nutrient reduction (Phosphorous and Nitrogen) not attributed to GPT as per Melbourne Water MUSIC guidelines.

Acronyms

RWT: Rain Water Tank

TF: Toilet Flushing

GPT: Gross Pollutant Trap

MUSIC v6.3.0 Input Parameters	
Rainfall data	
Rainfall Range & Station Name	C - Melbourne City (650-750mm)
10 Year Period	C - 1952-1961
Mean annual rainfall	C - 708mm
Evapotranspiration	C - 995
Time step	6 minutes
Estimation method	Stochastically generated

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

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

Pollutant Removal Rates (SPEL Hydrosystem)	
Total Suspended Solids	85%
Total Phosphorous	66%
Total Nitrogen	43%
Gross Pollutants	100%

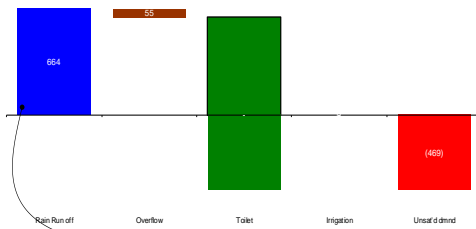
B.4 Rainwater Harvesting and Tank Reliability

Property Version **607-623 Collins Street, Melbourne**

Inputs:		Irrigation Schedule	
Commercial	Floor Area - NLA (m2)	1553.81	
	PPL [M/F]	53	
	Flush/Person/Day [M - Urinal]	2	
	Flush/Person/Day [M/F - WC]	2.3	
	Litres/Flush [Urinal/WC]	3.3	
	Total Daily usage (litres)	563	
Residential	PPL	239	
	Flush/Person/Day	3	
	Litres/Flush	3.33	
	Total Daily usage (litres)	2386	
Development	Total Daily usage (litres)	2953	
	Roof area (m2)	1,139	
	Collection Evaporation	5%	
	Tank Capacity (litres)	40,000	
	Irrigation Area (m2)	0	
	Toff if Total Rain (mm)	10	
	in the last	8 days	

Recalc updates pivots, table and graphs

System components (kls per year)



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

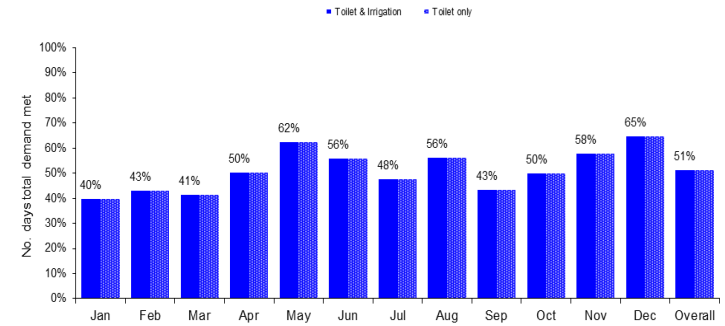
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Rain Run off	45	46	41	69	56	57	51	59	55	52	72	62	664
Overflow	(3)	(7)	(5)	(9)	(9)	(3)	-	(0)	(1)	(4)	(0)	(2)	(55)
Rain Water saved	41	40	36	60	55	54	51	58	54	47	62	50	609
Toilet	(92)	(83)	(92)	(89)	(92)	(89)	(92)	(92)	(89)	(92)	(89)	(91)	(1078)
(Shortfall) Surplus before Irrigation	(50)	(44)	(56)	(28)	(36)	(34)	(40)	(34)	(34)	(44)	(27)	(41)	(469)
Irrigation													
Unsatisfied Demand	(50)	(44)	(56)	(28)	(36)	(34)	(40)	(34)	(34)	(44)	(27)	(41)	(469)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Rain Run off	842	844	838	681	734	513	527	730	675	695	452	825	7,866
Overflow	(55)	(39)	(60)	(9)	(4)	(2)	-	(77)	(60)	(106)	(106)	(659)	(659)
Rain Water saved	487	705	677	662	692	511	527	730	599	545	452	719	7,307
Toilet	(1078)	(1078)	(1078)	(1081)	(1078)	(1078)	(1078)	(1081)	(1078)	(1078)	(1078)	(1078)	(12,937)
(Shortfall) Surplus before Irrigation	(590)	(373)	(400)	(419)	(385)	(567)	(550)	(351)	(479)	(533)	(626)	(356)	(5,630)
Irrigation													
Unsatisfied Demand	(590)	(373)	(400)	(419)	(385)	(567)	(550)	(351)	(479)	(533)	(626)	(356)	(5,630)

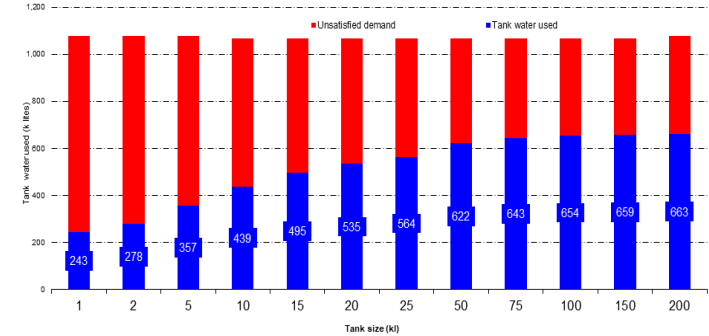
Reliability of supply (daily demand met)- Tank size what ifs

Tank	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Overall
%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
2k	10%	9%	10%	15%	20%	20%	19%	20%	18%	17%	15%	12%	16%
5k	7%	14%	19%	23%	30%	29%	31%	26%	24%	24%	21%	21%	24%
10k	24%	22%	24%	34%	42%	40%	36%	42%	35%	33%	36%	35%	34%
20k	32%	33%	31%	44%	54%	49%	42%	52%	41%	42%	49%	49%	43%
50k	44%	44%	45%	51%	65%	58%	48%	56%	43%	51%	58%	66%	52%
100k	58%	47%	52%	52%	66%	64%	64%	56%	43%	52%	58%	66%	56%
200k	58%	47%	55%	54%	66%	67%	58%	56%	43%	52%	58%	66%	57%

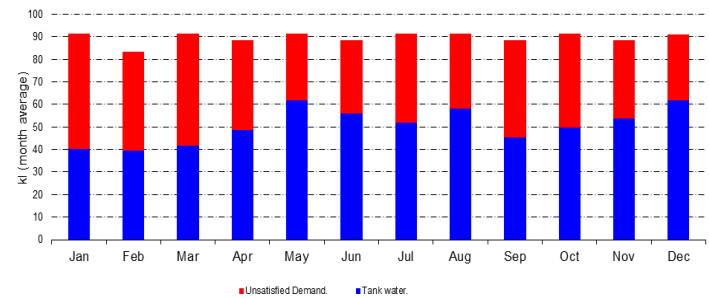
Graph 2 - Reliability of supply from tank (average across 12 years)



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



Graph 4 - Tank water used v unsatisfied demand by month



Appendix C. NatHERS Energy Ratings

FirstRate5 (Version 5.3.2b (3.21)) energy ratings have been undertaken for a representative sample of the apartments.

The development achieves a 7.0 star average NatHERS rating which exceeds the Councils 'best practice' standard of 6.5 stars and represents a high standard of thermal efficiency.

Class 2 Climate Zone 21

The results of the modelling confirm that:

- The development achieves a 7.0 star average NatHERS rating which exceeds the Councils 'best practice' standard of 6.5 stars and represents a high standard of thermal efficiency;
- All individual apartments have cooling loads of less than 30 MJ/m² and therefore meet the energy efficiency objectives set out in clause 58.03-1 of the Planning Scheme for the relevant climate zone (NatHERS Climate Zone 21 Melbourne);
- The average heating load of 51.8 MJ/m² and the cooling load of 23.1 MJ/m² are significantly less than the relevant threshold loads set out in NCC 2019 for Class 2 dwellings (average heating load <88 MJ/m², average cooling load <36 MJ/m²), and;
- The individual apartment heating and cooling loads are significantly less than the relevant threshold loads set out in NCC 2019 for Class 2 dwellings (heating load <120 MJ/m², cooling load <62 MJ/m²).

C.1 Results

Apartment	Star Rating	Energy Demand (MJ/m ²)		
		Total	Heating	Cooling
L17-Type 1	6.7	92.3	80.6	11.7
L17-Type 2	7.4	72.4	50.1	22.3
L17-Type 3	8.4	42.1	14.1	28.0
L17-Type 3	8.7	32.0	9.9	22.1
L17-Type 4	7.1	81.1	58.3	22.8
L17-Type 5	7.1	81.1	59.9	21.2
L17-Type 6	7.7	61.2	40.6	20.6
L17-Type 7	7.3	73.5	49.4	24.1
L17-Type 8	6.3	105.2	87.3	17.9
L20-Type 10	7.8	59.1	38.8	20.3
L20-Type 3	8.5	37.9	9.4	28.5
L20-Type 3	8.9	28.7	6.0	22.7
L20-Type 4	7.1	79.9	51.5	28.4
L20-Type 5	6.9	84.7	64.4	20.3
L20-Type 6	7.7	61.5	41.3	20.2
L20-Type 7	7.3	74.3	50.0	24.3
L20-Type 8	6.3	105.1	87.3	17.8
L20-Type 9	6.4	101.4	84.9	16.5
L21-Type 4	7.2	78.2	49.2	29.0
L22-Type 4	7.1	80.0	50.2	29.8
L28-Type 10	7.9	58.1	37.5	20.6
L28-Type 3	8.6	37.3	7.9	29.4
L28-Type 3	8.9	27.9	4.5	23.4
L28-Type 4	7.1	78.9	50.0	28.9

Apartment	Star Rating	Energy Demand (MJ/m ²)		
		Total	Heating	Cooling
L28-Type 11	8.0	52.9	27.2	25.7
L28-Type 12	7.3	74.5	48.9	25.6
L28-Type 7	7.3	75.3	51.3	24.0
L28-Type 8	6.2	107.8	90.2	17.6
L28-Type 9	6.4	102.6	86.2	16.4
L32-Type 13	6.9	84.6	69.0	15.6
L32-Type 14	7.1	79.9	62.6	17.3
L32-Type 15	7.9	57.6	36.9	20.7
L32-Type 16	7.6	64.1	34.3	29.8
L32-Type 17	7.9	54.4	30.7	23.7
L32-Type 18	7.4	70.3	47.9	22.4
L32-Type 19	7.9	56.8	38.5	18.3
L32-Type 20	5.9	115.9	90.7	25.2
L36-Type 21	7.0	82.9	64.5	18.4
L36-Type 22	7.9	57.1	39.2	17.9
L36-Type 23	7.4	68.5	40.0	28.5
L36-Type 24	6.8	87.7	62.6	25.1
L36-Type 19	7.6	66.0	45.9	20.1
L36-Type 20	5.5	130.6	101.3	29.3
L40-Type 25	6.9	84.1	55.2	28.9
L40-Type 26	7.2	78.0	49.4	28.6
L41-Type 25	5.7	123.0	93.5	29.5
L41-Type 26	6.1	112.0	83.6	28.4
Estimated Development Average	7.2	75.5	53.2	22.3

C.2 Building Materials

Element	Description	Added R Value
Floor Type	Entry Level: Suspended concrete Upper level: Timber	
Floor Insulation	Nil	Nil
Wall Insulation	Lightweight party walls: 75mm R 1.5 bulk insulation	R 1.5
	Lightweight corridor walls: 75mm R 1.5 bulk insulation	R 1.5
	Precast concrete Lift & stairwell walls: 75mm R 1.5 bulk insulation	R 1.5
	Insulated spandrel walls: 90mm R 2.5 bulk insulation	R 2.5
Roof Insulation	70mm Kingspan Kooltherm K10 G2 R 3.2 soffit board: Underside of concrete ceiling / roof sections shared with terraces & roof above	R 3.2
Roof Colour	Solar Absorptance – 0.5	
Window Frames	Aluminium thermally broken frames to all apartments	
Window Colour	Solar Absorptance – 0.5	
Sky Lights	Nil	
Ceiling fans	Nil	

NOTES

The added insulation R value must be equal to or higher than that specified above to meet the energy rating results.

All insulation specified for construction must meet Fire Engineer requirements

C.3 Glazing

Window Type	Description	Whole of Window Value		Location
		U	SHGC	
Thermally Broken Aluminium Awning Window	Capral Futureline 54W Series: Clear Double Glazed Low-e 6ET/12Ar/6	2.87	0.39	As per floor plans & elevations excluding apartments listed below
Thermally Broken Aluminium Fixed Window	Capral Futureline 419TB Series: Clear Double Glazed Low-e 6ET/12Ar/6	2.16	0.51	As per floor plans & elevations excluding apartments listed below
Thermally Broken Aluminium Awning Window	Capral Futureline 54W Series: Clear Double Glazed Insulglass 24mmInsulglassMax 564	2.88	0.19	L17-Type 1: To all West facing façade L17-Type 2: To all West facing façade & North facing bedroom façade L17-Type 4: Insulglass to East facing kitchen/living façade L17-Type 6: Insulglass to South facing kitchen/living façade L17-Type 8: To all West facing façade L20-Type 10: To all West facing façade & North facing bedroom façade L20-Type 4: To East kitchen/living façade L20-Type 5: Insulglass to East facing kitchen/living façade L20-Type 6: Insulglass to South facing kitchen/living façade L20-Type 8: To all West facing façade L20-Type 9: To all West facing façade L21-Type 4: To East kitchen/living façade L22-Type 4: To all East facing façade L28-Type 10: To all West facing façade & North facing bedroom façade L28-Type 4: To all East facing façade L28-Type 11: To all East facing façade L28-Type 12: To all East facing façade L28-Type 8: To all West facing façade L28-Type 9: To all West facing façade L32-Type 13: To all West facing façade L32-Type 14: To all West facing façade & North facing Kitchen/Living façade L32-Type 15: To all East facing façade & North facing Kitchen/Living façade

				<p>L32-Type 16: To all East facing façade</p> <p>L32-Type 17: To all East facing façade</p> <p>L32-Type 18: To all East facing façade</p> <p>L32-Type 20: To all West facing façade</p> <p>L36-Type 22: To all apartment</p> <p>L36-Type 23: To all East facing façade</p> <p>L36-Type 24: To all East facing façade</p> <p>L36-Type 20: To all West facing façade</p> <p>L40-Type 25: To all West facing façade</p> <p>L40-Type 26: To all East facing façade & North facing Kitchen/Living façade</p> <p>L41-Type 25: To all West facing façade & North facing façade</p> <p>L41-Type 26: To all East facing façade & North facing façade</p>
Thermally Broken Aluminium Fixed Window	Capral Futureline 419TB Series: Clear Double Glazed Insulglass 24mmInsulglassMax 564	2.16	0.23	<p>L17-Type 1: To all West facing façade</p> <p>L17-Type 2: To all West facing façade & North facing bedroom façade</p> <p>L17-Type 4: Insulglass to East facing kitchen/living façade</p> <p>L17-Type 6: Insulglass to South facing kitchen/living façade</p> <p>L17-Type 8: To all West facing façade</p> <p>L20-Type 10: To all West facing façade & North facing bedroom façade</p> <p>L20-Type 4: To East kitchen/living façade</p> <p>L20-Type 5: Insulglass to East facing kitchen/living façade</p> <p>L20-Type 6: Insulglass to South facing kitchen/living façade</p> <p>L20-Type 8: To all West facing façade</p> <p>L20-Type 9: To all West facing façade</p> <p>L21-Type 4: To East kitchen/living façade</p> <p>L22-Type 4: To all East facing façade</p> <p>L28-Type 10: To all West facing façade & North facing bedroom façade</p> <p>L28-Type 4: To all East facing façade</p> <p>L28-Type 11: To all East facing façade</p> <p>L28-Type 12: To all East facing façade</p> <p>L28-Type 8: To all West facing façade</p> <p>L28-Type 9: To all West facing façade</p> <p>L32-Type 13: To all West facing façade</p> <p>L32-Type 14: To all West facing façade & North facing Kitchen/Living façade</p> <p>L32-Type 15: To all East facing façade & North facing Kitchen/Living façade</p>

				L32-Type 16: To all East facing façade L32-Type 17: To all East facing façade L32-Type 18: To all East facing façade L32-Type 20: To all West facing façade L36-Type 22: To all apartment L36-Type 23: To all East facing façade L36-Type 24: To all East facing façade L36-Type 20: To all West facing façade L40-Type 25: To all West facing façade L40-Type 26: To all East facing façade & North facing Kitchen/Living façade L41-Type 25: To all West facing façade & North facing façade L41-Type 26: To all East facing façade & North facing façade
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GLAZING NOTES

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

The table above sets out the glazing specified 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.

** Insulglass has been specified to reduce the cooling loads to meet NCC and BADS maximum cooling load limits. Apartments listed are part of the representative sample of apartments that have been assessed. Insulglass requirements for apartments that have not been included as part of this representative sample, will be determined during the certification assessment process.

C.4 General Rating Assumptions

Item	Details
Floor Coverings	As per floor plans
Draught Proofing	Weather strips to all entry & external doors and windows. Seal all exhaust fans.
Down lights	Recessed down lights in ceiling /roof space to be sealed type / IC 4 rated to provide air tightness and contact with insulation
General	All party walls are classed as neighbour walls.
Shading	Overshadowing from adjoining buildings has been incorporated into the energy ratings

For apartments (class 2)

- Changes to any of the above stated specifications may affect energy performance and invalidate the energy ratings detailed in this report.
- 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 2019 Part J3

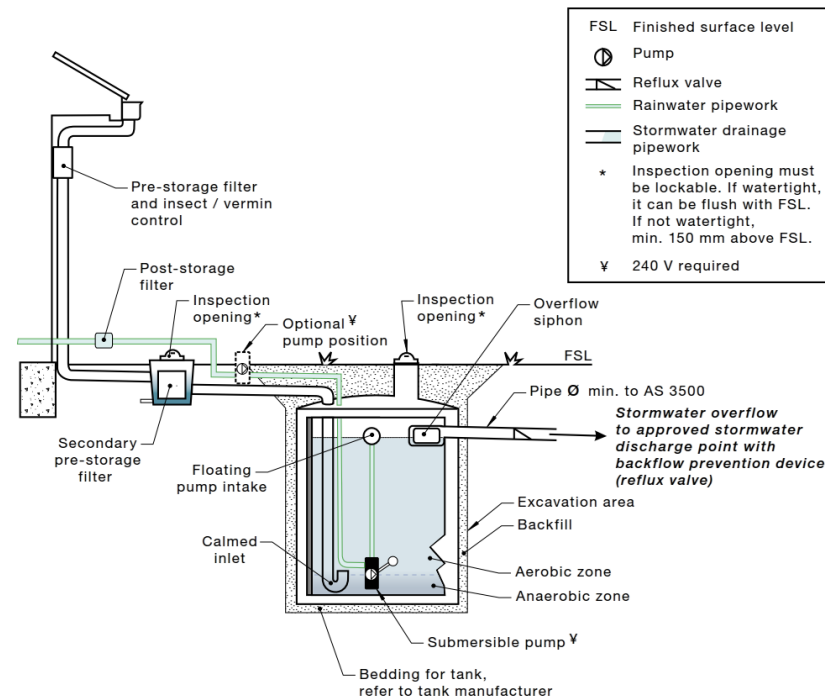
Once installed, a systematic maintenance program will be implemented by the owner's corporation maintenance contractor to ensure the rainwater harvesting system operates as designed and water quality is maintained.

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.



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		

Appendix E. Solar Photovoltaics

During the construction phase, high-efficiency solar PV modules with a total capacity of 56.4 kWp will be installed at roof level as per the preliminary layout indicated below.

Building services plant is subject to ongoing design development and it is anticipated that the optimal amount of PV integration will evolve to reflect this.

PV modules should be oriented in pairs to the east and west at 10-15° tilt and have at least 440Wp capacity (i.e. over 20% more efficient than traditional 360Wp 60-cell modules). High-efficiency modules deliver more compact arrays with inherently lower embodied ecological impact per unit of generation than standard efficiency modules.



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

During design development phase more detailed modelling will be undertaken to account for the effects of self-shading and shading from adjacent developments

Module level power electronics will be integrated to mitigate yield impacts of partial shading.

Total nett yield of this array is anticipated be of the order of 45MWh per annum equating to an estimated annual carbon emissions offset of 40 tonnes CO₂-e per annum. Simplistic modelling of the unshaded configuration is provided for reference.

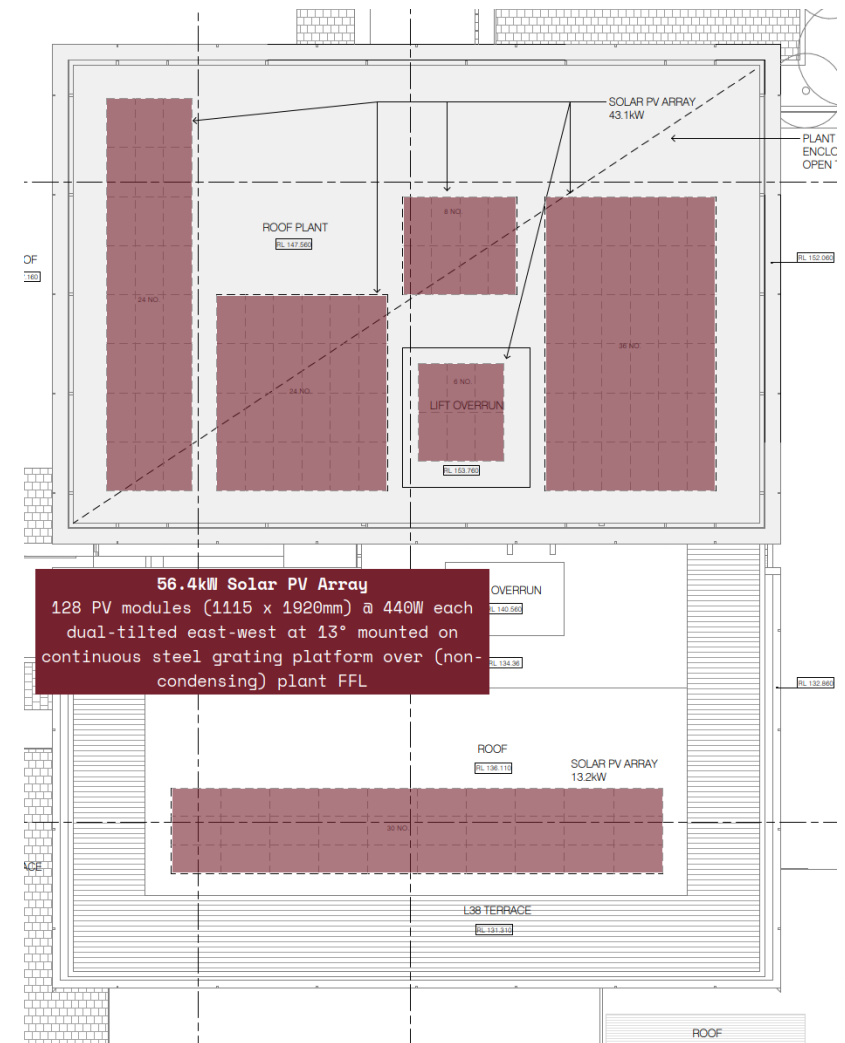


Figure 1 Indicative Solar Photovoltaic array layout

East facing array output

RESULTS


 Print Results

33,035 kWh/Year*

Month	Solar Radiation (kWh / m ² / day)	AC Energy (kWh)
January	6.75	4,418
February	6.07	3,627
March	4.93	3,343
April	3.26	2,154
May	2.05	1,407
June	1.81	1,197
July	1.88	1,300
August	2.64	1,819
September	3.79	2,535
October	5.00	3,385
November	5.47	3,557
December	6.57	4,294
Annual	4.19	33,036

User Comments

Type here to add optional comments to printout.

 Download Results: [Monthly](#) | [Hourly](#)

[Find A Local Installer](#)



* Caution: The PVWatts energy estimate is based on an hourly performance simulation using a typical-year weather file that represents a multi-year historical period for 607 Collins Street, Melbourne VIC 3001 for a Fixed (open rack) photovoltaic system.

These results are based on assumptions described in [Help](#) that may not accurately represent technical characteristics of the project you are modeling.

Location and Station Identification

Requested Location	607 Collins Street, Melbourne VIC 3001
Weather Data Source	Lat, Lng: -37.83, 144.94 1.1 mi
Latitude	37.83° S
Longitude	144.94° E

PV System Specifications

DC System Size	28.2 kW
Module Type	Premium
Array Type	Fixed (open rack)
System Losses	14.08%
Array Tilt	13°
Array Azimuth	90°
DC to AC Size Ratio	1.2
Inverter Efficiency	96%

West facing array output

RESULTS


 Print Results

33,380 kWh/Year*

Month	Solar Radiation (kWh / m ² / day)	AC Energy (kWh)
January	6.87	4,511
February	6.24	3,735
March	4.90	3,321
April	3.33	2,205
May	2.08	1,425
June	1.79	1,177
July	1.85	1,275
August	2.70	1,859
September	3.82	2,553
October	5.04	3,405
November	5.60	3,639
December	6.54	4,275
Annual	4.23	33,380

User Comments

Type here to add optional comments to printout.

 Download Results: [Monthly](#) | [Hourly](#)

[Find A Local Installer](#)



* Caution: The PVWatts energy estimate is based on an hourly performance simulation using a typical-year weather file that represents a multi-year historical period for 607 Collins Street, Melbourne VIC 3001 for a Fixed (open rack) photovoltaic system.

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Location and Station Identification

Requested Location	607 Collins Street, Melbourne VIC 3001
Weather Data Source	Lat, Lng: -37.83, 144.94 1.1 mi
Latitude	37.83° S
Longitude	144.94° E

PV System Specifications

DC System Size	28.2 kW
Module Type	Premium
Array Type	Fixed (open rack)
System Losses	14.08%
Array Tilt	13°
Array Azimuth	270°
DC to AC Size Ratio	1.2
Inverter Efficiency	96%

Appendix F. 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.

Appendix G. Green Star Buildings Credit 27 Movement & Place

A preliminary Movement and Place Calculations has been prepared to demonstrate that with the ratio of bicycle parking and carparks provided, the development is expected to meet the criteria for Credit Achievement.

Note that the calculator will be updated and included in the Sustainable Transport Plan to be prepared by the Traffic Consultants.

Calculator inputs are consistent with the Movement and Place Calculation Guide.



Movement and Place ^x

Scenario reference: Main

Summary

Project details

Project	9565
Address*	623 Collins St Melbourne 3000
Suburb*	Melbourne
State*	VIC
Latitude*	-37.8192066
Longitude*	144.9544422
Building type*	Multi-unit Residential

Results

Reduction in carbon emissions	40%
Increase in active mode use	566%
Reduction in vehicle kilometres travelled	29%
Categories of Amenities within a 400 m radius	Criteria Met
Amenities with a 400 m radius	Criteria Met
Credit Achievement	Credit Achieved

Project details

Project details

Project's Address	623 Collins St Melbourne VIC 3000
Building Type	Multi-unit Residential

Emission intensity

Does the project have its own proposed emissions intensity?	
Car (Driver) (g CO ₂ -e / vehicle km)	
Motorbike (g CO ₂ -e / passenger km)	

Sustainable transport

Mode shares

Train	17.99%	9.7%
Bus	3.17%	3%
Ferry	0%	0%
Tram	41.72%	23.3%
Car (Driver)	25.95%	20%
Car (Passenger)	4.09%	2%
Motorbike	0.91%	1%
Bicycle	3.85%	35%
Walk	2.31%	6%
Total mode share	99.99%	100%
Avoided Trips	2%	10%
Average trip length (km)	17.68	17.7
Work Weeks	40	40
Trips per annum	392	360
Emissions per trip (g CO ₂ -e/trip)	2774.69357776	1804.788288
Total emissions (tonnes/person/annum)	1.08767988	0.64972378
Total vkt (vkt/person/annum)	1798.48032	1274.4
Active modes (mode share % for active modes)	6.16%	41%

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Appendix H. ESD Referral Compliance Response

Section	Comments	Actions
General		
	Whilst the planning scheme does not require a registered Green Star project the industry has shifted considerably since the local policy was introduced. Green Star Buildings now has a significant amount of online calculators to demonstrate compliance with the tool and the preference is for a development of this scale to commit to going through a formal registration and certification process.	The project will not seek formal GBCA certification for this project.
	A buffer of 10% is advised for Green Star points to adequately achieve a 5 star – 35 point Green Star Building outcome.	The Green Star Buildings pathway has been updated to provide buffer points, with a 39 point target.
Responsible		
01 Green Star Accredited Professional	– Provide details of the Green Star Accredited Professional (individual) who has been engaged and has registered the project with the GBCA. Credit needs to be removed if benchmarking is only being pursued as it involves a level of marketing and financial disclosure that won't be realised.	This credit has been removed in the updated Green Star Buildings pathway and SMP.
03 Verification and Handover	– Schematic design stage should provide a review of the proposed design including an air barrier schematic, and to detail a proposed air tightness target.	This information is not available at schematic design phase. This can be provided by the architects at DD stage.
04 Operational Waste Management	– Credit is dependent upon review and approval from the waste team. The submitted Waste Management Plan should be updated to demonstrate compliance with this credit in addition to CoM Waste Management Guidelines.	To be conditioned. The Waste Management Plan will need to be updated to align with this credit.
05 Responsible Procurement	– Provide evidence of a risk and opportunities assessment and a responsible procurement plan. At a minimum, the design team with input from the building owner must demonstrate that 10 key items in the project's supply chain have been identified for the risk and opportunities assessment and responsible procurement plan.	A Risk & Opportunities assessment can be provided at TP stage. Partial compliance with the GSB credit can be conditioned.
Healthy		
11 Light Quality (Daylight)	– Provide calculations that demonstrate the amount of space that has adequate daylight as a proportion of the total regularly occupied areas of the building. Calculations must use Daylight Autonomy to assess daylight levels.	The GSB pathway has not targeted daylight. 2 points have been included for Artificial Lighting.

Section	Comments	Actions
Resilience		
16 Climate Change Resilience	– Provide a copy of the pre-screening climate change checklist and provide a project-specific climate change risk and adaptation assessment for the development. The assessment should detail and demonstrate how the design response addresses high and extreme risks.	A preliminary Climate Change Resilience report can be provided. This can be conditioned.
17 Operations Resilience	– Evidence should be provided that shows the project team have undertaken a comprehensive risk assessment of the acute shocks and chronic stresses likely to influence the future building operations. This should be address early in the design, as the design should respond to the identified risks.	A preliminary Operations Resilience report can be provided. This can be conditioned.
19 Heat Resilience	– Provide evidence via a site plan which itemises and calculates at least 75% of the whole site area comprises of one or a combination of strategies that reduce the heat island effect. The solar PV system area should be taken away from the total site area and then a calculation of 75% of the remaining site area needs to be calculated.	Ark Resources/Architects to provide calculations. This can be conditioned.
21 Upfront Carbon Emissions	– Further detail and evidence that the development can achieve the minimum requirements (buildings up front carbon emissions are 20% less than those of a reference building). Modelling or calculations via the Upfront Emissions Calculator need to be provided.	This information is not available at schematic design phase. Structural drawings and cost plan required can be provided by the architects at DD stage.
22 Energy Use	– The office space should provide details per the NABERS pathway indicating a Commitment Agreement will be entered into. Additional modelling for other spaces can be used using the reference pathway.	Due to centralised systems and isolation of services in the model, reference pathway for the whole building to be used. GBCA manual unclear on how to assess multiple building classifications.
24 Other Carbon Sources	– Provide a draft Zero Carbon Action Plan that details how the development will address energy consumption, procurement, generation and detail how the development will achieve 100% of building's electricity comes from renewable electricity and how 100% of the buildings energy comes from renewables.	Zero Carbon Action Plan not required when targeting exceptional performance (FAQ F-00291).
25 Water Use	– The preference is for the development to follow the Reducing Water Use pathway and demonstrate the building uses at least 15% less potable water compared to a reference building. This can be demonstrated using the GBCA's Potable Water Calculator which is also referenced in planning policy.	Green Star Buildings guidelines allows for water efficiency of fixtures to be nominated to meet this credit. Potable Water Calculations will not be undertaken.
Places		
27 Movement and Place	– Provide a Sustainable Transport Plan and additional evidence via the Movement and Place calculator that the project is meeting the minimum requirements in regards to bicycle parking spaces and associated change facilities, electric vehicle parking spaces and related infrastructure, a reduction in car parking and how the development prioritises walking (written description and walkscore evidence of 99).	The Movement and Place calculator will be included in the SMP and sustainable transport requirements confirmed by the Traffic consultant . A Sustainable Transport Plan can be conditioned.

Section	Comments	Actions
		Note that a reduction in parking is not a GSB criteria – reduction in emissions is the measurement for this credit.
	The development commits to 4 showers and 25 lockers as part of end of trip facilities that are shown on the planning drawings. 5% of car spaces are to be fitted with Electric Vehicle charges and 20% of spaces will be accommodated for future charging infrastructure.	Sustainable transport inclusions to be shown on plans – architects to address.
People		
34 Design for Inclusion	– Provide a needs analysis that confirms the development can achieve the requirements of the credit.	This credit has not been targeted in the GSB pathway.
35 Impacts to Nature	– Provide a report that indicates how the minimum expectations for the credit will be met by the design response including the building was not built on, or significantly impacted, a site with a high ecological value. The buildings light pollution has been minimised. It does not appear that a wetland system is existing onsite so it is advised to remove the following statement 'There is ongoing monitoring, reporting, and management of the site's wetland ecosystem'.	The SMP will be updated to clarify compliance with this credit.
36 Biodiversity Enhancement	– If the project uses the Green Factor tool to demonstrate the development meets a good level of green infrastructure on site it can be used to meet credit requirements under this credit. A technical question can be raised through the GBCA to enable this outcome.	This credit has not been targeted in the GSB pathway. This can be conditioned for the Landscape Conditions.
39 Waterway Protection	– The WSUD report that has been submitted meets the minimum requirements for stormwater quality and the targeted points under this credit. The planning drawings show a rainwater tank and note size (40KL), however, it should be noted on the drawings the intended reuse to toilets (to specified levels) and irrigation, as well as filtration requirements (proprietary device locations).	WSUD inclusions to be shown on plans – architects to address.

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