

Ark Resources Pty Ltd  
ABN 29 086 461 369  
arkresources.com.au

Level 1, 25 Ross Street  
South Melbourne VIC 3205  
61 3 9636 0280

Level 1, 241 Commonwealth Street  
Surry Hills NSW 2010  
61 2 8379 8968

8.05.2025

Mr Ben McCann  
Development Manager  
SMA Projects  
Level 3, 2-4 Ross Place  
South Melbourne VIC 3205

bmccann@smaprojects.com.au

**ADVERTISED  
PLAN**

Subject:

**Stage 2, 99 Derby Road, Sunshine — Sustainable Management Plan: Response to RFI**

Dear Ben,

I write in response to the ESD related queries in the RFI issued by the Department of Transport & Planning on 14 March 2023. I have provided a detailed response to each item below.

- Approximately seven dwellings exceed the NatHERS maximum cooling load for Tullamarine Climate Zone 60 of 22MJ/M2 per annum. This should be reviewed.

The NatHERS cooling caps referenced in clauses 55.07 & 58.03 were developed on behalf of DELWP by Ark Resources in 2016 in response to concerns that the prevailing (2016) NatHERS software did not impose sufficient limits on summer cooling loads in Victorian climate zones. In conjunction with the increase in the star rating threshold to 7 stars in NCC 2022, a very significant change was made to the NatHERS software underpinning calculations by referencing more recent climate data and a planning process under the Planning and Environment Act 1987. The NatHERS cooling caps therefore have been superseded.

In 2023, Ark Resources identified this misalignment between NCC 2022 NatHERS maximum cooling loads and the energy efficiency caps in clauses 55.07 & 58.03 and raised this issue on numerous occasions with representatives from DEECA, DTP and the relevant Ministers D'Ambrosio and Kilkenny. We were advised that agencies acknowledged the discrepancies and would be revising the BADS cooling load limits. We are not yet seen any formal response from either Department on this issue.

Notwithstanding the above, the combination of ceiling fans to apartment living rooms as shown on the architectural plans, the revised layouts and the inclusion of fans to bedrooms in B-202 and D-103 reduces the cooling loads of all seven apartments below 22MJ/m2 as summarised in the table below and in the revised SMP (Rev C) issued on 8 May 2025, which is attached.

Apartment	Cooling (SMP Rev B)	Cooling (SMP, Rev C)
B-202	24.2	21.8
B-503	25.0	18.7
B-603	25.0	19.3
D-102	26.2	21.9
D-103	22.3	21.3
D-502	24.3	20.7
D-503	23.0	21.5
D-602	23.7	21.2
D-603	22.4	21.4

Note that ceiling fans are also required in the bedrooms of apartments B-1.03, B-3.02, B-4.02, D-2.03, D-3.03, D-4.03 to meet required NatHERS star rating and clause 55.07 & 58.03 cooling caps. Refer to Appendix E.2 of the SMP (Rev C).

- *The switch from BESS to Green-Star assessment tool is queried. DTP expects the proposed development to achieve the same ESD credentials as was previously approved by Council. The Sustainability Management Plan must outline clear commitments, rather than targets. Please refer to Brimbank City Council's ESD advice.*

As outlined in the accompanying letter to the DTP provided on 25 February 2025 (attached), the ESD targets for the apartment buildings have been increased in stringency from the endorsed SMP. A 5 star certified Green Star Buildings rating is deemed to achieve ESD 'Excellence', whereas a 59% BESS score is recognised as 'Best Practice'. The NatHERS rating has also increased the minimum from 6.5 stars to a 7 star development average. Once the revised SMP is endorsed, formal certification through the Green Building Council peer review process must be obtained to meet the requirements of the planning permit, making this a clear commitment.

For reference, the decision to use the Green Star Building assessment method for the apartments being supported by the HAFF was made due to the design guidelines for social housing projects of this scale generally required to obtain a Green Star rating.

I trust this provides an adequate response to the queries raised by the DTP RFI, however please don't hesitate to let me know if you require further details.

Yours sincerely



Leonie Dixon  
Senior ESD Advisor

Attached:            Revised SMP (Rev C), dated 8 May 2025  
                         Letter to DTP, dated 25 February 2025  
                         Endorsed SMP (Rev M), dated 19 March 2024

**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**

**ADVERTISED  
PLAN**



08.05.2025  
File No. 622K

Sustainable Management Plan

Housing Australia Future Fund application  
Apartment Blocks B, C & D  
Stage 2, 99 Derby Road, Sunshine

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

99 Derby Road, Sunshine

DISCLAIMER

Note that this report has been prepared to support the town planning submission based on planning stage documentation and should not be used for tender or construction purposes, given that design details are preliminary and construction details are not yet sufficiently resolved.

Note that revised NatHERS ratings and Section J energy modelling, must be undertaken based on Design Development drawings (typically 70%) to accurately determine and specify thermal performance of building elements, insulation systems and glazing thermal performance prior to any detailed costing, or for NCC compliance purposes.

Issue	Date	Prepared	Checked	Status
A	22.10.2024	MT	LD	HAFF Draft
B	20.11.2024	MT	LD	HAFF
C	08.05.2025	MT	LD	HAFF DTP RFI

Contents

1.0	Introduction	3
2.0	Site Description	6
3.0	Key ESD Initiatives	8
4.0	Green Star Building	9
5.0	NatHERS Energy Ratings	11
6.0	MUSIC Modelling	12
7.0	Conclusion	13

Appendices

Appendix A.	Green Star Building Pathway	14
Appendix C.	MUSIC Modelling	25
Appendix D.	WSUD Maintenance Manual	29
Appendix E.	NatHERS Energy Rating Assumptions	31
Appendix F.	Solar Photovoltaics	36
Appendix G.	Site Management Plan	38

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.

ADVERTISED  
PLAN

## 1.0 Introduction

---

Ark Resources has been engaged by SMA Projects to provide advice in relation to environmentally sustainable development outcomes from apartment blocks B, C and D, which form the social housing component of the proposed development at 99 Derby Road, Sunshine, for the purposes of applying for funding through the Housing Australia Future Fund (HAFF).

The apartments have been designed to meet Clauses 15.01-2L-02 (Environmentally Sustainable Development), 19.03-3S and 53.18-5 (Stormwater Management) of the City of Brimbank Planning Scheme. They also meet the sustainable design requirements of the HAFF.

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 Ben McCann, SMA Projects.

**ADVERTISED  
PLAN**

**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 MAP Architecture set out below.

GROUND LEVEL MASTERPLAN	TP00.20	15	28.04.2025
LEVEL 1 MASTERPLAN	TP00.21	15	28.04.2025
LEVEL 2 MASTERPLAN	TP00.22	15	28.04.2025
LEVEL 3 MASTERPLAN	TP00.23	15	28.04.2025
LEVEL 4 MASTERPLAN	TP00.24	15	28.04.2025
LEVEL 5 MASTERPLAN	TP00.25	15	28.04.2025
LEVEL 6 MASTERPLAN	TP00.26	4	28.04.2025
ROOF MASTERPLAN	TP00.27	3	18.11.2024
GROUND - DRAWING AREA 1	TP01.00	18	28.04.2025
GROUND - DRAWING AREA 2	TP01.01	17	28.04.2025
GROUND - DRAWING AREA 3	TP01.02	17	28.04.2025
LEVEL 1 - DRAWING AREA 1	TP01.03	17	28.04.2025
LEVEL 1 - DRAWING AREA 2	TP01.04	16	28.04.2025
LEVEL 1 - DRAWING AREA 3	TP01.05	15	18.11.2024
LEVEL 2 - DRAWING AREA 1	TP01.06	16	28.04.2025
LEVEL 2 - DRAWING AREA 2	TP01.07	16	28.04.2025
LEVEL 2 - DRAWING AREA 3	TP01.08	15	18.11.2024
LEVEL 3 - DRAWING AREA 1	TP01.09	16	28.04.2025
LEVEL 3 - DRAWING AREA 2	TP01.10	16	28.04.2025
LEVEL 3- DRAWING AREA 3	TP01.10A	15	18.11.2024
LEVEL 4 - DRAWING AREA 1	TP01.11	16	28.04.2025
LEVEL 4 - DRAWING AREA 2	TP01.12	16	28.04.2025
LEVEL 4 - DRAWING AREA 3	TP01.13	15	18.11.2024
LEVEL 5 - DRAWING AREA 1	TP01.14	4	28.04.2025
LEVEL 5 - DRAWING AREA 2	TP01.15	4	28.04.2025

LEVEL 5 - DRAWING AREA 3	TP01.16	3	18.11.2024
LEVEL 6 - DRAWING AREA 1	TP01.17	4	28.04.2025
LEVEL 6 - DRAWING AREA 2	TP01.18	4	28.04.2025
LEVEL 6 - DRAWING AREA 3	TP01.19	3	18.11.2024
BASEMENT FLOOR PLAN	TP01.20	14	18.11.2024
BASEMENT RCP & DETAILS	TP01.21	7	18.11.2024
TYPICAL TOWNHOUSES	TP02.00	11	18.11.2024
TYPICAL TOWNHOUSES	TP02.01	7	18.11.2024
TYPICAL TOWNHOUSES	TP02.02	10	18.11.2024
TYPICAL TOWNHOUSES	TP02.03	11	18.11.2024
TYPICAL TOWNHOUSES	TP02.04	8	18.11.2024
TYPICAL TOWNHOUSES	TP02.05	8	18.11.2024
TYPICAL TOWNHOUSES	TP02.06	9	18.11.2024
TYPICAL TOWNHOUSES	TP02.07	7	18.11.2024
CLAUSE 58 ASSESSMENT -TYPICAL APARTMENTS	TP02.10	13	28.04.2025
CLAUSE 58 ASSESSMENT - TYPICAL APARTMENTS	TP02.11	13	28.04.2025
CLAUSE 58 ASSESSMENT - TYPICAL APARTMENTS	TP02.12	10	28.04.2025
CLAUSE 58 ASSESSMENT - TYPICAL APARTMENTS	TP02.13	10	28.04.2025
CLAUSE 58 ASSESSMENT - TYPICAL APARTMENTS	TP02.14	1	18.11.2024
SITE ELEVATIONS	TP03.00	21	18.11.2024
INTERNAL APARTMENT BLOCK ELEVATIONS	TP03.01	19	28.04.2025
INTERNAL TYPICAL LANEWAY ELEVATIONS	TP03.02	16	28.04.2025
INTERNAL LANEWAY ELEVATIONS	TP03.03	18	28.04.2025
INTERNAL LANEWAY ELEVATIONS	TP03.04	17	18.11.2024
INTERNAL LANEWAY ELEVATIONS	TP03.05	19	28.04.2025
INTERNAL LANEWAY ELEVATIONS	TP03.06	3	28.04.2025
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.10	9	18.11.2024
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.11	9	18.11.2024

TOWNHOUSES - TYPICAL ELEVATIONS	TP03.12	9	18.11.2024
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.13	8	18.11.2024
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.14	7	18.11.2024
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.15	7	18.11.2024
SECTION A & B	TP04.00	11	18.11.2024
SECTION C	TP04.01	10	18.11.2024
SECTION D	TP04.02	10	18.11.2024
OVERLOOKING PLAN	TP04.09	3	18.11.2024
SCREENING DEVICES	TP04.10	9	18.11.2024
SHADING DEVICES TO NORTH	TP04.11	9	18.11.2024
LANDSCAPE BREAK PLAN	TP04.12	2	18.11.2024
LANDSCAPE BREAK PLAN	TP04.13	2	18.11.2024
SHADOW DIAGRAM 9-10AM	TP06.01	12	28.04.2025
SHADOW DIAGRAM 11AM-12PM	TP06.02	13	28.04.2025
SHADOW DIAGRAM 1PM-3PM	TP06.03	12	28.04.2025
SHADOW ANALYSIS SOUTH 9AM SEPTEMBER 22nd EQUINOX	TP06.10	6	18.11.2024
SHADOW ANALYSIS SOUTH 10AM SEPTEMBER 22nd EQUINOX	TP06.11	7	18.11.2024
SHADOW ANALYSIS SOUTH 11AM SEPTEMBER 22nd EQUINOX	TP06.12	6	18.11.2024
SHADOW ANALYSIS SOUTH 12PM SEPTEMBER 22nd EQUINOX	TP06.13	6	18.11.2024
SHADOW ANALYSIS SOUTH 1PM SEPTEMBER 22nd EQUINOX	TP06.14	6	18.11.2024
SHADOW ANALYSIS SOUTH 2PM SEPTEMBER 22nd EQUINOX	TP06.15	3	18.11.2024
SHADOW ANALYSIS SOUTH 3PM SEPTEMBER 22nd EQUINOX	TP06.16	5	18.11.2024
CLAUSE 58 ASSESSMENT -COMPLIANCE SCHEDULE	TP08.00	11	28.04.2025
MATERIAL AND FINISHES SCHEDULE	TP09.01	13	18.11.2024

SITE CIRCULATION SPATIAL ANALYSIS	TP12.00	10	18.11.2024
SHADING DEVICE PLAN - GROUND LEVEL	TP14.00	14	18.11.2024
SHADING DEVICE PLAN - LEVEL 1	TP14.01	13	18.11.2024
SHADING DEVICE PLAN - LEVEL 2	TP14.02	13	18.11.2024
FENCE PLAN	TP20.01	4	18.11.2024

**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**

**ADVERTISED  
PLAN**



## 2.0 Site Description

---

The social housing application comprises the following attributes:

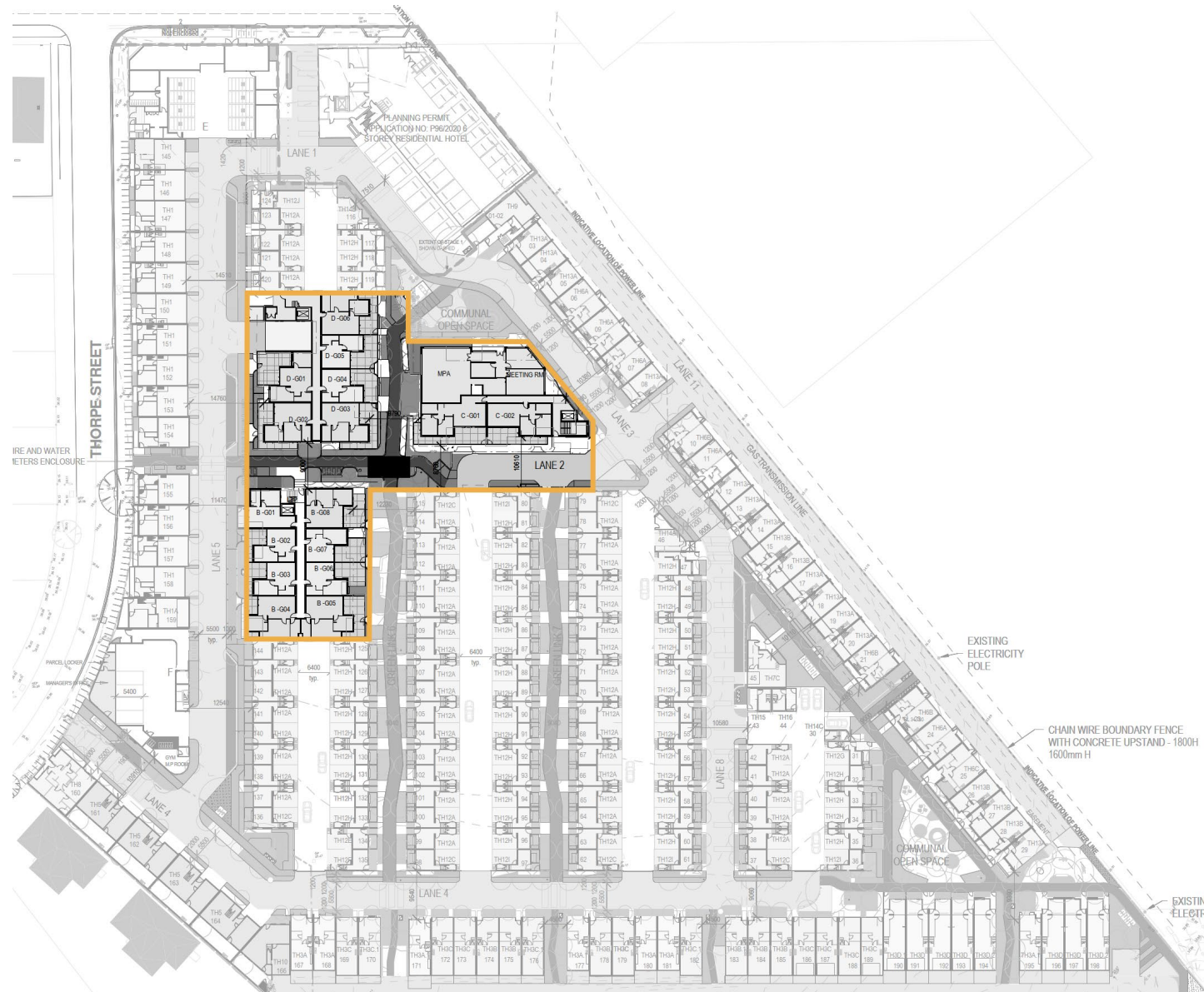
- Block B: 51 apartments with 82 bedrooms;
- Block C: 32 apartments with 60 bedrooms;
- Block D: 54 apartments with 76 bedrooms;
- Communal amenities for all residents;
- Located within the City of Brimbank;
- Application site area 2,284m<sup>2</sup> (approximately)

**ADVERTISED  
PLAN**

**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**



## 2.1 Application area







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

**ADVERTISED  
PLAN**

### 3.0 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:

<b>Energy</b> Commitment to 100% Green Power 	<b>Transport</b> Electric vehicle chargers and infrastructure 
<b>Water</b> Rainwater harvesting system for toilet flushing 	<b>Performance</b> High-performance glazing and energy efficient building services, appliances and fixtures 

### ADVERTISED PLAN

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

<b>Green Star Buildings</b> The development achieves a certified 5 Star Green Star Buildings performance standard  5 star	<b>Stormwater</b> The development meets the Best Practice standard for stormwater quality.  
<b>NatHERS Thermal Performance</b> The development achieves a 7.0 star development average  7.0 stars	<div>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</div>

## 4.0 Green Star Building

The Green Star Buildings (v1 Rev C) tool has been used as a benchmarking framework for the proposed apartment scheme and demonstrates the preliminary design potential to achieve a 5 Star standard, certified by the Green Building Council of Australia.

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 below and in Appendix A.

ADVERTISED  
PLAN

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

### Green Star Building Rating

5  
star

### Total Points Targeted

41  
points

Note that a minimum of 35 points must be achieved for a 5 star Green Star Buildings rating to be achieved. A points margin of 13% has been incorporated into the pathway presented in this report as a contingency to allow for the inevitable change to the pathway inclusive of 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.

Summary of Green Star Building credits targeted.

Credit		Target	Points
1	Industry Development	Credit Achievement	1
2	Responsible Construction	Credit Achievement	1
3	Verification and Handover	Credit Achievement	1
4	Responsible Resource Management	Minimum Expectation	
5	Responsible Procurement		
6	Responsible Structure		
7	Responsible Envelope		
8	Responsible Systems		
9	Responsible Finishes	Credit Achievement	1
10	Clean Air	Minimum Expectation	
11	Light Quality	Minimum Expectation	
12	Acoustic Comfort	Minimum Expectation	
13	Exposure to Toxins	Credit Achievement	2
14	Amenity and Comfort	Credit Achievement	2
15	Connection to Nature		
16	Climate Change Resilience	Credit Achievement	1
17	Operations Resilience		
18	Community Resilience		
19	Heat Resilience	Credit Achievement	1
20	Grid Resilience		
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		
28	Enjoyable Places		
29	Contribution to Place	Credit Achievement	2
30	Culture, Heritage and Identity		
31	Inclusive Construction Practices	Credit Achievement	1
32	Indigenous Inclusion		
33	Procurement and Workforce Inclusion	Credit Achievement	2
34	Design for Inclusion	Credit Achievement	2
35	Impacts to Nature	Credit Achievement	2
36	Biodiversity Enhancement	Credit Achievement	2
37	Nature Connectivity		
38	Nature Stewardship	Credit Achievement	2
39	Waterway Protection		
40	Market Transformation Homes for Homes	Credit Achievement	1
41	Leadership Challenges Climate Positive Pathway	Credit Achievement	1

41 points

Refer to Appendix A for details of credit requirements

ADVERTISED  
PLAN

## 5.0 NatHERS Energy Ratings

---

HERO (v4.1) energy ratings have been undertaken for a representative sample of the apartments in blocks B, C & D.

The development achieves a 7.0 star development average NatHERS rating which meets the NCC 2022 standard for thermal performance.

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

ADVERTISED  
PLAN

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

---

### NatHERS Rating

The apartments will achieve a NatHERS energy rating development average of:

7.0  
stars

---

### Heating Load

The apartments have an average heating load of

79.0  
MJ/m<sup>2</sup>

---

### Cooling Load

The apartments have an average cooling load of

13.4  
MJ/m<sup>2</sup>

---

To assess the quality of stormwater runoff, an analysis has been undertaken using MUSIC Modelling software for the entire Stage 2 site.

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:  83.7	Reduction in Total Phosphorus (TP) load:  45.7
Reduction in Total Nitrogen (TN) load:  47.1	Reduction in Gross Pollutants (GP) load:  99.3

Note that the Rocla CDS Nipper GPT has been nominated in the MUSIC model, with the nutrient reduction (Nitrogen and Phosphorous) not attributed to this device, as per Melbourne Water MUSIC Guidelines (Condition 1(r)iv). Independent testing results for this device are available at the following link:

<https://www.ewater.org.au/archive/croch/archive/pubs/pdfs/technical199902.pdf>

Refer to Appendix C. for the MUSIC rating results, and Appendix D for the WSUD Maintenance Manual.

A rainwater harvesting system will be installed comprising:

- Stormwater collection from all townhouse roof areas (combined catchment areas of approx. 9,923m<sup>2</sup>) and installation of rainwater tanks for each dwelling, as follows:
  - 34no. 1.0kL RWT for Type TH01, TH01A, TH03A, TH03D, TH07C, TH14A, TH14B.
  - 16no. 1.51kL RWT for Type TH03B, TH03C.
  - 7no. 2.0kL RWT for Type TH05, TH08, TH10.
  - 136no. 0.5kL RWT for Type TH06, TH06B, TH06C, TH12A-H, TH13B, TH14C, Th15, TH16.
- Total RWT capacity for townhouses is 141.66kL.
- Stormwater collection from:
  - Block B Apartments – approx. 590m<sup>2</sup> catchment area to 20kL tank.
  - Block C Apartments – approx. 410m<sup>2</sup> catchment area to 15kL tank.
  - Block D Apartments – approx. 595m<sup>2</sup> catchment area to 20kL tank.
  - Block E (Derby Corner) Apartments – approx. 336m<sup>2</sup> catchment area to 15kL tank.
  - Block F (Thorpe Street) Apartments – approx. 318m<sup>2</sup> catchment to 10kL tank.
- Re-use of water for toilet flushing in all 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:

- Treatment of runoff from all ground level paving (4,946m<sup>2</sup>) by raingardens with a total surface area of 99m<sup>2</sup>.
- Landscape areas that promote infiltration and reduce runoff during storm events.
- A Rocla CDS Nipper gross pollutant trap (or equivalent primary treatment device) located near stormwater Legal Point of Discharge to capture suspended solids and litter generated onsite.



## 7.0 Conclusion

---

This report provides details of a comprehensive package of sustainable design features which will be integrated into the design and specification of apartment blocks B, C and D 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 certified 5 star Green Star standard based on the Buildings rating tool (V1 Rev C);
- achieve a NatHERS development average of 7.0 stars; and
- attain the Best Practice standard for urban stormwater quality

Accordingly, the sustainable design outcomes from the proposed social housing apartment scheme are considered to be consistent with the objectives of Clauses 15.01-2L-02 (Environmentally Sustainable Development), 19.03-3S and 53.18-5 (Stormwater Management) of the City of Brimbank Planning Scheme, as well as the sustainable design requirements of the Housing Australia Future Fund.

**ADVERTISED  
PLAN**

**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**

---

### Green Star

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

**5** star

---

### NatHERS Ratings

The apartments will achieve a NatHERS rating development average of:

**7.0** stars

---

### 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 Submission Guidelines (v1 Revision C, 18 October 2023).

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
<b>1 Industry Development</b>  The development facilitates industry transformation through partnership, collaboration, and data sharing	The building owner or developer appoints a Green Star Accredited Professional (GSAP).	1	Strategy Brief Concept Design Tender Construction Handover Use
	The building owner or developer discloses the cost of sustainable building practices to the GBCA.  The project team must complete, and include in the submission, the Green Star Financial Transparency disclosure template. The template requires and enables the project team to submit the cost of sustainable building practices of the project including design, construction, and documentation to the GBCA.		
	The building owner or developer markets the building to enable it to be made available for the sole purpose of enabling its consideration and review as a case study for the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright.  The project team must: <ul style="list-style-type: none"> <li>– Provide information from the project's marketing team must answer the questions in the submission form for a Green Star Case Study. The case study seeks information on the sustainability initiatives that the building targeted to enable it being marketed and the Green Star Case Study.</li> <li>– Detail how the building will detail its sustainability achievements to its stakeholders. The stakeholders are defined as the typical building occupants and visitors.</li> </ul>		
	The building owner or developer appoints a Green Star Accredited Professional (GSAP).		
<b>2 Responsible Construction</b>  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"> <li>– Information on the sustainable building certification(s) sought, including:                             <ul style="list-style-type: none"> <li>· the sustainability attributes of the building and their benefits</li> </ul> </li> </ul>		

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
	<p>the value of certification</p> <ul style="list-style-type: none"> <li>the role site worker(s) play in delivering a sustainable building</li> </ul>		
	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	
<b>3 Verification and Handover</b>  The building has been optimised and handed over to deliver a high level of performance in operation	<p>The building is set up for optimum ongoing management due to its appropriate metering and monitoring systems.</p> <p>The building must have accessible energy and water metering for all common uses, major uses, and major sources.</p> <p>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.</p> <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"> <li>Prior to construction:               <ul style="list-style-type: none"> <li>Set environmental performance targets</li> <li>Perform a services and maintainability review</li> <li>Design for airtightness</li> </ul> </li> <li>During construction and practical completion:               <ul style="list-style-type: none"> <li>Commission the building</li> <li>Engage building tuning service provider</li> <li>Test for airtightness</li> </ul> </li> <li>After practical completion:               <ul style="list-style-type: none"> <li>Tune the building over the next 12 months</li> </ul> </li> </ul> <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"> <li>Appropriate content for all nominated building systems has been developed and provided</li> <li>The appropriate user group has access to the information they require to deliver best practice environmental outcomes</li> <li>Guidance on keeping information up to date is provided to the facilities management team in these documents</li> </ul>	MINIMUM EXPECTATION	Design Tender Construction Handover Use

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
	<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	
<p><b>4 Responsible Resource Management</b></p> <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>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 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"> <li>General waste going to landfill</li> <li>Recycling streams to be collected by the building's waste collection service, including: <ul style="list-style-type: none"> <li>paper and cardboard</li> <li>glass</li> <li>plastic</li> </ul> </li> <li>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"> <li>organics, e-waste, batteries etc.</li> </ul> </li> </ul> <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>	MINIMUM EXPECTATION	Design Handover Use
<p><b>9 Responsible Finishes</b></p> <p>The building's internal finishes are comprised of responsibly manufactured products</p>	<p>40% of all internal building finishes (by cost) meet a Responsible Products Value of at least 7.</p> <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>	1	Design Tender Construction

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
<b>10 Clean Air</b>  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	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.  All new and existing ductwork that serves the building must be cleaned prior to occupation in accordance with a recognised Standard.	MINIMUM EXPECTATION	Design Tender Construction Handover Use
	The building must be provided with at an adequate amount of outside air.  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:  Where ventilation is by mechanical means, the building must provide outdoor air as per AS1668.2:2012 for the default occupancy.  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.		
	Point source pollutants must be exhausted directly outside (bathrooms, kitchens,		
<b>11 Light Quality</b>  The building provides good daylight and its lighting is of high quality	Lighting within the building meets minimum comfort requirements.  Lighting within the building must meet the following requirements: <ul style="list-style-type: none"> <li>All LED lighting installed has no objectionable flicker (IEEE 1789-2015)</li> <li>Light sources must have a minimum Colour Rendering Index (CRI) of 80, or higher</li> <li>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</li> <li>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</li> <li>All light sources must have a maximum of 3 MacAdam Ellipses deviation.</li> </ul>	MINIMUM EXPECTATION	Concept Design Tender
	Good lighting levels suitable for the typical tasks in each space are available.		
	The building provides adequate levels of daylight. <ul style="list-style-type: none"> <li>Ensures regularly occupied areas are in reasonable proximity to glazed façades, windows, or skylights</li> <li>Maximises daylight to spaces that prioritise learning, healing, and living: <ul style="list-style-type: none"> <li>For apartments, how in 95% of all apartments, the living rooms and all bedrooms have access to a view and daylight.</li> </ul> </li> </ul>		
<b>12 Acoustic Comfort</b>	Internal noise levels from services and the outside is limited through an acoustic comfort strategy.  The Acoustic Comfort Strategy is to include: <ul style="list-style-type: none"> <li>A summary of the Standards, legislation, guidelines, and other requirements that apply to the project</li> </ul>	MINIMUM EXPECTATION	Design Tender Construction

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage																														
The building provides acoustic comfort for building occupants	<ul style="list-style-type: none"><li>– 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</li><li>– Description of how the design solution is intended to achieve the proposed performance metrics</li></ul>		Handover																														
<div><b>13 Exposure to Toxins</b></div> <div>The building’s occupants are not directly exposed to toxins in the spaces they spend time in</div>	<div>The building’s paints adhesives, sealants, and carpets are low in TVOC or non-toxic.</div> <div>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.</div> <div><b>Paints, Adhesives and Sealants</b></div> <table><thead><tr><th>Product category</th><th>Max. Total Volatile Organic Compounds (TVOC) content in grams per litre (g/L) of ready to use product</th></tr></thead><tbody><tr><td>General purpose adhesives and sealants</td><td>50</td></tr><tr><td>Interior wall and ceiling paint, all sheen levels</td><td>16</td></tr><tr><td>Trim, varnishes, and wood stains</td><td>75</td></tr><tr><td>Primers, sealers, and prep coats</td><td>65</td></tr><tr><td>One and two pack performance coatings for floors</td><td>140</td></tr><tr><td>Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives</td><td>250</td></tr><tr><td>Structural glazing adhesive, wood flooring and laminate adhesives and sealants</td><td>100</td></tr></tbody></table> <div><b>Carpets</b></div> <table><thead><tr><th>Compliance option</th><th>Test protocol</th><th>Limit</th></tr></thead><tbody><tr><td rowspan="2">ASTM D5116</td><td>ASTM D5116 - Total VOC limit*</td><td>limit* 0.5mg/m² per hour</td></tr><tr><td>ASTM D5116 - 4-PC (4-Phenylcyclohexene) *</td><td>0.05mg/m² per hour</td></tr><tr><td>ISO 16000 / EN 13419</td><td>ISO 16000 / EN 13419 - TVOC at three days</td><td>0.5 mg/m² per hour</td></tr><tr><td>ISO 10580 / ISO/TC 219 (Document N238)</td><td>ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours</td><td>0.5mg/m² per hour</td></tr></tbody></table> <div>The building’s engineered wood products are low in TVOC or non-toxic.</div>	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/m² per hour	ASTM D5116 - 4-PC (4-Phenylcyclohexene) *	0.05mg/m² per hour	ISO 16000 / EN 13419	ISO 16000 / EN 13419 - TVOC at three days	0.5 mg/m² per hour	ISO 10580 / ISO/TC 219 (Document N238)	ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5mg/m² per hour	MINIMUM EXPECTATION	Design Tender Construction Handover
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/m² per hour																															
	ASTM D5116 - 4-PC (4-Phenylcyclohexene) *	0.05mg/m² per hour																															
ISO 16000 / EN 13419	ISO 16000 / EN 13419 - TVOC at three days	0.5 mg/m² per hour																															
ISO 10580 / ISO/TC 219 (Document N238)	ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5mg/m² 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><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/m³**</td></tr><tr><td>AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)</td><td>≤1mg/L</td><td>ASTM E1333</td><td>≤0.12mg/m³***</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/m</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>	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/m³hr	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/m³hr (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/m³**	AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/L	ASTM E1333	≤0.12mg/m³***	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	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/m³hr	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/m³hr*				
	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/m³hr																																			
	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/m³hr (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/m³**																																				
AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/L	ASTM E1333	≤0.12mg/m³***																																				
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																																				
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/m³hr																																				
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/m³hr*																																						
	<p>Occupants are not exposed to banned or highly toxic materials in the building.</p> <p>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><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>	Element	Concentration	TVOC	0.27 ppm	Formaldehyde	0.02 ppm	2																															
Element	Concentration																																						
TVOC	0.27 ppm																																						
Formaldehyde	0.02 ppm																																						
<p><b>14 Amenity and Comfort</b></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</p> <p>Concept</p> <p>Design</p> <p>Tender</p> <p>Handover</p> <p>Use</p>																																				
<p><b>16 Climate Change Resilience</b></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	<p>Strategy</p> <p>Brief</p> <p>Concept</p> <p>Design</p>																																				

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
The building has been built to respond to the direct and indirect impacts of climate change	Climate Change Risk & Adaptation assessment undertaken during early stage aligned with AS5334 under RCP 8.5 for 2050 & 2080.	1	
<b>19 Heat Resilience</b>  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: Vegetation <ul style="list-style-type: none"> <li>Green roofs</li> <li>Roofing materials, including shading structures, having the following:               <ul style="list-style-type: none"> <li>For roof pitched &lt;15° – a three-year SRI of minimum 64</li> <li>For roof pitched &gt;15° – a three-year SRI of minimum 34</li> </ul> </li> <li>Unshaded hard-scaping elements with a three-year SRI of minimum 34 or an initial SRI of minimum 39</li> <li>Hardscaping elements shaded by overhanging vegetation</li> </ul>	1	Design Tender Construction
<b>21 Upfront Carbon Emissions</b>  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 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.		
<b>22 Energy Use</b>  (Residential Pathway)  The building has low energy consumption	The building has a weighted-area average of NatHERS 6.5 stars	MINIMUM EXPECTATION	Brief Concept Design Tender
	The building meets at least NatHERS 5 stars for each sole-occupancy unit		
	The building addresses domestic hot water demand		
	Where a pool exists, it has a pool cover		
	The building has a weighted-area average of NatHERS 7 Stars and at least NatHERS 5.5 Stars for each sole-occupancy unit	3	
	The building addresses four out of nine following building services energy uses (to be determined during DD):		

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
	<ul style="list-style-type: none"> <li>Domestic Hot Water</li> <li>Domestic Hot Water Generation</li> <li>Heating and Cooling of Sole Occupancy Units</li> <li>Clothes Drying</li> <li>Ceiling Fans</li> <li>Car Parking</li> <li>Vertical Transportation</li> <li>Lift Lobbies and Corridors</li> <li>On-site solar PV</li> </ul>		
<b>23 Energy Source</b> The building's energy comes from renewables	<p>The building provides a Zero Carbon Action Plan.</p> <p>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. The plan must include infrastructure provided for tenants or future occupants such as gas installations for cooking.</p>	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	3	
<b>24 Other Carbon Emissions</b> The building's emissions from refrigerants, upfront carbon, and remaining carbon sources are eliminated or offset	<p>The building owner eliminates emissions from high global warming potential refrigerants.</p> <p>or</p> <p>The building owner offsets emissions from refrigerants.</p>	2	Concept Design Tender Construction
<b>25 Water Use</b> (Residential – Class 2 or 3) The building has low water use	<p>The building installs efficient water fixtures:</p> <ul style="list-style-type: none"> <li>Taps 5 star</li> <li>Toilets 4 star</li> <li>Urinals 5 star</li> <li>Showers 3 star (<math>\leq 7.5</math> l/m)</li> <li>Dishwashers 5 star</li> <li>Washing machines 4 star</li> </ul>	MINIMUM EXPECTATION	Design Tender Construction Use

**ADVERTISED  
PLAN**

**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**

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
<b>26 Life Cycle Impacts</b>  The building has lower environmental impacts from resource use over its lifespan than a typical building	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. The results of the LCA must be entered into the GBCA's Life Cycle Assessment calculator.	2	Strategy Brief Concept Design Tender Construction
<b>27 Movement and Place</b>  The building's design and location encourage occupants and visitors to use active, low carbon, and public transport options instead of private vehicles	The building's access prioritises cycling and includes bicycle parking facilities <ul style="list-style-type: none"> <li>– 18 secure bicycle spaces</li> <li>– 9 visitor bike spaces</li> </ul> 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.		Strategy Brief Concept Design Tender Construction
	EV charging infrastructure: <ul style="list-style-type: none"> <li>– Chargers to 5% of car spaces: 4 chargers (minimum 7kW capacity)</li> <li>– EV charging to include load management supervisor hardware</li> <li>– Electrical containment e.g. trunking/conduit installed to facilitate future installation of cabling supplying all car spaces (NCC 2022 requirement)</li> </ul>		
	Walkability encouraged via access to at least 10 amenities categories		
<b>29 Contribution to Place</b>  The building's design makes a positive contribution to the quality of the public environment	The project team must provide an urban context report and public realm interface design that outlines the urban context of the development and the design responses. or Independent design reviews are to be held at key points in the development of the design.	2	Strategy Brief Concept Design Construction
<b>31 Inclusive Construction Practices</b>  The builder's construction practices promote diversity and	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.	2	

**ADVERTISED PLAN**

**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**

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
reduces physical and mental health impacts			
<b>33 Procurement and Workforce Inclusion</b>  The building's construction facilitates workforce participation and economic development of disadvantaged and under-represented groups	The project team must develop and implement a social procurement strategy or plan (this can be part of an overall project procurement plan/strategy) that directs at least 2% of the building's total contract value to generate employment opportunities for disadvantaged and under-represented groups.  The project team must also include targets and annual reporting requirements in the strategy.	2	Tender Construction
	At least 2% of the building's total contract value has been directed to generate employment opportunities for disadvantaged and under-represented groups.		
<b>34 Design for Inclusion</b>  The building is welcoming to a diverse population and is welcoming to their needs	The building's design and construction must be able to be navigated and enjoyed by stakeholders of diverse ages, genders, and physical and mental abilities. The application must include spaces, bathroom facilities, and amenities provided within the building.	2	Concept Design Tender Construction Handover Use
<b>35 Impacts to Nature</b>  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.		
	There is ongoing monitoring, reporting, and management of the site's wetland ecosystem		
	The project team must demonstrate how they have attempted to understand their site's historical and current ecological context by documenting the site's current ecological values by type and biomass. This includes terrestrial and aquatic ecological values, geologic features, and soils (including interaction with living things). When determining biodiversity value, the project must reference local, regional, state, and national priorities and strategies.	2	
	If deemed necessary by an Ecologist, at least 50% of existing site with high biodiversity value is retained.		
	The building's site includes an appropriate landscape area (minimum of 15% of the site area = 342m <sup>2</sup> )	2	Concept Design
	The landscaping includes a diversity of species and prioritises the use of climate-resilient and indigenous plants		

**ADVERTISED PLAN**

**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**

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
<b>36 Biodiversity Enhancement</b> The building's landscape enhances the biodiversity of the site	Significant trees provided, suitable for nesting, at 1 per 500m <sup>2</sup> of landscaping = 1 trees		Use
	The project team develops a site-specific Biodiversity Management Plan and provides it to the building owner or building owner representative. The plan will outline key actions that need to be undertaken in order to maintain the ecological integrity of biodiversity on the site, whether this is existing or that created as part of the development.		
<b>41 Leadership Challenges</b>	Homes for Homes Climate Positive Pathway	<b>2</b>	
<b>Total Green Star Points</b>		<b>41</b>	
<b>Green Star Rating</b>		<b>5 Star</b>	

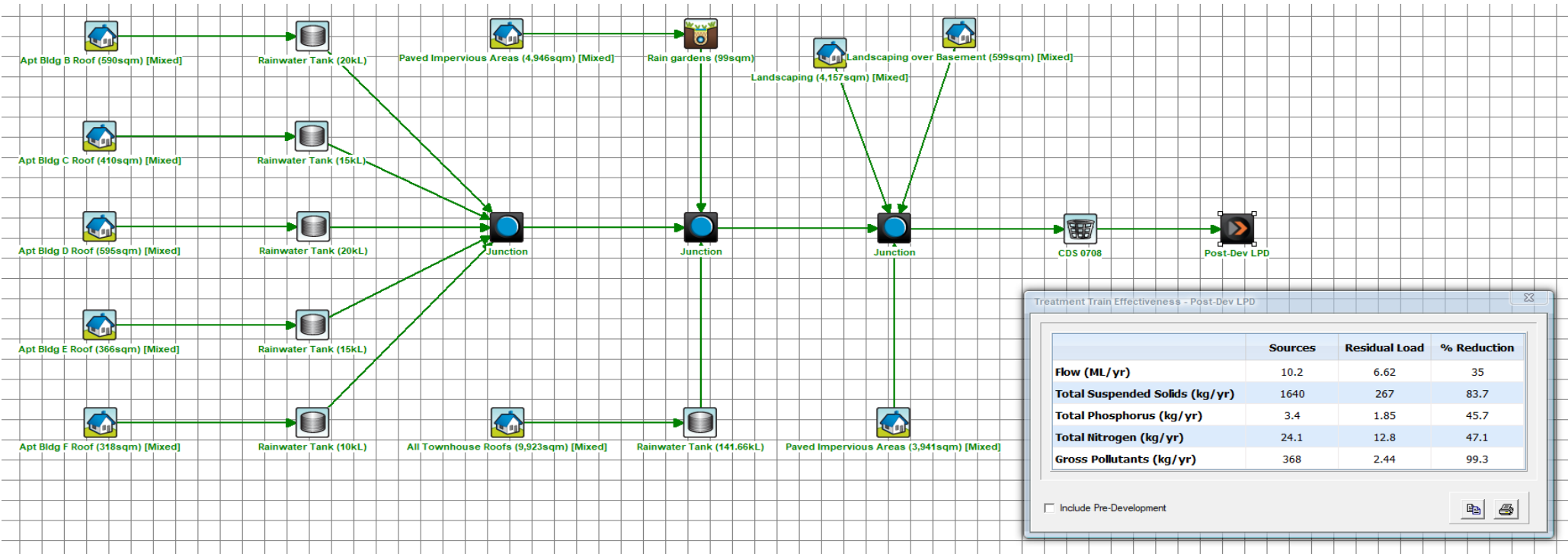
## ADVERTISED PLAN

**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



ADVERTISED  
PLAN

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.2 Rainwater Catchment Areas



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

**ADVERTISED  
PLAN**





### C.3 MUSIC Modelling Assumptions and Results

MUSIC Model 20/10/2023		
Treatment Devices Features		
RWT Type TH01, TH01A, TH03A, TH03D, TH07C, TH14A & TH14B		34 x 1.0 kL
RWT Type TH03B, TH03C		16 x 1.51 kL
RWT Type TH05, TH08, TH10		7 x 2.0 kL
RWT Type TH06, TH06B, TH06C, TH12A-H, TH13B, TH14C, TH15, TH16		139 x 0.5 kL
Total RWT Capacity for Townhouses		141.66 kL
RWT Apartment Building B		20 kL
RWT Apartment Building C		15 kL
RWT Apartment Building D		20 kL
RWT Apartment Building E		15 kL
RWT Apartment Building F		10 kL
Est. daily water demand for TF Townhouses (all toilets)		9.38 kL/day
Est. daily water demand for TF Apt Bldg B (all toilets)		1.10 kL/day
Est. daily water demand for TF Apt Bldg C (all toilets)		0.88 kL/day
Est. daily water demand for TF Apt Bldg D (all toilets)		1.06 kL/day
Est. daily water demand for TF Apt Bldg E (all toilets)		0.84 kL/day
Est. daily water demand for TF Apt Bldg F (all toilets)		0.96 kL/day
*Total RG surface area		99 m <sup>2</sup>
**Primary Treatment System 1 (GPT)	Rocla CDS 0708 GPT (or equivalent)	
Results		
Reduction in Total Suspended Solids (TSS)		83.7%
Reduction in Total Phosphorus (TP)		45.7%
Reduction in Total Nitrogen (TN)		47.1%
Reduction in Total Gross Pollutants		99.3%
Pollutant	MUSIC Model Results	Melbourne Water Targets
Reduction in Total Suspended Solids (TSS)	83.7%	80.0%
Reduction in Total Phosphorus (TP)	45.7%	45.0%
Reduction in Total Nitrogen (TN)	47.1%	45.0%
Reduction in Total Gross Pollutants	99.3%	70.0%
Compliance with Melbourne Water targets		✓
NOTES:		
* RGs vegetated with Effective Nutrient Removal Plants. Further specification to be undertaken in Detailed Design.		
**Nutrient reduction (Phosphorous and Nitrogen) not attributed to GPT as per Melbourne Water MUSIC guidelines.		

**Acronyms**  
RWT: Rain Water Tank  
RG: Rain Garden  
TF: Toilet Flushing  
GPT: Gross Pollutant Trap

Assumptions		
Area Name		Area [m <sup>2</sup> ]
Total Roof Areas		12,202
All Townhouse Roofs		9,923
Roof Apartment Building B		590
Roof Apartment Building C		410
Roof Apartment Building D		595
Roof Apartment Building E		366
Roof Apartment Building F		318
Paving Areas to Rain gardens		4,946
Roads/Laneways		4,946
Part Pervious Landscape Areas (over basement)		599
Pervious Landscape Areas		4,157
Remaining Area		3,941
Total Site Area		25,845

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

ADVERTISED  
PLAN

## Appendix D. 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.

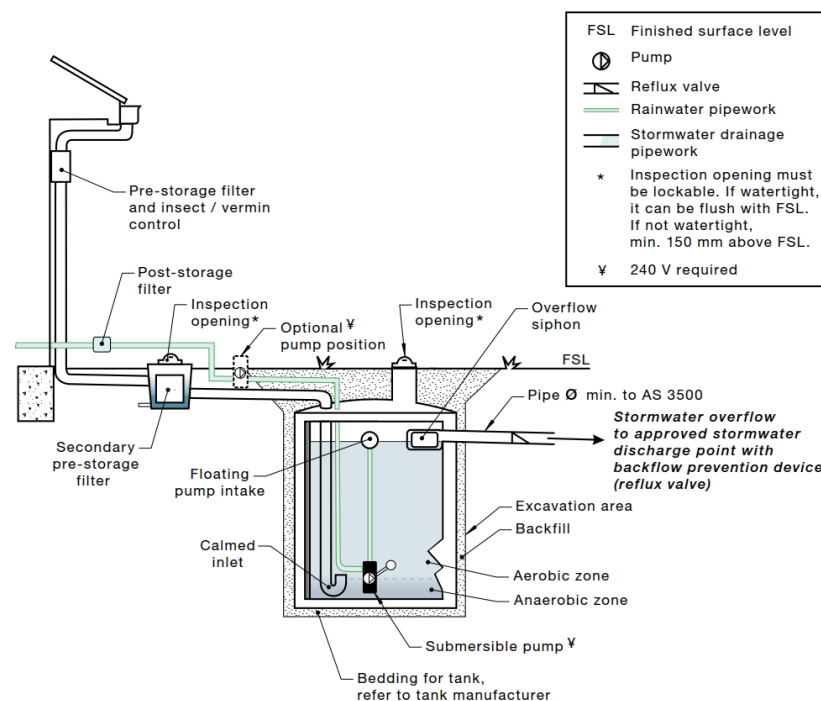
The scope of the maintenance program will include inspection and rectification of issues associated with:

- 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 Commission<sup>1</sup>. 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**



**ADVERTISED  
PLAN**

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		

**ADVERTISED  
PLAN**

**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. NatHERS Energy Rating Assumptions

### E.1 Results

Apartment	Star Rating	Energy Demand (MJ/m <sup>2</sup> )			Apartment	Star Rating	Energy Demand (MJ/m <sup>2</sup> )		
		Total	Heating	Cooling			Total	Heating	Cooling
B-G01	7.4	87.1	78.7	8.3	B-505	7.3	90.8	76.3	14.5
B-G02	7.0	97.9	87.2	10.7	B-506	6.8	103.8	89.6	14.2
B-G03	6.9	100.7	83.0	17.8	B-507	7.4	86.4	74.6	11.7
B-G04	7.5	83.9	74.0	9.9	B-601	7.1	95.2	82.7	12.5
B-G05	6.9	100.8	95.4	5.5	B-602	6.3	119.1	97.4	21.7
B-G06	7.2	93.5	78.8	14.7	B-603	6.7	106.7	87.3	19.3
B-G07	6.9	100.4	85.8	14.6	B-604	6.7	109.5	97.1	12.4
B-G08	7.4	84.7	77.9	6.8	B-605	6.8	105.4	88.6	16.8
B-101	6.8	103.9	83.2	20.7	B-606	6.4	115.1	99.3	15.8
B-102	6.9	100.1	81.5	18.6	B-607	7.2	92.1	78.0	14.1
B-201	8.1	67.3	55.8	11.5	B-608	7.0	97.9	94.7	3.2
B-202	7.1	95.4	73.6	21.8	B-609	7.2	93.7	90.1	3.6
B-203	8.0	68.6	51.8	16.8	C-101	8.2	62.1	57.2	4.8
B-204	7.3	88.7	77.4	11.3	C-102	8.8	47.3	41.2	6.1
B-205	7.6	79.9	63.9	15.9	C-103	8.5	53.9	41.8	12.1
B-206	7.3	90.1	75.1	15.0	C-104	7.5	83.3	76.3	7.0
B-207	7.4	85.6	73.5	12.1	C-105	7.2	91.8	84.9	6.9
B-501	7.9	71.8	61.2	10.6	C-501	8.2	64.0	56.0	8.0
B-502	6.7	109.2	88.2	21.1	C-502	8.4	56.4	50.4	6.0
B-503	7.3	89.9	71.1	18.7	C-503	8.3	61.5	48.7	12.8
B-504	6.7	107.8	97.5	10.3	C-504	6.9	103.4	94.2	9.2
					C-505	6.8	105.6	95.4	10.3

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



Apartment	Star Rating	Energy Demand (MJ/m2)		
C-601	7.1	94.6	80.6	14.1
C-602	6.3	119.2	102.1	17.1
C-603	6.3	121.5	102.7	18.8
C-604	7.6	80.8	73.6	7.2
C-605	7.6	81.4	66.7	14.8
D-G01	7.1	95.6	85.3	10.3
D-G02	7.0	98.7	87.8	10.9
D-G03	7.0	98.6	92.5	6.1
D-G04	7.6	80.8	72.6	8.2
D-G05	7.4	87.4	77.9	9.8
D-G06	7.7	79.1	71.4	7.8
D-101	7.6	81.7	66.4	15.4
D-102	7.2	93.5	71.6	21.9
D-103	7.4	86.2	64.9	21.3
D-104	7.0	98.3	81.8	16.5
D-105	7.0	97.9	89.2	8.7
D-106	7.6	79.5	68.6	10.9
D-107	7.3	89.3	75.5	13.8
D-108	8.0	68.2	56.6	11.5
D-501	8.4	57.7	43.5	14.2
D-502	6.9	102.9	82.3	20.7
D-503	7.0	97.9	76.4	21.5
D-504	6.8	104.9	86.7	18.2
D-505	6.7	109.1	98.0	11.1

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

Apartment	Star Rating	Energy Demand (MJ/m2)		
D-506	7.2	94.5	81.9	12.5
D-507	6.8	106.1	93.2	12.8
D-508	7.6	81.6	67.6	14.0
D-601	7.2	93.7	75.8	17.9
D-602	6.3	119.3	98.1	21.2
D-603	6.5	113.8	92.4	21.4
D-604	6.5	112.5	94.8	17.8
D-605	6.5	113.0	99.0	14.1
D-606	6.8	106.0	89.4	16.6
D-607	6.4	115.5	99.8	15.7
D-608	7.1	96.8	81.4	15.4
	7.0	92.4	79.0	13.4

The results of the modelling confirm that:

- All individual apartments have cooling loads of less than 22 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 60 Tullamarine);
- The average heating load of 79.0 MJ/m2 and the cooling load of 13.4 MJ/m2 are significantly less than the relevant threshold loads set out in NCC 2022 for Class 2 dwellings (average heating load <88 MJ/m2, average cooling load <48 MJ/m2), and;
- The individual apartment heating and cooling loads are significantly less than the relevant threshold loads set out in NCC 2022 for Class 2 dwellings (heating load <103 MJ/m2, cooling load <49 MJ/m2).

**ADVERTISED  
PLAN**

## E.2 Building Materials

Element	Description	Added R Value
Floor Type	Suspended concrete slab (all levels)	
Floor Insulation	Soffit of suspended floor slab: R 2.30 rigid board insulation: Ground floor slab over basement	R 2.30
	Soffit of suspended slab Levels 1 & 2 Building B & D: R 2.30 rigid board insulation (Apartment B-201, D-1.01) where exposed to outside below	R 2.30
Wall Insulation	Lightweight party walls: Insulation R 1.0 x 2	R 2.0
	Lightweight corridor walls: Insulation R 1.5	R 1.50
	Precast concrete Lift & stairwell walls: Insulation R 0.70	R 0.70
	Precast concrete external walls: Insulation R 2.50	R 2.50
	Lightweight external clad walls: Insulation R 2.50	R 2.50
Roof Insulation	Concrete roof R 2.30 rigid board insulation: Level 6 of buildings B, C & D	R 2.30
	Concrete roof R 3.20 rigid board insulation: Level 6 of building C (apartment C-6.04 only)	R 3.20
	Concrete roof R 4.10 rigid board insulation: Level 6 of building C (apartment C-6.05 only)	R 4.10
	All apartment concrete ceilings shared with terraces above: R 2.30 rigid board insulation Apartment B-101, B-102, C-5.04, C-5.05	R 2.30
Roof Colour	Solar Absorptance – 0.50 (Medium)	
Window Frames	Aluminium and aluminium <b>thermally broken</b> frames to all windows and glazed doors (see glazing tables below)	
Window Colour	Solar Absorptance –0.44 Medium (equivalent to Colorbond Shale Grey)	
Sky Lights	None	
Ceiling fans	To apartment living areas as marked on plans and to bedrooms to the following apartments: B-1.03, B2.02, B-3.02, B-4.02, D-1.03, D-2.03, D-3.03, D-4.03	1200mm diameter

### 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

**ADVERTISED  
PLAN**

**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**

# ADVERTISED PLAN

## E.3 Glazing

**Glazing Table 1:** Aluminium Frames to Levels 1 to 5

Window Type	Description	Whole of Window Value		Location
		U	SHGC	
Aluminium Hinged Door	CAP-048-06 Double glazed 6mm Energy Advantage/12mm Argon gap/6mm Clear	3.60	0.44	All Apartments on levels 1 to 5
Aluminium Awning Window	CAP-051-06 Double glazed 6mm Energy Advantage/12mm Argon gap/6mm Clear	4.42	0.41	All Apartments on levels 1 to 5
Aluminium Fixed Window	CAP-055-52 Double glazed 6mm Clear/12mm Argon gap/6mm Energy Advantage	2.71	0.58	All Apartments on levels 1 to 5
Aluminium Sliding Door	CAP-057-13 Double glazed 6mm Energy Advantage/12mm Argon gap/6mm Clear	2.19	0.48	All Apartments on levels 1 to 5

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

**Glazing Table 2:** Aluminium Thermally Broken Frames to Levels Ground and 6

Window Type	Description	Whole of Window Value		Location
	<b>Futureline Thermally Broken Frames</b>	U	SHGC	
Aluminium TB Hinged Door 46D Series	CAP-115-04 Double glazed 6mm EnergyTech Clear/12mm Argon/6mm Clear	2.73	0.42	All Apartments on Ground and Level 6
Aluminium TB Awning Window 54W Series	CAP-116-04 Double glazed 6mm EnergyTech Clear/12mm Argon/6mm Clear	2.87	0.39	All Apartments on Ground and Level 6
Aluminium TB Sliding Door	CAP-133-07 Double glazed 6mm EnergyTech Clear/12mm Argon/6mm Clear	2.40	0.40	All Apartments on Ground and Level 6
Aluminium TB Fixed Window 425 Series	CAP-148-05 Double glazed 6mm EnergyTech Clear/12mm Argon/6mm Clear	2.16	0.51	All Apartments on Ground and Level 6

# ADVERTISED PLAN

## GLAZING NOTES

Window system values used in the NatHERS ratings must be tested by an accredited professional according to the Technical Protocols and Procedures Manual for Energy Rating of Fenestration by the Australian Fenestration Rating Council, as per the NatHERS Technical Note (2023) and NCC 2022 Volume Two Housing Provisions. Energy ratings cannot be certified for NCC compliance until documentation is provided demonstrating window system performance values have been tested according to [this protocol](#).

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.

## E.4 General Rating Assumptions

Item	Details	
Floor Coverings	Tiles to bathrooms and laundries Carpet to bedrooms Timber boards to kitchen, living and all other areas	<div>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</div>
Window Coverings	Holland blinds to all windows. (Refer to item 20)	
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 fitted with fire proof unvented down light covers (external roof areas only) 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	
Ceiling Calculation	Calculation for loss of ceiling insulation due to down lights, exhaust fans, ceiling speakers etc. have been incorporated into the energy rating where applicable	

## NOTES

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.

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

## Appendix F. Solar Photovoltaics

During the construction phase, high-efficiency solar PV modules with a total capacity of 28kWp will be installed at roof level as per the preliminary layout indicated below.

PV modules should be oriented in pairs to the east and west at 10-15°.



The undulating east-west configuration prevents self-shading 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.

Total yield of this array will be approximately 33.7 MWh per annum equating to an estimated annual carbon emissions offset of 28.9 tonnes CO<sub>2</sub>-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

**ADVERTISED  
PLAN**

# ADVERTISED PLAN

## East facing array output

### RESULTS

 Print Results

17,022 kWh/Year\*

Month	Solar Radiation ( kWh / m <sup>2</sup> / day )	AC Energy ( kWh )
January	6.78	2,259
February	6.25	1,907
March	4.70	1,592
April	3.25	1,098
May	2.14	749
June	1.72	588
July	1.94	689
August	2.68	954
September	4.08	1,389
October	5.06	1,760
November	5.49	1,818
December	6.67	2,220
Annual	4.23	17,022

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

#### Location and Station Identification

Requested Location	99 Derby Road, Sunshine VIC
Weather Data Source	Lat, Lng: -37.79, 144.82 0.8 mi
Latitude	37.79° S
Longitude	144.82° E

#### PV System Specifications

DC System Size	14.4 kW
Module Type	Premium
Array Type	Fixed (open rack)
System Losses	14.08%
Array Tilt	13°
Array Azimuth	84°

## West facing array output

### RESULTS

 Print Results

17,022 kWh/Year\*

Month	Solar Radiation ( kWh / m <sup>2</sup> / day )	AC Energy ( kWh )
January	6.78	2,259
February	6.25	1,907
March	4.70	1,592
April	3.25	1,098
May	2.14	749
June	1.72	588
July	1.94	689
August	2.68	954
September	4.08	1,389
October	5.06	1,760
November	5.49	1,818
December	6.67	2,220
Annual	4.23	17,022

#### Location and Station Identification

Requested Location	99 Derby Road, Sunshine VIC
Weather Data Source	Lat, Lng: -37.79, 144.82 0.8 mi
Latitude	37.79° S
Longitude	144.82° E

#### PV System Specifications

DC System Size	14.4 kW
Module Type	Premium
Array Type	Fixed (open rack)
System Losses	14.08%
Array Tilt	13°
Array Azimuth	84°

# Appendix G. 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**

**ADVERTISED  
PLAN**



ADVERTISED PLAN

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

Level 1, 25 Ross Street  
South Melbourne VIC 3205

+61 3 9636 0280

Level 1, 241 Commonwealth Street  
Surry Hills NSW 2010

+61 2 8379 8968

info@arkresources.com.au  
arkresources.com.au

Ark Resources

Ark Resources Pty Ltd  
ABN 29 086 461 369  
arkresources.com.au

Level 1, 25 Ross Street  
South Melbourne VIC 3205  
61 3 9636 0280

Level 1, 241 Commonwealth Street  
Surry Hills NSW 2010  
61 2 8379 8968

25.02.2025

Mr Ben McCann  
Development Manager  
SMA Projects  
Level 3, 2-4 Ross Place  
South Melbourne VIC 3205

bmccann@smaprojects.com.au

Subject:

**Stage 2, 99 Derby Road, Sunshine — Sustainable Management Plan review**

Dear Ben,

As you are aware, Ark Resources has been engaged by SMA Projects to provide environmentally sustainable design advice for Stage 2 of the project at 99 Derby Road in Sunshine.

We initially prepared a Sustainable Management Plan & Water Sensitive Urban Design Response (SMP) for the entire Stage 2 development site, which was dated 19 March 2024 and endorsed by Brimbank City Council on 19 July 2024. This report responded to Condition 1(q) and (r) of the Planning Permit issued by VCAT on 12 July 2023 (Permit number P780/2021). This application encompassed the five apartment buildings (A-E) and all townhouses.

A subsequent Sustainable Management Plan issued on 20 November 2024 was prepared at the request of SMA Projects as part of their application for social housing funding provided through the Housing Australia Future Fund (HAFF SMP). As the funding application only applied to apartment Buildings B, C and D, the HAFF SMP is limited in scope to these three buildings only.

As no changes have been made to the print of the HAFF application, the provisions contained in the endorsed SMP for the townhouses and apartment Buildings E and F remain relevant.

To clarify, the HAFF SMP confirms that Buildings B, C and D will achieve a NatHERS development average of 7 stars and will also gain a 5 star Green Star Buildings rating certified by the Green Building Council Australia.

The endorsed SMP commits to a BESS score of 59% with the townhouses meeting the energy efficiency standards of NCC 2019, and the apartments in Buildings E and F achieving a development average of 6.5 stars.

The stormwater quality assessment to meet Clauses 19.03-3S and 53.18-5 of the Planning Scheme has been carried out on the entire Stage 2 site as the HAFF application area will not have its own Legal Point of Discharge. The MUSIC modelling results demonstrate that the project meets the Melbourne Water pollutant load reduction targets set out in the Best Practice Environmental Management Guidelines (CSIRO).

I trust this provides an adequate explanation of the commitments contained in the HAFF SMP and the endorsed report, however please don't hesitate to let me know if you require further details.

Yours sincerely



Leonie Dixon  
Senior ESD Advisor

Attached: Endorsed SMP, dated 19 March 2024  
HAFF SMP, dated 20 November 2024

**ADVERTISED  
PLAN**

# PROPOSED RESIDENTIAL DEVELOPMENT

99 Derby Road, Sunshine  
(Stage 2)

AMENDED PLAN  
PLANNING ENVIRONMENT ACT 1987  
BRIMBANK PLANNING SCHEME  
Plans referred to in Planning Permit: P0780/2021  
Page: 113 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

# SUSTAINABLE MANAGEMENT PLAN & WATER SENSITIVE URBAN DESIGN RESPONSE FOR SMA PROJECTS

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

19 March 2024

File 622K

ADVERTISED  
PLAN



## CONTENTS

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 114 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

1.	INTRODUCTION.....	4
2.	SITE DESCRIPTION.....	7
3.	SUMMARY OF KEY ESD INITIATIVES .....	7
3.1.	BUILT ENVIRONMENT SUSTAINABILITY SCORECARD (BESS).....	8
3.2.	ENERGY RATINGS .....	9
4.	MUSIC MODELLING .....	12
5.	SUSTAINABLE DESIGN INITIATIVES AND SYSTEMS .....	13
6.	IMPLEMENTATION STRATEGY .....	22
7.	CONCLUSION.....	24

## APPENDICES

APPENDIX A.	BESS RESULTS.....	25
APPENDIX B.	MUSIC RESULTS.....	68
APPENDIX C.	ENERGY RATING ASSUMPTIONS.....	73
APPENDIX D.	SECTION 3.12 VERIFICATION METHOD V2.6.2.2.....	79
APPENDIX E.	RAINWATER HARVESTING .....	91
APPENDIX F.	WSUD MAINTENANCE MANUAL .....	93
APPENDIX G.	APARTMENT SOLAR PHOTOVOLTAIC SYSTEMS .....	98
APPENDIX H.	SITE MANAGEMENT PLAN.....	102
APPENDIX I.	FIRE SYSTEM TEST WATER.....	103

**ADVERTISED  
PLAN**

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	Date	Prepared	Approved	Status
A	5 May 2020	MT / LD	JT	Draft
B	11 May 2020	MT / LD	JT	Draft
C	14 May 2020	MT / LD	JT	TP Issue
D	11 June 2020	MT / LD / DOL	JT	TP Issue
E	10 September 2020	MT / LD / DOL	JT	RFI Issue Draft
F	25 September 2020	MT / LD / DOL	JT	RFI Issue
G	3 December 2021	HM/MT/LD/DOL	JT	Draft
H	9 December 2021	HM/MT/LD/DOL	JT	TP Issue
I	22 April 2022	HM/MT/LD/DOL	JT	Draft
J	12 May 2022	MT	LD	Amended Scheme
K	24 October 2023	MT/DOL	LD	VCAT Endorsement Draft
L	3 November 2023	MT/DOL	LD	VCAT Endorsement
M	19 March 2024	MT/DOL	LD	VCAT Endorsement

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 115 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

## ADVERTISED PLAN

© Ark Resources 2024

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

P: +61 3 9636 0280  
 W: [arkresources.com.au](http://arkresources.com.au)  
 E: [info@arkresources.com.au](mailto:info@arkresources.com.au)

**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. Introduction

Ark Resources has been engaged by SMA Projects to provide advice in relation to environmentally sustainable development outcomes from the proposed development (Stage 2) at 99 Derby Road, Sunshine.

This Sustainable Management Plan has been prepared to meet the Application Requirements of Clauses 19.03-3S and 22.02 (Environmentally Sustainable Development Policy) of the Brimbank Planning Scheme. This report demonstrates how the development meets policy objectives of Clauses 19.03-3S and 22.02-2 of the Planning Scheme, as well as Condition 1(q)i-v, (r)iV, v of the Planning Permit.

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:
  - Hanif Agharazy, Hayball
  - Ben McCann, SMA Projects
- Architectural drawings prepared by Hayball set out below.

**ADVERTISED  
PLAN**

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 116 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

Description	Drawing No.	Revision	Date
COVER SHEET	TP00.00	10	25/10/2023
GROUND LEVEL MASTERPLAN	TP00.20	11	25/10/2023
LEVEL 1 MASTERPLAN	TP00.21	11	25/10/2023
LEVEL 2 MASTERPLAN	TP00.22	11	25/10/2023
LEVEL 3 MASTERPLAN	TP00.23	11	25/10/2023
LEVEL 4 MASTERPLAN	TP00.24	11	25/10/2023
ROOF MASTERPLAN	TP00.25	11	25/10/2023
GROUND - DRAWING AREA 1	TP01.00	12	25/10/2023
GROUND - DRAWING AREA 2	TP01.01	11	25/10/2023
GROUND - DRAWING AREA 3	TP01.02	12	25/10/2023
LEVEL 1 - DRAWING AREA 1	TP01.03	11	25/10/2023
LEVEL 1 - DRAWING AREA 2	TP01.04	11	25/10/2023
LEVEL 1 - DRAWING AREA 3	TP01.05	11	25/10/2023
LEVEL 2 - DRAWING AREA 1	TP01.06	11	25/10/2023
LEVEL 2 - DRAWING AREA 2	TP01.07	11	25/10/2023
LEVEL 2 - DRAWING AREA 3	TP01.08	11	25/10/2023
LEVEL 3 - DRAWING AREA 1	TP01.09	11	25/10/2023
LEVEL 3 - DRAWING AREA 2	TP01.10	11	25/10/2023
LEVEL 3 - DRAWING AREA 3	TP01.10A	11	25/10/2023

**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**

Description	Drawing No.	Revision	Date
LEVEL 4 - DRAWING AREA 1	AMENDED PLAN PLANNING AND ENVIRONMENT ACT 1987 BRIMBANK PLANNING SCHEME Plans referred to in Planning Permit: P0780/2021 TP01.12 of 256 Johnson, Adam   Delegate   City Planning Date: 19 July 2024	1	25/10/2023
LEVEL 4 - DRAWING AREA 2	TP01.12	11	25/10/2023
LEVEL 4 - DRAWING AREA 3	TP01.13	11	25/10/2023
BASEMENT FLOOR PLAN	TP01.20	9	21/09/2023
BASEMENT RCP & DETAILS	TP01.21	4	25/10/2023
TYPICAL TOWNHOUSES	TP02.00	9	25/10/2023
TYPICAL TOWNHOUSES	TP02.01	5	25/10/2023
TYPICAL TOWNHOUSES	TP02.02	8	21/09/2023
TYPICAL TOWNHOUSES	TP02.03	9	25/10/2023
TYPICAL TOWNHOUSES	TP02.04	6	25/10/2023
TYPICAL TOWNHOUSES	TP02.05	6	25/10/2023
TYPICAL TOWNHOUSES	TP02.06	7	25/10/2023
TYPICAL TOWNHOUSES	TP02.07	5	25/10/2023
CLAUSE 58 ASSESSMENT - TYPICAL APARTMENTS	TP02.10	8	25/10/2023
CLAUSE 58 ASSESSMENT - TYPICAL APARTMENTS	TP02.11	8	25/10/2023
CLAUSE 58 ASSESSMENT - TYPICAL APARTMENTS	TP02.12	5	25/10/2023
CLAUSE 58 ASSESSMENT - TYPICAL APARTMENTS	TP02.13	5	25/10/2023
SITE ELEVATIONS	TP03.00	14	25/10/2023
INTERNAL APARTMENT BLOCK ELEVATIONS	TP03.01	12	25/10/2023
INTERNAL TYPICAL LANEWAY ELEVATIONS	TP03.02	9	25/10/2023
INTERNAL LANEWAY ELEVATIONS	TP03.03	11	25/10/2023
INTERNAL LANEWAY ELEVATIONS	TP03.04	12	25/10/2023
INTERNAL LANEWAY ELEVATIONS	TP03.05	12	25/10/2023
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.10	5	25/10/2023
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.11	4	21/09/2023
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.12	4	21/09/2023
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.13	4	21/09/2023
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.14	3	21/09/2023
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.15	3	21/09/2023
SECTION A & B	TP04.00	9	
SECTION C	TP04.01	9	25/10/2023
SECTION D	TP04.02	7	21/09/2023



Description	Drawing No.	Revision	Date
SCREENING DEVICES	TP04.09	8	25/10/2023
SHADING DEVICES TO NORTH	TP04.11	8	21/09/2023
OVERLOOKING PLAN	TP04.12	1	25/10/2023
OVERLOOKING PLAN B	TP04.13	1	25/10/2023
SHADOW ANALYSIS SEPTEMBER 22nd EQUINOX	TP06.01	9	25/10/2023
SHADOW ANALYSIS SEPTEMBER 22nd EQUINOX	TP06.02	9	25/10/2023
SHADOW ANALYSIS SEPTEMBER 22nd EQUINOX	TP06.03	9	25/10/2023
SHADOW ANALYSIS CENTRAL APARTMENTS COURTYARD JUNE 21	TP06.04	7	25/10/2023
SHADOW ANALYSIS JUNE 21st SOLSTICE	TP06.05	5	25/10/2023
SHADOW ANALYSIS JUNE 21st SOLSTICE	TP06.06	5	25/10/2023
SHADOW ANALYSIS JUNE 21st SOLSTICE	TP06.07	5	25/10/2023
SHADOW ANALYSIS NORTHEAST JUNE 21st SOLSTICE	TP06.08	4	25/10/2023
SHADOW ANALYSIS SOUTHEAST JUNE 21st SOLSTICE	TP06.09	4	25/10/2023
SHADOW ANALYSIS SOUTH 9AM SEPTEMBER 22nd EQUINOX	TP06.10	5	25/10/2023
SHADOW ANALYSIS SOUTH 10AM SEPTEMBER 22nd EQUINOX	TP06.11	5	25/10/2023
SHADOW ANALYSIS SOUTH 11AM SEPTEMBER 22nd EQUINOX	TP06.12	5	25/10/2023
SHADOW ANALYSIS SOUTH 12PM SEPTEMBER 22nd EQUINOX	TP06.13	5	25/10/2023
SHADOW ANALYSIS SOUTH 1PM SEPTEMBER 22nd EQUINOX	TP06.14	5	25/10/2023
2PM SEPTEMBER 22nd EQUINOX	TP06.15	2	25/10/2023
SHADOW ANALYSIS SOUTH 3PM SEPTEMBER 22nd EQUINOX	TP06.16	4	25/10/2023
CLAUSE 58 ASSESSMENT -COMPLIANCE SCHEDULE	TP08.00	7	21/09/2023
MATERIAL AND FINISHES SCHEDULE	TP09.01	9	21/09/2023
INTERFACE DESIGN RENDERS	TP11.01	4	21/09/2023
INTERFACE DESIGN RENDERS	TP11.02	4	21/09/2023
INTERFACE DESIGN RENDERS	TP11.03	4	21/09/2023
INTERFACE DESIGN RENDERS	TP11.04	5	21/09/2023
INTERFACE DESIGN RENDERS	TP11.05	3	21/09/2023
INTERFACE DESIGN RENDERS	TP11.06	3	21/09/2023
SITE CIRCULATION SPATIAL ANALYSIS	TP12.00	9	21/09/2023
APARTMENT BUILDING HEIGHTS STUDY OVER VERIS SURVEY	TP12.01	9	21/09/2023
FENCE PLAN	TP20.01	1	25/10/2023

AMENDED PLAN  
PLANNING AND ENVIRONMENT ACT 1987  
BRIMBANK PLANNING SCHEME  
Plans referred to in Planning Permit: P0780/2021  
TP04.11 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

This copied document to be made available  
for future reference and for 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. Site Description

The proposed 99 Derby Street Stage 2 development comprises a food and beverage tenancy, plus 196 Class 1 townhouses and 111 apartments or class 2 duplex apartments, with a total of 704 bedrooms across the site. It is anticipated that approximately 755 people will reside in the development.

The development is located within the Brimbank City Council. The total site area is approximately 25,845 m<sup>2</sup>. The surrounding buildings are a mix of residential and industrial use.

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



Image accessed April 2020 ©Google Earth

**ADVERTISED  
PLAN**

## 3. Summary of 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:

- 50.4kW rooftop solar photovoltaic system for apartments;
- Individual 2.5kW rooftop solar photovoltaic systems for each townhouse;
- Rainwater harvesting system for toilet flushing;
- Stormwater management to improve water quality into the stormwater system;
- High-performance glazing and energy efficient building services, appliances and fixtures; and
- Environmentally preferable internal finishes.

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 119 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

An assessment of sustainable design outcomes of the proposed development has been undertaken with *BESS*, *MUSIC* and *FirstRate5* benchmarking tools. The information presented in this report demonstrates that:

- The class 2 apartments will achieve a minimum average NatHERS energy rating of 6.5 stars.
- The class 1 townhouses achieve the standard of building envelope energy efficiency, required by the Building Code of Australia.
- The combination of design features and services initiatives meets all the standards of the BESS sustainability assessment tool.
- The rainwater harvesting system is predicted to result in an annual mains water saving of 4,559 kL.
- The development meets the Best Practice standard for stormwater quality.

The results of the performance assessment are summarised below.

AMENDED PLAN  
PLANNING ENVIRONMENT ACT 1987  
BRIMBANK PLANNING SCHEME  
Plans referred to in Planning Permit: P0780/2021  
Page: 120 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

### 3.1. 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, several Victorian councils including Banyule, Bass Coast, Bayside, Bendigo, Brimbank, Darebin, Dandenong, Geelong, Hobsons Bay, Hume, Kingston, Knox, Manningham, Maribyrnong, Maroondah, Monash, Moonee Valley, Moreland, Port Phillip, Stonnington, Whitehorse, Whittlesea, Wyndham, Yarra and Yarra Ranges 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

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

Element	Required Score	Project Score	Compliance
Management	0%	52%	Yes
Water	50%	57%	Yes
Energy	50%	55%	Yes
Stormwater	100%	100%	Yes
Indoor Environment Quality	50%	95%	Yes
Transport	0%	31%	Yes
Waste	0%	33%	Yes
Urban Ecology	0%	48%	Yes
Innovation	0%	0%	Yes
<b>Project BESS Score</b>	<b>50%</b>	<b>59%</b>	<b>Yes</b>

The project meets the standard required for *water*, *energy*, *stormwater* and *Indoor Environment Quality*. The project also meets the 50% BESS Score required to demonstrate Best Practice.

Please refer Appendix A for the BESS Report and Appendix B for details of the MUSIC results.



## 3.2. Energy Ratings

FirstRate5 Version 5.3.1a (3.21) energy ratings and an alternative solution to Deemed-to-Satisfy (DTS) provisions using the Verification Method V2.6.2.2 – Verification using reference buildings have been undertaken for a representative sample of townhouses and apartments (Lot numbers indicated below) and are summarised in the following tables.

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 121 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024



**ADVERTISED  
PLAN**

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

Townhouse	Star Rating	Energy Demand (MJ/m <sup>2</sup> )		
		Total	Heating	Cooling
TH01 Lot 145	6.2	131.1	103.6	27.5
TH01 Lot 151	6.3	127.1	113.1	14.0
TH03A Lot 181	6.6	115.9	103.1	12.8
TH03D Lot 193	6.5	116.4	100.5	15.9
TH03D.1 Lot 198	6.3	128.0	104.3	23.7
TH05 Lot 161	6.3	127.1	113.1	14.0
TH06A Lot 11	6.0	136.4	107.4	29.0
TH06C Lot 25	6.1	135.0	105.7	29.3
TH07C Lot 45	6.6	114.7	86.9	27.8
TH08 Lot 160	6.2	128.9	105.2	23.7
TH10 Lot 166	6.3	127.4	102.8	24.6
TH12A Lot 75	6.1	134.3	118.5	15.8
TH12C Lot 79	6.4	121.1	94.2	26.9
TH 12C Lot 62*	6.5	144.4		
TH12E Lot 134	6.2	132.0	120.8	11.2
TH 12F Lot 135*	6.1	160.3		
TH12H Lot 48	6.0	137.1	124.3	12.8
TH 13A Lot 19*	6.4	140.9		
TH 13B Lot 26*	6.3	165.6		
TH14C Lot 30	6.4	123.1	105.3	17.8
TH15 Lot 43	6.1	134.5	105.3	29.2
TH 16 Lot 44	6.2	128.0	108.4	19.6

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 results of the modelling confirm that:

- The homes achieve a minimum of 6.0 star NatHERS rating which meets the NCC 2019 standard of 6.0 stars, and
- The heating load and the cooling loads of are less than the relevant threshold loads set out in NCC 2019 for Class 1 dwellings (heating load <126 MJ/m<sup>2</sup>, cooling load <31 MJ/m<sup>2</sup>) for the relevant climate zone (NatHERS Climate Zone 60 Tullamarine).

\* Note that these dwellings have been assessed using the V2.6.2.2 Verification Method. Refer to Appendix D for modelling methodology and detailed results.

**ADVERTISED  
PLAN**

AMENDED PLAN  
PLANNING ENVIRONMENT ACT 1987  
BRIMBANK PLANNING SCHEME  
Plans referred to in Planning Permit: P0780/2021  
Page: 122 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

Apartment	Star Rating	Energy Demand (MJ/m <sup>2</sup> )		
		Total	Heating	Cooling
B101 1A	6.8	106.1	86.7	19.4
B307 2J	5.4	161.6	143.8	17.8
B309 2H	6.1	132.7	113.1	19.6
B401 1A	5.9	143.2	123.4	19.8
CG03 2D	6.5	117.3	113.3	4.0
C105 2C	7.9	67.2	60.8	6.4
C106 1D	7.3	90.6	74.1	16.5
C203 1B	5.4	160.4	143.6	16.8
C204 2A	6.9	104.6	96.2	8.4
C301 3L	6.4	122.6	115.8	6.8
C306 3J	6.5	117.0	100.0	17.0
DG04 2A1	7.2	92.2	87.1	5.1
DG05 1E	7.1	96.4	88.4	8.0
E107 3G	7.2	92.1	111.5	3.6
E301 3F	7.2	92.1	81.3	10.8
F301 3D	6.8	105.5	92.5	13.0
F401 2E	5.4	161.8	143.2	18.6
TH09A Lot 01	6.1	135.1	125.9	9.2
TH09B Lot 02	5.9	139.0	126.0	13.0
<b>Estimated Development Average</b>	<b>6.5</b>	<b>119.0</b>	<b>106.7</b>	<b>12.3</b>

The results of the modelling confirm that:

- The development achieves a 6.5 star average NatHERS rating which meets 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 22 MJ/m<sup>2</sup> 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 60 Tullamarine);
- The average heating load of 106.7 MJ/m<sup>2</sup> and the cooling load of 12.3 MJ/m<sup>2</sup> are less than the relevant threshold loads set out in NCC 2019 for Class 2 dwellings (average heating load <113 MJ/m<sup>2</sup>, average cooling load <47 MJ/m<sup>2</sup>), and;
- The individual apartment heating and cooling loads are less than the relevant threshold loads set out in NCC 2019 for Class 2 dwellings (heating load <160 MJ/m<sup>2</sup>, cooling load <48 MJ/m<sup>2</sup>).

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

## 4. MUSIC Modelling

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 124 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

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

The MUSIC rating achieved indicates that the proposed development meets the best practice performance objectives outlined in the Urban Stormwater Best Practice Environmental Management Guidelines (CSIRO 1999) for Total Suspended Solids (TSS), Total Nitrogen (TN), Total Phosphorus (TP) and Gross Pollutants (GP).

The following reductions from typical urban loads will be achieved:

- Reduction in Total Suspended Solids (TSS) load: **83.7%**
- Reduction in Total Phosphorus (TP) load: **45.7%**
- Reduction in Total Nitrogen (TN) load: **47.1%**
- Reduction in Gross Pollutants (GP) load: **99.3%**

Please refer to Appendix B for a copy of the simulation models and results.

Note that the Rocla CDS Nipper GPT has been nominated in the MUSIC model, with the nutrient reduction (Nitrogen and Phosphorous) not attributed to this device, as per Melbourne Water MUSIC Guidelines (Condition 1(r)iv). Independent testing results for this device are available at the following link:

<https://www.ewater.org.au/archive/crcch/archive/pubs/pdfs/technical199902.pdf>

**ADVERTISED  
PLAN**

**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. Sustainable Design Initiatives and Systems

Issue	Performance Commitments / Description	Comments
<b>Building Management</b>		
Metering	<p>In addition to individual apartment meters for utilities, the following meters will be installed to provide information to the owner's corporation in relation to centralised building systems and common area energy consumption:</p> <ul style="list-style-type: none"> <li>Harvested rainwater supply line</li> <li>Flow meter for hot water plant</li> <li>Common area lift and lighting meter</li> <li>Car park lighting &amp; power meter</li> </ul>	<p>The information collected from these meters will be used by the Owner's Corporation manager to assess the function and efficacy of central systems during commissioning and ongoing operation.</p> <div> <p><b>AMENDED PLAN</b>  <b>PLANNING ENVIRONMENT ACT 1987</b>  <b>BRIMBANK PLANNING SCHEME</b>  <b>Plans referred to in Planning Permit: P0780/2021</b>  <b>Page: 125 of 256</b>  <b>Johnson, Adam   Delegate   City Planning</b>  <b>Date: 19 July 2024</b></p> </div>
Building Users Guide	<p>A Building Users Guide will be prepared and will provide details regarding the everyday operation of the building to enable building users to minimise energy and water consumption and optimise internal comfort and amenity.</p>	
<b>Water</b>		
Water Efficiency	<p>The following water efficient fittings and appliances will be specified to all dwellings and tenancies (as appropriate):</p> <ul style="list-style-type: none"> <li>WELS 3 star showers (&gt;6 but &lt;=7.5 litres/minute)</li> <li>WELS 4 star toilets (4.5/3 litre flush)</li> <li>WELS 5 star kitchen taps</li> <li>WELS 5 star basin taps (5 litres/minute)</li> <li>WELS 4 star dishwashers (or higher)</li> </ul>	<p>Water using fixtures and appliances will be specified during design development in accordance with this water efficiency performance standard.</p>

**ADVERTISED  
PLAN**

Issue	Performance Commitments / Description	Comments
Rainwater Harvesting	<p>A rainwater harvesting system will be installed comprising:</p> <ul style="list-style-type: none"> <li>Stormwater collection from all townhouse roof areas (combined catchment areas of approx. 9,923m<sup>2</sup>) and installation of rainwater tanks for each dwelling, as follows: <ul style="list-style-type: none"> <li>34no. 1.0kL RWT for Type TH01, TH01A, TH03A, TH03D, TH07C, TH14A, TH14B.</li> <li>16no. 1.51kL RWT for Type TH03B, TH03C.</li> <li>7no. 2.0kL RWT for Type TH05, TH08, TH10.</li> <li>136no. 0.5kL RWT for Type TH06, TH06B, TH06C, TH12A-H, TH13B, TH14C, Th15, TH16.</li> <li>Total RWT capacity for townhouses is 141.66kL.</li> </ul> </li> <li>Stormwater collection from: <ul style="list-style-type: none"> <li>Block B Apartments – approx. 590m<sup>2</sup> catchment area to 20kL tank.</li> <li>Block C Apartments – approx. 410m<sup>2</sup> catchment area to 15kL tank.</li> <li>Block D Apartments – approx. 595m<sup>2</sup> catchment area to 20kL tank.</li> <li>Block E (Derby Corner) Apartments – approx. 336m<sup>2</sup> catchment area to 15kL tank.</li> <li>Block F (Thorpe Street) Apartments – approx. 318m<sup>2</sup> catchment to 10kL tank.</li> </ul> </li> <li>Re-use of water for toilet flushing in all toilets</li> </ul>	<p>Rainwater modelling indicates that this system will provide an estimated annual mains water saving of 4.559 kL and a supply reliability of 80% from toilet flushing.</p> <p>Please refer to Appendix E for details of predicted harvested rainwater volumes and Appendix F for an indicative maintenance program.</p> <div style="border: 1px solid red; padding: 5px; margin: 10px 0;"> <p style="text-align: center; color: red; font-weight: bold;">AMENDED PLAN PLANNING ENVIRONMENT ACT 1987 BRIMBANK PLANNING SCHEME Plans referred to in Planning Permit: P0780/2021 Page: 126 of 256 Johnson, Adam   Delegate   City Planning Date: 19 July 2024</p> </div> <div style="text-align: center; color: red; font-weight: bold; font-size: 2em; margin-top: 20px;">ADVERTISED PLAN</div>
Water Efficient Landscaping	<p>Where appropriate, water sensitive landscape design will be incorporated into the development by specifying a combination of the following:</p> <ul style="list-style-type: none"> <li>Drought tolerant and/or indigenous plant species that are best suited to local climate; and</li> <li>Automated drip irrigation system</li> </ul>	<p>These initiatives will ensure efficient use of water and also reduce the total potable water used for landscape works.</p>

Issue	Performance Commitments / Description	Comments
Fire System Water Testing	Strategies to reduce potable water used for testing water in fire systems to be implemented.	Refer to Appendix I for BESS credit requirements plus VBA Building Practice Note ESM-08: Water saving options available when testing fire safety systems for approved reduction options.
<b>Energy</b>		
Thermal Performance – F&B Tenancy	Roof insulation specification will be a 10% improvement on Section J 2019 requirements.  Walls and window performance will meet NCC 2019 J1.5 façade requirements.	<div> <b>AMENDED PLAN</b>  <b>PLANNING ENVIRONMENT ACT 1987</b>  <b>BRIMBANK PLANNING SCHEME</b>  <b>Plans referred to in Planning Permit: P0780/2021</b>  <b>Page: 127 of 256</b>  <b>Johnson, Adam   Delegate   City Planning</b>  <b>Date: 19 July 2024</b> </div>
Apartment Energy Ratings	The apartments in the development will achieve an average energy rating of 6.5 stars.	The development energy rating achieved exceeds the NCC 2019 energy efficiency requirements for Class 2 dwellings.  Refer to Appendix C for details of building fabric assumptions.
Townhouse Energy Ratings	All townhouses within the development will meet the minimum 6.0 star NCC 2019 energy rating standard.	The energy ratings achieved will meet the NCC 2019 energy efficiency requirements for Class 1 dwellings.  Refer to Appendix C for details of building fabric assumptions.
Heating & Cooling	Space heating and cooling will be provided by reverse cycle heat pumps within 1 star for both heating and cooling of the best available at the time of tender.	Efficient reverse cycle units in conjunction with a thermally efficient building envelope are considered to be an environmentally acceptable method of space conditioning.
Renewable Energy System	Solar photovoltaic systems will be installed to offset greenhouse emissions arising from apartment common area and retail and community space energy usage and will provide a total peak generation capacity of 50.4 kW.  The solar panels will be distributed on the apartment block roofs so that residents and tenancies benefit equally from the energy savings and greenhouse gas emissions reductions.  In addition, each townhouse will have a 2.5 kW PV system.	Note that the total system capacity across the site is predicted to result in equivalent avoided greenhouse emissions of approximately 67.6 tonnes CO <sup>2</sup> -e each year.  Refer to Appendix G for details of proposed system capacity and panel numbers.  <b>ADVERTISED PLAN</b>

©Ark Resources

Issue	Performance Commitments / Description	Comments
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.	<div> <b>AMENDED PLAN</b>  <b>PLANNING ENVIRONMENT ACT 1987</b>  <b>BRIMBANK PLANNING SCHEME</b>  <b>Plans referred to in Planning Permit: P0780/2021</b>  <b>Page: 129 of 256</b>  <b>Johnson, Adam   Delegate   City Planning</b>  <b>Date: 19 July 2024</b> </div>
<b>Stormwater Management</b>		
Construction Stormwater Pollution Reduction Plan	A construction phase stormwater pollution reduction plan will be prepared and implemented during construction to ensure that litter, sediments and other pollution are prevented from entering the stormwater system.	Please refer to Appendix H for the preliminary Site Management Plan.
WSUD	<p>A preliminary analysis of stormwater quality outcomes has been undertaken using MUSIC modelling software.</p> <p>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:</p> <ul style="list-style-type: none"> <li>Treatment of runoff from parking and level paving (4,946m<sup>2</sup>) by raingardens with a total surface area of 99m<sup>2</sup> used for any purpose which may breach any copyright</li> <li>Landscape areas that promote infiltration and reduce runoff during storm events.</li> </ul> <p>A Rocla CDS Nipper gross pollutant trap (or equivalent primary treatment device) located near stormwater Legal Point of Discharge to capture suspended solids and litter generated onsite.</p>	<p>The proposed development exceeds the pollutant load reduction targets set out in the Best Practice Environmental Management Guidelines (BPEMG) for Total Suspended Solids (TSS), Total Phosphorus (TP), Total Nitrogen (TN) and Gross Pollutants (GP).</p> <p>Refer to Appendix B for the MUSIC rating results and Appendix F for the WSUD Maintenance Manual.</p> <p>Note that the preliminary MUSIC modelling undertaken to confirm achievable stormwater quality results is based on best information currently available relating to the technical and commercial feasibility of the WSUD strategy proposed. Further investigation will be undertaken during design development which may result in minor variations to the strategy described above to meet the <i>best practice</i> stormwater quality targets.</p>
<b>Indoor Environment Quality</b>		
Daylight Access - Apartments	Daylight compliance in the apartments has been determined using the BESS deemed to satisfy criteria and the room profiling calculator. The overall result is that 100% of living rooms and 100% of bedrooms satisfy the BESS measures for daylight access.	<div> <b>ADVERTISED PLAN</b> </div>

Issue	Performance Commitments / Description	Comments
Cross Ventilation - Apartments	Cross ventilation paths in apartments with openable windows on two facades results in 55% of the class 2 dwellings meeting the BESS Natural Ventilation criteria.	<div> <b>AMENDED PLAN</b>  <b>PLANNING ENVIRONMENT ACT 1987</b>  <b>BRIMBANK PLANNING SCHEME</b>  <b>Plans referred to in Planning Permit: P0780/2021</b>  <b>Page: 130 of 256</b>  <b>Johnson, Adam   Delegate   City Planning</b>  <b>Date: 19 July 2024</b> </div>
Thermal Comfort	Thermal comfort for residents will be enhanced by the specification of double glazing.	
Thermal Comfort	External shading will be installed on the east, west and north façades of the townhouses to assist in controlling summer heat gain. Note that overshadowing from neighbouring buildings has been taken into consideration when identifying the need for external shading devices.	Refer to the elevations for the location of the external shading devices.
<b>Urban Ecology</b>		
Private Open Space	A tap and floor waste will be provided to each balcony or terrace.	
Maintaining/Enhancing Ecological Value	Significant landscaping has been integrated into the proposed design, including a communal garden, shelter, play, eating and seating opportunities.	These features will provide amenity for building occupants and contribute to the ecological value of the proposed development.
Productive Gardens	At least 169m <sup>2</sup> of productive gardens will be provided across the site for use by apartment and townhouse residents.	Condition 1(q)v.

**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**

**ADVERTISED  
PLAN**



Issue	Performance Commitments / Description	Comments
<b>Building Materials</b>		
Environmentally Preferable Materials	<p>The following environmentally preferable materials will be specified with the objective of reducing off-site environmental impacts and improving indoor environmental quality for residents:</p> <ul style="list-style-type: none"> <li>All feature timber will be recycled or from accredited sustainably harvested plantation sources (FSC or PEFC); and</li> <li>MDF boards to be E0 or E1</li> <li>Polyester insulation with recycled content will be considered</li> <li>The Portland cement content in concrete will be reduced by 30% using supplementary cementitious materials. Recycled water will also be used in the mix.</li> </ul>	<div> <p><b>AMENDED PLAN</b>  <b>PLANNING ENVIRONMENT ACT 1987</b>  <b>BRIMBANK PLANNING SCHEME</b>  <b>Plans referred to in Planning Permit: P0780/2021</b>  <b>Page: 131 of 256</b>  <b>Johnson, Adam   Delegate   City Planning</b>  <b>Date: 19 July 2024</b></p> </div>
Volatile Organic Compounds	<p>Requires 95% of paints, adhesives, sealants and carpets comply with Total VOC limits prescribed as follows:</p> <ul style="list-style-type: none"> <li>16g/l for paints</li> <li>65g/l for primers, sealers &amp; prep coats</li> <li>50g/l for general purpose adhesives and sealants</li> <li>carpets &lt;0.5mg/m<sup>2</sup> TVOC @ 3 days</li> </ul> <p>Alternatively products selected to have GECA/Green Tag certification.</p>	

**ADVERTISED  
PLAN**

**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	Performance Commitments / Description	Comments
<b>Sustainable Transport</b>		
Bicycle Facilities	<p>Readily accessible bicycle storage facilities have been provided to encourage bicycle use by including the following:</p> <ul style="list-style-type: none"> <li>• 49 spaces for apartment residents, plus bike servicing area</li> <li>• An electrical outlet for e-bike charging in each apartment bike parking area</li> <li>• 34 spaces for apartment visitors</li> <li>• LED lights controlled with movement sensors to garages</li> </ul> <p>In addition, 11 hoops for 22 bicycles are provided across the site for staff and visitor parking. These spaces allow for horizontal parking in compliance with AS2890.3:2014.</p>	<p>Note that the bicycle facilities provided exceed the ratio set out in Clause 52.34 of the Brimbank Planning Scheme.</p> <p>Condition1(q)iv</p> <div style="border: 1px solid red; padding: 5px; text-align: center;"> <p><b>AMENDED PLAN</b>  <b>PLANNING ENVIRONMENT ACT 1987</b>  <b>BRIMBANK PLANNING SCHEME</b>  <b>Plans referred to in Planning Permit: P0780/2021</b>  <b>Page: 132 of 256</b>  <b>Johnson, Adam   Delegate   City Planning</b>  <b>Date: 19 July 2024</b></p> </div>
Walkability & Public Transport Access	<p>The site attains a Walk Score® of 80 out of 100 which is defined as 'Very Walkable', and a Transit Score of 75 out of 100 which is defined as 'Excellent Transit'.</p> <p>The site has numerous amenities within a walking distance (&lt;300m) such as schools, grocery stores, cafés, parks and shops. Building occupants won't require a car to run daily errands.</p> <p>The site is also within close proximity of convenient public transportation options including:</p> <ul style="list-style-type: none"> <li>• Train line: Sunshine Station (400m);</li> <li>• Bus routes: 219 Gardenvale, 428 Sunshine South, 426 Caroline Springs, 903 Altona-Mordialloc (&lt;100m); and</li> <li>• Bus routes: 471 Williamstown, 422 Brimbank, 456 Melton, 427 Sunshine West, 216 Brighton Beach (&lt;400m).</li> </ul>	<p>The location of the development will facilitate walking and public transport in lieu of private vehicle use.</p> <div style="border: 1px solid red; padding: 10px; text-align: center;"> <p><b>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</b></p> </div>

**ADVERTISED  
PLAN**

Issue	Performance Commitments / Description	Comments
<b>Waste Management</b>		
Construction Waste Minimisation	<p>A target recycling rate of 80% of construction and demolition waste has been adopted for the construction phase of the development to minimise the volume of waste to landfill.</p> <p>This will be achieved by the development of a comprehensive waste minimisation strategy including:</p> <ul style="list-style-type: none"> <li>• Separation of all commercially viable recyclable waste streams;</li> <li>• Training in waste minimisation for all site staff and contractors to form part of site induction training;</li> <li>• Record keeping of landfill waste and recyclable stream volumes to track performance against the 80% recyclable target; and</li> <li>• Quarterly reporting of volumes and percentages for each waste stream.</li> </ul>	<p>A dedicated recycling contractor will be engaged to facilitate separation of commercially viable recyclable waste streams in accordance with the target adopted.</p> <div> <p><b>AMENDED PLAN</b>  <b>PLANNING ENVIRONMENT ACT 1987</b>  <b>BRIMBANK PLANNING SCHEME</b>  <b>Plans referred to in Planning Permit: P0780/2021</b>  <b>Page: 133 of 256</b>  <b>Johnson, Adam   Delegate   City Planning</b>  <b>Date: 19 July 2024</b></p> </div>
Operational Waste Management	For details of waste generation rates and collection logistics, refer to the Waste Management Plan prepared by Ratio Consultants.	

**ADVERTISED  
PLAN**

**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**

## 6. Implementation Strategy

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

**ADVERTISED  
PLAN**

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 134 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

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	Metering	Specify meters in accordance with nominated schedule	Building Services Engineer	Design Development
2	Water Efficiency	Specify fixtures in accordance with nominated WELS star ratings	Architect	Design Development
3	Rainwater Harvesting	Design and specify rainwater harvesting system including toilet flushing & automated irrigation system	Building Services Engineer	Design Development
4	Landscaping	Specify water efficient landscaping and irrigation	Landscape architect	Design Development
5	Energy Ratings	Prepare NatHERS ratings for NCC certification	Thermal Performance Assessor	Design Development
6	PV system	Specify nominated solar PV system	Building Services Engineer	Design Development
7	Heating & Cooling	Specify units in accordance with nominated MEPS star ratings	Building Services Engineer	Design Development
8	Hot Water	Specify nominated hot water systems	Building Services Engineer	Design Development

ESD Initiative Implementation Schedule				
#	Initiative	Requirement	Responsibility	Stage
9	Lighting	Specify nominated energy efficient lighting types and automated controls	Building Services Engineer	Design Development
10	Clothes lines	External clothes lines installed	Architect	Design Development
11	Environmentally Preferable Materials	Specify materials in accordance with nominated schedule	Architect	Design Development
12	Bicycle Facilities	Specify bike racks & hoops	Architect	Design Development
13	Construction Waste Minimisation	Prepare construction waste minimisation plan	ESD consultant	Design Development
14	Private Open Space	Specify tap and floor waste to each dwelling	Architect	Design Development

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 135 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

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

**ADVERTISED**  
**PLAN**

## 7. Conclusion

This report sets out a range of sustainable design features, which are integrated into the design and specification of the proposed development, to improve environmental outcomes during occupation.

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

- Attains an overall BESS score of 59% and passes the mandatory water, energy, stormwater and indoor environment quality elements;
- Achieves a NatHERS 6.5 average star rating for the apartments
- Attains the *Best Practice* standard for urban stormwater quality

Accordingly, the sustainable design outcomes from the proposed development are adequate for a residential development of this scale and are consistent with the objectives set out in Clauses 19.03-3S and 22.02-2 of the Brimbank Planning Scheme, as well as Condition 1(q)i-v, (r)iV, v of the Planning Permit.

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 136 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

**ADVERTISED  
PLAN**

**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

### A.1 BESS IEQ Natural Ventilation

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 137 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

The number of apartments which have cross flow ventilation paths and permissible single sided room depth of less than 5m are shown in the markups below. As noted on the drawings, all living rooms without cross flow ventilation will have ceiling fans installed to facilitate natural air flow.

#### Cross ventilation

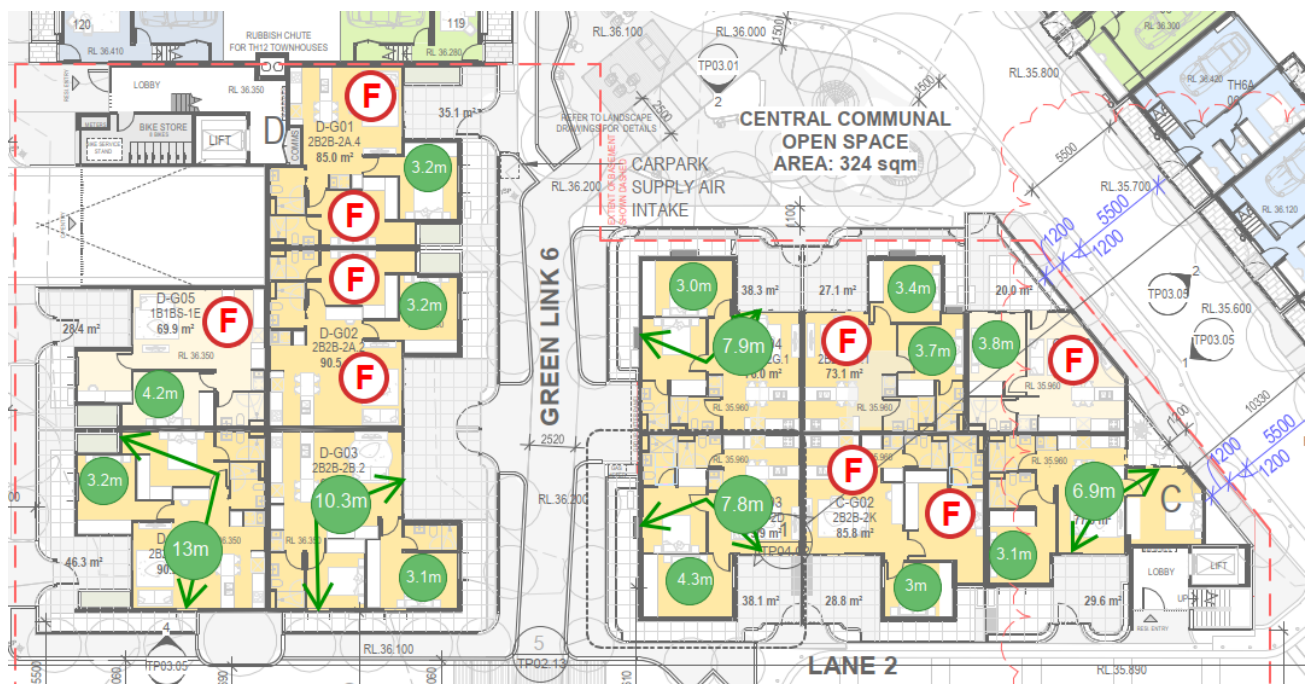
- A breeze path between 2 ventilation openings either within the room or from one room to another.
- Breeze path length less than 15m measured between ventilation openings and around internal walls, obstructions & partitions.
- Ventilation openings located either in opposite or adjacent external walls or an external wall and an operable skylight.
- Size of ventilation openings greater than 2% of total floor area or 1m<sup>2</sup>, whichever is greater. The opening is the maximum allowable clear open area for the window.
- No more than 1 doorway or opening <2m<sup>2</sup> between the ventilation openings.
- Where the breeze path travels through an internal door, that door must be provided with door catches.
- If on adjacent walls, ventilation openings must be at least 3m apart at their closest point. This is to ensure the space has reasonable ventilation throughout and not just in one corner.
- If relying on a courtyard adjacent to a ventilation opening the courtyard must have a minimum depth of 3m from the window or be a minimum size of 9m<sup>2</sup>.

#### Single-sided ventilation

- Maximum permissible depth of room 5m.
- Separated openings high and low or split across the width of the room/facade, each 5% of the floor area are preferred.

**This copied document to be made available for the sole purpose of enabling 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**

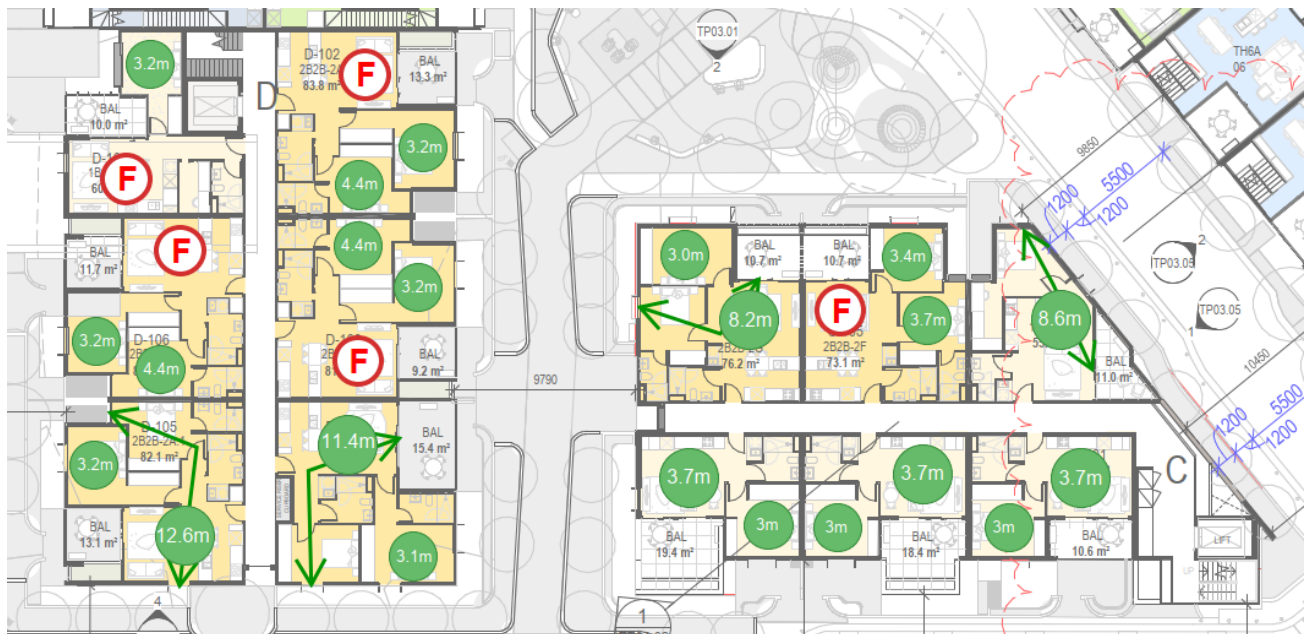
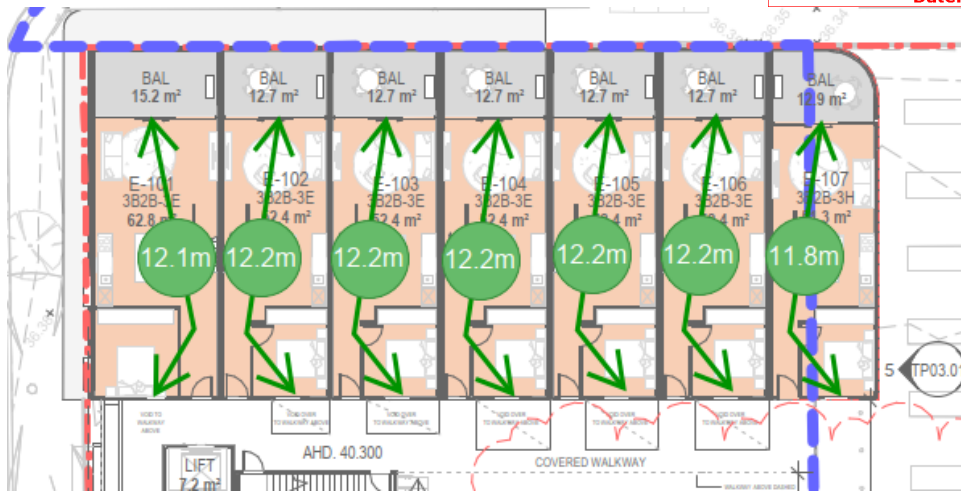
#### Drawing Area 1 - Ground



**ADVERTISED  
PLAN**

## Drawing Area 1 - Level 1

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 138 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024



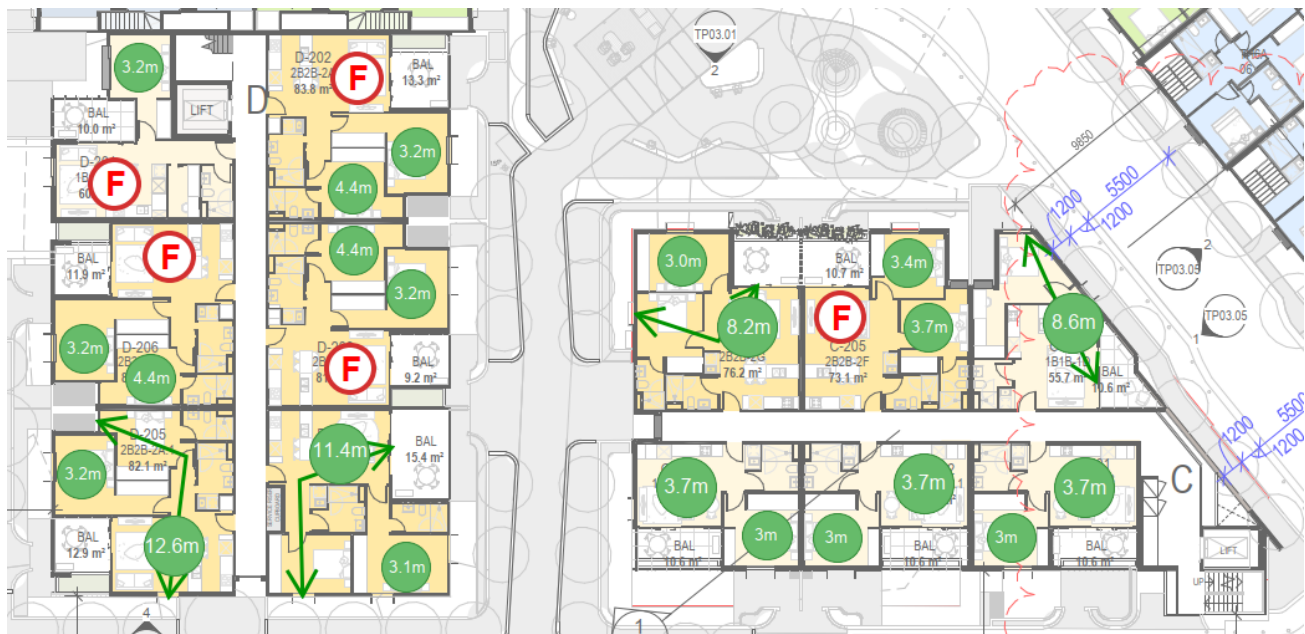
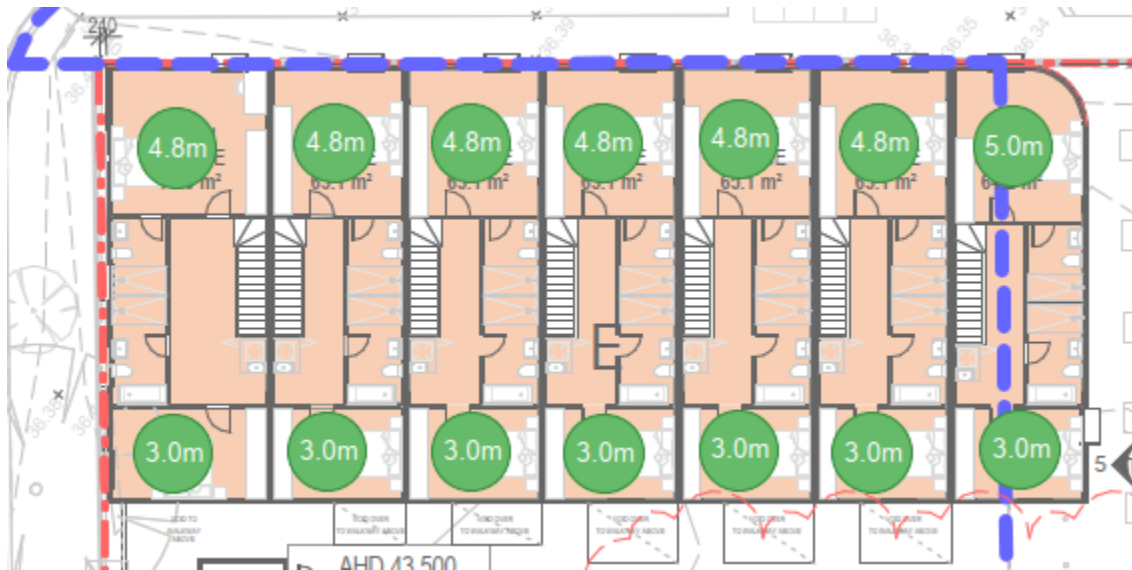
**ADVERTISED  
PLAN**

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

99 Derby Road, Sunshine

Sustainable Management Plan

19 March 2024

**Drawing Area 1 - Level 2**

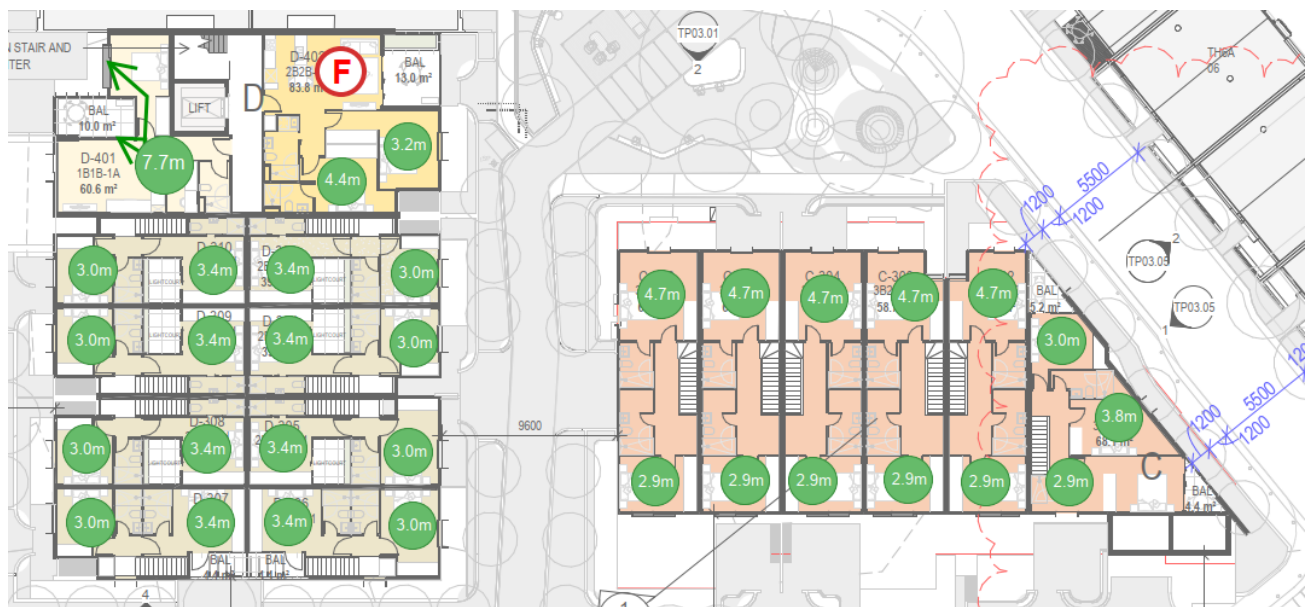
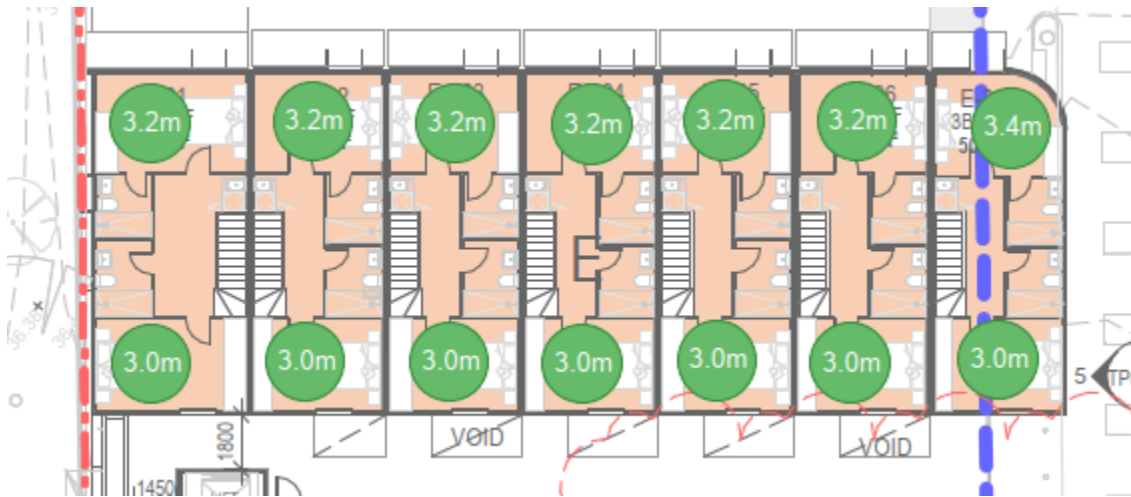
**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 139 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

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

**ADVERTISED  
 PLAN**



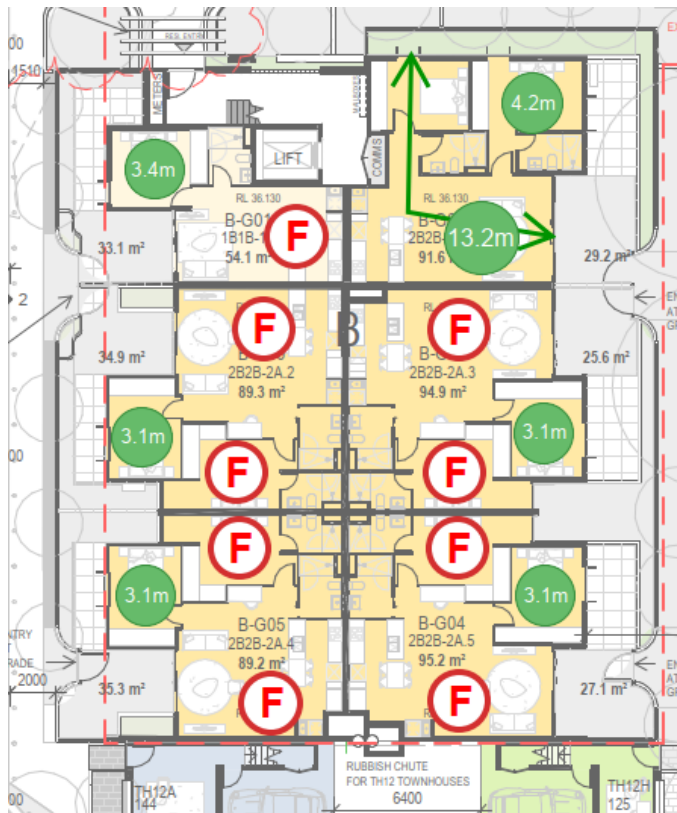


**Drawing Area 1 - Level 4**

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 141 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

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

**ADVERTISED  
PLAN**

**Drawing Area 2 – Ground**

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 142 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

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

**ADVERTISED  
 PLAN**



99 Derby Road, Sunshine

Sustainable Management Plan

19 March 2024

**Drawing Area 2 – Level 1**

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 143 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024



**ADVERTISED  
PLAN**

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

99 Derby Road, Sunshine

Sustainable Management Plan

19 March 2024

**Drawing Area 2 – Level 2**

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 144 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024



**ADVERTISED  
PLAN**

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

99 Derby Road, Sunshine

Sustainable Management Plan

19 March 2024

**Drawing Area 2 – Level 3**

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 145 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024



**ADVERTISED  
PLAN**

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



99 Derby Road, Sunshine

Sustainable Management Plan

19 March 2024

**Drawing Area 2 – Level 4**

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 146 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024



**ADVERTISED  
PLAN**

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

## A.2 BESS Report

Condition1(q)v

BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 147 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

# BESS Report

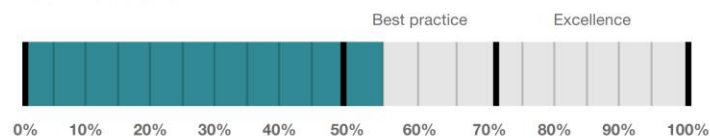
Built Environment Sustainability Scorecard



This BESS report outlines the sustainable design commitments of the proposed development at 99 Derby Rd Sunshine Victoria 3020. 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 Brimbank 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.

### Your BESS Score



# 59%

### Project details

Address 99 Derby Rd Sunshine Victoria 3020  
 Project no 1E2D4901-R2  
 BESS Version BESS-7

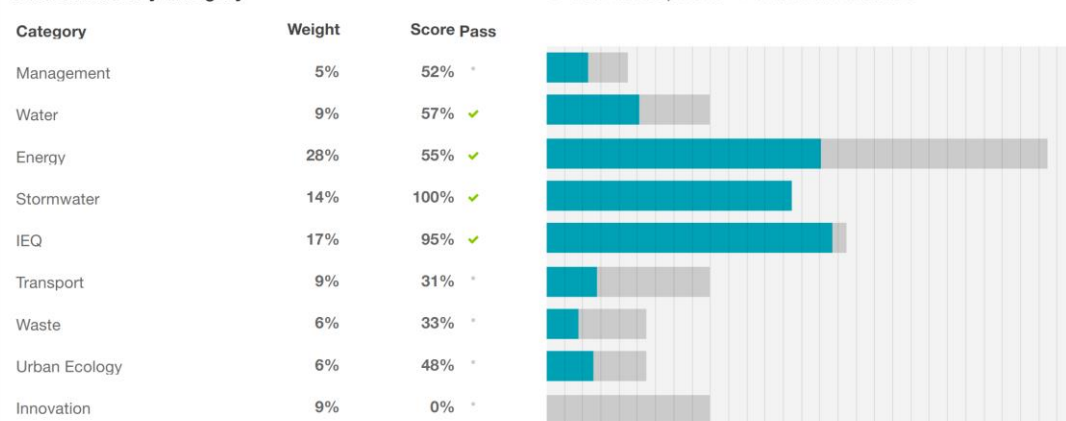
---

Site type Mixed use development  
 Account Id@arkresources.com.au  
 Application no.  
 Site area 25,845.00 m<sup>2</sup>  
 Building floor area 27,384.40 m<sup>2</sup>  
 Date 20 October 2023  
 Software version 1.8.0-B.402

**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**



### Performance by category



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](http://www.bess.net.au)

Page 1 of 33

# ADVERTISED PLAN

BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

**Buildings**

Name	Height	Footprint	% of total footprint
TH	3	9,923 m <sup>2</sup>	81%
Apt	5	2,279 m <sup>2</sup>	18%

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 148 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

**Dwellings & Non Res Spaces****Dwellings**

Name	Quantity	Area	Building	% of total area
<b>Townhouse</b>				
TH12	109	88.3 m <sup>2</sup>	TH	35%
TH3	32	119 m <sup>2</sup>	TH	13%
TH1	15	133 m <sup>2</sup>	TH	7%
TH13	19	90.0 m <sup>2</sup>	TH	6%
TH6	8	137 m <sup>2</sup>	TH	3%
TH14	3	99.3 m <sup>2</sup>	TH	1%
TH5	5	99.4 m <sup>2</sup>	TH	1%
TH16	1	97.7 m <sup>2</sup>	TH	< 1%
TH15	1	94.4 m <sup>2</sup>	TH	< 1%
TH10	1	112 m <sup>2</sup>	TH	< 1%
TH8	1	106 m <sup>2</sup>	TH	< 1%
TH7	1	123 m <sup>2</sup>	TH	< 1%
<b>Total</b>	<b>196</b>	<b>19,566 m<sup>2</sup></b>	<b>71%</b>	

**Apartment**

APT4	24	79.3 m <sup>2</sup>	Apt	6%
APT7	18	72.9 m <sup>2</sup>	Apt	4%
APT1	20	64.1 m <sup>2</sup>	Apt	4%
APT3	14	65.0 m <sup>2</sup>	Apt	3%
APT2	17	56.2 m <sup>2</sup>	Apt	3%
APT5	6	94.4 m <sup>2</sup>	Apt	2%
APT8	4	97.8 m <sup>2</sup>	Apt	1%
APT6	8	50.8 m <sup>2</sup>	Apt	1%
<b>Total</b>	<b>111</b>	<b>7,726 m<sup>2</sup></b>	<b>28%</b>	

**Non-Res Spaces**

Name	Quantity	Area	Building	% of total area
<b>Shop</b>				
Retail	1	90.7 m <sup>2</sup>	Apt	< 1%
<b>Total</b>	<b>1</b>	<b>90 m<sup>2</sup></b>	<b>&lt; 1%</b>	

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](http://www.bess.net.au)

Page 2 of 33

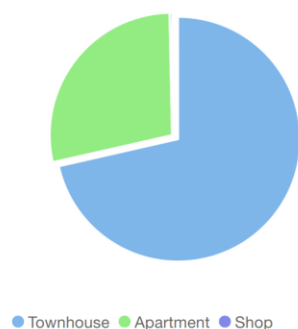
**ADVERTISED  
PLAN**

**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**

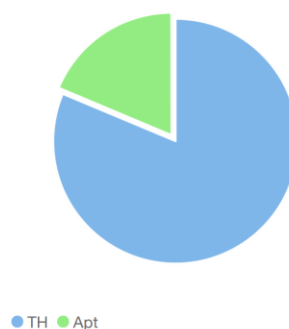


BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

Building Type composition



Building composition



**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 149 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

## Supporting information

### Floorplans & elevation notes

Credit	Requirement	Response	Status
Management 3.1	Annotation: Individual utility meters to be provided to all individual dwellings		-
Management 3.2	Annotation: Individual utility meters to be provided to all individual commercial tenancies		-
Water 3.1	Annotation: Water efficient garden details		-
Energy 3.1	Carpark with natural ventilation or CO monitoring system		-
Energy 3.3	Annotation: External lighting controlled by motion sensors		-
Energy 3.4	Location of clothes line (if proposed)		-
Energy 4.2	Location and size of solar photovoltaic system		-
Energy 4.5	Location and size of solar photovoltaic system		-
Stormwater 1.1	Location of any stormwater management systems (rainwater tanks, raingardens, buffer strips)		-
IEQ 1.1	If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.		-
IEQ 1.2	If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.		-
IEQ 1.5	Floor plans with compliant bedrooms marked		-
IEQ 2.1	Dwellings meeting the requirements for being 'naturally ventilated'		-
IEQ 2.2	Annotation: Dwellings designed for 'natural cross flow ventilation' (If not all dwellings, include a list of compliant dwellings)		-
IEQ 3.1	Annotation: Glazing specification (U-value, SHGC)		-
IEQ 3.2	Adjustable shading systems		-
IEQ 3.3	North-facing living areas		-
Transport 1.2	Location of residential visitor bicycle parking spaces		-
Transport 1.4	Location of non-residential bicycle parking spaces		-
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		-
Urban Ecology 2.1	Location and size of vegetated areas		-
Urban Ecology 2.4	Location of taps and floor waste on balconies / courtyards		-
Urban Ecology 3.1	Location of food production areas		-

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](http://www.bess.net.au)

Page 3 of 33

**ADVERTISED  
PLAN**

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 150 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

**Supporting evidence**

Credit	Requirement	Response	Status
Management 2.2	Preliminary NatHERS assessments		-
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 3.5	Average lighting power density and lighting type(s) to be used		-
Energy 3.6	Average lighting power density and lighting type(s) to be used		-
Energy 3.7	Average lighting power density and lighting type(s) to be used		-
Energy 4.2	Specifications of the solar photovoltaic system(s)		-
Energy 4.5	Specifications of the solar photovoltaic system(s)		-
Stormwater 1.1	STORM report or MUSIC model		-
IEQ 1.1	If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.		-
IEQ 1.2	If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.		-
IEQ 1.4	A short report detailing assumptions used and results achieved.		-
IEQ 1.5	A list of compliant bedrooms		-
IEQ 2.1	A list of naturally ventilated dwellings		-
IEQ 2.2	A list of dwellings with natural cross flow ventilation		-
IEQ 3.1	Reference to floor plans or energy modelling showing the glazing specification (U-value and Solar Heat Gain Coefficient, SHGC)		-
IEQ 3.2	Reference to floor plans and elevations showing shading devices		-
IEQ 3.3	Reference to the floor plans showing living areas orientated to the north		-

**Credit summary****Management Overall contribution 4.5%**

		52%
1.1 Pre-Application Meeting		0%
2.2 Thermal Performance Modelling - Multi-Dwelling Residential		100%
2.3 Thermal Performance Modelling - Non-Residential		0%
3.1 Metering - Residential		100%
3.2 Metering - Non-Residential		100%
3.3 Metering - Common Areas		N/A ✦ Scoped Out
		NA
4.1 Building Users Guide		100%

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](http://www.bess.net.au)

Page 4 of 33

**ADVERTISED  
PLAN**

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

**Water Overall contribution 9.0%**

	Minimum required 50%	57% <span>✓ Pass</span>
1.1 Potable Water Use Reduction	40%	
3.1 Water Efficient Landscaping	100%	
4.1 Building Systems Water Use Reduction	100%	

**Energy Overall contribution 27.5%**

	Minimum required 50%	55% <span>✓ Pass</span>
1.1 Thermal Performance Rating - Non-Residential	37%	
1.2 Thermal Performance Rating - Residential	4%	
2.1 Greenhouse Gas Emissions	100%	
2.2 Peak Demand	0%	
2.3 Electricity Consumption	100%	
2.4 Gas Consumption	71%	
2.5 Wood Consumption	N/A <span>✦ Scoped Out</span>	
No wood heating system present		
2.6 Electrification	0% <span>⊘ Disabled</span>	
Credit is available when project is declared to have no gas connection.		
3.1 Carpark Ventilation	100%	
3.2 Hot Water	71%	
3.3 External Lighting	100%	
3.4 Clothes Drying	100%	
3.5 Internal Lighting - Houses and Townhouses	100%	
3.6 Internal Lighting - Apartments	100%	
3.7 Internal Lighting - Non-Residential	100%	
4.1 Combined Heat and Power (cogeneration / trigeneration)	N/A <span>✦ Scoped Out</span>	
No cogeneration or trigeneration system in use.		
4.2 Renewable Energy Systems - Solar	98%	
4.4 Renewable Energy Systems - Other	0% <span>⊘ Disabled</span>	
No other (non-solar PV) renewable energy is in use.		
4.5 Solar PV - Houses and Townhouses	100%	

**Stormwater Overall contribution 13.5%**

	Minimum required 100%	100% <span>✓ Pass</span>
1.1 Stormwater Treatment	100%	

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](http://www.bess.net.au)

Page 5 of 33

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

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
Plans referred to in Planning Permit: P0780/2021  
Page: 151 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

**ADVERTISED  
PLAN**

BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

**IEQ Overall contribution 16.5%**

		Minimum required 50%	95%	✓ Pass
1.1	Daylight Access - Living Areas	100%		
1.2	Daylight Access - Bedrooms	100%		
1.3	Winter Sunlight	0%		
1.4	Daylight Access - Non-Residential	100%	✓ Achieved	
1.5	Daylight Access - Minimal Internal Bedrooms	100%		
2.1	Effective Natural Ventilation	100%		
2.2	Cross Flow Ventilation	100%		
2.3	Ventilation - Non-Residential	50%	✓ Achieved	
3.1	Thermal comfort - Double Glazing	100%		
3.2	Thermal Comfort - External Shading	100%		
3.3	Thermal Comfort - Orientation	100%		
3.4	Thermal comfort - Shading - Non-Residential	0%		
3.5	Thermal Comfort - Ceiling Fans - Non-Residential	0%		
4.1	Air Quality - Non-Residential	100%		

**Transport Overall contribution 9.0%**

		31%
1.1	Bicycle Parking - Residential	0%
1.2	Bicycle Parking - Residential Visitor	28%
1.3	Bicycle Parking - Convenience Residential	0% Disabled
Credit 1.1 must be achieved first.		
1.4	Bicycle Parking - Non-Residential	100%
1.5	Bicycle Parking - Non-Residential Visitor	100%
1.6	End of Trip Facilities - Non-Residential	0%
2.1	Electric Vehicle Infrastructure	100%
2.2	Car Share Scheme	0%
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%

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](http://www.bess.net.au)

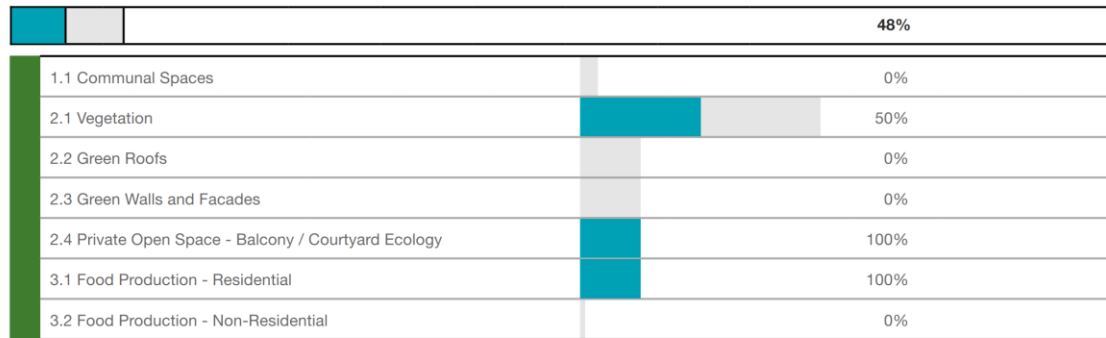
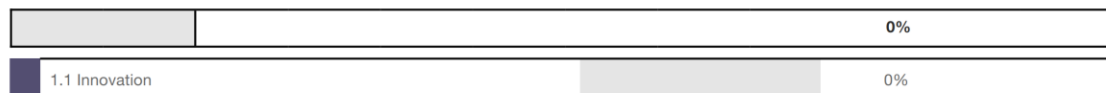
Page 6 of 33

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

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
Plans referred to in Planning Permit: P0780/2021  
Page: 152 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

**ADVERTISED  
PLAN**

BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

**Urban Ecology Overall contribution 5.5%****Innovation Overall contribution 9.0%**


**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 153 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

# ADVERTISED PLAN

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

**Credit breakdown****Management** Overall contribution 2%

<b>1.1 Pre-Application Meeting</b>	0%
Score Contribution	This credit contributes 47.7% 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	No
<b>2.2 Thermal Performance Modelling - Multi-Dwelling Residential</b>	100%
Score Contribution	This credit contributes 31.7% towards the category score.
Criteria	Have preliminary NatHERS ratings been undertaken for all thermally unique dwellings?
Question	Criteria Achieved ?
Townhouse	Yes
Apartment	Yes
<b>2.3 Thermal Performance Modelling - Non-Residential</b>	0%
Score Contribution	This credit contributes 0.1% towards the category score.
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2019 Section J1.5?
Question	Criteria Achieved ?
Shop	No
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2019 Section J (Energy Efficiency), NABERS or Green Star?
Question	Criteria Achieved ?
Shop	No
<b>3.1 Metering - Residential</b>	100%
Score Contribution	This credit contributes 4.5% towards the category score.
Criteria	Have utility meters been provided for all individual dwellings?
Question	Criteria Achieved ?
Apartment	Yes
<b>3.2 Metering - Non-Residential</b>	100%
Score Contribution	This credit contributes 0.1% towards the category score.
Criteria	Have utility meters been provided for all individual commercial tenants?
Question	Criteria Achieved ?
Shop	Yes
<b>3.3 Metering - Common Areas</b>	N/A  Scoped Out
This credit was scoped out	NA

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](http://www.bess.net.au)

Page 8 of 33

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

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
Plans referred to in Planning Permit: P0780/2021  
Page: 154 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

**ADVERTISED  
PLAN**



BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

<b>4.1 Building Users Guide</b>	100%
Score Contribution	This credit contributes 15.9% towards the category score.
Criteria	Will a building users guide be produced and issued to occupants?
Question	Criteria Achieved ?
Project	Yes

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 155 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

## ADVERTISED PLAN

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

**Water** Overall contribution 5% Minimum required 50%

<b>Water Approach</b>	
What approach do you want to use for Water?:	Use the built in calculation tools
<b>Project Water Profile Question</b>	
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
<b>Water fixtures, fittings and connections</b>	
Showerhead:	
Retail	Scope out
TH1	4 Star WELS (>= 6.0 but <= 7.5)
TH3	
TH5	
TH6	
TH7	
TH8	
TH10	
TH12	
TH13	
TH14	
TH15	
TH16	
APT1	
APT2	
APT3	
APT4	
APT5	
APT6	
APT7	
APT8	
Bath: All	Scope out
Kitchen Taps: All	>= 5 Star WELS rating
Bathroom Taps: All	>= 5 Star WELS rating

**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**

**AMENDED PLAN  
PLANNING ENVIRONMENT ACT 1987  
BRIMBANK PLANNING SCHEME  
Plans referred to in Planning Permit: P0780/2021  
Page: 156 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024**

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](http://www.bess.net.au)

Page 10 of 33

**ADVERTISED  
PLAN**

BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

Dishwashers:	
Retail	Scope out
TH1	>= 4 Star WELS rating
TH3	
TH5	
TH6	
TH7	
TH8	
TH10	
TH12	
TH13	
TH14	
TH15	
TH16	
APT1	
APT2	
APT3	
APT4	
APT5	
APT6	
APT7	
APT8	
WC: All	>= 4 Star WELS rating
Urinals:	
Retail	Scope out
TH1	>= 4 Star WELS rating
TH3	
TH5	
TH6	
TH7	
TH8	
TH10	
TH12	
TH13	
TH14	
TH15	
TH16	
APT1	
APT2	
APT3	
APT4	
APT5	
APT6	
APT7	
APT8	

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 157 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

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](http://www.bess.net.au)

Page 11 of 33

**ADVERTISED  
PLAN**

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

Washing Machine Water Efficiency:	
Retail	Scope out
TH1	Occupant to Install
TH3	
TH5	
TH6	
TH7	
TH8	
TH10	
TH12	
TH13	
TH14	
TH15	
TH16	
APT1	
APT2	
APT3	
APT4	
APT5	
APT6	
APT7	
APT8	
Which non-potable water source is the dwelling/space connected to?:	
Retail	-1
TH1	TH RWT
TH3	
TH5	
TH6	
TH7	
TH8	
TH10	
TH12	
TH13	
TH14	
TH15	
TH16	
APT1	Apt RWT
APT2	
APT3	
APT4	
APT5	
APT6	
APT7	
APT8	

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
Plans referred to in Planning Permit: P0780/2021  
Page: 158 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

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](http://www.bess.net.au)

Page 12 of 33

**ADVERTISED  
PLAN**

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

<b>Non-potable water source connected to Toilets:</b>	
Retail	No
TH1	Yes
TH3	
TH5	
TH6	
TH7	
TH8	
TH10	
TH12	
TH13	
TH14	
TH15	
TH16	
APT1	
APT2	
APT3	
APT4	
APT5	
APT6	
APT7	
APT8	
Non-potable water source connected to Laundry (washing machine): All	
Non-potable water source connected to Hot Water System: All No	
<b>Rainwater Tanks</b>	
What is the total roof area connected to the rainwater tank?:	
TH RWT	9,923 m <sup>2</sup>
Apt RWT	1,546 m <sup>2</sup>
Tank Size:	
TH RWT	141,660 Litres
Apt RWT	80,000 Litres
Irrigation area connected to tank:	
TH RWT	0.0 m <sup>2</sup>
Apt RWT	0.0 m <sup>2</sup>
Is connected irrigation area a water efficient garden?:	
TH RWT	No
Apt RWT	No
Other external water demand connected to tank?:	
TH RWT	-
Apt RWT	-

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 159 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

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](http://www.bess.net.au)

Page 13 of 33

**ADVERTISED  
PLAN**

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

<b>1.1 Potable Water Use Reduction</b>		40%
Score Contribution	This credit contributes 71.4% 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	39623 kL	
Output	Proposed (excluding rainwater and recycled water use)	
Project	31800 kL	
Output	Proposed (including rainwater and recycled water use)	
Project	28875 kL	
Output	% Reduction in Potable Water Consumption	
Project	27 %	
Output	% of connected demand met by rainwater	
Project	91 %	
Output	How often does the tank overflow?	
Project	Very Often	
Output	Opportunity for additional rainwater connection	
Project	15357 kL	
<b>3.1 Water Efficient Landscaping</b>		100%
Score Contribution	This credit contributes 14.3% towards the category score.	
Criteria	Will water efficient landscaping be installed?	
Question	Criteria Achieved ?	
Project	Yes	
<b>4.1 Building Systems Water Use Reduction</b>		100%
Score Contribution	This credit contributes 14.3% 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	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**

**AMENDED PLAN  
PLANNING ENVIRONMENT ACT 1987  
BRIMBANK PLANNING SCHEME  
Plans referred to in Planning Permit: P0780/2021  
Page: 160 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024**

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](http://www.bess.net.au)

Page 14 of 33

**ADVERTISED  
PLAN**



BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

**Energy** Overall contribution 15% 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
<b>Dwellings Energy Approach</b>	
What approach do you want to use for Energy?:	Use the built in calculation tools
<b>Project Energy Profile Question</b>	
Are you installing any solar photovoltaic (PV) system(s)?:	Yes
Are you installing any other renewable energy system(s)?:	No
Energy Supply:	Electricity & Natural Gas
Are you installing a cogeneration or trigeneration system?:	No
<b>Dwelling Energy Profiles</b>	
Building:	
TH1	TH
TH3	
TH5	
TH6	
TH7	
TH8	
TH10	
TH12	
TH13	
TH14	
TH15	
TH16	
APT1	Apt
APT2	
APT3	
APT4	
APT5	
APT6	
APT7	
APT8	

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](http://www.bess.net.au)

Page 15 of 33

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

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
Plans referred to in Planning Permit: P0780/2021  
Page: 161 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

**ADVERTISED  
PLAN**

BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

Below the floor is:	
TH1	Ground or Carpark
TH3	
TH5	
TH6	
TH7	
TH8	
TH10	
TH12	
TH13	
TH14	
TH15	
TH16	
APT6	
APT7	
APT8	
APT1	Another Occupancy
APT2	
APT3	
APT4	
APT5	
Above the ceiling is:	
TH1	Outside
TH3	
TH5	
TH6	
TH7	
TH8	
TH10	
TH12	
TH13	
TH14	
TH15	
TH16	
APT3	
APT4	
APT5	
APT1	Another Occupancy
APT2	
APT6	
APT7	
APT8	

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 162 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

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](http://www.bess.net.au)

Page 16 of 33

**ADVERTISED  
PLAN**

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

<b>Exposed sides:</b>	
TH1	2
TH5	
TH6	
TH8	
TH12	
TH13	
TH14	
TH15	
TH16	
APT2	
APT4	
APT7	
TH3	3
TH7	
TH10	
APT5	
APT8	
APT1	1
APT3	
APT6	
<b>NatHERS Annual Energy Loads - Heat:</b>	
TH1	104 MJ/sqm
TH3	103 MJ/sqm
TH5	113 MJ/sqm
APT3	
TH6	107 MJ/sqm
TH7	86.9 MJ/sqm
TH8	105 MJ/sqm
TH10	103 MJ/sqm
TH12	114 MJ/sqm
TH13	105 MJ/sqm
TH14	105 MJ/sqm
TH15	
TH16	108 MJ/sqm
APT1	60.8 MJ/sqm
APT2	105 MJ/sqm
APT4	121 MJ/sqm
APT5	110 MJ/sqm
APT6	86.7 MJ/sqm
APT7	104 MJ/sqm
APT8	112 MJ/sqm

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 163 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

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](http://www.bess.net.au)

Page 17 of 33

**ADVERTISED  
PLAN**

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

<b>NatHERS Annual Energy Loads - Cool:</b>	
TH1	27.5 MJ/sqm
TH3	17.5 MJ/sqm
TH5	14.0 MJ/sqm
TH6	29.2 MJ/sqm
TH15	
TH7	27.8 MJ/sqm
TH8	23.7 MJ/sqm
TH10	24.6 MJ/sqm
TH12	16.7 MJ/sqm
TH13	22.5 MJ/sqm
TH14	17.8 MJ/sqm
TH16	19.6 MJ/sqm
APT3	
APT1	6.4 MJ/sqm
APT2	13.9 MJ/sqm
APT4	15.9 MJ/sqm
APT5	13.3 MJ/sqm
APT6	19.4 MJ/sqm
APT7	6.6 MJ/sqm
APT8	3.6 MJ/sqm
<b>NatHERS star rating:</b>	
TH1	6.2
TH8	
TH12	
TH16	
TH3	6.5
APT2	
APT8	
TH5	6.3
TH10	
APT5	
TH6	6.1
TH15	
TH7	6.6
TH13	6.4
TH14	
APT1	7.8
APT3	6.0
APT4	5.9
APT6	6.7
APT7	
Type of Heating System: All	Reverse cycle space
Heating System Efficiency: All	4 Star
Type of Cooling System: All	Refrigerative space
Cooling System Efficiency: All	4 Stars

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](http://www.bess.net.au)

Page 18 of 33

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

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
Plans referred to in Planning Permit: P0780/2021  
Page: 164 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

**ADVERTISED  
PLAN**

BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

Type of Hot Water System: All	Gas Instantaneous 6 star
Is the hot water system shared by multiple dwellings?:	
TH1	N/A
TH3	
TH5	
TH6	
TH7	
TH8	
TH10	
TH12	
TH13	
TH14	
TH15	
TH16	
APT1	Yes
APT2	
APT3	
APT4	
APT5	
APT6	
APT7	
APT8	
% Contribution from solar hot water system: All	-
Clothes Line: All	Private outdoor clothesline
Clothes Dryer: All	No clothes dryer
<b>Non-Residential Building Energy Profile</b>	
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 - Gas - Reference fabric and services:	-
Heating - Gas - Proposed fabric and Reference services:	-
Heating - Gas - Proposed fabric and 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:	-
Hot Water - Gas - Baseline:	-
Hot Water - Gas - Proposed:	-
Lighting - Reference:	-
Lighting - Proposed:	-
Peak Thermal Cooling Load - Reference:	-
Peak Thermal Cooling Load - Proposed:	-
<b>Solar Photovoltaic systems</b>	

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](http://www.bess.net.au)

Page 19 of 33

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

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
Plans referred to in Planning Permit: P0780/2021  
Page: 165 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

**ADVERTISED  
PLAN**

BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

<b>System Size (lesser of inverter and panel capacity):</b>	
PV Apt	50.4 kW peak
PV TH	490 kW peak
<b>Orientation (which way is the system facing)?:</b>	
PV Apt	North
PV TH	North
<b>Inclination (angle from horizontal):</b>	
PV Apt	10.0 Angle (degrees)
PV TH	10.0 Angle (degrees)
<b>Which Building Class does this apply to?:</b>	
PV Apt	Apartment
PV TH	Townhouse
<b>1.1 Thermal Performance Rating - Non-Residential</b>	
37%	
Score Contribution	This credit contributes 0.1% towards the category score.
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC 2019 Section J)?
<b>1.2 Thermal Performance Rating - Residential</b>	
4%	
Score Contribution	This credit contributes 25.2% towards the category score.
Criteria	What is the average NatHERS rating?
Output	Average NATHERS Rating (Weighted)
Townhouse	6.2 Stars
Apartment	6.5 Stars
<b>2.1 Greenhouse Gas Emissions</b>	
100%	
Score Contribution	This credit contributes 8.4% towards the category score.
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?
Output	Reference Building with Reference Services (BCA only)
Townhouse	1,105,537 kg CO2
Apartment	454,306 kg CO2
Output	Proposed Building with Proposed Services (Actual Building)
Townhouse	393,508 kg CO2
Apartment	187,811 kg CO2
Output	% Reduction in GHG Emissions
Townhouse	64 %
Apartment	58 %

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
Plans referred to in Planning Permit: P0780/2021  
Page: 166 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

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](http://www.bess.net.au)



Page 20 of 33

**ADVERTISED  
PLAN**

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

<b>2.2 Peak Demand</b>		0%
Score Contribution	This credit contributes 4.2% towards the category score.	
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?	
Output	Peak Thermal Cooling Load - Baseline	
Townhouse	2,294 kW	
Apartment	1,257 kW	
Output	Peak Thermal Cooling Load - Proposed	
Townhouse	2,337 kW	
Apartment	1,243 kW	
Output	Peak Thermal Cooling Load - % Reduction	
Townhouse	-2 %	
Apartment	1 %	
<b>2.3 Electricity Consumption</b>		100%
Score Contribution	This credit contributes 8.4% towards the category score.	
Criteria	What is the % reduction in annual electricity consumption against the benchmark?	
Output	Reference	
Townhouse	937,794 kWh	
Apartment	373,497 kWh	
Output	Proposed	
Townhouse	291,611 kWh	
Apartment	116,815 kWh	
Output	Improvement	
Townhouse	68 %	
Apartment	68 %	
<b>2.4 Gas Consumption</b>		71%
Score Contribution	This credit contributes 8.4% towards the category score.	
Criteria	What is the % reduction in annual gas consumption against the benchmark?	
Output	Reference	
Townhouse	2,898,571 MJ	
Apartment	1,426,834 MJ	
Output	Proposed	
Townhouse	1,868,959 MJ	
Apartment	1,335,802 MJ	
Output	Improvement	
Townhouse	35 %	
Apartment	6 %	
<b>2.5 Wood Consumption</b>		N/A  Scoped Out
This credit was scoped out	No wood heating system present	
<b>2.6 Electrification</b>		0%  Disabled
This credit is disabled	Credit is available when project is declared to have no gas connection.	

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](http://www.bess.net.au)

Page 21 of 33

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

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
Plans referred to in Planning Permit: P0780/2021  
Page: 167 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

**ADVERTISED  
PLAN**

BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

<b>3.1 Carpark Ventilation</b>	100%
Score Contribution	This credit contributes 8.4% 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
<b>3.2 Hot Water</b>	71%
Score Contribution	This credit contributes 4.2% towards the category score.
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?
Output	Reference
Townhouse	2,898,571 MJ
Apartment	1,426,834 MJ
Output	Proposed
Townhouse	1,899,178 MJ
Apartment	1,385,549 MJ
Output	Improvement
Townhouse	34 %
Apartment	2 %
<b>3.3 External Lighting</b>	100%
Score Contribution	This credit contributes 3.0% towards the category score.
Criteria	Is the external lighting controlled by a motion detector?
Question	Criteria Achieved ?
Townhouse	Yes
<b>3.4 Clothes Drying</b>	100%
Score Contribution	This credit contributes 4.2% towards the category score.
Criteria	What is the % reduction in annual energy consumption (gas and electricity) from a combination of clothes lines and efficient driers against the benchmark?
Output	Reference
Townhouse	107,948 kWh
Apartment	49,414 kWh
Output	Proposed
Townhouse	21,590 kWh
Apartment	9,883 kWh
Output	Improvement
Townhouse	80 %
Apartment	80 %

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](http://www.bess.net.au)



Page 22 of 33

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

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 168 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

**ADVERTISED  
PLAN**

BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

<b>3.5 Internal Lighting - Houses and Townhouses</b>		100%
Score Contribution	This credit contributes 3.0% towards the category score.	
Criteria	Does the development achieve a maximum illumination power density of 4W/sqm or less?	
Question	Criteria Achieved?	
Townhouse	Yes	
<b>3.6 Internal Lighting - Apartments</b>		100%
Score Contribution	This credit contributes 2.4% towards the category score.	
Criteria	Is the maximum illumination power density (W/m2) in at least 90% of the relevant building class at least 20% lower than required by Table J6.2a of the NCC 2019 Vol 1 (Class 2-9)?	
Question	Criteria Achieved ?	
Apartment	Yes	
<b>3.7 Internal Lighting - Non-Residential</b>		100%
Score Contribution	This credit contributes 0.0% 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	
<b>4.1 Combined Heat and Power (cogeneration / trigeneration)</b>		N/A  Scoped Out
This credit was scoped out	No cogeneration or trigeneration system in use.	
<b>4.2 Renewable Energy Systems - Solar</b>		98%
Score Contribution	This credit contributes 1.2% 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	
Apartment	61,077 kWh	
Output	% of Building's Energy	
Apartment	12 %	
<b>4.4 Renewable Energy Systems - Other</b>		0%  Disabled
This credit is disabled	No other (non-solar PV) renewable energy is in use.	
<b>4.5 Solar PV - Houses and Townhouses</b>		100%
Score Contribution	This credit contributes 6.0% 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	
Townhouse	593,800 kWh	
Output	% of Building's Energy	
Townhouse	73 %	

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](http://www.bess.net.au)

Page 23 of 33

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

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
Plans referred to in Planning Permit: P0780/2021  
Page: 169 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

**ADVERTISED  
PLAN**

BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 170 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

**Stormwater** Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using?:	MUSIC or other modelling software
<b>1.1 Stormwater Treatment</b>	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	35.0 % Reduction
Question	Total Suspended Solids (kg/year)
Project	83.7 % Reduction
Question	Total Phosphorus (kg/year)
Project	45.7 % Reduction
Question	Total Nitrogen (kg/year)
Project	47.1 % Reduction

## ADVERTISED PLAN

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

**IEQ** Overall contribution 16% Minimum required 50%

<b>IEQ DTS</b>	
Use the BESS Deemed to Satisfy (DtS) method for IEQ?:	No
<b>Dwellings IEQ Approach</b>	
What approach do you want to use for dwellings?:	Use the built in calculation tools
<b>Dwelling Daylight Room Profile Questions</b>	
<b>Room Designation:</b>	
Compliant Living B-105, B-106 C-01 C-04 C-03	Living
Compliant Bed	Bedroom
<b>Quantity:</b>	
Compliant Living	108
Compliant Bed	234
B-105, B-106	2
C-01 C-04 C-03	1
<b>Auto-Pass:</b>	
Compliant Living Compliant Bed	Yes
B-105, B-106 C-01 C-04 C-03	No
<b>Room Floor Area:</b>	
Compliant Living Compliant Bed	-
B-105, B-106	22.3 m <sup>2</sup>
C-01	21.5 m <sup>2</sup>
C-04	28.7 m <sup>2</sup>
C-03	24.1 m <sup>2</sup>
<b>Vertical Angle:</b>	
Compliant Living Compliant Bed	-
B-105, B-106	53.0 Angle (degrees)
C-01 C-04 C-03	90.0 Angle (degrees)

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 171 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

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](http://www.bess.net.au)

Page 25 of 33

**ADVERTISED  
PLAN**

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

<b>Horizontal Angle:</b>	
Compliant Living	-
Compliant Bed	
B-105, B-106	58.0 Angle (degrees)
C-01	101 Angle (degrees)
C-04	57.0 Angle (degrees)
C-03	50.0 Angle (degrees)
<b>Window Area:</b>	
Compliant Living	-
Compliant Bed	
B-105, B-106	8.9 m²
C-01	
C-04	
C-03	
<b>Window Orientation:</b>	
Compliant Living	-
Compliant Bed	
B-105, B-106	West
C-01	South
C-04	
C-03	
<b>Glass Type:</b>	
Compliant Living	-
Compliant Bed	
B-105, B-106	Clear Low-E Double (VLT 0.73)
C-01	
C-04	
C-03	
<b>Daylight Criteria Achieved?: All</b>	
Yes	
<b>1.1 Daylight Access - Living Areas</b>	
100%	
Score Contribution	This credit contributes 12.6% towards the category score.
Criteria	What % of living areas achieve a daylight factor greater than 1%
Output	Calculated percentage
Apartment	100 %
<b>1.2 Daylight Access - Bedrooms</b>	
100%	
Score Contribution	This credit contributes 12.6% towards the category score.
Criteria	What % of bedrooms achieve a daylight factor greater than 0.5%
Output	Calculated percentage
Apartment	100 %

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 172 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

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](http://www.bess.net.au)

Page 26 of 33

**ADVERTISED  
PLAN**

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

<b>1.3 Winter Sunlight</b>	0%	
Score Contribution	This credit contributes 4.2% towards the category score.	
Criteria	Do 70% of dwellings receive at least 3 hours of direct sunlight in all Living areas between 9am and 3pm in mid-winter?	
Question	Criteria Achieved ?	
Apartment	-	
<b>1.4 Daylight Access - Non-Residential</b>	100%	✓ Achieved
Score Contribution	This credit contributes 0.3% towards the category score.	
Criteria	What % of the nominated floor area has at least 2% daylight factor?	
Question	Percentage Achieved?	
Shop	100 %	
<b>1.5 Daylight Access - Minimal Internal Bedrooms</b>	100%	
Score Contribution	This credit contributes 4.2% towards the category score.	
Criteria	Do at least 90% of dwellings have an external window in all bedrooms?	
Question	Criteria Achieved ?	
Apartment	Yes	
<b>2.1 Effective Natural Ventilation</b>	100%	
Score Contribution	This credit contributes 12.6% towards the category score.	
Criteria	What % of dwellings are effectively naturally ventilated?	
Question	Percentage Achieved?	
Apartment	100 %	
<b>2.2 Cross Flow Ventilation</b>	100%	
Score Contribution	This credit contributes 10.6% towards the category score.	
Criteria	Are all habitable rooms designed to achieve natural cross flow ventilation?	
Question	Criteria Achieved ?	
Townhouse	Yes	
<b>2.3 Ventilation - Non-Residential</b>	50%	✓ Achieved
Score Contribution	This credit contributes 0.3% towards the category score.	
Criteria	What % of the regular use areas are effectively naturally ventilated?	
Question	Percentage Achieved?	
Shop	100 %	
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	-	
Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?	
Question	Value	
Shop	-	

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](http://www.bess.net.au)

Page 27 of 33

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

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
Plans referred to in Planning Permit: P0780/2021  
Page: 173 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

**ADVERTISED  
PLAN**

BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

<b>3.1 Thermal comfort - Double Glazing</b>	100%
Score Contribution	This credit contributes 21.2% towards the category score.
Criteria	Is double glazing (or better) used to all habitable areas?
Question	Criteria Achieved ?
Townhouse	Yes
<b>3.2 Thermal Comfort - External Shading</b>	100%
Score Contribution	This credit contributes 10.6% towards the category score.
Criteria	Is appropriate external shading provided to east, west and north facing glazing?
Question	Criteria Achieved ?
Townhouse	Yes
<b>3.3 Thermal Comfort - Orientation</b>	100%
Score Contribution	This credit contributes 10.6% towards the category score.
Criteria	Are at least 50% of living areas orientated to the north?
Question	Criteria Achieved ?
Townhouse	Yes
<b>3.4 Thermal comfort - Shading - Non-Residential</b>	0%
Score Contribution	This credit contributes 0.1% towards the category score.
Criteria	What percentage of east, north and west glazing to regular use areas is effectively shaded?
Question	Percentage Achieved?
Shop	-
<b>3.5 Thermal Comfort - Ceiling Fans - Non-Residential</b>	0%
Score Contribution	This credit contributes 0.0% towards the category score.
Criteria	What percentage of regular use areas in tenancies have ceiling fans?
Question	Percentage Achieved?
Shop	-
<b>4.1 Air Quality - Non-Residential</b>	100%
Score Contribution	This credit contributes 0.0% 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	Yes
Criteria	Does all engineered wood meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Shop	Yes

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](http://www.bess.net.au)

Page 28 of 33


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

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
Plans referred to in Planning Permit: P0780/2021  
Page: 174 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

**ADVERTISED  
PLAN**

BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

**Transport** Overall contribution 3%

<b>1.1 Bicycle Parking - Residential</b>		0%
Score Contribution	This credit contributes 24.1% towards the category score.	
Criteria	How many secure and undercover bicycle spaces are there per dwelling for residents?	
Question	Bicycle Spaces Provided ?	
Townhouse	-	
Apartment	49	
Output	Min Bicycle Spaces Required	
Apartment	111	
<b>1.2 Bicycle Parking - Residential Visitor</b>		28%
Score Contribution	This credit contributes 24.1% towards the category score.	
Criteria	How many secure bicycle spaces are there per 5 dwellings for visitors?	
Question	Visitor Bicycle Spaces Provided ?	
Townhouse	19	
Apartment	34	
Output	Min Visitor Bicycle Spaces Required	
Townhouse	40	
Apartment	23	
<b>1.3 Bicycle Parking - Convenience Residential</b>		0%  Disabled
This credit is disabled	Credit 1.1 must be achieved first.	
<b>1.4 Bicycle Parking - Non-Residential</b>		100%
Score Contribution	This credit contributes 0.1% 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	Yes	
Question	Bicycle Spaces Provided ?	
Shop	2	
<b>1.5 Bicycle Parking - Non-Residential Visitor</b>		100%
Score Contribution	This credit contributes 0.0% 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	1	

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
Plans referred to in Planning Permit: P0780/2021  
Page: 175 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

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](http://www.bess.net.au)

Page 29 of 33

**ADVERTISED  
PLAN**

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

<b>1.6 End of Trip Facilities - Non-Residential</b>		0%
Score Contribution	This credit contributes 0.0% towards the category score.	
Criteria	Where adequate bicycle parking has been provided. Is there also: * 1 shower for the first 5 employee bicycle spaces plus 1 to each 10 employee bicycles spaces thereafter, * changing facilities adjacent to showers, and * one secure locker per employee bicycle space in the vicinity of the changing / shower facilities?	
Question	Number of showers provided ?	
Shop	0	
Question	Number of lockers provided ?	
Shop	0	
Output	Min Showers Required	
Shop	1	
Output	Min Lockers Required	
Shop	2	
<b>2.1 Electric Vehicle Infrastructure</b>		100%
Score Contribution	This credit contributes 24.1% towards the category score.	
Criteria	Are facilities provided for the charging of electric vehicles?	
Question	Criteria Achieved ?	
Project	Yes	
<b>2.2 Car Share Scheme</b>		0%
Score Contribution	This credit contributes 12.1% towards the category score.	
Criteria	Has a formal car sharing scheme been integrated into the development?	
Question	Criteria Achieved ?	
Project	No	
<b>2.3 Motorbikes / Mopeds</b>		0%
Score Contribution	This credit contributes 12.1% 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	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**

**AMENDED PLAN  
PLANNING ENVIRONMENT ACT 1987  
BRIMBANK PLANNING SCHEME  
Plans referred to in Planning Permit: P0780/2021  
Page: 176 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024**

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](http://www.bess.net.au)

Page 30 of 33

**ADVERTISED  
PLAN**

BESS, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

**Waste** Overall contribution 2%

<b>1.1 - Construction Waste - Building Re-Use</b>		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	No	
<b>2.1 - Operational Waste - Food &amp; Garden Waste</b>		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	No	
<b>2.2 - Operational Waste - Convenience of Recycling</b>		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	

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 177 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

**ADVERTISED  
PLAN**

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

**Urban Ecology** Overall contribution 3%

<b>1.1 Communal Spaces</b>	0%
Score Contribution	This credit contributes 3.4% towards the category score.
Criteria	Is there at least the following amount of common space measured in square meters : * 1m <sup>2</sup> for each of the first 50 occupants * Additional 0.5m <sup>2</sup> for each occupant between 51 and 250 * Additional 0.25m <sup>2</sup> for each occupant above 251?
Question	Common space provided
Apartment	-
Shop	0.0 m <sup>2</sup>
Output	Minimum Common Space Required
Apartment	127 m <sup>2</sup>
Shop	9 m <sup>2</sup>
<b>2.1 Vegetation</b>	50%
Score Contribution	This credit contributes 48.3% 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	18 %
<b>2.2 Green Roofs</b>	0%
Score Contribution	This credit contributes 12.1% towards the category score.
Criteria	Does the development incorporate a green roof?
Question	Criteria Achieved ?
Project	No
<b>2.3 Green Walls and Facades</b>	0%
Score Contribution	This credit contributes 12.1% towards the category score.
Criteria	Does the development incorporate a green wall or green façade?
Question	Criteria Achieved ?
Project	No
<b>2.4 Private Open Space - Balcony / Courtyard Ecology</b>	100%
Score Contribution	This credit contributes 12.0% towards the category score.
Criteria	Is there a tap and floor waste on every balcony / in every courtyard?
Question	Criteria Achieved ?
Townhouse	Yes
Apartment	Yes

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
Plans referred to in Planning Permit: P0780/2021  
Page: 178 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

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](http://www.bess.net.au)

Page 32 of 33

**ADVERTISED  
PLAN**

**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, 99 Derby Rd REV SCHEME VCAT End 99 Derby Rd, Sunshine 3020

<b>3.1 Food Production - Residential</b>		100%
Score Contribution	This credit contributes 12.0% towards the category score.	
Criteria	What area of space per resident is dedicated to food production?	
Question	Food Production Area	
Townhouse	117 m <sup>2</sup>	
Apartment	52.0 m <sup>2</sup>	
Output	Min Food Production Area	
Townhouse	117 m <sup>2</sup>	
Apartment	52 m <sup>2</sup>	
<b>3.2 Food Production - Non-Residential</b>		0%
Score Contribution	This credit contributes 0.0% towards the category score.	
Criteria	What area of space per occupant is dedicated to food production?	
Question	Food Production Area	
Shop	0.0 m <sup>2</sup>	
Output	Min Food Production Area	
Shop	3 m <sup>2</sup>	

**Innovation** Overall contribution 0%

<b>1.1 Innovation</b>		0%
Score Contribution	This credit contributes 100.0% towards the category score.	
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?	

**Disclaimer**

The Built Environment Sustainability Scorecard (BESS) has been provided for the purpose of information and communication. While we make every effort to ensure that material is accurate and up to date (except where denoted as 'archival'), this material does in no way constitute the provision of professional or specific advice. You should seek appropriate, independent, professional advice before acting on any of the areas covered by BESS.

The Municipal Association of Victoria (MAV) and CASBE (Council Alliance for a Sustainable Built Environment) member councils do not guarantee, and accept no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of BESS, any material contained on this website or any linked sites

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 179 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

**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](http://www.bess.net.au)

Page 33 of 33

**ADVERTISED  
 PLAN**



## MUSIC Assumptions & Results

Assumptions		
Area Name		Area [m <sup>2</sup> ]
Total Roof Areas		12,202
All Townhouse Roofs		9,923
Roof Apartment Building B		590
Roof Apartment Building C		410
Roof Apartment Building D		595
Roof Apartment Building E		366
Roof Apartment Building F		318
Paving Areas to Rain gardens		4,946
Roads/Laneways		4,946
Part Pervious Landscape Areas (over basement)		599
Pervious Landscape Areas		4,157
Remaining Area		3,941
<b>Total Site Area</b>		<b>25,845</b>

MUSIC Model 20/10/2023		
<b>Treatment Devices Features</b>		
RWT Type TH01, TH01A, TH03A, TH03D, TH07C, TH14A & TH14B		34 x 1.0 kL
RWT Type TH03B, TH03C		16 x 1.51 kL
RWT Type TH05, TH08, TH10		7 x 2.0 kL
RWT Type TH06, TH06B, TH06C, TH12A-H, TH13B, TH14C, TH15, TH16		139 x 0.5 kL
Total RWT Capacity for Townhouses		141.66 kL
RWT Apartment Building B		20 kL
RWT Apartment Building C		15 kL
RWT Apartment Building D		20 kL
RWT Apartment Building E		15 kL
RWT Apartment Building F		10 kL
Est. daily water demand for TF Townhouses (all toilets)		9.38 kL/day
Est. daily water demand for TF Apt Bldg B (all toilets)		1.10 kL/day
Est. daily water demand for TF Apt Bldg C (all toilets)		0.88 kL/day
Est. daily water demand for TF Apt Bldg D (all toilets)		1.06 kL/day
Est. daily water demand for TF Apt Bldg E (all toilets)		0.84 kL/day
Est. daily water demand for TF Apt Bldg F (all toilets)		0.96 kL/day
*Total RG surface area		99 m <sup>2</sup>
**Primary Treatment System 1 (GPT)		Rocla CDS 0708 GPT (or equivalent)

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

<b>Results</b>		
Reduction in Total Suspended Solids (TSS)		83.7%
Reduction in Total Phosphorus (TP)		45.7%
Reduction in Total Nitrogen (TN)		47.1%
Reduction in Total Gross Pollutants		99.3%

Pollutant	MUSIC Model Results	Melbourne Water Targets
Reduction in Total Suspended Solids (TSS)	83.7%	80.0%
Reduction in Total Phosphorus (TP)	45.7%	45.0%
Reduction in Total Nitrogen (TN)	47.1%	45.0%
Reduction in Total Gross Pollutants	99.3%	70.0%
Compliance with Melbourne Water targets		✓

### NOTES:

\* RGs vegetated with Effective Nutrient Removal Plants. Further specification to be undertaken in Detailed Design.

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

### Acronyms

RWT: Rain Water Tank

RG: Rain Garden

TF: Toilet Flushing

GPT: Gross Pollutant Trap

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 181 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

**ADVERTISED  
PLAN**

## MUSIC Parameters

MUSIC v6.3.0 Input Parameters	
<b>Rainfall data</b>	
Rainfall Range & Station Name	B - Melbourne Airport (500-650mm)
10 Year Period	B - 1971-1980
Mean annual rainfall	B - 575mm
Evapotranspiration	B - 1041
Time step	6 minutes
Estimation method	Stochastically generated
<b>Soil properties - Melbourne</b>	
Soil store capacity	120mm
Field capacity	50mm
<b>Rain Garden</b>	
Filter Depth	500mm
Extended Detention Depth	200mm
Saturated Hydraulic Conductivity	100mm/hour
Underdrain present?	Yes
<b>GPT Pollutant Removal Rates</b>	
Total Suspended Solids	70%
Total Phosphorous	0%
Total Nitrogen	0%
Gross Pollutants	98%
Validation report	<a href="#">CRC for Catchment Hydrology</a>

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 182 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

**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**

**ADVERTISED  
 PLAN**

**B.1 Rainwater catchment areas**

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

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 183 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

**ADVERTISED  
PLAN**





## B.2 Raingarden Locations

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 184 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024



**ADVERTISED  
PLAN**

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. Energy Rating Assumptions

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 185 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

### C.1 Building Materials - Townhouses

Element	Description	Added R Value
<b>Floor Type</b>	Concrete slab on ground (Ground) Suspended concrete slab (level 1) where over shared carpark and driveway (TH07, TH12's, TH14's TH15, TH16) Suspended timber construction (All other levels)	
<b>Floor Insulation</b>	30mm Kingspan Kooltherm K3 board (Types TH01, TH03D.1 & TH05): Underside of concrete slab on ground	<b>R 1.30</b>
	50mm Kingspan Kooltherm K3 board (Type TH06, TH07, TH08, TH12, TH13, TH15): Underside of concrete slab on ground	<b>R 2.30</b>
	70mm Kingspan Kooltherm K3 board (Types TH07, TH12's, TH14's TH15, TH16): Underside of suspended concrete slab level 1 over shared driveway and carparking	<b>R 3.20</b>
	Bulk Insulation (All types) Floors of levels 1 & 2 shared with garages and outside below	<b>R 4.0</b>
<b>Wall Insulation</b>	Lightweight party walls: Insulation R 1.5	<b>R 1.5</b>
	Internal walls between garages and dwellings: Insulation R 2.5	<b>R 2.5</b>
	Brick veneer walls: Insulation R 2.5	<b>R 2.5</b>
	Lightweight clad walls: Insulation R 2.5	<b>R 2.5</b>
<b>Wall Colour</b>	Solar Absorptance Medium = 0.5	
<b>Roof Insulation</b>	Metal Deck roof including skylight shafts: (Types TH01, TH03, TH05, TH08, TH10) R 5.0 bulk insulation to ceiling; Anticon 60 to roof R 1.3	<b>Roof R1.3 Ceiling R 5.0</b>
	Metal Deck roof including skylight shafts (All other TH types): R 6.0 bulk insulation to ceiling; Anticon 60 to roof R 1.3	<b>Roof R1.3 Ceiling R 6.0</b>
	All townhouse ceilings shared with terraces above: R 5.0 insulation + reflective sarking	<b>R 5.0</b>
<b>Roof Colour</b>	Solar Absorptance Light = 0.3	
<b>Window Frames</b>	Aluminium <b>thermally broken</b> frames to all windows and glazed doors	

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

Element	Description	Added R Value
<b>Window Frame Colour</b>	Solar Absorptance Medium = 0.5	
<b>Sky Lights</b>	Double glazed Fixed Clear. All bathrooms top floor without external window U-value = 3.97, SHGC = 0.27	
<b>External Blinds</b>	Screens and shading as per elevations	

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 186 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

**ADVERTISED  
PLAN**

**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.2 Building Materials – Apartments

Element	Description	Added R Value
<b>Floor Type</b>	Suspended concrete slab (Level 1) Suspended timber construction (Level 2)	AMENDED PLAN PLANNING ENVIRONMENT ACT 1987 BRIMBANK PLANNING SCHEME Plans referred to in Planning Permit: P0780/2021 Page: 187 of 256 Johnson, Adam   Delegate   City Planning Date: 19 July 2024
<b>Floor Insulation</b>	50mm Kingspan Kooltherm K3 board: Underside of level ground floors shared with car park and outside	<b>R 2.35</b>
	70mm Kingspan Kooltherm K3 board (Types 1A, 1B, 2B, 2D, 2F): Underside of level ground floors shared with car park and outside	<b>R 3.35</b>
<b>Wall Insulation</b>	Lightweight party walls: Insulation R 1.5	<b>R 1.5</b>
	Lightweight corridor walls: Insulation R 2.5	<b>R 2.5</b>
	Precast concrete Lift & stairwell walls: Insulation R0.7	<b>R 0.7</b>
	Brick veneer walls: Insulation R 2.5	<b>R 2.5</b>
	Lightweight clad walls: Insulation R 2.5	<b>R 2.5</b>
<b>Wall Colour</b>	Solar Absorptance Medium = 0.5	
<b>Roof Insulation</b>	50mm Kingspan Kooltherm K3 board: R2.30	<b>R2.30</b>
	70mm Kingspan Kooltherm K3 board (Apt types 2H, 2E): R3.20	<b>R3.20</b>
<b>Roof Colour</b>	Solar Absorptance Light = 0.3	
<b>Window Frames</b>	Aluminium frames to all windows and glazed doors	
<b>Window Frame Colour</b>	Solar Absorptance Medium = 0.5	
<b>Sky Lights</b>	Double glazed Fixed Clear. All bathrooms top floor without external window U-value = 2.53, SHGC = 0.21	
<b>External Blinds</b>	Screens and shading as per elevations	

### NOTES

1. The added insulation R value must be equal to or higher than that specified above to meet the energy rating results.
2. All insulation specified for construction must meet Fire Engineer requirements

### C.3 Glazing - Townhouses

Glazing Type	Description	Whole of Window Value		Location
<b>Capral – Thermally Broken Futureline 46D Series Hinged Door</b>		<b>U</b>	<b>SHGC</b>	
	CAP-115-04 Double glazed 6mm EnergyTech Clear/12mm Argon/6mm Clear	2.73	0.42	All Townhouse types
<b>Capral – Thermally Broken Futureline 419TB Series Fixed</b>		<b>U</b>	<b>SHGC</b>	
	CAP-157-06 Double glazed 6mm EnergyTech Clear/12mm Argon/6mm Clear	2.16	0.51	All Townhouse types
<b>Capral – Thermally Broken Futureline 54W Series Awning</b>		<b>U</b>	<b>SHGC</b>	
	CAP-116-04 Double glazed 6mm EnergyTech Clear/12mm Argon/6mm Clear	2.87	0.39	All Townhouse types
<b>Capral – Thermally Broken Futureline Lift &amp; Slide Door</b>		<b>U</b>	<b>SHGC</b>	
<b>Specified Glazing</b>	CAP-133-07 Double glazed 6mm EnergyTech Clear/12mm Argon/6mm Clear	2.40	0.46	All Townhouse types
<b>Energy Rating Software Equivalent</b>	REY-002-16 Reynaers CP 50 TB Sliding door DG 6mm Sunergy/12mm Argon gap/6mm Clear	2.46	0.39	

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 188 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

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

**ADVERTISED  
PLAN**

## C.4 Glazing - Apartments

Glazing Type	Whole of Window Value		Location
<b>Capral – 200 Series Hinged Door</b>	<b>U</b>	<b>SHGC</b>	
CAP-048-03 Double glazed 6mm Energy Advantage/12mm Air gap/6mm Clear	3.76	0.44	All apartments
<b>Capral – 419 Flushline Series Fixed</b>	<b>U</b>	<b>SHGC</b>	
CAP-055-18 Double glazed 6mm Clear/12mm Air gap/6mm Energy Advantage	2.91	0.58	All apartments
<b>Capral – 35 Series Awning</b>	<b>U</b>	<b>SHGC</b>	
CAP-051-03 Double glazed 6mm Energy Advantage/12mm Air gap/6mm Clear	4.55	0.41	All apartments
<b>Capral – 900 Series Sliding door</b>	<b>U</b>	<b>SHGC</b>	
CAP-057-05 Double glazed 6mm Energy Advantage/12mm Air gap/6mm Clear	3.37	0.48	All apartments

### NOTES

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

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

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

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 189 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

**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**

**ADVERTISED  
PLAN**

## C.5 General Rating Assumptions

Item	Details
<b>Floor Coverings</b>	<ul style="list-style-type: none"> <li>• Tiles to bathrooms,</li> <li>• Carpet to bedrooms,</li> <li>• Timber boards to kitchen, living and all other areas</li> </ul>
<b>Window Coverings</b>	Holland blinds to all windows. (Regulation Mode) <sup>1</sup>
<b>Draught Proofing</b>	Weather strips to all entry & external doors and windows. Seal all exhaust fans.
<b>Down lights</b>	Recessed down lights in ceiling /roof space to be fitted with fire proof unvented down light covers (external roof areas only) to provide air tightness and contact with insulation
<b>General</b>	All party walls are classed as neighbour walls.
<b>Shading</b>	Overshadowing from adjoining buildings has been incorporated into the energy ratings
<b>Ceiling Calculation</b>	Calculation for loss of ceiling insulation due to down lights, exhaust fans, ceiling speakers etc. have been incorporated into the energy rating where applicable

### NOTES

For Single dwellings (class 1)

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

NCC 2019 vol. 2 Part 3.12.3 requires that seals are to be provided to:

- a) Chimneys and flues
- b) Roof lights i.e. skylights or windows installed in a roof
- c) Around external doors and windows and
- d) Exhaust fans

Or for apartments (class 2)

1. Changes to any of the above stated specifications may affect energy performance and invalidate the energy ratings detailed in this report.
2. Sealing of gaps and cracks: inadequate sealing of gaps and cracks can negatively affect the energy performance of a dwelling. Provide sealing in accordance with NCC 2019 Part J3.

**ADVERTISED  
PLAN**

○ <sup>1</sup> Holland blinds are assumed as required by VBA Practice Note 55 (Clause 5.2). This assumption is for regulatory purposes only.



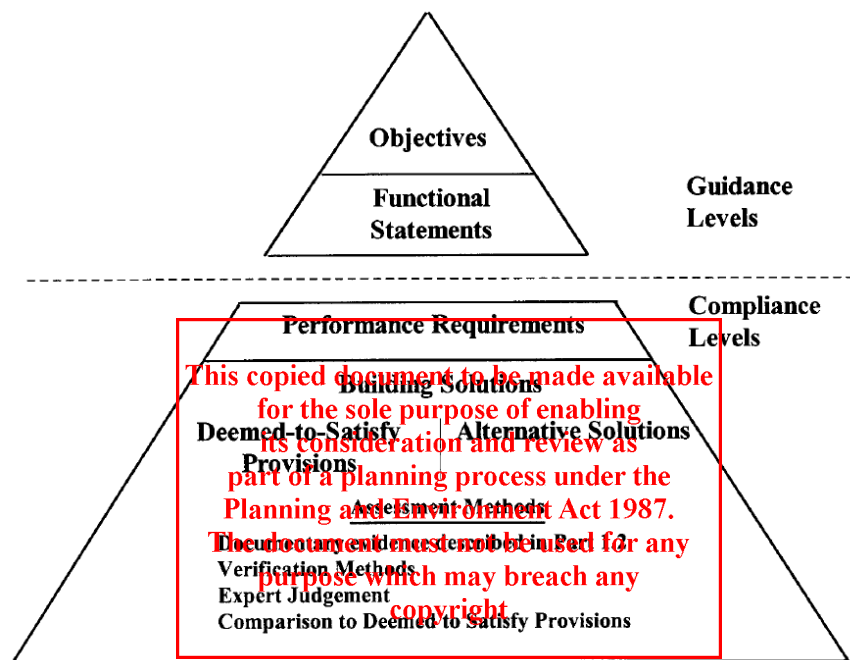
## Appendix D. Section 3.12 Verification Method V2.6.2.2 (TOWNHOUSE TYPE 12C, 12F, 13A AND 13B)

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 191 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

### D.1 Alternative Assessment Method

An alternative solution to Deemed-to-Satisfy (DTS) provisions has been used to demonstrate compliance of Townhouse Types 12C, 12D, 13A and 13B with Section 3.12 of the NCC 2019. The alternative assessment method used is the Verification Method V2.6.2.2.

The use of a Verification Method is an alternative assessment method to demonstrate compliance with the NCC, as described in the BCA Hierarchy (Figure 1.0.3 of the NCC 2019).



**Figure 1. The BCA Hierarchy**

Verification Method V2.6.2.2 – Verification using reference buildings for 99 Derby Rd, Sunshine complies with Section 3.12 – Energy Efficiency of the NCC 2019.

The Verification Method V2.6.2.2 requires a reference case building to be modelled in accordance with Sections 3.12.1 to 3.12.4 DTS provisions.

The heating load and cooling load of this reference building are then compared to the heating and cooling loads of the proposed building. In climate zone 6, the heating load and cooling load of the proposed building are to be less or equal to that of the reference building in order to satisfy the following parts of the DTS Provisions:

- 3.12.1 – Building Fabric;
- 3.12.2 – External Glazing;
- 3.12.3 – Building Sealing; and
- 3.12.4 – Air Movement.

**ADVERTISED  
PLAN**

### D.2 Simulation Software

The building has been modelled using IES Virtual Environment software version 2019.

IES Virtual Environment version 2019 complies with the ABCB 'Protocol for Building Energy Analysis Software for Class 3, 5, 6, 7, 8 and 9 Buildings' (Version 2006.1). Specifically, IES Virtual Environment:

- Is commercially available;
- Is based on a simulation program with hourly climate data file;
- Is capable of computing the annual energy consumption of a building in accordance with the verification methods of the NCC;
- Is capable of geometrically describing the building in three dimensions including taking into account the surface azimuth, tilt angle and adjacent structures and features; and
- Provides the results comparable to other similar software in accordance with ASHRAE Standard 140-2001.

IES Virtual Environment is an analysis software tested in accordance with ASHRAE Standard 140-2001 using the International Energy Agency BESTEST. IES Virtual Environment meets the following standards and can undertake the following methodologies:

Standards: ASHRAE 140: 2001, 2004, 2007 / BEST TEST / CIBSE TM33 / European Union EN13791: July 2000 / EPACT Qualified;

Methodologies: UK National Calculation methodology (NCM) / ASHRAE 55 calculation procedure / ASHRAE 90.1 Appendix G PRM calculation procedure / ASHRAE 62.1 calculation procedure / ISO 7730 calculation

For more information about IES Virtual Environment ANSI/ASHRAE Standard 140-2001 accreditation, please refer to the following webpage [http://www.iesve.com/news/ies---ansiashrae-standard-140-2001-accreditation\\_1330\\_/corporate](http://www.iesve.com/news/ies---ansiashrae-standard-140-2001-accreditation_1330_/corporate).

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 192 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

**ADVERTISED  
PLAN**

**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**

### D.3 Simulation Details and Assumptions

Details about building fabric, equipment and services used, including assumptions made, are provided in Table 1 below.

Item	NCC 2019 Reference Building	Proposed Building
<b>Climate Data</b>	Tullamarine Test Reference Year (TRY)	Tullamarine Test Reference Year (TRY)
<b>Operating Conditions</b>	<ul style="list-style-type: none"> <li>Heating 20-21°C in conditioned areas in accordance with V2.6.2.2 requirement for daytime occupied conditioned areas.</li> </ul>	As per reference case.
	<ul style="list-style-type: none"> <li>Cooling 25-28°C in conditioned areas in accordance with V2.6.2.2 requirement for daytime occupied conditioned areas</li> </ul>	As per reference case.
<b>Plant Operating Profile</b>	<p>Operation schedule as per V2.6.2.2 requirement – Explanatory information 1.</p> <p><u>For Bedrooms:</u> On all hours except 9am to 4pm (17 hours)</p> <p><u>For Living Spaces:</u> On from 8am to Midnight (16 hours)</p> <p><u>For Other Night Time Zones:</u> On all hours except 9am to 4pm (17 hours)</p> <p>Toilets and Ensuites are considered not conditioned</p>	<p>As per reference case.</p> <p>NCC2019 Volume II V2.6.2.2</p> <p><b>Explanatory information:</b></p> <p>In (c)(iv), the number of hours per day for which heating, and cooling is available would be expected to lie between 8 and 17, with values outside this range unlikely in other than exceptional circumstances.</p> <p>Toilets and Ensuites are considered not conditioned</p>
<b>Internal Gains People</b>	<p>Internal gains from people assumed to be as follows:</p> <ul style="list-style-type: none"> <li>Sensible heat gain : 75 W/person</li> <li>Latent heat gain : 55 W/person</li> </ul> <p>Operation schedule as per NCC 2019 – Volume One for Class 1a building.</p>	<p>As per reference case.</p> <p><b>AMENDED PLAN</b>  <b>PLANNING ENVIRONMENT ACT 1987</b>  <b>BRIMBANK PLANNING SCHEME</b>  <b>Plans referred to in Planning Permit: P0780/2021</b>  <b>Page: 193 of 256</b>  <b>Johnson, Adam   Delegate   City Planning</b>  <b>Date: 19 July 2024</b></p>
<b>Lighting</b>	<p>Maximum illumination power density for lighting as per Clause 3.12.5.5 (a) of the NCC 2019:</p> <ul style="list-style-type: none"> <li>5 W/m<sup>2</sup> for dwellings</li> </ul> <p>Operation schedule as per NCC 2019 – Volume One for Class 1a building.</p>	<p>As per reference case.</p> <p><b>ADVERTISED PLAN</b></p>
<b>Equipment</b>	<p>Internal sensible heat gain rate:</p> <ul style="list-style-type: none"> <li>5 W/m<sup>2</sup> (averaged for 24 hours per day, 7 days per week, continuous operation)</li> </ul>	As per reference case.
<b>Infiltration values</b>	10m <sup>3</sup> /h/m <sup>2</sup> of building envelope at 50Pa Equivalent to average annual infiltration of 0.25ach	10m <sup>3</sup> /h/m <sup>2</sup> of building envelope at 50Pa Equivalent to average annual infiltration of 0.25ach
<b>Natural Ventilation</b>	Triggered when room temperature minus 4°C is greater than ambient temperature and room temperature is greater than 24°C in accordance with First Rate 5.	As per reference case.

Item	NCC 2019 Reference Building	Proposed Building
<b>Insulation</b>	As per Deemed-to Satisfy requirements. See detailed information below.	See detailed information below.
<b>Roof/Ceiling</b>	As per Deemed-to Satisfy requirements. <b>R5.1</b> and solar absorptance of 0.6	<ul style="list-style-type: none"> <li>Metal sheet deck: R5.0 bulk insulation to ceiling + Anticon 60 to roof (Ceiling Insulation <b>R5</b> + Roof Insulation <b>R1.3</b>)</li> <li>Lightweight roofs with terrace decks above: R5.0 bulk insulation + reflective sarking (<b>R5.0</b>)</li> <li>Roof solar absorptance of 0.6</li> </ul>
<b>External walls</b>	As per Deemed-to Satisfy requirements. <b>R2.8</b> and solar absorptance of 0.7	<ul style="list-style-type: none"> <li>Lightweight clad walls: Insulation <b>R2.5</b></li> <li>Brick Veneer walls: Insulation <b>R2.5</b></li> </ul>
<b>Internal walls</b>	As per deemed-to Satisfy requirements. <ul style="list-style-type: none"> <li><b>R1.8</b> Internal wall adjacent to garage</li> <li>Other internal walls including adjacent to neighbor dwellings: <b>non-insulated</b></li> </ul>	<ul style="list-style-type: none"> <li>Lightweight party walls: Insulation <b>R1.5</b></li> <li>Lightweight walls between dwelling and garages: Insulation <b>R2.5</b></li> </ul>
<b>Floor</b>	As per deemed-to Satisfy requirements. <ul style="list-style-type: none"> <li>Slab on Ground: <b>R2.25</b></li> <li>Suspended timber construction above a non-conditioned space (garage) must have a barrier to prevent convection installed below floor level between the airspace under the floor and any wall cavities.</li> <li>Exposed timber construction conditioned zone to external air: <b>R2.25</b></li> <li>Floor Finish as per design</li> </ul>	<ul style="list-style-type: none"> <li>Slab on Ground: <b>R1.75</b> insulation under concrete slab</li> <li>Suspended timber construction above a non-conditioned space (garage): Bulk insulation <b>R4.0</b></li> <li>Exposed timber construction conditioned zone to external air: Bulk insulation <b>R4.0</b></li> </ul> <p>Floor Finish as per design</p>
<b>External shading</b>	External shading devices have been incorporated into the analysis.	As per reference case.

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

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
Plans referred to in Planning Permit: P0780/2021  
Page: 194 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

**ADVERTISED  
PLAN**

Item	NCC 2019 Reference Building	Proposed Building
<b>Glazing</b>	<p>Glazing area as per proposed design.</p> <p>As per DTS J2 Compliance for Class 1 building (Glazing Calculators).</p>	<p>The proposed building is based on the following glazing performances <b>(or equivalent)</b>:</p> <p>Whole of Window performance values (All Thermally Broken Frames):</p> <p><b>Capral – Futureline 419TB Series Fixed</b> 6mm EnergyTech Clear/12mm Argon/6mm Clear U value 2.16 / SHGC 0.51</p> <p><b>Capral – Futureline 54W Series Awning</b> 6mm EnergyTech Clear/12mm Argon/6mm Clear U value 2.87 / SHGC 0.39</p> <p><b>Capral - Futureline Lift &amp; Slide Door</b> 6mm EnergyTech Clear/12mm Argon/6mm Clear U value 2.4 / SHGC 0.46</p> <p>Note: Any window system may be used as long as the U-value is less than the values listed above and the SHGC is +/- 5% of the values listed above.</p>

Table 1: Simulation Details and Assumptions.

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 195 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

Please refer to Appendix D.3 for the relevant NCC 2019 Volume Two Glazing Calculators.

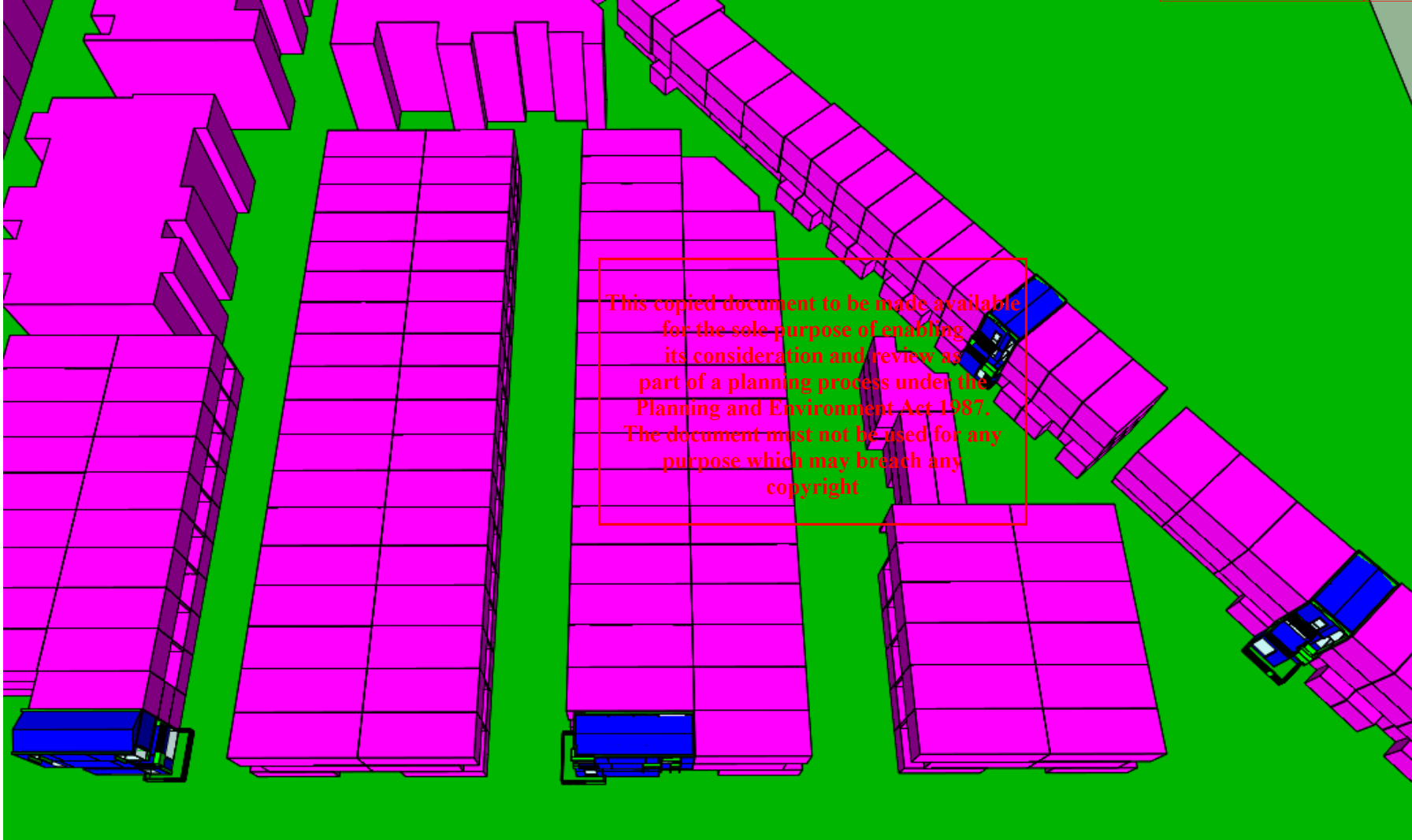
**This copied document to be made available  
for the sole purpose of enabling  
its consideration and review as  
part of a planning process under the  
Planning and Environment Act 1987.  
The document must not be used for any  
purpose which may breach any  
copyright**

**ADVERTISED  
PLAN**

**D.1 Building Model**

Images of the 3D model used for the reference and proposed buildings are shown below.

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 196 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024



**Figure 4. Model Image of the proposed development – Site View**



## D.1 Modelling Results

The comparative heating and cooling loads of the reference and proposed buildings is summarised in Tables 2 and 3 below:

Townhouse Type	Heating Plant (MWh/yr)	Cooling Plant (MWh/yr)	Total (MJ/yr)
	<i>Sensible Load</i>	<i>Sensible + Latent Loads</i>	
TH 12C No 62	0.29	4.77	18,241
TH 12F No 135	1.85	2.89	17,056
TH 13A No 19	0.14	3.59	13,420
TH 13B No 26	0.39	3.98	15,714

Table 2. NCC reference building simulation results

Townhouse Type	Heating Plant (MWh/yr)	Cooling Plant (MWh/yr)	Total (MJ/yr)
	<i>Sensible Load</i>	<i>Sensible + Latent Loads</i>	
TH 12C No 62	0.56	3.74	15,483
TH 12F No 135	1.76	2.74	16,194
TH 13A No 19	0.20	3.27	12,505
TH 13B No 26	0.42	3.61	14,486

Table 3. Proposed building simulation results

Townhouse Type	Total Loads (MJ/m <sup>2</sup> /yr)	Savings over Reference Model (%)	Comparative Star Rating
TH 12C No 62	144.7	15.1%	6.5
TH 12F No 135	155.7	5.1%	6.2
TH 13A No 19	130.3	6.8%	6.2
TH 13B No 26	159.2	7.8%	6.3

Table 4. Comparative Star Rating Performance

As shown in tables 2, 3 and 4 above, the heating and cooling loads of each proposed townhouse is lower than the reference building.

As a result, the Verification Method V2.6.2.2 analysis demonstrates that the proposed designs achieve compliance with Section 3.12 – Energy Efficiency of the NCC 2019 (Volume II), based on the design and modelling assumptions set out in this report.

## D.2 Conclusion

Both the heating and cooling loads of the proposed residence are lower than that of the reference buildings, modelled in accordance with the DTS provisions of the NCC 2019.

This demonstrates that the proposed design achieves compliance with the following parts of the Section 3.12 Energy Efficiency of the NCC 2019 (Volume Two), based on the glazing and modelling assumptions set out in this report in combination.

- 3.12.1 – Building Fabric;
- 3.12.2 – External Glazing;
- 3.12.3 – Building Sealing; and
- 3.12.4 – Air Movement.

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 198 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

**ADVERTISED  
PLAN**

**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**

## D.3 Glazing Calculators

### TH 12C No 62

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 199 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

**ABC** **Glazing** **National Construction Code**

**Calculator**

1. Enter building name and description below - identifying the particular part(s) covered by this assessment.

TH Type 12C, Lot 62, 99 Derby Road, Sunshine (Ground)

Climate Zone **6**

Constants  $C_u$  6.418  $C_{SHGC}$  0.153

Storey **Ground** Floor Construction **Area** **20m²** Wall Insulation Option Chosen for 3.12.1.4 **No wall insulation concession used**

Air Movement **Standard** Direct Contact **20m²** Suspended **7.0m²** (35% of area of storey)

Allowances  $C_{g(w)}$  6.4  $C_{SHGC} \times \text{Area}$  3.1

Number of rows for table below **3** (as currently displayed)

Glazing Elements, Orientation Sector, Size and Performance Characteristics							Shading		Calculation Data				Calculated Outcomes				
Glazing element		Orientation		Size		Performance		P&H or Device		Exposure		Size		Conductance - PASSED		Solar heat gain - PASSED	
Description (optional)	Facing Sector	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	Es	Area used (m²)	U x area / Winter Access	Element Share of % of Allowance Used	SHGC x Es x Area	Element Share of % of Allowance Used		
1	W	2.15	1.80	1.82	0.50	0.40	2.15	0.19	1.14	3.87	3.53	55% of 100%	2.2	71% of 100%			
2	S	2.15	1.20	1.82	0.50	0.61	2.58	2.35	37% of 100%	0.8	25% of 100%						
3	Glazing in door	S	1.80	0.30	1.82	0.50	0.35	1.95	0.18	0.45	0.54	0.49	8% of 100%	0.1	4% of 100%		

TH 12C No 62 Ground Level Glazing Calculator

**ABC** **Glazing** **National Construction Code**

**Calculator**

1. Enter building name and description below - identifying the particular part(s) covered by this assessment.

TH Type 12C, Lot 62, 99 Derby Road, Sunshine (1F)

Climate Zone **6**

Constants  $C_u$  5.776  $C_{SHGC}$  0.138

Storey **First** Floor Construction **Area** **39m²** Wall Insulation Option Chosen for 3.12.1.4 **No wall insulation concession used**

Air Movement **Standard** Direct Contact **39m²** Suspended **15.3m²** (39% of area of storey)

Allowances  $C_{g(w)}$  5.8  $C_{SHGC} \times \text{Area}$  5.4

Number of rows for table below **3** (as currently displayed)

Glazing Elements, Orientation Sector, Size and Performance Characteristics							Shading		Calculation Data				Calculated Outcomes				
Glazing element		Orientation		Size		Performance		P&H or Device		Exposure		Size		Conductance - PASSED		Solar heat gain - PASSED	
Description (optional)	Facing Sector	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	Es	Area used (m²)	U x area / Winter Access	Element Share of % of Allowance Used	SHGC x Es x Area	Element Share of % of Allowance Used		
1	W	2.70	3.05	1.42	0.60	2.20	2.90	0.76	0.68	8.24	3.13	54% of 100%	3.4	62% of 100%			
2	S	2.70	1.75	1.42	0.60	0.30	2.70	0.11	0.48	4.73	1.79	31% of 100%	1.4	25% of 100%			
3	S	2.70	0.85	1.42	0.60	0.30	2.70	0.11	0.48	2.30	0.87	15% of 100%	0.7	12% of 100%			

TH 12C No 62 Level 1 Glazing Calculator

**ABC** **Glazing** **National Construction Code**

**Calculator**

1. Enter building name and description below - identifying the particular part(s) covered by this assessment.

TH Type 12C, Lot 62, 99 Derby Road, Sunshine (2F)

Climate Zone **6**

Constants  $C_u$  5.776  $C_{SHGC}$  0.138

Storey **Second** Floor Construction **Area** **48m²** Wall Insulation Option Chosen for 3.12.1.4 **No wall insulation concession used**

Air Movement **Standard** Direct Contact **48m²** Suspended **12.0m²** (25% of area of storey)

Allowances  $C_{g(w)}$  5.8  $C_{SHGC} \times \text{Area}$  6.6

Number of rows for table below **3** (as currently displayed)

Glazing Elements, Orientation Sector, Size and Performance Characteristics							Shading		Calculation Data				Calculated Outcomes				
Glazing element		Orientation		Size		Performance		P&H or Device		Exposure		Size		Conductance - PASSED		Solar heat gain - PASSED	
Description (optional)	Facing Sector	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	Es	Area used (m²)	U x area / Winter Access	Element Share of % of Allowance Used	SHGC x Es x Area	Element Share of % of Allowance Used		
1	W	2.70	0.80	1.92	0.81	0.30	2.70	0.11	1.24	2.16	1.04	18% of 100%	2.2	36% of 91%			
2	S	2.70	1.85	1.92	0.81	0.30	2.70	0.11	0.48	5.00	2.40	42% of 100%	2.0	33% of 91%			
3	S	2.70	1.80	1.92	0.81	0.30	2.70	0.11	0.48	4.86	2.33	40% of 100%	1.9	32% of 91%			

TH 12C No 62 Level 2 Glazing Calculator

99 Derby Road, Sunshine

Sustainable Management Plan

19 March 2024

**TH 12F No 135**

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: **1501409021**  
 Page: 200 of 258  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

**ABCBC** **Glazing** **National Construction Code**

Help Calculator

1. Enter building name and description below - identifying the particular part(s) covered by this assessment.

TH Type 12F, Lot 135, 99 Derby Road, Sunshine (Ground) Climate Zone 6

Storey: Ground Floor Construction: Direct Contact Area: 17m² Wall Insulation Option Chosen for 3.12.1.4: No wall insulation concession used

Air Movement: Standard Area of storey: 17m² Area of glazing: 9.8m² (58% of area of storey)

Number of rows for table below: 3 (as currently displayed)

Glazing Elements, Orientation Sector, Size and Performance Characteristics							Shading		Calculation Data		Calculated Outcomes				
Glazing element		Orientation		Size		Performance		P&H or Device		Exposure		Conductance - PASSED		Solar heat gain - PASSED	
Description (optional)	Facing Sector	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	Es	Area used (m²)	U x area / Winter Access	Element Share of % of Allowance Used	SHGC x Es x Area	Element Share of % of Allowance Used
1	E	2.35	2.85		1.18	0.27				1.15	6.70	4.35	68% of 100%	2.1	80% of 100%
2	S	2.15	1.20		1.18	0.27				0.61	2.58	1.68	26% of 100%	0.4	16% of 100%
3	S	1.80	0.30		1.18	0.27				0.61	0.54	0.35	6% of 100%	0.1	3% of 100%

TH 12F No 135 Ground Level Glazing Calculator

**ABCBC** **Glazing** **National Construction Code**

Help Calculator

1. Enter building name and description below - identifying the particular part(s) covered by this assessment.

TH Type 12F, Lot 135, 99 Derby Road, Sunshine (1F) Climate Zone 6

Storey: First Floor Construction: Direct Contact Area: 39m² Wall Insulation Option Chosen for 3.12.1.4: No wall insulation concession used

Air Movement: Standard Area of storey: 39m² Area of glazing: 10.4m² (27% of area of storey)

Number of rows for table below: 2 (as currently displayed)

Glazing Elements, Orientation Sector, Size and Performance Characteristics							Shading		Calculation Data		Calculated Outcomes				
Glazing element		Orientation		Size		Performance		P&H or Device		Exposure		Conductance - PASSED		Solar heat gain - PASSED	
Description (optional)	Facing Sector	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	Es	Area used (m²)	U x area / Winter Access	Element Share of % of Allowance Used	SHGC x Es x Area	Element Share of % of Allowance Used
1	E	2.70	2.85		2.08	0.51				1.15	7.70	4.27	74% of 100%	4.5	84% of 100%
2	S	2.70	1.00		2.08	0.51				0.61	2.70	1.50	26% of 100%	0.8	16% of 100%

TH 12F No 135 Level 1 Glazing Calculator

**ABCBC** **Glazing** **National Construction Code**

Help Calculator

1. Enter building name and description below - identifying the particular part(s) covered by this assessment.

TH Type 12F, Lot 135, 99 Derby Road, Sunshine (2F) Climate Zone 6

Storey: Second Floor Construction: Direct Contact Area: 48m² Wall Insulation Option Chosen for 3.12.1.4: No wall insulation concession used

Air Movement: Standard Area of storey: 48m² Area of glazing: 12.0m² (25% of area of storey)

Number of rows for table below: 4 (as currently displayed)

Glazing Elements, Orientation Sector, Size and Performance Characteristics							Shading		Calculation Data		Calculated Outcomes				
Glazing element		Orientation		Size		Performance		P&H or Device		Exposure		Conductance - PASSED		Solar heat gain - PASSED	
Description (optional)	Facing Sector	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	Es	Area used (m²)	U x area / Winter Access	Element Share of % of Allowance Used	SHGC x Es x Area	Element Share of % of Allowance Used
1	E	2.70	0.85		2.16	0.65				1.15	2.30	1.10	19% of 100%	1.7	26% of 100%
2	S	2.70	1.85		2.16	0.65				0.61	5.00	2.40	42% of 100%	2.0	30% of 100%
3	S	2.70	1.00		2.16	0.65				0.61	2.70	1.30	22% of 100%	1.1	16% of 100%
4	W	2.70	0.75		2.16	0.65				1.40	2.03	0.97	17% of 100%	1.8	28% of 100%

TH 12F No 135 Level 2 Glazing Calculator



## TH 13A No 19

**Glazing**

AMENDED PLAN  
PLANNING ENVIRONMENT ACT 1987  
BRIMBANK PLANNING SCHEME  
Plans referred to in Planning Permit: B0780/2021  
Page: 201 of 258  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

1. Enter building name and description below - identifying the particular part(s) covered by this assessment.

TH Type 13, Lot 19, 99 Derby Road, Sunshine (Ground)

Climate Zone: 6

Constants:  $C_{U1}$  6.418,  $C_{SHGC}$  0.153

Storey: Ground  
Floor Construction: Direct Contact  
Area: 12m<sup>2</sup>  
Wall Insulation Option Chosen for 3.12.1.4: No wall insulation concession used

Air Movement: Standard  
Suspended  
Area of storey: 12m<sup>2</sup>  
Area of glazing: 4.9m<sup>2</sup> (41% of area of storey)

Allowances:  $C_{U1}^{(m)}$  6.4,  $C_{SHGC} \times \text{Area}$  1.8

Number of rows for table below: 3 (as currently displayed)

Glazing Elements, Orientation Sector, Size and Performance Characteristics							Shading		Calculation Data		Calculated Outcomes				
Glazing element		Orientation		Size		Performance		P&H or Device		Exposure		Conductance - PASSED		Solar heat gain - PASSED	
Description (optional)	Facing Sector	Height (m)	Width (m)	Area (m <sup>2</sup> )	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	PI/H	Es	Area used (m <sup>2</sup> )	U x area / Winter Access	Element Share of % of Allowance Used	SHGC x Es x Area	Element Share of % of Allowance Used
1	SW	2.30	0.95		1.02	0.58	0.55	2.30	0.24	0.79	2.19	2.84	44% of 100%	1.0	56% of 100%
2	SE	2.30	0.95		1.02	0.58	1.15	2.30	0.50	0.50	2.19	2.84	44% of 100%	0.6	35% of 100%
3 Glazing in door	SW	1.85	0.30		1.02	0.58	1.45	2.00	0.73	0.53	0.56	0.72	11% of 100%	0.2	9% of 100%

TH 13A No 19 Ground Level Glazing Calculator

**Glazing**

1. Enter building name and description below - identifying the particular part(s) covered by this assessment.

TH Type 13, Lot 19, 99 Derby Road, Sunshine (1F)

Climate Zone: 6

Constants:  $C_{U1}$  5.776,  $C_{SHGC}$  0.138

Storey: First  
Floor Construction: Direct Contact  
Area: 37m<sup>2</sup>  
Wall Insulation Option Chosen for 3.12.1.4: No wall insulation concession used

Air Movement: Standard  
Suspended  
Area of storey: 37m<sup>2</sup>  
Area of glazing: 10.9m<sup>2</sup> (29% of area of storey)

Allowances:  $C_{U1}^{(m)}$  5.8,  $C_{SHGC} \times \text{Area}$  5.1

Number of rows for table below: 3 (as currently displayed)

Glazing Elements, Orientation Sector, Size and Performance Characteristics							Shading		Calculation Data		Calculated Outcomes				
Glazing element		Orientation		Size		Performance		P&H or Device		Exposure		Conductance - PASSED		Solar heat gain - PASSED	
Description (optional)	Facing Sector	Height (m)	Width (m)	Area (m <sup>2</sup> )	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	PI/H	Es	Area used (m <sup>2</sup> )	U x area / Winter Access	Element Share of % of Allowance Used	SHGC x Es x Area	Element Share of % of Allowance Used
1	SW	2.70	2.95		1.32	0.49	0.25	2.70	0.09	0.92	7.97	4.21	73% of 100%	3.6	70% of 100%
2	SW	2.30	0.90		1.32	0.49				1.05	2.07	1.09	19% of 100%	1.1	21% of 100%
3	NE	0.60	1.50		1.32	0.49				1.08	0.90	0.48	8% of 100%	0.5	9% of 100%

TH 13A No 19 Level 1 Glazing Calculator

**Glazing**

1. Enter building name and description below - identifying the particular part(s) covered by this assessment.

TH Type 13, Lot 19, 99 Derby Road, Sunshine (2F)

Climate Zone: 6

Constants:  $C_{U1}$  5.776,  $C_{SHGC}$  0.138

Storey: Second  
Floor Construction: Direct Contact  
Area: 39m<sup>2</sup>  
Wall Insulation Option Chosen for 3.12.1.4: No wall insulation concession used

Air Movement: Standard  
Suspended  
Area of storey: 39m<sup>2</sup>  
Area of glazing: 8.2m<sup>2</sup> (21% of area of storey)

Allowances:  $C_{U1}^{(m)}$  5.8,  $C_{SHGC} \times \text{Area}$  5.4

Number of rows for table below: 3 (as currently displayed)

Glazing Elements, Orientation Sector, Size and Performance Characteristics							Shading		Calculation Data		Calculated Outcomes				
Glazing element		Orientation		Size		Performance		P&H or Device		Exposure		Conductance - PASSED		Solar heat gain - PASSED	
Description (optional)	Facing Sector	Height (m)	Width (m)	Area (m <sup>2</sup> )	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	PI/H	Es	Area used (m <sup>2</sup> )	U x area / Winter Access	Element Share of % of Allowance Used	SHGC x Es x Area	Element Share of % of Allowance Used
1	SW	2.30	0.90		3.37	0.64	0.20	2.30	0.09	0.92	2.07	1.46	25% of 100%	1.2	23% of 100%
2	SW	2.30	0.90		3.37	0.64				1.05	2.07	1.46	25% of 100%	1.4	26% of 100%
3	NE	2.70	1.50		3.37	0.64				1.08	4.05	2.86	49% of 100%	2.8	52% of 100%

TH 13A No 19 Level 2 Glazing Calculator

99 Derby Road, Sunshine

Sustainable Management Plan

19 March 2024

**TH 13B No 26**

**ABCBC** **Glazing** **AMENDED PLAN** **PLANNING ENVIRONMENT ACT 1987** **BRIMBANK PLANNING SCHEME** **National Construction Code**  
 Plans referred to in Planning Permit: P0750/2021  
 Page: 202 of 258  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

1. Enter building name and description below - identifying the particular part(s) covered by this assessment.

TH Type 13B, Lot 26, 99 Derby Road, Sunshine (Ground)

Climate Zone: 6

Constants:  $C_u$  6.418,  $C_{SHGC}$  0.153

Storey: Ground, Floor Construction: Direct Contact, Area: 15m<sup>2</sup>, Wall Insulation Option Chosen for 3.12.1.4: No wall insulation concession used

Air Movement: Standard, Area of storey: 15m<sup>2</sup>, Area of glazing: 5.0m<sup>2</sup> (33% of area of storey)

Allowances:  $C_u^{(only)}$  6.4,  $C_{SHGC} \times Area$  2.3

Number of rows for table below: 2 (as currently displayed)

Glazing Elements, Orientation Sector, Size and Performance Characteristics							Shading		Calculation Data				Calculated Outcomes				
Glazing element		Orientation		Size		Performance		P&H or Device		Exposure		Size		Conductance - PASSED		Solar heat gain - PASSED	
Description (optional)	Facing Sector	Height (m)	Width (m)	Area (m <sup>2</sup> )	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	Es	Area used (m <sup>2</sup> )	U x area / Winter Access	Element Share of % of Allowance Used	SHGC x Es x Area	Element Share of % of Allowance Used		
1	SW	2.45	1.80		1.17	0.61	0.55	2.30	0.24	0.79	4.41	5.66	89% of 100%	2.1	92% of 100%		
2	SW	1.85	0.30		1.17	0.61	1.45	2.00	0.73	0.53	0.56	0.71	11% of 100%	0.2	8% of 100%		

**TH 13B No 26 Ground Level Glazing Calculator**

**ABCBC** **Glazing** **AMENDED PLAN** **PLANNING ENVIRONMENT ACT 1987** **BRIMBANK PLANNING SCHEME** **National Construction Code**  
 Plans referred to in Planning Permit: P0750/2021  
 Page: 202 of 258  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

1. Enter building name and description below - identifying the particular part(s) covered by this assessment.

TH Type 13B, Lot 26, 99 Derby Road, Sunshine (1F)

Climate Zone: 6

Constants:  $C_u$  5.776,  $C_{SHGC}$  0.138

Storey: First, Floor Construction: Direct Contact, Area: 37m<sup>2</sup>, Wall Insulation Option Chosen for 3.12.1.4: No wall insulation concession used

Air Movement: Standard, Area of storey: 37m<sup>2</sup>, Area of glazing: 10.9m<sup>2</sup> (29% of area of storey)

Allowances:  $C_u^{(only)}$  5.8,  $C_{SHGC} \times Area$  5.1

Number of rows for table below: 3 (as currently displayed)

Glazing Elements, Orientation Sector, Size and Performance Characteristics							Shading		Calculation Data				Calculated Outcomes				
Glazing element		Orientation		Size		Performance		P&H or Device		Exposure		Size		Conductance - PASSED		Solar heat gain - PASSED	
Description (optional)	Facing Sector	Height (m)	Width (m)	Area (m <sup>2</sup> )	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	Es	Area used (m <sup>2</sup> )	U x area / Winter Access	Element Share of % of Allowance Used	SHGC x Es x Area	Element Share of % of Allowance Used		
1	SW	2.70	2.95		1.32	0.49	0.25	2.70	0.09	0.92	7.97	4.21	73% of 100%	3.6	70% of 100%		
2	SW	2.30	0.90		1.32	0.49				1.05	2.07	1.09	19% of 100%	1.1	21% of 100%		
3	NE	0.60	1.50		1.32	0.49				1.08	0.90	0.48	8% of 100%	0.5	9% of 100%		

**TH 13B No 26 Level 1 Glazing Calculator**

**ABCBC** **Glazing** **AMENDED PLAN** **PLANNING ENVIRONMENT ACT 1987** **BRIMBANK PLANNING SCHEME** **National Construction Code**  
 Plans referred to in Planning Permit: P0750/2021  
 Page: 202 of 258  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

1. Enter building name and description below - identifying the particular part(s) covered by this assessment.

TH Type 13B, Lot 26, 99 Derby Road, Sunshine (2F)

Climate Zone: 6

Constants:  $C_u$  5.776,  $C_{SHGC}$  0.138

Storey: Second, Floor Construction: Direct Contact, Area: 39m<sup>2</sup>, Wall Insulation Option Chosen for 3.12.1.4: No wall insulation concession used

Air Movement: Standard, Area of storey: 39m<sup>2</sup>, Area of glazing: 8.2m<sup>2</sup> (21% of area of storey)

Allowances:  $C_u^{(only)}$  5.8,  $C_{SHGC} \times Area$  5.4

Number of rows for table below: 3 (as currently displayed)

Glazing Elements, Orientation Sector, Size and Performance Characteristics							Shading		Calculation Data				Calculated Outcomes				
Glazing element		Orientation		Size		Performance		P&H or Device		Exposure		Size		Conductance - PASSED		Solar heat gain - PASSED	
Description (optional)	Facing Sector	Height (m)	Width (m)	Area (m <sup>2</sup> )	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	Es	Area used (m <sup>2</sup> )	U x area / Winter Access	Element Share of % of Allowance Used	SHGC x Es x Area	Element Share of % of Allowance Used		
1	SW	2.30	0.90		3.37	0.64	0.20	2.30	0.09	0.92	2.07	1.46	25% of 100%	1.2	23% of 100%		
2	SW	2.30	0.90		3.37	0.64				1.05	2.07	1.46	25% of 100%	1.4	26% of 100%		
3	NE	2.70	1.50		3.37	0.64				1.08	4.05	2.86	49% of 100%	2.8	52% of 100%		



## Appendix E. Rainwater Harvesting

 Property  
Version

Stage 2, 99 Derby Road, Sunshine

box 1

### Inputs

PPL	755
Flush/Person/Day	5
Litres/Flush	4
Total Daily usage (litres)	15100
Roof area (m2)	12,202
Collection Evaporation	5%
Tank Capacity (litres)	220,160
Irrigation Area (m2)	0
Toff if Total Rain (mm)	10
in the last	5 days

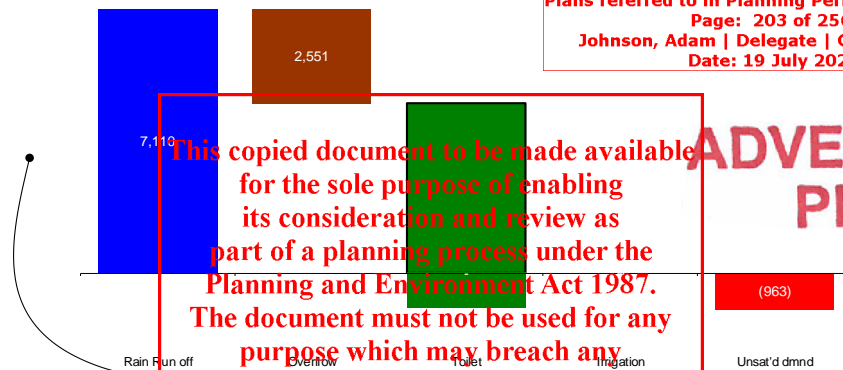
Recalc, update  
pivots, table  
and graphs

### Irrigation Schedule

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

box 2

### System components (kls per year)



box 3

### 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	449	550	425	705	623	631	553	615	597	552	770	641	7,110
Overflow	(154)	(214)	(140)	(272)	(204)	(231)	(105)	(159)	(187)	(198)	(375)	(314)	(2,551)
Rain Water saved	296	336	285	433	419	401	448	457	410	354	394	327	4,559
Toilet	(468)	(426)	(468)	(453)	(468)	(453)	(468)	(468)	(453)	(468)	(453)	(465)	(5,512)
(Shortfall)/Surplus before Irrigation	(172)	(91)	(183)	(20)	(49)	(52)	(20)	(11)	(43)	(114)	(58)	(139)	(953)
Irrigation	-	-	-	-	-	-	-	-	-	-	-	-	-
Unsatisfied Demand	(172)	(91)	(183)	(20)	(49)	(52)	(20)	(11)	(43)	(114)	(58)	(139)	(953)

### Actual Years

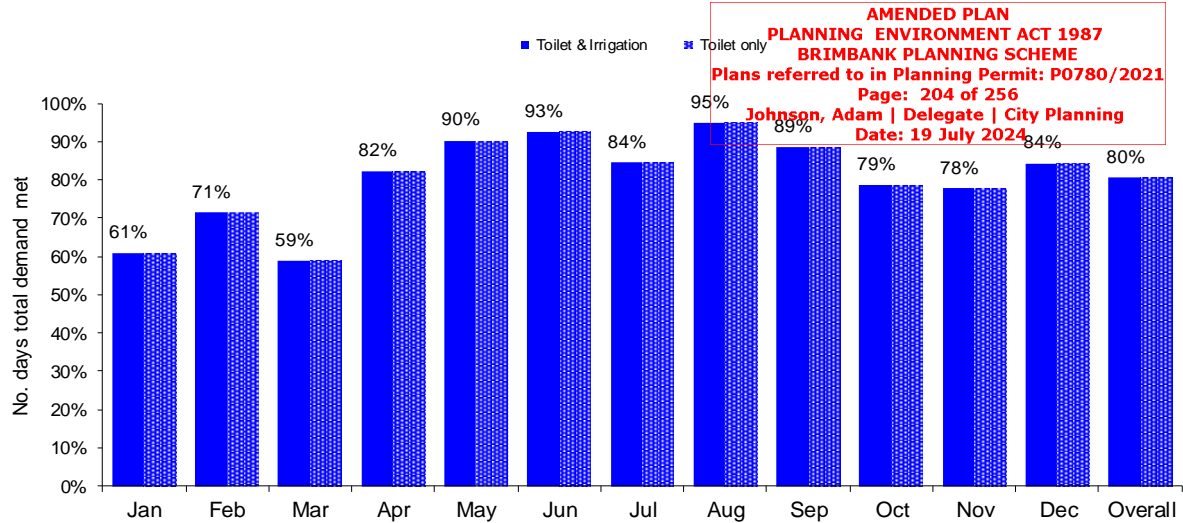
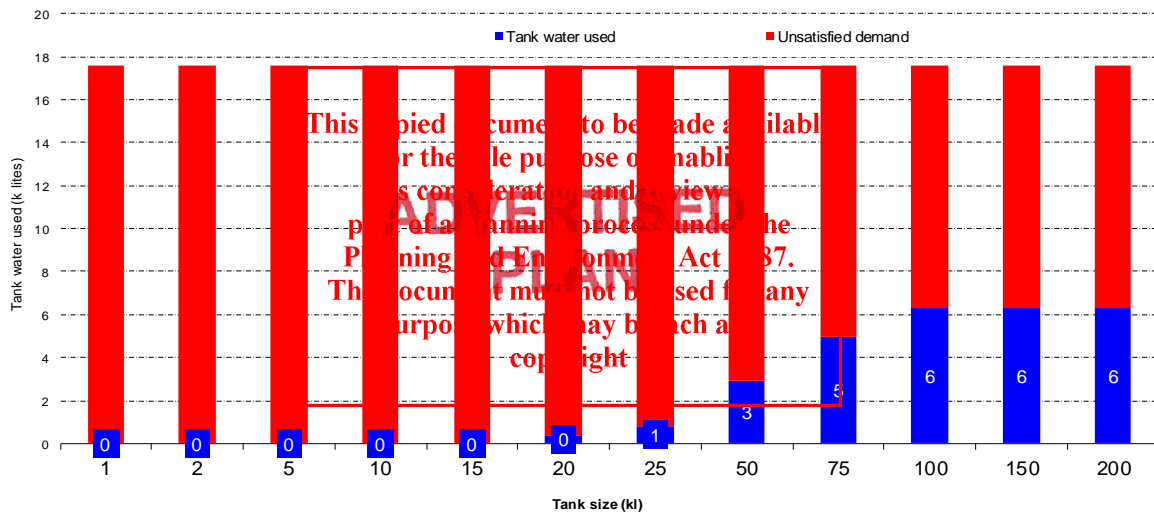
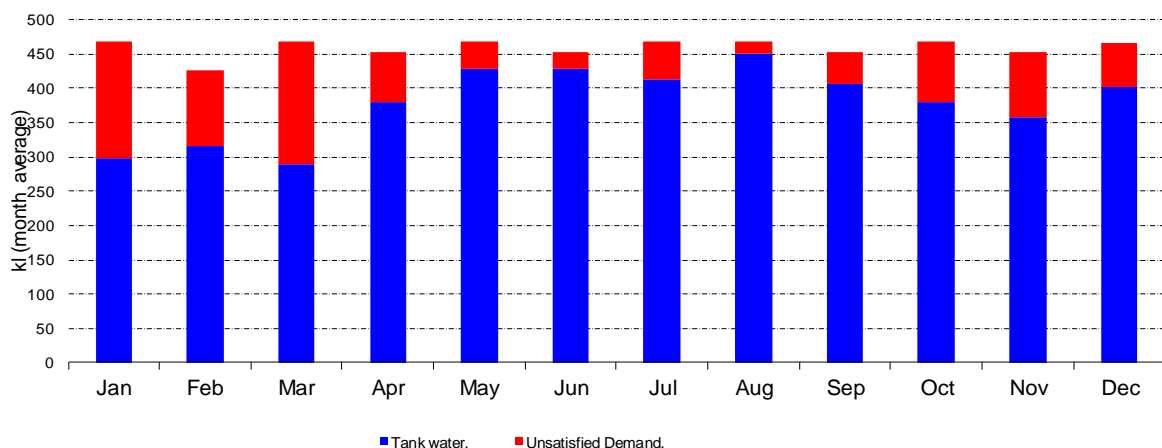
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
Rain Run off	5,805	9,044	8,976	7,294	7,859	5,496	5,651	7,470	7,585	6,483	4,827	8,853	-
Overflow	(1,809)	(4,063)	(4,055)	(2,391)	(3,202)	(1,319)	(1,190)	(2,531)	(2,753)	(2,324)	(1,010)	(3,975)	-
Rain Water saved	3,996	4,981	4,920	4,903	4,657	4,177	4,461	4,939	4,832	4,160	3,817	4,878	-
Toilet	(5,481)	(5,512)	(5,512)	(5,512)	(5,512)	(5,512)	(5,512)	(5,512)	(5,512)	(5,512)	(5,512)	(5,527)	(30)
(Shortfall)/Surplus before Irrigation	(1,485)	(531)	(591)	(609)	(854)	(1,335)	(1,051)	(573)	(680)	(1,352)	(1,695)	(648)	(30)
Irrigation	-	-	-	-	-	-	-	-	-	-	-	-	-
Unsatisfied Demand	(1,485)	(531)	(591)	(609)	(854)	(1,335)	(1,051)	(573)	(680)	(1,352)	(1,695)	(648)	(30)

box 4

### 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	13%	12%	12%	16%	23%	22%	23%	27%	21%	19%	17%	14%	18%
2k	13%	12%	12%	16%	23%	23%	23%	27%	21%	19%	17%	14%	18%
5k	13%	12%	12%	16%	24%	23%	24%	28%	22%	20%	18%	14%	19%
10k	13%	12%	12%	16%	26%	23%	24%	29%	22%	21%	18%	14%	19%
20k	20%	22%	21%	27%	40%	38%	38%	43%	35%	32%	29%	25%	31%
50k	30%	35%	32%	43%	60%	58%	59%	64%	53%	50%	44%	42%	48%
100k	40%	47%	44%	61%	78%	77%	73%	85%	69%	65%	58%	65%	64%
200k	59%	69%	56%	80%	90%	91%	84%	94%	87%	77%	76%	83%	79%

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

Graph 3 - Tank water used (per year) V Tank size  
Kls per yearGraph 4 - Tank water used v unsatisfied demand  
by month (kls per month)

## Appendix F. WSUD Maintenance Manual

### Rainwater Harvesting System Maintenance Program

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.

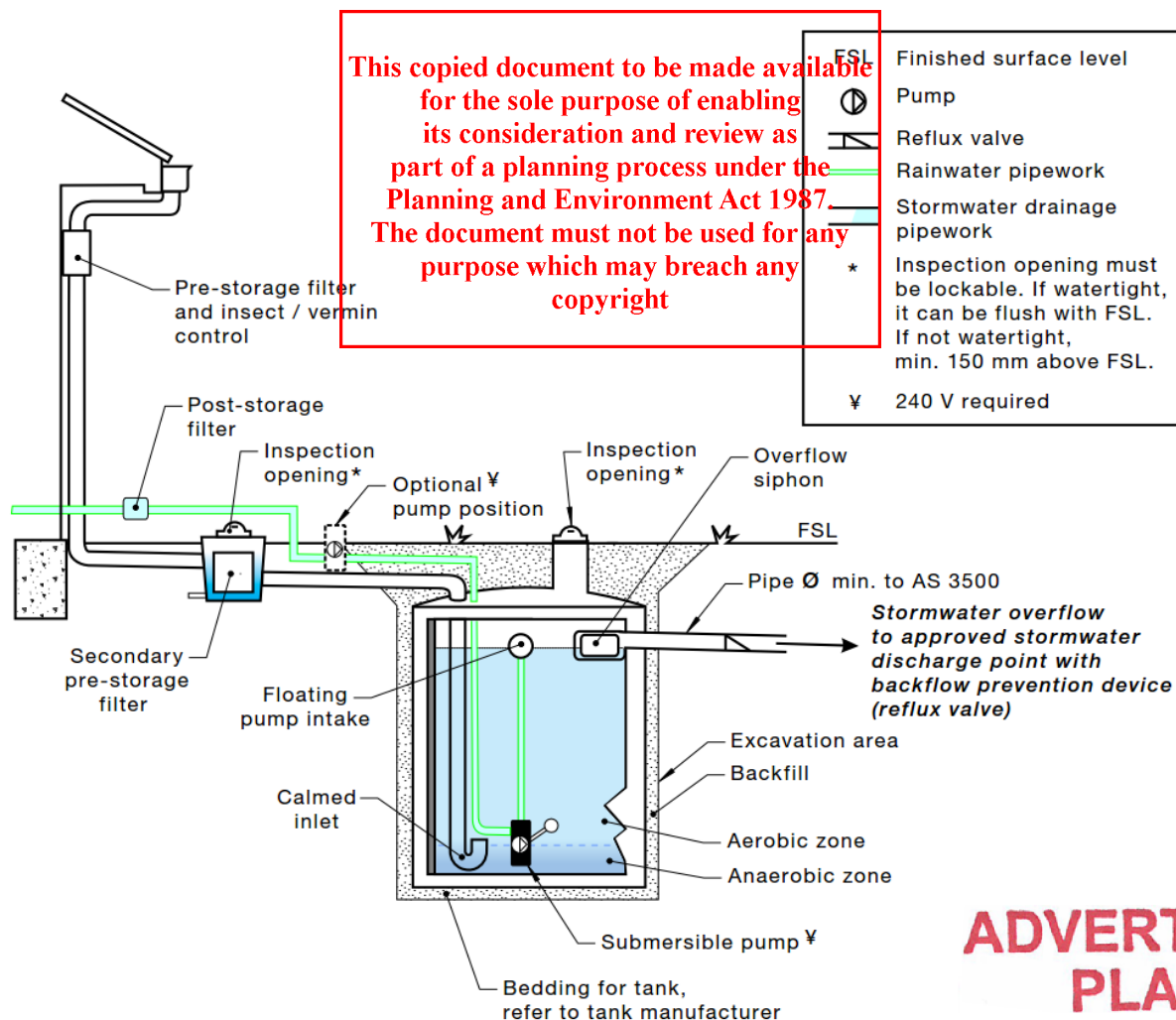
The scope of the maintenance program will include inspection and rectification of issues associated with:

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

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 205 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

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 Commission<sup>2</sup>. A schematic diagram of the rainwater tank installation is provided below.



<sup>2</sup> Rainwater Design & Installation Handbook, National Water Commission, 2008

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 206 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

**Maintenance Checklist**

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												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
All tasks	x			x			x			x		

**ADVERTISED  
PLAN**

**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**

### Raingarden Design & Construction

Design, construction and planting of raingardens shall be implemented in accordance with the relevant Instruction Sheet published by Melbourne Water and the Victorian state government:

- Inground raingardens: - <https://www.melbournewater.com.au/media/447/download>
- Infiltration raingardens: - <https://www.melbournewater.com.au/media/446/download>

Further guidelines for raingarden planning, design, construction and maintenance guidelines have been developed by the Cooperative Research Centre for Water Sensitive Cities, with support from Melbourne Water:

<https://watersensitivecities.org.au/content/stormwater-biofilter-design/>

The design of the raingardens will be such that the velocity of flow at all inlets will be minimised to ensure no erosion or scouring occurs.

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 207 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

### Raingarden Proposed Plant Species

	SHRUBS, GRASSES + GROUND COVERS		MIX %				
MIX 1	WSUD PLANTING						726
	<i>Carpobrotus modestus</i>	Pig Face	10%	0.2 x 1m	300mm	Native	73
	<i>Dianella tasmanica</i>	Tasman Flax Lily	25%	0.75-1 x indef	300mm	Exotic	182
	<i>Ficinia nodosa</i>	Knobby Club Rush	50%	0.5-1 x 0.5-1m	300mm	Native	363
	<i>Limonium perezii</i>	Perennial Statice	15%	0.6 x 0.7m	300mm	Native	109

### Raingarden Maintenance Program

A systematic maintenance program will be implemented by the owner's corporation maintenance contractor to ensure the any installed raingardens operate as designed and water quality is maintained. The scope of the maintenance program will include inspection and rectification of issues associated with:

- Raingarden soil mix
- Ponding area
- Plants
- Overflow system
- Mulch/ pebble/ rock layer
- Underdrain system (where applicable)

**ADVERTISED  
PLAN**

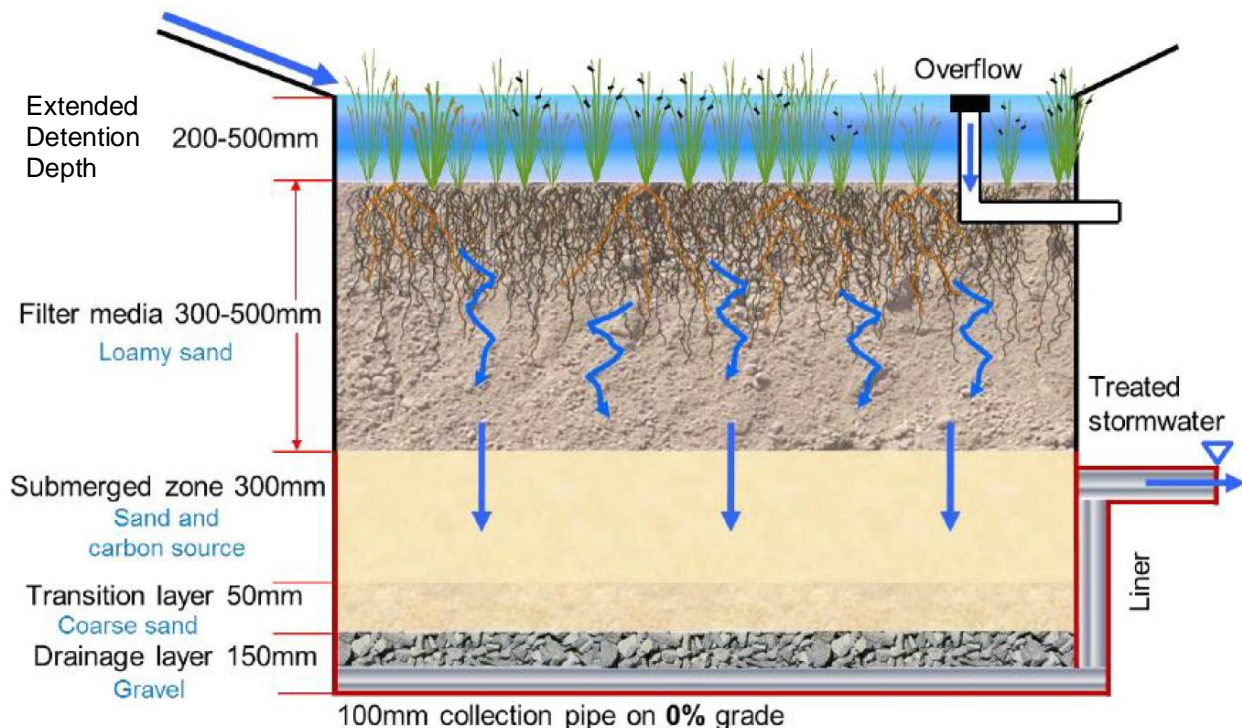
**This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright**

Inspections of the raingarden system and any maintenance works required will be undertaken as outlined in the maintenance schedule below.

Component	Maintenance Action
<b>AFTER STORM EVENTS</b>	
Ponding Area	<ul style="list-style-type: none"> <li>• Check raingarden inlet for sediment, rubbish and leaves and remove as required.</li> <li>• Check for erosion or scour and repair.</li> <li>• Check and ensure that the garden is infiltrating effectively.</li> <li>• Check and re-profile topsoil as necessary – ensure level is below surrounding hard surface and overflow.</li> </ul>
Kerb, Paved Area, or Grass Filter Strip (if included)	<ul style="list-style-type: none"> <li>• Remove rubbish, leaves and other debris from surrounding areas</li> </ul>
Mulch	<ul style="list-style-type: none"> <li>• Check and redistribute/add mulch as necessary – particularly at the raingarden inlets.</li> </ul>

Component	Maintenance Action
<b>3 MONTHLY</b>	
Ponding area	<ul style="list-style-type: none"> <li>Check raingarden inlets for sediment build up, litter and leaves.</li> <li>Check for erosion or scour and repair if necessary.</li> </ul>
Mulch Layer	<ul style="list-style-type: none"> <li>Remove litter, leaves and other debris.</li> <li>Redistribute/add mulch if necessary.</li> </ul>
Overflow system	<ul style="list-style-type: none"> <li>Check for any blockages and remove as necessary.</li> </ul>
Plants	<ul style="list-style-type: none"> <li>Check plant health and replace dead plants as necessary.</li> <li>Remove weeds – do not use herbicides, pesticides and fertilisers as the chemicals may infiltrate through the rain garden and pollute the stormwater runoff.</li> </ul>
<b>ANNUALLY</b>	
Mulch Layer	<ul style="list-style-type: none"> <li>Check for sediment build up – remove and replace as required.</li> </ul>
Ponding Area	<ul style="list-style-type: none"> <li>Check all water has drained 24 hours after heavy rain – remove and replace the crust from the top of raingarden if drainage not effective.</li> <li>Check for litter, leaves and sediment build up and remove as necessary.</li> <li>Check for erosion and gouging and repair where necessary.</li> </ul>
Raingarden Soil Mix	<ul style="list-style-type: none"> <li>Check soil level is below surrounding hard surface level and the</li> </ul>
Underdrain System	<ul style="list-style-type: none"> <li>Check underdrain present and flush underdrain and check for blockages – repair if necessary.</li> </ul>

A cross-sectional diagram of a typical raingarden is provided below.





**Gross Pollutant Trap (GPT) Maintenance Program**

Once installed, a systematic maintenance program will be implemented by the landowner to ensure the GPT operates as designed and water quality is maintained.

Cleaning and maintenance will be carried out in accordance with the manufacturer's written guidelines. Maintenance requirements and frequencies are dependent on the pollutant load characteristics.

The scope of the maintenance program will include inspection and rectification of issues associated with:

- Manhole cover
- Inlet pipe
- Outlet
- Screening area
- Collection area

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 209 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

Inspections of the GPT and any maintenance works required will be undertaken as outlined as a guide in the maintenance schedule below. Manufacturer's guidelines will take precedence.

	Maintenance Action
<b>3-6 MONTHLY</b>	
	<ul style="list-style-type: none"> <li>• Check components for damage.</li> <li>• Check that the inlet and outlet are free from debris or obstructions.</li> <li>• Remove large floating pollutants.</li> <li>• Measure sediment depth.</li> </ul>
<b>12-24 MONTHLY (or as guided by sediment depth)</b>	
	<ul style="list-style-type: none"> <li>• Removal of accumulated sediment and gross pollutants.</li> <li>• Inspection of screen and cleaning if required.</li> </ul>

**ADVERTISED  
PLAN**

**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 G. Apartment Solar Photovoltaic Systems

High-efficiency solar PV modules with a total capacity of 50 kWp will be installed on apartment roofs as per the preliminary layouts indicated below, with energy shared between apartment residents and the non-residential spaces.

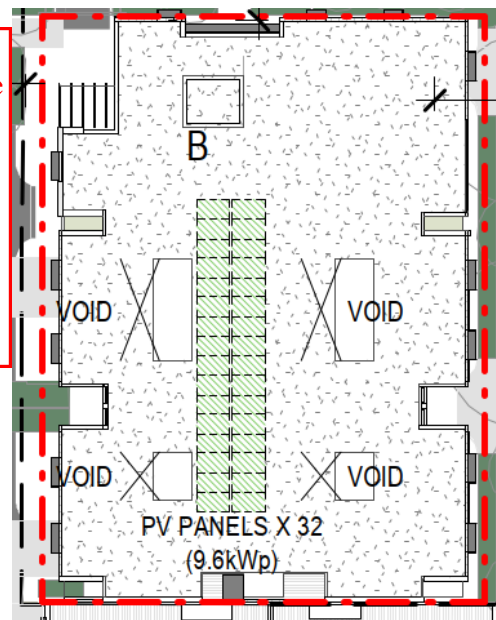
PV modules will be oriented in pairs to the east and west at 10-15° tilt and have at least 300Wp capacity (i.e. over 20% more efficient than traditional 250Wp 60-cell modules). High-efficiency modules deliver more compact arrays with inherently lower embodied ecological impact per unit of generation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

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.



Total yield of these arrays will be approximately 67.6 MWh per annum equating to an estimated annual carbon emissions offset of 67.6 CO<sub>2</sub>-e per annum (Condition1(q)i).

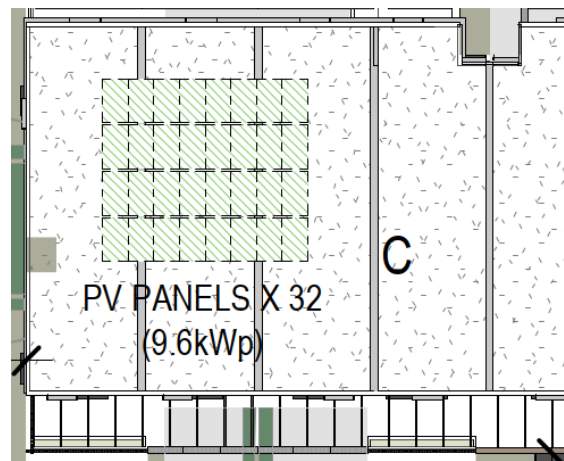
This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright



Block B Apartments Indicative Solar Photovoltaic array layout

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 210 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

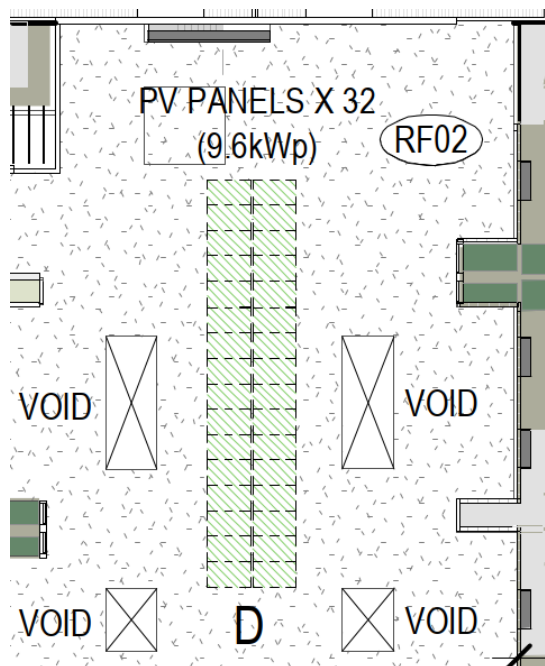
**ADVERTISED  
PLAN**



**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 211 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024



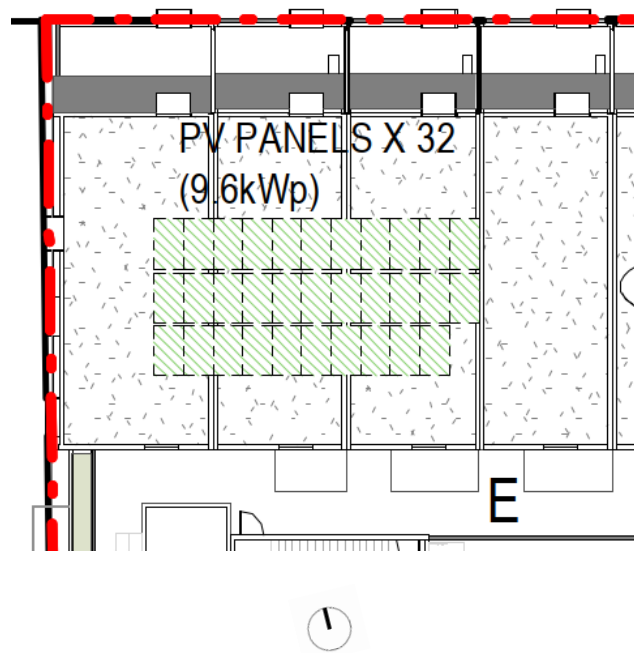
Block C Apartments Indicative Solar Photovoltaic array layout



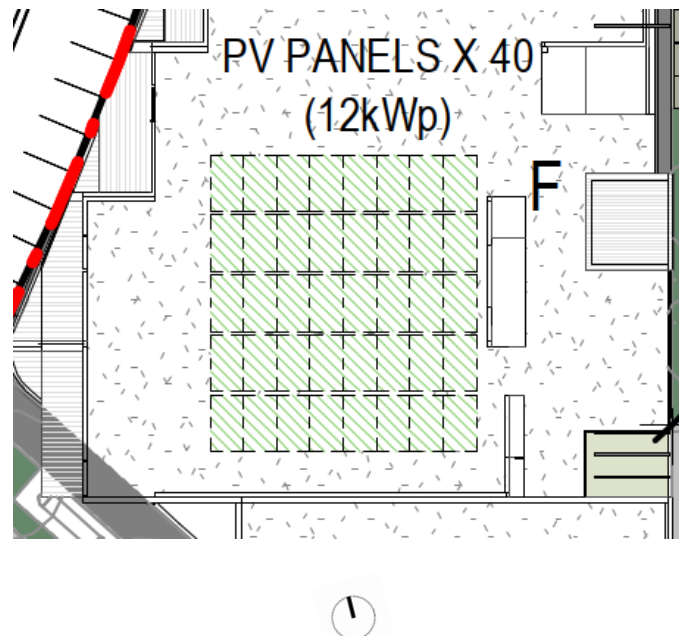
Block D Apartments Indicative Solar Photovoltaic array layout

**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**

**ADVERTISED  
 PLAN**



Block E (Derby Rd) Apartments Indicative Solar Photovoltaic array layout



Block F (Thorpe St) Apartments Indicative Solar Photovoltaic array layout

**ADVERTISED  
PLAN**

**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**



Caution: Photovoltaic system performance predictions calculated by PVWatts® include many inherent assumptions and uncertainties and do not reflect variations between PV technologies nor site-specific characteristics except as represented by PVWatts® inputs. For example, PV modules with better performance are not differentiated within PVWatts® from lesser performing modules. Both NREL and private companies provide more sophisticated PV modeling tools (such as the System Advisor Model at <https://sam.nrel.gov/>) that allow for more precise and complex modeling of PV systems.

The expected range is based on 30 years of actual weather data at the given location and is intended to provide an indication of the variation you might see. For more information, please refer to this NREL report: The Error Report.

Disclaimer: The PVWatts® Model ("Model") is provided by the National Renewable Energy Laboratory ("NREL"), which is operated by the Alliance for Sustainable Energy, LLC ("Alliance") for the U.S. Department Of Energy ("DOE") and may be used for any purpose whatsoever.

The names DOE/NREL/ALLIANCE shall not be used in any representation, advertising, publicity or other manner whatsoever to endorse or promote any entity that adopts or uses the Model. DOE/NREL/ALLIANCE shall not provide any support, consulting, training or assistance of any kind with regard to the use of the Model or any updates, revisions or new versions of the Model.

YOU AGREE TO INDEMNIFY DOE/NREL/ALLIANCE, AND ITS AFFILIATES, OFFICERS, AGENTS, AND EMPLOYEES AGAINST ANY CLAIM OR DEMAND, INCLUDING REASONABLE ATTORNEY'S FEES, RELATED TO YOUR USE, RELIANCE, OR ADOPTION OF THE MODEL FOR ANY PURPOSE WHATSOEVER. THE MODEL IS PROVIDED BY DOE/NREL/ALLIANCE "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. IN NO EVENT SHALL DOE/NREL/ALLIANCE BE LIABLE FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER, INCLUDING BUT NOT LIMITED TO CLAIMS ASSOCIATED WITH THE LOSS OF DATA OR PROFITS, WHICH MAY RESULT FROM ANY ACTION IN CONTRACT, NEGLIGENCE OR OTHER TORTIOUS CLAIM THAT ARISES OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THE MODEL.

The energy output range is based on analysis of 30 years of historical weather data for nearby, and is intended to provide an indication of the possible interannual variability in generation for a Fixed (open rack) PV system at this location.

## RESULTS

67,672 kWh/Year\*

Month	Solar Radiation ( kWh / m <sup>2</sup> / day )	AC Energy ( kWh )	Value ( \$ )
January	7.03	8,494	N/A
February	6.38	6,912	N/A
March	5.42	6,508	N/A
April	3.81	4,572	N/A
May	2.55	3,249	N/A
June	1.89	2,367	N/A
July	2.30	3,002	N/A
August	3.22	4,171	N/A
September	4.54	5,569	N/A
October	5.65	7,026	N/A
November	6.68	7,948	N/A
December	6.49	7,853	N/A
<b>Annual</b>	<b>4.66</b>	<b>67,671</b>	<b>0</b>

### Location and Station Identification

Requested Location	99 Derby Road, Sunshine Australia	
Weather Data Source	(INTL) MELBOURNE, AUSTRALIA	8.3 mi
Latitude	37.67° S	
Longitude	144.83° E	

### PV System Specifications (Residential)

DC System Size	50 kW
Module Type	Standard
Array Type	Fixed (open rack)
Array Tilt	13°
Array Azimuth	0°
System Losses	14.08%
Inverter Efficiency	96%
DC to AC Size Ratio	1.2

### Economics

Average Retail Electricity Rate	No utility data available
---------------------------------	---------------------------

### Performance Metrics

Capacity Factor	15.5%
-----------------	-------

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 213 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

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

**ADVERTISED  
PLAN**

## Appendix H. 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.

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
 Plans referred to in Planning Permit: P0780/2021  
 Page: 214 of 256  
 Johnson, Adam | Delegate | City Planning  
 Date: 19 July 2024

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.

Furthermore, the initiatives are consistent with the Application Requirements set out in Clauses 19.03-3S and 22.02-2 of the Brimbank Planning Scheme.

**ADVERTISED  
PLAN**

**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 I. Fire System Test Water

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 215 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

BESS Tool Notes on requirements for Water Credit 4.1 relating to Fire System Test Water tanks.

### 4.1 - Building Systems Water Use Reduction

#### Applies to

Non-residential development

#### Objective

Ensure the efficient use of water, to reduce total operating potable water use and to encourage the appropriate use of alternative water sources for cooling and fire testing systems.

#### Summary

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 includes collecting test water for re-use, either with the fire test system or for another fit-for purpose use. 'Fire testing systems' refers to testing of hydrants, hose reels, sprinklers. Refer to VBA PN-61-2018.

If the building does not have a sprinkler system and water based heat rejection systems, this credit is 'N/A' and should be scoped out.

#### Documentation & evidence required

- Site / Floor plans showing location of fire test system water tank and specifications including tank capacity and intended re-use.

#### Further Information

- [VBA Practice Note 61-2018 - Water Savings Options Available when testing Fire Safety Systems](#)

VBA Pra

**ADVERTISED  
PLAN**

**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**

## ESSENTIAL SAFETY MEASURES

### Building Practice Note ESM-08: Water saving options available when testing fire safety systems

This Practice Note provides guidance on the regulatory requirements and water saving options available when testing fire safety systems.

The content below provides guidance on:

- Water use for maintenance of fire safety systems
- Regulatory Requirements
- Water Saving Options
- Australian Standard for routine servicing of fire protection systems and equipment
- Design options for water saving

AMENDED PLAN  
PLANNING ENVIRONMENT ACT 1987  
BRIMBANK PLANNING SCHEME  
Plans referred to in Planning Permit: P0780/2021  
Page: 216 of 256  
Johnson, Adam | Delegate | City Planning  
Date: 19 July 2024

#### Abbreviations & Definitions

The abbreviations and definitions set out below are for guidance only. They are not intended to vary those set out in the Building Act 1993 (Act) or the Building Regulations 2018 (Regulations).

- **Act** – Building Act 1993
- **RBS** – Relevant Building Surveyor
- **Regulations** – Building Regulations 2018
- **ESM** – Essential safety measure
- **MBS** – Municipal Building Surveyor

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

ADVERTISED  
PLAN

#### Water use for maintenance of fire safety systems

Hydrants, hose reels and sprinklers need regular maintenance to ensure their reliability. Concerns have been raised by the community, government and the fire protection industry about the large amount of water used in testing, particularly with sprinkler systems.

Significant amounts of water are used in routine maintenance of fire safety systems but building owners can reduce this water consumption in several ways. Water saving methods can include sprinkler alarm testing with proprietary test devices and changes to the test water supply design – see Water Saving Options and Other Design Options for Water Saving below for more details.

#### Use this format for checklists

Part 5 of the Act sets out requirements for occupying buildings and places of public entertainment. It specifically details when occupancy permits are required and the form and effect of those permits. Part 5 of the Act also details the decision-making responsibilities of the RBS.

Most importantly, section 40 of the Act requires that a person must not occupy a building in contravention of the occupancy permit. This includes any conditions, such as maintenance requirements of the Regulations, to which occupation is subject. Substantial penalties may be applied if the Act is contravened.

### Building Permit Requirements

Any building work that affects an ESM, including alternative ESM design options, or work that may adversely affect the safety of the public or occupiers of the building will require a building permit.

## Water saving options

Building owners can reduce water consumption in several ways. The simplest and usually least costly method is a maintenance regime under AS1851-2012 – Routine Service of Fire Protection Systems and Equipment. Design options are also worth considering, such as voluntary retrofitting beyond the minimum requirements of the original installation standard, particularly for sprinkler systems, fire pumpset systems and fire hydrant systems.

These options could also be looked at during the design stage of a new building.

Water saving methods for testing can include sprinkler alarm testing with proprietary test devices and changes to the test water supply design.

Options for test water supply could include:

- break tanks and return line
- pump recirculating tanks
- variable speed pumps
- remote annubar test facility; and
- recycled water supplies.

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 217 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

## Australian Standard for routine servicing of fire protection systems and equipment

### Adoption of AS1851-2012

AS1851-2012 is the current Australian Standard for routine servicing of fire protection systems and equipment in buildings. Adoption of AS1851-2012 may result in water saving due to a reduction in the frequency of some testing.

There is no mandatory requirement to use AS1851-2012 unless it is required by a maintenance determination or a condition on an occupancy permit. However, there may be a common law obligation. Building owners, occupiers and service providers need to carefully consider how they will meet their statutory and public safety duties and responsibilities. If AS1851-2012 is not used, owners, occupiers and service providers should satisfy themselves that they have a sound reason for not adopting the latest standard.

Regulations 196 (occupancy permits) and 217 (maintenance determinations) allow the owners of buildings subject to an occupancy permit or a maintenance determination that requires an ESM to be maintained in accordance with AS 1851-2005 or a prior equivalent standard, to elect to maintain the ESM in accordance with AS 1851-2012. Once that decision is made the owner must continue to comply with the 2012 edition.

It is recommended that before making a decision to adopt AS1851-2012, owners ask a suitably qualified and competent person, such as a building surveyor or engineer, to assess their existing fire safety systems and provide advice on potential water savings.

### Buildings constructed before 1 July 1994

Owners of these buildings can also adopt the testing regime of AS1851-2012, without the need to amend the certificate of occupancy for their building.

Owners must still maintain the ESMs in their building, but the Regulations do not nominate specific frequency and standards for maintenance. All ESMs must be maintained in a state that enables them to fulfill their purpose.

Owners who decide to use AS1851-2012 should clearly document that maintenance of fire safety systems is being undertaken in accordance with that standard.

## Design options for water saving

The following are water saving options for owners and designers. These are not exhaustive. Owners should consult with appropriately qualified persons, such as mechanical engineers, to discuss the most suitable option for each individual situation.

### Sprinkler alarm testing

A recirculating pump proprietary test device does not consume water and importantly, retains the non-potable water within the system.

For proprietary devices to be considered, they must be able to fully test a component's functionality in the same way a current test is conducted or so that a similar level of reliability is assured.

### Fire system water testing

Water supply testing, at six-monthly and yearly periods, consumes more water than all of the sprinkler fire brigade alarm tests combined. This water is drawn directly from potable supply, making it possible to consider a broad range of water re-use possibilities.

Using fire pumps to boost pressure from the mains water supply can dramatically increase the amount of test water consumed. Monthly pump run testing and annual pump load testing are required, in addition to alarm testing and flow testing.

Although pumps are fitted with relief valves to protect them from overheating and damage when operating with little or no discharge, a much larger valve is required to protect the system from excess pressure.

Excess pump pressure is controlled by a relief valve that dumps excess water to waste, bringing the pump back to system maximum pressure. Typically, this is about 25 per cent of the pump duty flow.

### Pump recirculating tanks

Pump recirculating tanks have a number of benefits. With the tank filled as required and the town main water supply isolated, test water from both pump run and pump load tests is returned to the tank for contained reuse during the test period. After the test, the town main supply is reinstated.

The recirculating tank will need to be designed to cope with the maximum duty pump flow output and to prevent turbulence from return lines. As the pump is still relying on town main supply in a retrofit situation existing pump sets can remain. However, the annual water supply test must be conducted without recycling.

### Variable speed pumps

Variable speed pumps are now recognised in AS2419 and can achieve similar outcomes to recycling tanks. Excess pump pressure is regulated by adjusting the pump speed, rather than using a relief valve. However, during the annual pump load test (which requires maximum duty flow), the pump speed cannot be reduced, and test water will still be consumed.

**ADVERTISED  
PLAN**

### Break tank and return lines

Almost all of the test water can be recycled, if tank return lines are fitted to the pump pressure relief valves and flow test lines. Test water from both pump run and pump load tests can be returned to the tank.

Annual flow testing can be undertaken as part of the annual pump load test. The break tank capacity must be designed to cope with the maximum pump duty flow.

As break tanks rely on tank infill for the total volume of water, an annual flow test of town main supply to confirm tank infill capability is required. This test water cannot be returned to the tank for reuse. However, annual flow testing can be performed as part of the annual pump load test and tank return lines can be retrofitted to the existing water tank supply.

**AMENDED PLAN**  
**PLANNING ENVIRONMENT ACT 1987**  
**BRIMBANK PLANNING SCHEME**  
**Plans referred to in Planning Permit: P0780/2021**  
**Page: 219 of 256**  
**Johnson, Adam | Delegate | City Planning**  
**Date: 19 July 2024**

### Remote annubar test facility for sprinkler systems

AS2118-1999 requires that an annubar test facility is located at the sprinkler control valve assembly, which may be some distance from the water supply tank. Where long tank return lines are required, consider adding an annubar test facility remote from the sprinkler valve assembly immediately after the pump outlet – as permitted for non-sprinkler fire pump installation. Hydraulic reference point would also have to be added to the new location.

Subsequent editions of AS2118 permit annubars to be located away from the sprinkler control valve and require return lines wherever water supply tanks are fitted.

### Recycled water supplies

There are a number of recycled water options that owners can explore to source water that may be treated and made available for firefighting services. Sources may include:

- storm water run-off;
- shower and bathroom water (grey water);
- sewage effluent (black water).

**ADVERTISED  
PLAN**

**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**



20.11.2024  
File No. 622K

Sustainable Management Plan

Housing Australia Future Fund application  
Apartment Blocks B, C & D  
Stage 2, 99 Derby Road, Sunshine

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

99 Derby Road, Sunshine



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](mailto:info@arkresources.com.au)  
[arkresources.com.au](http://arkresources.com.au)

**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	Date	Prepared	Checked	Status
A	22.10.2024	MT	LD	HAFF Draft
B	20.11.2024	MT	LD	HAFF

## Contents

1.0	Introduction	3
2.0	Site Description	6
3.0	Key ESD Initiatives	8
4.0	Green Star Building	9
5.0	NatHERS Energy Ratings	11
6.0	MUSIC Modelling	12
7.0	Conclusion	13

## Appendices

Appendix A.	Green Star Building Pathway	14
Appendix C.	MUSIC Modelling	25
Appendix D.	WSUD Maintenance Manual	29
Appendix E.	NatHERS Energy Rating Assumptions	31
Appendix F.	Solar Photovoltaics	36
Appendix G.	Site Management Plan	38

**ADVERTISED  
PLAN**

## 1.0 Introduction

---

Ark Resources has been engaged by SMA Projects to provide advice in relation to environmentally sustainable development outcomes from apartment blocks B, C and D, which form the social housing component of the proposed development at 99 Derby Road, Sunshine, for the purposes of applying for funding through the Housing Australia Future Fund (HAFF).

The apartments have been designed to meet Clauses 15.01-2L-02 (Environmentally Sustainable Development), 19.03-3S and 53.18-5 (Stormwater Management) of the City of Brimbank Planning Scheme. They also meet the sustainable design requirements of the HAFF.

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 Ben McCann, SMA Projects.

**ADVERTISED  
PLAN**

**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 MAP Architecture set out below.

GROUND LEVEL MASTERPLAN	TP00.20	14	18.11.2024
LEVEL 1 MASTERPLAN	TP00.21	14	18.11.2024
LEVEL 2 MASTERPLAN	TP00.22	14	18.11.2024
LEVEL 3 MASTERPLAN	TP00.23	14	18.11.2024
LEVEL 4 MASTERPLAN	TP00.24	14	18.11.2024
LEVEL 5 MASTERPLAN	TP00.25	14	18.11.2024
LEVEL 6 MASTERPLAN	TP00.26	3	18.11.2024
ROOF MASTERPLAN	TP00.27	3	18.11.2024
GROUND - DRAWING AREA 1	TP01.00	17	18.11.2024
GROUND - DRAWING AREA 2	TP01.01	16	18.11.2024
GROUND - DRAWING AREA 3	TP01.02	17	18.11.2024
LEVEL 1 - DRAWING AREA 1	TP01.03	16	18.11.2024
LEVEL 1 - DRAWING AREA 2	TP01.04	15	18.11.2024
LEVEL 1 - DRAWING AREA 3	TP01.05	15	18.11.2024
LEVEL 2 - DRAWING AREA 1	TP01.06	15	18.11.2024
LEVEL 2 - DRAWING AREA 2	TP01.07	15	18.11.2024
LEVEL 2 - DRAWING AREA 3	TP01.08	15	18.11.2024
LEVEL 3 - DRAWING AREA 1	TP01.09	15	18.11.2024
LEVEL 3 - DRAWING AREA 2	TP01.10	15	18.11.2024
LEVEL 3- DRAWING AREA 3	TP01.10A	15	18.11.2024
LEVEL 4 - DRAWING AREA 1	TP01.11	15	18.11.2024
LEVEL 4 - DRAWING AREA 2	TP01.12	15	18.11.2024
LEVEL 4 - DRAWING AREA 3	TP01.13	15	18.11.2024
LEVEL 5 - DRAWING AREA 1	TP01.14	3	18.11.2024
LEVEL 5 - DRAWING AREA 2	TP01.15	3	18.11.2024

LEVEL 5 - DRAWING AREA 3	TP01.16	3	18.11.2024
LEVEL 6 - DRAWING AREA 1	TP01.17	3	18.11.2024
LEVEL 6 - DRAWING AREA 2	TP01.18	3	18.11.2024
LEVEL 6 - DRAWING AREA 3	TP01.19	3	18.11.2024
BASEMENT FLOOR PLAN	TP01.20	14	18.11.2024
BASEMENT RCP & DETAILS	TP01.21	7	18.11.2024
TYPICAL TOWNHOUSES	TP02.00	11	18.11.2024
TYPICAL TOWNHOUSES	TP02.01	7	18.11.2024
TYPICAL TOWNHOUSES	TP02.02	10	18.11.2024
TYPICAL TOWNHOUSES	TP02.03	11	18.11.2024
TYPICAL TOWNHOUSES	TP02.04	8	18.11.2024
TYPICAL TOWNHOUSES	TP02.05	8	18.11.2024
TYPICAL TOWNHOUSES	TP02.06	9	18.11.2024
TYPICAL TOWNHOUSES	TP02.07	7	18.11.2024
CLAUSE 58 ASSESSMENT -TYPICAL APARTMENTS	TP02.10	12	18.11.2024
CLAUSE 58 ASSESSMENT - TYPICAL APARTMENTS	TP02.11	12	18.11.2024
CLAUSE 58 ASSESSMENT - TYPICAL APARTMENTS	TP02.12	9	18.11.2024
CLAUSE 58 ASSESSMENT - TYPICAL APARTMENTS	TP02.13	9	18.11.2024
SITE ELEVATIONS	TP03.00	21	18.11.2024
INTERNAL APARTMENT BLOCK ELEVATIONS	TP03.01	18	18.11.2024
INTERNAL TYPICAL LANEWAY ELEVATIONS	TP03.02	15	18.11.2024
INTERNAL LANEWAY ELEVATIONS	TP03.03	17	18.11.2024
INTERNAL LANEWAY ELEVATIONS	TP03.04	17	18.11.2024
INTERNAL LANEWAY ELEVATIONS	TP03.05	18	18.11.2024
INTERNAL LANEWAY ELEVATIONS	TP03.06	2	18.11.2024
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.10	9	18.11.2024
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.11	9	18.11.2024
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.12	8	18.11.2024

TOWNHOUSES - TYPICAL ELEVATIONS	TP03.13	8	18.11.2024
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.14	7	18.11.2024
TOWNHOUSES - TYPICAL ELEVATIONS	TP03.15	7	18.11.2024
SECTION A & B	TP04.00	11	18.11.2024
SECTION C	TP04.01	10	18.11.2024
SECTION D	TP04.02	10	18.11.2024
OVERLOOKING PLAN	TP04.09	3	18.11.2024
SCREENING DEVICES	TP04.10	9	18.11.2024
SHADING DEVICES TO NORTH	TP04.11	9	18.11.2024
LANDSCAPE BREAK PLAN	TP04.12	2	18.11.2024
LANDSCAPE BREAK PLAN	TP04.13	2	18.11.2024
SHADOW ANALYSIS SEPTEMBER 22nd EQUINOX	TP06.01	11	18.11.2024
SHADOW ANALYSIS SEPTEMBER 22nd EQUINOX	TP06.02	12	18.11.2024
SHADOW ANALYSIS SEPTEMBER 22nd EQUINOX	TP06.03	11	18.11.2024
CLAUSE 58 ASSESSMENT - COMPLIANCE SCHEDULE	TP08.00	10	18.11.2024
MATERIAL AND FINISHES SCHEDULE	TP09.01	13	18.11.2024
SITE CIRCULATION SPATIAL ANALYSIS	TP12.00	10	18.11.2024
SHADING DEVICE PLAN - GROUND LEVEL	TP14.00	13	18.11.2024
SHADING DEVICE PLAN - LEVEL 1	TP14.01	13	18.11.2024
SHADING DEVICE PLAN - LEVEL 2	TP14.02	13	18.11.2024
FENCE PLAN	TP20.01	4	18.11.2024

**ADVERTISED  
PLAN**

**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

---

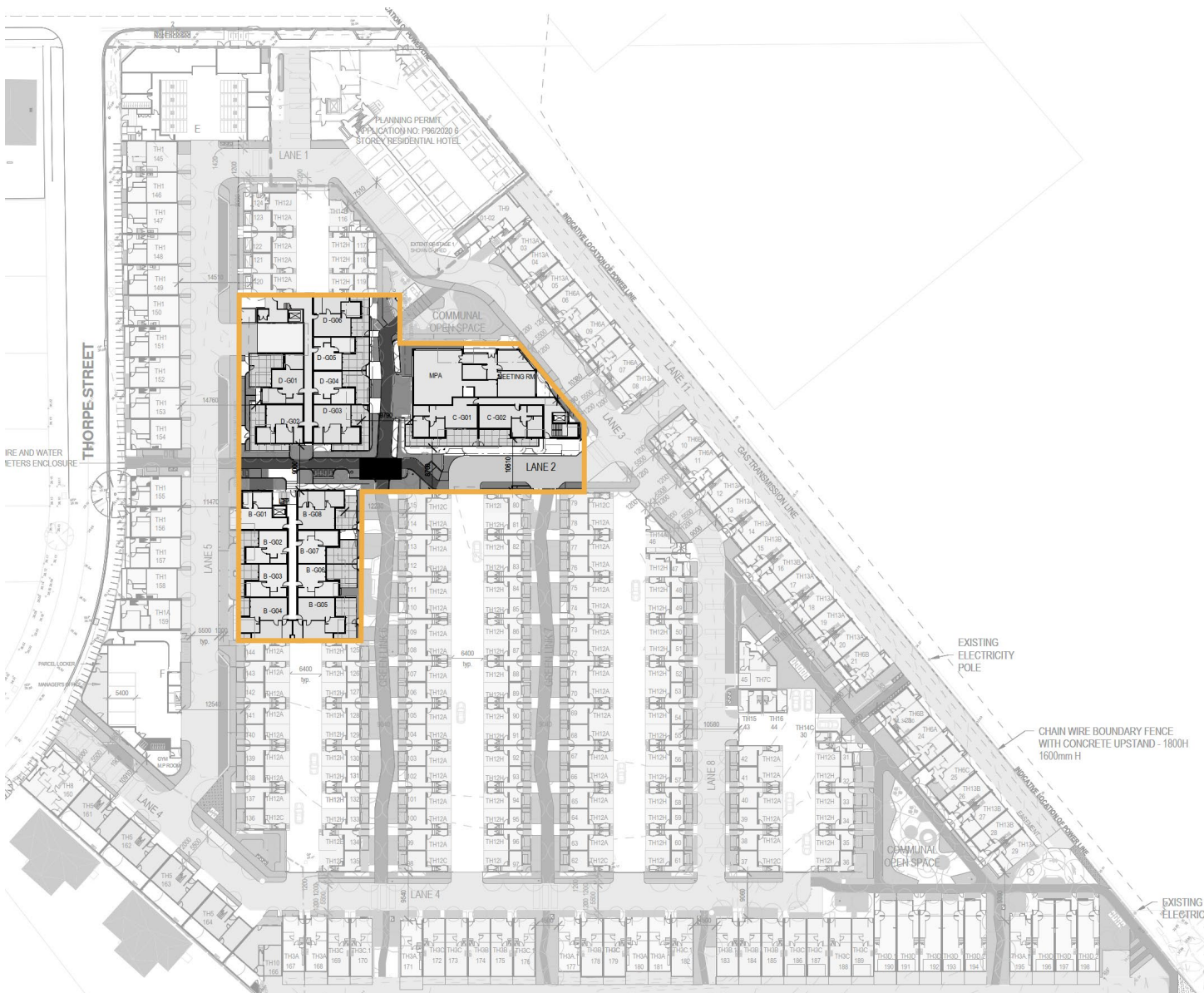
The social housing application comprises the following attributes:

- Block B: 51 apartments with 82 bedrooms;
- Block C: 32 apartments with 60 bedrooms;
- Block D: 54 apartments with 76 bedrooms;
- Communal amenities for all residents;
- Located within the City of Brimbank;
- Application site area 2,284m<sup>2</sup> (approximately)

**ADVERTISED  
PLAN**

**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**

## 2.1



**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**





## ADVERTISED PLAN



### 3.0 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:

<b>Energy</b> Commitment to 100% Green Power 	<b>Transport</b> Electric vehicle chargers and infrastructure 
<b>Water</b> Rainwater harvesting system for toilet flushing 	<b>Performance</b> High-performance glazing and energy efficient building services, appliances and fixtures 

### ADVERTISED PLAN

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

<b>Green Star Buildings</b> The development achieves a 5 Star Green Star Buildings performance standard  5 star	<b>Stormwater</b> The development meets the Best Practice standard for stormwater quality.  
<b>NatHERS Thermal Performance</b> The development achieves a 7.0 star development average  7.0 stars	<div>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</div>

## 4.0 Green Star Building

---

The Green Star Buildings (v1 Rev C) tool has been used as a benchmarking framework for the proposed apartment scheme and demonstrates the preliminary design potential to achieve a certified 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 below and in Appendix A.

ADVERTISED  
PLAN

**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**

---

### Green Star Building Rating

5  
star

---

### Total Points Targeted

41  
points

---

Note that a minimum of 35 points must be achieved for a 5 star Green Star Buildings rating to be achieved. A points margin of 13% has been incorporated into the pathway presented in this report as a contingency to allow for the inevitable change to the pathway inclusive of 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.

Summary of Green Star Building credits targeted.

Credit		Target	Points
1	Industry Development	Credit Achievement	1
2	Responsible Construction	Credit Achievement	1
3	Verification and Handover	Credit Achievement	1
4	Responsible Resource Management	Minimum Expectation	
5	Responsible Procurement		
6	Responsible Structure		
7	Responsible Envelope		
8	Responsible Systems		
9	Responsible Finishes	Credit Achievement	1
10	Clean Air	Minimum Expectation	
11	Light Quality	Minimum Expectation	
12	Acoustic Comfort	Minimum Expectation	
13	Exposure to Toxins	Credit Achievement	2
14	Amenity and Comfort	Credit Achievement	2
15	Connection to Nature		
16	Climate Change Resilience	Credit Achievement	1
17	Operations Resilience		
18	Community Resilience		
19	Heat Resilience	Credit Achievement	1
20	Grid Resilience		
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		
28	Enjoyable Places		
29	Contribution to Place	Credit Achievement	2
30	Culture, Heritage and Identity		
31	Inclusive Construction Practices	Credit Achievement	1
32	Indigenous Inclusion		
33	Procurement and Workforce Inclusion	Credit Achievement	2
34	Design for Inclusion	Credit Achievement	2
35	Impacts to Nature	Credit Achievement	2
36	Biodiversity Enhancement	Credit Achievement	2
37	Nature Connectivity		
38	Nature Stewardship	Credit Achievement	2
39	Waterway Protection		
40	Market Transformation Homes for Homes	Credit Achievement	1
41	Leadership Challenges Climate Positive Pathway	Credit Achievement	1

41 points

Refer to Appendix A for details of credit requirements

ADVERTISED  
PLAN

## 5.0 NatHERS Energy Ratings

HERO (v4.1) energy ratings have been undertaken for a representative sample of the apartments in blocks B, C & D.

The development achieves a 7.0 star development average NatHERS rating which meets the NCC 2022 standard for thermal performance.

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

ADVERTISED  
PLAN

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

### NatHERS Rating

The apartments will achieve a NatHERS energy rating development average of:

7.0  
stars

### Heating Load

The apartments have an average heating load of

78.4  
MJ/m<sup>2</sup>

### Cooling Load

The apartments have an average cooling load of

14.1  
MJ/m<sup>2</sup>

To assess the quality of stormwater runoff, an analysis has been undertaken using MUSIC Modelling software for the entire Stage 2 site.

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:  83.7	Reduction in Total Phosphorus (TP) load:  45.7
Reduction in Total Nitrogen (TN) load:  47.1	Reduction in Gross Pollutants (GP) load:  99.3

Note that the Rocla CDS Nipper GPT has been nominated in the MUSIC model, with the nutrient reduction (Nitrogen and Phosphorous) not attributed to this device, as per Melbourne Water MUSIC Guidelines (Condition 1(r)iv). Independent testing results for this device are available at the following link:

<https://www.ewater.org.au/archive/croch/archive/pubs/pdfs/technical199902.pdf>

Refer to Appendix C. for the MUSIC rating results, and Appendix D for the WSUD Maintenance Manual.

A rainwater harvesting system will be installed comprising:

- Stormwater collection from all townhouse roof areas (combined catchment areas of approx. 9,923m<sup>2</sup>) and installation of rainwater tanks for each dwelling, as follows:
  - 34no. 1.0kL RWT for Type TH01, TH01A, TH03A, TH03D, TH07C, TH14A, TH14B.
  - 16no. 1.51kL RWT for Type TH03B, TH03C.
  - 7no. 2.0kL RWT for Type TH05, TH08, TH10.
  - 136no. 0.5kL RWT for Type TH06, TH06B, TH06C, TH12A-H, TH13B, TH14C, Th15, TH16.
- Total RWT capacity for townhouses is 141.66kL.
- Stormwater collection from:
  - Block B Apartments – approx. 590m<sup>2</sup> catchment area to 20kL tank.
  - Block C Apartments – approx. 410m<sup>2</sup> catchment area to 15kL tank.
  - Block D Apartments – approx. 595m<sup>2</sup> catchment area to 20kL tank.
  - Block E (Derby Corner) Apartments – approx. 336m<sup>2</sup> catchment area to 15kL tank.
  - Block F (Thorpe Street) Apartments – approx. 318m<sup>2</sup> catchment to 10kL tank.
- Re-use of water for toilet flushing in all 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:

- Treatment of runoff from all ground level paving (4,946m<sup>2</sup>) by raingardens with a total surface area of 99m<sup>2</sup>.
- Landscape areas that promote infiltration and reduce runoff during storm events.
- A Rocla CDS Nipper gross pollutant trap (or equivalent primary treatment device) located near stormwater Legal Point of Discharge to capture suspended solids and litter generated onsite.

## 7.0 Conclusion

---

This report provides details of a comprehensive package of sustainable design features which will be integrated into the design and specification of apartment blocks B, C and D 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 certified 5 star Green Star standard based on the Buildings rating tool (V1 Rev C);
- achieve a NatHERS development average of 7.0 stars; and
- attain the Best Practice standard for urban stormwater quality

Accordingly, the sustainable design outcomes from the proposed social housing apartment scheme are considered to be consistent with the objectives of Clauses 15.01-2L-02 (Environmentally Sustainable Development), 19.03-3S and 53.18-5 (Stormwater Management) of the City of Brimbank Planning Scheme, as well as the sustainable design requirements of the Housing Australia Future Fund.

**ADVERTISED  
PLAN**

**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**

---

### Green Star

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

**5** star

---

### NatHERS Ratings

The apartments will achieve a NatHERS rating development average of:

**7.0** stars

---

### 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 Submission Guidelines (v1 Revision C, 18 October 2023).

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
<b>1 Industry Development</b>  The development facilitates industry transformation through partnership, collaboration, and data sharing	The building owner or developer appoints a Green Star Accredited Professional (GSAP).	1	Strategy Brief Concept Design Tender Construction Handover Use
	The building owner or developer discloses the cost of sustainable building practices to the GBCA.  The project team must complete, and include in the submission, the Green Star Financial Transparency disclosure template. The template requires and enables the project team to submit the cost of sustainable building practices of the project including design, construction, and documentation to the GBCA.		
	The building owner or developer markets the building to enable it to be made available for the sole purpose of enabling its consideration and review as a case study for the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright.  The project team must: <ul style="list-style-type: none"> <li>– Provide information from the project's marketing team must answer the questions in the submission form for a Green Star Case Study. The case study seeks information on the sustainability initiatives that the building targeted to enable it being marketed and the Green Star Case Study.</li> <li>– Detail how the building will detail its sustainability achievements to its stakeholders. The stakeholders are defined as the typical building occupants and visitors.</li> </ul>		
	The building owner or developer appoints a Green Star Accredited Professional (GSAP).		
<b>2 Responsible Construction</b>  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"> <li>– Information on the sustainable building certification(s) sought, including:                             <ul style="list-style-type: none"> <li>· the sustainability attributes of the building and their benefits</li> </ul> </li> </ul>		

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
	<p>the value of certification</p> <ul style="list-style-type: none"> <li>the role site worker(s) play in delivering a sustainable building</li> </ul>		
	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	
<b>3 Verification and Handover</b>  The building has been optimised and handed over to deliver a high level of performance in operation	<p>The building is set up for optimum ongoing management due to its appropriate metering and monitoring systems.</p> <p>The building must have accessible energy and water metering for all common uses, major uses, and major sources.</p> <p>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.</p> <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"> <li>Prior to construction:               <ul style="list-style-type: none"> <li>Set environmental performance targets</li> <li>Perform a services and maintainability review</li> <li>Design for airtightness</li> </ul> </li> <li>During construction and practical completion:               <ul style="list-style-type: none"> <li>Commission the building</li> <li>Engage building tuning service provider</li> <li>Test for airtightness</li> </ul> </li> <li>After practical completion:               <ul style="list-style-type: none"> <li>Tune the building over the next 12 months</li> </ul> </li> </ul> <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"> <li>Appropriate content for all nominated building systems has been developed and provided</li> <li>The appropriate user group has access to the information they require to deliver best practice environmental outcomes</li> <li>Guidance on keeping information up to date is provided to the facilities management team in these documents</li> </ul>	MINIMUM EXPECTATION	Design Tender Construction Handover Use

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
	<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	
<p><b>4 Responsible Resource Management</b></p> <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>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 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"> <li>General waste going to landfill</li> <li>Recycling streams to be collected by the building's waste collection service, including: <ul style="list-style-type: none"> <li>paper and cardboard</li> <li>glass</li> <li>plastic</li> </ul> </li> <li>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"> <li>organics, e-waste, batteries etc.</li> </ul> </li> </ul> <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>	MINIMUM EXPECTATION	Design Handover Use
<p><b>9 Responsible Finishes</b></p> <p>The building's internal finishes are comprised of responsibly manufactured products</p>	<p>40% of all internal building finishes (by cost) meet a Responsible Products Value of at least 7.</p> <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>	1	Design Tender Construction

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
<b>10 Clean Air</b>  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	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.  All new and existing ductwork that serves the building must be cleaned prior to occupation in accordance with a recognised Standard.	MINIMUM EXPECTATION	Design Tender Construction Handover Use
	The building must be provided with at an adequate amount of outside air.  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:  Where ventilation is by mechanical means, the building must provide outdoor air as per AS1668.2:2012 for the default occupancy.  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.		
	Point source pollutants must be exhausted directly outside (kitchens, kitchens,		
<b>11 Light Quality</b>  The building provides good daylight and its lighting is of high quality	Lighting within the building meets minimum comfort requirements.  Lighting within the building must meet the following requirements: <ul style="list-style-type: none"> <li>All LED lighting installed has no objectionable flicker (IEEE 1789-2015)</li> <li>Light sources must have a minimum Colour Rendering Index (CRI) of 80, or higher</li> <li>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</li> <li>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</li> <li>All light sources must have a maximum of 3 MacAdam Ellipses deviation.</li> </ul>	MINIMUM EXPECTATION	Concept Design Tender
	Good lighting levels suitable for the typical tasks in each space are available.		
	The building provides adequate levels of daylight. <ul style="list-style-type: none"> <li>Ensures regularly occupied areas are in reasonable proximity to glazed façades, windows, or skylights</li> <li>Maximises daylight to spaces that prioritise learning, healing, and living: <ul style="list-style-type: none"> <li>For apartments, how in 95% of all apartments, the living rooms and all bedrooms have access to a view and daylight.</li> </ul> </li> </ul>		
<b>12 Acoustic Comfort</b>	Internal noise levels from services and the outside is limited through an acoustic comfort strategy.  The Acoustic Comfort Strategy is to include: <ul style="list-style-type: none"> <li>A summary of the Standards, legislation, guidelines, and other requirements that apply to the project</li> </ul>	MINIMUM EXPECTATION	Design Tender Construction

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage																														
The building provides acoustic comfort for building occupants	<ul style="list-style-type: none"><li>– 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</li><li>– Description of how the design solution is intended to achieve the proposed performance metrics</li></ul>		Handover																														
<div>13 Exposure to Toxins</div> <div>The building’s occupants are not directly exposed to toxins in the spaces they spend time in</div>	<div>The building’s paints adhesives, sealants, and carpets are low in TVOC or non-toxic.</div> <div>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.</div> <div><div>Paints, Adhesives and Sealants</div><table><thead><tr><th>Product category</th><th>Max. Total Volatile Organic Compounds (TVOC) content in grams per litre (g/L) of ready to use product</th></tr></thead><tbody><tr><td>General purpose adhesives and sealants</td><td>50</td></tr><tr><td>Interior wall and ceiling paint, all sheen levels</td><td>16</td></tr><tr><td>Trim, varnishes, and wood stains</td><td>75</td></tr><tr><td>Primers, sealers, and prep coats</td><td>65</td></tr><tr><td>One and two pack performance coatings for floors</td><td>140</td></tr><tr><td>Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives</td><td>250</td></tr><tr><td>Structural glazing adhesive, wood flooring and laminate adhesives and sealants</td><td>100</td></tr></tbody></table><div>Carpets</div><table><thead><tr><th>Compliance option</th><th>Test protocol</th><th>Limit</th></tr></thead><tbody><tr><td rowspan="2">ASTM D5116</td><td>ASTM D5116 - Total VOC limit*</td><td>limit* 0.5mg/m² per hour</td></tr><tr><td>ASTM D5116 - 4-PC (4-Phenylcyclohexene) *</td><td>0.05mg/m² per hour</td></tr><tr><td>ISO 16000 / EN 13419</td><td>ISO 16000 / EN 13419 - TVOC at three days</td><td>0.5 mg/m² per hour</td></tr><tr><td>ISO 10580 / ISO/TC 219 (Document N238)</td><td>ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours</td><td>0.5mg/m² per hour</td></tr></tbody></table></div> <div>The building’s engineered wood products are low in TVOC or non-toxic.</div>	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/m² per hour	ASTM D5116 - 4-PC (4-Phenylcyclohexene) *	0.05mg/m² per hour	ISO 16000 / EN 13419	ISO 16000 / EN 13419 - TVOC at three days	0.5 mg/m² per hour	ISO 10580 / ISO/TC 219 (Document N238)	ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5mg/m² per hour	MINIMUM EXPECTATION	Design Tender Construction Handover
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/m² per hour																															
	ASTM D5116 - 4-PC (4-Phenylcyclohexene) *	0.05mg/m² per hour																															
ISO 16000 / EN 13419	ISO 16000 / EN 13419 - TVOC at three days	0.5 mg/m² per hour																															
ISO 10580 / ISO/TC 219 (Document N238)	ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5mg/m² 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><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/m³**</td></tr><tr><td>AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)</td><td>≤1mg/L</td><td>ASTM E1333</td><td>≤0.12mg/m³***</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/m</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>	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/m³hr	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/m³hr (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/m³**	AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/L	ASTM E1333	≤0.12mg/m³***	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	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/m³hr	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/m³hr*				
	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/m³hr																																			
	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/m³hr (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/m³**																																				
AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/L	ASTM E1333	≤0.12mg/m³***																																				
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																																				
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/m³hr																																				
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/m³hr*																																						
	<p>Occupants are not exposed to banned or highly toxic materials in the building.</p> <p>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><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>	Element	Concentration	TVOC	0.27 ppm	Formaldehyde	0.02 ppm	2																															
Element	Concentration																																						
TVOC	0.27 ppm																																						
Formaldehyde	0.02 ppm																																						
<p><b>14 Amenity and Comfort</b></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</p> <p>Concept</p> <p>Design</p> <p>Tender</p> <p>Handover</p> <p>Use</p>																																				
<p><b>16 Climate Change Resilience</b></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	<p>Strategy</p> <p>Brief</p> <p>Concept</p> <p>Design</p>																																				



Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
The building has been built to respond to the direct and indirect impacts of climate change	Climate Change Risk & Adaptation assessment undertaken during early stage aligned with AS5334 under RCP 8.5 for 2050 & 2080.	1	
<b>19 Heat Resilience</b>  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: Vegetation <ul style="list-style-type: none"> <li>Green roofs</li> <li>Roofing materials, including shading structures, having the following:               <ul style="list-style-type: none"> <li>For roof pitched &lt;15° – a three-year SRI of minimum 64</li> <li>For roof pitched &gt;15° – a three-year SRI of minimum 34</li> </ul> </li> <li>Unshaded hard-scaping elements with a three-year SRI of minimum 34 or an initial SRI of minimum 39</li> <li>Hardscaping elements shaded by overhanging vegetation</li> </ul>	1	Design Tender Construction
<b>21 Upfront Carbon Emissions</b>  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 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.		
<b>22 Energy Use</b>  (Residential Pathway)  The building has low energy consumption	The building has a weighted-area average of NatHERS 6.5 stars	MINIMUM EXPECTATION	Brief Concept Design Tender
	The building meets at least NatHERS 5 stars for each sole-occupancy unit		
	The building addresses domestic hot water demand		
	Where a pool exists, it has a pool cover		
	The building has a weighted-area average of NatHERS 7 Stars and at least NatHERS 5.5 Stars for each sole-occupancy unit	3	
	The building addresses four out of nine following building services energy uses (to be determined during DD):		

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
	<ul style="list-style-type: none"> <li>Domestic Hot Water</li> <li>Domestic Hot Water Generation</li> <li>Heating and Cooling of Sole Occupancy Units</li> <li>Clothes Drying</li> <li>Ceiling Fans</li> <li>Car Parking</li> <li>Vertical Transportation</li> <li>Lift Lobbies and Corridors</li> <li>On-site solar PV</li> </ul>		
<b>23 Energy Source</b> The building's energy comes from renewables	<p>The building provides a Zero Carbon Action Plan.</p> <p>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. The plan must include infrastructure provided for tenants or future occupants such as gas installations for cooking.</p>	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	3	
<b>24 Other Carbon Emissions</b> The building's emissions from refrigerants, upfront carbon, and remaining carbon sources are eliminated or offset	<p>The building owner eliminates emissions from high global warming potential refrigerants.</p> <p>or</p> <p>The building owner offsets emissions from refrigerants.</p>	2	Concept Design Tender Construction
<b>25 Water Use</b> (Residential – Class 2 or 3) The building has low water use	<p>The building installs efficient water fixtures:</p> <ul style="list-style-type: none"> <li>Taps 5 star</li> <li>Toilets 4 star</li> <li>Urinals 5 star</li> <li>Showers 3 star (<math>\leq 7.5</math> l/m)</li> <li>Dishwashers 5 star</li> <li>Washing machines 4 star</li> </ul>	MINIMUM EXPECTATION	Design Tender Construction Use

**ADVERTISED  
PLAN**

**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**

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
<b>26 Life Cycle Impacts</b>  The building has lower environmental impacts from resource use over its lifespan than a typical building	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. The results of the LCA must be entered into the GBCA's Life Cycle Assessment calculator.	2	Strategy Brief Concept Design Tender Construction
<b>27 Movement and Place</b>  The building's design and location encourage occupants and visitors to use active, low carbon, and public transport options instead of private vehicles	The building's access prioritises cycling and includes bicycle parking facilities <ul style="list-style-type: none"> <li>– 18 secure bicycle spaces</li> <li>– 9 visitor bike spaces</li> </ul> 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.		Strategy Brief Concept Design Tender Construction
	EV charging infrastructure: <ul style="list-style-type: none"> <li>– Chargers to 5% of car spaces: 4 chargers (minimum 7kW capacity)</li> <li>– EV charging to include load management supervisor hardware</li> <li>– Electrical containment e.g. trunking/conduit installed to facilitate future installation of cabling supplying all car spaces (NCC 2022 requirement)</li> </ul>		
	Walkability encouraged via access to at least 10 amenities categories		
<b>29 Contribution to Place</b>  The building's design makes a positive contribution to the quality of the public environment	The project team must provide an urban context report and public realm interface design that outlines the urban context of the development and the design responses. or Independent design reviews are to be held at key points in the development of the design.	2	Strategy Brief Concept Design Construction
<b>31 Inclusive Construction Practices</b>  The builder's construction practices promote diversity and	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.	2	

**ADVERTISED PLAN**

**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**

Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
reduces physical and mental health impacts			
<b>33 Procurement and Workforce Inclusion</b>  The building's construction facilitates workforce participation and economic development of disadvantaged and under-represented groups	The project team must develop and implement a social procurement strategy or plan (this can be part of an overall project procurement plan/strategy) that directs at least 2% of the building's total contract value to generate employment opportunities for disadvantaged and under-represented groups.  The project team must also include targets and annual reporting requirements in the strategy.	2	Tender Construction
	At least 2% of the building's total contract value has been directed to generate employment opportunities for disadvantaged and under-represented groups.		
<b>34 Design for Inclusion</b>  The building is welcoming to a diverse population and is welcoming to their needs	The building's design and construction must be able to be navigated and enjoyed by stakeholders of diverse ages, genders, and physical and mental abilities. The application must include spaces, bathroom facilities, and amenities provided within the building.	2	Concept Design Tender Construction Handover Use
<b>35 Impacts to Nature</b>  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.		
	There is ongoing monitoring, reporting, and management of the site's wetland ecosystem		
	The project team must demonstrate how they have attempted to understand their site's historical and current ecological context by documenting the site's current ecological values by type and biomass. This includes terrestrial and aquatic ecological values, geologic features, and soils (including interaction with living things). When determining biodiversity value, the project must reference local, regional, state, and national priorities and strategies.	2	
	If deemed necessary by an Ecologist, at least 50% of existing site with high biodiversity value is retained.		
	The building's site includes an appropriate landscape area (minimum of 15% of the site area = 342m <sup>2</sup> )	2	Concept Design
	The landscaping includes a diversity of species and prioritises the use of climate-resilient and indigenous plants		

## ADVERTISED PLAN

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

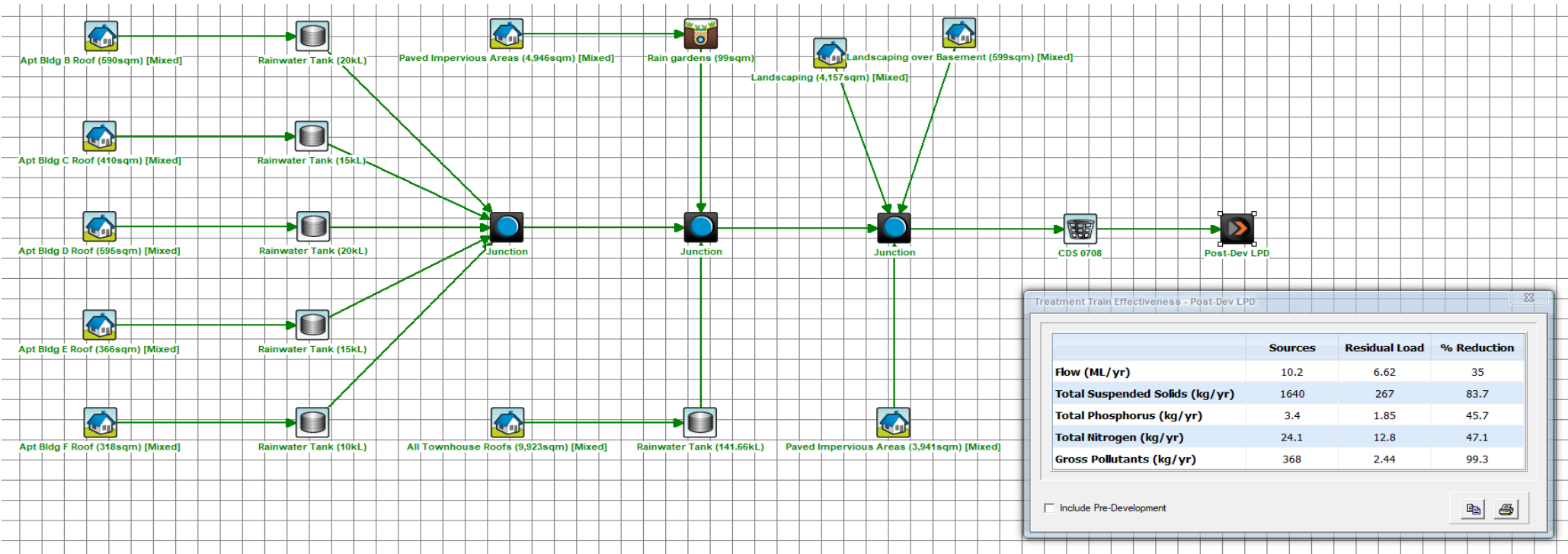
Green Star Credit Project Outcomes	Credit outcomes	Target	Project Stage
<b>36 Biodiversity Enhancement</b> The building's landscape enhances the biodiversity of the site	Significant trees provided, suitable for nesting, at 1 per 500m <sup>2</sup> of landscaping = 1 trees		Use
	The project team develops a site-specific Biodiversity Management Plan and provides it to the building owner or building owner representative. The plan will outline key actions that need to be undertaken in order to maintain the ecological integrity of biodiversity on the site, whether this is existing or that created as part of the development.		
<b>41 Leadership Challenges</b>	Homes for Homes Climate Positive Pathway	<b>2</b>	
<b>Total Green Star Points</b>		<b>41</b>	
<b>Green Star Rating</b>		<b>5 Star</b>	

## ADVERTISED PLAN

**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



ADVERTISED  
PLAN

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

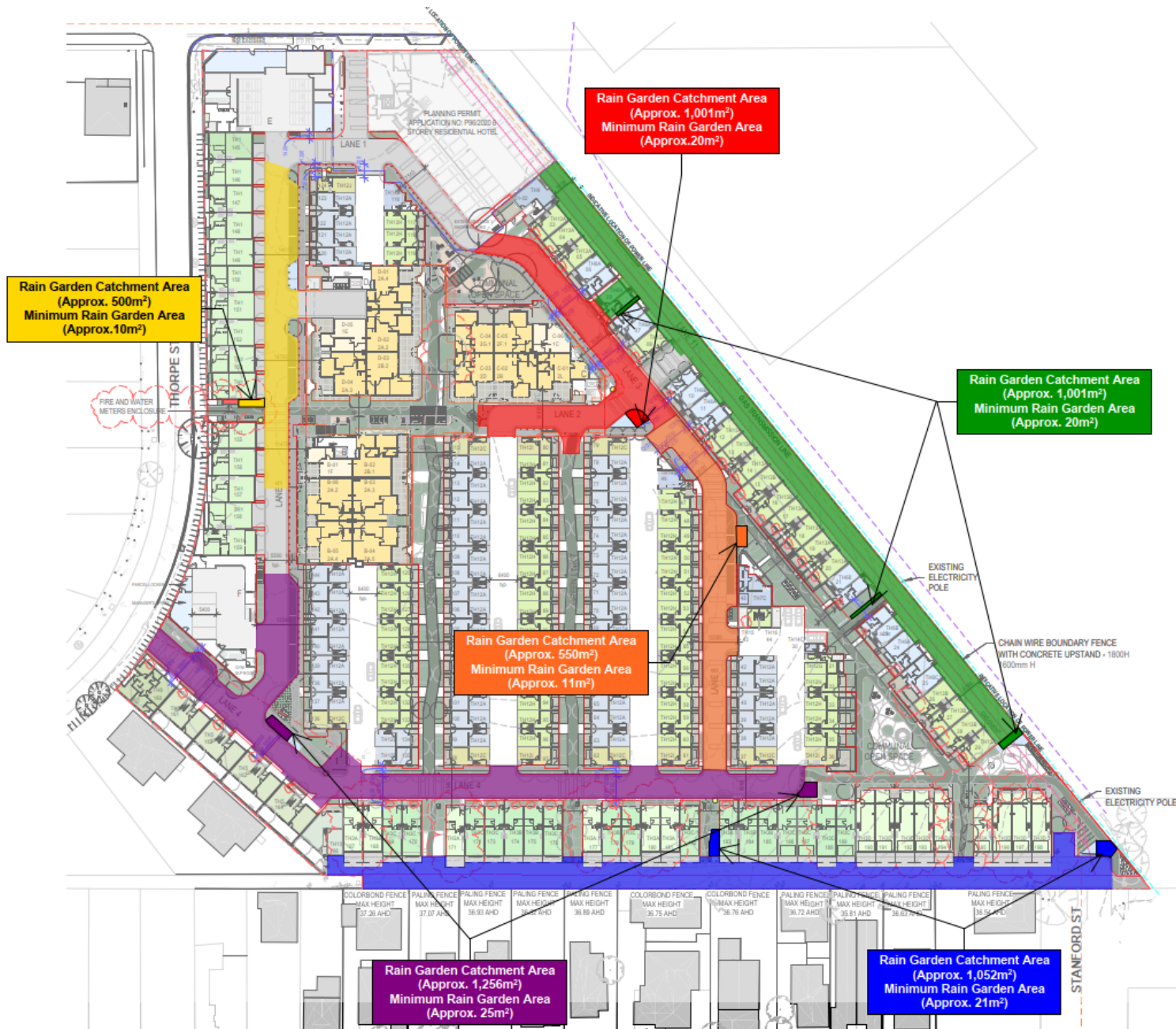


## C.2 Rainwater Catchment Areas



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

**ADVERTISED  
PLAN**



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

## ADVERTISED PLAN

## C.3 MUSIC Modelling Assumptions and Results

MUSIC Model 20/10/2023		
Treatment Devices Features		
RWT Type TH01, TH01A, TH03A, TH03D, TH07C, TH14A & TH14B		34 x 1.0 kL
RWT Type TH03B, TH03C		16 x 1.51 kL
RWT Type TH05, TH08, TH10		7 x 2.0 kL
RWT Type TH06, TH06B, TH06C, TH12A-H, TH13B, TH14C, TH15, TH16		139 x 0.5 kL
Total RWT Capacity for Townhouses		141.66 kL
RWT Apartment Building B		20 kL
RWT Apartment Building C		15 kL
RWT Apartment Building D		20 kL
RWT Apartment Building E		15 kL
RWT Apartment Building F		10 kL
Est. daily water demand for TF Townhouses (all toilets)		9.38 kL/day
Est. daily water demand for TF Apt Bldg B (all toilets)		1.10 kL/day
Est. daily water demand for TF Apt Bldg C (all toilets)		0.88 kL/day
Est. daily water demand for TF Apt Bldg D (all toilets)		1.06 kL/day
Est. daily water demand for TF Apt Bldg E (all toilets)		0.84 kL/day
Est. daily water demand for TF Apt Bldg F (all toilets)		0.96 kL/day
*Total RG surface area		99 m <sup>2</sup>
**Primary Treatment System 1 (GPT)	Rocla CDS 0708 GPT (or equivalent)	

Results		
Reduction in Total Suspended Solids (TSS)		83.7%
Reduction in Total Phosphorus (TP)		45.7%
Reduction in Total Nitrogen (TN)		47.1%
Reduction in Total Gross Pollutants		99.3%

Pollutant	MUSIC Model Results	Melbourne Water Targets
Reduction in Total Suspended Solids (TSS)	83.7%	80.0%
Reduction in Total Phosphorus (TP)	45.7%	45.0%
Reduction in Total Nitrogen (TN)	47.1%	45.0%
Reduction in Total Gross Pollutants	99.3%	70.0%
Compliance with Melbourne Water targets		✓

### NOTES:

\* RGs vegetated with Effective Nutrient Removal Plants. Further specification to be undertaken in Detailed Design.

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

### Acronyms

RWT: Rain Water Tank

RG: Rain Garden

TF: Toilet Flushing

GPT: Gross Pollutant Trap

Assumptions		
Area Name		Area [m <sup>2</sup> ]
Total Roof Areas		12,202
All Townhouse Roofs		9,923
Roof Apartment Building B		590
Roof Apartment Building C		410
Roof Apartment Building D		595
Roof Apartment Building E		366
Roof Apartment Building F		318
Paving Areas to Rain gardens		4,946
Roads/Laneways		4,946
Part Pervious Landscape Areas (over basement)		599
Pervious Landscape Areas		4,157
Remaining Area		3,941
<b>Total Site Area</b>		<b>25,845</b>

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

**ADVERTISED  
PLAN**



## Appendix D. WSUD Maintenance Manual

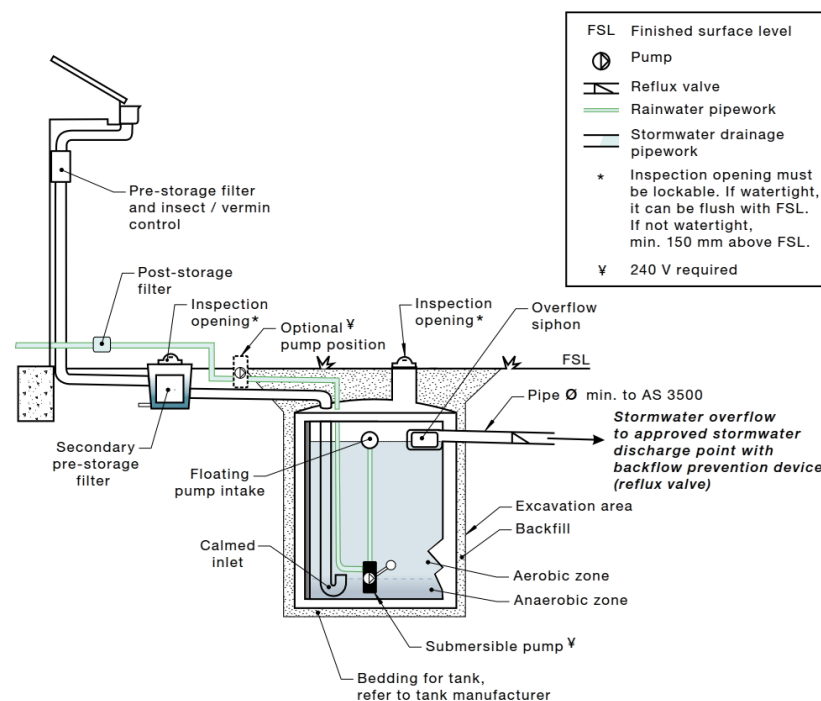
Once installed, a systematic maintenance program will be implemented by the owner's corporation maintenance contractor to ensure the rainwater harvesting system operates as designed and water quality is maintained.

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 Commission<sup>1</sup>. A schematic diagram of the rainwater tank installation is provided below.



**ADVERTISED  
PLAN**

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		

**ADVERTISED  
PLAN**

**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. NatHERS Energy Rating Assumptions

E.1 Results

Apartment	Star Rating	Energy Demand (MJ/m2)		
		Total	Heating	Cooling
B-G01	7.4	88.1	79.3	8.8
B-G02	6.9	99.5	88.9	10.6
B-G03	6.9	100.6	82.8	17.8
B-G04	7.5	83.9	74.0	9.9
B-G05	6.9	100.3	94.8	5.5
B-G06	7.2	93.5	78.8	14.7
B-G07	6.9	100.6	85.8	14.8
B-G08	7.4	84.7	77.9	6.8
B-101	7.1	97.0	76.5	20.5
B-102	6.9	101.6	83.0	18.6
B-201	8.1	67.4	55.9	11.5
B-202	7.2	93.3	69.1	24.2
B-203	8.0	68.5	51.8	16.8
B-204	7.3	88.7	77.4	11.3
B-205	7.6	79.8	63.9	15.9
B-206	7.3	90.1	75.1	15.0
B-207	7.4	85.6	73.5	12.1
B-501	7.9	71.8	61.2	10.6
B-502	6.8	105.8	83.9	21.8
B-503	7.2	92.6	67.6	25.0
B-504	6.7	107.7	97.5	10.2

Apartment	Star Rating	Energy Demand (MJ/m2)		
B-505	7.3	90.9	76.3	14.6
B-506	6.8	103.8	89.6	14.2
B-507	7.4	86.4	74.7	11.7
B-601	7.1	95.2	82.7	12.5
B-602	6.3	119.2	97.4	21.8
B-603	6.7	109.1	84.1	25.0
B-604	6.7	109.4	97.0	12.4
B-605	6.8	105.4	88.6	16.8
B-606	6.4	115.1	99.3	15.8
B-607	7.2	92.1	78.0	14.2
C-G01	7.0	98.7	94.1	4.6
C-G02	7.1	95.3	89.5	5.8
C-101	8.5	54.5	48.6	5.9
C-102	8.5	53.6	43.1	10.5
C-103	8.4	55.3	41.8	13.5
C-104	7.6	80.7	73.9	6.8
C-105	7.3	89.2	82.6	6.5
C-501	8.4	58.5	51.7	6.8
C-502	8.2	62.9	52.8	10.1
C-503	8.3	61.5	48.8	12.7
C-504	7.1	95.4	84.9	10.5
C-505	7.0	98.6	86.4	12.1
C-601	7.6	80.6	69.4	11.2



Apartment	Star Rating	Energy Demand (MJ/m2)		
C-602	7.3	88.9	76.3	12.6
C-603	7.6	81.5	66.7	14.8
C-604	6.7	107.3	98.3	9.0
C-605	6.8	106.1	94.9	11.2
D-G01	7.0	97.7	87.4	10.3
D-G02	7.0	98.3	87.4	10.9
D-G03	7.0	98.1	91.8	6.3
D-G04	7.6	80.2	72.1	8.1
D-G05	6.7	109.1	94.0	15.1
D-G06	7.7	79.3	71.4	7.9
D-101	7.4	84.3	64.5	19.8
D-102	7.4	86.8	60.6	26.2
D-103	7.4	87.2	64.8	22.9
D-104	7.0	97.8	81.2	16.6
D-105	7.0	97.6	88.8	8.7
D-106	7.7	79.3	68.3	11.0
D-107	7.3	89.3	75.5	13.8
D-108	8.0	68.7	56.9	11.9
D-501	7.2	91.5	70.3	21.3
D-502	7.1	96.5	72.3	24.3
D-503	6.9	100.5	77.6	23.0
D-504	6.8	104.8	86.6	18.2
D-505	6.7	109.1	98.0	11.1
D-506	7.2	94.5	82.0	12.5

Apartment	Star Rating	Energy Demand (MJ/m2)		
D-507	6.8	106.0	93.2	12.8
D-508	7.6	81.8	67.7	14.1
D-601	6.6	109.7	89.4	20.3
D-602	6.6	110.9	87.3	23.7
D-603	6.4	115.6	93.2	22.4
D-604	6.6	112.4	94.7	17.7
D-605	6.5	113.1	99.0	14.0
D-606	6.8	105.7	89.4	16.3
D-607	6.4	115.7	99.8	16.0
D-608	7.1	97.2	81.7	15.6
	7.0	92.5	78.4	14.1

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 results of the modelling confirm that:

- The average heating load of 68.8 MJ/m2 and the cooling load of 12.5 MJ/m2 are significantly less than the relevant threshold loads set out in NCC 2022 for Class 2 dwellings (average heating load <88 MJ/m2, average cooling load <48 MJ/m2), and;
- The individual apartment heating and cooling loads are significantly less than the relevant threshold loads set out in NCC 2022 for Class 2 dwellings (heating load <103 MJ/m2, cooling load <49 MJ/m2).

**ADVERTISED  
PLAN**

## E.2 Building Materials

Element	Description	Added R Value
Floor Type	Suspended concrete slab (all levels)	
Floor Insulation	Soffit of suspended floor slab: R 2.30 rigid board insulation Ground floor slab over basement	R 2.30
	Soffit of suspended slab Level 2 Building B: R 2.30 rigid board insulation Apartment B-201	R 2.30
Wall Insulation	Lightweight party walls: Insulation R 1.0 x 2	R 2.0
	Lightweight corridor walls: Insulation R 1.5	R 1.50
	Precast concrete Lift & stairwell walls: Insulation R 0.70	R 0.70
	Precast concrete external walls: Insulation R 2.50	R 2.50
	Lightweight external clad walls: Insulation R 2.50	R 2.50
Roof Insulation	Concrete roof: R 2.30 rigid board insulation Level 6 of buildings B, C & D	R 2.30
	All apartment concrete ceilings shared with terraces above: R 2.30 rigid board insulation Apartment B-101, B-102	R 2.30
Roof Colour	Solar Absorptance – 0.50 (Medium)	
Window Frames	Aluminium and aluminium <b>thermally broken</b> frames to all windows and glazed doors (see glazing tables below)	
Window Colour	Solar Absorptance –0.44 Medium (equivalent to Colorbond Shale Grey)	
Sky Lights	None	
Ceiling fans	To some apartments as indicated on plans.	1200mm diameter

### 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

**ADVERTISED  
PLAN**

**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**

## E.3 Glazing

**Glazing Table 1:** Aluminium Frames to Levels 1 to 5

Window Type	Description	Whole of Window Value		Location
		U	SHGC	
Aluminium Hinged Door	CAP-048-06 Double glazed 6mm Energy Advantage/12mm Argon gap/6mm Clear	3.60	0.44	All Apartments on levels 1 to 5
Aluminium Awning Window	CAP-051-06 Double glazed 6mm Energy Advantage/12mm Argon gap/6mm Clear	4.42	0.41	All Apartments on levels 1 to 5
Aluminium Fixed Window	CAP-055-52 Double glazed 6mm Clear/12mm Argon gap/6mm Energy Advantage	2.71	0.58	All Apartments on levels 1 to 5
Aluminium Sliding Door	CAP-057-13 Double glazed 6mm Energy Advantage/12mm Argon gap/6mm Clear	2.19	0.48	All Apartments on levels 1 to 5

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

**Glazing Table 2:** Aluminium Thermally Broken Frames to Levels Ground and 6

Window Type	Description	Whole of Window Value		Location
	<b>Futureline Thermally Broken Frames</b>	U	SHGC	
Aluminium TB Hinged Door 46D Series	CAP-115-04 Double glazed 6mm EnergyTech Clear/12mm Argon/6mm Clear	2.73	0.42	All Apartments on Ground and Level 6
Aluminium TB Awning Window 54W Series	CAP-116-04 Double glazed 6mm EnergyTech Clear/12mm Argon/6mm Clear	2.87	0.39	All Apartments on Ground and Level 6
Aluminium TB Sliding Door	CAP-133-07 Double glazed 6mm EnergyTech Clear/12mm Argon/6mm Clear	2.40	0.40	All Apartments on Ground and Level 6
Aluminium TB Fixed Window 425 Series	CAP-148-05 Double glazed 6mm EnergyTech Clear/12mm Argon/6mm Clear	2.16	0.51	All Apartments on Ground and Level 6

# ADVERTISED PLAN

## GLAZING NOTES

Window system values used in the NatHERS ratings must be tested by an accredited professional according to the Technical Protocols and Procedures Manual for Energy Rating of Fenestration by the Australian Fenestration Rating Council, as per the NatHERS Technical Note (2023) and NCC 2022 Volume Two Housing Provisions. Energy ratings cannot be certified for NCC compliance until documentation is provided demonstrating window system performance values have been tested according to [this protocol](#).

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.

## E.4 General Rating Assumptions

Item	Details	
Floor Coverings	Tiles to bathrooms and laundries Carpet to bedrooms Timber boards to kitchen, living and all other areas	<div>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</div>
Window Coverings	Holland blinds to all windows. (Refer to item 20)	
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 fitted with fire proof unvented down light covers (external roof areas only) 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	
Ceiling Calculation	Calculation for loss of ceiling insulation due to down lights, exhaust fans, ceiling speakers etc. have been incorporated into the energy rating where applicable	

## NOTES

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.

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

## Appendix F. Solar Photovoltaics

During the construction phase, high-efficiency solar PV modules with a total capacity of 28kWp will be installed at roof level as per the preliminary layout indicated below.

PV modules should be oriented in pairs to the east and west at 10-15°.



The undulating east-west configuration prevents self-shading 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.

Total yield of this array will be approximately 33.7 MWh per annum equating to an estimated annual carbon emissions offset of 28.9 tonnes CO<sub>2</sub>-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

**ADVERTISED  
PLAN**

# ADVERTISED PLAN

## East facing array output

### RESULTS

 Print Results

17,022 kWh/Year\*

Month	Solar Radiation ( kWh / m <sup>2</sup> / day )	AC Energy ( kWh )
January	6.78	2,259
February	6.25	1,907
March	4.70	1,592
April	3.25	1,098
May	2.14	749
June	1.72	588
July	1.94	689
August	2.68	954
September	4.08	1,389
October	5.06	1,760
November	5.49	1,818
December	6.67	2,220
Annual	4.23	17,023

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

#### Location and Station Identification

Requested Location	99 Derby Road, Sunshine VIC
Weather Data Source	Lat, Lng: -37.79, 144.82 0.8 mi
Latitude	37.79° S
Longitude	144.82° E

#### PV System Specifications

DC System Size	14.4 kW
Module Type	Premium
Array Type	Fixed (open rack)
System Losses	14.08%
Array Tilt	13°
Array Azimuth	84°

## West facing array output

### RESULTS

 Print Results

17,022 kWh/Year\*

Month	Solar Radiation ( kWh / m <sup>2</sup> / day )	AC Energy ( kWh )
January	6.78	2,259
February	6.25	1,907
March	4.70	1,592
April	3.25	1,098
May	2.14	749
June	1.72	588
July	1.94	689
August	2.68	954
September	4.08	1,389
October	5.06	1,760
November	5.49	1,818
December	6.67	2,220
Annual	4.23	17,023

#### Location and Station Identification

Requested Location	99 Derby Road, Sunshine VIC
Weather Data Source	Lat, Lng: -37.79, 144.82 0.8 mi
Latitude	37.79° S
Longitude	144.82° E

#### PV System Specifications

DC System Size	14.4 kW
Module Type	Premium
Array Type	Fixed (open rack)
System Losses	14.08%
Array Tilt	13°
Array Azimuth	84°



# Appendix G. 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**

**ADVERTISED  
PLAN**

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