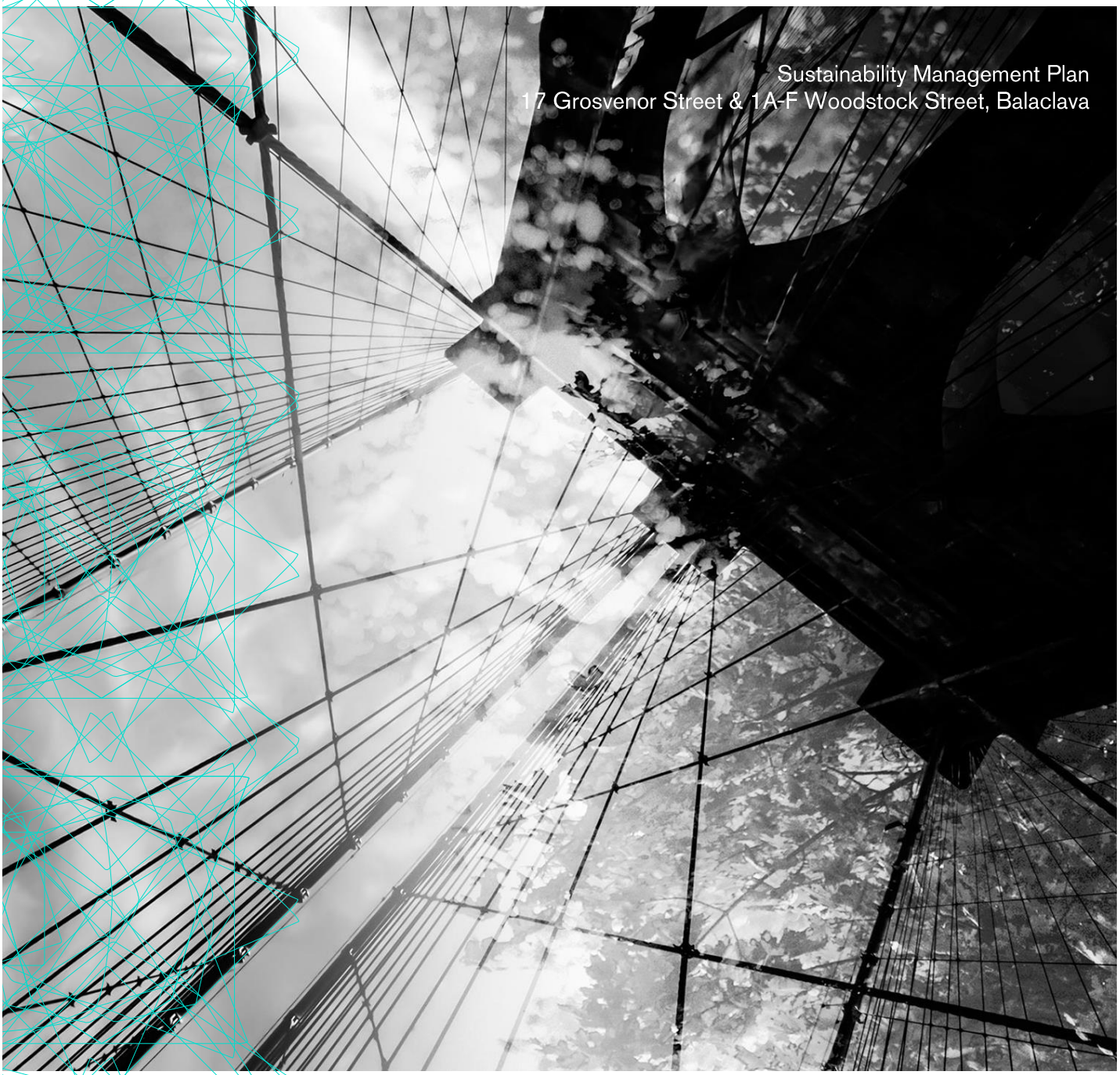
SUSTAINABLE DEVELOPMENT
_CONSULTANTS

CREATE A BETTER PLACE TO LIVE.



Sustainability Management Plan
17 Grosvenor Street & 1A-F Woodstock Street, Balaclava

SUSTAINABLE DEVELOPMENT
_CONSULTANTS

Proposed Residential Development
17 Grosvenor Street & 1A-F Woodstock Street, Balaclava

Sustainability Management Plan

August 2024

S4992 SMP.V2

PREPARED BY:

Sustainable Development Consultants

2nd Floor, 555 Riversdale Rd.
Camberwell VIC 3124

T: (03) 9882 9967 F: (03) 9882 9969
info@sdconsultants.com.au

sdconsultants.com.au

Table of Contents

Version	Date of Issue	Description	Author	Approved
V1	09-02-2024	For Submission	NC	AR
V2	02-08-2024	Daylight modelling included	AR	AR

1. Introduction

This Sustainability Management Plan (SMP) has been prepared to assist the design, construction and operation of the proposed residential development at 17 Grosvenor Street & 1A-F Woodstock Street, Balaclava, which is to be a three-storey residential development comprising 68 apartments with ground floor communal spaces.

Sustainable Development Consultants have assessed the proposed development and provided input to the design team. This SMP captures initiatives necessary to ensure that the development meets the sustainability requirements of Clause 15.01-2L-02 of the Port Phillip planning scheme, as outlined in Section 1.3 of this report.

This document has been prepared by Sustainable Development Consultants with reference to the architectural drawings prepared by H2o Architects.

1.1 Site Description

The site at 17 Grosvenor Street & 1A-F Woodstock Street, Balaclava is on the corner of Grosvenor and Woodstock Streets, near Brighton Road. It is approximately 6.5km south-east of Melbourne CBD and around 400m from Balaclava Station. The site is currently occupied by 20 single-storey units which will be demolished prior to the construction of the proposed development.

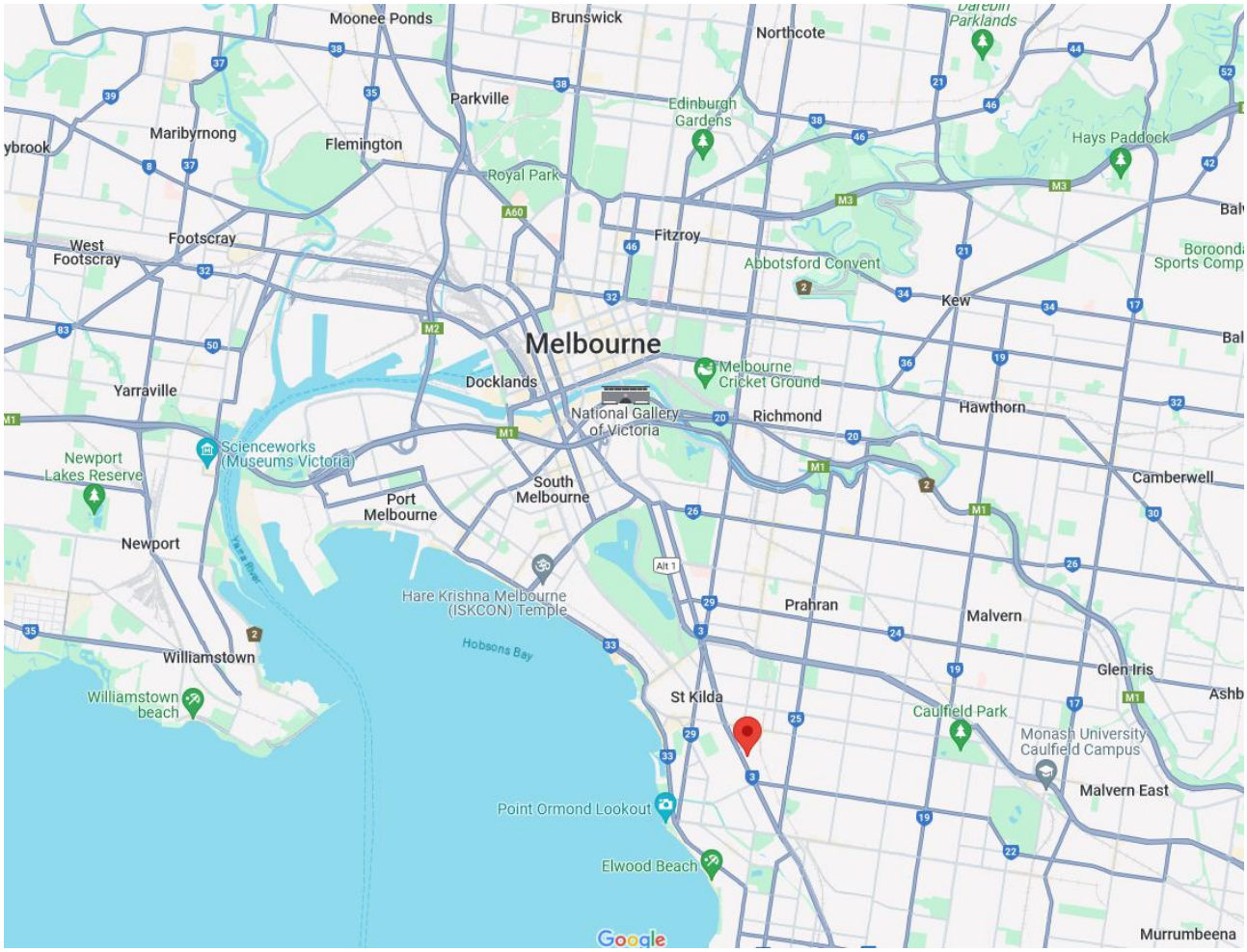


Figure 1: Location of 17 Grosvenor Street & 1A-F Woodstock Street, Balaclava in relation to the Melbourne CBD (Source: Google Maps)

Figure 2: Aerial image of the development site at 17 Grosvenor Street & 1A-F Woodstock Street, Balaclava (Source: LandChecker, mark-up by SDC)

1.2 Development Summary

Set out in Table 1 below is a development summary for this project.

Table 1: Development Summary

Development Information	
Total Site Area	3,790m^2
Carparking and Bikes	41 on-site car spaces, 32 resident bike spaces and 14 visitor bike spaces
Levels Ground to 4	68 apartments (44 x one-bedroom, 21 x two-bedroom and 3 x three bedroom)

1.3 Town Planning Requirements

Port Phillip City Council is committed to making Port Phillip a more sustainable place to live, work and play and critical to achieving this commitment, they require new developments to meet appropriate environmental design standards.

The City of Port Phillip planning expects that this project should achieve best practice in environmentally sustainable development from the design stage through to construction and operation and requires a SMP which demonstrates how for this project, the relevant policy objectives will be achieved.

The proposed project is pursuing approval under Clause 53.23, and as such must address the relevant requirements of Clause 15.01-2L-02 *Environmentally Sustainable Development*. To do so, this project is required to satisfy the objectives as set out within the following categories, where applicable:

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

The City of Port Phillip also require the relevant sustainability considerations within the following planning scheme provisions to also be addressed:

- Clause 52.34 *Bicycle Facilities*
- Clause 53.18 *Stormwater Management in Urban Development*
- Clause 55.07 *Apartment Developments*

In September 2019, the City of Port Phillip declared a climate emergency and as part of this, are committed to enhanced Environmentally Sustainable Design.

1.4 ESD Assessment Tools

There are several calculators and modelling programs available in Victoria to assess proposed developments against benchmarks for ESD, as set by the Victorian government, local councils and the Building Code of Australia.

Set out below are the assessment tools that have been adopted for this project.

1.4.1 BESS

BESS was developed by the Council Alliance for Sustainability in the Built Environment (CASBE). This tool assesses the energy and water efficiency, thermal comfort and overall environmental sustainability performance of new buildings or alterations. It was created to demonstrate that new development meets sustainability requirements as part of a planning permit application.

A BESS assessment has been conducted for the proposed development. This provides a guide as to the level of sustainability achieved by the proposed development in line with the Council's ESD requirements.

Each target area within the BESS tool generally receives a score of between 1% and 100%. A minimum score of 50% is required for the energy, water and indoor environment quality (IEQ) areas, whilst a 100% score is required for stormwater. An overall score of 50% for the project represents 'Best Practice' while a score over 70% represents 'Excellence'.

The results of the BESS assessment can be found in Appendix 1 of this report.

1.4.2 FIRSTRATE5

FirstRate5 is a house energy rating software that is accredited under the Nationwide House Energy Rating Scheme (NatHERS) Software Protocol to generate energy ratings for the purpose of demonstrating compliance of residential dwellings under the National Construction Code of Australia (NCC).

The software is used to assess the thermal performance of dwellings based on climate zone, materials used in a structure, positioning, orientation and building sealing. Higher scores are achieved through adoption of passive design principles such as improved building fabric elements (e.g. glazing and insulation), effective shading and promoting natural ventilation, among others.

A representative sample of dwellings have been modelled to determine the predicted heating and cooling loads and subsequent NatHERS ratings to provide an overview of how the development design is likely to perform. The results of these assessment will be found in Appendix 2 of this report.

2. Sustainability Initiatives

The following sections outline the initiatives that will be incorporated into the development throughout its design, construction and operation. Initiatives that are included to contribute towards the BESS benchmark have a reference next to them, e.g. (BESS Management 4.1). Some initiatives without the BESS reference have also been included as they contribute to the overall sustainability of the development.

The following sections, as well as nominating the sustainability initiatives, also identify the party/parties responsible for implementation of the initiative, and the stage at which implementation will be demonstrated.

The following are the broad project stages:

1	Design Development	• Consultants develop conceptual design drawing to a detailed stage suitable as a basis for preparing working drawings - Integration of architectural, services, structure and site attributes • Checking compliance with all statutory requirements, codes and standards • Arranging special surveys or reports as required
2	Construction Documentation	• Architectural and services drawing sets completed • All specialist reports completed • All necessary planning and building consents obtained as required by authorities
3	Construction	• All work carried out onsite – site preparation, construction, alteration, extension, demolition • Purchase of all materials / certification • Evidence gathering from subcontractors • Commissioning
4	Post Occupancy	• Operation and Maintenance • Education – Building Users Guides

2.1 Building Management and Innovation

Initiatives included in this section promote adoption of environmental initiatives at different stages of the project – not just in the project design stage.

Design Requirements	Responsibility & Implementation	Project Stage
Thermal Performance Modelling – Residential (BESS Management 2.2)		
Preliminary NatHERS ratings have been undertaken for all thermally unique dwellings. Draft results and details of the modelling parameters, will be provided in Appendix 2.	ESD Consultant	Design Development
Metering (BESS Management 3.1 & 3.3)		
Separate utility meters (water and electricity) will be provided for each dwelling. This will allow residents to monitor and reduce their consumption. Common area services (i.e., the lift and corridor lighting, as well as the mechanical ventilation system and lighting for the shared car park) will be separately sub-metered.	Services Consultant	Construction Documentation
Building User Guide (BESS Management 4.1)		
A Building User's Guide (BUG) will be developed and made available to building management and residents. It will comprehensively feature the manuals of the systems installed in the development and offer relevant suggestions for sustainable operation.	Developer/ Builder	Construction Documentation

2.2 Energy Efficiency

The development will minimise energy use through best practice building envelopes and efficient heating and air conditioning, as well as efficient hot water systems and lighting.

Design Requirements	Responsibility & Implementation	Project Stage
Building Envelope (BESS Energy 1.2, 2.1 & 2.2)		
Building fabric selection for the apartments will ensure the development achieves a minimum average NatHERS rating of 7.0-Stars, with no individual apartment achieving a rating of less than 6.0-Stars. Additionally, all apartment ratings for the development will adhere to the cooling load requirement of ≤30MJ/m^2 as per Clause 52.20-7.1 (Climate Zone 21). A preliminary NatHERS assessment has been completed based on the current town planning documentation which demonstrates the ability of the building design to meet this target. Please see Appendix 2 for details of the preliminary assessment.	ESD Consultant/ Architect	Construction Documentation
Heating and Cooling Systems (BESS Energy 2.1, 2.2 & 2.3)		
Heating and cooling for all spaces within the development will be provided by energy efficient air conditioners (minimum 3 Star as per www.energyrating.gov.au).	Mechanical Engineer	Design Development
Domestic Hot Water (BESS Energy 2.3 & 3.2)		
Hot water to the apartments will be provided by electric instantaneous hot water units.	Services Consultant	Design Development

Design Requirements	Responsibility & Implementation	Project Stage
Gas Substitution Roadmap (BESS Energy 2.4 & 2.6)		
The Victorian Government has committed to decarbonizing the gas sector via their Gas Substitution Roadmap, with the aim of transitioning to net zero emissions. This project will not be connected to a gas supply (all-electric building) and all dwellings will be provided with efficient electric induction cooktops.	Services Consultant	Design Development
Carpark Ventilation		
Basement carpark to be provided with Carbon Monoxide (CO) monitoring to control the operation and speed of the ventilation fans.	Services Consultant	Design Development
Indoor Lighting (BESS Energy 3.6)		
Energy consumption from artificial lighting within the dwellings will be reduced by using LED lighting and by optimising daylight diffusion via light-coloured internal surfaces. Lighting levels in the apartments will demonstrate a 20% improvement against Table J6.2a of the NCC 2019 Vol 1.	Electrical Engineer	Design Development
External Lighting		
External lighting will be LED and will have controls (e.g. motion detectors, and timers) to minimise consumption during off-peak times (e.g. 11pm-5am).	Electrical Engineer	Design Development
Lift		
An energy efficient lift will be specified that includes measures to specifically reduce stand-by consumption such as: • Switching off control devices when the lift is not in motion & using more efficient power supply unit; • LED lights and display; and • Suspension specifically designed to reduce friction.	Service Consultant	Design Development
Renewable Energy Systems - Solar (BESS Energy 4.2)		
Peak electricity demand to be reduced with the addition of roof-mounted solar photovoltaic arrays. Space on the roof of the development will be allocated for the provision of a minimum 35kW solar PV system. This PV system will reduce mains electricity use and the overall greenhouse gas emissions of the building by producing an estimated 39,000kWh of green electricity per year.[1]	Architect / Electrical Engineer	Design Development

[1] Solar PV annual energy generation estimate provided by the BESS tool.

2.3 Water Resources & Stormwater Treatment

Water will be used efficiently throughout the development through efficient fixtures and fittings, and collection and use of rainwater which helps to reduce mains water requirements and diverts stormwater.

Design Requirements	Responsibility & Implementation	Project Stage
Water Fixtures and Fittings (BESS Water 1.1)		
Efficient water fittings and fixtures will be installed to reduce the volume of mains water used. The following Water Efficiency Labelling Scheme (WELS) star ratings will be specified: • Kitchen and Bathroom taps: flowrate ≤6.0L/min (5 Star); • Toilets: dual flush, 3/4.5 L/flush (4 Star); and • Showers: ≤7.5L/min (4 Star)	Architect / Services Consultant	Design Development
Water Efficient Appliances (BESS Water 1.1)		
Dishwashers will be minimum of 4 Star WELS rated (if installed by the developer as a part of the contracted building works only).	Developer	Construction Documentation
Rainwater Collection and Reuse (BESS Water 1.1 & Stormwater 1.1)		
Rainwater will be harvested from the building roof and sent to storage tanks with a total effective storage capacity of 40kL. Collected water will be used for toilet flushing. Further rainwater will be harvested from the central paved podium and sent to storage tanks with a total effective storage capacity of 10kL. This collected water will be used for irrigation. Please refer to the Stormwater Management Plan provided by MCG Consult for further details on the stormwater management initiatives.	Civil / Hydraulic Engineer	Design Development
Water Efficient Landscaping (BESS Water 3.1)		
Landscaping in garden beds and terrace planter boxes will be drought tolerant and will include mulch and soil wetting agents to reduce the potable water which will be required to water these garden areas in future. Alternatively, this portion of landscaping will be designed in accordance with xeriscape principles, emphasizing drought tolerance and grouping plants with similar water demand characteristics together. If required, a sub-surface drip irrigation system with moisture sensor override will be specified. All irrigation is to be via the rainwater tank.	Developer	Construction Documentation

Figure 3: Examples of drought tolerant landscaping that could be incorporated into the development design

Design Requirements	Responsibility & Implementation	Project Stage
Waterless HVAC System (BESS Water 4.1)		
Air-conditioning units will use air-cooled condenser components which will help to reduce the development's overall water usage, whilst also preventing the growth of legionella bacterium which thrive in warm stagnant water.	Mechanical Engineer	Construction Documentation
Fire System Water (BESS Water 4.1)		
The fire test system will not expel potable water for testing, or a minimum 80% of test water from fire sprinkler systems to be captured for reuse.	Fire Services Consultant	Design Documentation

2.4 Indoor Environment Quality

Indoor Environment Quality (IEQ) will be improved through various initiatives which help to create a healthy indoor environment free from toxins with ample supply of daylight and outside air.

Design Requirements	Responsibility & Implementation	Project Stage
Daylight Access (BESS IEQ 1.1 & 1.2)		
Access to natural daylight is extremely important for all occupants, provides an essential connection with nature and improves occupants' health and well-being. Based on the BESS in-built daylight calculator, it is predicted that 95% of living areas and 100% of bedrooms within the development will be provided with a high level of internal daylight amenity, with the inputs for the typical south facing apartments demonstrating that good daylight levels will be provided to these spaces. See Appendix 4 for daylight modelling assessment completed for the building.	Architect	Construction Documentation
Daylight Improvement		
Daylight penetration through windows/openings will be enhanced with the use of clear glazing and light internal colours, allowing for a better internal reflection of daylight.	Architect	Construction Documentation
Acoustic Comfort		
Acoustic comfort will be achieved in the apartments via appropriate construction, including double glazing and sufficient insulation, to ensure good acoustic separation between spaces.	Acoustic/ Mechanical Engineer	Construction Documentation
Mechanical Ventilation		
All kitchens will have a separate dedicated exhaust fan (range hood) which will not be recycled to any enclosed space within the building; it will be ducted directly outside.	Mechanical Engineer	Design Development
Effective Natural Ventilation		
All kitchen/living areas and bedrooms are designed to achieve natural ventilation through the provision of openable windows/sliding doors. This will enhance the occupants' thermal comfort by providing fresh air and passive cooling opportunities. Window locks and magnetic door catches will be included in breeze paths (to prevent openings slamming shut) to further encourage natural ventilation.	Architect	Construction Documentation
Volatile Organic Compounds (VOCs)		
All paints, adhesives and sealants and flooring (including carpets) will not exceed the limits outlined in Appendix 3. Alternatively, products with no VOCs will be selected.	Builder	Construction Documentation

Design Requirements	Responsibility & Implementation	Project Stage
Formaldehyde Minimisation		
All engineered wood products will have 'low' formaldehyde emissions, certified as E0 or better. Alternatively, products will be specified with no formaldehyde. Emissions limits are listed in Appendix 3.	Builder	Construction Documentation

2.5 Building, Construction and Waste Management

Initiatives included in building, construction and waste management promote adoption of environmental initiatives at different stages of the project – not just in the project design stage.

Design Requirements	Responsibility & Implementation	Project Stage
Construction Waste Diversion		
The builder will develop a construction waste management plan (CWMP) for the construction phase. This will include the following: • Waste generation; • Any waste systems; • Minimisation Strategy; • Performance / Reduction targets; • Bin quantity and size; • Collection frequency; • Signage; and • Monitoring and reporting including frequency and method. The CWMP will include a requirement for not less than 80% of all civil works and built form construction waste to be recycled or re-used. The CWMP will require that all hazardous substances, pollutants and contaminants must be managed and disposed of in accordance with all state regulatory requirements. Where these materials are treated, or used on site, they must be in accordance with a sanctioned remediation process. The CWMP may form part of a broader Construction Environmental Management Plan (CEMP).	Builder	Construction Documentation
Operational Waste (BESS Waste 2.1 & 2.2)		
The development will provide facilities for separation and collection of four waste streams. These being organic & green waste (FOGO), general waste (landfill), glass and commingled recyclables. This will assist to minimise the risk of recyclables and food and garden waste ending up in landfill. Colouring and signage will ensure distinction between the streams and will ensure the recycling facilities of the development will be just as convenient to access as the general waste facilities.	Architect/ Building Owner	Design Development/ Post Occupancy

Figure 4: Examples of kitchen waste management bins incorporated into joinery

Figure 5: Examples of bins separated by waste stream which may be suitable for a development of this type

2.6 Building Materials

Materials initiatives help reduce the use of virgin materials and generating waste and promote the use of materials with lower embodied energy and environmental impacts.

Design Requirements	Responsibility & Implementation	Project Stage
Concrete		
A minimum of 50% of the concrete mix will contain non-potable mains water (rainwater or purchased recycled water).	Builder / Structural Engineer	Construction Documentation
Steel		
Wherever possible, steel for the development will be sourced from a Responsible Steel Maker[2]. Reinforcing steel for the project will be manufactured using energy reducing processes.	Builder / Structural Engineer	Construction Documentation
Timber		
All timber used in the development will be Forest Stewardship Council (FSC) or Program for the Endorsement of Forest Certification (PEFC) certified, or recycled / reused.	Architect	Construction Documentation

[2] A Responsible Steel Maker must have facilities with a currently valid and certified ISO 14001 Environmental Management System (EMS) in place and be a member of the World Steel Association's (WSA) Climate Action Program (CAP).

Design Requirements	Responsibility & Implementation	Project Stage
Cables, pipes, floors and blinds		
All standard uses of cables, pipes, flooring and blinds within the development will either not contain any PVC or will be sourced from a manufacturer/supplier that adheres to the Green Building Council of Australia's *Best Practice Guidelines for PVC in the Built Environment*.	Services Consultant	Construction Documentation
Flooring		
All flooring will be manufactured from materials/products certified under any of the following: • Carpet Institute of Australia Limited, Environmental Certification Scheme (ECS) v1.2; • Ecospecifier GreenTag GreenRate V3.1; • Good Environmental Choice (GECA); and/or • The Institute for Market Transformation to Sustainability (MTS) Sustainable Materials Rating Technology Standard Version 4.0 – SMaRT 4.0. Alternatively, floor coverings must be durable, include some eco-preferred content, be modular and/or come from a manufacturer with a product stewardship program and ISO14001 certification.	Builder/ Architect	Construction Documentation

Figure 6: Examples of approved environmental labels for products which may be incorporated for the development

2.7 Transport

The 17 Grosvenor Street & 1A-F Woodstock Street, Balaclava proposed development site has been assessed using the "Walk Score" locational performance tool. The tool was developed in 2007 by Front Seat using the Google Maps tools. This tool takes into account the number of facilities within close proximity, and public transit based on distance and type of nearby transit lines. Numerical scores of between 0 and 100 for the following 2 aspects are provided:

- Walk Score: 0 being heavily car dependent with access to community facilities that are located some distance away, and 100 reflecting a location that is easily accessible to abundant facilities by foot.
- Transit Score: 0 being the location only provides minimal transit while 100 reflecting a location that is well served by public transport.

The proposed development in Balaclava achieves a Walk score of 96 out of 100 – "Walker's Paradise" and a Transit Score of 78 out of 100 – "Excellent Transit", which indicate that daily errands do not require a car and that transit is convenient for most trips.

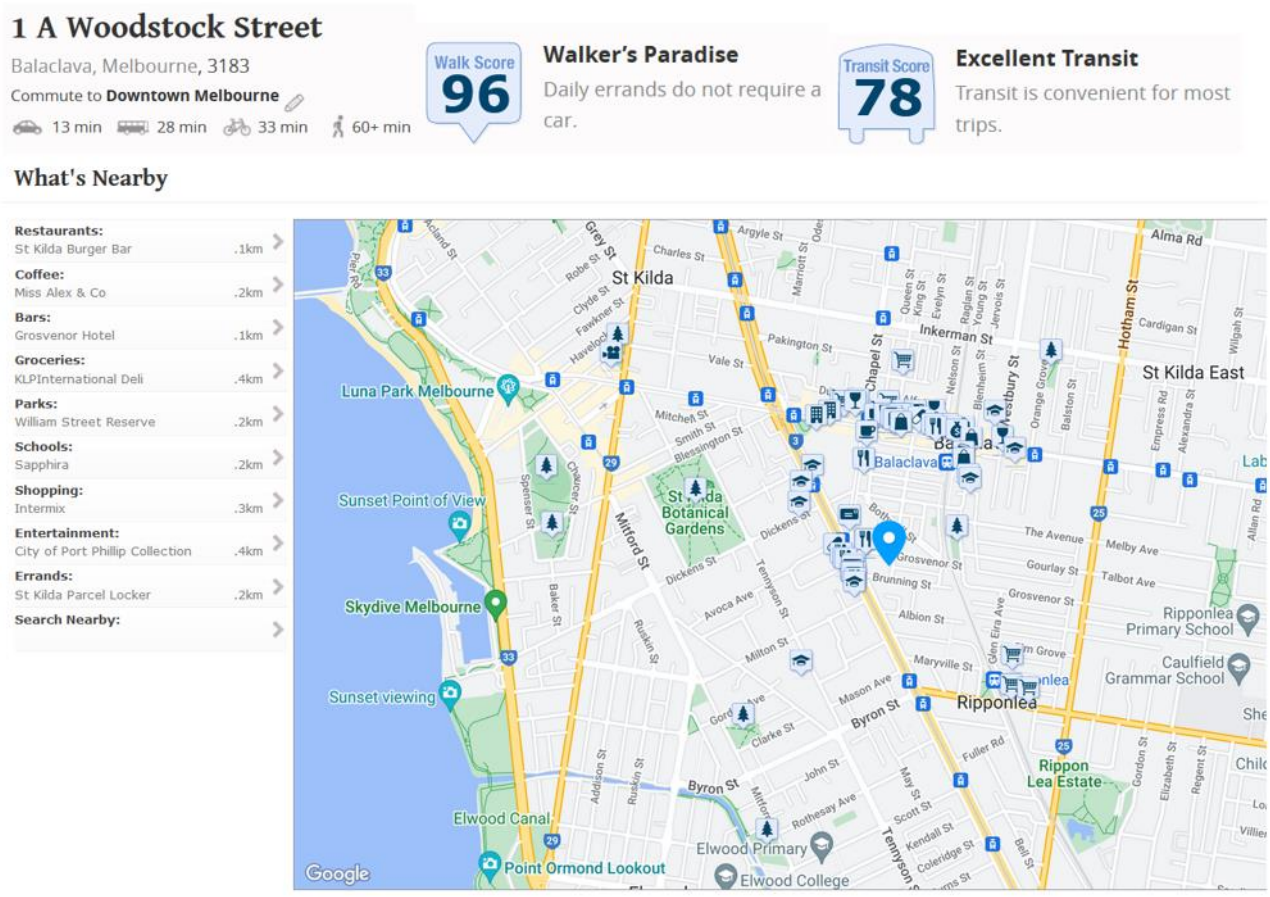


Figure 7: Walk Score results and map showing amenities surrounding 17 Grosvenor Street & 1A-F Woodstock Street, Balaclava. (Source: walkscore.com)

Design Requirements	Responsibility & Implementation	Project Stage
Bicycle Parking (BESS Transport 1.2)		
32 secure bike parking spaces will be provided for residents within the basement. 14 additional spaces will be provided for visitors at ground level.	Architect	Construction Documentation

Design Requirements	Responsibility & Implementation	Project Stage
Electric Vehicle Charging		
Provisions will be made to assist in future installation of electric vehicle charging infrastructure, including additional space provided on the electrical board and conduits provided to the basement level.	Services Consultant	Design Development
Public Transport		
The proposed development has direct access within 1km walking distance to the following public transport options: Train Line: • Balaclava Station: Sandringham Line Tram Routes: • 67: Carnegie – Melbourne University • 16: Kew – Melbourne University • 78: Balaclava via Prahran – North Richmond • 3/3a: East Malvern – Melbourne University Bus Routes: • 600: St Kilda Station – Southland SC • 603: Alfred Hospital – Brighton Beach Station • 606: Elsternwick Station – Fishermans Bend • 623: St Kilda – Glen Waverley • 922: St Kilda Station – Southland SC • 923: St Kilda Station – Southland SC	Inherent in Location	

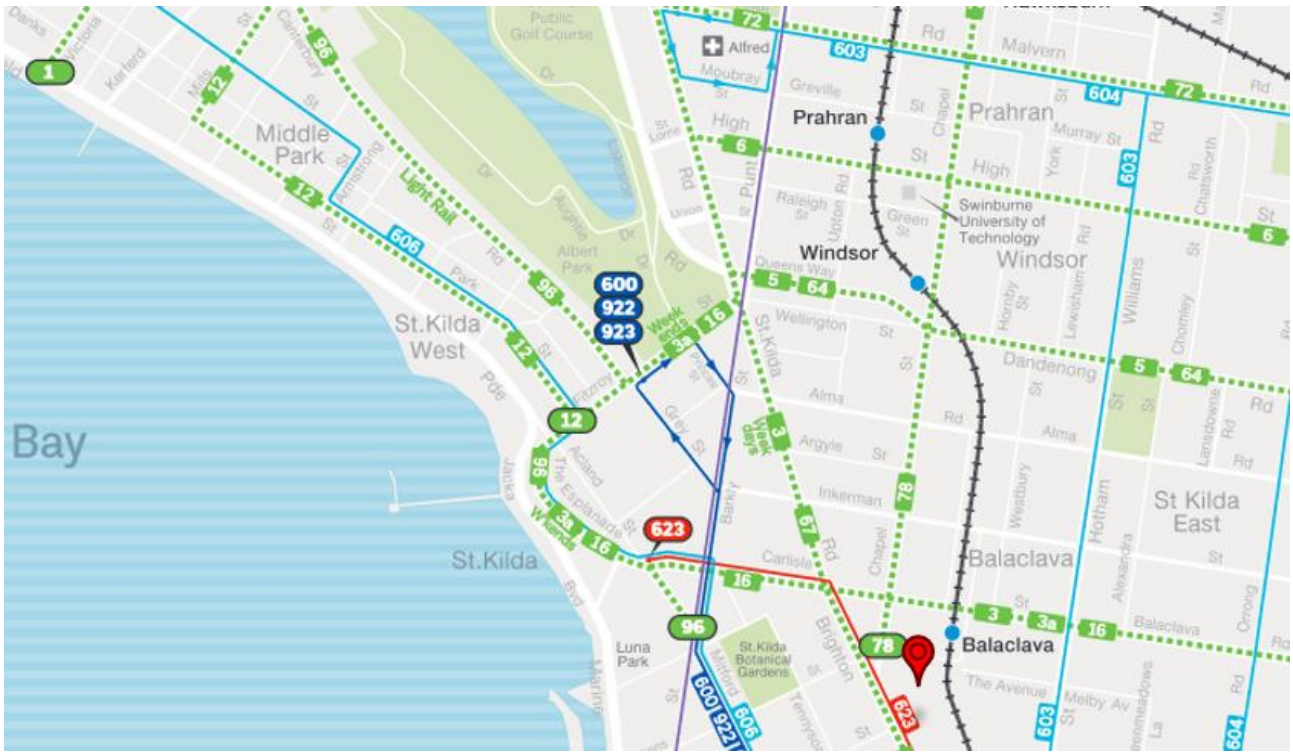


Figure 8: PTV Local Area Map indicating the public transport options surrounding the site (marked by the red balloon. Source: ptv.vic.gov.au)

2.8 Urban Ecology

Design Requirements	Responsibility & Implementation	Project Stage
Communal Spaces (Urban Ecology 1.1)		
A dedicated outdoor area (810m^2) has been provided on the ground floor of the development, which residents will be able to use to gather in for social exchange. An additional indoor area has been provided (74m^2) to provide further amenity for the building occupants.	Architect	Design Development
Vegetation (BESS Urban Ecology 2.1)		
Approximately 24% of the site is proposed to include planting and vegetated land covering. It is recommended that several indigenous species be included in the landscaping of the site. This will help maintain/enhance local biodiversity and encourage native birds to visit the space.	Architect / Landscape Architect	Design Development
Balcony / Courtyard Ecology (BESS Urban Ecology 2.4)		
A tap and floor waste/drain is to be provided on every balcony and in every courtyard to encourage plants to be grown on balconies and in courtyards.	Architect	Construction Documentation
Light Pollution		
No external luminaire on the project will have an Upward light Output Ratio (ULOR) exceeding 5%, relative to its mounted orientation. External lighting will be designed to avoid light spill off the site or into the night sky.	Architect/ Electrical Engineer	Schematic Design
Urban Heat Island Effect Reduction		
The development will adopt multiple initiatives to reduce the impact of urban heat island effect on the site. These initiatives include areas of landscaping and light-coloured surfaces. Landscaped areas, including a raingarden, will help provide cooling. The proposed concrete roof will have high solar reflectivity that reduces the solar heat gain into dwellings when compared to darker roofing options. White concrete would be an appropriate selection.	Architect	Design Development

3. Conclusion

As set out in this SMP the proposed development at 17 Grosvenor Street & 1A-F Woodstock Street, Balaclava, will meet best practice requirements through the initiatives outlined in this report including the use of energy efficient systems, rainwater tank(s) and the use of low to zero VOC content materials, as well as reduced environmental impacts during the construction stage.

The ESD initiatives proposed to be included within the project focus on delivering excellent outcome regarding affordability and safety for occupants, while also achieve climate change resilience through the life of this asset.

The initiatives that have been included within this SMP all have a proven track record of serving their individual purpose and can be easily maintained with any failures obvious to occupants. This helps to ensure the ongoing sustainability of the development, as the systems installed in the beginning are maintained for purpose throughout the life of the building.

The implementation of this SMP requires a clear process that will include:

- Full integration with architectural and building services plans and specifications;
- Endorsement of the SMP with town planning drawings; and
- SMP initiatives to be included in plans and specifications for building approval.

To ensure all the proposed ESD initiatives are implemented as per the design intent, the project will require an ESD implementation check to be completed.

Appendix 1 – BESS Assessment

BESS, 17 Grosvenor St, Balaclava VIC 3183, Australia 17 Grosvenor St, Balaclav…

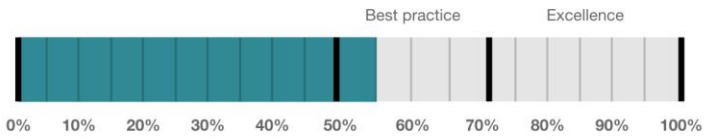
BESS Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at 17 Grosvenor St Balaclava Victoria 3183. 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 Port Phillip 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

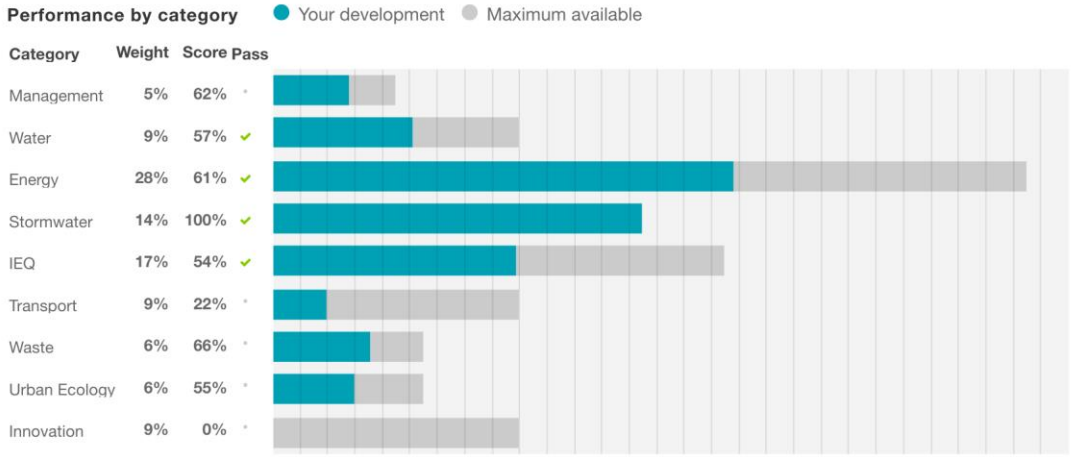


56%

Project details

Address	17 Grosvenor St Balaclava Victoria 3183
Project no	09191C40-R1
BESS Version	BESS-7
Site type	Multi unit development (apartment building)
Account	nyree@sdconsultants.com.au
Application no.	
Site area	3,790.00 m²
Building floor area	4,187.77 m²
Date	30 January 2024
Software version	1.8.1-B.407

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**

Page 1 of 21

Buildings

Name	Height	Footprint	% of total footprint
North Building	3	1,270 m²	56%
South Building	3	985 m²	43%

Dwellings & Non Res Spaces

Dwellings

Name	Quantity	Area	Building	% of total area
Apartment				
A.204	16	55.9 m²	North Building	21%
B.203	8	73.8 m²	South Building	14%
A.G09	7	71.2 m²	North Building	11%
B.G08	7	49.5 m²	South Building	8%
A.G07	6	50.7 m²	North Building	7%
A.212	4	71.2 m²	South Building	6%
B.209	4	49.5 m²	South Building	4%
A.203	3	62.6 m²	North Building	4%
A.109	2	95.3 m²	North Building	4%
A.G02	3	62.6 m²	North Building	4%
B.G01	3	48.3 m²	South Building	3%
A.210	2	71.2 m²	North Building	3%
B.108	2	50.7 m²	South Building	2%
A.G04	1	115 m²	North Building	2%
Total	**68**	**4,187 m²**	**100%**	

Supporting information

Floorplans & elevation notes

Credit	Requirement	Response	Status
Management 3.1	Annotation: Individual utility meters to be provided to all individual dwellings		-
Management 3.3	Annotation: Sub-meters to be provided to all major common area services (list each)		-
Water 3.1	Annotation: Water efficient garden details		-
Energy 4.2	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		-
Transport 1.2	Location of residential visitor bicycle parking spaces		-
Waste 2.1	Location of food and garden waste facilities		-

BESS, 17 Grosvenor St, Balaclava VIC 3183, Australia 17 Grosvenor St, Balaclav…

Credit	Requirement	Response	Status
Waste 2.2	Location of recycling facilities		-
Urban Ecology 1.1	Location and size of communal spaces		-
Urban Ecology 2.1	Location and size of vegetated areas		-
Urban Ecology 2.4	Location of taps and floor waste on balconies / courtyards		-

Supporting evidence

Credit	Requirement	Response	Status
Management 2.2	Preliminary NatHERS assessments		-
Energy 3.6	Average lighting power density and lighting type(s) to be used		-
Energy 4.2	Specifications of the solar photovoltaic system(s)		-
Stormwater 1.1	STORM report or MUSIC model		-
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 1.5	A list of compliant bedrooms		-

Credit summary

Management Overall contribution 4.5%

62%

1.1 Pre-Application Meeting	0%
2.2 Thermal Performance Modelling - Multi-Dwelling Residential	100%
3.1 Metering - Residential	100%
3.3 Metering - Common Areas	100%
4.1 Building Users Guide	100%

Water Overall contribution 9.0%

Minimum required 50% 57% ✔ Pass

1.1 Potable Water Use Reduction	40%
3.1 Water Efficient Landscaping	100%
4.1 Building Systems Water Use Reduction	100%

BESS, 17 Grosvenor St, Balaclava VIC 3183, Australia 17 Grosvenor St, Balaclav…

Energy Overall contribution 27.5%

	Minimum required 50%	61%	Pass
1.2 Thermal Performance Rating - Residential		50%	
2.1 Greenhouse Gas Emissions		100%	
2.2 Peak Demand		0%	
2.3 Electricity Consumption		100%	
2.4 Gas Consumption		N/A	Scoped Out
		No gas connection in use	
2.6 Electrification		100%	
3.1 Carpark Ventilation		0%	
3.2 Hot Water		100%	
3.4 Clothes Drying		0%	
3.6 Internal Lighting - Apartments		100%	
4.2 Renewable Energy Systems - Solar		100%	
4.4 Renewable Energy Systems - Other		0%	Disabled
		No other (non-solar PV) renewable energy is in use.	

Stormwater Overall contribution 13.5%

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

IEQ Overall contribution 16.5%

	Minimum required 50%	54%	Pass
1.1 Daylight Access - Living Areas		66%	
1.2 Daylight Access - Bedrooms		100%	
1.3 Winter Sunlight		0%	
1.5 Daylight Access - Minimal Internal Bedrooms		100%	
2.1 Effective Natural Ventilation		0%	

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

Page 4 of 21

BESS, 17 Grosvenor St, Balaclava VIC 3183, Australia 17 Grosvenor St, Balaclav…

Transport Overall contribution 9.0%

22%

1.1 Bicycle Parking - Residential	0%
1.2 Bicycle Parking - Residential Visitor	100%
1.3 Bicycle Parking - Convenience Residential	0% ⊘ Disabled
	Credit 1.1 must be achieved first.
2.1 Electric Vehicle Infrastructure	0%
2.2 Car Share Scheme	0%
2.3 Motorbikes / Mopeds	0%

Waste Overall contribution 5.5%

66%

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

Urban Ecology Overall contribution 5.5%

55%

1.1 Communal Spaces	100%
2.1 Vegetation	75%
2.2 Green Roofs	0%
2.3 Green Walls and Facades	0%
2.4 Private Open Space - Balcony / Courtyard Ecology	100%
3.1 Food Production - Residential	0%

Innovation Overall contribution 9.0%

0%

1.1 Innovation	0%

Credit breakdown

Management Overall contribution 3%

1.1 Pre-Application Meeting		0%
Score Contribution	This credit contributes 37.5% 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	
2.2 Thermal Performance Modelling - Multi-Dwelling Residential		100%
Score Contribution	This credit contributes 25.0% towards the category score.	
Criteria	Have preliminary NatHERS ratings been undertaken for all thermally unique dwellings?	
Question	Criteria Achieved ?	
Apartment	Yes	
3.1 Metering - Residential		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Have utility meters been provided for all individual dwellings?	
Question	Criteria Achieved ?	
Apartment	Yes	
3.3 Metering - Common Areas		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Have all major common area services been separately submetered?	
Question	Criteria Achieved ?	
Apartment	Yes	
4.1 Building Users Guide		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Will a building users guide be produced and issued to occupants?	
Question	Criteria Achieved ?	
Project	Yes	

BESS, 17 Grosvenor St, Balaclava VIC 3183, Australia 17 Grosvenor St, Balaclav…

Water Overall contribution 5% Minimum required 50%

Water Approach	
What approach do you want to use for Water?:	Use the built in calculation tools
Project Water Profile Question	
Do you have a reticulated third pipe or an on-site water recycling system?:	No
Are you installing a swimming pool?:	No
Are you installing a rainwater tank?:	Yes
Water fixtures, fittings and connections	
Showerhead: All	4 Star WELS (>= 6.0 but <= 7.5)
Bath: All	Scope out
Kitchen Taps: All	>= 5 Star WELS rating
Bathroom Taps: All	>= 5 Star WELS rating
Dishwashers: All	>= 4 Star WELS rating
WC: All	>= 4 Star WELS rating
Urinals: All	Scope out
Washing Machine Water Efficiency: All	Occupant to Install
Which non-potable water source is the dwelling/space connected to?: All	Tank 1
Non-potable water source connected to Toilets: All	Yes
Non-potable water source connected to Laundry (washing machine): All	No
Non-potable water source connected to Hot Water System: All	No
Rainwater Tanks	
What is the total roof area connected to the rainwater tank?:	
Tank 1	2,100 m²
Tank 2	500 m²
Tank Size:	
Tank 1	40,000 Litres
Tank 2	10,000 Litres
Irrigation area connected to tank:	
Tank 1	-
Tank 2	713 m²
Is connected irrigation area a water efficient garden?:	
Tank 1	No
Tank 2	Yes
Other external water demand connected to tank?:	
Tank 1	-
Tank 2	-

1.1 Potable Water Use Reduction		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	7099 kL	
Output	Proposed (excluding rainwater and recycled water use)	
Project	5790 kL	
Output	Proposed (including rainwater and recycled water use)	
Project	4951 kL	
Output	% Reduction in Potable Water Consumption	
Project	30 %	
Output	% of connected demand met by rainwater	
Project	84 %	
Output	How often does the tank overflow?	
Project	Very Often	
Output	Opportunity for additional rainwater connection	
Project	2574 kL	

3.1 Water Efficient Landscaping		100%
Score Contribution	This credit contributes 14.3% towards the category score.	
Criteria	Will water efficient landscaping be installed?	
Question	Criteria Achieved ?	
Project	Yes	

4.1 Building Systems Water Use Reduction		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	

BESS, 17 Grosvenor St, Balaclava VIC 3183, Australia 17 Grosvenor St, Balaclav…

Energy Overall contribution 17% Minimum required 50%

Dwellings Energy Approach	
What approach do you want to use for Energy?:	Use the built in calculation tools
Project Energy Profile Question	
Are you installing any solar photovoltaic (PV) system(s)?:	Yes
Are you installing any other renewable energy system(s)?:	No
Energy Supply:	All-electric
Dwelling Energy Profiles	
Building:	
A.G02 A.G04 A.G07 A.G09 A.109 A.203 A.204 A.210	North Building
A.212 B.G01 B.G08 B.108 B.203 B.209	South Building
Below the floor is:	
A.G02 A.G04 A.G07 A.G09 A.212 B.G01 B.G08	Ground or Carpark
A.109 A.203 A.204 A.210 B.108 B.203 B.209	Another Occupancy

Above the ceiling is:	
A.G02	Another Occupancy
A.G04	
A.G07	
A.G09	
A.109	
A.212	
B.G01	
B.G08	
B.108	
A.203	Outside
A.204	
A.210	
B.203	
B.209	
Exposed sides: All	2
NatHERS Annual Energy Loads - Heat:	
A.G02	49.5 MJ/sqm
A.G04	40.8 MJ/sqm
A.G07	85.9 MJ/sqm
A.G09	37.5 MJ/sqm
A.109	43.2 MJ/sqm
A.203	65.7 MJ/sqm
A.204	61.3 MJ/sqm
A.210	27.9 MJ/sqm
A.212	36.5 MJ/sqm
B.G01	57.2 MJ/sqm
B.G08	68.0 MJ/sqm
B.108	58.8 MJ/sqm
B.203	63.1 MJ/sqm
B.209	25.3 MJ/sqm
NatHERS Annual Energy Loads - Cool:	
A.G02	2.8 MJ/sqm
A.G04	3.8 MJ/sqm
A.G07	12.7 MJ/sqm
A.G09	6.8 MJ/sqm
A.109	7.8 MJ/sqm
A.203	10.6 MJ/sqm
A.204	27.4 MJ/sqm
A.210	17.2 MJ/sqm
A.212	15.0 MJ/sqm
B.G01	9.7 MJ/sqm
B.G08	8.8 MJ/sqm
B.108	16.7 MJ/sqm
B.203	24.9 MJ/sqm
B.209	18.5 MJ/sqm

NatHERS star rating:	
A.G02 A.109 A.212	8.1
A.G04 A.G09 A.210 B.209	8.3
A.G07	6.4
A.203 B.G08	7.2
A.204 B.203	6.8
B.G01	7.5
B.108	7.3
Type of Heating System: All	Reverse cycle space
Heating System Efficiency: All	3 Star
Type of Cooling System: All	Refrigerative space
Cooling System Efficiency: All	3 Stars
Type of Hot Water System: All	Electric Instantaneous
Is the hot water system shared by multiple dwellings?: All	No
Clothes Line: All	No drying facilities
Clothes Dryer: All	Occupant to Install
Solar Photovoltaic systems	
System Size (lesser of inverter and panel capacity):	
PV East Facing	17.5 kW peak
PV West Facing	17.5 kW peak
Orientation (which way is the system facing)?:	
PV East Facing	East
PV West Facing	West
Inclination (angle from horizontal):	
PV East Facing	10.0 Angle (degrees)
PV West Facing	10.0 Angle (degrees)

1.2 Thermal Performance Rating - Residential 50%

Score Contribution	This credit contributes 28.6% towards the category score.
Criteria	What is the average NatHERS rating?
Output	Average NATHERS Rating (Weighted)
Apartment	7.4 Stars

2.1 Greenhouse Gas Emissions		100%
Score Contribution	This credit contributes 9.5% 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)	
Apartment	374,455 kg CO2	
Output	Proposed Building with Proposed Services (Actual Building)	
Apartment	159,599 kg CO2	
Output	% Reduction in GHG Emissions	
Apartment	57 %	
2.2 Peak Demand		0%
Score Contribution	This credit contributes 4.8% towards the category score.	
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?	
Output	Peak Thermal Cooling Load - Baseline	
Apartment	752 kW	
Output	Peak Thermal Cooling Load - Proposed	
Apartment	699 kW	
Output	Peak Thermal Cooling Load - % Reduction	
Apartment	7 %	
2.3 Electricity Consumption		100%
Score Contribution	This credit contributes 9.5% towards the category score.	
Criteria	What is the % reduction in annual electricity consumption against the benchmark?	
Output	Reference	
Apartment	367,112 kWh	
Output	Proposed	
Apartment	156,470 kWh	
Output	Improvement	
Apartment	57 %	
2.4 Gas Consumption		N/A ◈ Scoped Out
This credit was scoped out	No gas connection in use	
2.6 Electrification		100%
Score Contribution	This credit contributes 9.5% towards the category score.	
Criteria	Is the development all-electric?	
Question	Criteria Achieved?	
Project	Yes	

3.1 Carpark Ventilation		0%
Score Contribution	This credit contributes 9.5% 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	No	
3.2 Hot Water		100%
Score Contribution	This credit contributes 4.8% 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	
Apartment	606,167 MJ	
Output	Proposed	
Apartment	312,790 MJ	
Output	Improvement	
Apartment	48 %	
3.4 Clothes Drying		0%
Score Contribution	This credit contributes 4.8% 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	
Apartment	27,754 kWh	
Output	Proposed	
Apartment	27,754 kWh	
Output	Improvement	
Apartment	0 %	
3.6 Internal Lighting - Apartments		100%
Score Contribution	This credit contributes 9.5% 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	

4.2 Renewable Energy Systems - Solar		100%	
Score Contribution	This credit contributes 4.8% 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	39,222 kWh		
Output	% of Building's Energy		
Apartment	25 %		
4.4 Renewable Energy Systems - Other		0%	⊘ Disabled
This credit is disabled	No other (non-solar PV) renewable energy is in use.		

Stormwater

Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using?:	MUSIC or other modelling software	
1.1 Stormwater Treatment		100%
Score Contribution	This credit contributes 100.0% towards the category score.	
Criteria	Has best practice stormwater management been demonstrated?	
Question	Flow (ML/year)	
Project	42.9 % Reduction	
Question	Total Suspended Solids (kg/year)	
Project	85.3 % Reduction	
Question	Total Phosphorus (kg/year)	
Project	45.5 % Reduction	
Question	Total Nitrogen (kg/year)	
Project	46.7 % Reduction	

IEQ Overall contribution 9% Minimum required 50%

IEQ DTS	
Use the BESS Deemed to Satisfy (DtS) method for IEQ?:	No
Dwellings IEQ Approach	
What approach do you want to use for dwellings?:	Use the built in calculation tools
Dwelling Daylight Room Profile Questions	
Room Designation:	
Autopass Living A.G06 B.G01 B.G04 B.G07	Living
Autopass Bedrooms	Bedroom
Quantity:	
Autopass Living	44
Autopass Bedrooms	95
A.G06	17
B.G01 B.G04	3
B.G07	1
Auto-Pass:	
Autopass Living Autopass Bedrooms	Yes
A.G06 B.G01 B.G04 B.G07	No
Room Floor Area:	
Autopass Living Autopass Bedrooms	-
A.G06	21.1 m²
B.G01	24.7 m²
B.G04	24.5 m²
B.G07	24.6 m²
Vertical Angle:	
Autopass Living Autopass Bedrooms	-
A.G06	29.2 Angle (degrees)
B.G01	28.4 Angle (degrees)
B.G04	35.2 Angle (degrees)
B.G07	72.2 Angle (degrees)

Horizontal Angle:	
Autopass Living Autopass Bedrooms	-
A.G06	120 Angle (degrees)
B.G01	68.8 Angle (degrees)
B.G04	137 Angle (degrees)
B.G07	82.1 Angle (degrees)
Window Area:	
Autopass Living Autopass Bedrooms	-
A.G06	7.9 m^2
B.G01	7.0 m^2
B.G04	54.0 m^2
B.G07	7.7 m^2
Window Orientation:	
Autopass Living Autopass Bedrooms	-
A.G06 B.G04 B.G07	South
B.G01	East
Glass Type:	
Autopass Living Autopass Bedrooms	-
A.G06 B.G01 B.G04 B.G07	Clear Double (VLT 0.71)
Daylight Criteria Achieved?:	
Autopass Living Autopass Bedrooms A.G06 B.G04 B.G07	Yes
B.G01	No

1.1 Daylight Access - Living Areas		66%
Score Contribution	This credit contributes 27.3% towards the category score.	
Criteria	What % of living areas achieve a daylight factor greater than 1%	
Output	Calculated percentage	
Apartment	95 %	

1.2 Daylight Access - Bedrooms		100%
Score Contribution	This credit contributes 27.3% towards the category score.	
Criteria	What % of bedrooms achieve a daylight factor greater than 0.5%	
Output	Calculated percentage	
Apartment	100 %	

1.3 Winter Sunlight		0%
Score Contribution	This credit contributes 9.1% 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	No	
1.5 Daylight Access - Minimal Internal Bedrooms		100%
Score Contribution	This credit contributes 9.1% towards the category score.	
Criteria	Do at least 90% of dwellings have an external window in all bedrooms?	
Question	Criteria Achieved ?	
Apartment	Yes	
2.1 Effective Natural Ventilation		0%
Score Contribution	This credit contributes 27.3% towards the category score.	
Criteria	What % of dwellings are effectively naturally ventilated?	
Question	Percentage Achieved?	
Apartment	15 %	

Transport Overall contribution 2%

1.1 Bicycle Parking - Residential		0%	
Score Contribution	This credit contributes 22.2% towards the category score.		
Criteria	How many secure and undercover bicycle spaces are there per dwelling for residents?		
Question	Bicycle Spaces Provided ?		
Apartment	32		
Output	Min Bicycle Spaces Required		
Apartment	68		
1.2 Bicycle Parking - Residential Visitor		100%	
Score Contribution	This credit contributes 22.2% towards the category score.		
Criteria	How many secure bicycle spaces are there per 5 dwellings for visitors?		
Question	Visitor Bicycle Spaces Provided ?		
Apartment	14		
Output	Min Visitor Bicycle Spaces Required		
Apartment	14		
1.3 Bicycle Parking - Convenience Residential		0%	⊘ Disabled
This credit is disabled	Credit 1.1 must be achieved first.		
2.1 Electric Vehicle Infrastructure		0%	
Score Contribution	This credit contributes 22.2% towards the category score.		
Criteria	Are facilities provided for the charging of electric vehicles?		
Question	Criteria Achieved ?		
Project	No		
2.2 Car Share Scheme		0%	
Score Contribution	This credit contributes 11.1% towards the category score.		
Criteria	Has a formal car sharing scheme been integrated into the development?		
Question	Criteria Achieved ?		
Project	No		
2.3 Motorbikes / Mopeds		0%	
Score Contribution	This credit contributes 11.1% 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		

Waste Overall contribution 4%

1.1 - Construction Waste - Building Re-Use		0%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used?	
Question	Criteria Achieved ?	
Project	No	
2.1 - Operational Waste - Food & Garden Waste		100%
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	Yes	
2.2 - Operational Waste - Convenience of Recycling		100%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	Are the recycling facilities at least as convenient for occupants as facilities for general waste?	
Question	Criteria Achieved ?	
Project	Yes	

BESS, 17 Grosvenor St, Balaclava VIC 3183, Australia 17 Grosvenor St, Balaclav…

Urban Ecology Overall contribution 3%

1.1 Communal Spaces		100%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Is there at least the following amount of common space measured in square meters : * 1m² for each of the first 50 occupants * Additional 0.5m² for each occupant between 51 and 250 * Additional 0.25m² for each occupant above 251?	
Question	Common space provided	
Apartment	811 m²	
Output	Minimum Common Space Required	
Apartment	81 m²	
2.1 Vegetation		75%
Score Contribution	This credit contributes 44.4% 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	24 %	
2.2 Green Roofs		0%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Does the development incorporate a green roof?	
Question	Criteria Achieved ?	
Project	No	
2.3 Green Walls and Facades		0%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Does the development incorporate a green wall or green façade?	
Question	Criteria Achieved ?	
Project	No	
2.4 Private Open Space - Balcony / Courtyard Ecology		100%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Is there a tap and floor waste on every balcony / in every courtyard?	
Question	Criteria Achieved ?	
Apartment	Yes	
3.1 Food Production - Residential		0%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	What area of space per resident is dedicated to food production?	
Question	Food Production Area	
Apartment	-	
Output	Min Food Production Area	
Apartment	29 m²	

Innovation Overall contribution 0%

1.1 Innovation		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

Appendix 2 – Preliminary NatHERS Assessment

The subject site is located in Climate Zone 21 (Melbourne) and is required by the 2019 Building Code of Australia (BCA) to achieve the following minimum energy performance targets:

Each apartment must achieve a minimum energy rating of 5.0-Stars and collectively achieve an average energy rating of no less than 6.0-Stars, in addition to adhering to the ABCB heating and cooling load limits to comply with the NCC BCA energy provisions. However, it is noted that a minimum 7.0-Star average rating has been set as the target for this project, with no individual apartment achieving a rating less than 6.0-Stars.

Further, to meet the requirements of Clause 52.20-07-7.1 Table 4 of the Victoria Planning Provisions, each dwelling should not exceed a cooling load of 30MJ/m^2.

Please note that as this assessment has been completed using Town Planning documentation. It is not suitable for the purpose of demonstrating compliance for the building permit and is for information only.

Table 2: The following are the scores achieved by the apartments

Sample Dwelling	Star Rating	Energy Usage (MJ/m^2)	Heating Energy (MJ/m^2)	Cooling Energy (MJ/m^2)
A.G02	8.1	52.3	49.5	2.8
A.G04	8.3	44.6	40.8	3.8
A.G07	6.4	98.6	85.9	12.7
A.G09	8.3	44.3	37.5	6.8
A.109	8.1	51.0	43.2	7.8
A.203	7.2	76.3	65.7	10.6
A.204	6.8	88.7	61.3	27.4
A.210	8.3	45.1	27.9	17.2
A.212	8.1	51.5	36.5	15.0
B.G01	7.5	66.9	57.2	9.7
B.G08	7.2	76.8	68	8.8
B.108	7.3	75.5	58.8	16.7
B.203	6.8	88	63.1	24.9
B.209	8.3	43.8	25.3	18.5

Table 3: Thermal groups and weighted average rating

Sample Dwelling	Thermally Similar	Star Rating
A.G02	A.102, A.202	8.1
A.G04	-	8.3
A.G07	A.G05, A.G06, B.G05, B.G06, B.G07	6.4
A.G09	G.G10, A.111, A.112, A.113, A.101, B.G10	8.3
A.109	A.209	8.1
A.203	A.G03, A.103	7.2
A.204	A.104, A.105, A.106, A.107, A.108 A.205, A.206, A.207, A.208, B.105 B.106 B.107, B.205, B.206, B.207	6.8
A.210	A.110	8.3
A.212	A.211, A.212, A.201	8.1
B.G01	A.G08, A.G01	7.5
B.G08	B.G09, B.G02, B.109, B.110, B.101, B.102	7.2
B.108	B.208	7.3
B.203	B.210, B.201, B.202	6.8
B.209	B.G03, B.G04, B.103, B.104, B.204, B.111, B.211	8.3
Weighted Average		**7.3-Stars**

The energy ratings have been completed with the following building fabric elements for all dwellings:

<table>
<tr><th>Building Fabric Element</th><th>Description</th></tr>
<tr><td>External Walls</td><td>External walls have been modelled as a mix of heavy and lightweight wall, based on elevations provided. All external walls to apartments have been modelled with a minimum R2.5 insulation.</td></tr>
<tr><td>Party Walls</td><td>Party walls between dwellings are modelled as double stud with R4.0 insulation added. (R2.0 to both sides).

Walls between dwellings and services/lifts/stairs modelled as precast concrete and will be insulated with R2.0 thermal insulation.

Walls between dwellings and corridors modelled as lightweight timber framed with R4.0 thermal insulation.</td></tr>
<tr><td>Internal Walls</td><td>Internal walls of apartments typically modelled as plasterboard stud walls with no thermal insulation.</td></tr>
<tr><td>Floors</td><td>All floors modelled as 200mm suspended concrete slab.

A minimum R1.30 insulation has been modelled beneath the ground level slab sitting over the basement carpark. No insulation provided to the slab on ground.</td></tr>
<tr><td>Floor Coverings</td><td>Floor coverings are modelled timber to kitchen/living/corridors, tiles to bathrooms and laundries and carpet to bedrooms.</td></tr>
<tr><td>Roof Insulation</td><td>All roofs to the top level apartments have been modelled as 200mm suspended concrete slab with a minimum R5.0 insulation added.

Apartments on the lower floors with sections of ceiling/roof that are exposed to outdoor air above have been provided with a minimum R2.5 insulation.</td></tr>
<tr><td>Windows and Glazing</td><td>Windows / glazed doors to all windows have been modelled with the following glass-and-frame combined thermal performance values:
<table>
<tr><th>Glazing Type</th><th>U-Value</th><th>SHGC</th></tr>
<tr><td>Fixed Window</td><td>2.7</td><td>0.58</td></tr>
<tr><td>Awning Window</td><td>3.2</td><td>0.48</td></tr>
<tr><td>Sliding Door</td><td>4.4</td><td>0.40</td></tr>
</table>
Fenestration systems that can achieve these values can be found in argon-filled low-e clear double glazing in standard aluminium frames.

Window frame colour is to be selected with a solar absorptance of 0.73 or lower (e.g. Colourbond Monument or lighter).

Other glazing system could also be considered where the supplied ‘Total System’ performances (Glass & Frame) meet each of the following criteria:
• Less than or equal to the U-Value specified, and
• Within +/-5% of the SHGC value specified.

The values above are provided for information only and are just one example of a potential compliant option. A full energy assessment is required to be undertaken when more detailed documentation has been complete to confirm compliance.</td></tr>
</table>

Building Fabric Element	Description
Building Sealing	All doors, windows, exhaust fans and openings will be sealed so to not allow for air infiltration in the apartments. Exhaust fans have been assumed in all kitchens, bathrooms, ensuites & laundries.
Downlights	Downlights must be 'IC' rated (Insulation Contact) to allow for insulation to be placed over the top, and, be sealed units to prevent air-leakage. Otherwise downlight covers must be installed to allow for insulation to be placed over the top and no air leakage between habitable room and ceiling.

Note: The above building elements may vary as the plans are refined for building approval, however the average energy rating performance for all apartments will not be less than 7.0-Stars and no individual apartment will achieve an energy rating of less than 6.0-Stars.

Appendix 3 – Green Star VOC and Formaldehyde Limits

Table 4: Maximum Volatile Organic Compound Levels for construction materials (Source: Green Building Council Australia – Green Star Buildings Submission Guidelines Version 1, 2021)

Product Type/Sub Category	Max TVOC Content (g/L of ready-to-use-product)
Paints, Adhesives and Sealants	
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
Carpets	
Total VOC limit	0.5 mg/m^2 per hour
4-PC (4-Phenylcyclohexene)	0.05mg/m^2 per hour
ISO 16000 / EN 13419 - TVOC at three days	0.5 mg/m^2 per hour
ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5 mg/m^2 per hour

Table 5: Maximum Formaldehyde levels for processed wood products. (Source: Green Building Council Australia – Green Star Buildings Submission Guidelines Version 1, 2021)

Formaldehyde emission limit values for different testing methods	
Test Method	**Emission Limit/ Unit of Measurement**
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	≤1mg/ L
AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.5 mg/L
AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1mg/ L
AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/ L
Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL	≤1mg/ L
JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	≤0.1 mg/m^{2}hr
ASTM D5116 (applicable to high pressure laminates and compact laminates)	≤0.1 mg/m^{2}hr
ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	≤0.1 mg/m^{2}hr (at 3 days)
ASTM D6007	≤0.12mg/m^3
ASTM E1333	≤0.12mg/m^3
EN 717-1 (also known as DIN EN 717-1)	≤0.12mg/m^3
EN 717-2 (also known as DIN EN 717-2)	≤3.5mg/m^{2}hr

Appendix 4 – Daylight Modelling

Sustainable Development Consultants have completed daylight modelling for the proposed development at 17 Grosvenor Street & 1A-F Woodstock, using the 3D modelling program DesignBuilder.

The daylight modelling was undertaken to predict the expected internal daylight amenity provided to the living areas (including kitchens) and bedrooms within the proposed development design.

The design was assessed against the desired daylight levels outlined under SDAPP[3] Indoor Environment Quality guidelines. For residential dwellings, these levels have been defined as:

- ≥0.5% daylight factor achieved across at least 90% of the floor area for bedrooms; and
- ≥1.0% daylight factor achieved across at least 90% of the floor area for living and kitchen areas

These values have typically been accepted by councils and VCAT as being appropriate for the purposes of determining good daylight access.

Daylight Modelling Methodology

The modelling was completed using the DesignBuilder software. DesignBuilder is a comprehensive analysis software package that uses the accurate physics-based Radiance simulation engine which utilises material types and finishes, glazing properties, reflectance off internal and external surfaces as well as local weather, latitude and longitude coordinates for the proposed site.

The analysis grid points are determined at just above the floor surface level. Results are presented using Daylight Factor (DF) which is the percentage (%) of the available daylight under a design sky. The simulation was undertaken using the CIE Overcast Day for Melbourne and the illuminance is set to 10,000 lux. This sky model represents the luminance distribution observed for overcast sky. The sky brightness increases gradually with altitude from the horizon to the zenith, but it does not vary with azimuth.

The following information was incorporated into the DesignBuilder daylight model:

- The development has been modelled in detail with the internal walls and windows built into the model. All elements that could overshadow or reflect light into the subject rooms are deemed important for the assessment and were included in the model.
- All external glazing was modelled with a Visible Light Transmittance (VLT) of 70%, typical of most clear double glazing. Glazing dimensions are modelled as per floor plans and elevations and exclude framing (Glass only).
- External walls were modelled as having a surface reflectance of 40%.
- Internal walls were modelled as being white colour plasterboard with a reflectivity of 70%.
- Internal floor surfaces were modelled with a reflectivity of 30%.
- Ceilings were modelled as white colour plasterboard with a reflectivity of 80%.
- Neighbouring buildings were modelled with a reflectivity of 40%.

[3] SDAPP – Sustainable Design Assessment in the Planning Process.

Below is a 3D image of the rendered view of the DesignBuilder model of the proposed development. Note that the colour is for display purposes only.

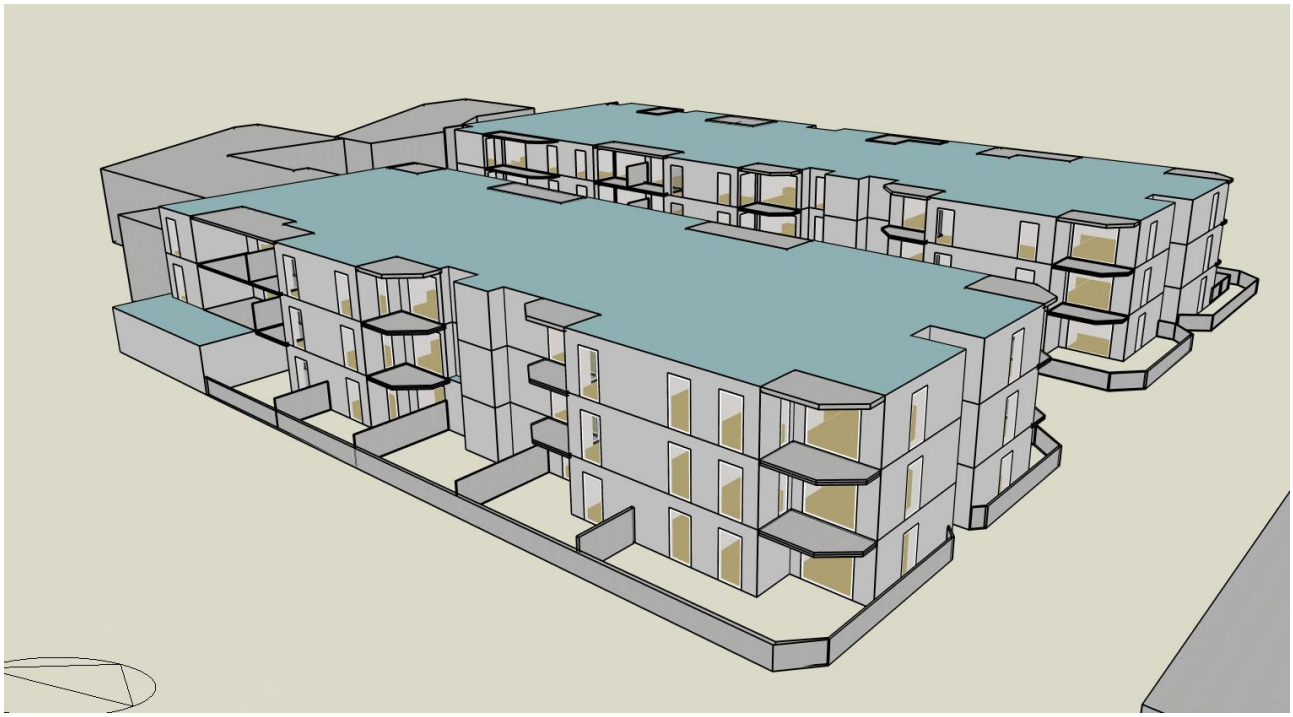


Figure 9: 3D rendered image of the proposed development as modelled in DesignBuilder.

Results

The table below provides a summary of the daylight modelling results completed for the proposed development.

Table 1 – Summary of Results

Building	Number of Bedrooms predicted to achieve the desired daylight levels (0.5% DF)	Number of Living Areas predicted to achieve the desired daylight levels (1.0% DF)
Building A	79 of 95 (83%)	28 of 68 (41%)

The tables below present the numerical daylight results for each space within the proposed development included in this assessment.

Table 2 Bedrooms - 0.5% Daylight Factor

Zone	Total Floor Area (m^2)	Floor Area Achieving Targeted Daylight Level (m^2)	Percentage of Floor Area Achieving Targeted Daylight Level
A.G01 B1	10.8	10.8	100%
A.G02 B1	20.2	20.2	100%
A.G03 B1	20.4	20.4	100%
A.G04 B1	14.2	14.2	100%
A.G04 B2	11.8	11.8	100%
A.G04 B3	17.9	15.6	87%
A.G05 B1	12.4	12.4	100%
A.G06 B1	12.5	12.5	100%
A.G07 B1	12.7	12.7	100%

A.G08 B1	10.9	10.9	100%
A.G09 B1	12.7	12.7	100%
A.G09 B2	16.0	10.1	63%
A.G10 B1	13.4	13.4	100%
A.G10 B2	16.1	10.9	68%
B.G01 B1	11.5	11.5	100%
B.G02 B1	13.0	13.0	100%
B.G03 B1	11.2	11.2	100%
B.G03 B2	16.1	16.1	100%
B.G04 B1	9.6	9.6	100%
B.G04 B2	15.4	15.4	100%
B.G05 B1	12.6	12.6	100%
B.G06 B1	13.3	13.3	100%
B.G07 B1	13.4	13.4	100%
B.G08 B1	13.1	13.1	100%
B.G09 B1	12.8	12.8	100%
B.G10 B1	14.8	14.8	100%
B.G10 B2	16.8	6.6	39%
A.101 B1	15.4	8.9	58%
A.101 B2	13.4	13.4	100%
A.102 B1	20.2	20.2	100%
A.103 B1	20.4	20.4	100%
A.104 B1	14.1	14.1	100%
A.105 B1	13.8	13.8	100%
A.106 B1	12.4	12.4	100%
A.107 B1	12.5	12.5	100%
A.108 B1	12.7	12.7	100%
A.109 B1	10.8	10.8	100%
A.109 B2	12.4	12.4	100%
A.109 B3	13.8	6.7	49%
A.110 B1	15.5	10.2	66%
A.110 B2	13.3	13.3	100%
A.111 B1	15.3	9.6	63%
A.111 B2	13.5	13.5	100%
A.112 B1	12.7	12.7	100%
A.112 B2	16.0	11.2	70%
A.113 B1	16.1	11.8	73%
A.113 B2	13.4	13.4	100%
B.101 B1	12.1	12.1	100%
B.102 B1	13.0	13.0	100%
B.103 B1	11.2	11.2	100%
B.103 B2	16.1	16.1	100%
B.104 B1	9.6	9.6	100%
B.104 B2	15.4	15.4	100%
B.105 B1	12.6	12.6	100%

B.106 B1	13.3	13.3	100%
B.107 B1	13.4	13.4	100%
B.108 B1	10.3	10.3	100%
B.109 B1	13.1	13.1	100%
B.110 B1	12.8	12.8	100%
B.111 B1	9.4	9.4	100%
B.111 B2	15.2	15.2	100%
A.201 B1	15.4	9.0	58%
A.201 B2	13.4	13.4	100%
A.202 B1	20.2	20.2	100%
A.203 B1	20.4	20.4	100%
A.204 B1	14.1	14.1	100%
A.205 B1	13.8	13.8	100%
A.206 B1	12.4	12.4	100%
A.207 B1	12.5	12.5	100%
A.208 B1	12.7	12.7	100%
A.209 B1	10.8	10.8	100%
A.209 B2	12.4	12.4	100%
A.209 B3	13.8	7.4	53%
A.210 B1	15.5	10.4	67%
A.210 B2	13.3	13.3	100%
A.211 B1	15.3	9.9	65%
A.211 B2	13.5	13.5	100%

Table 3 Living Rooms - 1.0% Daylight Factor

Zone	Total Floor Area (m^2)	Floor Area Achieving Targeted Daylight Level (m^2)	Percentage of Floor Area Achieving Targeted Daylight Level
A.G01 Living	21.5	17.1	80%
A.G02 Living	27.9	17.4	62%
A.G03 Living	26.4	25.2	95%
A.G04 Living	38.4	21.0	55%
A.G05 Living	22.7	14.3	63%
A.G06 Living	21.8	12.3	57%
A.G07 Living	21.5	12.1	56%
A.G08 Living	23.2	13.1	57%
A.G09 Living	28.1	7.8	28%
A.G10 Living	29.1	7.1	25%
B.G01 Living	25.6	15.3	60%
B.G02 Living	20.5	8.5	41%
B.G03 Living	20.0	19.0	95%
B.G04 Living	21.5	21.5	100%
B.G05 Living	22.9	16.4	71%
B.G06 Living	22.0	20.6	94%
B.G07 Living	20.1	14.6	73%

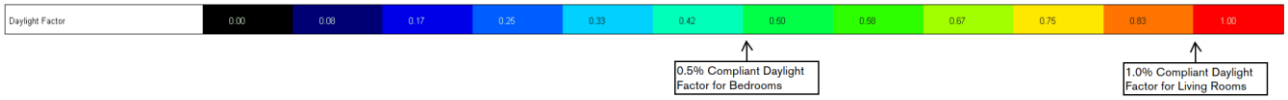
B.G08 Living	20.6	7.2	35%
B.G09 Living	20.0	7.6	38%
B.G10 Living	28.7	9.3	33%
A.101 Living	28.0	9.4	34%
A.102 Living	27.9	21.2	76%
A.103 Living	26.5	26.5	100%
A.104 Living	26.1	26.1	100%
A.105 Living	26.8	19.7	74%
A.106 Living	22.7	21.9	96%
A.107 Living	21.8	18.0	83%
A.108 Living	21.5	18.4	86%
A.109 Living	33.5	14.1	42%
A.110 Living	28.6	10.8	38%
A.111 Living	29.3	8.6	29%
A.112 Living	28.1	9.4	33%
A.113 Living	29.1	9.5	33%
B.101 Living	22.7	16.6	73%
B.102 Living	20.5	14.5	71%
B.103 Living	20.2	20.2	100%
B.104 Living	21.7	21.7	100%
B.105 Living	22.9	22.9	100%
B.106 Living	21.9	21.9	100%
B.107 Living	20.0	19.3	96%
B.108 Living	29.1	27.7	95%
B.109 Living	20.6	12.1	59%
B.110 Living	19.9	13.6	68%
B.111 Living	22.4	15.8	71%
A.201 Living	28.0	8.4	30%
A.202 Living	27.9	20.5	73%
A.203 Living	26.5	26.5	100%
A.204 Living	26.1	26.1	100%
A.205 Living	26.8	25.9	97%
A.206 Living	22.7	22.7	100%
A.207 Living	21.8	21.8	100%
A.208 Living	21.5	21.5	100%
A.209 Living	33.5	15.8	47%
A.210 Living	28.6	10.0	35%
A.211 Living	29.3	7.8	27%
A.212 Living	28.1	8.9	32%
A.213 Living	29.1	9.4	32%
B.201 Living	22.7	21.4	94%
B.202 Living	20.5	18.9	92%
B.203 Living	20.2	20.2	100%
B.204 Living	21.7	21.7	100%
B.205 Living	22.9	22.9	100%

B.206 Living	21.9	21.9	100%
B.207 Living	20.0	19.2	96%
B.208 Living	29.1	27.5	94%
B.209 Living	20.6	15.9	77%
B.210 Living	19.9	17.0	85%
B.211 Living	22.4	20.7	92%

The images below are daylight factor maps exported from the modelling program DesignBuilder which were produced using the Radiance simulation engine. Please note that they are graphical representations of the results only; for accurate results please refer to the tables above.

Daylight factor map legend:

- Daylight Factor Scale 0.0% to 1.0%
- Green > 0.5% Compliant Daylight Factor for Bedrooms
- Red > 1.0% Compliant Daylight Factor for Living Rooms



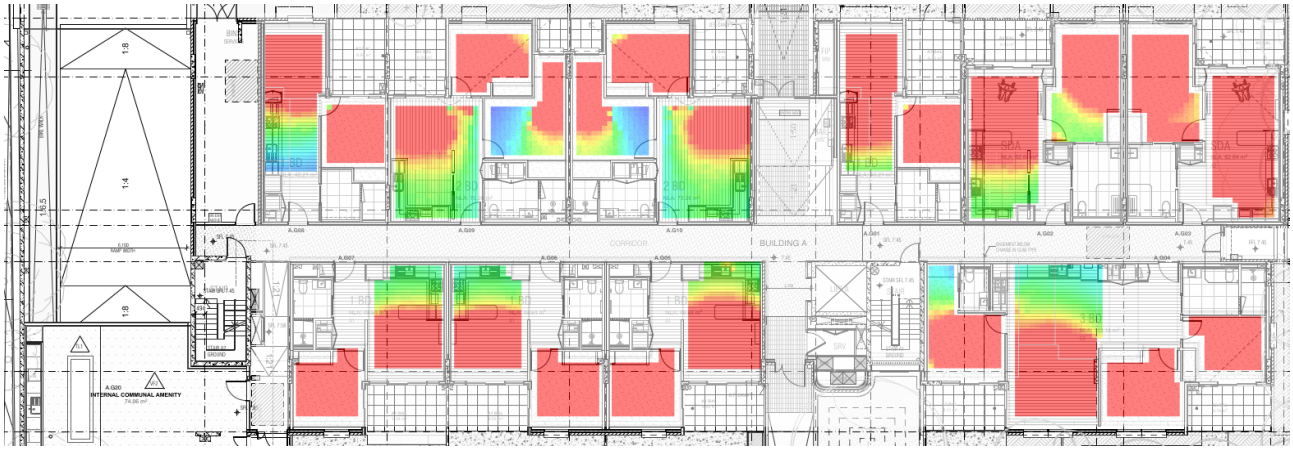


Figure 2: Daylight Factor Contour Plots for Ground Building A (North)

Figure 3: Daylight Factor Contour Plots for Ground Building B (South)

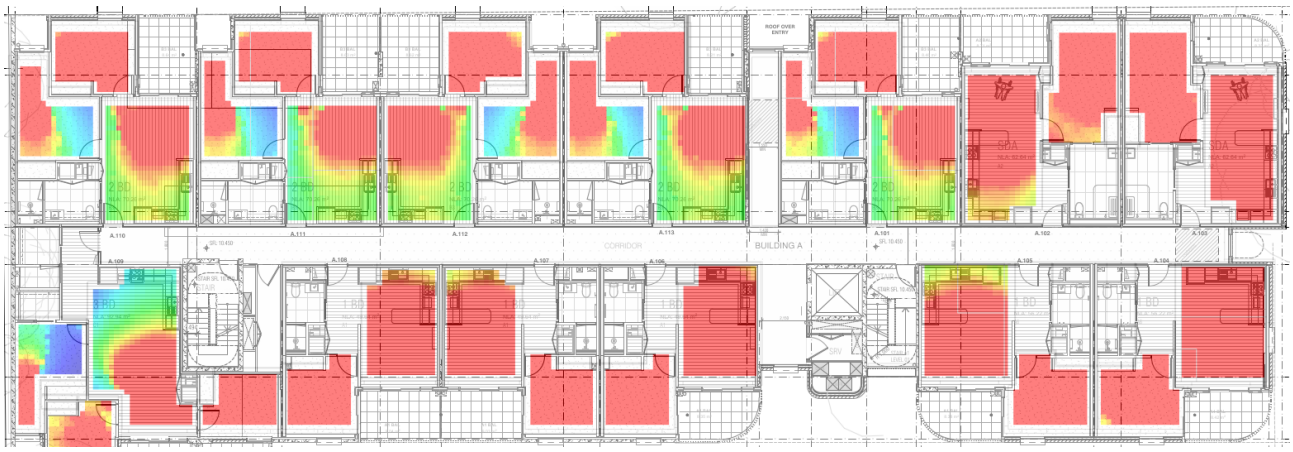


Figure 4: Daylight Factor Contour Plots for Level 1 Building A (North)

Figure 5: Daylight Factor Contour Plots for Level 1 Building B (South)

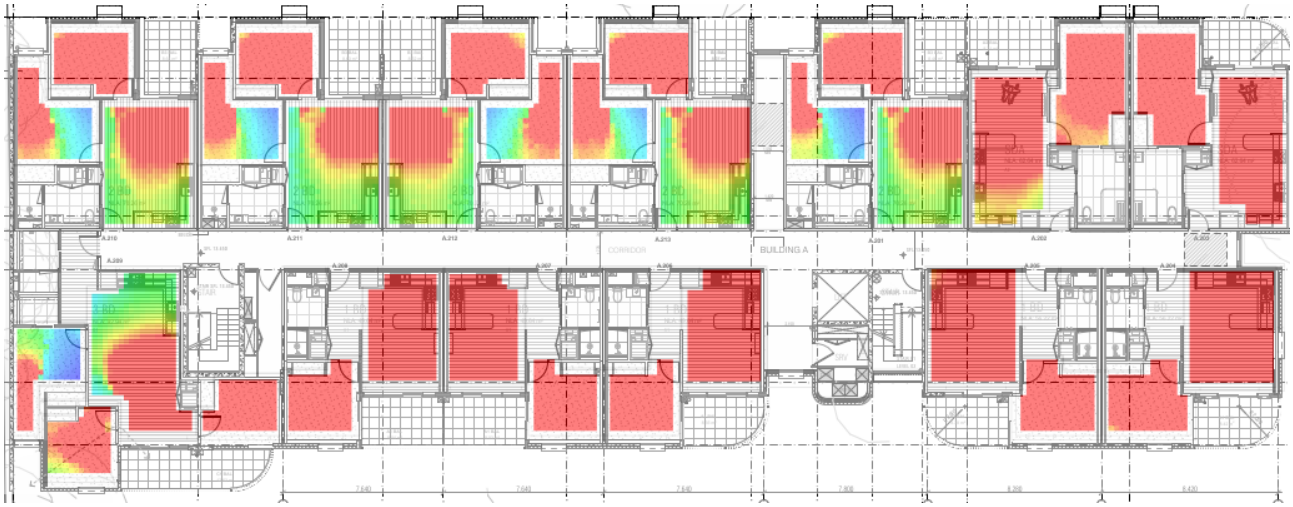


Figure 6: Daylight Factor Contour Plots for Level 2 Building A (North)

Figure 7: Daylight Factor Contour Plots for Level 2 Building B (South)

Conclusion

The results of the daylight assessment indicate that a high level of internal daylight amenity will be provided most habitable rooms within the proposed development. Overall, the targeted daylight levels of 0.5% daylight factor across at least 90% of the floor area is predicted to be achieved within 83% of bedrooms across the development. The results also show that, while not all bedrooms are able to meet the daylight target, an adequate level of daylight amenity is still achieved within those falling short of this benchmark.

The results also show that 41% of kitchen/living rooms achieve the targeted daylight level. The living areas which do not meet the best practice standard still provide the targeted 1.0% daylight factor across the main living space of these apartments, with the daylight levels decreasing slightly further back into the rooms. The daylight levels across these areas are typically within the range of 0.5%-0.9% DF, which is only slightly below the best practice benchmark and still provides additional amenity to the rear kitchen area.