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Sustainable Management Plan

1-9 Allen St & 777-781 Warrigal Road,
Oakleigh

Date 10/09/2021

Project No. 21048



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Executive Summary

The proposed retirement living development at 1-9 Allen Street & 777-781 Warrigal Road, Oakleigh has been designed to meet Monash City Council sustainability policy and National Construction Code (NCC 2019) Section J energy efficiency requirements.

The ESD strategy for the proposed development has incorporated the use of both NCC 2019 Section J and BESS (Built Environment Sustainability Scorecard) to meet Monash City Council sustainability policy requirements.

The development has achieved an overall score of 53% of nine key BESS categories and demonstrate 'Best Practice' sustainable design.

Category	Contributes to Overall Score	Project Category Score
Management	4.5%	100%
Water	9.0%	57%
Energy	27.5%	60%
Stormwater	13.5%	100%
IEQ	16.5%	53%
Transport	9.0%	20%
Waste	5.5%	33%
Urban Ecology	5.5%	22%
Innovation	9%	0%
Total Rate	100%	53%

Based on the level of information available at this stage of the design process, the proposed retirement living development at 1-9 Allen Street & 777-781 Warrigal Road, Oakleigh demonstrates 'Best Practice' in ESD and meets the Monash City Council ESD objectives.



1. Introduction

The Sustainable Management Plan (SMP) has been prepared to summarise the environmental objectives and initiatives incorporated into the design of the proposed retirement living development and demonstrates how these components incorporate environmentally sustainable design initiatives in accordance with the Monash City Council ESD objectives.

The ESD initiatives proposed for this development are based on:

- Architectural Drawing Package Issued for Town Planning prepared by Via Architects and
- Discussions and correspondence with the Architects and Services Engineers.

The Site

The proposed 4-storey retirement living development is located at 1-9 Allen Street & 777-781 Warrigal Road close to Scotchman's Creek Linear Park.

The proposed development is 4-storey, comprising communal facilities and residential dwellings.

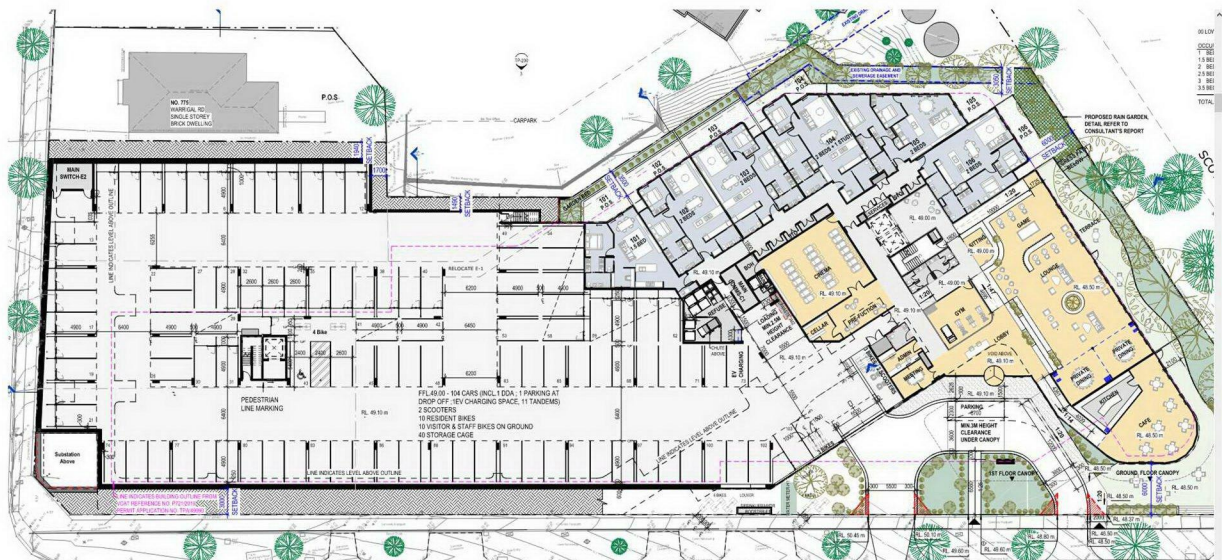


Figure 1 Proposed Site Plan

The development is located within the City of Monash and consists of:

- Lower Ground: Carpark, Communal Facilities and Residential Dwellings
- Ground to Level 02: Residential Dwellings and Communal Facilities



2. Summary of key ESD Initiatives

The SMP provides a detailed sustainability assessment of the proposed development. It assesses all key sustainable design initiatives outlined in BESS sustainable design rating tool, demonstrates that a holistic ESD review has been undertaken during the project early design stage and sets up the environmental benchmarks with quantifiable and measurable performance indicators. These indicators will be achieved by the project as evidence demonstrating the development achieves 'Best Practice'.

2.1 Incorporation of Environmentally Sustainable Design Objectives

The proposed development aims to incorporate the following Environmentally Sustainable Design initiatives to comply with the Monash City Council Planning Scheme.

2.2 Utilise Energy Efficiently and Sustainably

Mechanical Plant - Energy efficient air-cooled air-conditioning system or equivalent is proposed for the whole development.

Domestic Hot Water – Heat pump type domestic hot water system or equivalent will be proposed for the whole development.

Energy Efficient Lighting – lighting power density is designed to be at least 20% lower than required by Table J6.2a of the NCC 2019; LED light fittings will be installed as much as practicable throughout the development; and occupancy and daylight sensors will be provided for common area lighting to minimise lighting energy use when unoccupied.

2.3 Utilise Potable Water Use Efficiently and Sustainably

To minimise the amenity water consumption and discharge to the municipal sewerage system, water efficient fixtures with the WELS rating as summarised below are to be used for the development.

- Kitchen Taps - 5 Star WELS Rating
- Bathroom Taps - 5 Star WELS Rating
- Dishwasher - 5 Star WELS Rating
- WCs - 4 Star WELS Rating
- Urinals - 5 Star WELS Rating
- Showers - 4 Star WELS Rating (≤ 7.5 L/min)

Alternative Water Sources – 25kL Rainwater tank(s) are proposed for the development residential dwelling and communal facilities toilet flushing and landscaping irrigation.

Low water use plant selection (e.g., Xeriscaping) or water efficient landscaping design is proposed (e.g., drip irrigation with timers and rain sensors) to minimise water usage for irrigation.

Air cooled air-conditioning system is recommended in lieu of water cooled for the development; and fire testing water is collected and reused to reduce potable water consumption.

2.4 Minimising Waste Going to Landfill

Construction Waste - the building contractor will be engaged to prepare a Waste Management Plan (WMP) which forms part of a Site Management Plan (SMP) and 80% (by mass) of all demolition & construction waste to be reused or recycled.

Operational Waste – a waste auditor will be engaged to implement the operational waste initiatives within the development to ensure the recycling facilities are as convenient for occupants as facilities for general waste.



2.5 Use Sustainable Sourced Materials

Internal paints, adhesives, sealants and flooring are selected with low VOC content and engineered wood is to be selected to have low formaldehyde emissions.



3. BESS Sustainable Assessment

The Built Environment Sustainability Scorecard (BESS) assesses energy and water efficiency, thermal comfort, and overall environmental sustainability performance of the proposed development.

It assesses the project against a standard design practice building in nine environmental categories and the percentage contribution of each category varies depending on the scale and typology of the development.

A score of 50% and higher equates to 'Best Practice' via BESS rating. In order to meet BESS 'Best Practice' requirement, the development is targeting an overall score of 53% and exceed the pass rates on four mandatory categories.

- Water;
- Energy;
- Stormwater; and
- Indoor Environment Quality (IEQ)

The proposed retirement living development achieves an overall score of 53% and equates to 'Best Practice' sustainable design. BESS assessment report is enclosed as Appendix A for details.



Best practice - 50% and above



4. Sustainable Assessment

Sustainable assessment is performed on the nine key environmental issues and demonstrate the proposed development will meet best practice sustainable design.

4.1 Management

Best practice for building management means that sustainability is integrated from concept design through the construction process. Good decisions made early will always deliver the maximum benefit for the lowest cost.

For that reason, all the key credits available in this category are being targeted and incorporated in the design:

- Engage the IGS ESD team to provide BESS advise from schematic design to construction stage and involved in a pre-application meeting with Council;
- For residential components, a preliminary NatHERS thermal modelling of residential dwellings has been carried out;
- For non-residential components, a preliminary JV3 energy modelling has been undertaken;
- Install utility meters (electricity, water and natural gas) for all individual dwellings and commercial tenants;
- Provide sub-metering facilities for common area energy and water monitoring and control; and
- Produce a Building User's Guide to enable building users to optimise the building's environmental performance.

4.2 Water

Water will be used efficiently throughout the whole building development with inclusion of efficient fixtures and fittings, collection and reuse of rainwater and water efficient landscaping design.

These water saving initiatives are proposed to ensure the efficient use of water and collection and reuse of stormwater and to minimise the associated water costs.

BESS rating tool is used to assess the overall development water efficiency and demonstrates the design potential to achieve an over 50% improvement compared to an identical size 'reference' project and meet the best practice sustainable design.

4.2.1 Water Efficient Fixtures

To minimise the amenity water consumption and discharge to the municipal sewerage system, water efficient fixtures are to be used for the development.

- Kitchen Taps - 5 Star WELS Rating
- Bathroom Taps - 5 Star WELS Rating
- Dishwashers - 5 Star WELS Rating
- WCs - 4 Star WELS Rating
- Urinals - 5 Star WELS Rating; and
- Showers - 4 Star WELS Rating (≤ 7.5 L/min)

4.2.2 Rainwater Harvesting

Rainwater is to be harvested from the roof areas and 25kL rainwater tanks will be proposed to collect rainwater on the roof and used for communal facilities and residential dwellings toilet flushing, wash-down and landscaping irrigation.



4.2.3 Building Services Water Use Reduction

Air cooled air-conditioning system is proposed for the development and fire testing water is to be collected and reused to reduce potable water consumption.

4.3 Energy Performance

The whole development (communal facilities and residential dwellings) will benchmark BESS Energy Efficiency as followings:

- **BESS Energy 1.1:** For non-residential portion – Ground floor communal facilities will reduce the heating and cooling by more than 10% compared to NCC section J reference building with reference services.
- **BESS Energy 1.2:** For residential portion – A preliminary NatHERS rating assessment has been undertaken and an average NatHERS rating of above 7 Star is targeted for the dwellings.
- **BESS Energy 2.1:** the energy efficient building services are proposed for the whole development to reduce the greenhouse gas emissions by more than 10% compared to NCC Section J reference building.
- **BESS Energy 2.3:** the energy efficient building services are proposed for the whole development to reduce the electricity consumption by more than 10% compared to NCC Section J reference building.
- **BESS Energy 3.1:** the carpark spaces are proposed to install CO sensor to monitor and control the operation of the car park exhaust fan speed;
- **BESS Energy 3.2:** heat pump type domestic hot water system is proposed to the residential dwellings and reduce electricity by more than 10% compared to NCC section J reference building with reference services.
- **BESS Energy 3.6:** For the residential dwellings, lighting power density is proposed to be at least 20% lower than required by NCC Section J6 Table 6.2a; and
- **BESS Energy 3.7:** General lighting power density to be at least 20% lower than required by NCC Section J6 Table 6.2a.

Overall, the development is targeting to achieve over 50% energy efficiency improvement compared to an identical size 'reference' project and meet the best practice sustainable design.

4.3.1 Passive Design Features

Passive design features will be incorporated to minimise the energy consumption associated with the development heating, cooling and artificial lighting demand.

Maximising the passive design of the building is the first step for the proposed development. This will reduce the resident's reliance on heating, cooling and artificial lighting as well as increasing occupant's thermal comfort.

The following passive design features will be incorporated:

- Thermally enhanced building fabric and windows.
- Natural ventilation via operable windows and doors; and
- Natural lighting provided to all residential primary spaces e.g., bedrooms, living rooms and dining rooms.

4.3.2 Building Fabric

High level of building fabric insulations in conjunction with double glazed windows are provided to prevent heat loss during winter and heat gain during summer.



4.3.3 Energy Efficient System

For the proposed development, energy efficient HVAC, lighting and domestic hot water systems will be designed to minimum operational energy use and greenhouse gas emissions and reduce peak energy demand.

For communal facilities, the energy efficient system will include:

- Energy efficient air cooled variable refrigerant volume AC system with COP of 3.5 or equivalent;
- Heat pump type domestic hot water system or equivalent;
- Energy efficient LED light fittings to be installed and lighting power density is proposed to be at least 20% lower than required by NCC Section J6 Table 6.2a.

For residential dwellings the energy efficient system will include:

- A minimum 4-Star energy star rating split air conditioning system for the residential dwellings space heating, cooling and ventilation;
- Heat pump type domestic hot water system for DHW supply;
- Energy efficient LED light fittings for the whole development as much as possible and lighting power density is proposed to be at least 20% lower than required by NCC Section J6 Table 6.2a with dwellings occupied spaces to be equal to or below 4 W/m²; and
- Common area and carpark spaces for the automatic lighting control.

4.3.4 Energy Management and Monitoring

To enable the building energy to be monitored, sub meters will be provided on the building energy systems and substantial loads, including:

- Mechanical
 - Common area supply air system; and
 - Car park ventilation
- Electrical
 - Common area lighting and power;
 - Substantive energy use (greater than 20kVA)
- Vertical transportation
 - Passenger lifts

4.3.5 Car Park ventilation

The car park ventilation system will include variable speed drives (VSDs) on the fans and will be controlled by CO sensors to minimise unnecessary energy use.

4.3.6 Renewable Energy

The roof of the development will host a 10kW photo-voltaic system for renewable energy generation. These panels will provide the green power supply to the main switchboard which is then consumed to power as a fraction of the building communal facilities electrical load.



4.4 Stormwater

Stormwater quality is a significant issue as the high levels of impervious surfaces transport stormwater quickly into the drainage system along with sediment and pollutants.

The strategy for improving stormwater quality in the proposed development include:

- 25kL rainwater tanks connected to the dwellings tower roof for rainwater collection and reuse for residential dwellings toilet flushing and communal landscape irrigation;
- Water sensible landscaping design in conjunction with the rain garden to increase the stormwater infiltration and improve the quality of stormwater before it enters to the drainage system.

A MUSIC version 6.2 software water pollutants quality modelling was undertaken, and the results indicate that 70%, 80%, 45% and 45% reduction targets for Gross Pollutants (GP), Total Suspended Solids (TSS), Total Phosphorus (TP) and Total Nitrogen (TN) respectively can be achieved.

Refer to Storm Water Management Plan for further details.

4.4.1 Site Management Plan

A stormwater pollution reduction strategy will be contractually required to be adopted by the Main Contractor to ensure the earth is not eroded and prevent construction debris and litter from entering the stormwater systems.

The strategy will be required to specifically address the following in respect to stormwater:

- No impact on offsite surface or ground water(s) due to construction activities;
- Site stormwater to be managed to minimise any contaminated water discharged from site, such as:
 - Materials and waste to be stored at least 2m away from drainage lines;
 - All inadvertent chemical spills will be required to be cleaned up immediately;
 - The road will be required to be kept clean, with the number of sweepers cleaning the road to be in response to mess created;
 - Application and inclusion of a range of mitigation measures for soil depositing on roads, stormwater, dust and noise;
 - Incorporate prevention measures to stormwater from adjacent properties from entering site;
 - Installation of hay bales around stormwater drains to minimise sediment entering stormwater;
 - Removal of sediment and rubbish from sediment fences and stormwater inlet filters after storm events, and checking of sediment traps after storm events;
 - Capping and bunding of stockpiled or treatment piles of contaminated spoils;
 - Stormwater discharge quality will be required to meet SEPP (Waters of Victoria) standards; and
 - Regular inspections of the effectiveness of sediment control and surface run-off measures, including during and immediately after storm events, with necessary improvements.

4.4.2 Maintenance Program

The proposed rainwater harvesting system will be routinely maintained as part of the maintenance programme and specifically the following maintenance will be required:

- First flush devices to be cleaned at least every 6 months;
- Roof and other collection areas to be inspected regularly, at minimum every 3 months to ensure they are maintained free of pollutants, leaves and other debris;
- Manufacturers required maintenance for type of tank(s) and pump(s) installed to be performed typically annually; and
- As installed design details/diagrams to be provided to the building owner as part of the building handover.



4.5 Indoor Environment Quality

The proposed development will improve the indoor environment quality and achieve a healthy indoor environment quality for the wellbeing of building occupants through adoption of the followings into the design.

4.5.1 Overall Daylight Access

For Ground Level communal facilities, more than 30% of the area will have to achieve above 2% DF (daylight factor).

For residential dwellings, more than 80% of the bedrooms will achieve above 0.5% DF.

Daylight Modelling Report is enclosed as Appendix B for reference.

4.5.2 Natural Ventilation via Openable Windows

Openable windows are provided to all living rooms and bedrooms of all dwellings. This will enable occupants to introduce fresh air to their dwellings and enable natural cooling during much of the year.

Minimum 60% of dwellings will have openable windows or sliding doors with ventilation openings at least 2% of the total floor area or 1m², whichever is greater.

- CO₂ sensors are proposed for the communal facilities where applicable with a maximum CO₂ concentration of 800ppm; and
- Low Volatile Organic Compound (VOC) paints, adhesive and sealant to be used in the development.

Product Type Category	Max TVOC Content (g/l of ready-to-use product)
General purpose adhesives	50
Design & As Built 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

- Low VOC Carpets to be used in the development.

Test protocol	Limit
ASTM D5116 – Total VOC limit	0.5mg/m ² /h per hour
ASTM D5116 – 4 – PC (4-Phenylcyclohexene)	0.5mg/m ² /h per hour
ISO 16000/EN 13419 – TVOC at three days	0.5mg/m ² /h per hour
ISO 10580/ISO/TC 219 (Document N238) – TVOC at 24 hours	0.5mg/m ² /h per hour

- Low formaldehyde wood products to be used in the development.

Test protocol	Emission limit/ Unit of Measurement
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	≤1.0mg/L
AS/NZS 1859.1:2004 – Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.5mg/L
AS/NZS 1859.2:2004 – MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.0mg/L
AS/NZS 4357.4 – Laminated Veneer Lumber (LVL)	≤1.0mg/L



Japanese Agricultural Standard MAFF Notification NO.701 Appendix Clause 3 (11) - LVL	$\leq 1.0\text{mg/L}$
JIS A 5908:2003 – Particle Board and Plywood, with use of testing procedure JISA 1460	$\leq 1.0\text{mg/L}$
JIS A 5905:2003 – MDF, with use of testing procedure JIS A 1460	$\leq 1.0\text{mg/L}$
JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	$\leq 0.1\text{mg/m}^2\text{hr}^*$
ASTM D5116 (applicable to high pressure laminated and compact laminates)	$\leq 0.1\text{mg/m}^2\text{hr}$
ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	$\leq 0.1\text{mg/m}^2\text{hr}$ (at 3 days)
ASTM D6007	$\leq 0.12\text{mg/m}^3^{**}$
ASTM E1333	$\leq 0.12\text{mg/m}^3^{***}$
EN 717-1 (also known as DIN EN 717-1)	$\leq 0.12\text{mg/m}^3$
EN 717-2 (also known as DIN EN 717-2)	$\leq 3.5\text{mg/m}^3\text{hr}$

* $\text{mg/m}^2\text{hr}$ may also be represented as $\text{mg/m}^2/\text{hr}$

** The test report must confirm that the conditions of Table 3 comply for the particular wood product type, the final results must be presented in EN717-1 equivalent (as presented in the table) using the correlation ratio of 0.98.

***The final results must be presented in EN 717-1 equivalent (as presented in the table), using the correlation ration of 0.98.



4.6 Transport

4.6.1 Bicycle Parking

In total 20 bike facilities are proposed on site with 10 bike facilities for residents and 10 bike facilities for visitors & staff.

4.6.2 Electric Vehicle Infrastructure

At least one parking space is proposed with EV charging infrastructure installed on the lower ground floor.

4.7 Waste Management

BESS rating tool has been used to assess the overall development waste collection and reuse and demonstrate the project has the design potential to achieve the best practice design for the Waste Management.

4.7.1 Construction Waste Management Plan

Building Contractor will provide Construction Site Management Plan prior to any construction works.

As part of the Construction Site Management Plan, a Construction Waste Management Plan will be prepared to encourage waste avoidance, reuse and recycling during the construction and at least 80 per cent of construction and demolition waste are to be reused or recycled.

4.7.2 Operational Waste Management Plan

An Operational Waste Management Plan will be prepared for this development to assess the requirements for waste storage including size, location and accessibility and the recycling facilities are proposed as convenient for occupants as facilities for general waste.

4.7.3 Construction Phase Stormwater Pollution Reduction

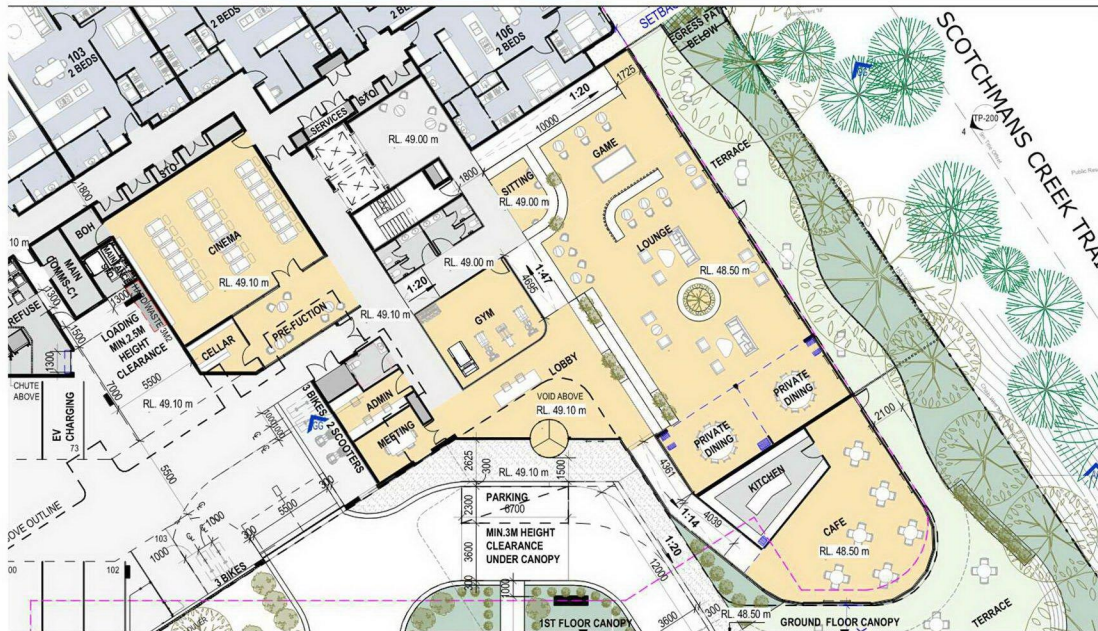
The Building Contractor will implement an Environmental Management Plan (EMP) to include the site management procedures to reduce the stormwater pollution during construction phase.



4.8 Urban Ecology

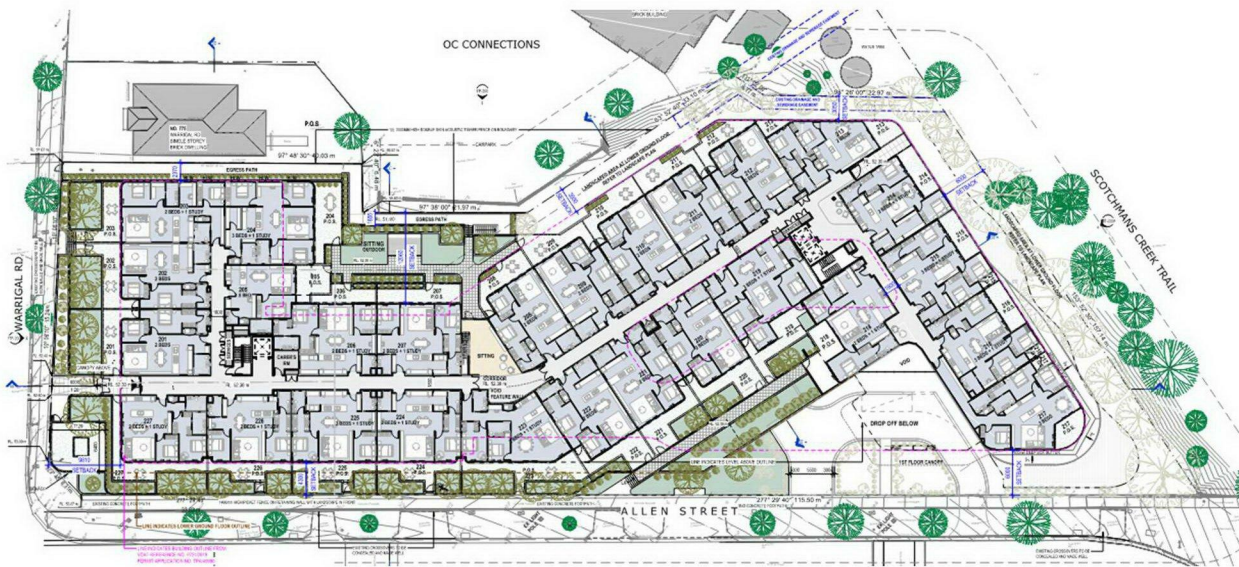
4.8.1 Communal Spaces

At least 300m² of communal spaces are proposed in the form of gym, lounge, dining, etc (as hatched in Yellow) for people social exchange.



4.8.2 Vegetation

Minimum 5% of the total site is covered with vegetation in the form of soft landscaped ground and rain garden.



4.9 Innovation

N/A



5. Overall BESS Scores Aiming to Target

With inclusion of all ESD initiatives summarised above, the proposed design is estimated to be able to achieve an overall score of 53% of nine key BESS categories and demonstrating 'Best Practice' sustainable design.

BESS assessment report is enclosed as Appendix A for details. Through the design development and construction phases, an alternative assemblage of the BESS targeted credits may be considered on the condition that the performance outcome meets the overall score of above 50% and Planning Permit Condition.

Category	Contributes to overall Score	Project Category Score
Management	4.5%	100%
Water	9.0%	57%
Energy	27.5%	60%
Stormwater	13.5%	100%
Indoor Environment Quality (IEQ)	16.5%	53%
Transport	9.0%	20%
Waste	5.5%	33%
Urban Ecology	5.5%	22%
Innovation	9%	0%
Total Rate	100%	53%



6. Conclusion

This SMP provides a summary of sustainable design features, which are integrated into the design of the proposed 1-9 Allen Street & 777-781 Warrigal Road, retirement living development to demonstrate 'Best Practice' in ESD to meet Monash City Council Planning sustainable objectives.

The proposed development will be designed to include all key initiatives as shown below:

- Thermally enhanced building fabrics to achieve an average NatHERS rating above 7 Stars for all dwellings;
- Ground floor communal facilities to provide with energy efficient air-cooled packaged AC system with a minimum COP of 3.5 or equivalent;
- Building Services energy consumption reduced by 20% compared to NCC 2019 Section J;
- Minimum 4 Star energy rating split air-conditioning system for the dwellings;
- Heat pump type domestic hot water system or equivalent for the development;
- 25kL rainwater harvesting system for residential dwellings and communal facilities toilet flushing;
- Water efficient fixtures and fittings with minimum WELS rating specified;
- Improved stormwater quality via rainwater harvesting system and landscaping design;
- Introduce a high level of natural light into the primary residential spaces;
- A construction Waste Management Plan (WMP) to be prepared and implemented and a minimum 80% of all demolition and construction waste to be reused or recycled;
- Meet Best Practice Sustainable Design using BESS rating tool; and
- Provision of a Building User's Guide for residents to optimise the building's environmental performance.

Therefore, the proposed retirement living development has been designed to meet the Monash City Council ESD objectives and the project team will ensure the performance outcomes proposed in this Environmentally Sustainable Design Statement be implemented prior to occupancy at no cost to the Monash City Council and be to the satisfaction of the Responsible Authority.

Appendix A – BESS Summary Report

BESS Report

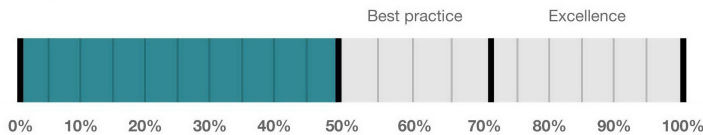
Built Environment Sustainability Scorecard



This BESS report outlines the sustainable design commitments of the proposed development at 1-9 Allen St & 777-781 Warrigal Rd Oakleigh VIC 3166. 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 Monash 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



53%

Project details

Address 1-9 Allen St & 777-781 Warrigal Rd Oakleigh VIC 3166
Project no 60D07EE9-R3
BESS Version BESS-6

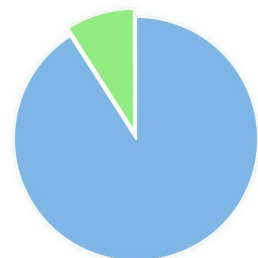
Site type Mixed use development
Account li.huan@igs.com.au
Application no.
Site area 6,309 m²
Building floor area 9,633.599999999999 m²
Date 09 September 2021
Software version 1.7.0-B.366



Performance by category

Category	Weight	Score	Pass	Your development	Maximum available
Management	5%	100%	*	100%	100%
Water	9%	57%	✓	57%	100%
Energy	28%	60%	✓	60%	100%
Stormwater	14%	100%	✓	100%	100%
IEQ	17%	53%	✓	53%	100%
Transport	9%	20%	*	20%	100%
Waste	6%	33%	*	33%	100%
Urban Ecology	6%	22%	*	22%	100%
Innovation	9%	0%	*	0%	100%

Building Type composition



● Apartment ● Public building

Buildings

Name	Height	Footprint	% of total footprint
Retirement Village	4	4,678 m ²	100%

Dwellings & Non Res Spaces

Dwellings

Name	Quantity	Area	Building	% of total area
Apartment				
2-2.5B Apartments	62	96.8 m ²	Retirement Village	62%
3-3.5B Apartments	17	140 m ²	Retirement Village	24%
1-1.5B Apartments	5	76.0 m ²	Retirement Village	3%
Total	84	8,761 m²	90%	

Non-Res Spaces

Name	Quantity	Area	Building	% of total area
Public building				
Lounge Game, Gym, etc	1	872 m ²	Retirement Village	9%
Total	1	872 m²	9%	

Supporting information

Floorplans & elevation notes







Credit	Requirement	Response	Status
Management 3.1	Individual utility meters annotated		-
Management 3.2	Individual utility meters annotated		-
Management 3.3	Common area submeters annotated		-
Water 3.1	Water efficient garden annotated		-
Energy 3.1	Carpark with natural ventilation or CO monitoring system		-
Energy 4.2	Floor plans showing location of photovoltaic panels as described.		-
Stormwater 1.1	Location of any stormwater management systems used in STORM or MUSIC modelling (e.g. Rainwater tanks, raingarden, buffer strips)		-
IEQ 1.2	If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.		-
IEQ 1.3	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'		-
Transport 2.1	Location of electric vehicle charging infrastructure		-
Waste 2.1	Location of food and garden waste facilities		-
Urban Ecology 1.1	Size and location of communal spaces		-
Urban Ecology 2.1	Vegetated areas		-

Supporting evidence

Credit	Requirement	Response	Status
Management 2.2	Preliminary NatHERS assessments		-
Management 2.3	Preliminary modelling report		-
Management 2.3a	Section J glazing assessment		-
Management 2.3b	Preliminary modelling report		-
Energy 1.1	Energy Report showing calculations of reference case and proposed buildings		-
Energy 3.1	Provide a written explanation of either the fully natural carpark ventilation or carbon monoxide monitoring, describing how these systems will work, what systems are required for them to be fully integrated and who will be responsible for their implementation throughout the design, procurement and operational phases of the building life.		-
Energy 3.6	Provide a written description of the average lighting power density to be installed in the development and specify the lighting type(s) to be used.		-
Energy 3.7	Provide a written description of the average lighting power density to be installed in the development and specify the 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 1.2	If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.		-
IEQ 1.3	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		-

Credit summary

Management Overall contribution 4.5%

Requirement	Progress	Percentage
Management		100%
1.1 Pre-Application Meeting		100%
2.2 Thermal Performance Modelling - Multi-Dwelling Residential		100%
2.3 Thermal Performance Modelling - Non-Residential		100%
3.1 Metering		100%
3.2 Metering		100%
3.3 Metering		100%
4.1 Building Users Guide		100%

Water Overall contribution 9.0%

Requirement	Progress	Percentage	Notes
Water		57%	Minimum required 50% ✔ Pass
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%	60%	✔ Pass
1.1 Thermal Performance Rating - Non-Residential			12%	
1.2 Thermal Performance Rating - Residential			66%	
2.1 Greenhouse Gas Emissions			100%	
2.2 Peak Demand			0%	
2.3 Electricity Consumption			100%	
2.4 Gas Consumption			0%	
3.1 Carpark Ventilation			100%	
3.2 Hot Water			100%	
3.4 Clothes Drying			0%	
3.6 Internal Lighting - Residential Multiple Dwellings			100%	
3.7 Internal Lighting - Non-Residential			100%	
4.1 Combined Heat and Power (cogeneration / trigeneration)			N/A	⚠ Scoped Out
No reason provided				
4.2 Renewable Energy Systems - Solar			9%	
4.4 Renewable Energy Systems - Other			N/A	🚫 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%	53%	✔ Pass
1.1 Daylight Access - Living Areas			0%	
1.2 Daylight Access - Bedrooms			66%	
1.3 Winter Sunlight			100%	
1.4 Daylight Access - Non-Residential			40%	✔ Achieved
1.5 Daylight Access - Minimal Internal Bedrooms			100%	
2.1 Effective Natural Ventilation			66%	
2.3 Ventilation - Non-Residential			66%	✔ Achieved
3.4 Thermal comfort - Shading - Non-residential			0%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential			0%	
4.1 Air Quality - Non-Residential			67%	

Transport Overall contribution 9.0%

		20%
1.1 Bicycle Parking - Residential		0%
1.2 Bicycle Parking - Residential Visitor		0%
1.3 Bicycle Parking - Convenience Residential		N/A <input checked="" type="checkbox"/> Disabled
Credit 1.1 must be achieved first.		
1.4 Bicycle Parking - Non-Residential		0%
1.5 Bicycle Parking - Non-Residential Visitor		0%
1.6 End of Trip Facilities - Non-Residential		N/A <input checked="" type="checkbox"/> Disabled
Credit 1.4 must be complete first.		
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		100%
2.2 - Operational Waste - Convenience of Recycling		0%

Urban Ecology Overall contribution 5.5%

		22%
1.1 Communal Spaces		100%
2.1 Vegetation		25%
2.2 Green Roofs		0%
2.3 Green Walls and Facades		0%
2.4 Private Open Space - Balcony / Courtyard Ecology		0%
3.1 Food Production - Residential		0%
3.2 Food Production - Non-Residential		0%

Innovation Overall contribution 9.0%

		0%
1.1 Innovation		N/A <input checked="" type="checkbox"/> Disabled
Please enter at least one innovation.		

Credit breakdown

Management Overall contribution 4%

1.1 Pre-Application Meeting	100%
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	Yes
2.2 Thermal Performance Modelling - Multi-Dwelling Residential	100%
Score Contribution	This credit contributes 22.7% towards the category score.
Criteria	Have preliminary NatHERS ratings been undertaken for all thermally unique dwellings?
Question	Criteria Achieved ?
Apartment	Yes
2.3 Thermal Performance Modelling - Non-Residential	100%
Score Contribution	This credit contributes 2.3% towards the category score.
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2019 Section J1.5?
Question	Criteria Achieved ?
Public building	Yes
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2019 Section J (Energy Efficiency), NABERS or Green Star?
Question	Criteria Achieved ?
Public building	Yes
3.1 Metering	100%
Score Contribution	This credit contributes 11.4% towards the category score.
Criteria	Have utility meters been provided for all individual dwellings?
Question	Criteria Achieved ?
Apartment	Yes
3.2 Metering	100%
Score Contribution	This credit contributes 1.1% towards the category score.
Criteria	Have utility meters been provided for all individual commercial tenants?
Question	Criteria Achieved ?
Public building	Yes

3.3 Metering		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	
Public building	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	

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	
Building: All	Retirement Village
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	>= 5 Star WELS rating
WC: All	>= 4 Star WELS rating
Urinals:	
1-1.5B Apartments	Scope out
2-2.5B Apartments	
3-3.5B Apartments	
Lounge Game, Gym, etc	>= 5 Star WELS rating
Washing Machine Water Efficiency: All	Scope out
Which non-potable water source is the dwelling/space connected to?:	
1-1.5B Apartments	-1
2-2.5B Apartments	
3-3.5B Apartments	
Lounge Game, Gym, etc	Rainwater Tank - 1
Non-potable water source connected to Toilets:	
1-1.5B Apartments	No
2-2.5B Apartments	
3-3.5B Apartments	
Lounge Game, Gym, etc	Yes
Non-potable water source connected to Laundry (washing machine): All	No
Non-potable water source connected to Hot Water System: All	No
Rainwater Tank	
What is the total roof area connected to the rainwater tank?:	2,800 m ²
Rainwater Tank - 1	
Tank Size: Rainwater Tank - 1	25,000 Litres
Irrigation area connected to tank: Rainwater Tank - 1	0.0 m ²
Is connected irrigation area a water efficient garden?:	Yes
Rainwater Tank - 1	

Other external water demand connected to tank?: Rainwater -	
Tank - 1	
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	12985 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	9837 kL
Output	Proposed (including rainwater and recycled water use)
Project	9455 kL
Output	% Reduction in Potable Water Consumption
Project	27 %
Output	% of connected demand met by rainwater
Project	100 %
Output	How often does the tank overflow?
Project	Very Often
Output	Opportunity for additional rainwater connection
Project	3569 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

Energy Overall contribution 17% Minimum required 50%

Use the BESS Deem to Satisfy (DtS) method for Energy?:	No
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
Gas supplied into building:	Natural Gas
Are you installing a cogeneration or trigeneration system?:	No
Dwelling Energy Profiles	
Building: All	Retirement Village
Below the floor is: All	Another Occupancy
Above the ceiling is:	
1-1.5B Apartments	Another Occupancy
2-2.5B Apartments	Outside
3-3.5B Apartments	
Exposed sides: All	3
NatHERS Annual Energy Loads - Heat: All	49.7 MJ/sqm
NatHERS Annual Energy Loads - Cool: All	12.4 MJ/sqm
NatHERS star rating: All	7.8
Type of Heating System: All	D Reverse cycle space
Heating System Efficiency: All	4 Star
Type of Cooling System: All	Refrigerative space
Cooling System Efficiency: All	4 Stars
Type of Hot Water System: All	C Electric Heat Pump
Is the hot water system shared by multiple dwellings?: All	Yes
% Contribution from solar hot water system:	
1-1.5B Apartments	0 %
2-2.5B Apartments	-
3-3.5B Apartments	
Clothes Line: All	A No drying facilities
Clothes Dryer: All	A No clothes dryer
Non-Residential Building Energy Profile	
Heating, Cooling & Comfort Ventilation - Electricity - reference fabric and reference services:	60,841 kWh
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and reference services:	60,686 kWh
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and proposed services:	53,897 kWh
Heating - Gas - reference fabric and reference services:	-
Heating - Gas - proposed fabric and reference services:	-
Heating - Gas - proposed fabric and proposed services:	-
Heating - Wood - reference fabric and reference services:	-

Heating - Wood - proposed fabric and reference services:	-
Heating - Wood - proposed fabric and proposed services:	-
Hot Water - Electricity - Baseline:	48,009 kWh
Hot Water - Electricity - Proposed:	16,003 kWh
Hot Water - Gas - Baseline:	0.0 MJ
Hot Water - Gas - Proposed:	0.0 MJ
Lighting - Baseline:	22,150 kWh
Lighting - Proposed:	15,297 kWh
Peak Thermal Cooling Load - Baseline:	0.0 kW
Peak Thermal Cooling Load - Proposed:	0.0 kW

Solar Photovoltaic system

System Size (lesser of inverter and panel capacity): Solar PV	10.0 kW peak
Orientation (which way is the system facing)?: Solar PV	North
Inclination (angle from horizontal): Solar PV	30.0 Angle (degrees)
Which Building Class does this apply to?: Solar PV	Public building

1.1 Thermal Performance Rating - Non-Residential

12%

Score Contribution	This credit contributes 3.4% towards the category score.
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC 2019 Section J)?
Output	Total Improvement
Public building	0 %

1.2 Thermal Performance Rating - Residential

66%


Score Contribution	This credit contributes 25.9% towards the category score.
Criteria	What is the average NatHERS rating?
Output	Average NATHERS Rating (Weighted)
Apartment	7.8 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	653,518 kg CO2
Public building	10,050 kg CO2
Output	Proposed Building with Proposed Services (Actual Building)
Apartment	208,208 kg CO2
Public building	6,454 kg CO2
Output	% Reduction in GHG Emissions
Apartment	68 %
Public building	35 %

2.2 Peak Demand	0%
Score Contribution	This credit contributes 4.7% towards the category score.
Criteria	What is the % reduction in instantaneous (peak-hour) demand against the benchmark?
Output	Peak Thermal Cooling Load - Baseline
Apartment	1,048 kW
Output	Peak Thermal Cooling Load - Proposed
Apartment	942 kW
Output	Peak Thermal Cooling Load - % Reduction
Apartment	10 %
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	640,704 kWh
Public building	9,853 kWh
Output	Proposed
Apartment	204,126 kWh
Public building	6,327 kWh
Output	Improvement
Apartment	68 %
Public building	35 %
2.4 Gas Consumption	0%
Score Contribution	This credit contributes 9.5% towards the category score.
Criteria	What is the % reduction in annual gas consumption against the benchmark?
3.1 Carpark Ventilation	100%
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	Yes

3.2 Hot Water	100%
Score Contribution	This credit contributes 4.7% 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	223,381 kWh
Public building	4,346 kWh
Output	Proposed
Apartment	89,757 kWh
Public building	1,449 kWh
Output	Improvement
Apartment	59 %
Public building	66 %
3.4 Clothes Drying	0%
Score Contribution	This credit contributes 4.3% 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	47,307 kWh
Output	Proposed
Apartment	47,307 kWh
Output	Improvement
Apartment	0 %
3.6 Internal Lighting - Residential Multiple Dwellings	100%
Score Contribution	This credit contributes 8.6% 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) and Clause 3.12.5.5 NCC 2019 Vol 2 (Class 1 & 10)?
Question	Criteria Achieved ?
Apartment	Yes
3.7 Internal Lighting - Non-Residential	100%
Score Contribution	This credit contributes 0.9% 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 ?
Public building	Yes
4.1 Combined Heat and Power (cogeneration / trigeneration)	N/A  Scoped Out
This credit was scoped out	None

4.2 Renewable Energy Systems - Solar		9%
Score Contribution	This credit contributes 4.7% 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	
Public building	13,030 kWh	
Output	% of Building's Energy	
Public building	168 %	
4.4 Renewable Energy Systems - Other		N/A <input checked="" type="checkbox"/> 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	80.1 % Reduction	
Question	Total Suspended Solids (kg/year)	
Project	80.7 % Reduction	
Question	Total Phosphorus (kg/year)	
Project	87.1 % Reduction	
Question	Total Nitrogen (kg/year)	
Project	79.4 % 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?:	Provide our own calculations		
1.1 Daylight Access - Living Areas		0%	
Score Contribution	This credit contributes 21.9% towards the category score.		
Criteria	What % of living areas achieve a daylight factor greater than 1%		
Question	Percentage Achieved ?		
Apartment	60 %		
1.2 Daylight Access - Bedrooms		66%	
Score Contribution	This credit contributes 21.9% towards the category score.		
Criteria	What % of bedrooms achieve a daylight factor greater than 0.5%		
Question	Percentage Achieved ?		
Apartment	80 %		
1.3 Winter Sunlight		100%	
Score Contribution	This credit contributes 7.3% 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	Yes		
1.4 Daylight Access - Non-Residential		40%	✓ Achieved
Score Contribution	This credit contributes 4.4% towards the category score.		
Criteria	What % of the regular use floor areas have at least 2% daylight factor?		
Question	Percentage Achieved?		
Public building	40 %		
1.5 Daylight Access - Minimal Internal Bedrooms		100%	
Score Contribution	This credit contributes 7.3% 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		66%	
Score Contribution	This credit contributes 21.9% towards the category score.		
Criteria	What % of dwellings are effectively naturally ventilated?		
Question	Percentage Achieved?		
Apartment	60 %		
2.3 Ventilation - Non-Residential		66%	✓ Achieved
Score Contribution	This credit contributes 4.4% towards the category score.		

Criteria	What % of the regular use areas are effectively naturally ventilated?
Question	Percentage Achieved?
Public building	-
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?
Public building	50 %
Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?
Question	Value
Public building	800 ppm
3.4 Thermal comfort - Shading - Non-residential	0%
Score Contribution	This credit contributes 2.2% towards the category score.
Criteria	What percentage of east, north and west glazing to regular use areas is effectively shaded?
Question	Percentage Achieved?
Public building	-
3.5 Thermal Comfort - Ceiling Fans - Non-Residential	0%
Score Contribution	This credit contributes 0.7% towards the category score.
Criteria	What percentage of regular use areas in tenancies have ceiling fans?
Question	Percentage Achieved?
Public building	-
4.1 Air Quality - Non-Residential	67%
Score Contribution	This credit contributes 8.0% towards the category score.
Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Project	Yes
Criteria	Does all carpet meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Project	Yes
Criteria	Does all engineered wood meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Project	No

Transport Overall contribution 2%

1.1 Bicycle Parking - Residential	0%
Score Contribution	This credit contributes 18.4% towards the category score.
Criteria	How many secure and undercover bicycle spaces are there per dwelling for residents?
Question	Bicycle Spaces Provided ?
Apartment	10
Output	Min Bicycle Spaces Required
Apartment	84
1.2 Bicycle Parking - Residential Visitor	0%
Score Contribution	This credit contributes 18.4% towards the category score.
Criteria	How many secure bicycle spaces are there per 5 dwellings for visitors?
Question	Visitor Bicycle Spaces Provided ?
Apartment	0
1.3 Bicycle Parking - Convenience Residential	N/A <input checked="" type="checkbox"/> Disabled
This credit is disabled	Credit 1.1 must be achieved first.
1.4 Bicycle Parking - Non-Residential	0%
Score Contribution	This credit contributes 1.8% 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 ?
Public building	No
Question	Bicycle Spaces Provided ?
Public building	5
1.5 Bicycle Parking - Non-Residential Visitor	0%
Score Contribution	This credit contributes 0.9% 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 ?
Public building	No
Question	Bicycle Spaces Provided ?
Public building	5
1.6 End of Trip Facilities - Non-Residential	N/A <input checked="" type="checkbox"/> Disabled
This credit is disabled	Credit 1.4 must be complete first.
2.1 Electric Vehicle Infrastructure	100%
Score Contribution	This credit contributes 20.2% towards the category score.
Criteria	Are facilities provided for the charging of electric vehicles?
Question	Criteria Achieved ?
Project	Yes

2.2 Car Share Scheme		0%
Score Contribution	This credit contributes 10.1% 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 20.2% 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 2%

1.1 - Construction Waste - Building Re-Use		0%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used?	
Question	Criteria Achieved ?	
Project	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		0%
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	No	

Urban Ecology Overall contribution 1%

1.1 Communal Spaces	100%
Score Contribution	This credit contributes 11.2% towards the category score.
Criteria	Is there at least the following amount of common space measured in square meters : * 1m ² for each of the first 50 occupants * Additional 0.5m ² for each occupant between 51 and 250 * Additional 0.25m ² for each occupant above 251?
Question	Common space provided
Apartment	164 m ²
Public building	173 m ²
Output	Minimum Common Space Required
Apartment	127 m ²
Public building	68 m ²
2.1 Vegetation	25%
Score Contribution	This credit contributes 44.9% 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	5 %
2.2 Green Roofs	0%
Score Contribution	This credit contributes 11.2% 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 11.2% 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	0%
Score Contribution	This credit contributes 10.2% towards the category score.
Criteria	Is there a tap and floor waste on every balcony / in every courtyard?
Question	Criteria Achieved ?
Apartment	No

3.1 Food Production - Residential		0%
Score Contribution	This credit contributes 10.2% 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	52 m ²	
3.2 Food Production - Non-Residential		0%
Score Contribution	This credit contributes 1.0% towards the category score.	
Criteria	What area of space per occupant is dedicated to food production?	
Question	Food Production Area	
Public building	-	
Output	Min Food Production Area	
Public building	22 m ²	

Innovation Overall contribution 0%

1.1 Innovation		N/A	<input checked="" type="checkbox"/> Disabled
This credit is disabled	Please enter at least one innovation.		

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Appendix B – Daylight Assessment Report



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**BESS IEQ DAYLIGHT
ACCESS MODELLING REPORT**

1-9 Allen St & 777-781 Warrigal Road,
Oakleigh

Date 10/09/2021

Project No. 21048



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Document Control

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1. Executive Summary

IGS was engaged to undertake a daylight simulation on the retirement apartment development 1-9 Allen St & 777-781 Warrigal Rd, Oakleigh to identify the BESS Indoor Environment Quality (IEQ) Daylight Access to retirement apartments and communal facilities daylight availability compliances.

The daylight availability simulation has been undertaken above the finished floor level under the Uniform Cloudy Sky. A Uniform Cloudy Sky represents a sky with a constant value of luminance. The values are derived from a statistical analysis of outdoor illuminance levels. They represent a horizontal illuminance level that exceeds 85% of the time between the hours of 9am and 5pm throughout the year. They also represent that the building has been designed to meet the modelled daylight levels for at least 85% of the daytime annually.

A daylight modelling was undertaken for both retirement apartments and communal facilities at the current preliminary design stage.

BESS IEQ category requires more than 80% of the total number of bedrooms achieve a daylight factor greater than 0.5% to 90% of the floor area for retirement apartments and minimum 30% of the floor area achieves at least 2% daylight factor for non-residential component.

The daylight modelling results indicate more than 80% of the bedrooms achieve a daylight factor of at least 0.5% to 90% of the floor area and more than 30% of the non-residential component achieves minimum 2% daylight factor.

Overall, the modelling result indicates both residential dwellings and non-residential tenancies meet the BESS IEQ Daylight requirement.



2. Introduction

2.1 Key Assumptions

The proposed external windows visible light transmissions (VLTs) are recommended to be:

- | | |
|--|----------------|
| ▪ Residential Glazed Windows and Doors | VLT \geq 70% |
| ▪ Communal Spaces and Café | VLT \geq 40% |
| ▪ Skylight | VLT \geq 40% |

Finishes Reflectance Values

The following reflectance values are used for the building finishes daylight availability modelling.

- Floor covering reflectance = 0.45
- Walls and Internal Partitions reflectance= 0.9
- Ceiling reflectance = 0.9
- Surrounding Buildings reflectance =0.2

2.2 Sky Model

The Uniform Cloudy Sky of horizontal external illuminance of 10,000 Lux is used for daylight availability simulation. A Uniform Cloudy Sky represents a sky with a constant value of luminance. The values are derived from a statistical analysis of outdoor illuminance levels. They represent a horizontal illuminance level that exceeds 85% of the time between the hours of 9am and 5pm throughout the year. Thus, they also represent that the building has been designed to meet the modelled daylight levels for at least 85% of the daytime annually.

2.3 Building Shape

The building physical shape is modelled in accordance with the architectural drawings package Town Planning issue dated 10/09/2021.



Figure 1 – Building Model of the site



3. BESS Daylight Requirement

3.1 Residential Daylight Requirement

For residential dwellings, BESS Indoor Environment Quality (IEQ) 1.2 Daylight Access – Bedroom category requires the daylight modelling to be undertaken to demonstrate more than 80% of the total number of bedrooms achieve a daylight factor greater than 0.5% to 90% of the floor area in each room assuming a uniform design sky. Points are awarded as follows.

- 66% score for 80% of the total number of bedrooms achieves the daylight of at least 0.5% to 90% of the floor area; and
- 100% score for 100% of the total number of bedrooms achieves the daylight of at least 0.5% to 90% of the floor area.

3.2 Non-Residential Daylight Requirement

For Non-residential component, BESS Indoor Environment Quality (IEQ) 1.4 Daylight Access – Non-Residential requires the daylight modelling to be undertaken to demonstrate more than 30% of the nominated area achieves a daylight factor of at least 2% assuming a uniform design sky. Points are awarded as follows:

- 33% score for 30% of the nominated floor area achieves the daylight of at least 2%;
- 66% score for 60% of the nominated floor area achieves the daylight of at least 2%;
- 100% score for 90% of the nominated floor area achieves the daylight of at least 2%.



4. Daylight Result -Contour Map

4.1 Lower Ground Level Daylight Result - Contour Plot

Below is the daylight contour plot extracted from Design Builder daylight modelling result showing daylight availability across Lower Ground Level residential dwellings and communal spaces of the building.

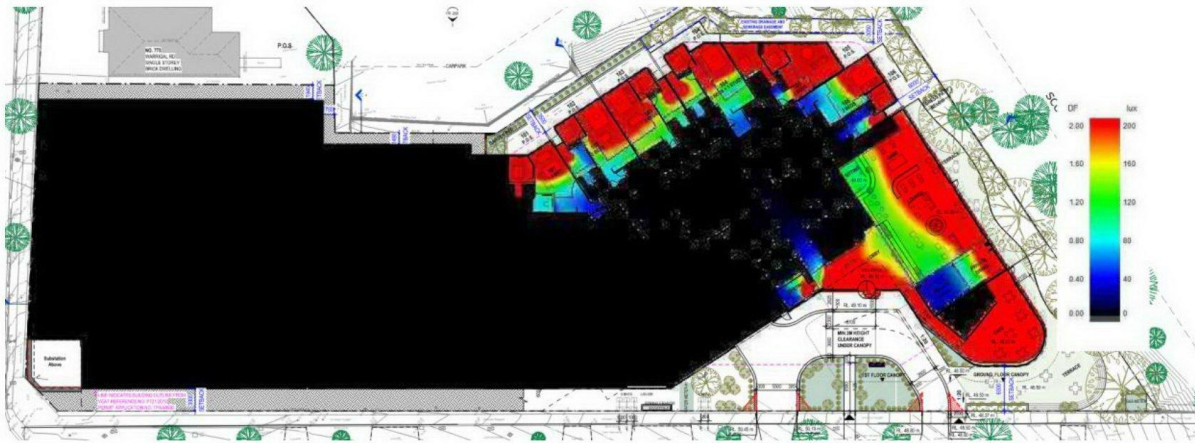


Figure 3 – Lower Ground Level Daylight Contour Plot

4.2 Ground Level Daylight Result - Contour Plot

Below is the daylight contour plot extracted from Design Builder daylight modelling result showing daylight availability across Ground Level residential dwellings and communal spaces of the building.

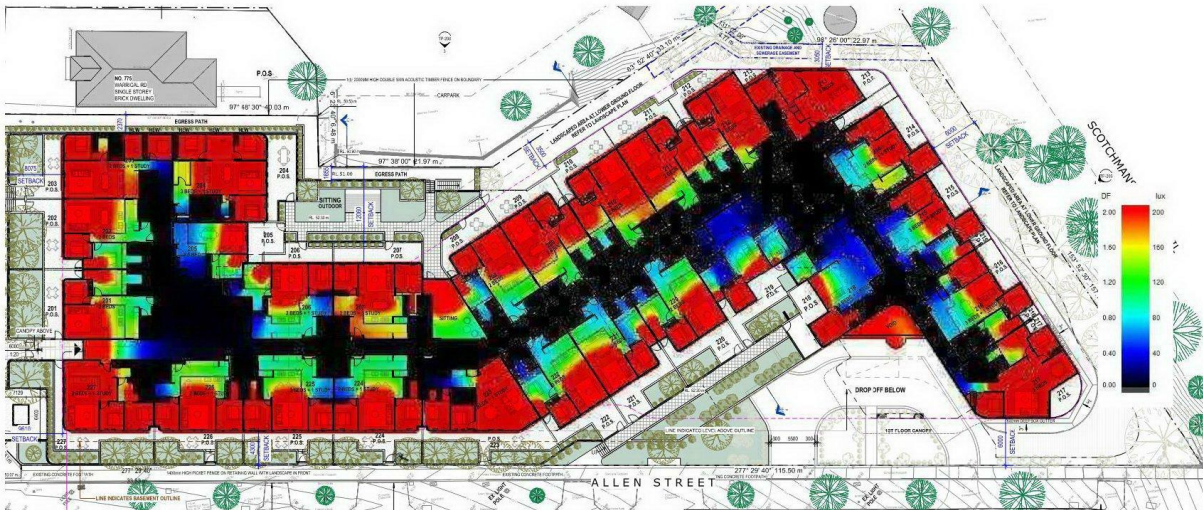


Figure 4 – Ground Level Daylight Contour Plot



4.3 Level 01 Daylight Result - Contour Plot

Below is the daylight contour plot extracted from Design Builder daylight modelling result showing daylight availability across Level 01 residential dwellings and communal spaces of the building.

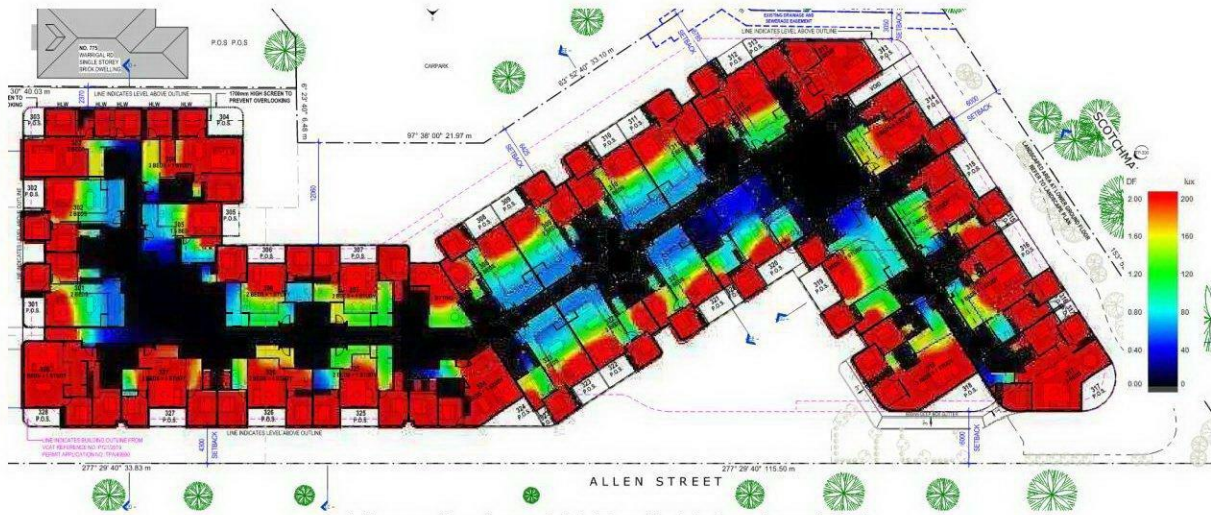


Figure 5 – Level 01 Daylight Contour Plot

4.4 Level 02 Daylight Result - Contour Plot

Below is the daylight contour plot extracted from Design Builder daylight modelling result showing daylight availability across Level 02 residential dwellings and communal spaces of the building.

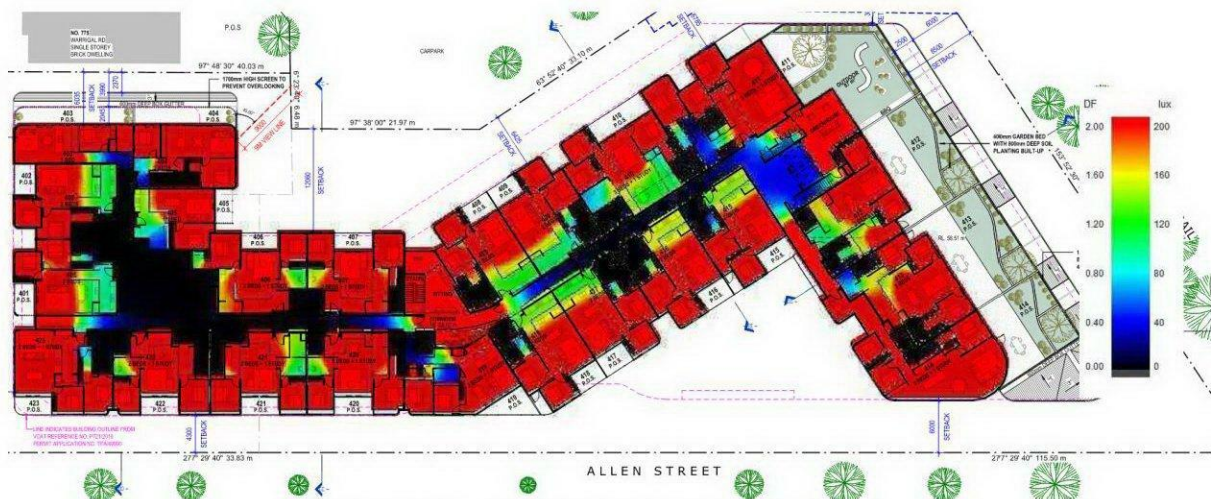


Figure 6 – Level 02 Daylight Contour Plot



4.5 Residential Apartments Bedroom Daylight Result – Summary Table

Block	Zone	Floor area (m2)	Floor Area above Daylight Factor of 0.5 (m2)	Floor Area above Daylight Factor of 0.5 (%)
LG	101-Bed1	13.3	13.3	100%
LG	102-Bed1	10.6	10.6	100%
LG	102-Bed2	12.5	12.5	100%
LG	103-Bed1	10.2	10.2	100%
LG	103-Bed2	12.9	12.9	100%
LG	104-Bed1	11.6	11.6	100%
LG	104-Bed2	13.0	13.0	100%
LG	105-Bed1	11.8	11.8	100%
LG	105-Bed2	17.4	17.4	100%
LG	106-Bed1	10.1	10.1	100%
LG	106-Bed2	12.6	9.0	72%
L00	201-Bed1	10.4	10.4	100%
L00	201-Bed2	14.1	14.1	100%
L00	202-Bed1	11.9	11.9	100%
L00	202-Bed2	13.9	13.9	100%
L00	203-Bed1	13.1	13.1	100%
L00	203-Bed2	10.1	10.1	100%
L00	204-Bed1	12.9	12.9	100%
L00	204-Bed2	14.1	14.1	100%
L00	204-Bed3	11.6	11.6	100%
L00	205-Bed1	10.7	10.7	100%
L00	206-Bed1	11.3	11.3	100%
L00	206-Bed2	11.6	11.6	100%
L00	207-Bed1	11.7	11.7	100%
L00	207-Bed2	13.9	13.9	100%
L00	208-Bed1	10.5	10.5	100%
L00	208-Bed2	12.7	12.5	98%
L00	209-Bed1	10.6	10.6	100%
L00	209-Bed2	13.6	13.6	100%
L00	210-Bed1	10.7	10.7	100%
L00	210-Bed2	13.8	13.8	100%
L00	211-Bed1	10.1	10.1	100%
L00	211-Bed2	14.1	14.1	100%
L00	212-Bed1	10.5	10.5	100%
L00	212-Bed2	14.1	14.1	100%
L00	213-Bed1	12.8	12.8	100%
L00	213-Bed2	12.0	12.0	100%
L00	214-Bed1	10.8	10.8	100%
L00	214-Bed2	12.2	12.2	100%
L00	215-Bed1	11.9	11.9	100%



L00	215-Bed2	10.7	10.7	100%
L00	215-Bed3	12.4	11.4	92%
L00	216-Bed1	17.4	17.0	98%
L00	216-Bed2	10.7	10.7	100%
L00	216-Bed3	12.5	12.5	100%
L00	217-Bed1	11.0	11.0	100%
L00	217-Bed2	14.7	14.7	100%
L00	217-Bed3	11.4	11.4	100%
L00	218-Bed1	10.0	10.0	100%
L00	218-Bed2	13.4	13.4	100%
L00	219-Bed1	10.4	10.4	100%
L00	219-Bed2	10.5	7.5	71%
L00	219-Bed3	11.5	11.2	97%
L00	220-Bed1	10.0	10.0	100%
L00	220-Bed2	13.9	13.9	100%
L00	221-Bed1	11.8	11.8	100%
L00	221-Bed2	13.3	13.3	100%
L00	222-Bed1	9.9	9.9	100%
L00	222-Bed2	14.0	14.0	100%
L00	223-Bed1	13.0	13.0	100%
L00	223-Bed2	11.1	11.1	100%
L00	224-Bed1	11.9	11.9	100%
L00	224-Bed2	14.6	14.6	100%
L00	225-Bed1	14.7	14.7	100%
L00	225-Bed2	12.5	12.5	100%
L00	226-Bed1	15.3	15.3	100%
L00	226-Bed2	12.1	12.1	100%
L00	227-Bed1	12.3	12.3	100%
L00	227-Bed2	13.5	13.5	100%
L01	301-Bed1	11.1	11.1	100%
L01	301-Bed2	12.0	12.0	100%
L01	302-Bed1	11.4	11.4	100%
L01	302-Bed2	12.0	12.0	100%
L01	303-Bed1	12.8	12.8	100%
L01	303-Bed2	10.4	10.4	100%
L01	304-Bed1	10.4	10.4	100%
L01	304-Bed2	11.6	11.6	100%
L01	304-Bed3	15.1	15.1	100%
L01	305-Bed1	13.9	13.9	100%
L01	306-Bed1	16.0	16.0	100%
L01	306-Bed2	12.6	12.6	100%
L01	307-Bed1	12.9	12.9	100%
L01	307-Bed2	16.3	16.3	100%
L01	308-Bed1	11.8	11.8	100%



L01	308-Bed2	10.9	10.9	100%
L01	309-Bed1	11.3	11.3	100%
L01	309-Bed2	11.7	11.7	100%
L01	310-Bed1	11.5	11.5	100%
L01	310-Bed2	12.0	12.0	100%
L01	311-Bed1	11.6	11.6	100%
L01	311-Bed2	11.9	11.9	100%
L01	312-Bed1	10.6	10.6	100%
L01	312-Bed2	11.9	11.9	100%
L01	313-Bed1	12.5	12.5	100%
L01	313-Bed2	11.9	11.9	100%
L01	314-Bed1	11.4	11.4	100%
L01	314-Bed2	12.1	12.1	100%
L01	315-Bed1	12.0	12.0	100%
L01	315-Bed2	10.7	10.7	100%
L01	315-Bed3	12.7	12.7	100%
L01	316-Bed1	13.6	13.6	100%
L01	316-Bed2	10.9	10.9	100%
L01	316-Bed3	12.8	12.8	100%
L01	317-Bed1	10.9	10.9	100%
L01	317-Bed2	14.9	14.9	100%
L01	317-Bed3	11.1	11.1	100%
L01	318-Bed1	10.6	10.6	100%
L01	318-Bed2	12.0	12.0	100%
L01	318-Bed3	13.1	13.1	100%
L01	319-Bed1	11.5	11.5	100%
L01	319-Bed2	18.6	18.6	100%
L01	319-Bed3	9.9	9.9	100%
L01	320-Bed1	11.8	11.8	100%
L01	320-Bed2	11.3	11.3	100%
L01	320-Bed3	14.0	14.0	100%
L01	321-Bed1	13.4	13.4	100%
L01	321-Bed2	12.2	12.2	100%
L01	322-Bed1	12.1	12.1	100%
L01	322-Bed2	13.4	13.4	100%
L01	323-Bed1	11.1	11.1	100%
L01	323-Bed2	13.9	13.9	100%
L01	324-Bed1	11.1	11.1	100%
L01	324-Bed2	13.1	13.1	100%
L01	325-Bed1	14.9	14.9	100%
L01	325-Bed2	13.1	13.1	100%
L01	326-Bed1	12.4	12.4	100%
L01	326-Bed2	15.7	15.7	100%
L01	327-Bed1	15.7	15.7	100%



L01	327-Bed2	12.5	12.5	100%
L01	328-Bed1	11.3	11.3	100%
L01	328-Bed2	13.3	13.3	100%
L02	401-Bed1	11.5	11.5	100%
L02	401-Bed2	13.5	13.5	100%
L02	402-Bed1	10.8	10.8	100%
L02	402-Bed2	13.4	13.4	100%
L02	403-Bed1	11.8	11.8	100%
L02	404-Bed1	15.4	15.4	100%
L02	404-Bed2	12.7	12.7	100%
L02	405-Bed1	13.6	13.6	100%
L02	406-Bed1	15.8	15.8	100%
L02	406-Bed2	12.7	12.7	100%
L02	407-Bed1	16.2	16.2	100%
L02	407-Bed2	12.3	12.3	100%
L02	408-Bed1	11.4	11.4	100%
L02	408-Bed2	11.4	11.4	100%
L02	409-Bed1	11.1	11.1	100%
L02	409-Bed2	13.9	13.9	100%
L02	410-Bed1	10.9	10.9	100%
L02	410-Bed2	11.5	11.5	100%
L02	410-Bed3	15.2	15.2	100%
L02	411-Bed1	16.6	16.6	100%
L02	411-Bed2	11.3	11.3	100%
L02	411-Bed3	20.2	20.2	100%
L02	412-Bed1	10.5	10.5	100%
L02	412-Bed2	11.3	11.3	100%
L02	412-Bed3	15.7	15.7	100%
L02	413-Bed1	10.7	10.7	100%
L02	413-Bed2	11.7	11.7	100%
L02	413-Bed3	12.0	12.0	100%
L02	414-Bed1	14.6	14.6	100%
L02	414-Bed2	10.1	10.1	100%
L02	414-Bed3	10.3	10.3	100%
L02	415-Bed1	11.6	11.6	100%
L02	415-Bed2	13.6	13.6	100%
L02	416-Bed1	11.2	11.2	100%
L02	416-Bed2	13.7	13.7	100%
L02	417-Bed1	11.4	11.4	100%
L02	417-Bed2	13.4	13.4	100%
L02	418-Bed1	10.9	10.9	100%
L02	418-Bed2	12.8	12.8	100%
L02	419-Bed1	11.2	11.2	100%
L02	419-Bed2	12.6	12.6	100%



L02	420-Bed1	14.8	14.8	100%
L02	420-Bed2	11.7	11.7	100%
L02	421-Bed1	11.9	11.9	100%
L02	421-Bed2	15.1	15.1	100%
L02	422-Bed1	15.2	15.2	100%
L02	422-Bed2	11.5	11.5	100%
L02	423-Bed1	10.9	10.9	100%
L02	423-Bed2	13.9	13.9	100%

Total Assessed Bedrooms	180
Total Compliant Bedrooms	178
Total Compliant (% Rooms)	99%
Total Compliant (% Areas)	100%



4.6 Residential Apartments Living Room Daylight Result – Summary Table

Block	Zone	Floor area (m2)	Floor Area above Daylight Factor of 1.0 (m2)	Floor Area above Daylight Factor of 1.0 (%)
LG	101-Living	33.3	30.3	91%
LG	102-Living	33.0	33.0	100%
LG	103-Living	32.1	32.1	100%
LG	104-Living	31.5	31.0	98%
LG	105-Living	33.4	33.4	100%
LG	106-Living	35.8	32.2	90%
L00	201-Living	33.6	33.6	100%
L00	202-Living	34.2	34.2	100%
L00	203-Living	35.4	35.4	100%
L00	204-Living	33.4	33.4	100%
L00	205-Living	27.0	20.7	77%
L00	206-Living	32.7	32.4	99%
L00	207-Living	36.5	36.4	100%
L00	208-Living	32.7	32.7	100%
L00	209-Living	32.2	32.2	100%
L00	210-Living	33.2	33.2	100%
L00	211-Living	32.5	32.5	100%
L00	212-Living	32.1	32.1	100%
L00	213-Living	33.3	33.3	100%
L00	214-Living	31.3	25.2	80%
L00	215-Living	29.0	20.3	70%
L00	216-Living	31.3	25.7	82%
L00	217-Living	47.1	47.1	100%
L00	218-Living	36.1	13.5	37%
L00	219-Living	43.9	11.8	27%
L00	220-Living	31.9	31.9	100%
L00	221-Living	32.0	32.0	100%
L00	222-Living	32.5	32.5	100%
L00	223-Living	44.4	44.4	100%
L00	224-Living	37.1	36.2	98%
L00	225-Living	36.9	35.8	97%
L00	226-Living	35.0	34.9	100%
L00	227-Living	32.0	32.0	100%
L01	301-Living	34.5	25.4	74%
L01	302-Living	34.1	27.4	80%
L01	303-Living	37.7	37.7	100%
L01	304-Living	32.5	32.5	100%
L01	305-Living	27.7	23.3	84%
L01	306-Living	28.4	26.9	95%
L01	307-Living	24.8	24.8	100%



L01	308-Living	29.1	20.0	69%
L01	309-Living	28.9	19.0	66%
L01	310-Living	29.6	20.2	68%
L01	311-Living	29.7	21.9	74%
L01	312-Living	30.1	30.1	100%
L01	313-Living	35.9	35.9	100%
L01	314-Living	29.8	29.6	99%
L01	315-Living	28.3	28.3	100%
L01	316-Living	25.6	25.6	100%
L01	317-Living	58.5	58.5	100%
L01	318-Living	50.6	50.6	100%
L01	319-Living	40.0	32.8	82%
L01	320-Living	41.7	15.4	37%
L01	321-Living	29.5	18.3	62%
L01	322-Living	30.1	21.7	72%
L01	323-Living	30.4	19.2	63%
L01	324-Living	34.9	34.9	100%
L01	325-Living	27.2	27.2	100%
L01	326-Living	24.6	24.6	100%
L01	327-Living	25.0	25.0	100%
L01	328-Living	42.2	42.2	100%
L02	401-Living	34.4	33.1	96%
L02	402-Living	35.4	35.4	100%
L02	403-Living	31.9	31.9	100%
L02	404-Living	32.8	32.8	100%
L02	405-Living	28.3	28.3	100%
L02	406-Living	28.4	28.4	100%
L02	407-Living	24.9	24.9	100%
L02	408-Living	29.3	29.3	100%
L02	409-Living	30.3	30.3	100%
L02	410-Living	36.1	36.1	100%
L02	411-Living	61.4	61.4	100%
L02	412-Living	32.3	32.3	100%
L02	413-Living	42.6	42.6	100%
L02	414-Living	93.1	93.1	100%
L02	415-Living	32.2	32.2	100%
L02	416-Living	30.5	30.5	100%
L02	417-Living	30.7	30.7	100%
L02	418-Living	30.9	30.9	100%
L02	419-Living	35.3	35.3	100%
L02	420-Living	27.1	27.1	100%
L02	421-Living	25.1	25.1	100%
L02	422-Living	24.9	24.9	100%
L02	423-Living	40.4	40.4	100%



Total Assessed Living Rooms	84
Total Compliant Living Rooms	66
Total Compliant (% Rooms)	79%
Total Compliant (% Areas)	93%



4.7 Communal Spaces Daylight Result – Summary Table

Block	Zone	Floor area (m2)	Floor Area above Daylight Factor of 2.0 (m2)	Floor Area above Daylight Factor of 2.0 (%)
Lower Ground	Pre-function	28.3	0.0	0%
Lower Ground	Cinema	101.0	0.0	0%
Lower Ground	Admin	10.7	0.0	0%
Lower Ground	Meeting	16.5	3.7	22%
Lower Ground	Gym	37.0	0.0	0%
Lower Ground	Lounge and Game	233.9	117.2	50%
Lower Ground	Café	95.2	95.2	100%
Lower Ground	Kitchen	30.2	0.0	0%
Lower Ground	Lobby	73.6	45.5	62%
Ground	Sitting	37.9	15.9	42%
Level 1	Sitting	32.1	18.2	57%
Level 2	Sitting	20.4	20.4	100%
Level 2	Greenhouse	47.2	47.2	100%

Total Compliance Area (m2)	363
Total Assessed Area (m2)	764
Total Compliant (% Areas)	48%



5. Conclusion

BESS compliance on IEQ bedrooms requires at least 80% of the residential bedrooms to achieve a daylight factor of at least 0.5% to 90% of the floor area within the room. The daylight modelling result indicates more than 80% of the bedrooms achieve a daylight factor of at least 0.5% to 90% of the floor area within the room and meets the minimum BESS daylight access requirement which requires 80% of residential bedrooms comply.

For non-residential component, BESS IEQ category requires minimum 30% floor area achieves at least 2% daylight factor for non-residential component and more than 30% of the non-residential component achieves minimum 2% daylight factor.

Overall, the development has met the BESS daylight requirements on both residential dwellings and non-residential component.

Appendix C – Sample Apartment NatHERS Report



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**NCC 2019 NatHERS
ASSESSMENT REPORT**

1-9 Allen St & 777-781 Warrigal Road,
Oakleigh

Date 10/09/2021

Project No. 21048





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Document Control

Version	Date	Author		Reviewer	
00	02/09/2021	Li Huan	LH	Chris Orr	CO
01	10/09/2021	Li Huan	LH	Chris Orr	CO

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1. Summary

Thermal performance assessment of the Class 2 apartments using accredited FirstRate5 Version 5.3.0a (3.13) software has been conducted on sample residential apartments to NCC 2019 Section J0.2 requires apartments to achieve a minimum rating of 5.0 stars and an average rating of 6.0 stars.

NCC 2019 Volume 1 Section J0.2 requires all Class 2 apartment units to achieve a minimum rating of 5.0 stars individually and an average (all apartments) rating of 6.0 stars.

As part of Monash City Council planning permit condition, BESS sustainable rating tool is referenced, and the residential apartments will achieve an average rating of above 6.5 stars.

Based on the NatHERS modelling results, all sample apartments will achieve a minimum rating of above 5.0 stars individually and an average rating of above 7.0 stars to meet both the NCC 2019 Energy Efficiency Requirement and Monash City Council planning permit condition.

The following residential thermal performance assessor details are provided for building permit purposes.

Assessor's Name: Li Huan
Accreditation Number: VIC/BDAV/12/1395
AAO: FirstRate5 House Energy Rating Organization

Refer to Appendix 1 for NatHERS star rating results. The official star rating certificate can be provided by FirstRate5 House Energy Rating Organization on request and at the client's cost of \$100 (+GST) per certificate which includes \$30(+GST) per certificate application required by FirstRate5 House Energy Rating Organization and \$70(+GST) for processing, uploading per energy model and downloading per certificate. The certificate can be generated no later than three (3) months after the report is issued.



2. Overview

Project: 1-9 Allen Street & 777-781 Warrigal Road, Oakleigh, Victoria

Applicable NCC: 2019

NatHERS Climate Zone: 62 Moorabbin Airport

NCC Classification and Verification method:

- Class 2 – Apartments with shared underground carpark spaces
- Class 2 building fabric and services – NCC 2019 deemed-to-satisfy provisions, Part J0.

Reference Documents: This report has been based upon review of a set of Architectural Drawings dated 10/09/2021 Issued for Planning application.



3. Modelling Inputs Assumptions

Building Fabric Thermal Performance

Element	Type	Description	Added Insulation	Total System R-value
Wall	All	Refer architectural drawings		
	Internal	Walls adjoining a corridor	R2.0	R2.3
	Internal	Walls adjoining lift shaft / Stairwell	R2.0	R2.3
	Internal	All other internal walls	N/A	-
	External	Exposed External Walls	R2.0	R2.3
Floor	Typical Floor	Suspended concrete slab on ground	R1.2	R1.5
		Suspended concrete slab on basement and exposed open air	R1.2	R1.5
		Suspended concrete Slab to neighbour apartment	N/A	-
	Coverings	Tiles – Wet areas, as per drawings Carpet – Bedrooms Timber – Kitchen	Nil	-
Ceilings	Suspended concrete ceilings to adjoining balconies		R2.0	R2.3
	Suspended concrete Slab adjoining neighbour/conditioned area – All other apartments		N/A	-
	Roof & ceiling construction		R4.0	R4.3
Seals	All windows and externally facing doors are weather stripped.		Nil	-
Exhaust Fans	Each kitchen area has 1 sealed exhaust fan. 1 sealed exhaust fan is provided for all bathrooms.		Nil	-
LED Downlights	All recessed downlights to be IC-4 rated or equivalent		Nil	-
Shading	Windows	Balconies protruding on the level above and adjacent building.	Nil	-

Note: Total System R-Value including allowance for thermal bridging must be calculated to NCC 2019 Volume One Section J1.2 requirements.



Windows Thermal Performance

Element	Type	Description
Windows (Typical)	Frame	AS (Improved) Aluminium Frames or equivalent
	External Glazing	Double Glazed
	Overall Window System Properties	$U_w \leq 3.2$ SHGC _w = $0.4 \pm 5\%$



Appendix 1 – NatHERS Assessment Results

Location	Building Apartment Number	Number of Apartments	NatHERS Rating	Energy (MJ/m ²)			Net Conditioned Floor Area (m ²)
				Total	Heating	Cooling	
Lower Ground	101	1	8.2	52.1	48.5	3.6	75
Lower Ground	102	1	8.6	39.2	33.1	6.1	86.1
Lower Ground	103	1	9.2	20.7	15.7	5	86.5
Lower Ground	104	1	9.1	25.2	22.4	2.8	93.5
Lower Ground	105	1	7.2	84.9	69.8	15.1	86.5
Lower Ground	106	1	6.6	106	97.2	8.8	87.1
Second Floor	401	1	8.1	55.2	39.2	16	81.9
Second Floor	402	1	8.1	56.1	41.1	15	81.9
Second Floor	403	1	7.9	60.5	40.2	20.3	53.2
Second Floor	404	1	7.4	75.3	54.4	20.9	76.2
Second Floor	405	1	8.3	49.3	39.5	9.8	68.9
Second Floor	406	1	8.5	42	32	10	94.4
Second Floor	407	1	8.4	45.8	33.6	12.2	87.5
Second Floor	408	1	8.6	39.2	27.5	11.7	80.7
Second Floor	409	1	8.5	42.8	31.7	11.1	80.1
Second Floor	410	1	8.4	44.6	34.2	10.4	113.4
Second Floor	411	1	7.7	69.9	48.8	21	143.7
Second Floor	412	1	8.6	40.7	22.8	17.9	98.5
Second Floor	413	1	8.4	46.2	29.7	16.5	103.4
Second Floor	414	1	5.9	125.7	105.3	20.4	133.8
Second Floor	415	1	7.2	84.4	76	8.4	78.8
Second Floor	416	1	7.9	59	49.2	9.8	80.1
Second Floor	417	1	7.9	59	49.2	9.8	80.1
Second Floor	418	1	7.2	83	74.8	8.2	79.3
Second Floor	419	1	7.4	77.7	67.1	10.6	87.2
Second Floor	420	1	7.7	68.2	57.8	10.4	87.5
Second Floor	421	1	7.7	68.3	58.1	10.2	87.5
Second Floor	422	1	7.7	67.3	57.1	10.2	87.2
Second Floor	423	1	7.2	85.5	66	19.5	91.3
TOTALS		29		62.2	49.7	12.4	
WEIGHTED AVERAGE					7.85		
CALCULATED MINIMUM					5.9		

Appendix D – JV3 Energy Modelling Report



IGS INTEGRATED
GROUP
SERVICES

Value | Innovation | Trust

**NCC 2019 JV3
VERIFICTION REPORT**



1-9 Allen St & 777-781 Warrigal Road,
Oakleigh, Victoria

Date 10/09/2021

Project No. 21048



Document Control

Version	Date	Author		Reviewer	
00	02/09/2021	Li Huan	LH	Chris Orr	CO
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1. Executive Summary

IGS was engaged to assess whether the proposed mixed-use residential development non-residential portion at 1-9 Allen St & 777-781 Warrigal Road, Oakleigh comply with NCC 2019 Section J using verification method JV3 Modelling.

This assessment was required due to features of the building façade that do not currently comply with the NCC 2019 Deemed-to-Satisfy provisions (Section J – part J1.5).

As requested in the JV3 Modelling Verification Method, three distinct models have been used for the assessment for each building:

1. **Reference Building:** Reference Building is modelled as per NCC 2019 requirement;
2. **Proposed Building (Services as Reference):** Proposed Building is modelled with the same services as the Reference Building; and
3. **Proposed Building (Services as Specified):** Proposed Building is modelled with the proposed services.

The analysis demonstrates that the Proposed Building complies with the limits set in the JV3 Verification Method as detailed in Table 1 below.

Table 01. Summary of JV3 energy results

		Reference Building	Proposed Building (Services as Reference)	Proposed Building (Services as Specified)
Annual Energy Consumption	Total Electricity Use (kWh)	82,992	82,836	69,194
	Total GHG Emissions (kgCO ₂ -e)	96,503	96,322	80,459
	Total Conditioned Space (m ²)	872	872	872
	GHG Emissions Density (kgCO ₂ -e/m ² /yr)	111	110	92
		✓ Section J Compliant		



2. Methodology

2.1 Software

The energy modelling was carried out using Design Builder, which uses Energy Plus v8.3.0.001 as the calculation engine.

The software integrates site specific climate data with dynamic thermal simulation and custom-built HVAC systems to provide a powerful energy analysis tool. The dynamic simulation engine of the software suite is accredited with ANSI/ASHRAE Standard 140-2001 “Standard Method of Test for Evaluation of Building Energy Analysis Computer Programs”.

As this is an energy modelling exercise on Communal Facilities and Café, some intricacies of the architectural design were simplified. Where simplifications were necessary, every effort was made to retain the neutral thermal impact on both Reference Building and Proposed Building.



Figure 01 – Northeast View



2.2 Modelling Assumptions

Verification was carried out based on the procedures and parameters detailed in JV3 of NCC 2019 Section J.

2.2.1 NCC Class Classification

It will follow relevant NCC 2019 Class 6 for Café and Dining and Class 9b Assembly for Communal spaces of the building.

2.2.2 Limitations

The assumptions were based on review of a set of Architectural Drawings dated 10/09/2021 issued for Town Planning.

Computer building simulation provides an estimate of building performance only. This estimate is based on a necessarily simplified and idealized version of the building that does not and cannot fully represent all of the intricacies of the building once built. As a result, simulation results only represent an interpretation of the potential performance of the building. No guarantee or warranty of building performance can be based on simulation results alone.

2.2.3 Airconditioned Spaces

The air-conditioning spaces assessed in the model are in accordance with the mechanical services air-conditioning system design.

Non-residential Airconditioned Spaces (m ²)
872

2.2.4 Walls and Glazing

The total wall and glazing construction thermal performance for both the Reference and the Proposed Buildings are as follows:

Total Construction	Reference Building	Proposed Building
Walls and Glazing	Refer to Appendix 1	Wall-Minimum R value 2.8 Window System – Lower Ground Café and Communal Spaces U-value ≤ 2.5 ; and SHGC _w ≤ 0.25 Window System – Ground to Level 2 Communal Spaces U-value ≤ 2.7 ; and SHGC _w ≤ 0.27

2.2.5 Floor

The total floor construction thermal performance for both the reference and the Proposed Buildings are as follows:

Total Construction	Reference Building	Proposed Building
Floors (Conditioned to unconditioned spaces)	R value 2.0	Minimum R value 2.0



2.2.6 Roof

The total roof construction thermal performance for both the Reference and the Proposed Building are as follows:

Total Construction	Reference Building	Proposed Building
Roof and Ceiling Construction above Ground Floor Retail	R value 3.2	Minimum R value 4.0

2.2.7 Roof light

Total Construction	Reference Building	Proposed Building
Roof light	No more than 5% of the floor area of the served space; U-value ≤ 3.9 SHGC _w ≤ 0.29	U-value ≤ 2.7 SHGC _w ≤ 0.27

Note: To occupants' thermal comfort, SHGC shall be selected no greater than 0.3

2.2.8 Shading

External shading due to horizontal projections and adjacent building overshadows is taken into account.

No internal shading has been allowed for in the analysis.

2.2.9 Occupancy, Air Conditioning, Lighting and Internal Heat Gain Profiles

All models use the building operation profiles within NCC 2019 Specification JV for occupancy, air-conditioning, lighting and internal heat gains.

Building Class	Profiles as per NCC Specification JV Table 2
Ground Floor – Café and Dining	Table 2f – Class 6 Café
Communal Facilities	Table 2i – Class 9b assembly facilities

2.2.10 Infiltration

For both Reference Building and Proposed Building, the infiltration value is 0.7 air changes per hour throughout all zones when there are no mechanically supplied outdoor, and 0.35 air changes per hour at all other times.

2.2.11 Internal Design Conditions

For both Reference Building and Proposed Building, the internal design conditions are:

Winter: 21°C DB, RH uncontrolled
 Summer: 24°C DB, RH uncontrolled



2.2.12 Lighting

Maximum lighting power density to NCC 2019 Part J6 is used to model for Reference Building and Proposed Building reference services and the following lighting power density is allowed for the Proposed Building with the proposed services.

Function Space	Reference Services Lighting Power Density (W/m ²)	Proposed Services Lighting Power Density (W/m ²)
Store	4.0	3.5
Café	14.0	8.0
Dining	14.0	8.0
Lounge	4.5	3.5
Lobby	9.0	5.0
Corridor	5.0	3.5
Gym	4.5	3.5
Admin	5.0	3.5
Meeting	5.0	3.5
Cinema	5.0	3.5
Lounge, Game, Function	4.5	3.5
Kitchen	4.0	3.5
Sitting	4.5	3.5
Greenhouse	4.5	3.5

2.2.13 HVAC

In line with JV3 verification method, reference services are modelled as air cooled packaged air conditioning system and the proposed services are modelled the same as reference building to provide cooling and space heating.

Item	Reference Building	Proposed Building with the same services as the Reference Building	Proposed Building with Proposed Services
Air-Conditioner Cooling- COP	2.9	2.9	3.5
Air-Conditioner Heating - COP	2.9	2.9	3.5

2.2.14 Ventilation Fans

Ventilation fan efficiencies are modelled as 70% for the reference services and 75% for the proposed services.



3. Results

The results of the modelling exercise are as follows:

Item	Reference Building	Proposed Building with the same services as the Reference Building	Proposed Building with Proposed Services
Space Heating Electricity Use (kWh)	9,588	9,950	9,079
Space Cooling (kWh)	17,598	17,080	13,406
Lighting (kWh)	22,150	22,150	15,297
Ventilation Fans (kWh)	33,655	33,655	31,411
Conditioned Area (m ²)	872	872	872
Total Electricity Use (kWh)	82,992	82,836	69,194
Total GHG Emissions (kgCO ₂ -e)	96,503	96,322	80,459
GHG Emissions Density (kgCO ₂ -e/m ² /yr)	111	110	92



4. Conclusion

Compliance with Part J of the NCC 2019 for the non-residential components have been shown by verification method JV3. The GHG Emissions were calculated to be:


- | | |
|--|---|
| ▪ Reference Building: | 111 kgCO ₂ -e/m ² /yr |
| ▪ Proposed Building (with reference services): | 110 kgCO ₂ -e/m ² /yr |
| ▪ Proposed Building (with proposed services): | 92 kgCO ₂ -e/m ² /yr |

We can therefore advise that the proposed model will comply with the requirements of Section J of the NCC 2019 through compliance with the modelling outcomes as detailed in JV3.




Appendix 1 – NCC 2019 Façade Report

Appendix 1 - Reference Building under Method 1





Façade

Wall Glazing Areas + Results


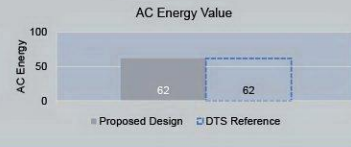


Re: []
Active Row - All Inputs Required []
User Dropdown []
Calculator

Method 1

Method 2

Wall Glazing Area

Room	Glazing Reference	Height (m)	Width (m)	Glazing Area (m²)	Shading Reference	Wall Reference	Wall Area (m²)	Total Area (m²)	Internal	
rth	GL-02-GF to Level 2	2.65	8.7	23.055	IGS-S01	IGS-Wall	5.295	28.35	<input type="checkbox"/>	
	GL-02-GF to Level 2	2.65	2.7	7.155	IGS-S01	IGS-Wall	2.295	9.45	<input type="checkbox"/>	
	GL-02-GF to Level 2	2.65	3.8	9.54		IGS-Wall	10.53	20.07	<input type="checkbox"/>	
									<input type="checkbox"/>	
				Result	Target					
				Wall-glazing U-Value (W/m².K)	2.26	2.00				
				Solar Admittance	0.124	0.130				
				Glazing Area (m²)		69.165	Average Glazing U-Value (W/m².K)	2.70		
				Glazing to Façade Ratio		15.885	Average Glazing SHGC	0.27		
						81%	Average Wall R-Value (m².K/W)	2.80		
ast	GL01-Lower Ground	3.4	4.08	13.872	IGS-S03-2.625	IGS-Wall	3.848	17.72	<input type="checkbox"/>	
	GL01-Lower Ground	3.4	34.2	116.28	IGS-S02-2.1	IGS-Wall		116.28	<input type="checkbox"/>	
	GL-02-GF to Level 2	2.65	4.45	11.7925		IGS-Wall	3.7325	15.53	<input type="checkbox"/>	
									<input type="checkbox"/>	
				Result	Target					
				Wall-glazing U-Value (W/m².K)	2.06	2.00				
				Solar Admittance	0.125	0.130				
				Glazing Area (m²)		39.5365	Average Glazing U-Value (W/m².K)	2.56		
				Glazing to Façade Ratio		11.544	Average Glazing SHGC	0.26		
						77%	Average Wall R-Value (m².K/W)	2.80		
rth	GL01-Lower Ground	3.4	10	34		IGS-Wall	1.7	35.70	<input type="checkbox"/>	
	GL01-Lower Ground	2.8	1.31	3.668		IGS-Wall	12.572	16.24	<input type="checkbox"/>	
									<input type="checkbox"/>	
									<input type="checkbox"/>	
				Result	Target					
				Wall-glazing U-Value (W/m².K)	2.40	2.00				
				Solar Admittance	0.238	0.130				
				Glazing Area (m²)		68	Average Glazing U-Value (W/m².K)	2.50		
				Glazing to Façade Ratio		3.4	Average Glazing SHGC	0.25		
						95%	Average Wall R-Value (m².K/W)	2.80		
ast	GL01-Lower Ground	3.4	24.2	82.28	IGS-S05-11	IGS-Wall	2.72	85.00	<input type="checkbox"/>	
									<input type="checkbox"/>	
									<input type="checkbox"/>	
									<input type="checkbox"/>	
				Result	Target					
				Wall-glazing U-Value (W/m².K)	2.43	2.00				
				Solar Admittance	0.085	0.130				
				Glazing Area (m²)		82.28	Average Glazing U-Value (W/m².K)	2.50		
				Glazing to Façade Ratio		2.72	Average Glazing SHGC	0.25		
						97%	Average Wall R-Value (m².K/W)	2.80		

Reference Building

Include shading?

	Glazing to Façade Ratio	Wall U-Value (W/m².K)	Method 1 Glazing U-Value (W/m².K)	Shading Multiplier	SHGC	Method 2 Wall U-Value (W/m².K)	Method 2 Glazing U-Value (W/m².K)	SHGC
rth	81%	0.36	2.38	0.567	0.28			
ast	77%	0.36	2.48	0.623	0.27			
rth	95%	0.36	2.08	1.000	0.16			
ast	97%	0.36	2.05	0.350	0.38	0.36	2.21	0.00

Appendix 1 - Proposed Building Facade Report

Project Summary

Date
02/09/2021

Name
Li Huan

Company
Integrated Group Services

Position
ESD Leader

Building Name / Address
1-9 Allen Street & 777-781 Warrigal Road
Oakleigh, VIC

Building State
VIC

Climate Zone
Climate Zone 6 - Mild temperate

Building Classification
Class 9b - public halls, function rooms or the like

Stores Above Ground
6

Tool Version
1.2 (June 2020)

The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Aspects).

Compliant Solution =
 Non-Compliant Solution =

	North	East	Method 1 South	West	Method 2 All
Wall-glazing U-Value (W/m².K)	2.26	2.06	2.40	2.43	2.31
Solar Admittance	0.12	0.13	0.24	0.08	
AC Energy					62

Method 1

Solar Admittance

Method 2

AC Energy Value

Project Details

	North	East	South	West
Glazing Area (m²)	69.165	39.5365	68	82.28
Glazing to Façade Ratio	81%	77%	95%	97%
Glazing References	GL-02-GF to Level 2	GL01-Lower Ground GL-02-GF to Level 2	GL01-Lower Ground	GL01-Lower Ground
Glazing System Types	Fixed	Fixed	Fixed	Fixed
Glass Types	IGS Glazing - Communal	IGS Glazing - Commercial IGS Glazing - Communal	IGS Glazing - Commercial	IGS Glazing - Commercial
Frame Types	Aluminium	Aluminium	Aluminium	Aluminium
Average Glazing U-Value (W/m².K)	2.70	2.56	2.50	2.50
Average Glazing SHGC	0.27	0.26	0.25	0.25
Shading Systems	Device Horizontal	Device Horizontal	Device Horizontal	Device Horizontal
Wall Area (m²)	15.885	11.544	3.4	2.72
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	IGS-Thermal K05	IGS-Thermal K05	IGS-Thermal K05	IGS-Thermal K05
Wall Thickness	80	80	80	80
Average Wall R-value (m².K/W)	2.80	2.80	2.80	2.80
Solar Absorptance	0.6	0.6	0.6	0.6