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23 July 2026

[redacted]

ARCARE LOVELY BANKS
PROPOSED AGED CARE FACILITY
SUSTAINABLE MANAGEMENT PLAN (SMP) REPORT

As requested, we enclose a copy of the report on the Ecologically Sustainable Development for the above project.

We trust that the report provides sufficient information for your immediate purpose and we would be most pleased to further discuss any aspect upon your request.

Yours faithfully
BESTEC PTY LTD

[redacted]

MECHANICAL & ESD SERVICES ENGINEER

Encl.

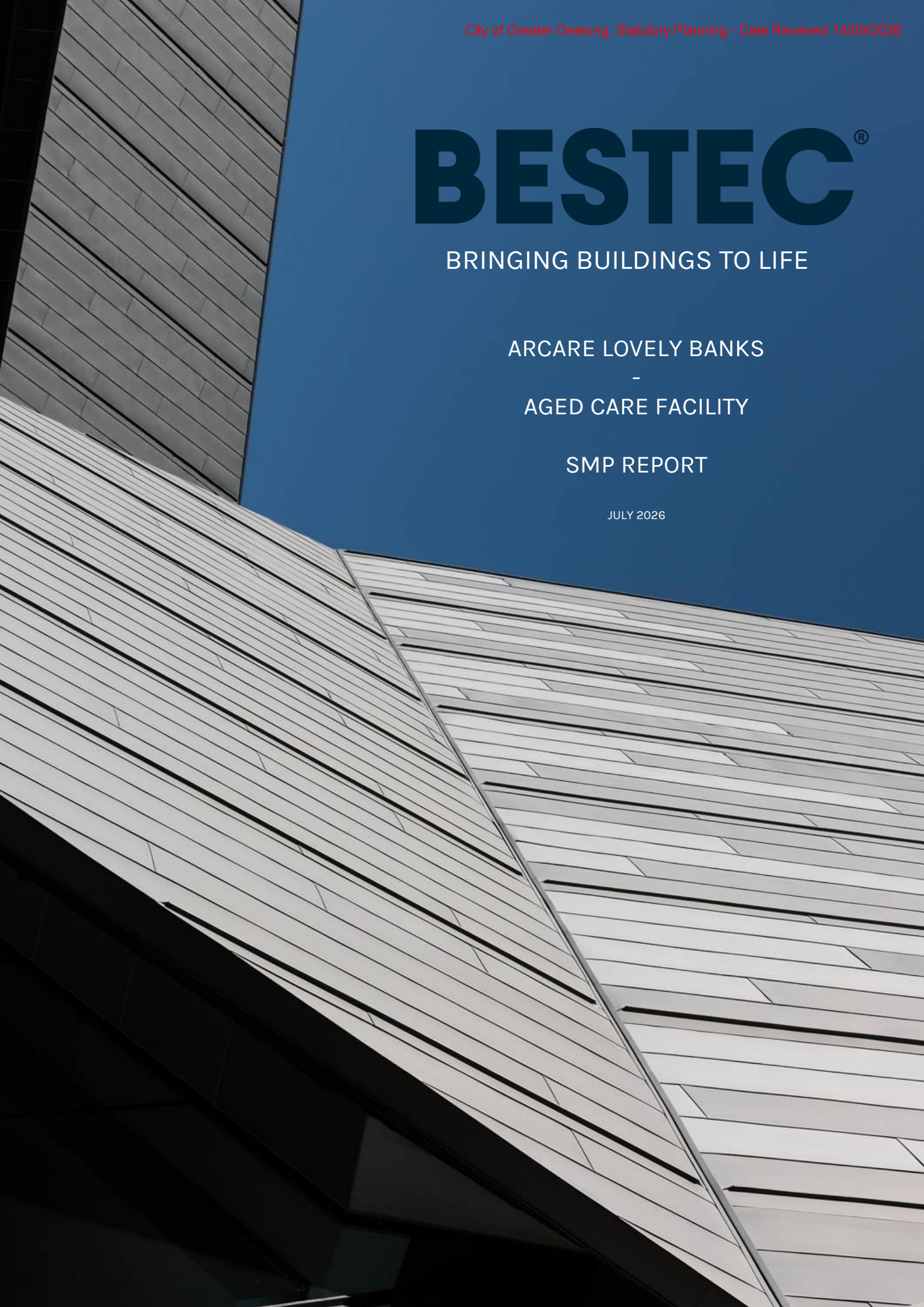
BESTEC®

BRINGING BUILDINGS TO LIFE

ARCARE LOVELY BANKS
-
AGED CARE FACILITY

SMP REPORT

JULY 2026



REPORT ISSUE REGISTER

REVISION	DATE	REVISION DESCRIPTION
01	20.04.2026	Draft Issue for Review
02	23.07.2026	Updated Response to Council RFI

CONTENTS

Introduction

BESTEC has been engaged by Knowles Group to provide advice in relation to environmentally sustainable development outcomes for the proposed aged care facility 215 & 217-227 Purnell Road, Lovely Banks.

This report contains a summary of:-

- Environmental objectives adopted for the proposal in line with the City of Greater Geelong Scheme (Clause 15.01-2L - Environmentally Sustainable Development).
- The process to be followed for various scales of buildings in the City of Greater Geelong is as follows (refer Figure 1 below):

Residential

Consider as relevant:

A Sustainable Design Assessment (including an assessment using BESS, STORM or other methods) for:

- 3 - 9 dwellings.
- A building for accommodation other than dwellings with a gross floor area between 100 square metres and 1500 square metres.

A Sustainability Management Plan (including an assessment using BESS, STORM, Green star, MUSIC or other methods) and a Green Travel Plan for:

- 10 or more dwellings.
- A building for accommodation other than dwellings with a gross floor area of 1500 square metres or more.

Non-residential

Consider as relevant:

A Sustainable Design Assessment (including an assessment using BESS, STORM, MUSIC or other methods) for:

- A non-residential building with a gross floor area between 300 square metres and 1500 square metres.
- An extension to an existing non-residential building creating between 300 square metres and 1500 square metres of additional gross floor area.

A Sustainability Management Plan (including an assessment using BESS, STORM, Green star, MUSIC or other methods) and a Green Travel Plan for:

- A non-residential building with a gross floor area of 1500 square metres or more.
- An extension to an existing non-residential building creating 1500 square metres or more of additional gross floor area.

Mixed use

Consider as relevant:

Applicable assessments or plans for the residential and non-residential components of the development.

Figure 1: Sustainable Design Assessment in the Planning Process (SDAPP)

To align early design decisions for the above development, with the City of Greater Geelong Planning Scheme, the following seven key Environmentally Sustainable Development objectives were focused on (as detailed within clause 15.01-2L of the City of Greater Geelong Planning Scheme);

Energy performance:-

Reduce both energy use and energy peak demand through design measures such as:

- Building orientation
- Shading to glazed surfaces
- Optimising glazing to exposed surfaces
- Inclusion of or space allocation for renewable technologies

Integrated Water Management:-

- Reduce total operating potable water use through appropriate design measures such as water efficient fixtures, appliances, equipment, irrigation and landscaping
- Encourage the appropriate use of alternative water sources (including greywater, rainwater and stormwater)
- Incorporate water sensitive urban design to improve the quality of stormwater runoff and reduce impacts on water systems and water bodies

Indoor Environmental Quality

- Achieve a healthy indoor environment quality, including thermal performance and access to fresh air and daylight, prioritising passive design over mechanical heating, ventilation, cooling and lighting
- Reduce indoor air pollutants by encouraging use of non-toxic materials
- Minimise noise levels and noise transfer within and between buildings associated external areas

Transport

- Design development to minimise car dependency; and promote the use of walking, cycling and public transport, in that order
- Promote the use of low emissions vehicle technologies and supporting infrastructure

Waste Management

- Promote waste avoidance, reuse and recycling during the design, construction and operation stages of development
- Encourage use of durable and reusable building materials
- Ensure sufficient space is allocated for future change in waste management needs, including (where possible) composing and green waste facilities

Urban Ecology

- Protect and enhance biodiversity by incorporating natural habitats and planting indigenous vegetation

- Reduce urban heat island effects through landscape design, water sensitive urban design and the retention and provision of canopy trees

- Encourage the provision of space for productive gardens, particularly in large residential developments

To show that the above objectives are satisfied, the analysis in this report is based upon an assessment using the following tools (which are considered appropriate for the scale and type of development proposed for this site):
- Built Environment Sustainability Scorecard (BESS)
- Better Buildings (formerly Speckel)
- NCC BCA 2022
- Model for Urban Stormwater Improvement Conceptualisation (MUSIC) software

Performance outcomes in the report are based on:
- Discussions and correspondence with the Design Team
- Architectural drawings

Site Description

The development site is a previously developed site. The surrounding area is primarily made up of residential dwellings. The total site area is approximately 12,243 m²; refer to Figure 2: Proposed site and surrounding locale below for details of the proposed site and its surrounding context:

Figure 2: Proposed site and surrounding locale

The site is located within the City of Greater Geelong.

The proposed development comprises of the following uses (refer Table 1 below):

Proposal summary for space types are as follows:

Type	Num OFF
Care Rooms	106

Table 1: Proposal summary

Sustainable Design Principles

The proposed development has been conceived with the objective of incorporating best practice sustainable design initiatives consistent with achieving a best practice standard.

Key environmentally sustainable design principles which have guided the building design are set out below:-

- Minimise building energy use and greenhouse emissions through passive design strategies.
- Manage solar access to enhance amenity and function throughout the year.
- Minimise greenhouse emissions associated with energy systems and energy supply.
- Achieve sustainable water cycle management through:-
    - Efficient use of potable water supplies.
    - Integrating stormwater treatment into the design of urban spaces and landscapes.
- Optimise indoor environmental quality in buildings and structures.
- Reduce the use of material resources during construction and throughout occupancy.
- Provide landscaping which enhances amenity and contributes to biodiversity.

The BESS tool has been used during the schematic design phase to benchmark the design as it has evolved with the objective of ensuring that a best practice standard is attained. BESS supports the 'Sustainable Design Assessment in the Planning Process' program, and is supported by many Victorian councils.

The BESS tool is based on a comprehensive ESD framework which assesses the performance of buildings in the following nine categories:-

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

The BESS assessment is based on individual credits which contribute to category scores. The overall score is shown as a percentage figure; this figure represents a percentage improvement over a benchmark project. A score of 50% and higher equates to 'best practice' and is an effective pass of the BESS tool, while a score of 70% and higher equates to BESS 'excellence' and exists as a higher benchmark in the tool.

Summary of Key ESD Initiatives

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

The following key ESD initiatives have been incorporated into the proposed development:-

- A reduction of heating, cooling and ventilation energy consumption when assessed against NCC BCA 2022 requirements. Demonstrated through a J1V3 assessment
- A solar PV system with a minimum capacity of 30kW
- Rainwater reuse
- High performance glazing throughout
- Energy efficient building services and appliances
- Water efficient fittings, fixtures and appliances
- Environmentally preferable internal finishes

An assessment of sustainable design outcomes of the proposed development has been undertaken utilising the BESS, NCC BCA 2022, and STORM benchmarking tools. The information presented in this report demonstrates:-

- The combination of design features and services initiatives meets the standards of the BESS sustainability assessment tool
- The proposal achieves a Council's Best Practice sustainable design standard
- The proposed development exceeds the minimum standard of building envelope energy efficiency as required by the National Construction Code (NCC) 2022
- The proposal exceeds the Council's Best Practice standard for stormwater quality

The results of the performance assessment are summarised below.

BESS

The proposed development has been designed to achieve a Council's best practice sustainable design standard.

A BESS assessment has been undertaken to confirm best practice is achieved by the proposed scheme and is summarised below. The overall combined target achieves the minimum requirement of 50% for the project.

Project Category	BESS Score
Management	57%
Integrated Water Management	71%

Operational Energy	50%
IEQ	58%
Transport	33%
Waste & Resource Recovery	66%
Urban Ecology	50%
Innovation	0%
BESS Score	**51%**

Please refer to Appendix A: BESS Report for further details relating to the BESS assessment.

J1V3 Alternative Solution Energy Simulation

A preliminary J1V3 assessment has been undertaken for the proposed development. The results are summarised in the table below:

	Reference Building	Proposed Building
Cooling	13,872	15,112
Heating	51,933	50,401
Fans	2,569	2,654
Lighting	99,198	99,198
Equipment	77,726	77,726
Total	245,298	245,091

Since the energy consumption of the proposed building is less than that of the reference building the proposed glazing specification is compliant with NCC BCA Section J requirements.

Please refer to Appendix B: J1V3 Energy Rating Report for further detail summarising the assessment comparing the reference building (reference services) against the proposed building (reference services).

Water Sensitive Urban Design (WSUD)

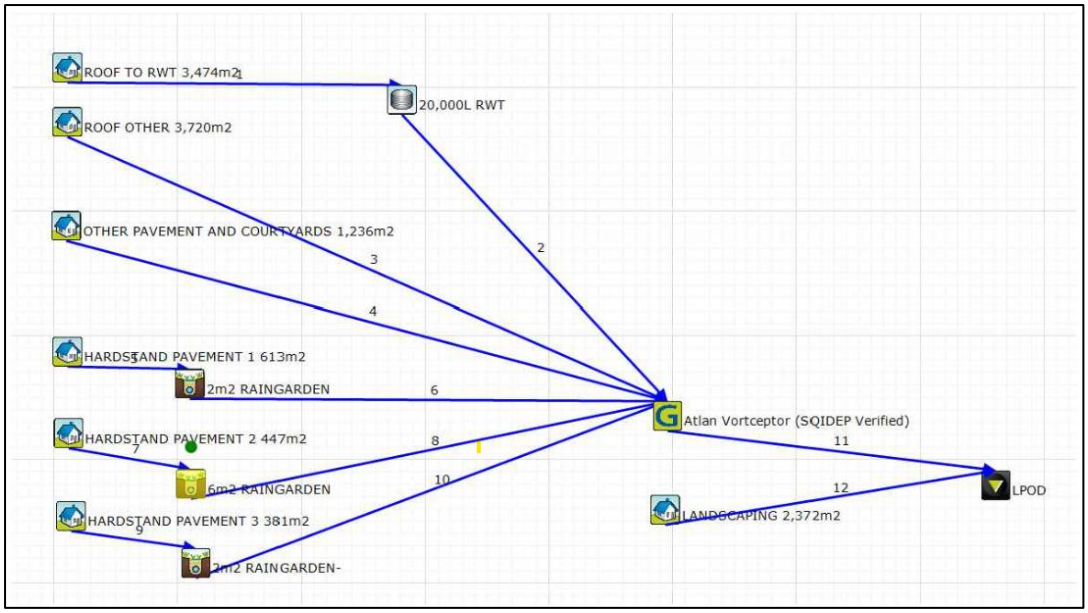
A Model for Urban Stormwater Improvement Conceptualisation (MUSIC) assessment has been undertaken by Lanigan Civil for the proposal to ensure and demonstrate that the objectives of City of Greater Geelong's Water Sensitive Urban Design requirements are met.

The Water Sensitive Urban Design (WSUD) proposal for the site is as follows:

- Treatment to be provided through
    - 20L Rainwater Tank
        - Connected to a minimum of 3,474 m² of roof area
        - Plumbed for irrigation of landscaped areas (min 500m²)
    - Raingardens:
        - Minimum of 10 m² of raingarden filtration surface area
        - Filtering a minimum of 1,441 m² of hardstand/pavement run off
    - 1 x Atlan Vortceptor Gross Pollutant Trap – SQIDEP Approved Device

Refer MUSIC output and pollution reductions summary below (refer Appendix C for proposed Catchment area markup):

	Sources	Residual Load	% Reduction
Flow (ML/yr)	4.32	3.962	8.301
Total Suspended Solids (kg/yr)	890.2	86.99	90.23
Total Phosphorus (kg/yr)	1.793	0.2843	84.15
Total Nitrogen (kg/yr)	12.43	5.723	53.97
Gross Pollutants (kg/yr)	174.6	3.869	97.78



It has been advised, that given the nature of the aged care facility, that rainwater reuse is not proposed internally due to the potential risks from an infection prevention and control (IPC) perspective. As such, it is proposed that rainwater reuse will only be used for landscape irrigation only. Please refer to the advice letter, within Appendix C, received from Infection Prevention Australia further detailing this.

Please refer to Appendix C: Stormwater Management Plan for WSUD report and Infection Prevention Australia further information.

Key Sustainability Design Criteria

1. Indoor Environmental Quality

Indoor environment quality is about creating healthy living spaces for building occupants. Key defining points which affect indoor environmental quality are as follows;

- Natural light
- External Views
- Air quality
- Ventilation
- Thermal Comfort
- Noise
- Occupant Control
- Materials

Issues	Design Responses
Daylighting	The proposed floor plan allows for well-balanced access to natural daylight. Through daylight modelling it is demonstrated that 34.7% of regular use floor area is achieving a Daylight Factor greater than 2%. Further to this, an assessment has been undertaken against the BESS daylighting requirements for bedrooms. It has been found that 92.7% of the care rooms satisfy the requirement of having a Daylight Factor no less than 0.5% to greater than 90% of its floor area. In order to satisfy the daylighting requirements, the following minimum visual light transmittance (VLT) of glazing is required: - VLT no less than 0.55 Refer Appendix D: Daylighting Report for further details regarding daylight modelling.
Ventilation	Through operable glazing, a minimum of 77% of regularly used spaces are effectively naturally ventilated throughout the aged care facility. Where mechanical ventilation is required for communal areas, outside air provided will be designed to achieve 50% higher O/A rates than required by AS 1668:2012, i.e. 11.25 L/s/person. Refer Appendix E: Natural Ventilation Markup detailing spaces compliant with the BESS natural ventilation requirements.
Shading	Effective shading has been proposed with 72% of all North, East and West facing glazing effectively shaded. This is achieved through a combination of horizontal overhangs, screens and existing building form providing shading to east and west facing glazing. Refer to Appendix F: Shading Markup further detailing the proposed shading strategy.
Internal Noise Levels	Excessive noise generated by neighbours, traffic and hard surfaces have been reduced by the inclusion of: - Specification of double-glazed units throughout the proposal - Acoustic insulation to internal and external walls

Hazardous Material and VOC	The proposal recognises the importance of designing with acknowledgment to occupant health and is committed to reducing internal air pollutant levels. The development will specify low VOC paints, adhesives, sealants and carpets as specified in Green Star Design & As Built v1.2 Table 13.1.1 and Table 13.1.2 (refer below). Formaldehyde in wood products will be minimised as per the emission limits dictated through Green Star Design & As Built v1.2 Table 13.2 (refer below), noting that this commitment excludes the following engineered wood products:- - formwork; - car park applications; and - non-engineered wood products such as milled timber

Table 13.1.1: Maximum TVOC Limits for Paints, Adhesives and Sealants

Product Category	Max TVOC content (g/L of ready-to-use product)
General purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	16
Trim, varnishes and wood stains	75
Primers, sealers and prep coats	65
One and two pack performance coatings for floors	140
Acoustic sealants, architectural sealant, waterproofing and membranes and sealant, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100

Table 13.1.2: Carpet Test Standards and TVOC Emissions Limits

Test Protocol	Limit
ASTM D5116 - Total VOC limit	0.5mg/m^2 per hour
ASTM D5116 - 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	0.5mg/m^2 per hour

Table 13.2: Formaldehyde Emission Limit Values for Engineered Wood Products

Test Protocol	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
*mg/m^{2}hr may also be represented as mg/m^2/hr.	

2. Energy Efficiency

Buildings contribute approximately 20% of global greenhouse gas emissions, and therefore represent a huge potential for energy and greenhouse gas emission reduction. Many design decisions can be made to increase a building's energy efficiency, key areas to consider include;

- Building envelope
- Internal layout and orientation
- Heating and cooling systems
- Lighting
- Renewable energy generation
- Water heaters
- Clothes drying facility
- Reducing peak demand

Issues	Design Responses
BCA Energy Efficiency and Thermal Envelope	A preliminary J1V3 assessment has been undertaken to ensure energy reduction targets are achievable during the design development stage of the project. The project proposes a reduction on the minimum standard of building envelope energy efficiency as required by the National Construction Code (NCC) 2022 In order to achieve the above energy reduction commitment, the development proposes the following glazing and thermal insulation values, noting the glazing performance will be reviewed during design development to ensure the commitment above is still achieved. <u>Glazing (the values below are total system, glass and frame, performance values):-</u> In order to achieve the Section J requirements stipulated within this report, the following preliminary glazing performance values are proposed: Glazing: - U-Value ≤ 2.7 - SHGC = 0.30 <u>Insulation:-</u> Proposed total construction R-Values as follows: - External walls throughout = Rt-1.4 (to be assessed against the requirements of NCC2022 requirements)

<table>
<tr><td></td><td>- Roof = Rt-5.0

<table>
<tr><td></td><td colspan="2">Energy Consumption (kWh/annum)</td></tr>
<tr><td></td><td>Ref. Building</td><td>Prop. Building</td></tr>
<tr><td>Cooling</td><td>13,872</td><td>15,112</td></tr>
<tr><td>Heating</td><td>51,933</td><td>50,401</td></tr>
<tr><td>Fans</td><td>2,569</td><td>2,654</td></tr>
<tr><td>Lighting</td><td>99,198</td><td>99,198</td></tr>
<tr><td>Equipment</td><td>77,726</td><td>77,726</td></tr>
<tr><td>Total</td><td>245,298</td><td>245,091</td></tr>
</table>

Appendix B – J1V3 Energy Rating Report t which further details this.

The above modelling and thermal performance specification will be updated and remodelled during the Building Permit stage of the project to ensure the Energy initiatives proposed within BESS are maintained.</td></tr>
<tr><td>Heating and Cooling System</td><td>Heating and cooling throughout the development will utilise reverse cycle air conditioning units with a capacity based on heat load assessments of individually conditioned zones

*Minimum EER/COP values as follows:
- Heating ≥ 2.75
- Cooling ≥ 3.3</td></tr>
<tr><td>Efficient Lighting</td><td>Generous well-controlled areas of windows will minimise the requirement for artificial lighting in habitable rooms during daylight hours.

Energy efficient lighting systems will be installed throughout the proposal including:
- LED lighting throughout care rooms.
- LED lights controlled with occupancy sensors and daylight sensors (as appropriate) to corridors and public areas.
- LED or compact fluorescent external lighting.
- An energy efficient carpark lighting system comprising T5 fluorescent or LED lamps with a minimum of 75% of basement carpark lighting to be controlled according to motion sensors. The remaining lights will act as a “skeleton” lighting circuit and will be permanently lit.

Throughout the development, internal lighting will be designed to ensure the maximum power illumination density complies with the NCC BCA 2022. As set out below:

- Care Rooms ≤ 5.0 W/m²
- Lounge Areas ≤ 4.5 W/m²
- Dining ≤ 14.0 W/m²
- Entry Lobby ≤ 9.0 W/m²
- Examination Rooms (Healthcare) ≤ 4.5 W/m²
- Corridors (Healthcare) ≤ 2.5 W/m²</td></tr>
<tr><td>Renewable Energy Generation</td><td>Installation of a minimum 30kW capacity solar PV system to be installed</td></tr>
</table>

	A system of this size is expected to have an annual energy production of approximately 37,332 kWh/annum, resulting in a total carbon emissions reduction of 37,496 kgCO_2-e/annum.
Energy Efficient Appliances	Appliances incorporated in the base building package to be selected with an understanding of power consumption and are to be within 1 star of best available.
Domestic Hot Water	Domestic hot water system will be provided by an efficient centralised gas hot water system within 1 star of the best available.

3. Water Efficiency

In order to conserve our precious water resources, our cities and our buildings need to carefully plan for water efficiency, and for water use that is 'fit-for-purpose'. Efficient use of water benefits both the consumer and the environment in such ways as lowering water bills, maintaining the garden through periods of low rainfall and discharging less sewage to the ocean. Keys areas of water efficiency to consider include;

- Rainwater tanks
- Water efficient fixtures and appliances
- Rainwater reuse
- Greywater reuse

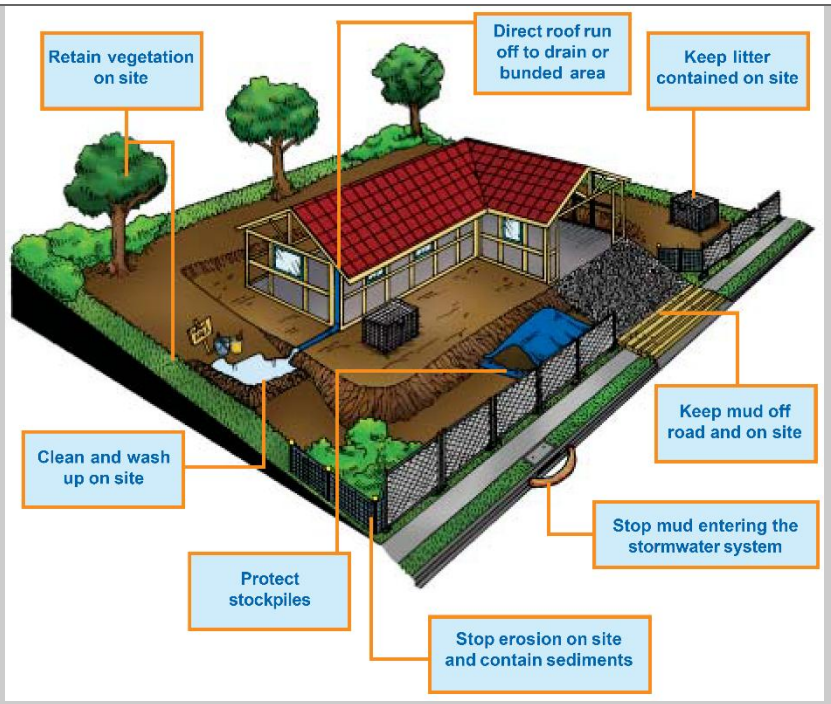
Issues	Design Responses
Water Efficient Fixtures	Water Efficient fittings and fixtures to be specified throughout the proposal, are to comply with the following minimum WELS ratings:- - WELS 4 Star toilets - WELS 5 Star kitchen taps - WELS 6 Star bathroom taps - WELS 4 Star showers ≥6.0 but less than or equal to ≤7.5 litres per minute)
Water Efficient Appliances	Appliances to be specified throughout the proposal, are to comply with the following minimum WELS ratings:- - WELS 5 Star dishwashers - WELS 5 Star clothes washing machines ***Please note:*** *5 Star dishwashers and 5 Star washing machines are proposed and have been modelled within the BESS assessment as all washing machines and dishwashers will form part of the base building construction. i.e. resident of the age care facility will not be providing their own dishwashers and clothes washing machines.*
Heat Rejection	To help reduce potable water consumption and eliminate the risk of legionnaires' disease, no water-based heat rejection systems are to be installed in the proposed development.

4. Storm Water Management

Stormwater quality is a significant issue in urban areas as the high levels of impervious surfaces transport stormwater quickly into the drainage system along with sediment and pollutants from the urban environment. Example strategies for improving stormwater are;

- Rainwater tanks
- Drought tolerant landscaping
- Rain garden

Issues	Design Responses
Stormwater Quality	Council's Best Practice standard for stormwater quality is achieved as demonstrated through the MUSIC assessment. Please refer to Appendix C: Stormwater Management Plan showing the required reductions are achieved as per the Environment Protection Authority (EPA) Vic guidelines.
Stormwater Quality	The Water Sensitive Urban Design (WSUD) proposal for the site is as follows: - Treatment to be provided through o 20L Rainwater Tank ▪ Connected to a minimum of 3,474 m² of roof area ▪ Plumbed for irrigation of landscaped areas (min 500m²) o Raingardens: ▪ Minimum of 10 m² of raingarden filtration surface area ▪ Filtering a minimum of 1,441 m² of hardstand/pavement run off o 1 x Atlan Vortceptor Gross Pollutant Trap – SQIDEP Approved Device Please refer to Appendix C: Stormwater Management Plan further proposed catchment areas.
Site Stormwater Management in the Construction Stage	Stormwater management in the construction stage will include measures which will be put in place to minimise the likelihood of contaminating stormwater discharge from the site as well as reduce the velocity of the flows generated from the building as it is being constructed. This will mean ensuring that buffer strips are in place, and the site will be kept clean from any loose rubbish. More information is available from "Keeping our Stormwater Clean – A Builder's Guide" by Melbourne Water, which can be downloaded here: https://www.melbournewater.com.au/sites/default/files/Keeping-our-stormwater-clean-builders-guidelines.pdf The diagram below is an illustration of the various objectives which assist in minimising the impacts of stormwater runoff during the construction phase. Typical pollutants that are generated from a construction site during rainfall events include:- - Dust - Silt - Mud - Gravel - Stockpiled materials - Spills/oils - Debris/litter



The builder will be required to review and incorporate the Keeping Our Stormwater Clean – A Builder's Guide into the Construction Management Plan (CMP).

5. Building Materials

A building's life cycle impact is largely influenced by material selection, including embodied energy of the material, longevity/durability, source, ability to be reused/recycled and the toxicity of material components. Key design considerations include;

- Embodied energy
- Retaining and re-using existing materials
- Specifying recycled materials
- Sustainably sourced timber
- Obtaining third party certification
- Life cycle assessment

Issues	Design Responses
Hazardous Material and VOC	Refer to IEQ section for details on commitments for toxic material reduction.
Responsible Building Materials & Reductions in Embodied Carbon	All timber used will be certified sustainable timber by credible source, FSC or similar.
Environmentally Preferable Materials	All HVAC refrigerants and thermal insulation products will have an Ozone Depleting Potential (ODP) of zero.

6. Transport

Many transport impacts are inherent to a building's location, such as the distance from employment, shops, services, schools and recreation. Promoting environmentally friendly transport is incorporated into a building's design through the following key design decisions:

- Reducing onsite car parking
- Fuel efficient transport
- Car share
- Bicycle facilities and parking
- Showers and lockers for staff

Issues	Design Responses
Bicycle Parking Facilities	The following provisions for bicycle parking has been provided onsite:- - 2 bicycle parking spaces for staff - 2 bicycle parking spaces for visitors *Note: There are no planning requirements regarding bicycle parking for a residential aged care facility. As such, in accordance with BESS requirements for staff and visitor bicycle parking where there is no planning scheme requirement, the above is proposed.*

7. Waste Management

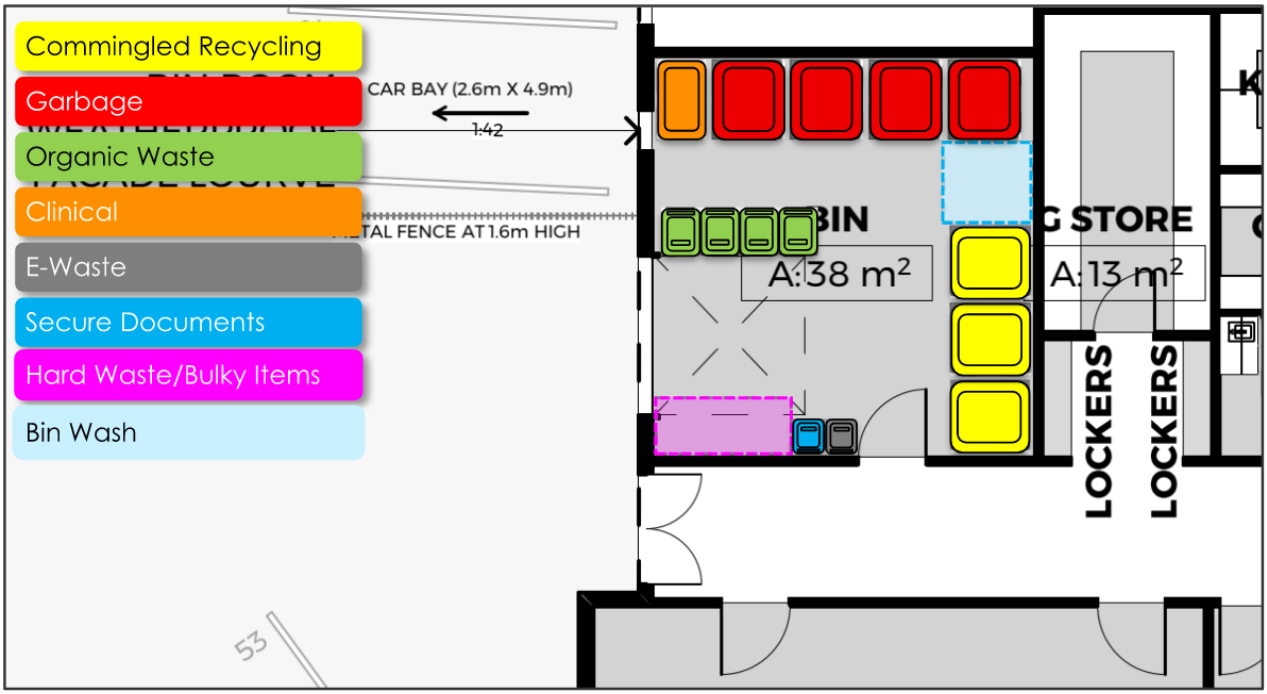
Up to 40% of the waste going to Australia's landfills is related to construction and demolition of buildings and even more waste is produced during the occupancy of the building. Key design considerations that minimise the waste going to Australia's landfills are listed below;

- Construction waste management
- What should be recycled and reused?
- Operational waste
- Stormwater management during construction

Issues	Design Responses
Construction Waste Management	A target recycling rate of 80% of construction and demolition waste will be adopted for the construction phase of the development to minimise the volume of waste to landfill. This will be achieved by the development of a comprehensive waste minimisation strategy including:- - Separation of all commercially viable recyclable waste streams - Training in waste minimisation for all site staff and contractors to form part of sit induction training - Record keeping of landfill waste and recyclable stream volumes to track performance against the 80% recyclable target This commitment will be clearly stipulated within the waste contractors contract documentation.
Storage Spaces for Recycling	Sufficient space for waste bins for both recycling and general waste will be provided with clear access for all required parties, refer proposed bin room layout below and Appendix F: Waste Management Plan Excerpt for further information.

Food and Garden Waste	Facilities to be provided on-site for both food and garden waste. This is achieved through appropriate space in bin area. Separate bins for different waste streams and waste collection and processing agreements in place with private contractors. Refer proposed bin room layout below and Appendix F: Waste Management Plan Excerpt for further information.

Bin Room Layout:



8. Urban Ecology

Urban ecology is about promoting and protecting ecosystems and biodiversity. Urban and agricultural development has caused displacement of species and degradation of natural environments – therefore in many established urban areas the aim is to increase biodiversity. The many benefits from proper ecosystem management include;

- Environmental benefits
- Health and well being
- Economic benefits
- Communal (ie. providing privacy through the use of vegetation etc.)
- Landscaping for seasonal heat control
- Landscaping to reduce glare and ground temperature
- Landscaping to reduce wind penetration and capture summer breeze

Issues	Design Responses
Heat Island Effect	Through the inclusion of vegetation throughout the development in conjunction with the specification of a light coloured roof. It is anticipated the development will not contribute to the Urban Heat Island Effect and its associated negative impacts to surrounding dwellings.
Vegetation	It is proposed that a minimum of 20% of the site area be landscaped. Please refer to landscape drawings for extent of proposed landscaped areas.

9. Ongoing Building and Site Management

Using environmentally sustainable design principles, buildings have a much greater potential to lessen their impact on the environment. Such initiatives include;

- An early commitment to environmental targets
- A demolition and construction waste minimization strategy
- An operational waste separation strategy
- Regular tuning of building services
- Preparation of a Building Users Guide

Issues	Design Responses
Commissioning and Maintenance	All energy and water management systems set out in this report will be commissioned in accordance with the manufacturer's specifications and relevant standards. Ongoing maintenance and regular monitoring of building systems will be undertaken by building management staff to ensure effective and efficient ongoing operation of all centralised building systems set out in this report including the rainwater harvesting system.
Metering	Meters will be installed to provide information to the building owner in relation to centralised building systems and common area energy consumption: - Common area lighting - HVAC - Basement Lighting and Ventilation - Solar PV
Building Users Guide	A Building Users Guide will be prepared and will provide details regarding the everyday operation of the building to enable building users to minimise energy and water consumption and optimise internal comfort and amenity.

Building Users Guide

As is the case with any technical product, a users guide or instruction manual should be provided with it. A building is no different. A 'Building Users Guide' (BUG) should be provided, especially in large commercial and residential developments. It can be provided in the form of a booklet, even in combination with up to date information on a website, or on digital screens in a building's entrance area. The provision of a BUG can substantially improve the building's environmental performance. It will assist:

- property managers in operating the building asset efficiently
- contractors to understand how to service and maintain particular building systems
- occupants to understand their ability to influence a building's internal amenities without minimising its overall environmental performance.

A BUG should be written in a non-technical style and outline a development's:

- key environmental strategies and targets
- concept and implementation of passive design strategies (e.g. use of flexible shading and night ventilation)
- building services controls (e.g. heating, cooling and hot water systems)
- potable and non-potable water supply
- onsite energy generation
- sustainable material choices
- pro-active maintenance regime
- fine-tuning strategy, especially for complex HVAC systems
- sustainable transport opportunities (including bicycle parking provisions, end of trip facilities and availability of public transport)
- waste minimisation and separation policies
- provision of sub-metering and the interpretation of the metering data
- environmental monitoring or participation in environmental reporting schemes
- building management and other building supply contacts.

Smaller developments should consider operational needs when including building services such as solar hot water or photo-voltaic panels and flexible shading elements or automated windows. While these installations will drastically improve the performance of a building, only regular maintenance will ensure long and efficient service.

Implementation Plan

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

- Architect
- Thermal Performance Assessor
- Building Services Consultant
- Fire Services Engineer
- Structural Engineer
- Waste Management Consultant

An implementation schedule is set out in the table below:

#	Initiative	Requirement	Responsibility	Stage
1	Coordination of Initiatives	Full implementation	Project Manager	All
2	Window Glazing	To be specified according to energy ratings & BCA	Thermal Performance Assessor	Design Development
3	Heating & Cooling	Specification of units in accordance with nominated MEPS star rating and/or COP/EER	Building Services Engineer	Design Development
4	Energy Efficient Appliances	Specification of nominated base building appliances	Architect	Design Development
5	Lighting	Specification of nominated energy efficient lighting types and automated controls	Architect	Design Development
6	Domestic Hot Water	Specification an efficient gas hot water system within 1 star of the best available	Building Services Engineer	Design Development
7	Water Efficient Fixtures and Fittings	Specify fixtures in accordance with nominated WELS star ratings	Architect	Design Development
8	Operational Waste Management	Provide layout waste storage areas	Waste Management Consultant	Design Development
9	Construction Waste Minimisation	Prepare construction waste minimisation plan, 80% commitment	Builder	Design Development
10	Environmentally Preferable Materials	Specify materials in accordance with nominated schedule (Low VOC paints, sustainable timber, low solar absorptance roof colour etc).	Architect / Builder	Design Development
11	Metering	Specify meters in accordance with nominated schedule	Building Services Engineer	Design Development
12	Solar PV	Specify solar PV system in accordance with this requirements set out within this report	Building Services Engineer	Design Development

13	Site Stormwater Management in the Construction Stage	Manage pollutant runoff generated during construction into the stormwater system	Builder	Construction
14	Commissioning & Maintenance	Commission & tune all equipment in accordance with performance standards & targets	Builder	Construction/Occupancy
15	Building User's Guide	Prepare a building user's guide for residents	Owner's Corporation, Architect, Building Services Engineers, ESD Consultant	Construction/Occupancy

Conclusion

This report summarises the requirements set out by City of Greater Geelong for Sustainability Initiatives and demonstrates how we intend to meet these requirements with the project's design, construction and operation.

To demonstrate that the intent of the key sustainability initiatives has been met we have used NCC Section J J1V3 Energy Efficiency modelling and BESS.

The design both meets and exceeds the benchmarks set out by the City of Greater Geelong for environmentally sustainable development.

Appendices

Appendix A: BESS Report

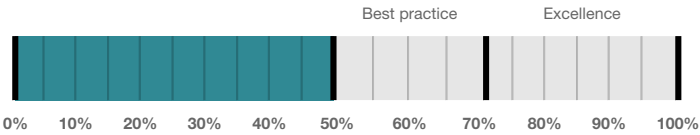
BESS Buildings Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at Purnell Rd Lovely Banks Victoria 3213. The BESS report and accompanying documents and evidence are submitted in response to the requirement for a Sustainable Design Assessment or Sustainability Management Plan at Greater Geelong City Council.

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

Your BESS Score

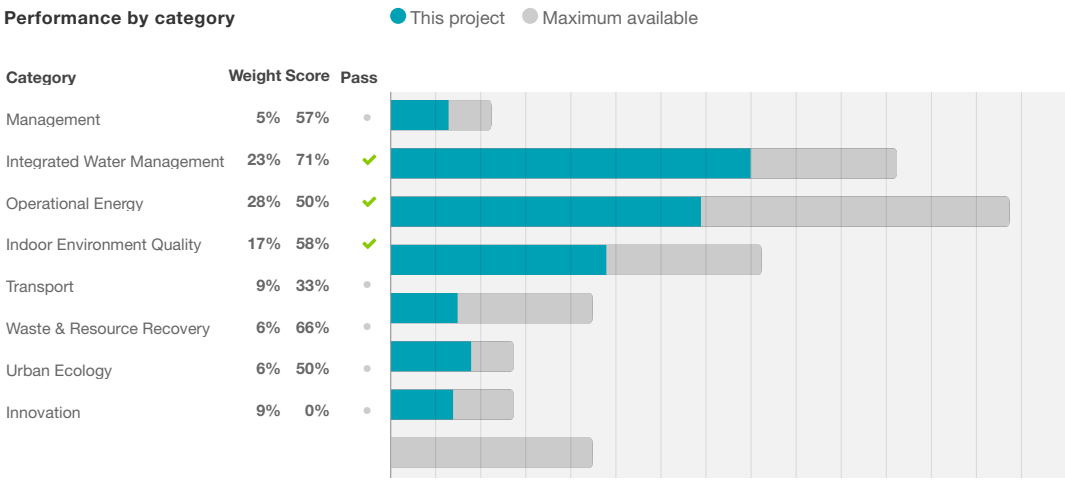


51%

Project details

Name	Arcare Lovely Banks
Address	Purnell Rd Lovely Banks Victoria 3213
Project ID	B48ADEF6-R2
BESS Version	BESS-10
Date	23 July 2026
Software version	2.3.0-B.655
Site type	Non-residential development
Account	[redacted]
Application no.	
Site area	12,243 m²
Building floor area	6,160 m²

Performance by category



Buildings

Name	Height	Footprint	% of total footprint
Aged Care Facility	1	6,160 m²	100%

Dwellings & Non Res Spaces

Non-Res Spaces

Name	Quantity	Area	Building	% of total area
Public building				
Arcare Lovely Banks	1	6,160 m²	Aged Care Facility	100%
Total	**1**	**6,160 m²**	**100%**	

Supporting Evidence

Shown on Floor Plans

Credit	Requirement	Response	Status
Management 3.3	Annotation: Sub-meters to be provided to all major common area services (list each)	To be printed Refer ESD notes table on drawing TP.100	✔
Integrated Water Management 2.1	Location of any stormwater management systems (rainwater tanks, raingardens, buffer strips)	To be printed Refer ESD notes table on drawing TP.100 for minimum rainwater tank capacity and raingarden area. Refer drawing TP.100 for indicative proposed locations. Also refer to WSUD proposal drawing number LC3230-SMP2.	✔
Operational Energy 4.2	Location and size of solar photovoltaic system	To be printed Refer ESD notes table on drawing TP.100 for minimum proposed solar capacity. Refer drawing TP.101 for indicative locations.	✔
Transport 1.4	Location of non-residential bicycle parking spaces	To be printed Refer drawing TP.100 for locations of bicycle parking spaces.	✔
Transport 1.5	Location of non-residential visitor bicycle parking spaces	To be printed Refer drawing TP.100 for locations of bicycle parking spaces.	✔
Waste & Resource Recovery 2.1	Location of food and garden waste facilities	To be printed Refer proposed Bin Room Layout on drawing TP.100	✔
Waste & Resource Recovery 2.2	Location of recycling facilities	To be printed Refer proposed Bin Room Layout on drawing TP.100	✔

Credit	Requirement	Response	Status
Urban Ecology 1.1	Location and size of communal spaces	To be printed Communal space locations and size shown on drawing TP.100. These spaces are in the form of lounges, dinging, activity, gym etc	✔
Urban Ecology 2.1	Location and size of vegetated areas	To be printed Refer drawing Tp.100 for proposed vegetated areas. Further details can be found on the landscape architects drawings.	✔

Supporting Documentation

Credit	Requirement	Response	Status
Management 2.3a	Section J glazing assessment	To be printed Refer Appendix B of ESD Report	✔
Management 2.3b	Preliminary modelling report	To be printed Refer Appendix B of ESD Report	✔
Integrated Water Management 2.1	STORM report or MUSIC model	To be printed Refer Appendix C of ESD Report	✔
Operational Energy 1.1	Energy Report showing calculations of reference case and proposed buildings	To be printed Refer Appendix B of ESD Report	✔
Operational Energy 3.7	Average lighting power density and lighting type(s) to be used	To be printed Refer Energy Section of ESD Report	✔
Operational Energy 4.2	Specifications of the solar photovoltaic system(s)	To be printed Refer Energy Section of ESD Report	✔
Indoor Environment Quality 1.4	A short report detailing assumptions used and results achieved.	To be printed Refer Appendix D of ESD Report	✔

Credit summary

Management Overall contribution 4.5%

57%

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

IWM Overall contribution 22.5%

71% ✔ Pass

1.1 Potable Water Use	49%	✔ Achieved
2.1 Stormwater Treatment	100%	✔ Achieved
3.1 Water Efficient Landscaping	0%	
4.1 Building Systems Water Use	0%	

Operational Energy Overall contribution 27.5%

	Minimum required 50%	50%	✔ Pass
1.1 Thermal Performance Rating - Non-Residential		13%	
2.1 Greenhouse Gas Emissions		100%	
2.2 Peak Demand		0%	
2.6 Electrification		0%	⊘ Disabled
	Credit is available when the energy supply is set to all-electric (no gas or wood).		
2.7 Energy consumption		100%	
3.1 Carpark Ventilation		N/A	✣ Scoped Out
			external carpark
3.2 Hot Water - Non-Residential		100%	
3.7 Internal Lighting - Non-Residential		100%	
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A	✣ Scoped Out
			No cogeneration or trigeneration system in use.
4.2 Renewable Energy Systems - Solar		100%	
4.4 Renewable Energy Systems - Other		N/A	✣ Scoped Out
			No other (non-solar PV) renewable energy is in use.

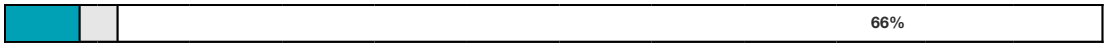
IEQ Overall contribution 16.5%

	Minimum required 50%	58%	✔ Pass
1.4 Daylight Access - Non-Residential		34%	✔ Achieved
2.3 Ventilation - Non-Residential		73%	✔ Achieved
3.4 Thermal comfort - Shading - Non-Residential		81%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%	
4.1 Air Quality - Non-Residential		100%	

Transport Overall contribution 9.0%

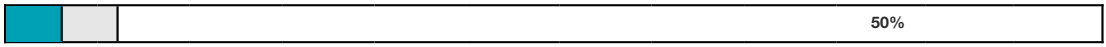
	33%
1.4 Bicycle Parking - Non-Residential	100%
1.5 Bicycle Parking - Non-Residential Visitor	100%
1.6 End of Trip Facilities - Non-Residential	0%
2.1 Electric Vehicle Infrastructure	0%
2.2 Car Share Scheme	0%
2.3 Motorbikes / Mopeds	0%

Waste & Resource Recovery Overall contribution 5.5%



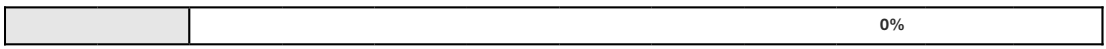
1.1 Construction Waste - Building Re-Use	0%
2.1 Operational Waste - Food & Garden Waste	100%
2.2 Operational Waste - Convenience of Recycling	100%

Urban Ecology Overall contribution 5.5%



1.1 Communal Spaces	100%
2.1 Vegetation	75%
2.2 Green Roofs	0%
2.3 Green Walls and Facades	0%
3.2 Food Production - Non-Residential	0%

Innovation Overall contribution 9.0%



1.1 Innovation	0%

Credit breakdown

Management Overall contribution 4.5%

57%

1.1 Pre-Application Meeting	0%
Score Contribution	This credit contributes 42.9% towards the category score.
Criteria	Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?
Question	Criteria Achieved ?
Project	No
2.3 Thermal Performance Modelling - Non-Residential	100%
Score Contribution	This credit contributes 28.6% towards the category score.
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2022 Section J4D6?
Question	Criteria Achieved ?
Public building	Yes
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2022 Section J (Energy Efficiency), NABERS or Green Star?
Question	Criteria Achieved ?
Public building	Yes
3.2 Metering - Non-Residential	N/A Scoped Out
	owner operated
This credit was scoped out	owner operated
3.3 Metering - Common Areas	100%
Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Have all major common area services been separately submetered?
Question	Criteria Achieved ?
Public building	Yes
4.1 Building Users Guide	100%
Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Will a building users guide be produced and issued to occupants?
Question	Criteria Achieved ?
Project	Yes

IWM Overall contribution 22.5%

		71%	✔ Pass

Do you have a reticulated third pipe or an on-site water recycling system?:	No
Are you installing a swimming pool?:	No

Stormwater profile	
Which stormwater modelling software are you using?:	MUSIC or other modelling software
Blue Factor score achieved?:	-
Flow:	8 %
Total Suspended Solids:	90 %
Total Phosphorus:	84 %
Total Nitrogen:	97 %

Rainwater tank profile	
What is the total roof area connected to the rainwater tank?:	
RW Tank	3,474 m^2
	-
Tank Size:	
RW Tank	20,000 Litres
	-
Irrigation area connected to tank:	
RW Tank	500 m^2
	-
Is connected irrigation area a water efficient garden?:	
RW Tank	No
	-
Other external water demand connected to tank?:	
RW Tank	-
	-

Fixtures, fittings & connections profile	
Building:	Aged Care Facility
Showerhead:	4 Star WELS (>= 6.0 but <= 7.5)
Bath:	Scope out
Kitchen Taps:	>= 5 Star WELS rating
Bathroom Taps:	>= 6 Star WELS rating
Dishwashers:	>= 5 Star WELS rating
WC:	>= 4 Star WELS rating
Urinals:	Scope out
Washing Machine Water Efficiency:	>= 5 Star WELS rating
Which non-potable water source is the dwelling/space connected to?:	-
Non-potable water source connected to Toilets:	No

Non-potable water source connected to Laundry (washing machine):	No
Non-potable water source connected to Hot Water System:	No

1.1 Potable Water Use	49%	✔ Achieved

Score Contribution	This credit contributes 31.2% 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	27849 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	19245 kL
Output	Proposed (including rainwater and recycled water use)
Project	18951 kL
Output	% Reduction in Potable Water Consumption
Project	31 %
Output	% of connected demand met by rainwater
Project	99 %
Output	How often does the tank overflow?
Project	Very Often
Output	Opportunity for additional rainwater connection
Project	11384 kL

2.1 Stormwater Treatment	100%	✔ Achieved

Score Contribution	This credit contributes 56.2% towards the category score.
Criteria	Has best practice stormwater management been demonstrated?
Output	Flow
Project	8 %
Output	Min Suspended Solids reduction
Project	80 %
Output	Total Suspended Solids reduction
Project	90 %
Output	Min Phosphorus reduction
Project	45 %
Output	Total Phosphorus reduction
Project	84 %
Output	Min Nitrogen reduction
Project	45 %
Output	Total Nitrogen reduction
Project	97 %

3.1 Water Efficient Landscaping	0%

Score Contribution	This credit contributes 6.2% towards the category score.
Criteria	Will water efficient landscaping be installed?
Question	Criteria Achieved ?
Project	No

4.1 Building Systems Water Use	0%

Score Contribution	This credit contributes 6.2% towards the category score.
Criteria	Where applicable, have measures been taken to reduce potable water consumption by >80% in the buildings air-conditioning chillers and when testing fire safety systems?
Question	Criteria Achieved ?
Project	No

Operational Energy Overall contribution 27.5%

		Minimum required 50%	50% ✔ Pass

Project profile	
Use the BESS Deem to Satisfy (DtS) method for Non-residential spaces?:	No
Are you installing any renewable energy system(s) (other than solar photovoltaic)?:	No
Energy Supply:	Electricity & Natural Gas
Are you installing a cogeneration or trigeneration system?:	No
Solar Photovoltaic system profile	
System Size (lesser of inverter and panel capacity): Solar PV	30.0 kW peak
Orientation (which way is the system facing)?: Solar PV	North
Inclination (angle from horizontal): Solar PV	10.0 Angle (degrees)
Non-residential buildings profile	
Heating, Cooling & Comfort Ventilation Electricity Reference fabric and Reference services:	68,374 kWh
Heating, Cooling & Comfort Ventilation Electricity Proposed fabric and Reference services:	68,167 kWh
Heating, Cooling & Comfort Ventilation Electricity Proposed fabric and Proposed services:	68,167 kWh
Heating - Gas - Reference fabric and services:	0.0 MJ
Heating - Gas - Proposed fabric and Reference services:	0.0 MJ
Heating Gas Proposed fabric & Proposed services:	0.0 MJ
Heating Wood Reference fabric and Reference services:	0.0 MJ
Heating Wood Proposed fabric and Reference services:	0.0 MJ
Heating Wood Proposed fabric and Proposed services:	0.0 MJ
Hot Water Electricity - Reference:	0.0 kWh
Hot Water Electricity - Proposed:	0.0 kWh
Hot Water Gas - Reference:	100,000 MJ
Hot Water Gas - Proposed:	100,000 MJ

Lighting Electricity - Reference:	99,198 kWh
Lighting Electricity - Proposed:	99,198 kWh
Peak Thermal Cooling Load Reference:	0.0 kW
Peak Thermal Cooling Load Proposed:	0.0 kW

1.1 Thermal Performance Rating - Non-Residential 13%

Score Contribution	This credit contributes 36.4% towards the category score.
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC2022 Section J)?
Output	Total Improvement
Public building	< 1 %

2.1 Greenhouse Gas Emissions 100%

Score Contribution	This credit contributes 9.1% towards the category score.
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?
Output	Reference Building with Reference Services (BCA only)
Public building	58,447 kg CO2
Output	Proposed Building with Proposed Services (Actual Building)
Public building	58,286 kg CO2
Output	% Reduction in GHG Emissions
Public building	< 1 %

2.2 Peak Demand 0%

Score Contribution	This credit contributes 4.5% towards the category score.
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?

2.6 Electrification 0% ⊘ Disabled

Credit is available when the energy supply is set to all-electric (no gas or wood).

This credit is disabled	Credit is available when the energy supply is set to all-electric (no gas or wood).

2.7 Energy consumption 100%

Score Contribution	This credit contributes 18.2% towards the category score.
Criteria	What is the % reduction in annual energy consumption against the benchmark?
Output	Reference Building with Reference Services (BCA only)
Public building	346,146 MJ
Output	Proposed Building with Proposed Services (Actual Building)
Public building	345,401 MJ
Output	% Reduction in total energy
Public building	< 1 %

3.1 Carpark Ventilation N/A ✥ Scoped Out

external carpark

This credit was scoped out	external carpark

3.2 Hot Water - Non-Residential	100%
Score Contribution	This credit contributes 4.5% towards the category score.
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?
Output	Reference
Public building	100,000 MJ
Output	Proposed
Public building	100,000 MJ
Output	Improvement
Public building	0 %

3.7 Internal Lighting - Non-Residential	100%
Score Contribution	This credit contributes 9.1% towards the category score.
Criteria	Does the maximum illumination power density (W/m2) in at least 90% of the area of the relevant building class meet the requirements in Table J7D3a of the NCC 2022 Vol 1?
Question	Criteria Achieved ?
Public building	Yes

4.1 Combined Heat and Power (cogeneration / trigeneration)	N/A Scoped Out
	No cogeneration or trigeneration system in use.

This credit was scoped out	No cogeneration or trigeneration system in use.

4.2 Renewable Energy Systems - Solar	100%
Score Contribution	This credit contributes 4.5% towards the category score.
Criteria	What % of the estimated energy consumption of the building class it supplies does the solar power system provide?
Output	Solar Power - Energy Generation per year
Public building	36,355 kWh
Output	% of Building's Energy
Public building	18 %

4.4 Renewable Energy Systems - Other	N/A Scoped Out
	No other (non-solar PV) renewable energy is in use.

This credit was scoped out	No other (non-solar PV) renewable energy is in use.

IEQ Overall contribution 16.5%

	Minimum required 50%	58%	✔ Pass

1.4 Daylight Access - Non-Residential		34%	✔ Achieved
Score Contribution	This credit contributes 35.3% towards the category score.		
Criteria	What % of the nominated floor area has at least 2% daylight factor?		
Question	Percentage Achieved?		
Public building	34 %		
2.3 Ventilation - Non-Residential		73%	✔ Achieved
Score Contribution	This credit contributes 35.3% towards the category score.		
Criteria	What % of the regular use areas are effectively naturally ventilated?		
Question	Percentage Achieved?		
Public building	77 %		
Criteria	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2:2012?		
Question	Percentage Achieved?		
Public building	50 %		
Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?		
Question	Value		
Public building	0 ppm		
3.4 Thermal comfort - Shading - Non-Residential		81%	
Score Contribution	This credit contributes 17.6% 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	72 %		
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%	
Score Contribution	This credit contributes 5.9% towards the category score.		
Criteria	What percentage of regular use areas in tenancies have ceiling fans?		
Question	Percentage Achieved?		
Public building	0 %		
4.1 Air Quality - Non-Residential		100%	
Score Contribution	This credit contributes 5.9% towards the category score.		

Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Public building	Yes

Criteria	Does all carpet meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Public building	Yes

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

Transport Overall contribution 9.0%

			33%

1.4 Bicycle Parking - Non-Residential		100%
Score Contribution	This credit contributes 22.2% 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	Yes	
Question	Bicycle Spaces Provided ?	
Public building	2	
1.5 Bicycle Parking - Non-Residential Visitor		100%
Score Contribution	This credit contributes 11.1% 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	Yes	
Question	Bicycle Spaces Provided ?	
Public building	2	
1.6 End of Trip Facilities - Non-Residential		0%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Where adequate bicycle parking has been provided. Is there also: * 1 shower for the first 5 employee bicycle spaces plus 1 to each 10 employee bicycles spaces thereafter, * changing facilities adjacent to showers, and * one secure locker per employee bicycle space in the vicinity of the changing / shower facilities?	
Question	Number of showers provided ?	
Public building	-	
Question	Number of lockers provided ?	
Public building	-	
Output	Min Showers Required	
Public building	1	
Output	Min Lockers Required	
Public building	2	
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 22.2% 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 & Resource Recovery **Overall contribution 5.5%**

66%

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

Urban Ecology Overall contribution 5.5%

50%

1.1 Communal Spaces	100%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Is there at least the following amount of common space measured in square meters : * 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
Public building	291 m²
Output	Minimum Common Space Required
Public building	291 m²

2.1 Vegetation	75%
Score Contribution	This credit contributes 50% 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	20 %

2.2 Green Roofs	0%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Does the development incorporate a green roof?
Question	Criteria Achieved ?
Project	No

2.3 Green Walls and Facades	0%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Does the development incorporate a green wall or green façade?
Question	Criteria Achieved ?
Project	No

3.2 Food Production - Non-Residential	0%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	What area of space per occupant is dedicated to food production?
Question	Food Production Area
Public building	0.0 m²
Output	Min Food Production Area
Public building	154 m²

Innovation Overall contribution 9.0%

	0%

1.1 Innovation		0%
Score Contribution	This credit contributes 100% 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.

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Appendix B: J1V3 Energy Rating Report

BESTEC

J1V3 Building Assessment

National Construction Code 2022 - Volume 1

Project	Arcare Lovely Banks
Address	217 Purnell Rd, Lovely Banks VIC 3213, Australia (38.07° S, 144.34° E)
Date	2026-07-21, 08:54 AM
Author	[redacted]
Scope	National Construction Code 2022
Performance Requirements	J1P1 Energy Use
Assessment Process	A2G2 Performance Solution Clause (2)(b)(i)
Building Class	9C
Climate Zone	6
Storeys	1
Floor to Floor Height	2700 mm

Using Better Building

Better Building provides various calculations in line with the National Construction Code 2022 - Volume 1 - Section J Energy Efficiency. These calculations are tested in line with all applicable NCC equations or NCC referenced primary or secondary documents, for them to represent an accurate Performance Solution against the Performance Requirements - J1P1 Energy Use. A Performance Solution must be shown to comply with the relevant Performance Requirements through one or a combination of Assessment Methods. Better Building is a valid Assessment Method by comparison with the Deemed-to-Satisfy Provisions of each relevant area.

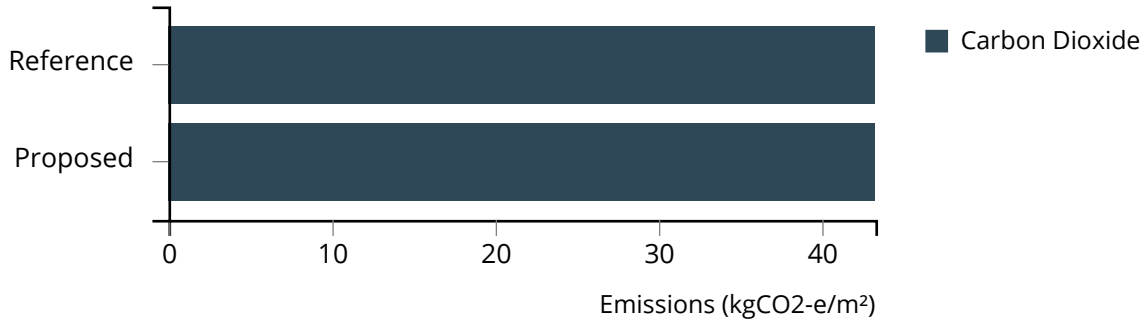
Results

The National Construction Code (NCC) specifies minimum performance standards for the energy efficiency of buildings through the Building Code of Australia (BCA) Volume 1, Section J. To enable flexibility in the architectural design of the building, a Performance Solution has been used to comply with the Performance Requirement - J1P1.

The Assessment Method, 'J1V3 Verification using a reference building' has been used and is an Alternative Solution for the Building Fabric only. As such, a Proposed Building with the proposed fabric has been modelled as part of this approach, to compare against the Reference Building services.

Building Emissions

To meet the acceptance criteria, annual Supplied Energy emissions must be less than **43.29** kgCO2-e/m². Based on a treated floor area of 5690.99 m², the simulated building achieved **43.26** kgCO2-e/m², **meeting** the acceptance criteria.



Thermal Comfort (PMV)

To meet the acceptance criteria, **95** % of total area across the assessed zones must meet the conditions:

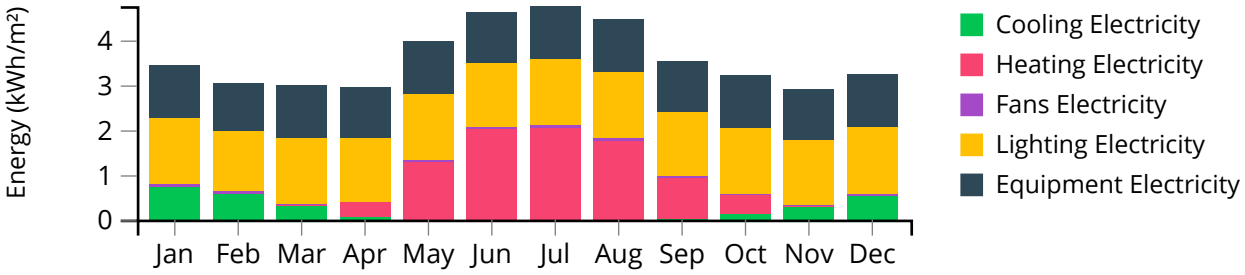
- zone thermal comfort (pmv) is between -1.0 and 1.0 PMV
- for at least 98 % of hours
- when above 20 % occupancy

A total area of 3051.23 m² across 135 zones were assessed, where zones of **96.90** % area achieved the conditions, **meeting** the acceptance criteria.

BESTEC

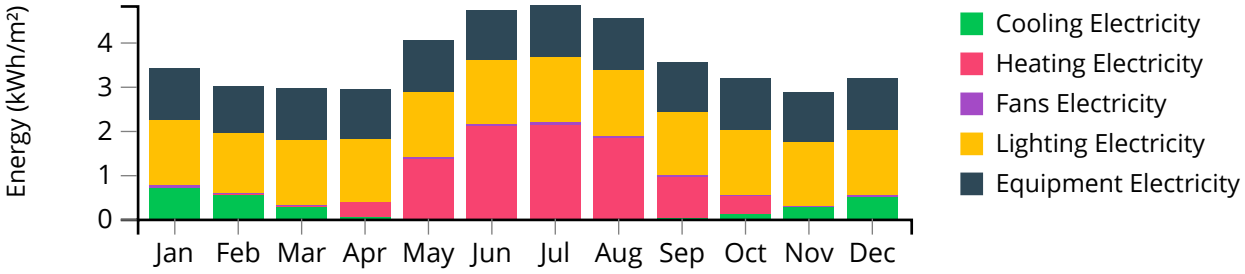
Building Meters

Proposed



Meter	Energy (kWh)	Energy (kWh/m²)	Peak (kW)	Time
Cooling Electricity	15111.95	2.66	62.61	25 Feb 16:15
Heating Electricity	50401.07	8.86	66.43	22 Jul 05:00
Fans Electricity	2653.60	0.47	2.52	25 Feb 16:15
Lighting Electricity	99198.33	17.43	20.04	1 Jan 07:15
Equipment Electricity	77725.71	13.66	17.52	1 Jan 06:15

Reference



Meter	Energy (kWh)	Energy (kWh/m²)	Peak (kW)	Time
Cooling Electricity	13872.18	2.44	56.10	25 Feb 16:15
Heating Electricity	51933.02	9.13	64.52	22 Jul 05:00
Fans Electricity	2568.57	0.45	2.32	22 Jul 05:00
Lighting Electricity	99198.33	17.43	20.04	1 Jan 07:15
Equipment Electricity	77725.71	13.66	17.52	1 Jan 06:15

Method

Approach

- The National Construction Code (NCC) specifies minimum performance standards for the energy efficiency of buildings through the Building Code of Australia (BCA) Volume 1, Section J.
- To enable flexibility in the architectural design of the building, a Performance Solution has been used to comply with the Performance Requirement - J1P1.
- The Assessment Method, J1V3 verification using a reference building, has been used and is an Alternative Solution for the Building Fabric only. As such, a Proposed Building with the proposed fabric has been modelled as part of this approach to compare against the Reference Building services.
- To meet acceptance criteria, the Proposed Building with the proposed fabric Greenhouse Gas (GHG) emissions must be no greater than the Reference Building services.
- Greenhouse gas emission factors are selected according Vol 1 Specification 34 Modelling Parameters for J1V3 Table S34C3 Greenhouse Gas Emissions Factors (kgCO2-e/GJ). In the case of the ACT, an exception is made where a greenhouse gas emission factor of nil is provided, as the national emission factors are not applied as they do not take into account investments in renewable electricity generation in the National Electricity Market.
- When the Simulated Shading Multipliers feature is enabled, each window is simulated in EnergyPlus twice, to compare a completely unshaded window, to a window affected by attached shading, building self-shading, and surrounding structures. The multiplier is based on the ratio of shaded versus unshaded annual average external incident solar radiation, limited between 0.0 and 1.0.

Assumptions / Limitations

- Parts J3, J5, J6, J7, J8 and J9 are not part of this assessment.
- Specification 33 Additional requirements - General is only met for provisions (a) General Thermal Construction and (b) for Floor Edge Insulation. All other provisions (c - n) are not part of this assessment.
- Specification 34 Modelling parameters for J1V3 S34C1 Scope, S34C2 Reference building and S34C3 Proposed building and reference building have been used to form the basis of the Method of Assessment.
- S34C4 Services Proposed and Reference Building is not part of this assessment as the minimum performance requirements of the services are not included.
- To ensure the reference building can be calculated, windows are limited to a maximum of 99% window-to-wall ratio (WWR).

BESTEC

Inputs

The NCC 2022 - Vol 1 contains technical design and construction requirements for all commercial buildings and their associated structures.

Building Class	9C
Wall Area (m²)	1352.58
Window Area (m²)	818.97
Roof Area (m²)	5968.57
Floor Area (m²)	5968.57
Glazed Door (m²)	
Opaque Door (m²)	
Window-Wall Ratio (%)	37.71

Levels

Level	Drawing	# Zones	Floor Area (m²)	Wall (m²)	Window (m²)
1	Ground	202	6055.7	1352.6	819.0

Zones

Level	Zone	Area (m²)	Volume (m³)	Treated Area (m²)
1	188. WC,Circ (Rm009)	7.99	22.37	7.99
1	81. WC,Circ (Rm017-Rm018)	18.34	51.35	18.34
1	13. WC,Circ (Rm021-Rm029)	73.42	205.57	73.42
1	19. WC,Circ (Rm033-Rm039)	59.17	165.67	59.17
1	11. Kitchen	79.84	223.56	79.84
1	17. Laundry	68.60	192.08	68.60
1	32. Bin	39.44	110.44	0.00
1	52. G Store	25.47	71.32	25.47
1	43. Services (uncond)	28.22	79.01	0.00
1	47. WC,Circ (Rm047-Rm049)	26.36	73.80	26.36

BESTEC

Level	Zone	Area (m²)	Volume (m³)	Treated Area (m²)
1	183. WC,Circ (Rm053)	8.99	25.16	8.99
1	15. Theatre	71.00	198.79	71.00
1	164. WC,Circ (Rm054-Rm055)	16.13	45.18	16.13
1	189. Store	7.74	21.67	7.74
1	194. Servery	7.09	19.85	7.09
1	191. San	7.71	21.58	7.71
1	30. WC,Circ (Rm061-Rm065)	42.71	119.59	42.71
1	186. WC,Circ (Rm060)	8.31	23.27	8.31
1	169. WC,Circ (Rm058-Rm059)	15.11	42.30	15.11
1	63. Servery	22.06	61.75	22.06
1	187. WC,Circ (Rm056)	8.13	22.75	8.13
1	178. WC,Circ (Rm057)	11.65	32.61	11.65
1	175. Meeting	14.93	41.81	14.93
1	179. Clinical/WC	10.93	30.59	10.93
1	29. WC,Circ (Rm066-Rm070)	45.95	128.65	45.95
1	41. San/Pan/Pwd/Clin	29.55	82.74	29.55
1	177. Med/Eq	13.21	36.98	13.21
1	184. Env	8.38	23.46	8.38
1	200. Eq	3.15	8.83	3.15
1	163. WC,Circ (Rm019-Rm020)	16.17	45.28	16.17
1	181. WC/Pan	10.07	28.19	10.07
1	165. Doc	16.13	45.17	16.13
1	57. Env/Stores	23.53	65.87	23.53
1	23. Store/Maintenance	57.37	160.65	57.37
1	35. WC,Circ (Rm071-Rm075)	35.47	99.31	35.47

BESTEC

Level	Zone	Area (m²)	Volume (m³)	Treated Area (m²)
1	198. EQ	5.13	14.35	5.13
1	80. Doc	18.72	52.42	18.72
1	196. WC,Circ (Rm071)	6.88	19.26	6.88
1	182. Env	9.23	25.85	9.23
1	37. WC,Circ (Rm086-Rm089)	32.15	90.03	32.15
1	39. WC,Circ (Rm081-Rm085)	31.22	87.42	31.22
1	33. WC,Circ (Rm076-Rm080)	38.59	108.05	38.59
1	193. WC,Circ (Rm081)	7.42	20.77	7.42
1	202. WC,Circ (Rm081)	2.13	5.96	2.13
1	185. Clin	8.23	23.04	8.23
1	86. Doc	18.16	50.85	18.16
1	180. Pan/WC	10.23	28.64	10.23
1	36. WC,Circ (Rm102-Rm105)	32.79	91.82	32.79
1	190. Med	7.74	21.68	7.74
1	68. WC,Circ (Rm100-Rm101)	19.45	54.46	19.45
1	31. WC,Circ (Rm095-Rm099)	40.96	114.69	40.96
1	201. WC,Circ (Rm106)	2.44	6.84	2.44
1	199. WC,Circ (Rm106)	4.91	13.74	4.91
1	26. WC,Circ (Rm090-Rm094)	46.77	130.95	46.77
1	161. Clin/Med	16.48	46.14	16.48
1	195. San	6.88	19.25	6.88
1	38. Activity	32.04	89.72	32.04
1	192. Env	7.53	21.09	7.53
1	12. WC,Circ (Rm001-Rm008)	77.34	216.56	77.34
1	46. Comms	27.44	76.84	27.44

BESTEC

Level	Zone	Area (m²)	Volume (m³)	Treated Area (m²)
1	48. WC,Circ (Rm050-Rm052)	25.74	72.07	25.74
1	25. TC/Env/PPE/WCs	49.59	138.86	49.59
1	22. WC,Circ (Rm040-Rm046)	56.81	159.07	56.81
1	51. WC,Circ (Rm030-Rm032)	25.15	70.43	25.15
1	21. Lsm/Gsm/Archive	58.43	163.62	58.43
1	20. WC,Circ (Rm010-Rm016)	58.40	163.51	58.40
1	60. RM-001	22.38	62.67	22.38
1	58. RM-002	22.99	64.37	22.99
1	83. RM-003	18.29	51.22	18.29
1	172. RM-004	15.24	42.69	15.24
1	145. RM-005	17.36	48.60	17.36
1	147. RM-006	17.36	48.60	17.36
1	67. RM-007	20.22	56.62	20.22
1	156. RM-008	16.97	47.52	16.97
1	49. RM-009	25.78	72.18	25.78
1	28. Community	47.34	132.54	47.34
1	173. AirLock	14.60	40.89	0.00
1	55. Sitting	25.12	70.35	25.12
1	61. Library	22.58	63.24	22.58
1	70. RM-011	20.04	56.13	20.04
1	66. RM-012	20.60	57.67	20.60
1	69. RM-010	19.98	55.96	19.98
1	89. RM-013	18.12	50.75	18.12
1	91. RM-014	18.12	50.75	18.12
1	88. RM-015	18.11	50.72	18.11

BESTEC

Level	Zone	Area (m²)	Volume (m³)	Treated Area (m²)
1	59. RM-016	22.42	62.78	22.42
1	9. Circulation-6	82.30	230.45	82.30
1	167. RM-017	15.94	44.63	15.94
1	71. RM-018	19.85	55.57	19.85
1	137. Rm-019	17.51	49.03	17.51
1	153. Rm-021	17.16	48.06	17.16
1	100. Rm-023	17.82	49.88	17.82
1	92. Rm-024	18.05	50.54	18.05
1	94. Rm-025	17.93	50.21	17.93
1	96. Rm-026	17.93	50.21	17.93
1	97. Rm-027	17.93	50.21	17.93
1	95. Rm-028	17.93	50.21	17.93
1	151. Rm-029	17.35	48.57	17.35
1	140. RM-030	17.35	48.57	17.35
1	109. RM-031	17.74	49.67	17.74
1	139. Rm-022	17.35	48.58	17.35
1	157. Rm-020	16.97	47.52	16.97
1	103. RM-032	17.65	49.42	17.65
1	127. Rm-033	17.50	49.01	17.50
1	114. Rm-034	17.55	49.14	17.55
1	76. Rm-035	18.89	52.90	18.89
1	77. Rm-036	18.88	52.85	18.88
1	170. Rm-037	15.24	42.69	15.24
1	136. Rm-038	17.55	49.14	17.55
1	121. Rm-039	17.55	49.14	17.55

BESTEC

Level	Zone	Area (m²)	Volume (m³)	Treated Area (m²)
1	18. Lounge	63.29	177.21	63.29
1	132. Rm-040	17.55	49.14	17.55
1	128. Rm-041	17.55	49.14	17.55
1	125. Rm-042	17.55	49.14	17.55
1	143. Rm-043	17.34	48.55	17.34
1	142. Rm-044	17.36	48.60	17.36
1	144. Rm-045	17.36	48.60	17.36
1	150. Rm-046	17.36	48.60	17.36
1	171. Rm-047	15.24	42.69	15.24
1	124. Rm-048	17.55	49.14	17.55
1	102. Rm-049	17.78	49.78	17.78
1	53. Sitting	25.68	71.89	25.68
1	119. Rm-050	17.55	49.14	17.55
1	78. Rm-051	18.69	52.34	18.69
1	54. Rm-052	25.04	70.10	25.04
1	10. Lounge	82.19	230.14	82.19
1	197. Airlock	6.34	17.76	6.34
1	148. Rm-0053	17.32	48.49	17.32
1	155. Rm-054	17.13	47.97	17.13
1	6. Circulation-1	120.79	338.22	120.79
1	146. Rm-055	17.27	48.35	17.27
1	40. Rm-057	30.36	85.01	30.36
1	42. Salon	28.79	80.62	28.79
1	62. P/D	22.16	62.04	22.16
1	34. Cafe+ Sitting	38.88	108.85	38.88

BESTEC

Level	Zone	Area (m²)	Volume (m³)	Treated Area (m²)
1	79. Admin	18.65	52.23	18.65
1	99. RM	17.80	49.85	17.80
1	44. Meeting	28.07	78.60	28.07
1	108. Rm-058	17.74	49.67	17.74
1	93. Rm-059	17.97	50.32	17.97
1	111. Rm-060	17.67	49.47	17.67
1	101. Rm-061	17.78	49.78	17.78
1	134. Rm-062	17.55	49.14	17.55
1	115. Rm-063	17.55	49.14	17.55
1	75. Rm-064	19.27	53.94	19.27
1	74. Rm-065	19.28	53.98	19.28
1	123. Rm-066	17.55	49.14	17.55
1	159. Rm-067	16.89	47.29	16.89
1	138. Rm-068	17.39	48.69	17.39
1	154. Rm-069	17.16	48.06	17.16
1	168. Rm-070	15.85	44.38	15.85
1	72. Sitting	19.62	54.94	19.62
1	152. Rm-056	17.25	48.30	17.25
1	5. Foyer/Circ.	126.07	353.00	126.07
1	27. Billiards	47.80	133.83	47.80
1	16. Dining	71.15	199.23	71.15
1	56. Rm-071	23.93	67.00	23.93
1	112. Rm-072	17.58	49.23	17.58
1	174. Rm-073	14.86	41.61	14.86
1	176. Rm-074	14.40	40.32	14.40

BESTEC

Level	Zone	Area (m²)	Volume (m³)	Treated Area (m²)
1	162. Rm-075	16.34	45.76	16.34
1	158. Rm-076	16.94	47.44	16.94
1	149. Rm-077	17.35	48.58	17.35
1	141. Rm-078	17.36	48.60	17.36
1	113. Rm-079	17.57	49.20	17.57
1	118. Rm-080	17.57	49.20	17.57
1	73. Rm-081	19.28	53.98	19.28
1	133. Rm-082	17.55	49.14	17.55
1	135. Rm-083	17.55	49.14	17.55
1	129. Rm-084	17.55	49.14	17.55
1	131. Rm-085	17.55	49.14	17.55
1	4. Circulation-3	154.87	433.63	154.87
1	98. Rm-086	17.93	50.21	17.93
1	110. Rm-087	17.70	49.56	17.70
1	85. Rm-088	18.17	50.87	18.17
1	84. Rm-089	18.31	51.27	18.31
1	64. Rm-090	21.44	60.02	21.44
1	87. Rm-091	18.11	50.72	18.11
1	90. Rm-092	18.12	50.75	18.12
1	82. Rm-093	18.34	51.36	18.34
1	160. Rm-094	16.58	46.43	16.58
1	45. Gym	27.71	77.58	27.71
1	106. Rm-095	17.74	49.67	17.74
1	107. Rm-096	17.74	49.67	17.74
1	105. Rm-097	17.74	49.67	17.74

Level	Zone	Area (m²)	Volume (m³)	Treated Area (m²)
1	104. Rm-098	17.74	49.67	17.74
1	166. Rm-099	16.01	44.84	16.01
1	65. Rm-100	20.83	58.32	20.83
1	122. Rm-101	17.54	49.11	17.54
1	8. Dining	91.78	256.99	91.78
1	117. Rm-102	17.55	49.14	17.55
1	116. Rm-103	17.55	49.14	17.55
1	120. Rm-104	17.55	49.14	17.55
1	126. Rm-105	17.55	49.14	17.55
1	130. Rm-106	17.55	49.14	17.55
1	1. Circulation-4	262.93	736.19	262.93
1	50. Sitting	25.89	72.48	25.89
1	3. Circulation-2	194.20	543.77	194.20
1	24. Activity B	50.15	140.43	50.15
1	14. Lounge	71.25	199.49	71.25
1	2. Circulation-5	231.81	649.07	231.81
1	7. Dining	106.47	298.11	106.47
		5773.26		5690.99

Walls

Total System R-values of all walls include the effects of thermal bridging, which are calculated in accordance with AS/NZS 4859.2 and NZ 4214:2006 (as per J4D3 Thermal Construction — General (5)) or are stated values.

For the purpose of the Reference Building, the wall total system R-value of the wall-glazing construction has been calculated in accordance with J4D6 Walls and Glazing and Specification 37 Calculation of U-Value and solar admittance.

Proposed	Title	Class	R-Value (m².°K/W)	Solar Abs.	Area (m²)

Proposed	Title	Class	R-Value (m².°K/W)	Solar Abs.	Area (m²)
Exposed to Unconditioned	Concept	9C	1.40	0.7	101.25
External	Concept	9C	1.40	0.7	1251.33
Reference	**Title**	**Class**	**R-Value (m².°K/W)**	**Solar Abs.**	**Area (m²)**
Exposed to Unconditioned	Concept	9C	1.40	0.6	101.25
External	Concept	9C	1.40	0.6	1251.33

Roofs

Total system R-values of all roofs include the effects of thermal bridging are calculated in accordance with AS/NZS 4859.2 and NZ 4214:2006 (as per J4D3 Thermal Construction — General (5)) or are stated values.

For the purpose of the Reference Building, the roof total system R-value has been assumed in accordance with J4D4 Roof and ceiling construction.

Proposed	Title	Class	R-Value (m².°K/W)	Solar Abs.	Area (m²)
Top	Concept	9C	5.00	0.5	5968.57
Reference	**Title**	**Class**	**R-Value (m².°K/W)**	**Solar Abs.**	**Area (m²)**
Top	Concept	9C	3.20	0.5	5968.57

Floors

Total system R-values of all floors include the effects of thermal bridging are calculated in accordance with AS/NZS 4859.2, NZ 4214:2006 and Section 3.5 of CIBSE Guide A (as per J4D3 Thermal Construction — General (5)) or are stated values

For the purpose of the Reference Building, the floor total system R-value has been assumed in accordance with J4D7 Floors.

Proposed	Title	Class	R-Value (m².°K/W)	Solar Abs.	Area (m²)
Bottom	Concept	9C	2.00	0.5	5968.57
Reference	**Title**	**Class**	**R-Value (m².°K/W)**	**Solar Abs.**	**Area (m²)**
Bottom	Concept	9C	2.00	0.5	5968.57

Windows

Total system U-values of all windows include the effects of thermal bridging at the frame, which are calculated in accordance with ISO 15099, as per J4D3 Thermal Construction — General (5).

For the purpose of the Reference Building, the glazing total system U-value and solar admittance of the wall-glazing construction has been calculated in accordance with J4D6 Walls and Glazing and Specification 37 Calculation of U-Value and solar admittance.

Proposed	**Title**	**Class**	**U-value (W/m².°K)**	**SHGC**	**Area (m²)**
External	Concept	9C	2.70	0.30	818.97
Reference	**Title**	**Class**	**U-value (W/m².°K)**	**SHGC**	**Area (m²)**
External	Concept	9C	1.74	0.24	818.97

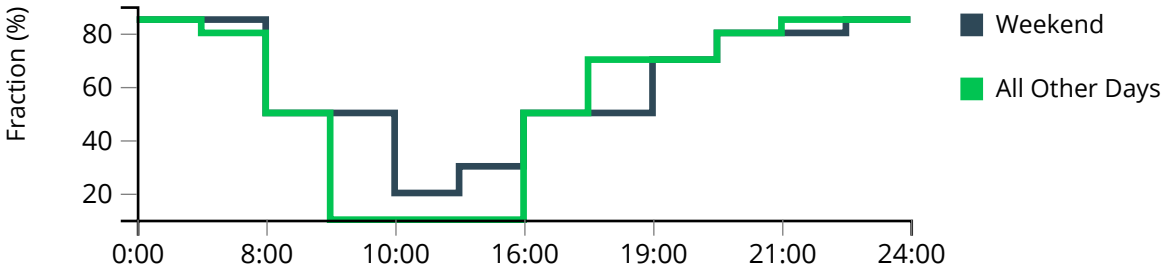
Climate

The climate file AUS_NSW_Avalon.AP.948955_TMYx.2007-2021, located at Avalon.AP, NSW AUS, was used for simulations. This file was sourced from Climate.OneBuilding, an online repository collated from public sources. http://www.climate.onebuilding.org/.

Occupants

Space Default

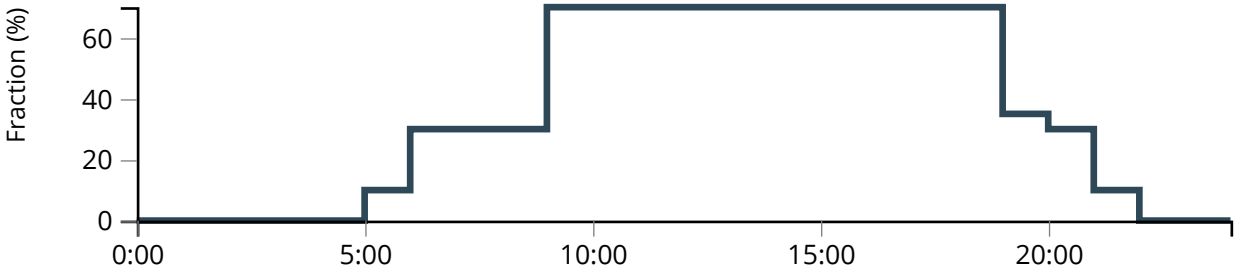
	All Year
Design Level (m²/Person)	10.00



Option	**Value**
Activity Level (W)	130.00
Air Velocity (m/s)	0.10
Clothing Level (Clo)	0.70

Space Daytime

	All Year
Design Level (m²/Person)	3.00



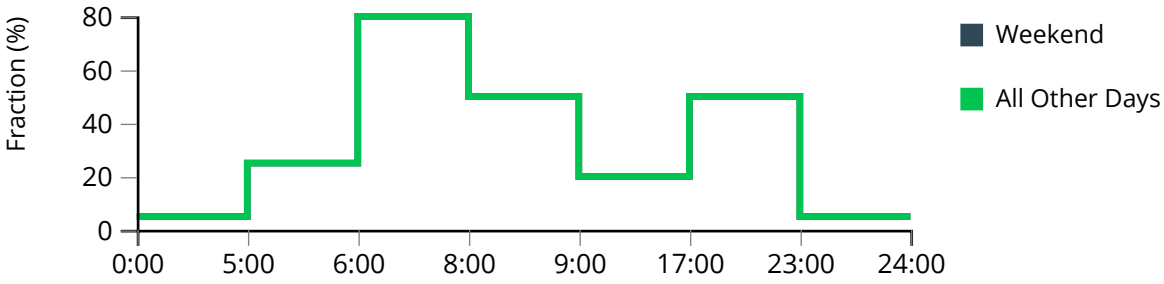
Option	Value
Activity Level (W)	130.00
Air Velocity (m/s)	0.10
Clothing Level (Clo)	0.70

Lighting

Lighting power density (W/m²) is stipulated in each thermal zone, subject to the function and purpose of the space. Internal heat gains for the Reference and Proposed Reference Building equipment density have been nominated as identical.

Space Default

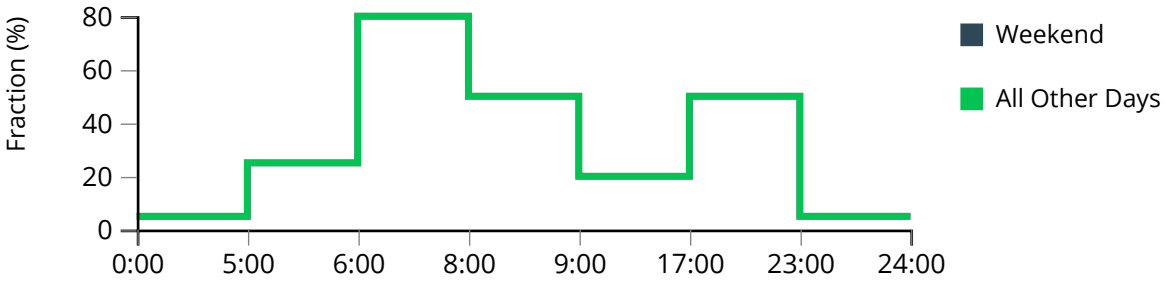
	All Year
Design Level (W/m²)	5.00



Space Aged Care - unocc.

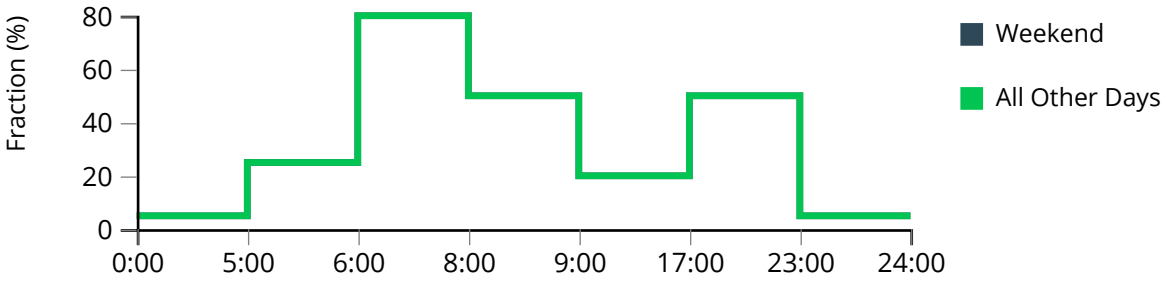
	All Year

	All Year
Design Level (W/m²)	5.00



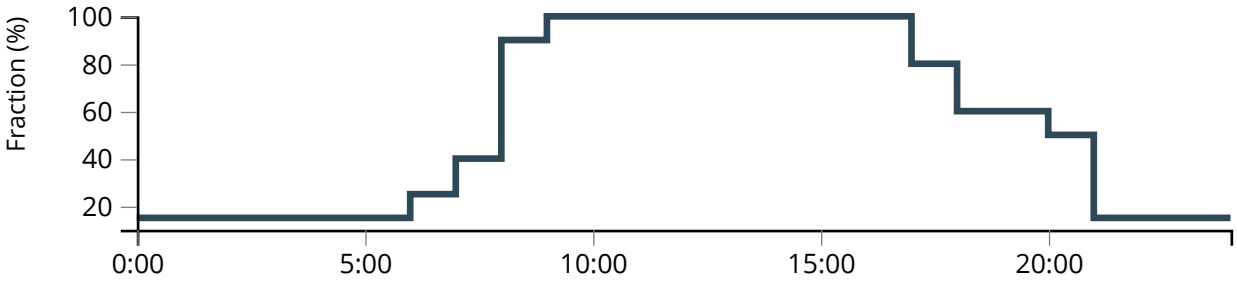
Space Corridor

	All Year
Design Level (W/m²)	5.00



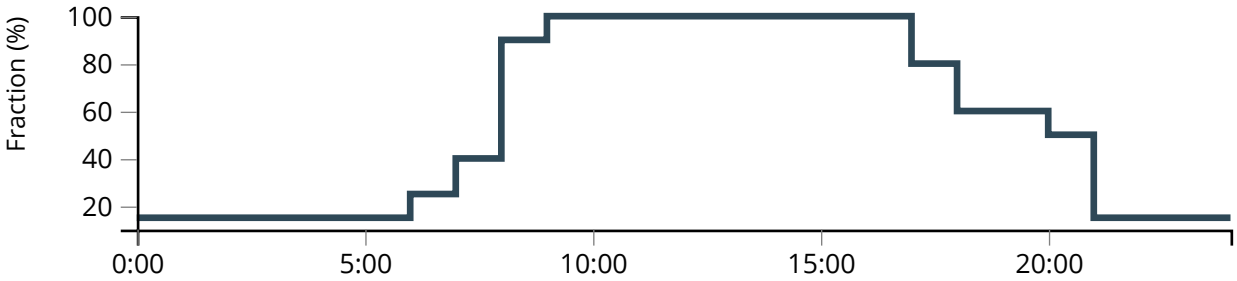
Space Daytime

	All Year
Design Level (W/m²)	4.50



Space Daytime(unocc.)

	All Year
Design Level (W/m²)	2.00

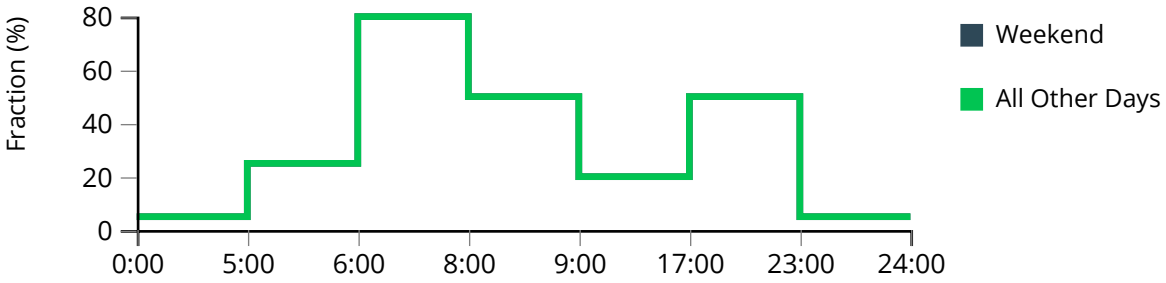


Equipment

Space Default

Electric Equipment

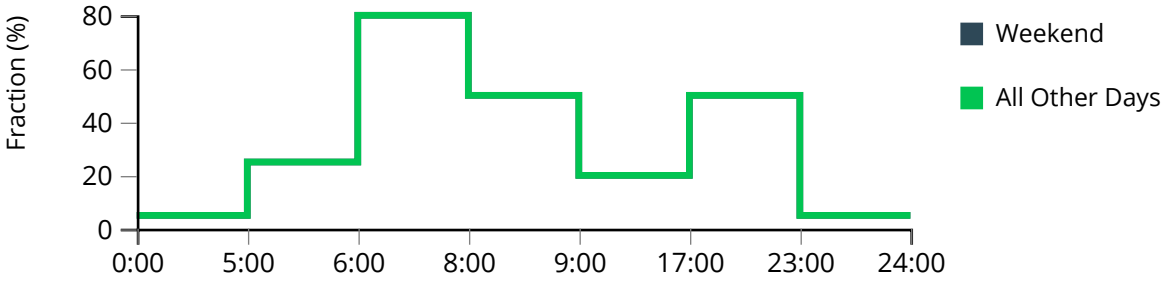
	All Year
Design Level (W/m²)	6.40



Space Aged Care - unocc.

Electric Equipment

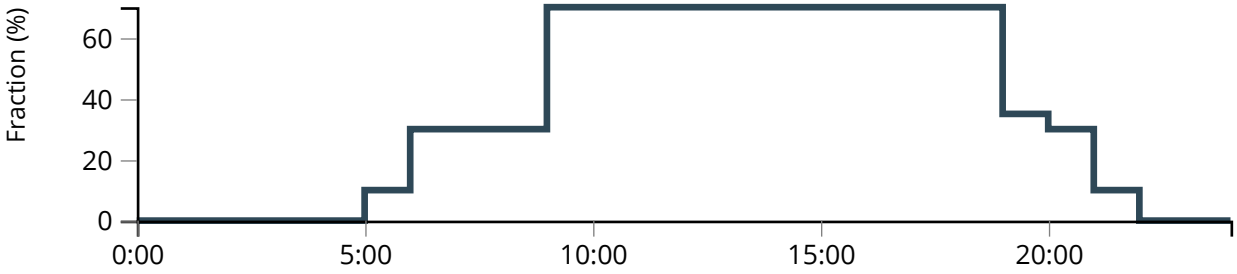
	All Year
Design Level (W/m²)	6.40



Space Daytime

Electric Equipment

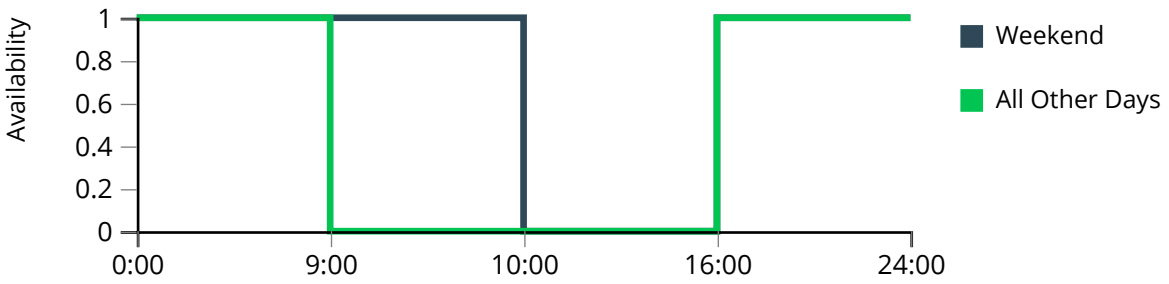
	All Year
Design Level (W/m²)	8.00



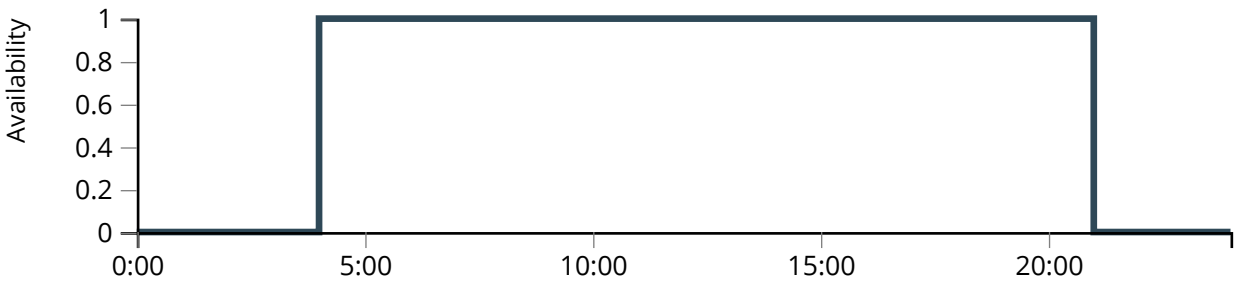
Air-Conditioning

As a fabric only assessment, air-conditioning equipment and mechanical ventilation rates for the Reference and Proposed Building are identical. Minimum mechanical ventilation is required as per Part F6P3 Outdoor air supply.

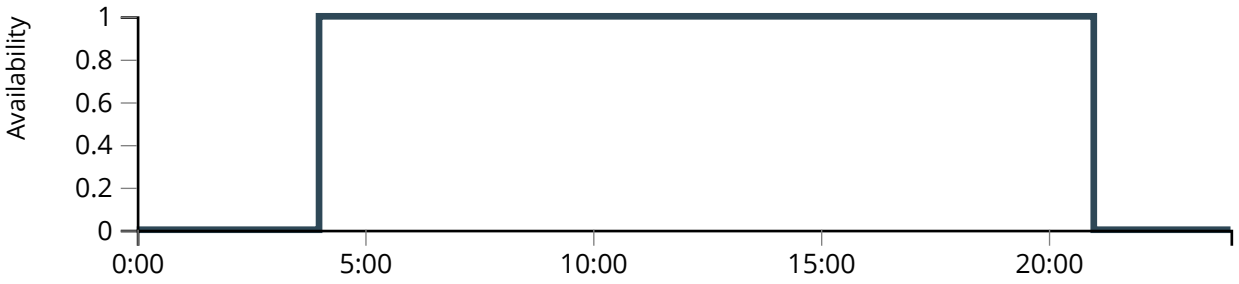
Space Default



Space Corridor



Space Daytime

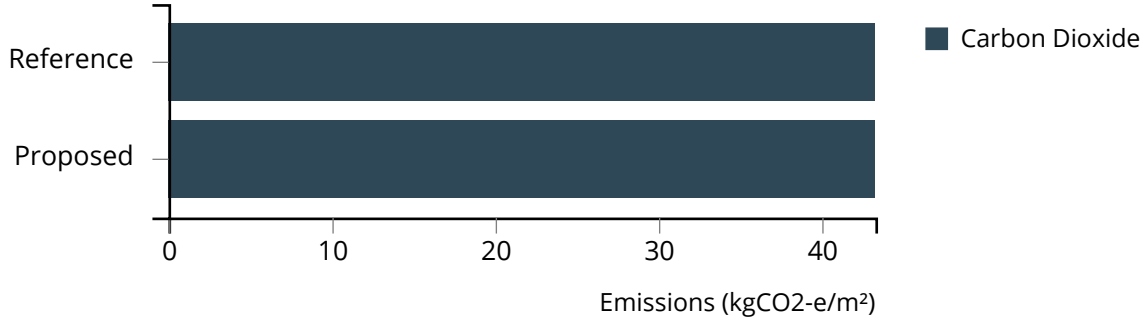


BESTEC

Detailed Results

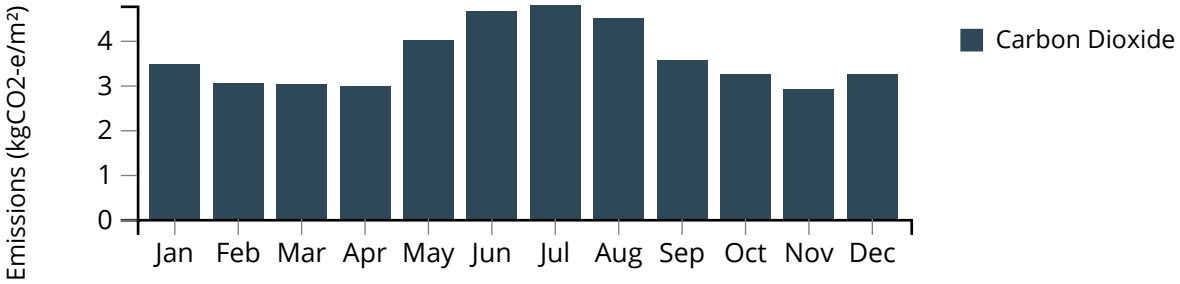
Building Emissions

To meet the acceptance criteria, annual Supplied Energy emissions must be less than **43.29** kgCO2-e/m². Based on a treated floor area of 5690.99 m², the simulated building achieved **43.26** kgCO2-e/m², **meeting** the acceptance criteria.



Greenhouse gas emission factors have been nominated as **279.00** kilogram / GJ for electricity , and **51.53** kilogram / GJ for natural gas.

Proposed



Meter	Emissions (kgCO2-e)	Emissions (kgCO2-e/m²)
Emissions	246169.05	43.26

Electricity Purchased

Period	Energy (kWh)	Energy (kWh/m²)	Peak (kW)	Time
Jan	19552.57	3.44	84.39	7 Jan 16:15
Feb	17189.86	3.02	88.44	25 Feb 16:15
Mar	17047.89	3.00	63.31	4 Mar 17:15
Apr	16810.04	2.95	53.09	27 Apr 07:30

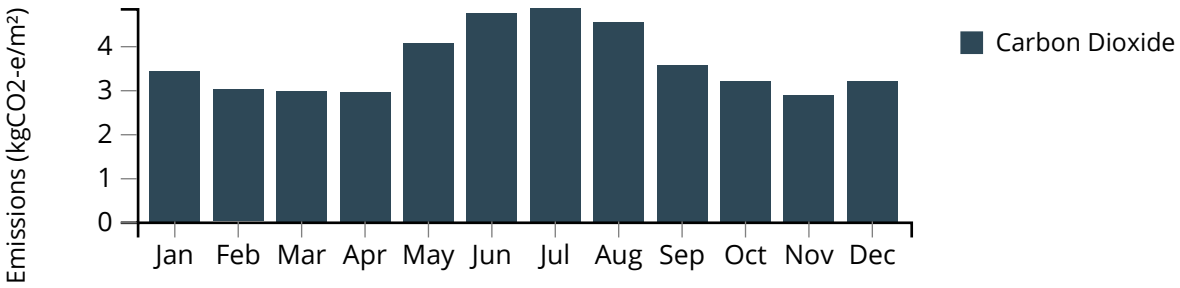
Period	Energy (kWh)	Energy (kWh/m²)	Peak (kW)	Time
May	22612.30	3.97	95.20	23 May 07:00
Jun	26312.51	4.62	99.18	15 Jun 07:00
Jul	27032.76	4.75	81.72	22 Jul 06:15
Aug	25349.81	4.45	77.87	1 Aug 07:15
Sep	20062.63	3.53	74.22	3 Sep 06:15
Oct	18318.89	3.22	67.62	1 Oct 06:45
Nov	16455.54	2.89	63.47	9 Nov 17:30
Dec	18345.84	3.22	63.26	9 Dec 16:15
Total	245090.66	43.07	99.18	15 Jun 07:00

Gas Demand

The simulated building did not include Gas Demand.

Reference

The Reference Building simulated results are shown below, which sets the acceptance criteria threshold.



Meter	Emissions (kgCO2-e)	Emissions (kgCO2-e/m²)
Emissions	246377.13	43.29

Electricity Purchased

Period	Energy (kWh)	Energy (kWh/m²)	Peak (kW)	Time
Jan	19355.10	3.40	80.16	7 Jan 17:00
Feb	16979.08	2.98	81.67	25 Feb 16:15
Mar	16816.25	2.95	60.92	4 Mar 17:15

Period	Energy (kWh)	Energy (kWh/m²)	Peak (kW)	Time
Apr	16714.66	2.94	52.69	18 Apr 07:15
May	22982.71	4.04	94.11	23 May 07:00
Jun	26769.55	4.70	98.12	15 Jun 07:00
Jul	27466.67	4.83	80.47	22 Jul 06:15
Aug	25704.47	4.52	76.32	26 Aug 07:15
Sep	20130.56	3.54	73.14	3 Sep 06:15
Oct	18050.44	3.17	67.57	2 Oct 06:15
Nov	16219.64	2.85	60.67	9 Nov 17:30
Dec	18108.70	3.18	59.74	24 Dec 17:15
Total	245297.81	43.10	98.12	15 Jun 07:00

Gas Demand

The simulated building did not include Gas Demand.

BESTEC

Thermal Comfort (PMV)

To meet the acceptance criteria, **95** % of total area across the assessed zones must meet the conditions:

- zone thermal comfort (pmv) is between -1.0 and 1.0 PMV
- for at least 98 % of hours
- when above 20 % occupancy

A total area of 3051.23 m² across 135 zones were assessed, where zones of **96.90** % area achieved the conditions, **meeting** the acceptance criteria.

Level	Zone	Area (m²)	Assessed (Hrs)	Pass (Hrs)	Ratio	Pass
1	155. Rm-054	17.13	6415	6378	99.42	✓
1	146. Rm-055	17.27	6415	6352	99.02	✓
1	40. Rm-057	30.36	6415	6377	99.41	✓
1	42. Salon	28.79	5475	5449	99.53	✓
1	62. P/D	22.16	5475	5462	99.76	✓
1	34. Cafe+ Sitting	38.88	5475	5472	99.95	✓
1	79. Admin	18.65	5475	5474	99.98	✓
1	99. RM	17.80	5475	5473	99.96	✓
1	44. Meeting	28.07	5475	5472	99.95	✓
1	108. Rm-058	17.74	6415	6371	99.31	✓
1	93. Rm-059	17.97	6415	6360	99.14	✓
1	111. Rm-060	17.67	6415	6367	99.25	✓
1	101. Rm-061	17.78	6415	6407	99.88	✓
1	134. Rm-062	17.55	6415	6409	99.91	✓
1	115. Rm-063	17.55	6415	6409	99.91	✓
1	75. Rm-064	19.27	6415	6410	99.92	✓
1	74. Rm-065	19.28	6415	6410	99.92	✓
1	123. Rm-066	17.55	6415	6409	99.91	✓
1	159. Rm-067	16.89	6415	6409	99.91	✓
1	138. Rm-068	17.39	6415	6409	99.91	✓

BESTEC

Level	Zone	Area (m²)	Assessed (Hrs)	Pass (Hrs)	Ratio	Pass
1	148. Rm-0053	17.32	6415	6384	99.52	✓
1	154. Rm-069	17.16	6415	6409	99.91	✓
1	54. Rm-052	25.04	6415	6393	99.66	✓
1	127. Rm-033	17.50	6415	6366	99.24	✓
1	114. Rm-034	17.55	6415	6377	99.41	✓
1	76. Rm-035	18.89	6415	6379	99.44	✓
1	77. Rm-036	18.88	6415	6371	99.31	✓
1	170. Rm-037	15.24	6415	6371	99.31	✓
1	136. Rm-038	17.55	6415	6374	99.36	✓
1	121. Rm-039	17.55	6415	6376	99.39	✓
1	18. Lounge	63.29	5475	5325	97.26	✗
1	132. Rm-040	17.55	6415	6377	99.41	✓
1	128. Rm-041	17.55	6415	6377	99.41	✓
1	125. Rm-042	17.55	6415	6372	99.33	✓
1	143. Rm-043	17.34	6415	6368	99.27	✓
1	142. Rm-044	17.36	6415	6377	99.41	✓
1	144. Rm-045	17.36	6415	6372	99.33	✓
1	150. Rm-046	17.36	6415	6352	99.02	✓
1	171. Rm-047	15.24	6415	6390	99.61	✓
1	124. Rm-048	17.55	6415	6395	99.69	✓
1	102. Rm-049	17.78	6415	6398	99.73	✓
1	53. Sitting	25.68	5475	5379	98.25	✓
1	119. Rm-050	17.55	6415	6397	99.72	✓
1	78. Rm-051	18.69	6415	6396	99.70	✓
1	10. Lounge	82.19	5475	5421	99.01	✓

BESTEC

Level	Zone	Area (m²)	Assessed (Hrs)	Pass (Hrs)	Ratio	Pass
1	168. Rm-070	15.85	6415	6402	99.80	✓
1	72. Sitting	19.62	5475	5443	99.42	✓
1	152. Rm-056	17.25	6415	6375	99.38	✓
1	82. Rm-093	18.34	6415	6367	99.25	✓
1	160. Rm-094	16.58	6415	6372	99.33	✓
1	45. Gym	27.71	6415	6378	99.42	✓
1	106. Rm-095	17.74	6415	6378	99.42	✓
1	107. Rm-096	17.74	6415	6393	99.66	✓
1	105. Rm-097	17.74	6415	6394	99.67	✓
1	104. Rm-098	17.74	6415	6395	99.69	✓
1	166. Rm-099	16.01	6415	6404	99.83	✓
1	65. Rm-100	20.83	6415	6407	99.88	✓
1	122. Rm-101	17.54	6415	6409	99.91	✓
1	8. Dining	91.78	5475	5450	99.54	✓
1	117. Rm-102	17.55	6415	6380	99.45	✓
1	116. Rm-103	17.55	6415	6381	99.47	✓
1	120. Rm-104	17.55	6415	6380	99.45	✓
1	126. Rm-105	17.55	6415	6376	99.39	✓
1	130. Rm-106	17.55	6415	6367	99.25	✓
1	50. Sitting	25.89	5475	5375	98.17	✓
1	24. Activity B	50.15	5475	5388	98.41	✓
1	14. Lounge	71.25	5475	5403	98.68	✓
1	90. Rm-092	18.12	6415	6372	99.33	✓
1	87. Rm-091	18.11	6415	6370	99.30	✓
1	64. Rm-090	21.44	6415	6365	99.22	✓

BESTEC

Level	Zone	Area (m²)	Assessed (Hrs)	Pass (Hrs)	Ratio	Pass
1	84. Rm-089	18.31	6415	6366	99.24	✓
1	27. Billiards	47.80	6415	6399	99.75	✓
1	16. Dining	71.15	5475	5464	99.80	✓
1	56. Rm-071	23.93	6415	6375	99.38	✓
1	112. Rm-072	17.58	6415	6374	99.36	✓
1	174. Rm-073	14.86	6415	6370	99.30	✓
1	176. Rm-074	14.40	6415	6367	99.25	✓
1	162. Rm-075	16.34	6415	6370	99.30	✓
1	158. Rm-076	16.94	6415	6376	99.39	✓
1	149. Rm-077	17.35	6415	6395	99.69	✓
1	103. RM-032	17.65	6415	6361	99.16	✓
1	141. Rm-078	17.36	6415	6395	99.69	✓
1	118. Rm-080	17.57	6415	6402	99.80	✓
1	73. Rm-081	19.28	6415	6404	99.83	✓
1	133. Rm-082	17.55	6415	6410	99.92	✓
1	135. Rm-083	17.55	6415	6409	99.91	✓
1	129. Rm-084	17.55	6415	6409	99.91	✓
1	131. Rm-085	17.55	6415	6396	99.70	✓
1	98. Rm-086	17.93	6415	6374	99.36	✓
1	110. Rm-087	17.70	6415	6381	99.47	✓
1	85. Rm-088	18.17	6415	6376	99.39	✓
1	113. Rm-079	17.57	6415	6397	99.72	✓
1	157. Rm-020	16.97	6415	6377	99.41	✓
1	139. Rm-022	17.35	6415	6377	99.41	✓
1	109. RM-031	17.74	6415	6375	99.38	✓

BESTEC

Level	Zone	Area (m²)	Assessed (Hrs)	Pass (Hrs)	Ratio	Pass
1	165. Doc	16.13	5475	5368	98.05	✓
1	80. Doc	18.72	5475	5475	100.00	✓
1	202. WC,Circ (Rm081)	2.13	6415	6391	99.63	✓
1	86. Doc	18.16	5475	5475	100.00	✓
1	15. Theatre	71.00	5475	5400	98.63	✓
1	63. Servery	22.06	5475	5403	98.68	✓
1	175. Meeting	14.93	5475	5472	99.95	✓
1	61. Library	22.58	5475	5442	99.40	✓
1	70. RM-011	20.04	6415	6409	99.91	✓
1	66. RM-012	20.60	6415	6407	99.88	✓
1	69. RM-010	19.98	6415	6405	99.84	✓
1	89. RM-013	18.12	6415	6408	99.89	✓
1	91. RM-014	18.12	6415	6408	99.89	✓
1	88. RM-015	18.11	6415	6408	99.89	✓
1	59. RM-016	22.42	6415	6401	99.78	✓
1	167. RM-017	15.94	6415	6367	99.25	✓
1	71. RM-018	19.85	6415	6365	99.22	✓
1	137. Rm-019	17.51	6415	6367	99.25	✓
1	153. Rm-021	17.16	6415	6375	99.38	✓
1	100. Rm-023	17.82	6415	6382	99.49	✓
1	92. Rm-024	18.05	6415	6382	99.49	✓
1	94. Rm-025	17.93	6415	6382	99.49	✓
1	96. Rm-026	17.93	6415	6382	99.49	✓
1	97. Rm-027	17.93	6415	6382	99.49	✓
1	95. Rm-028	17.93	6415	6382	99.49	✓

BESTEC

Level	Zone	Area (m²)	Assessed (Hrs)	Pass (Hrs)	Ratio	Pass
1	151. Rm-029	17.35	6415	6380	99.45	✓
1	140. RM-030	17.35	6415	6376	99.39	✓
1	55. Sitting	25.12	5475	5437	99.31	✓
1	28. Community	47.34	5475	5424	99.07	✓
1	49. RM-009	25.78	6415	6401	99.78	✓
1	38. Activity	32.04	5475	5360	97.90	✗
1	60. RM-001	22.38	6415	6404	99.83	✓
1	58. RM-002	22.99	6415	6405	99.84	✓
1	83. RM-003	18.29	6415	6407	99.88	✓
1	172. RM-004	15.24	6415	6408	99.89	✓
1	145. RM-005	17.36	6415	6408	99.89	✓
1	147. RM-006	17.36	6415	6408	99.89	✓
1	67. RM-007	20.22	6415	6409	99.91	✓
1	156. RM-008	16.97	6415	6407	99.88	✓
1	7. Dining	106.47	5475	5475	100.00	✓
					Pass	✓

Level	Zone	Area (m²)	<-1	-1 to -0.5	-0.5 to 0	0 to 0.5	0.5 to 1	>1
1	15. Theatre	71.00	75.0	284.0	579.0	4360.0	177.0	0.0
1	63. Servery	22.06	72.0	851.0	1570.0	2982.0	0.0	0.0
1	175. Meeting	14.93	3.0	2310.0	1493.0	1669.0	0.0	0.0
1	165. Doc	16.13	107.0	484.0	1369.0	3515.0	0.0	0.0
1	80. Doc	18.72	0.0	1801.0	1643.0	2031.0	0.0	0.0
1	202. WC,Circ (Rm081)	2.13	24.0	2833.0	1571.0	1975.0	12.0	0.0
1	86. Doc	18.16	0.0	1977.0	1581.0	1917.0	0.0	0.0

BESTEC

Level	Zone	Area (m²)	<-1	-1 to -0.5	-0.5 to 0	0 to 0.5	0.5 to 1	>1
1	38. Activity	32.04	115.0	424.0	1062.0	3874.0	0.0	0.0
1	60. RM-001	22.38	7.0	2574.0	1745.0	2033.0	52.0	4.0
1	58. RM-002	22.99	6.0	2585.0	1856.0	1937.0	27.0	4.0
1	83. RM-003	18.29	6.0	2488.0	1833.0	2071.0	15.0	2.0
1	172. RM-004	15.24	5.0	2325.0	1953.0	2114.0	16.0	2.0
1	145. RM-005	17.36	5.0	2336.0	1912.0	2147.0	13.0	2.0
1	147. RM-006	17.36	5.0	2314.0	1921.0	2160.0	13.0	2.0
1	67. RM-007	20.22	5.0	2469.0	1782.0	2145.0	13.0	1.0
1	156. RM-008	16.97	6.0	2636.0	1683.0	2076.0	12.0	2.0
1	49. RM-009	25.78	12.0	2778.0	1477.0	2134.0	12.0	2.0
1	28. Community	47.34	51.0	873.0	1516.0	3016.0	19.0	0.0
1	55. Sitting	25.12	38.0	889.0	1596.0	2933.0	19.0	0.0
1	61. Library	22.58	33.0	918.0	1590.0	2915.0	19.0	0.0
1	70. RM-011	20.04	6.0	2614.0	1728.0	2054.0	13.0	0.0
1	66. RM-012	20.60	6.0	2501.0	1790.0	2102.0	14.0	2.0
1	69. RM-010	19.98	6.0	2619.0	1672.0	2082.0	32.0	4.0
1	89. RM-013	18.12	5.0	2345.0	1895.0	2155.0	13.0	2.0
1	91. RM-014	18.12	5.0	2341.0	1904.0	2150.0	13.0	2.0
1	88. RM-015	18.11	5.0	2456.0	1835.0	2104.0	13.0	2.0
1	59. RM-016	22.42	9.0	2819.0	1701.0	1831.0	50.0	5.0
1	167. RM-017	15.94	45.0	3026.0	1154.0	2022.0	165.0	3.0
1	71. RM-018	19.85	46.0	2999.0	1134.0	2095.0	137.0	4.0
1	137. Rm-019	17.51	45.0	2999.0	1095.0	2136.0	137.0	3.0
1	153. Rm-021	17.16	37.0	2834.0	1113.0	2220.0	208.0	3.0
1	100. Rm-023	17.82	27.0	2699.0	1105.0	2286.0	292.0	6.0

BESTEC

Level	Zone	Area (m²)	<-1	-1 to -0.5	-0.5 to 0	0 to 0.5	0.5 to 1	>1
1	92. Rm-024	18.05	27.0	2682.0	1104.0	2305.0	291.0	6.0
1	94. Rm-025	17.93	27.0	2680.0	1105.0	2302.0	295.0	6.0
1	96. Rm-026	17.93	27.0	2680.0	1105.0	2302.0	295.0	6.0
1	97. Rm-027	17.93	27.0	2684.0	1104.0	2300.0	294.0	6.0
1	95. Rm-028	17.93	27.0	2713.0	1096.0	2290.0	283.0	6.0
1	151. Rm-029	17.35	30.0	2758.0	1127.0	2247.0	248.0	5.0
1	140. RM-030	17.35	35.0	2807.0	1123.0	2199.0	247.0	4.0
1	109. RM-031	17.74	35.0	2815.0	1100.0	2211.0	249.0	5.0
1	139. Rm-022	17.35	32.0	2786.0	1102.0	2218.0	271.0	6.0
1	157. Rm-020	16.97	34.0	2763.0	1143.0	2206.0	265.0	4.0
1	103. RM-032	17.65	48.0	3007.0	1066.0	2040.0	248.0	6.0
1	127. Rm-033	17.50	47.0	3169.0	1187.0	1983.0	27.0	2.0
1	114. Rm-034	17.55	36.0	3097.0	1195.0	2063.0	22.0	2.0
1	76. Rm-035	18.89	35.0	3070.0	1198.0	2092.0	19.0	1.0
1	77. Rm-036	18.88	42.0	3103.0	1169.0	2078.0	21.0	2.0
1	170. Rm-037	15.24	42.0	3137.0	1195.0	2017.0	22.0	2.0
1	136. Rm-038	17.55	39.0	3104.0	1208.0	2042.0	20.0	2.0
1	121. Rm-039	17.55	38.0	3084.0	1230.0	2048.0	14.0	1.0
1	18. Lounge	63.29	150.0	1087.0	1559.0	2679.0	0.0	0.0
1	132. Rm-040	17.55	37.0	3085.0	1221.0	2053.0	18.0	1.0
1	128. Rm-041	17.55	36.0	3102.0	1212.0	2044.0	19.0	2.0
1	125. Rm-042	17.55	41.0	3127.0	1227.0	2006.0	12.0	2.0
1	143. Rm-043	17.34	45.0	3141.0	1191.0	2015.0	21.0	2.0
1	142. Rm-044	17.36	36.0	3105.0	1201.0	2050.0	21.0	2.0
1	144. Rm-045	17.36	41.0	3129.0	1216.0	2007.0	20.0	2.0

BESTEC

Level	Zone	Area (m²)	<-1	-1 to -0.5	-0.5 to 0	0 to 0.5	0.5 to 1	>1
1	150. Rm-046	17.36	63.0	3346.0	1306.0	1690.0	10.0	0.0
1	171. Rm-047	15.24	16.0	2710.0	1290.0	2196.0	194.0	9.0
1	124. Rm-048	17.55	8.0	2404.0	1243.0	2377.0	371.0	12.0
1	102. Rm-049	17.78	8.0	2508.0	1251.0	2326.0	313.0	9.0
1	53. Sitting	25.68	96.0	2429.0	1030.0	1920.0	0.0	0.0
1	119. Rm-050	17.55	8.0	2442.0	1262.0	2359.0	334.0	10.0
1	78. Rm-051	18.69	7.0	2337.0	1228.0	2436.0	395.0	12.0
1	54. Rm-052	25.04	16.0	2506.0	1239.0	2405.0	243.0	6.0
1	10. Lounge	82.19	54.0	807.0	1476.0	3122.0	16.0	0.0
1	148. Rm-0053	17.32	24.0	2553.0	1281.0	2405.0	145.0	7.0
1	155. Rm-054	17.13	35.0	3007.0	1294.0	2060.0	17.0	2.0
1	146. Rm-055	17.27	61.0	3144.0	1158.0	1986.0	64.0	2.0
1	40. Rm-057	30.36	38.0	2980.0	1342.0	2049.0	6.0	0.0
1	42. Salon	28.79	26.0	718.0	1503.0	3212.0	16.0	0.0
1	62. P/D	22.16	13.0	775.0	1574.0	3090.0	23.0	0.0
1	34. Cafe+ Sitting	38.88	3.0	20.0	615.0	1505.0	3332.0	0.0
1	79. Admin	18.65	1.0	2192.0	1401.0	1881.0	0.0	0.0
1	99. RM	17.80	2.0	2170.0	1439.0	1864.0	0.0	0.0
1	44. Meeting	28.07	3.0	2345.0	1342.0	1785.0	0.0	0.0
1	108. Rm-058	17.74	44.0	3171.0	1300.0	1887.0	13.0	0.0
1	93. Rm-059	17.97	55.0	3303.0	1298.0	1751.0	8.0	0.0
1	111. Rm-060	17.67	47.0	3014.0	1156.0	2099.0	98.0	1.0
1	101. Rm-061	17.78	7.0	2583.0	1692.0	2120.0	12.0	1.0
1	134. Rm-062	17.55	4.0	2134.0	1960.0	2301.0	14.0	2.0
1	115. Rm-063	17.55	4.0	2179.0	1935.0	2281.0	14.0	2.0

BESTEC

Level	Zone	Area (m²)	<-1	-1 to -0.5	-0.5 to 0	0 to 0.5	0.5 to 1	>1
1	75. Rm-064	19.27	4.0	2077.0	1957.0	2361.0	15.0	1.0
1	74. Rm-065	19.28	4.0	2106.0	1910.0	2380.0	14.0	1.0
1	123. Rm-066	17.55	4.0	2098.0	1942.0	2355.0	14.0	2.0
1	159. Rm-067	16.89	4.0	2088.0	1980.0	2327.0	14.0	2.0
1	138. Rm-068	17.39	4.0	2094.0	1980.0	2321.0	14.0	2.0
1	154. Rm-069	17.16	4.0	2176.0	1919.0	2300.0	14.0	2.0
1	168. Rm-070	15.85	11.0	2620.0	1655.0	2113.0	14.0	2.0
1	72. Sitting	19.62	32.0	931.0	1563.0	2942.0	7.0	0.0
1	152. Rm-056	17.25	38.0	2995.0	1179.0	2115.0	86.0	2.0
1	27. Billiards	47.80	16.0	2745.0	1397.0	2245.0	12.0	0.0
1	16. Dining	71.15	11.0	19.0	469.0	1544.0	3432.0	0.0
1	56. Rm-071	23.93	40.0	3022.0	1311.0	2033.0	9.0	0.0
1	112. Rm-072	17.58	40.0	3115.0	1300.0	1948.0	11.0	1.0
1	174. Rm-073	14.86	43.0	3159.0	1280.0	1916.0	15.0	2.0
1	176. Rm-074	14.40	46.0	3177.0	1298.0	1871.0	21.0	2.0
1	162. Rm-075	16.34	43.0	3078.0	1305.0	1975.0	12.0	2.0
1	158. Rm-076	16.94	33.0	2657.0	1147.0	2322.0	250.0	6.0
1	149. Rm-077	17.35	8.0	2417.0	1218.0	2393.0	367.0	12.0
1	141. Rm-078	17.36	7.0	2360.0	1240.0	2426.0	369.0	13.0
1	113. Rm-079	17.57	8.0	2430.0	1285.0	2420.0	262.0	10.0
1	118. Rm-080	17.57	12.0	2713.0	1467.0	2211.0	11.0	1.0
1	73. Rm-081	19.28	11.0	2860.0	1545.0	1990.0	9.0	0.0
1	133. Rm-082	17.55	5.0	2539.0	1774.0	2083.0	14.0	0.0
1	135. Rm-083	17.55	5.0	2400.0	1853.0	2143.0	13.0	1.0
1	129. Rm-084	17.55	6.0	2511.0	1786.0	2098.0	14.0	0.0

BESTEC

Level	Zone	Area (m²)	<-1	-1 to -0.5	-0.5 to 0	0 to 0.5	0.5 to 1	>1
1	131. Rm-085	17.55	19.0	2947.0	1564.0	1875.0	10.0	0.0
1	98. Rm-086	17.93	38.0	2919.0	1101.0	2145.0	209.0	3.0
1	110. Rm-087	17.70	30.0	2775.0	1130.0	2209.0	267.0	4.0
1	85. Rm-088	18.17	35.0	2834.0	1094.0	2196.0	252.0	4.0
1	84. Rm-089	18.31	47.0	3103.0	1095.0	2039.0	129.0	2.0
1	64. Rm-090	21.44	50.0	3178.0	1305.0	1875.0	7.0	0.0
1	87. Rm-091	18.11	45.0	3159.0	1280.0	1920.0	11.0	0.0
1	90. Rm-092	18.12	42.0	3129.0	1245.0	1986.0	12.0	1.0
1	82. Rm-093	18.34	47.0	3156.0	1231.0	1966.0	14.0	1.0
1	160. Rm-094	16.58	43.0	3115.0	1303.0	1945.0	9.0	0.0
1	45. Gym	27.71	37.0	2741.0	1216.0	2416.0	5.0	0.0
1	106. Rm-095	17.74	24.0	2562.0	1126.0	2344.0	346.0	13.0
1	107. Rm-096	17.74	8.0	2358.0	1214.0	2420.0	401.0	14.0
1	105. Rm-097	17.74	7.0	2334.0	1226.0	2449.0	385.0	14.0
1	104. Rm-098	17.74	7.0	2359.0	1249.0	2474.0	313.0	13.0
1	166. Rm-099	16.01	8.0	2453.0	1457.0	2474.0	20.0	3.0
1	65. Rm-100	20.83	8.0	2695.0	1561.0	2140.0	11.0	0.0
1	122. Rm-101	17.54	4.0	2097.0	1896.0	2397.0	19.0	2.0
1	8. Dining	91.78	25.0	75.0	509.0	1813.0	3053.0	0.0
1	117. Rm-102	17.55	32.0	2756.0	1180.0	2282.0	162.0	3.0
1	116. Rm-103	17.55	29.0	2727.0	1129.0	2253.0	272.0	5.0
1	120. Rm-104	17.55	30.0	2730.0	1116.0	2257.0	277.0	5.0
1	126. Rm-105	17.55	34.0	2782.0	1115.0	2206.0	273.0	5.0
1	130. Rm-106	17.55	46.0	3051.0	1108.0	2085.0	123.0	2.0
1	50. Sitting	25.89	100.0	1265.0	1534.0	2576.0	0.0	0.0

Level	Zone	Area (m²)	<-1	-1 to -0.5	-0.5 to 0	0 to 0.5	0.5 to 1	>1
1	24. Activity B	50.15	87.0	749.0	1534.0	3105.0	0.0	0.0
1	14. Lounge	71.25	72.0	1127.0	1418.0	2846.0	12.0	0.0
1	7. Dining	106.47	0.0	1.0	677.0	1740.0	3057.0	0.0

Building Class 9C

Method Two

AC Energy Threshold	184.84
U-Value Threshold (W/m².K)	1.10
Reference Window U-Value (W/m².K)	1.74
Reference Window SHGC	0.24
Reference Wall R-Value (m².K/W)	1.40
Total Area (m²)	2171.55
Window-Wall Ratio	0.38

Method One - North Aspect

Reference Window U-Value (W/m².K)	1.70
Reference Window SHGC	0.24
Reference Wall R-Value (m².K/W)	1.40
Solar Admittance Threshold	0.07
U-Value Threshold (W/m².K)	1.10
Solar Admittance Weighting	1.52
Aspect Area (m²)	606.45
Window-Wall Ratio	0.39

Title	Heading (°)	U-value (W/m².°K)	SHGC	Area (m²)	P (m)	G (m)	H (m)	SC
Concept	9.0	1.74	0.24	5.94	0.80	0.30	3.00	0.84
Concep	9.0	1.74	0.24	5.16	0.80	0.60	3.00	0.91

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Title	Heading (°)	U-value (W/m².°K)	SHGC	Area (m²)	P (m)	G (m)	H (m)	SC
t								
Concept	9.0	1.74	0.24	7.02	1.20	0.30	3.00	0.74
Concept	9.0	1.74	0.24	7.02	1.32	0.30	3.00	0.71
Concept	9.0	1.74	0.24	5.94	1.35	0.30	3.00	0.70
Concept	9.0	1.74	0.24	15.48	1.35	0.60	3.00	0.79
Concept	9.0	1.74	0.24	24.84	1.40	0.30	3.00	0.69
Concept	9.0	1.74	0.24	41.28	1.40	0.60	3.00	0.77
Concept	9.0	1.74	0.24	92.88	1.80	0.60	3.00	0.68
Concept	9.0	1.74	0.24	30.96	1.85	0.60	3.00	0.67

Method One - East Aspect

Reference Window U-Value (W/m².K)	1.67
Reference Window SHGC	0.24
Reference Wall R-Value (m².K/W)	1.40
Solar Admittance Threshold	0.07
U-Value Threshold (W/m².K)	1.10
Solar Admittance Weighting	1.28
Aspect Area (m²)	479.40
Window-Wall Ratio	0.40

Title	Heading (°)	U-value (W/m².°K)	SHGC	Area (m²)	P (m)	G (m)	H (m)	SC

BESTEC

Title	Heading (°)	U-value (W/m².°K)	SHGC	Area (m²)	P (m)	G (m)	H (m)	SC
Concept	99.0	1.74	0.24	1.48	1.30	0.60	3.00	0.80
Concept	99.0	1.74	0.24	25.79	1.35	0.30	3.00	0.70
Concept	99.0	1.74	0.24	64.44	1.35	0.60	3.00	0.79
Concept	99.0	1.74	0.24	46.44	1.40	0.60	3.00	0.77
Concept	99.0	1.74	0.24	5.80	1.45	0.30	3.00	0.67
Concept	99.0	1.74	0.24	15.48	1.45	0.60	3.00	0.76
Concept	99.0	1.74	0.24	10.32	2.05	0.60	3.00	0.63
Concept	99.0	1.74	0.24	21.60	3.45	0.30	3.00	0.40
Concept	99.0	1.74	0.24	2.40	3.65	0.60	3.00	0.47

Method One - South Aspect

Reference Window U-Value (W/m².K)	1.73
Reference Window SHGC	0.22
Reference Wall R-Value (m².K/W)	1.40
Solar Admittance Threshold	0.07
U-Value Threshold (W/m².K)	1.10
Solar Admittance Weighting	1.00
Aspect Area (m²)	606.30
Window-Wall Ratio	0.38

Title	Heading (°)	U-value (W/m².°K)	SHGC	Area (m²)	P (m)	G (m)	H (m)	SC

BESTEC

Title	Heading (°)	U-value (W/m².°K)	SHGC	Area (m²)	P (m)	G (m)	H (m)	SC
Concept	189.0	1.74	0.24	2.40	0.00	0.00	0.00	1.00
Concept	189.0	1.74	0.24	15.48	0.75	0.60	3.00	0.94
Concept	189.0	1.74	0.24	10.32	1.30	0.60	3.00	0.88
Concept	189.0	1.74	0.24	35.76	1.35	0.60	3.00	0.87
Concept	189.0	1.74	0.24	73.44	1.40	0.60	3.00	0.86
Concept	189.0	1.74	0.24	14.58	1.45	0.30	3.00	0.80
Concept	189.0	1.74	0.24	4.80	1.75	0.60	3.00	0.82
Concept	189.0	1.74	0.24	15.60	1.80	0.60	3.00	0.81
Concept	189.0	1.74	0.24	14.04	1.90	0.30	3.00	0.74
Concept	189.0	1.74	0.24	5.16	1.90	0.60	3.00	0.80
Concept	189.0	1.74	0.24	5.16	2.00	0.60	3.00	0.78
Concept	189.0	1.74	0.24	17.55	2.35	0.30	3.00	0.68
Concept	189.0	1.74	0.24	16.74	4.15	0.30	3.00	0.62

Method One - West Aspect

Reference Window U-Value (W/m².K)	1.89
Reference Window SHGC	0.26
Reference Wall R-Value (m².K/W)	1.40

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Solar Admittance Threshold	0.07
U-Value Threshold (W/m².K)	1.10
Solar Admittance Weighting	1.33
Aspect Area (m²)	479.40
Window-Wall Ratio	0.33

Title	Heading (°)	U-value (W/m².°K)	SHGC	Area (m²)	P (m)	G (m)	H (m)	SC
Concept	279.0	1.74	0.24	28.49	1.20	0.30	3.00	0.74
Concept	279.0	1.74	0.24	4.80	1.20	0.60	3.00	0.82
Concept	279.0	1.74	0.24	24.72	1.30	0.60	3.00	0.80
Concept	279.0	1.74	0.24	13.50	1.35	0.30	3.00	0.70
Concept	279.0	1.74	0.24	6.60	1.35	0.60	3.00	0.79
Concept	279.0	1.74	0.24	8.10	1.40	0.30	3.00	0.69
Concept	279.0	1.74	0.24	46.44	1.40	0.60	3.00	0.77
Concept	279.0	1.74	0.24	5.16	1.90	0.60	3.00	0.66
Concept	279.0	1.74	0.24	4.32	2.05	0.60	3.00	0.63
Concept	279.0	1.74	0.24	2.52	2.85	0.60	3.00	0.49
Concept	279.0	1.74	0.24	2.40	4.60	0.60	3.00	0.47
Concept	279.0	1.74	0.24	8.10	8.80	0.30	3.00	0.40

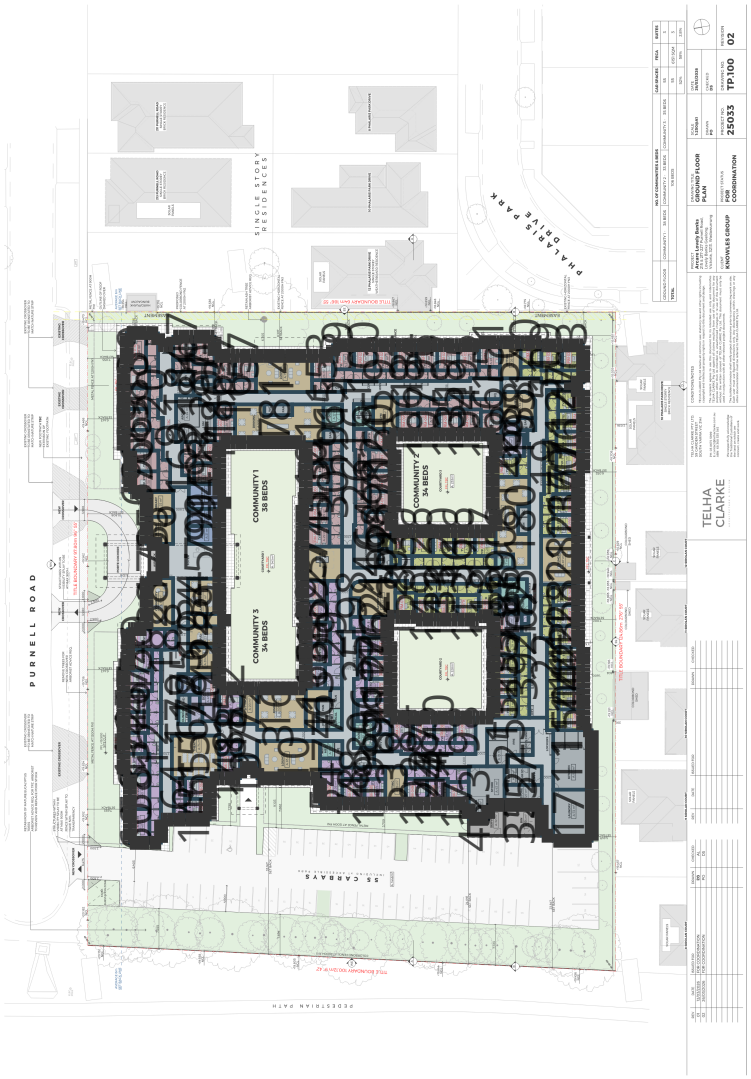
BESTEC

Title	Heading (°)	U-value (W/m².°K)	SHGC	Area (m²)	P (m)	G (m)	H (m)	SC
Concept	279.0	1.74	0.24	1.32	9.25	0.60	3.00	0.47
Concept	279.0	1.74	0.24	1.20	13.75	0.60	3.00	0.47

BESTEC

Drawings

Level 1 - Ground



Thermal Line | Windows | Class 9C | Unconditioned

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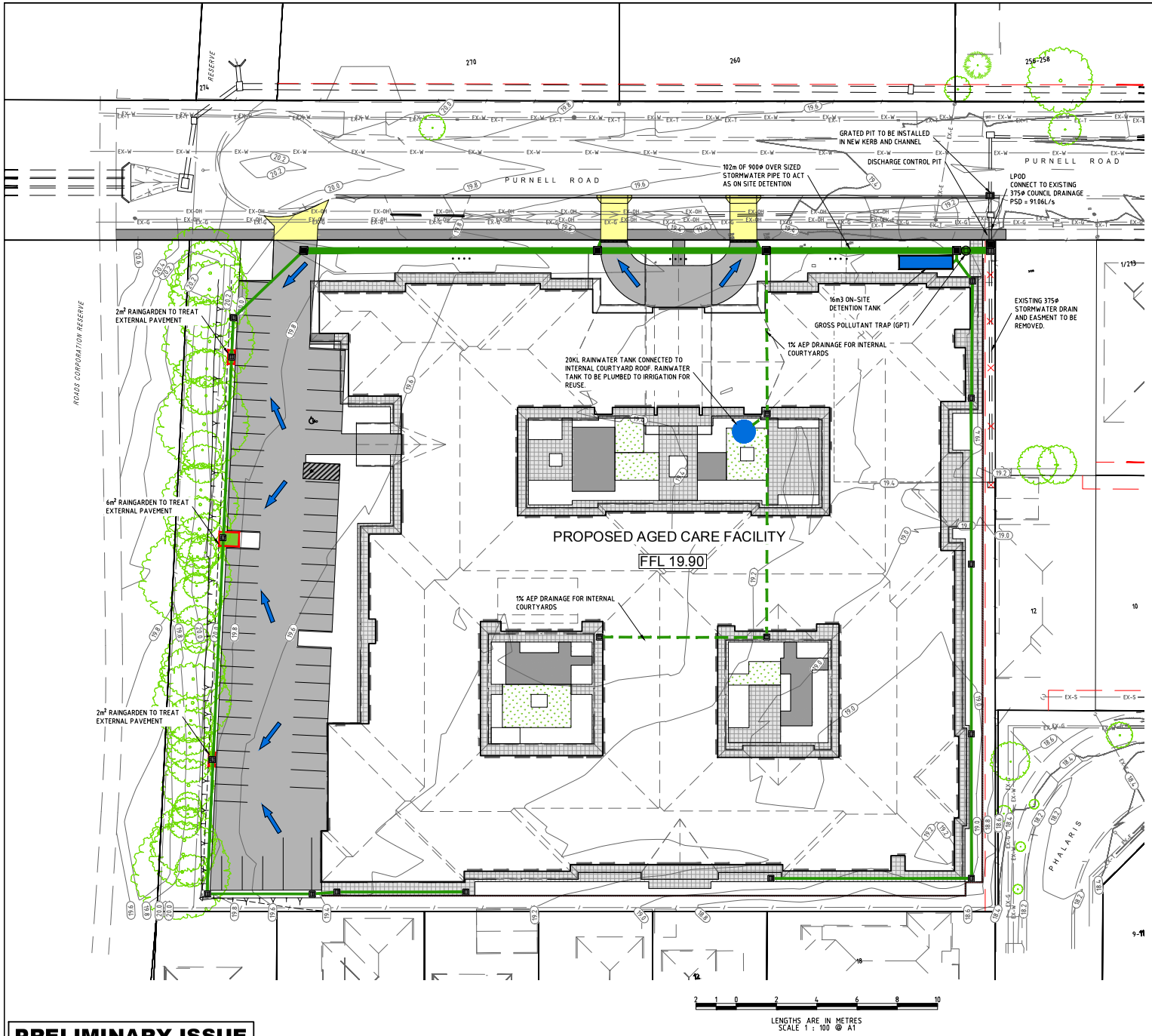
Appendix C: Stormwater Management Plan



LEGEND

DRAINAGE PIPES	STORMWATER DRAINAGE (10%AEP)
	STORMWATER DRAINAGE (1%AEP)
	EXISTING DRAINAGE
OVERLAND FLOW	INDICATED BY FLOW ARROWS ON PLAN
LEVELS	EXISTING CONTOURS
	EXISTING SPOT LEVELS

STORMWATER MANAGEMENT SUMMARY

FLOODING:

COUNCIL LIABLE TO FLOODING ADVICE (REG 51(2)) - NO. NO APPLICABLE LSIO / SBO.

OVERLAND FLOWS: SEE ON PLAN

STORMWATER SURFACE OVERLAND FLOWS FOR 1% AEP STORMS ARE INDICATED BY ARROWS ON PLAN, AND ALL DIRECTED TO PURNELL ROAD AND RESERVE.

STORMWATER ON-SITE DETENTION:

PSD = 91.06L/s
CATCHMENT = 12,243m²
DETENTION STORAGE REQUIREMENT = 83.43m³ (FOR 10% AEP POST-DEVELOPMENT EVENT AS PER GREATER GEELONG COUNCIL DRAINAGE DESIGN GUIDELINES)
ON SITE DETENTION HAS BEEN CALCULATED USING RATIONAL METHOD.
REQUIRED MINIMUM ON-SITE STORAGE OF 83.43m³ TO BE MET VIA THE USE OF AN UNDERGROUND STORAGE TANK AND OVERSIZED PIPES.

WATER QUALITY (WSUD):

STORMWATER RUNOFF EXITING THE LAND MEETS THE CURRENT BEST PRACTICE WITH THE USE OF THE FOLLOWING TREATMENT DEVICES:

- 1 X ATLAN VORTCEPTOR GROSS POLLUTANT TRAP (IVR.025) - SQIDEP APPROVED DEVICE
- 1 X 20,000L RAINWATER TANK PLUMBED FOR REUSE
  - CONNECTED TO MINIMUM ROOF AREA (3,474m2)
  - PLUMBED TO IRRIGATION FOR REUSE - ALLOWED FOR MINIMUM 500m² GARDEN @ 2L/m²/day = 1000L/day DEMAND
- CARPARK HARSTAND PAVEMENT DIRECTED TO 10m² OF RAINGARDEN

NOTE:
LEGAL POINT OF DISCHARGE CONNECTION TO BE CONSTRUCTED OVER EXISTING COUNCIL PIPE.

DRAINAGE DESIGN PARAMETERS:
MINOR FLOWS:
10% AEP UNDERGROUND PIPED DRAINAGE NETWORK DIRECTED TO THE LPOD SHOWN ON PLAN.

MAJOR FLOWS:
1% AEP OVERLAND FLOW PATHS DIRECTED TO PURNELL ROAD AND RESERVE.

DRAWING INDEX

NO.	DRAWING TITLE
SMP1	STORMWATER MANAGEMENT PLAN
SMP2	STORMWATER QUALITY PLAN

PRELIMINARY ISSUE

NO	BY	REVISION	DATE	NO	BY	REVISION	DATE
P3	STH	ADDED GRATED PIT IN PURNELL ROAD	17/07/26				
P2	MJL	AMENDED BACKGROUND	21/04/26				
P1	MJL	PRELIMINARY ISSUE	01/04/26				

arcare AGED CARE
KNOWLES GROUP

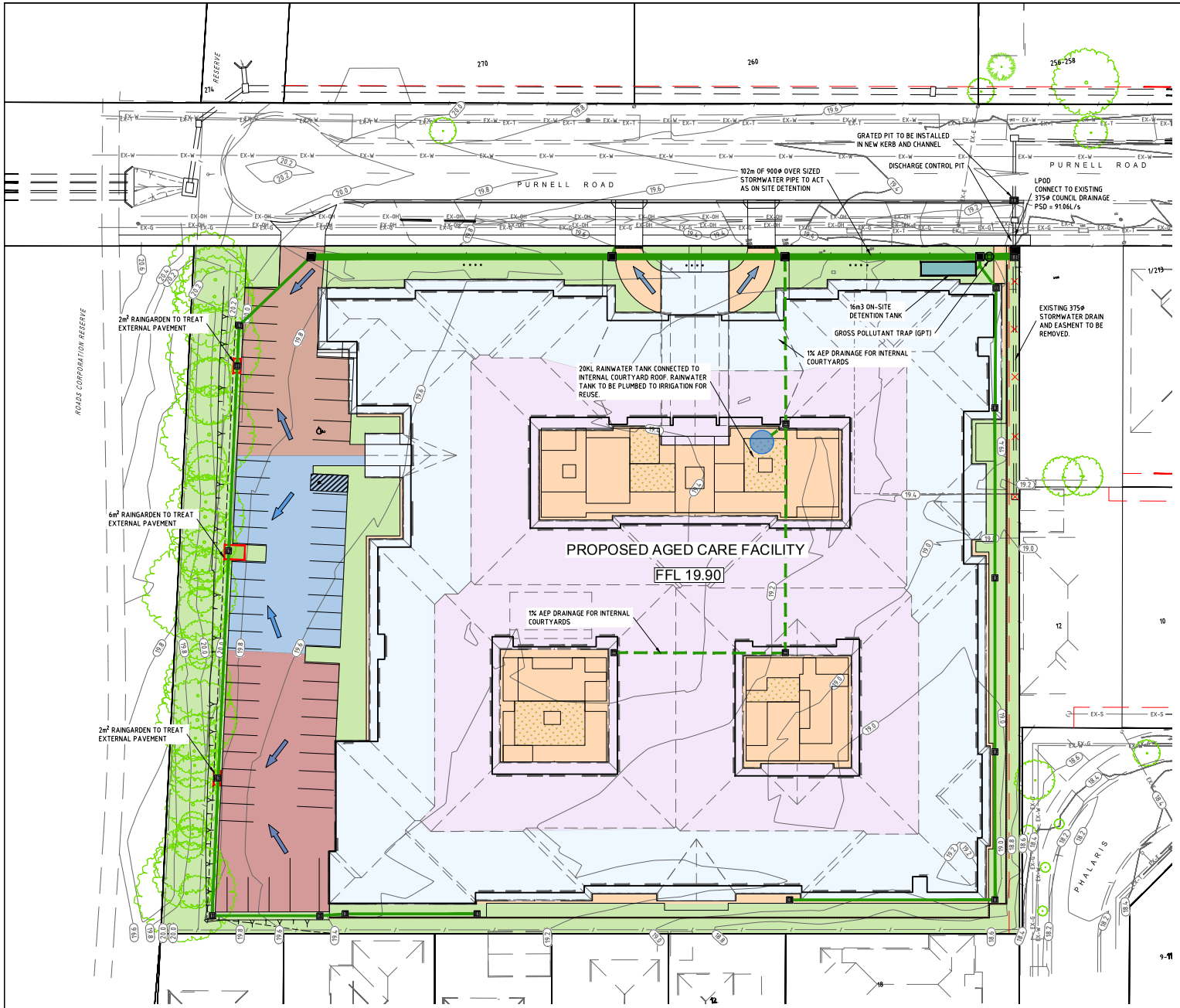
Lanigan Civil
Patama Pty Ltd (ABN: 79 108 035 463)
Trading as Lanigan Civil
Consulting Civil Engineers
Unit 4, 7-9 Hall Street, Braeside VIC 3195
Tel: 03 9558 4380 Fax: 03 9587 9707
Email: admin@lancivil.com.au

PROPOSED AGED CARE
217-227 PURNELL ROAD
LOVELY BANKS 3213

STORMWATER MANAGEMENT PLAN

DESIGNED	DRAWN	CHECKED
MJL	MJL	NJC
DATE: 30/03/26	SCALE/S: AS NOTED	
DRG NO: LC3230-SMP1	ISSUE: P3	

DIAL BEFORE YOU DIG www.1100.com.au
CONTRACTOR MUST DIAL 1100 TO CONFIRM LOCATION OF EXISTING SERVICES AND COMPLY WITH ANY AUTHORITY REQUIREMENTS REGARDING EXISTING SERVICES PRIOR TO COMMENCEMENT OF ANY WORKS.



CATCHMENT AREAS:

PLAN COLOUR	CATCHMENT TYPE	AREA m^2	TREATMENT
	ROOF TO RWT TANKS	3,474	1 x 20,000L RAINWATER TANK, ATLAN VORTCEPTOR IVR.825
	ROOF OTHER	3,720	ATLAN VORTCEPTOR GPT
	OTHER PAVEMENT AND COURTYARDS	1,236	ATLAN VORTCEPTOR GPT
	HARDSTAND PAVEMENT 1	613	2m² RAINGARDEN & ATLAN VORTCEPTOR GPT
	HARDSTAND PAVEMENT 2	447	6m² RAINGARDEN & ATLAN VORTCEPTOR GPT
	HARDSTAND PAVEMENT 3	381	2m² RAINGARDEN & ATLAN VORTCEPTOR GPT
	LANDSCAPING	2,372	
	TOTAL SITE AREA	12,243	

STORMWATER TREATMENT:

THE CONCEPTUAL STORMWATER DRAINAGE SYSTEM ON THIS SITE HAS BEEN DESIGNED, WITH THE USE OF "MUSIC" (MODEL FOR URBAN STORMWATER IMPROVEMENT CONCEPTUALISATION),SUCH THAT STORMWATER RUNOFF EXITING THE LAND MEETS THE CURRENT BEST PRACTICE PERFORMANCE OBJECTIVES FOR STORMWATER QUALITY, AS CONTAINED IN THE URBAN STORMWATER BEST PRACTICE ENVIRONMENTAL MANAGEMENT GUIDELINES (VICTORIAN STORMWATER COMMITTEE, 1999).

80% REDUCTION OF THE TYPICAL ANNUAL LOAD OF SUSPENDED SOLIDS (90.23% ACHIEVED).

45% REDUCTION OF THE TYPICAL ANNUAL LOAD OF TOTAL PHOSPHORUS (84.15% ACHIEVED).

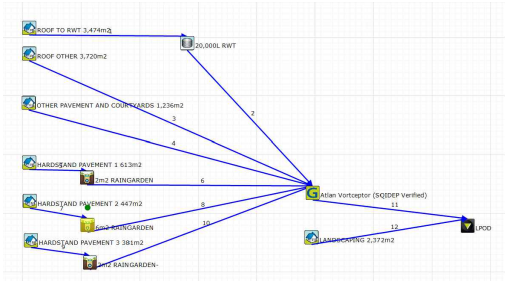
45% REDUCTION OF THE TYPICAL ANNUAL LOAD OF TOTAL NITROGEN (53.97% ACHIEVED).

70% REDUCTION OF THE TYPICAL ANNUAL LOAD OF GROSS POLLUTANTS (97.77% ACHIEVED).

Latest Run : Treatment Train Effectiveness : LPOD

	Sources	Residual Load	% Reduction
Flow (ML/yr)	4.32	3.962	8.301
Total Suspended Solids (kg/yr)	890.2	86.99	90.23
Total Phosphorus (kg/yr)	1.793	0.2843	84.15
Total Nitrogen (kg/yr)	12.43	5.723	53.97
Gross Pollutants (kg/yr)	174.6	3.869	97.78

MUSIC RESULTS



MUSIC TREATMENT TRAIN

TOTAL SITE AREA
= 12,243 m^2

LENGTHS ARE IN METRES
SCALE 1 : 100 @ A1

PRELIMINARY ISSUE

DIAL BEFORE YOU DIG www.1100.com.au
CONTRACTOR MUST DIAL 1100 TO CONFIRM LOCATION OF EXISTING SERVICES AND COMPLY WITH ANY AUTHORITY REQUIREMENTS REGARDING EXISTING SERVICES PRIOR TO COMMENCEMENT OF ANY WORKS.

NO	BY	REVISION	DATE
P4	MJL	AMENDED CATCHMENTS AREAS TABLE	17/07/26
P3	STH	ADDED GRATED PIT IN PURNELL ROAD	17/07/26
P2	MJL	AMENDED BACKGROUND	21/04/26
P1	MJL	PRELIMINARY ISSUE	01/04/26

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Email: admin@lancivil.com.au

PROPOSED AGED CARE
217-227 PURNELL ROAD
LOVELY BANKS 3213

STORMWATER QUALITY PLAN

NORTH

DESIGNED	DRAWN	CHECKED
MJL	MJL	NJC

DATE: 30/03/26
SCALE/S: AS NOTED
DRG NO: LC3230-SMP2
ISSUE: P4

Lin Zhu
Design Manager

KNOWLES GROUP

2nd November 2023

Dear Lin

Thank you for the detailed conversation regarding the use of rainwater for flushing of toilets at the new Arcare Aged Care facility that is under design.

Whilst at all stages we would expect to promote and comply with the requirements to be environmentally conscious the use of rainwater to flush toilets raises concern from an infection prevention and control (IPC) perspective.

Firstly, we are housing a vulnerable population with a wide range of ageing and therefore comorbidities that increases the risk of poor outcomes if the environment is not designed to be fit for purpose and reduce all risks where possible.

In this environment there are factors that we need to consider ensuring we are providing the safest and best environment for the residents of the facility, their representatives, the workforce, and the broader community who frequent these residential aged care facilities.

Whilst the concept of using the rainwater to flush toilets is as such a very environmentally favorable practice, it does not support and promote a safe environment for the consumers of aged care.

There are a range of reasons why from an IPC perspective, we would not accept this practice. In the first instance the residents themselves have multiple chronic conditions and comorbidity and have lower level of immunity and are therefore far more vulnerable to the exposure of any communicable disease including for example legionella.

There is an increased risk of environmental factors when not always using potable water, which increases the risk of possible resident exposure to droplet particles that may contain legionella and other water contaminants.

An Aged Care Facility, being group or residential accommodation, by way of its nature and design increases the risk of further transmission should there be just the one case of a communicable disease. This is due to close living proximity and high acuity of care required. This can very quickly translate into large outbreaks across the facility with increased risk of spread between residents and mortality due to the residents being immunocompromised.

There are a large number of rooms planned in this facility which may take some time to fill which means there would be possible stagnation of water in plumbing again increasing the risk of environmental contamination and growth of contaminants in the lines. The introduction of dead legs is also a must to avoid due to water stagnation and therefore growth of contaminants.

It is in my opinion that the use of rainwater should only be used for external purposes such as irrigation of the grounds, possible use during fire but under no circumstance do I support the use of rainwater to flush toilets in the Arcare Aged Care Facility . Use of Rainwater in Aged Care facilities is putting the health and safety of elderly residents at risk.

I appreciate your engagement and promotion of all things environmental sustainability but there are certain concepts in health and aged care that cannot be supported for a range of reasons.

I trust you will take on board my recommendation and support the request from the Deputy State Operations Manager representing the organization and provide feedback and move forward with support of the plans as drawn and not continue with the request for rainwater use for toilet flushing.

SINCERELY

Michelle Bibby

Director Infection Prevention Australia

michelle@infectionprevention.com.au

www.infectionprevention.com.au

Appendix D: Daylighting Report

BESTEC

Daylight Simulation Report

Project	Arcare Lovely Banks
Address	217 Purnell Rd, Lovely Banks VIC 3213, Australia (38.07° S, 144.34° E)
Date	2026-07-21, 09:34 AM
Author	[redacted]
Scope	National Construction Code 2022

Using Better Building

Better Building provides various daylight calculations to satisfy the requirements of your local construction code. Radiance 5.3 (Validated against CIE171:2006) has been used to simulate the building with wall, roof, floor, window, and shading surfaces according to user inputs. A grid of sensor points have been generated in the appropriate zones accordance with user inputs. Each metric result includes a summary compared to required outcomes, a level-by-level visualisation of results, and zone-by-zone reporting.

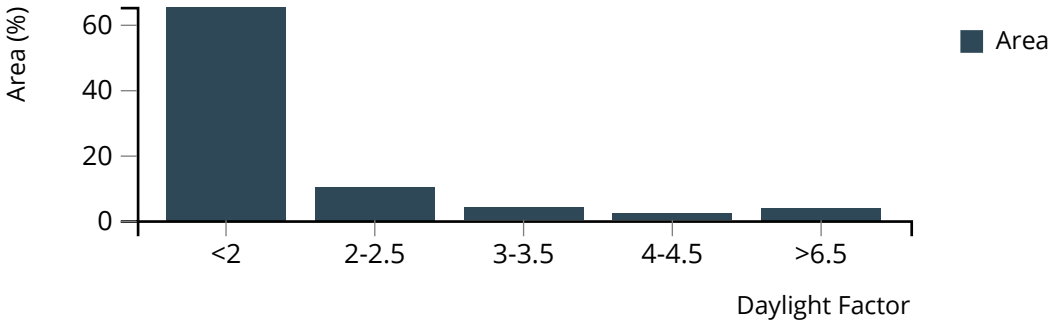
Results

Daylight Factor 1

To meet the acceptance criteria, **34** % of total area across the assessed zones must meet the conditions:

- daylight factor is greater than 2.00 %

A total of 12750 sensor points representing an area of 2930.06 m² across 128 zones were assessed, where an area of **34.75** % achieved the conditions, **meeting** the acceptance criteria.

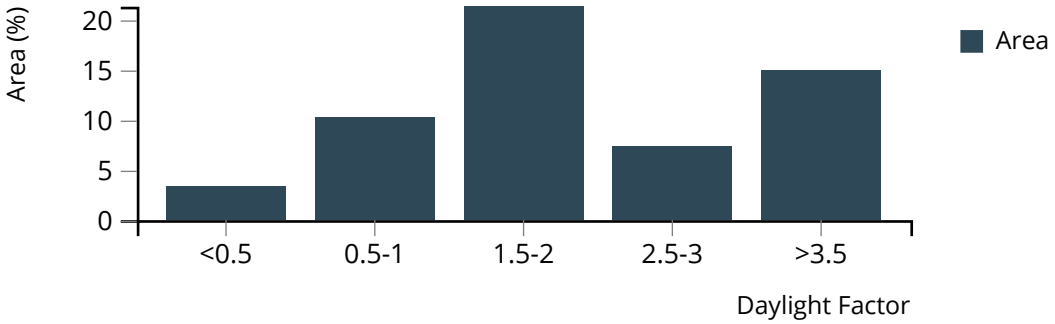


Daylight Factor 2

To meet the acceptance criteria, **80** % of the assessed zones must meet the conditions:

- daylight factor is greater than 0.50 %
- for at least 90 % of area in each zone

A total of 8999 sensor points representing an area of 2060.75 m² across 109 zones was assessed, where **92.66** % of the zones achieved the conditions, **meeting** the acceptance criteria.



BESTEC

Inputs

Levels

Level	Drawing	# Zones	Floor Area (m²)	Wall (m²)	Window (m²)
1	Ground	128	2996.7	7588.0	836.5

Zones

Level	Zone	Area (m²)	Volume (m³)	Treated Area (m²)
1	7. Dining	106.47	298.11	106.47
1	8. Dining	91.78	256.99	91.78
1	10. Lounge	82.19	230.14	82.19
1	14. Lounge	71.25	199.49	71.25
1	16. Dining	71.15	199.23	71.15
1	18. Lounge	63.29	177.21	63.29
1	24. Activity B	50.15	140.43	50.15
1	27. Billiards	47.80	133.83	47.80
1	28. Community	47.34	132.54	47.34
1	34. Cafe+ Sitting	38.88	108.85	38.88
1	40. Rm-057	30.36	85.01	30.36
1	42. Salon	28.79	80.62	28.79
1	44. Meeting	28.07	78.60	28.07
1	45. Gym	27.71	77.58	27.71
1	49. RM-009	25.78	72.18	25.78
1	50. Sitting	25.89	72.48	25.89
1	53. Sitting	25.68	71.89	25.68
1	54. Rm-052	25.04	70.10	25.04
1	55. Sitting	25.12	70.35	25.12
1	56. Rm-071	23.93	67.00	23.93

BESTEC

Level	Zone	Area (m²)	Volume (m³)	Treated Area (m²)
1	58. RM-002	22.99	64.37	22.99
1	59. RM-016	22.42	62.78	22.42
1	60. RM-001	22.38	62.67	22.38
1	61. Library	22.58	63.24	22.58
1	62. P/D	22.16	62.04	22.16
1	64. Rm-090	21.44	60.02	21.44
1	65. Rm-100	20.83	58.32	20.83
1	66. RM-012	20.60	57.67	20.60
1	67. RM-007	20.22	56.62	20.22
1	69. RM-010	19.98	55.96	19.98
1	70. RM-011	20.04	56.13	20.04
1	71. RM-018	19.85	55.57	19.85
1	72. Sitting	19.62	54.94	19.62
1	73. Rm-081	19.28	53.98	19.28
1	74. Rm-065	19.28	53.98	19.28
1	75. Rm-064	19.27	53.94	19.27
1	76. Rm-035	18.89	52.90	18.89
1	77. Rm-036	18.88	52.85	18.88
1	78. Rm-051	18.69	52.34	18.69
1	79. Admin	18.65	52.23	18.65
1	82. Rm-093	18.34	51.36	18.34
1	83. RM-003	18.29	51.22	18.29
1	84. Rm-089	18.31	51.27	18.31
1	85. Rm-088	18.17	50.87	18.17
1	87. Rm-091	18.11	50.72	18.11

BESTEC

Level	Zone	Area (m²)	Volume (m³)	Treated Area (m²)
1	88. RM-015	18.11	50.72	18.11
1	89. RM-013	18.12	50.75	18.12
1	90. Rm-092	18.12	50.75	18.12
1	91. RM-014	18.12	50.75	18.12
1	92. Rm-024	18.05	50.54	18.05
1	93. Rm-059	17.97	50.32	17.97
1	94. Rm-025	17.93	50.21	17.93
1	95. Rm-028	17.93	50.21	17.93
1	96. Rm-026	17.93	50.21	17.93
1	97. Rm-027	17.93	50.21	17.93
1	98. Rm-086	17.93	50.21	17.93
1	99. RM	17.80	49.85	17.80
1	100. Rm-023	17.82	49.88	17.82
1	101. Rm-061	17.78	49.78	17.78
1	102. Rm-049	17.78	49.78	17.78
1	103. RM-032	17.65	49.42	17.65
1	104. Rm-098	17.74	49.67	17.74
1	105. Rm-097	17.74	49.67	17.74
1	106. Rm-095	17.74	49.67	17.74
1	107. Rm-096	17.74	49.67	17.74
1	108. Rm-058	17.74	49.67	17.74
1	109. RM-031	17.74	49.67	17.74
1	110. Rm-087	17.70	49.56	17.70
1	111. Rm-060	17.67	49.47	17.67
1	112. Rm-072	17.58	49.23	17.58

BESTEC

Level	Zone	Area (m²)	Volume (m³)	Treated Area (m²)
1	113. Rm-079	17.57	49.20	17.57
1	114. Rm-034	17.55	49.14	17.55
1	115. Rm-063	17.55	49.14	17.55
1	116. Rm-103	17.55	49.14	17.55
1	117. Rm-102	17.55	49.14	17.55
1	118. Rm-080	17.57	49.20	17.57
1	119. Rm-050	17.55	49.14	17.55
1	120. Rm-104	17.55	49.14	17.55
1	121. Rm-039	17.55	49.14	17.55
1	122. Rm-101	17.54	49.11	17.54
1	123. Rm-066	17.55	49.14	17.55
1	124. Rm-048	17.55	49.14	17.55
1	125. Rm-042	17.55	49.14	17.55
1	126. Rm-105	17.55	49.14	17.55
1	127. Rm-033	17.50	49.01	17.50
1	128. Rm-041	17.55	49.14	17.55
1	129. Rm-084	17.55	49.14	17.55
1	130. Rm-106	17.55	49.14	17.55
1	131. Rm-085	17.55	49.14	17.55
1	132. Rm-040	17.55	49.14	17.55
1	133. Rm-082	17.55	49.14	17.55
1	134. Rm-062	17.55	49.14	17.55
1	135. Rm-083	17.55	49.14	17.55
1	136. Rm-038	17.55	49.14	17.55
1	137. Rm-019	17.51	49.03	17.51

BESTEC

Level	Zone	Area (m²)	Volume (m³)	Treated Area (m²)
1	138. Rm-068	17.39	48.69	17.39
1	139. Rm-022	17.35	48.58	17.35
1	140. RM-030	17.35	48.57	17.35
1	141. Rm-078	17.36	48.60	17.36
1	142. Rm-044	17.36	48.60	17.36
1	143. Rm-043	17.34	48.55	17.34
1	144. Rm-045	17.36	48.60	17.36
1	145. RM-005	17.36	48.60	17.36
1	146. Rm-055	17.27	48.35	17.27
1	147. RM-006	17.36	48.60	17.36
1	148. Rm-0053	17.32	48.49	17.32
1	149. Rm-077	17.35	48.58	17.35
1	150. Rm-046	17.36	48.60	17.36
1	151. Rm-029	17.35	48.57	17.35
1	152. Rm-056	17.25	48.30	17.25
1	153. Rm-021	17.16	48.06	17.16
1	154. Rm-069	17.16	48.06	17.16
1	155. Rm-054	17.13	47.97	17.13
1	156. RM-008	16.97	47.52	16.97
1	157. Rm-020	16.97	47.52	16.97
1	158. Rm-076	16.94	47.44	16.94
1	159. Rm-067	16.89	47.29	16.89
1	160. Rm-094	16.58	46.43	16.58
1	162. Rm-075	16.34	45.76	16.34
1	166. Rm-099	16.01	44.84	16.01

Level	Zone	Area (m²)	Volume (m³)	Treated Area (m²)
1	167. RM-017	15.94	44.63	15.94
1	168. Rm-070	15.85	44.38	15.85
1	170. Rm-037	15.24	42.69	15.24
1	171. Rm-047	15.24	42.69	15.24
1	172. RM-004	15.24	42.69	15.24
1	174. Rm-073	14.86	41.61	14.86
1	176. Rm-074	14.40	40.32	14.40
1	202. WC,Circ (Rm081)	2.13	5.96	2.13
		2858.18		2858.18

Grid Parameters

Timestep (mins)	60 minutes
Grid Corners	Mitred
Plane Height (m)	0.75
Boundary Margin (m)	0.2
Internal Boundary Margin (m)	
Internal Shading Margin (m)	
Grid Size (m)	0.5

Materials

Ceiling	**Value (%)**
Reflectivity	80.0
Specularity	0.0
Roughness	5.0
Floor	**Value (%)**
Reflectivity	30.0
Specularity	0.0
Roughness	5.0
Wall	**Value (%)**
Reflectivity	70.0
Specularity	0.0
Roughness	5.0
Shading	**Value (%)**
Reflectivity	40.0
Ground	**Value (%)**
Reflectivity	20.0

Glazing

Level	Zone	Title	Heading (°)	VLT	Area (m²)
1	10. Lounge	Concept	279.0	0.55	13.50
1	100. Rm-023	Concept	99.0	0.55	5.16
1	101. Rm-061	Concept	9.0	0.55	5.16
1	102. Rm-049	Concept	279.0	0.55	5.16
1	103. RM-032	Concept	99.0	0.55	5.16
1	103. RM-032	Concept	189.0	0.55	1.20
1	104. Rm-098	Concept	279.0	0.55	5.16
1	105. Rm-097	Concept	279.0	0.55	5.16
1	106. Rm-095	Concept	279.0	0.55	5.16
1	107. Rm-096	Concept	279.0	0.55	5.16
1	108. Rm-058	Concept	189.0	0.55	5.16
1	109. RM-031	Concept	99.0	0.55	5.16
1	110. Rm-087	Concept	99.0	0.55	5.16
1	111. Rm-060	Concept	279.0	0.55	4.80
1	112. Rm-072	Concept	189.0	0.55	5.16
1	113. Rm-079	Concept	279.0	0.55	5.16
1	114. Rm-034	Concept	189.0	0.55	5.16
1	115. Rm-063	Concept	9.0	0.55	5.16
1	116. Rm-103	Concept	99.0	0.55	5.16
1	117. Rm-102	Concept	99.0	0.55	5.16
1	118. Rm-080	Concept	279.0	0.55	4.32
1	119. Rm-050	Concept	279.0	0.55	5.16
1	120. Rm-104	Concept	99.0	0.55	5.16
1	121. Rm-039	Concept	189.0	0.55	5.16

BESTEC

Level	Zone	Title	Heading (°)	VLT	Area (m²)
1	122. Rm-101	Concept	9.0	0.55	5.16
1	123. Rm-066	Concept	9.0	0.55	5.16
1	124. Rm-048	Concept	279.0	0.55	5.16
1	125. Rm-042	Concept	189.0	0.55	5.16
1	126. Rm-105	Concept	99.0	0.55	5.16
1	127. Rm-033	Concept	189.0	0.55	5.16
1	128. Rm-041	Concept	189.0	0.55	5.16
1	129. Rm-084	Concept	9.0	0.55	5.16
1	130. Rm-106	Concept	99.0	0.55	5.16
1	131. Rm-085	Concept	9.0	0.55	5.16
1	132. Rm-040	Concept	189.0	0.55	5.16
1	133. Rm-082	Concept	9.0	0.55	5.16
1	134. Rm-062	Concept	9.0	0.55	5.16
1	135. Rm-083	Concept	9.0	0.55	5.16
1	136. Rm-038	Concept	189.0	0.55	5.16
1	137. Rm-019	Concept	99.0	0.55	5.16
1	138. Rm-068	Concept	9.0	0.55	5.16
1	139. Rm-022	Concept	99.0	0.55	5.16
1	14. Lounge	Concept	99.0	0.55	21.60
1	140. RM-030	Concept	99.0	0.55	5.16
1	141. Rm-078	Concept	279.0	0.55	5.16
1	142. Rm-044	Concept	189.0	0.55	5.16
1	143. Rm-043	Concept	189.0	0.55	5.16
1	144. Rm-045	Concept	189.0	0.55	5.16
1	145. RM-005	Concept	9.0	0.55	5.16

BESTEC

Level	Zone	Title	Heading (°)	VLT	Area (m²)
1	146. Rm-055	Concept	189.0	0.55	5.16
1	147. RM-006	Concept	9.0	0.55	5.16
1	148. Rm-0053	Concept	279.0	0.55	5.16
1	149. Rm-077	Concept	279.0	0.55	5.16
1	150. Rm-046	Concept	189.0	0.55	5.16
1	151. Rm-029	Concept	99.0	0.55	5.16
1	152. Rm-056	Concept	99.0	0.55	5.16
1	153. Rm-021	Concept	99.0	0.55	5.16
1	154. Rm-069	Concept	9.0	0.55	5.16
1	155. Rm-054	Concept	189.0	0.55	5.16
1	156. RM-008	Concept	9.0	0.55	5.16
1	157. Rm-020	Concept	99.0	0.55	5.16
1	158. Rm-076	Concept	279.0	0.55	5.16
1	159. Rm-067	Concept	9.0	0.55	5.16
1	16. Dining	Concept	99.0	0.55	19.98
1	160. Rm-094	Concept	189.0	0.55	4.80
1	162. Rm-075	Concept	189.0	0.55	5.16
1	166. Rm-099	Concept	279.0	0.55	4.08
1	167. RM-017	Concept	99.0	0.55	5.16
1	168. Rm-070	Concept	9.0	0.55	5.16
1	170. Rm-037	Concept	189.0	0.55	5.16
1	171. Rm-047	Concept	279.0	0.55	5.16
1	172. RM-004	Concept	9.0	0.55	5.16
1	174. Rm-073	Concept	189.0	0.55	5.16
1	176. Rm-074	Concept	189.0	0.55	5.16

BESTEC

Level	Zone	Title	Heading (°)	VLT	Area (m²)
1	18. Lounge	Concept	189.0	0.55	17.55
1	24. Activity B	Concept	279.0	0.55	2.40
1	27. Billiards	Concept	9.0	0.55	10.80
1	28. Community	Concept	9.0	0.55	14.04
1	34. Cafe+ Sitting	Concept	189.0	0.55	14.58
1	40. Rm-057	Concept	189.0	0.55	5.16
1	42. Salon	Concept	189.0	0.55	7.02
1	44. Meeting	Concept	189.0	0.55	5.28
1	45. Gym	Concept	279.0	0.55	2.52
1	49. RM-009	Concept	9.0	0.55	5.16
1	49. RM-009	Concept	99.0	0.55	1.48
1	50. Sitting	Concept	99.0	0.55	5.80
1	53. Sitting	Concept	279.0	0.55	8.10
1	54. Rm-052	Concept	279.0	0.55	5.16
1	55. Sitting	Concept	9.0	0.55	7.02
1	56. Rm-071	Concept	189.0	0.55	5.16
1	58. RM-002	Concept	9.0	0.55	10.32
1	59. RM-016	Concept	9.0	0.55	10.32
1	60. RM-001	Concept	9.0	0.55	10.32
1	61. Library	Concept	9.0	0.55	7.02
1	62. P/D	Concept	189.0	0.55	7.02
1	64. Rm-090	Concept	189.0	0.55	4.80
1	65. Rm-100	Concept	9.0	0.55	5.16
1	66. RM-012	Concept	9.0	0.55	5.16
1	66. RM-012	Concept	279.0	0.55	1.32

BESTEC

Level	Zone	Title	Heading (°)	VLT	Area (m²)
1	67. RM-007	Concept	9.0	0.55	5.16
1	69. RM-010	Concept	9.0	0.55	5.16
1	69. RM-010	Concept	279.0	0.55	1.44
1	7. Dining	Concept	279.0	0.55	28.49
1	70. RM-011	Concept	9.0	0.55	5.16
1	71. RM-018	Concept	99.0	0.55	5.16
1	72. Sitting	Concept	99.0	0.55	5.80
1	73. Rm-081	Concept	9.0	0.55	5.16
1	74. Rm-065	Concept	9.0	0.55	5.16
1	75. Rm-064	Concept	9.0	0.55	5.16
1	76. Rm-035	Concept	189.0	0.55	5.16
1	77. Rm-036	Concept	189.0	0.55	5.16
1	78. Rm-051	Concept	279.0	0.55	5.16
1	79. Admin	Concept	189.0	0.55	5.16
1	8. Dining	Concept	9.0	0.55	11.88
1	82. Rm-093	Concept	189.0	0.55	5.16
1	83. RM-003	Concept	9.0	0.55	5.16
1	83. RM-003	Concept	279.0	0.55	1.20
1	84. Rm-089	Concept	99.0	0.55	5.16
1	85. Rm-088	Concept	99.0	0.55	5.16
1	87. Rm-091	Concept	189.0	0.55	5.16
1	88. RM-015	Concept	9.0	0.55	5.16
1	89. RM-013	Concept	9.0	0.55	5.16
1	90. Rm-092	Concept	189.0	0.55	5.16
1	91. RM-014	Concept	9.0	0.55	5.16

Level	Zone	Title	Heading (°)	VLT	Area (m²)
1	92. Rm-024	Concept	99.0	0.55	5.16
1	93. Rm-059	Concept	189.0	0.55	5.16
1	94. Rm-025	Concept	99.0	0.55	5.16
1	95. Rm-028	Concept	99.0	0.55	5.16
1	96. Rm-026	Concept	99.0	0.55	5.16
1	97. Rm-027	Concept	99.0	0.55	5.16
1	98. Rm-086	Concept	99.0	0.55	5.16
1	99. RM	Concept	189.0	0.55	5.16

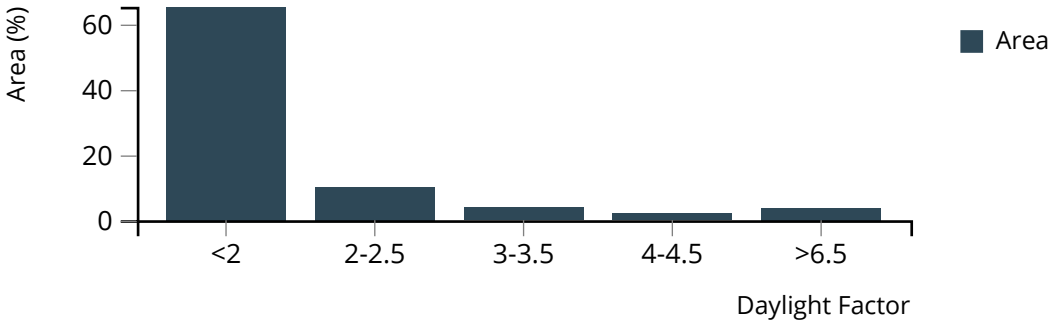
Detailed Results

Daylight Factor 1

To meet the acceptance criteria, **34** % of total area across the assessed zones must meet the conditions:

- daylight factor is greater than 2.00 %

A total of 12750 sensor points representing an area of 2930.06 m² across 128 zones were assessed, where an area of **34.75** % achieved the conditions, **meeting** the acceptance criteria.



Level	Zone	Area (m²)	Min (%)	Avg (%)	Max (%)	Pass Area (m²)	Contribution (%)
1	10. Lounge	81.12	0.36	1.51	8.50	15.15	0.52
1	100. Rm-023	18.05	0.95	2.54	9.46	7.97	0.27
1	101. Rm-061	18.80	0.56	1.86	7.83	4.50	0.15
1	102. Rm-049	18.00	0.98	2.55	8.95	8.00	0.27
1	103. RM-032	17.06	1.52	3.15	11.15	10.54	0.36
1	104. Rm-098	18.76	0.87	2.56	9.24	7.67	0.26
1	105. Rm-097	18.76	0.84	2.67	9.66	8.00	0.27
1	106. Rm-095	18.76	0.78	2.33	8.47	6.75	0.23
1	107. Rm-096	18.76	0.85	2.66	9.58	8.15	0.28
1	108. Rm-058	18.76	0.80	2.07	7.10	5.25	0.18
1	109. RM-031	17.97	0.86	2.36	8.87	7.52	0.26
1	110. Rm-087	18.72	0.81	2.60	9.99	8.05	0.27
1	111. Rm-060	18.67	0.38	1.15	5.13	2.50	0.09

BESTEC

Level	Zone	Area (m²)	Min (%)	Avg (%)	Max (%)	Pass Area (m²)	Contribution (%)
1	112. Rm-072	18.60	0.72	2.38	8.61	6.75	0.23
1	113. Rm-079	18.60	0.65	2.22	8.25	6.75	0.23
1	114. Rm-034	17.77	0.98	2.56	8.94	7.78	0.27
1	115. Rm-063	18.56	0.82	2.41	9.41	7.17	0.24
1	116. Rm-103	18.56	0.78	2.58	10.21	7.67	0.26
1	117. Rm-102	18.56	0.52	1.66	7.30	4.50	0.15
1	118. Rm-080	18.56	0.26	0.78	3.01	1.00	0.03
1	119. Rm-050	17.77	1.02	2.57	8.92	8.15	0.28
1	120. Rm-104	18.56	0.84	2.65	10.29	8.25	0.28
1	121. Rm-039	17.77	0.97	2.40	7.92	7.15	0.24
1	122. Rm-101	18.56	0.93	3.23	13.66	9.92	0.34
1	123. Rm-066	18.56	0.95	2.66	10.22	8.50	0.29
1	124. Rm-048	17.77	1.03	2.55	8.85	8.15	0.28
1	125. Rm-042	17.77	1.04	2.42	8.11	7.17	0.24
1	126. Rm-105	18.56	0.78	2.57	9.98	7.90	0.27
1	127. Rm-033	17.31	1.06	2.61	8.94	8.40	0.29
1	128. Rm-041	17.77	1.11	2.71	9.15	9.45	0.32
1	129. Rm-084	18.56	0.73	2.15	7.82	5.82	0.20
1	130. Rm-106	18.56	0.61	1.90	8.07	5.00	0.17
1	131. Rm-085	18.56	0.46	1.43	5.86	3.50	0.12
1	132. Rm-040	17.77	0.92	2.34	7.94	6.90	0.24
1	133. Rm-082	18.56	0.56	1.88	7.29	5.55	0.19
1	134. Rm-062	18.56	0.78	2.47	9.68	7.50	0.26
1	135. Rm-083	18.56	0.74	2.19	7.91	6.00	0.20
1	136. Rm-038	17.77	1.11	2.70	9.17	9.01	0.31

BESTEC

Level	Zone	Area (m²)	Min (%)	Avg (%)	Max (%)	Pass Area (m²)	Contribution (%)
1	137. Rm-019	17.74	0.77	1.94	7.27	5.55	0.19
1	138. Rm-068	18.40	0.86	2.60	10.34	8.00	0.27
1	139. Rm-022	17.21	1.30	2.73	8.79	9.26	0.32
1	14. Lounge	70.82	0.64	1.53	4.26	15.27	0.52
1	140. RM-030	17.46	1.23	2.58	8.38	8.00	0.27
1	141. Rm-078	18.37	0.83	2.58	9.15	7.67	0.26
1	142. Rm-044	17.58	1.35	2.86	9.13	11.01	0.38
1	143. Rm-043	17.39	1.10	2.63	8.97	8.25	0.28
1	144. Rm-045	17.58	1.02	2.59	8.94	8.25	0.28
1	145. RM-005	17.58	1.02	2.24	6.88	6.80	0.23
1	146. Rm-055	16.69	0.93	2.20	7.92	5.80	0.20
1	147. RM-006	17.58	0.98	2.23	6.89	6.62	0.23
1	148. Rm-0053	17.19	0.62	1.51	4.94	3.25	0.11
1	149. Rm-077	18.37	0.80	2.51	9.00	7.25	0.25
1	150. Rm-046	17.58	1.02	2.53	8.18	8.50	0.29
1	151. Rm-029	17.47	1.20	2.61	8.34	8.10	0.28
1	152. Rm-056	18.26	0.50	1.72	6.78	4.25	0.15
1	153. Rm-021	17.38	0.67	1.77	5.28	5.00	0.17
1	154. Rm-069	18.17	0.76	2.57	10.46	7.67	0.26
1	155. Rm-054	17.35	0.51	1.31	4.96	3.40	0.12
1	156. RM-008	17.18	0.96	2.02	5.97	5.12	0.17
1	157. Rm-020	17.18	0.98	2.40	7.66	7.00	0.24
1	158. Rm-076	17.94	0.51	1.57	5.39	3.50	0.12
1	159. Rm-067	17.91	0.73	2.63	10.56	7.65	0.26
1	16. Dining	72.22	0.59	2.34	9.96	26.37	0.90

BESTEC

Level	Zone	Area (m²)	Min (%)	Avg (%)	Max (%)	Pass Area (m²)	Contribution (%)
1	160. Rm-094	17.55	0.38	1.14	3.88	2.00	0.07
1	162. Rm-075	17.32	0.36	1.03	3.71	2.00	0.07
1	166. Rm-099	16.96	0.42	1.21	5.31	2.50	0.09
1	167. RM-017	15.85	1.03	2.28	6.57	6.50	0.22
1	168. Rm-070	16.83	0.54	2.04	8.18	5.00	0.17
1	170. Rm-037	15.40	0.97	2.55	7.62	7.28	0.25
1	171. Rm-047	15.40	0.87	2.49	7.57	6.50	0.22
1	172. RM-004	15.40	1.02	2.48	7.00	7.00	0.24
1	174. Rm-073	15.80	0.87	2.87	9.15	8.40	0.29
1	176. Rm-074	15.35	0.87	2.80	8.86	7.25	0.25
1	18. Lounge	62.90	0.64	1.83	5.80	17.85	0.61
1	202. WC,Circ (Rm081)	2.47	0.00	0.00	0.00	0.00	0.00
1	24. Activity B	51.49	0.04	0.18	2.36	0.25	0.01
1	27. Billiards	49.07	0.33	2.05	10.89	14.70	0.50
1	28. Community	46.65	0.81	1.99	7.00	13.52	0.46
1	34. Cafe+ Sitting	39.53	0.94	2.68	8.56	19.90	0.68
1	40. Rm-057	31.79	0.09	0.72	4.39	2.22	0.08
1	42. Salon	30.09	0.57	1.63	6.52	6.00	0.20
1	44. Meeting	29.44	0.29	1.36	9.06	4.76	0.16
1	45. Gym	29.00	0.09	0.32	3.52	1.02	0.03
1	49. RM-009	25.62	0.67	1.90	7.80	7.55	0.26
1	50. Sitting	26.27	0.47	1.90	9.15	8.02	0.27
1	53. Sitting	25.93	0.60	2.54	9.42	11.92	0.41
1	54. Rm-052	24.54	0.78	1.96	8.87	7.15	0.24

BESTEC

Level	Zone	Area (m²)	Min (%)	Avg (%)	Max (%)	Pass Area (m²)	Contribution (%)
1	55. Sitting	24.87	0.61	1.68	6.51	5.80	0.20
1	56. Rm-071	25.11	0.35	1.24	6.04	3.50	0.12
1	58. RM-002	22.92	1.87	3.02	6.78	22.65	0.77
1	59. RM-016	21.73	2.06	3.32	7.27	21.73	0.74
1	60. RM-001	21.70	2.46	3.68	7.59	21.70	0.74
1	61. Library	22.55	0.77	1.90	6.78	6.97	0.24
1	62. P/D	23.30	0.90	2.12	7.12	8.67	0.30
1	64. Rm-090	22.54	0.35	1.12	5.51	2.75	0.09
1	65. Rm-100	21.93	0.60	1.65	7.26	4.20	0.14
1	66. RM-012	20.68	1.24	2.33	7.31	9.70	0.33
1	67. RM-007	20.37	0.99	2.05	7.52	6.79	0.23
1	69. RM-010	19.72	1.30	2.57	8.35	9.27	0.32
1	7. Dining	108.90	0.48	2.52	10.49	47.50	1.62
1	70. RM-011	20.34	0.80	1.75	6.30	4.37	0.15
1	71. RM-018	19.47	0.88	1.89	7.06	5.27	0.18
1	72. Sitting	20.59	0.47	2.19	9.84	7.85	0.27
1	73. Rm-081	20.35	0.42	1.13	4.84	2.20	0.08
1	74. Rm-065	20.34	0.78	2.37	10.23	7.52	0.26
1	75. Rm-064	20.34	0.90	2.49	10.41	8.12	0.28
1	76. Rm-035	19.16	1.00	2.42	8.95	7.90	0.27
1	77. Rm-036	18.97	1.11	2.50	9.05	8.46	0.29
1	78. Rm-051	18.90	0.89	2.46	8.91	8.00	0.27
1	79. Admin	19.72	0.64	1.79	7.28	5.60	0.19
1	8. Dining	94.06	0.32	1.35	12.78	13.67	0.47
1	82. Rm-093	19.40	1.01	3.10	12.43	9.25	0.32

BESTEC

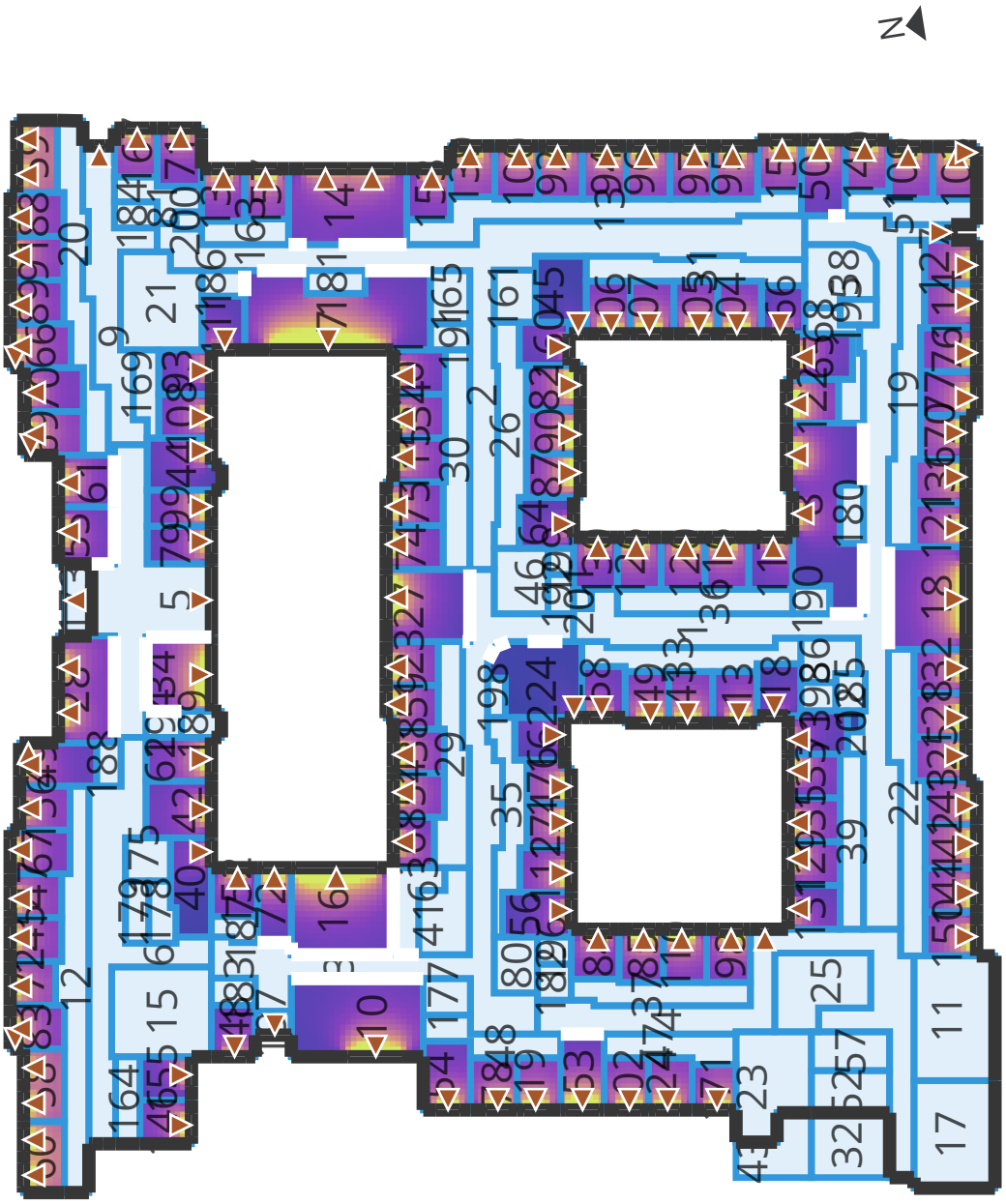
Level	Zone	Area (m²)	Min (%)	Avg (%)	Max (%)	Pass Area (m²)	Contribution (%)
1	83. RM-003	18.32	1.09	2.35	7.58	7.30	0.25
1	84. Rm-089	19.35	0.65	1.89	7.24	5.00	0.17
1	85. Rm-088	19.20	0.81	2.51	9.84	7.50	0.26
1	87. Rm-091	19.16	1.05	3.17	12.80	9.65	0.33
1	88. RM-015	18.25	0.93	2.19	7.39	6.62	0.23
1	89. RM-013	18.37	0.84	2.12	7.28	5.87	0.20
1	90. Rm-092	19.16	1.06	3.26	13.15	10.17	0.35
1	91. RM-014	18.37	0.96	2.22	7.39	6.77	0.23
1	92. Rm-024	18.29	0.96	2.53	9.50	8.43	0.29
1	93. Rm-059	19.00	0.51	1.46	5.19	3.50	0.12
1	94. Rm-025	18.17	0.96	2.54	9.48	8.25	0.28
1	95. Rm-028	18.17	0.94	2.41	8.81	7.90	0.27
1	96. Rm-026	18.17	0.98	2.56	9.51	8.40	0.29
1	97. Rm-027	18.17	0.92	2.52	9.43	8.00	0.27
1	98. Rm-086	18.96	0.71	2.41	9.40	7.00	0.24
1	99. RM	18.85	0.82	2.45	9.15	7.50	0.26
						Pass	Yes

Radiance Options

Option	Value	Description
Secondary Source Presampling Density (dp)	512	Density of samples taken for secondary light sources.
Direct Sampling Ratio (ds)	0.05	Ratio of samples taken to estimate direct lighting.
Direct Threshold (dt)	0.15	Threshold for considering direct lighting contribution.
Direct Certainty (dc)	0.75	Level of confidence in direct lighting calculations.
Limit Weight (lw)	9.765625e-06	Maximum influence of specific effects in rendering.
Limit Reflections (lr)	8	Maximum number of reflections considered in rendering.
Specular Sampling Threshold (st)	0.85	Threshold for considering specular reflections.
Ambient Bounces (ab)	6	Number of times light reflects off surfaces.
Ambient Accuracy (aa)	0.05	Degree of precision in simulating indirect light.
Ambient Divisions (ad)	2048	Subdivision of surfaces for ambient lighting calculation.
Ambient Supersamples (as)	1024	Additional samples taken to improve accuracy in ambient lighting.
Ambient Resolution (ar)	512	Detail level in ambient lighting computation.
Sky Model		CIE 110 Overcast Sky
Design Sky Illuminance (lux)	10000	

BESTEC

Level 1



Min: 0.0%
Max: 5.0%
Thermal Line
Windows
Air Boundary
VLT 0.5 - 0.6

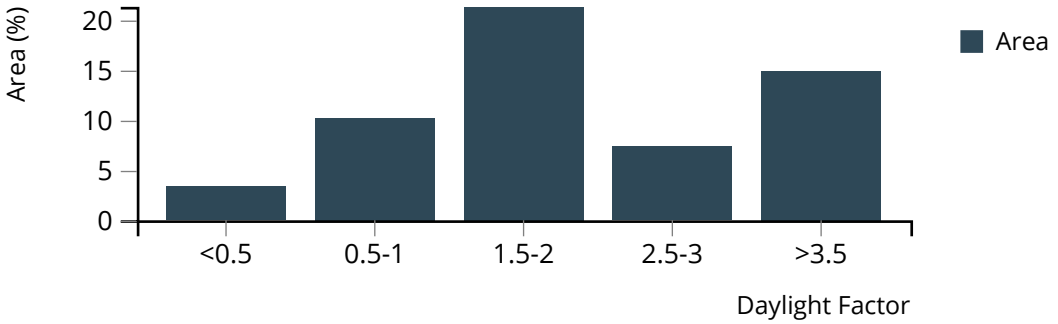
BESTEC

Daylight Factor 2

To meet the acceptance criteria, **80** % of the assessed zones must meet the conditions:

- daylight factor is greater than 0.50 %
- for at least 90 % of area in each zone

A total of 8999 sensor points representing an area of 2060.75 m² across 109 zones was assessed, where **92.66** % of the zones achieved the conditions, **meeting** the acceptance criteria.



Level	Zone	Area (m²)	Min (%)	Avg (%)	Max (%)	Pass Area (m²)	Required Area (m²)	Pass
1	100. Rm-023	18.05	0.97	2.56	9.49	18.05	16.25	Yes
1	101. Rm-061	18.80	0.62	1.89	7.83	18.80	16.92	Yes
1	102. Rm-049	18.00	0.99	2.54	8.90	18.00	16.20	Yes
1	103. RM-032	17.06	1.52	3.17	11.09	17.06	15.36	Yes
1	104. Rm-098	18.76	0.84	2.53	9.22	18.76	16.89	Yes
1	105. Rm-097	18.76	0.85	2.67	9.76	18.76	16.89	Yes
1	106. Rm-095	18.76	0.76	2.31	8.40	18.76	16.89	Yes
1	107. Rm-096	18.76	0.80	2.62	9.50	18.76	16.89	Yes
1	108. Rm-058	18.76	0.80	2.06	7.09	18.76	16.89	Yes
1	109. RM-031	17.97	0.88	2.38	8.86	17.97	16.18	Yes
1	110. Rm-087	18.72	0.89	2.66	10.01	18.72	16.85	Yes
1	111. Rm-060	18.67	0.38	1.15	5.13	16.40	16.81	No
1	112. Rm-072	18.60	0.81	2.47	8.70	18.60	16.74	Yes

BESTEC

Level	Zone	Area (m²)	Min (%)	Avg (%)	Max (%)	Pass Area (m²)	Required Area (m²)	Pass
1	113. Rm-079	18.60	0.65	2.22	8.23	18.60	16.74	Yes
1	114. Rm-034	17.77	1.00	2.57	8.99	17.77	16.00	Yes
1	115. Rm-063	18.56	0.85	2.48	9.48	18.56	16.71	Yes
1	116. Rm-103	18.56	0.79	2.58	10.10	18.56	16.71	Yes
1	117. Rm-102	18.56	0.58	1.72	7.28	18.56	16.71	Yes
1	118. Rm-080	18.56	0.29	0.80	3.00	12.90	16.71	No
1	119. Rm-050	17.77	1.03	2.57	8.94	17.77	16.00	Yes
1	120. Rm-104	18.56	0.91	2.74	10.35	18.56	16.71	Yes
1	121. Rm-039	17.77	0.95	2.38	7.90	17.77	16.00	Yes
1	122. Rm-101	18.56	0.99	3.30	13.72	18.56	16.71	Yes
1	123. Rm-066	18.56	0.98	2.68	10.27	18.56	16.71	Yes
1	124. Rm-048	17.77	1.04	2.55	8.83	17.77	16.00	Yes
1	125. Rm-042	17.77	1.00	2.40	8.09	17.77	16.00	Yes
1	126. Rm-105	18.56	0.76	2.55	9.96	18.56	16.71	Yes
1	127. Rm-033	17.31	1.04	2.60	9.00	17.31	15.58	Yes
1	128. Rm-041	17.77	1.11	2.69	9.14	17.77	16.00	Yes
1	129. Rm-084	18.56	0.76	2.19	7.79	18.56	16.71	Yes
1	130. Rm-106	18.56	0.64	1.95	8.06	18.56	16.71	Yes
1	131. Rm-085	18.56	0.62	1.55	5.94	18.56	16.71	Yes
1	132. Rm-040	17.77	1.02	2.43	7.97	17.77	16.00	Yes
1	133. Rm-082	18.56	0.65	1.97	7.40	18.56	16.71	Yes
1	134. Rm-062	18.56	0.76	2.47	9.70	18.56	16.71	Yes
1	135. Rm-083	18.56	0.69	2.14	7.86	18.56	16.71	Yes
1	136. Rm-038	17.77	1.10	2.71	9.17	17.77	16.00	Yes

BESTEC

Level	Zone	Area (m²)	Min (%)	Avg (%)	Max (%)	Pass Area (m²)	Required Area (m²)	Pass
1	137. Rm-019	17.74	0.72	1.90	7.29	17.74	15.97	Yes
1	138. Rm-068	18.40	0.98	2.67	10.40	18.40	16.56	Yes
1	139. Rm-022	17.21	1.16	2.63	8.71	17.21	15.49	Yes
1	140. RM-030	17.46	1.22	2.58	8.36	17.46	15.71	Yes
1	141. Rm-078	18.37	0.89	2.61	9.08	18.37	16.53	Yes
1	142. Rm-044	17.58	1.23	2.76	9.06	17.58	15.82	Yes
1	143. Rm-043	17.39	1.09	2.62	8.96	17.39	15.65	Yes
1	144. Rm-045	17.58	1.03	2.60	8.93	17.58	15.82	Yes
1	145. RM-005	17.58	1.10	2.30	6.93	17.58	15.82	Yes
1	146. Rm-055	16.69	0.94	2.21	7.96	16.69	15.02	Yes
1	147. RM-006	17.58	1.06	2.31	6.94	17.58	15.82	Yes
1	148. Rm-0053	17.19	0.61	1.49	4.87	17.19	15.47	Yes
1	149. Rm-077	18.37	0.82	2.49	9.00	18.37	16.53	Yes
1	150. Rm-046	17.58	0.90	2.43	8.08	17.58	15.82	Yes
1	151. Rm-029	17.47	1.24	2.64	8.40	17.47	15.72	Yes
1	152. Rm-056	18.26	0.52	1.73	6.78	18.26	16.43	Yes
1	153. Rm-021	17.38	0.67	1.78	5.25	17.38	15.64	Yes
1	154. Rm-069	18.17	0.82	2.61	10.41	18.17	16.35	Yes
1	155. Rm-054	17.35	0.47	1.27	4.99	16.88	15.62	Yes
1	156. RM-008	17.18	0.92	1.99	5.88	17.18	15.46	Yes
1	157. Rm-020	17.18	0.97	2.40	7.65	17.18	15.46	Yes
1	158. Rm-076	17.94	0.52	1.57	5.37	17.94	16.15	Yes
1	159. Rm-067	17.91	0.74	2.64	10.56	17.91	16.12	Yes
1	160. Rm-094	17.55	0.40	1.16	3.87	16.60	15.79	Yes

BESTEC

Level	Zone	Area (m²)	Min (%)	Avg (%)	Max (%)	Pass Area (m²)	Required Area (m²)	Pass
1	162. Rm-075	17.32	0.39	1.06	3.72	14.07	15.59	No
1	166. Rm-099	16.96	0.43	1.22	5.31	15.97	15.27	Yes
1	167. RM-017	15.85	0.95	2.20	6.54	15.85	14.26	Yes
1	168. Rm-070	16.83	0.53	2.04	8.22	16.83	15.15	Yes
1	170. Rm-037	15.40	0.89	2.48	7.51	15.40	13.86	Yes
1	171. Rm-047	15.40	0.87	2.47	7.60	15.40	13.86	Yes
1	172. RM-004	15.40	1.02	2.48	6.98	15.40	13.86	Yes
1	174. Rm-073	15.80	0.94	2.93	9.17	15.80	14.22	Yes
1	176. Rm-074	15.35	0.93	2.88	8.97	15.35	13.81	Yes
1	202. WC,Circ (Rm081)	2.47	0.00	0.00	0.00	0.00	2.22	No
1	27. Billiards	49.07	0.36	2.15	10.88	48.07	44.17	Yes
1	40. Rm-057	31.79	0.09	0.73	4.40	14.71	28.61	No
1	45. Gym	29.00	0.08	0.29	3.51	2.80	26.10	No
1	49. RM-009	25.62	0.81	2.05	7.89	25.62	23.06	Yes
1	54. Rm-052	24.54	0.77	1.96	8.88	24.54	22.09	Yes
1	56. Rm-071	25.11	0.35	1.24	6.10	21.35	22.60	No
1	58. RM-002	22.92	1.86	3.06	6.84	22.92	20.63	Yes
1	59. RM-016	21.73	2.05	3.32	7.29	21.73	19.56	Yes
1	60. RM-001	21.70	2.33	3.57	7.48	21.70	19.53	Yes
1	64. Rm-090	22.54	0.35	1.13	5.49	17.70	20.29	No
1	65. Rm-100	21.93	0.66	1.70	7.26	21.93	19.74	Yes
1	66. RM-012	20.68	1.15	2.26	7.27	20.68	18.62	Yes
1	67. RM-007	20.37	1.00	2.07	7.53	20.37	18.33	Yes

BESTEC

Level	Zone	Area (m²)	Min (%)	Avg (%)	Max (%)	Pass Area (m²)	Required Area (m²)	Pass
1	69. RM-010	19.72	1.11	2.38	8.22	19.72	17.75	Yes
1	70. RM-011	20.34	0.82	1.75	6.27	20.34	18.31	Yes
1	71. RM-018	19.47	0.89	1.90	7.02	19.47	17.52	Yes
1	73. Rm-081	20.35	0.44	1.14	4.84	19.52	18.31	Yes
1	74. Rm-065	20.34	0.77	2.38	10.26	20.34	18.31	Yes
1	75. Rm-064	20.34	0.83	2.42	10.36	20.34	18.31	Yes
1	76. Rm-035	19.16	0.99	2.42	8.93	19.16	17.24	Yes
1	77. Rm-036	18.97	1.13	2.52	9.10	18.97	17.07	Yes
1	78. Rm-051	18.90	0.88	2.46	8.95	18.90	17.01	Yes
1	82. Rm-093	19.40	0.98	3.08	12.40	19.40	17.46	Yes
1	83. RM-003	18.32	1.29	2.48	7.71	18.32	16.49	Yes
1	84. Rm-089	19.35	0.60	1.85	7.24	19.35	17.41	Yes
1	85. Rm-088	19.20	0.87	2.54	9.78	19.20	17.28	Yes
1	87. Rm-091	19.16	1.14	3.23	12.85	19.16	17.24	Yes
1	88. RM-015	18.25	0.86	2.13	7.35	18.25	16.42	Yes
1	89. RM-013	18.37	0.84	2.12	7.30	18.37	16.53	Yes
1	90. Rm-092	19.16	1.08	3.26	13.09	19.16	17.24	Yes
1	91. RM-014	18.37	0.86	2.12	7.31	18.37	16.53	Yes
1	92. Rm-024	18.29	1.01	2.57	9.50	18.29	16.46	Yes
1	93. Rm-059	19.00	0.52	1.47	5.21	19.00	17.10	Yes
1	94. Rm-025	18.17	1.05	2.61	9.51	18.17	16.35	Yes
1	95. Rm-028	18.17	0.91	2.39	8.79	18.17	16.35	Yes
1	96. Rm-026	18.17	1.00	2.57	9.51	18.17	16.35	Yes
1	97. Rm-027	18.17	0.94	2.53	9.47	18.17	16.35	Yes

Level	Zone	Area (m²)	Min (%)	Avg (%)	Max (%)	Pass Area (m²)	Required Area (m²)	Pass
1	98. Rm-086	18.96	0.83	2.49	9.53	18.96	17.06	Yes
							Pass	Yes

Radiance Options

Option	Value	Description
Secondary Source Presampling Density (dp)	512	Density of samples taken for secondary light sources.
Direct Sampling Ratio (ds)	0.05	Ratio of samples taken to estimate direct lighting.
Direct Threshold (dt)	0.15	Threshold for considering direct lighting contribution.
Direct Certainty (dc)	0.75	Level of confidence in direct lighting calculations.
Limit Weight (lw)	9.765625e-06	Maximum influence of specific effects in rendering.
Limit Reflections (lr)	8	Maximum number of reflections considered in rendering.
Specular Sampling Threshold (st)	0.85	Threshold for considering specular reflections.
Ambient Bounces (ab)	6	Number of times light reflects off surfaces.
Ambient Accuracy (aa)	0.05	Degree of precision in simulating indirect light.
Ambient Divisions (ad)	2048	Subdivision of surfaces for ambient lighting calculation.
Ambient Supersamples (as)	1024	Additional samples taken to improve accuracy in ambient lighting.
Ambient Resolution (ar)	512	Detail level in ambient lighting computation.
Sky Model		CIE 110 Overcast Sky
Design Sky Illuminance (lux)	10000	

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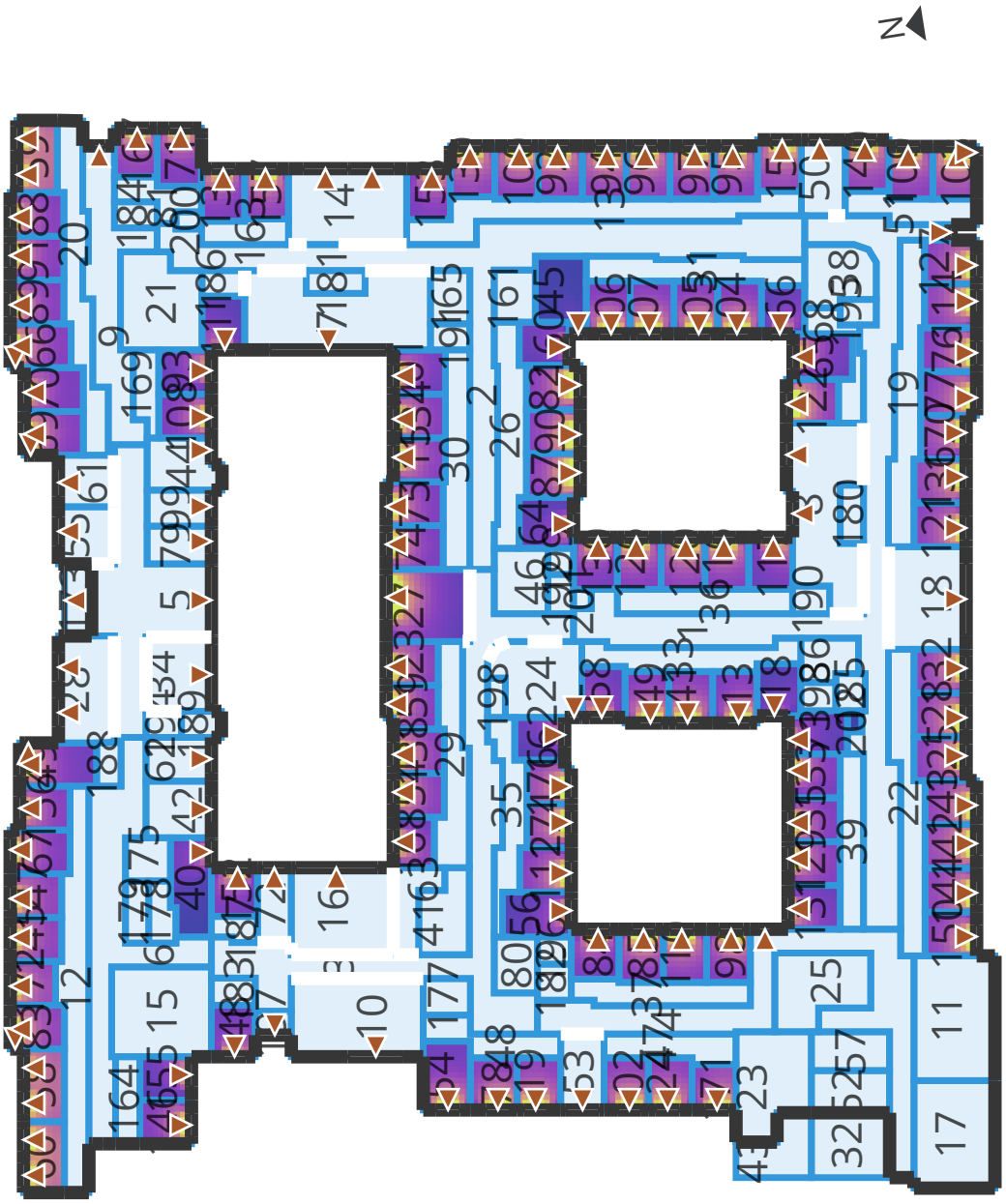
Level 1



Min: 0.0%
Max: 5.0%
Thermal Line
Windows
Air Boundary
VLT 0.5 - 0.6

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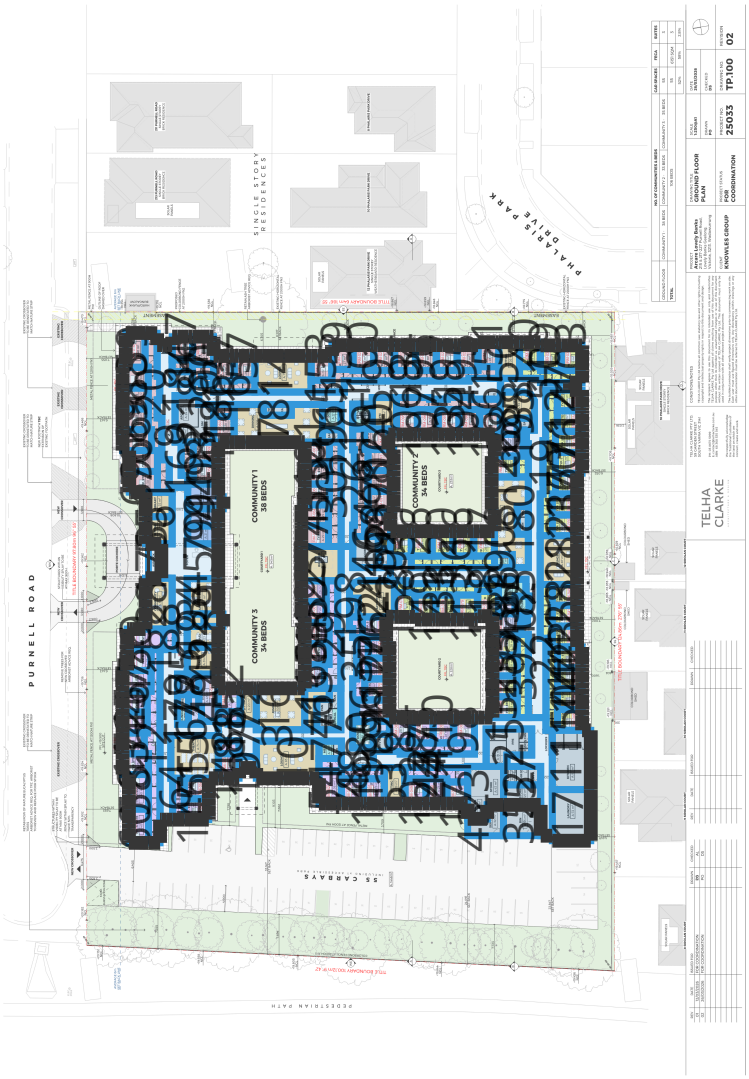
Drawings

Level 1 - Ground



Thermal Line

Windows

BESTEC

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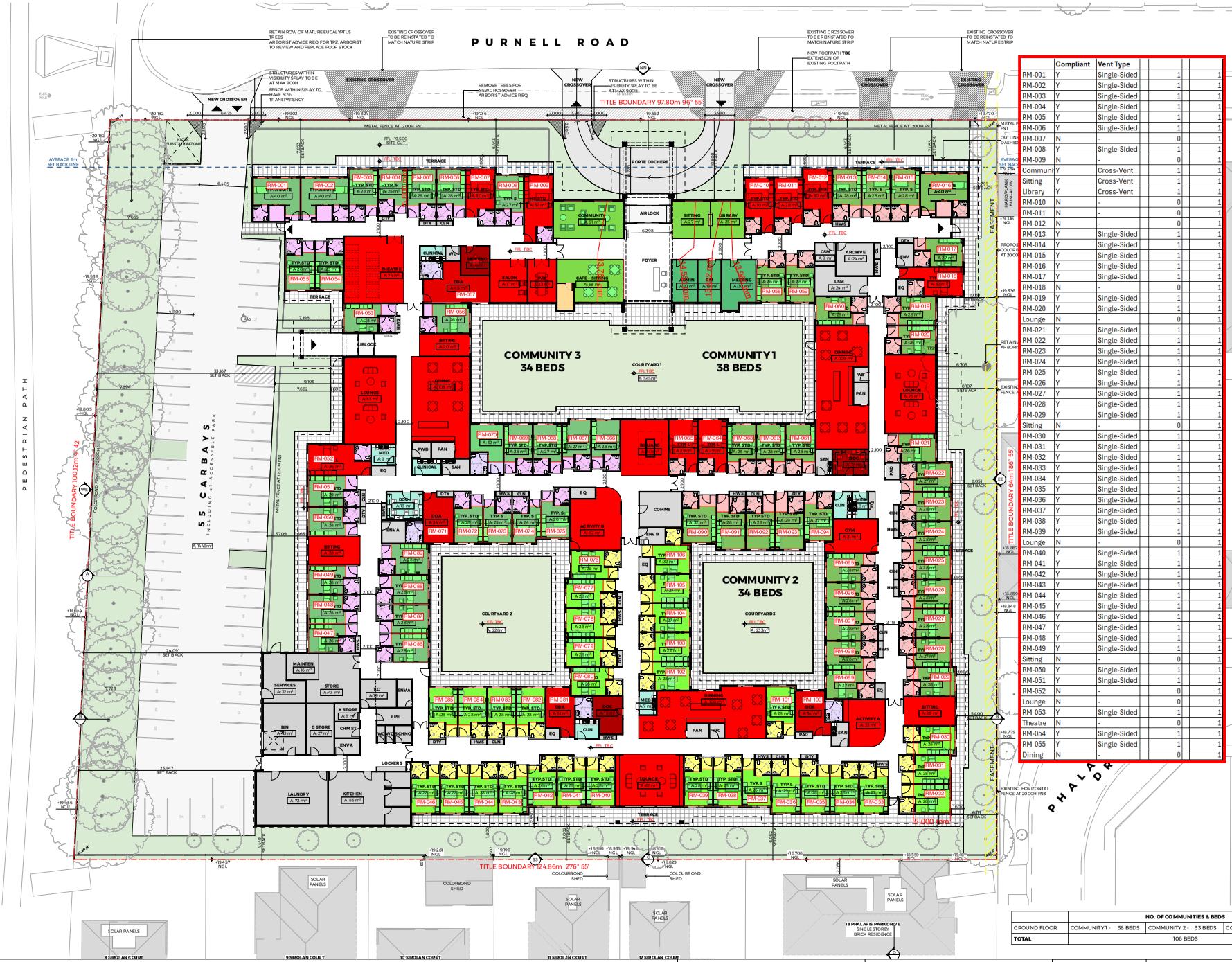
Appendix E: Natural Ventilation Markup



	Compliant	Vent Type		
RM-001	Y	Single-Sided	1	1
RM-002	Y	Single-Sided	1	1
RM-003	Y	Single-Sided	1	1
RM-004	Y	Single-Sided	1	1
RM-005	Y	Single-Sided	1	1
RM-006	Y	Single-Sided	1	1
RM-007	N	-	0	1
RM-008	Y	Single-Sided	1	1
RM-009	N	-	0	1
Communi	Y	Cross-Vent	1	1
Sitting	Y	Cross-Vent	1	1
Library	Y	Cross-Vent	1	1
RM-010	N	-	0	1
RM-011	N	-	0	1
RM-012	N	-	0	1
RM-013	Y	Single-Sided	1	1
RM-014	Y	Single-Sided	1	1
RM-015	Y	Single-Sided	1	1
RM-016	Y	Single-Sided	1	1
RM-017	Y	Single-Sided	1	1
RM-018	N	-	0	1
RM-019	Y	Single-Sided	1	1
RM-020	Y	Single-Sided	1	1
Lounge	N	-	0	1
RM-021	Y	Single-Sided	1	1
RM-022	Y	Single-Sided	1	1
RM-023	Y	Single-Sided	1	1
RM-024	Y	Single-Sided	1	1
RM-025	Y	Single-Sided	1	1
RM-026	Y	Single-Sided	1	1
RM-027	Y	Single-Sided	1	1
RM-028	Y	Single-Sided	1	1
RM-029	Y	Single-Sided	1	1
Sitting	N	-	0	1
RM-030	Y	Single-Sided	1	1
RM-031	Y	Single-Sided	1	1
RM-032	Y	Single-Sided	1	1
RM-033	Y	Single-Sided	1	1
RM-034	Y	Single-Sided	1	1
RM-035	Y	Single-Sided	1	1
RM-036	Y	Single-Sided	1	1
RM-037	Y	Single-Sided	1	1
RM-038	Y	Single-Sided	1	1
RM-039	Y	Single-Sided	1	1
Lounge	N	-	0	1
RM-040	Y	Single-Sided	1	1
RM-041	Y	Single-Sided	1	1
RM-042	Y	Single-Sided	1	1
RM-043	Y	Single-Sided	1	1
RM-044	Y	Single-Sided	1	1
RM-045	Y	Single-Sided	1	1
RM-046	Y	Single-Sided	1	1
RM-047	Y	Single-Sided	1	1
RM-048	Y	Single-Sided	1	1
RM-049	Y	Single-Sided	1	1
Sitting	N	-	0	1
RM-050	Y	Single-Sided	1	1
RM-051	Y	Single-Sided	1	1
RM-052	N	-	0	1
Lounge	N	-	0	1
RM-053	Y	Single-Sided	1	1
Theatre	N	-	0	1
RM-054	Y	Single-Sided	1	1
RM-055	Y	Single-Sided	1	1
Dining	N	-	0	1

Sitting	N	-	0	1
RM-056	Y	Single-Sided	1	1
RM-057	N	-	0	1
Meeting	N	-	0	1
Salon	N	-	0	1
P/D	N	-	0	1
Café+Sittir	Y	Cross-Vent	1	1
Admin	Y	Cross-Vent	1	1
RM	Y	Cross-Vent	1	1
Meeting	Y	Cross-Vent	1	1
RM-058	Y	Single-Sided	1	1
RM-059	Y	Single-Sided	1	1
RM-060	Y	Single-Sided	1	1
Dining	N	-	0	1
RM-061	Y	Single-Sided	1	1
RM-062	Y	Single-Sided	1	1
RM-063	Y	Single-Sided	1	1
RM-064	N	-	0	1
RM-065	N	-	0	1
Billiard	N	-	0	1
RM-066	Y	Single-Sided	1	1
RM-067	Y	Single-Sided	1	1
RM-068	Y	Single-Sided	1	1
RM-069	Y	Single-Sided	1	1
RM-070	Y	Single-Sided	1	1
RM-071	N	-	0	1
RM-072	Y	Single-Sided	1	1
RM-073	Y	Single-Sided	1	1
RM-074	Y	Single-Sided	1	1
RM-075	Y	Single-Sided	1	1
Activity B	N	-	0	1
RM-076	Y	Single-Sided	1	1
RM-077	Y	Single-Sided	1	1
RM-078	Y	Single-Sided	1	1
RM-079	Y	Single-Sided	1	1
RM-080	Y	Single-Sided	1	1
Doc	N	-	0	1
RM-081	N	-	0	1
RM-082	Y	Single-Sided	1	1
RM-083	Y	Single-Sided	1	1
RM-084	Y	Single-Sided	1	1
RM-085	Y	Single-Sided	1	1
RM-086	Y	Single-Sided	1	1
RM-087	Y	Single-Sided	1	1
RM-088	Y	Single-Sided	1	1
RM-089	Y	Single-Sided	1	1
RM-090	Y	Single-Sided	1	1
RM-091	Y	Single-Sided	1	1
RM-092	Y	Single-Sided	1	1
RM-093	Y	Single-Sided	1	1
RM-094	Y	Single-Sided	1	1
Gym	N	-	0	1
RM-095	Y	Single-Sided	1	1
RM-096	Y	Single-Sided	1	1
RM-097	Y	Single-Sided	1	1
RM-098	Y	Single-Sided	1	1
RM-099	Y	Single-Sided	1	1
RM-100	N	-	0	1
RM-101	Y	Single-Sided	1	1
Dining	N	-	0	1
RM-102	Y	Single-Sided	1	1
RM-103	Y	Single-Sided	1	1
RM-104	Y	Single-Sided	1	1
RM-105	Y	Single-Sided	1	1
RM-106	Y	Single-Sided	1	1
			Comp	Total
			100	130
			Comp.	77%

	NO. OF COMMUNITIES & BEDS			CAR SPACES	FECA	SUITES
GROUND FLOOR	COMMUNITY 1 - 38 BEDS	COMMUNITY 2 - 33 BEDS	COMMUNITY 3 - 35 BEDS	55		3
TOTAL	106 BEDS			55	6151 SQM	3
				52%	58%	2.8%

REV	DATE	ISSUED FOR	DRAWN	CHECKED
01	12/03/2026	FOR COORDINATION	ED	AL
02	26/03/2026	FOR COORDINATION	PO	DS

REV	DATE	ISSUED FOR	DRAWN	CHECKED

TELHA CLARKE
ARCHITECTURE & DESIGN

TELHA CLARKE PTY LTD.
59 GARDEN STREET
SOUTH YARRA VIC 3141

PH: 03 8872 5999
E: contact@telhaclarke.com.au
ABN 68 368 535 545

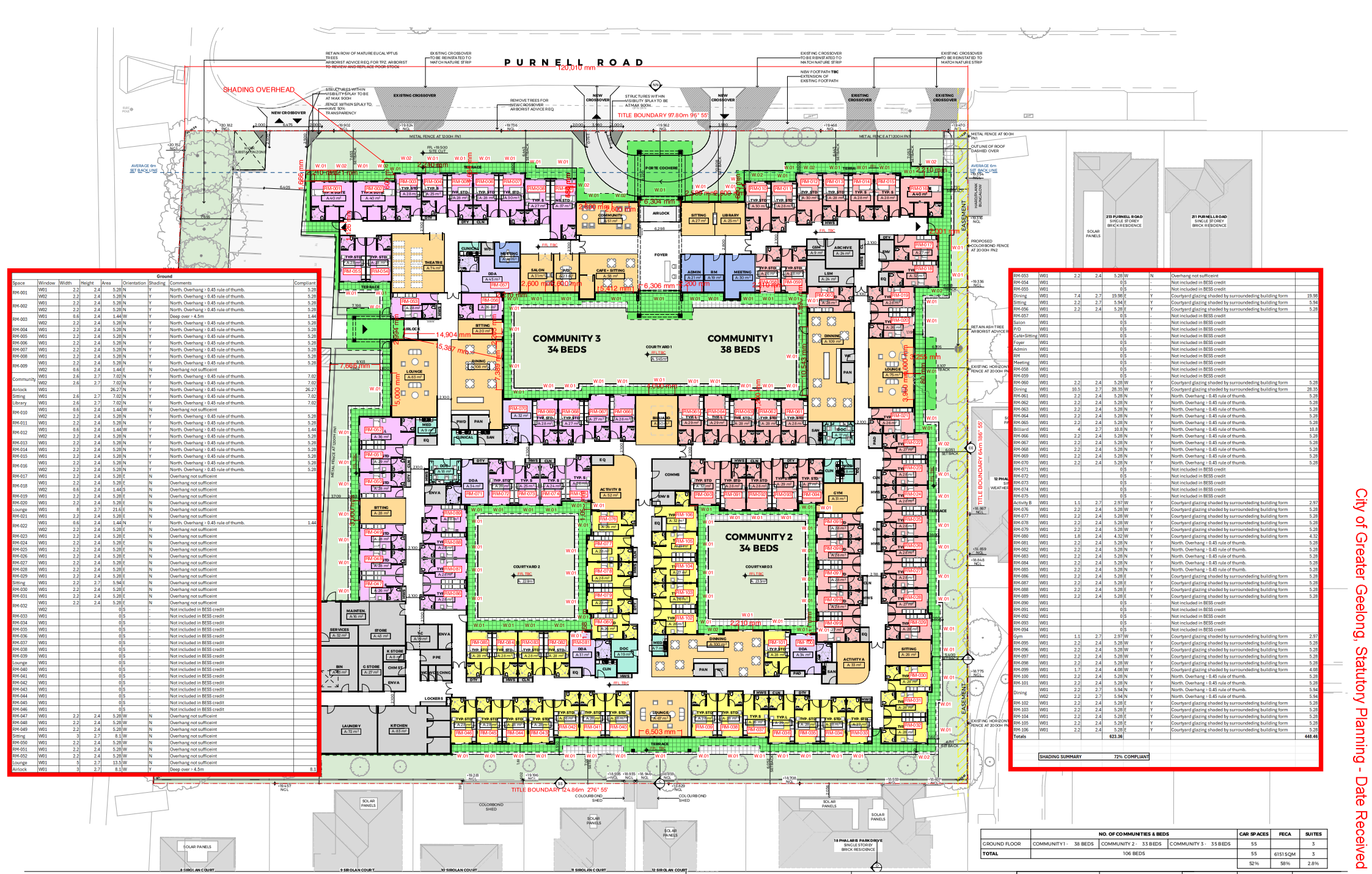
We respectfully acknowledge the Traditional Custodians of the land on which we connect, create and work.

CONDITIONS/NOTES

The builder/contractor shall verify project dimensions prior to commencing work on site. Each user must use figured dimensions only. Any discrepancy within drawings or any other documentation must be referred to TELHA CLARKE Pty Ltd

PROJECT **Arcare Lovely Banks** 215 & 217-227 Purnell Road, Lovely Banks Geelong. Victoria, 3213. Wadawurrung	DRAWING TITLE **GROUND FLOOR PLAN**	SCALE **1:250@A1**	DATE **26/03/2026**
		DRAWN **PO**	CHECKED **DS**
CLIENT **KNOWLES GROUP**	PROJECT STATUS **FOR COORDINATION**	PROJECT NO. **25033**	DRAWING NO. **TP.100**
			REVISION **02**

Appendix F: Shading Markup



Ground

Space	Window	Width	Height	Area	Orientation	Shading	Comments	Compliant
RM-001	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
	W02	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-002	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
	W02	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-003	W01	0.6	2.4	1.44	W	Y	Deep over > 4.5m	1.44
	W02	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-004	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-005	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-006	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-007	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-008	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-009	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
	W02	0.6	2.4	1.44	E	N	Overhang not sufficeint	
Community	W01	2.6	2.7	7.02	N	Y	North. Overhang > 0.45 rule of thumb.	7.02
	W02	2.6	2.7	7.02	N	Y	North. Overhang > 0.45 rule of thumb.	7.02
Airlock	W01			26.27	N	Y	North. Overhang > 0.45 rule of thumb.	26.27
Sitting	W01	2.6	2.7	7.02	N	Y	North. Overhang > 0.45 rule of thumb.	7.02
Library	W01	2.6	2.7	7.02	N	Y	North. Overhang > 0.45 rule of thumb.	7.02
RM-010	W01	0.6	2.4	1.44	W	N	Overhang not sufficeint	
	W02	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-011	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-012	W01	0.6	2.4	1.44	W	Y	North. Overhang > 0.45 rule of thumb.	1.44
	W02	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-013	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-014	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-015	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-016	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
	W02	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-017	W01	2.2	2.4	5.28	E	N	Overhang not sufficeint	
RM-018	W01	2.2	2.4	5.28	E	N	Overhang not sufficeint	
	W02	0.6	2.4	1.44	S	N	Overhang not sufficeint	
RM-019	W01	2.2	2.4	5.28	E	N	Overhang not sufficeint	
RM-020	W01	2.2	2.4	5.28	E	N	Overhang not sufficeint	
Lounge	W01	8	2.7	21.6	E	N	Overhang not sufficeint	
RM-021	W01	2.2	2.4	5.28	E	N	Overhang not sufficeint	
RM-022	W01	0.6	2.4	1.44	N	Y	North. Overhang > 0.45 rule of thumb.	1.44
	W02	2.2	2.4	5.28	E	N	Overhang not sufficeint	
RM-023	W01	2.2	2.4	5.28	E	N	Overhang not sufficeint	
RM-024	W01	2.2	2.4	5.28	E	N	Overhang not sufficeint	
RM-025	W01	2.2	2.4	5.28	E	N	Overhang not sufficeint	
RM-026	W01	2.2	2.4	5.28	E	N	Overhang not sufficeint	
RM-027	W01	2.2	2.4	5.28	E	N	Overhang not sufficeint	
RM-028	W01	2.2	2.4	5.28	E	N	Overhang not sufficeint	
RM-029	W01	2.2	2.4	5.28	E	N	Overhang not sufficeint	
Sitting	W01	2.2	2.7	5.94	E	N	Overhang not sufficeint	
RM-030	W01	2.2	2.4	5.28	E	N	Overhang not sufficeint	
RM-031	W01	2.2	2.4	5.28	E	N	Overhang not sufficeint	
RM-032	W01	2.2	2.4	5.28	E	N	Overhang not sufficeint	
	W02			0	S	-	Not included in BESS credit	
RM-033	W01			0	S	-	Not included in BESS credit	
RM-034	W01			0	S	-	Not included in BESS credit	
RM-035	W01			0	S	-	Not included in BESS credit	
RM-036	W01			0	S	-	Not included in BESS credit	
RM-037	W01			0	S	-	Not included in BESS credit	
RM-038	W01			0	S	-	Not included in BESS credit	
RM-039	W01			0	S	-	Not included in BESS credit	
Lounge	W01			0	S	-	Not included in BESS credit	
RM-040	W01			0	S	-	Not included in BESS credit	
RM-041	W01			0	S	-	Not included in BESS credit	
RM-042	W01			0	S	-	Not included in BESS credit	
RM-043	W01			0	S	-	Not included in BESS credit	
RM-044	W01			0	S	-	Not included in BESS credit	
RM-045	W01			0	S	-	Not included in BESS credit	
RM-046	W01			0	S	-	Not included in BESS credit	
RM-047	W01	2.2	2.4	5.28	W	N	Overhang not sufficeint	
RM-048	W01	2.2	2.4	5.28	W	N	Overhang not sufficeint	
RM-049	W01	2.2	2.4	5.28	W	N	Overhang not sufficeint	
Sitting	W01	3	2.7	8.1	W	N	Overhang not sufficeint	
RM-050	W01	2.2	2.4	5.28	W	N	Overhang not sufficeint	
RM-051	W01	2.2	2.4	5.28	W	N	Overhang not sufficeint	
RM-052	W01	2.2	2.4	5.28	W	N	Overhang not sufficeint	
Lounge	W01	5	2.7	13.5	W	N	Overhang not sufficeint	
Airlock	W01	3	2.7	8.1	W	Y	Deep over > 4.5m	8.1
RM-053	W01	2.2	2.4	5.28	W	N	Overhang not sufficeint	
RM-054	W01			0	S	-	Not included in BESS credit	
RM-055	W01			0	S	-	Not included in BESS credit	
Dining	W01	7.4	2.7	19.98	E	Y	Courtyard glazing shaded by surrounddeing building form	19.98
Sitting	W01	2.2	2.7	5.94	E	Y	Courtyard glazing shaded by surrounddeing building form	5.94
RM-056	W01	2.2	2.4	5.28	E	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-057	W01			0	S	-	Not included in BESS credit	
Salon	W01			0	S	-	Not included in BESS credit	
P/D	W01			0	S	-	Not included in BESS credit	
Café+Sitting	W01			0	S	-	Not included in BESS credit	
Foyer	W01			0	S	-	Not included in BESS credit	
Admin	W01			0	S	-	Not included in BESS credit	
RM	W01			0	S	-	Not included in BESS credit	
Meeting	W01			0	S	-	Not included in BESS credit	
RM-058	W01			0	S	-	Not included in BESS credit	
RM-059	W01			0	S	-	Not included in BESS credit	
RM-060	W01	2.2	2.4	5.28	W	Y	Courtyard glazing shaded by surrounddeing building form	5.28
Dining	W01	10.5	2.7	28.35	W	Y	Courtyard glazing shaded by surrounddeing building form	28.35
RM-061	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-062	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-063	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-064	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-065	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
Billiard	W01	4	2.7	10.8	N	Y	North. Overhang > 0.45 rule of thumb.	10.8
RM-066	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-067	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-068	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-069	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-070	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-071	W01			0	S	-	Not included in BESS credit	
RM-072	W01			0	S	-	Not included in BESS credit	
RM-073	W01			0	S	-	Not included in BESS credit	
RM-074	W01			0	S	-	Not included in BESS credit	
RM-075	W01			0	S	-	Not included in BESS credit	
Activity B	W01	1.1	2.7	2.97	W	Y	Courtyard glazing shaded by surrounddeing building form	2.97
RM-076	W01	2.2	2.4	5.28	W	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-077	W01	2.2	2.4	5.28	W	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-078	W01	2.2	2.4	5.28	W	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-079	W01	2.2	2.4	5.28	W	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-080	W01	1.8	2.4	4.32	W	Y	Courtyard glazing shaded by surrounddeing building form	4.32
RM-081	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-082	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-083	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-084	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-085	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-086	W01	2.2	2.4	5.28	E	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-087	W01	2.2	2.4	5.28	E	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-088	W01	2.2	2.4	5.28	E	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-089	W01	2.2	2.4	5.28	E	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-090	W01			0	S	-	Not included in BESS credit	
RM-091	W01			0	S	-	Not included in BESS credit	
RM-092	W01			0	S	-	Not included in BESS credit	
RM-093	W01			0	S	-	Not included in BESS credit	
RM-094	W01			0	S	-	Not included in BESS credit	
Gym	W01	1.1	2.7	2.97	W	Y	Courtyard glazing shaded by surrounddeing building form	2.97
RM-095	W01	2.2	2.4	5.28	W	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-096	W01	2.2	2.4	5.28	W	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-097	W01	2.2	2.4	5.28	W	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-098	W01	2.2	2.4	5.28	W	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-099	W01	1.7	2.4	4.08	W	Y	Courtyard glazing shaded by surrounddeing building form	4.08
RM-100	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
RM-101	W01	2.2	2.4	5.28	N	Y	North. Overhang > 0.45 rule of thumb.	5.28
Dining	W01	2.2	2.7	5.94	N	Y	North. Overhang > 0.45 rule of thumb.	5.94
	W02	2.2	2.7	5.94	N	Y	North. Overhang > 0.45 rule of thumb.	5.94
RM-102	W01	2.2	2.4	5.28	E	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-103	W01	2.2	2.4	5.28	E	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-104	W01	2.2	2.4	5.28	E	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-105	W01	2.2	2.4	5.28	E	Y	Courtyard glazing shaded by surrounddeing building form	5.28
RM-106	W01	2.2	2.4	5.28	E	Y	Courtyard glazing shaded by surrounddeing building form	5.28
Totals				**623.36**				**448.46**

SHADING SUMMARY	72% COMPLIANT

	NO. OF COMMUNITIES & BEDS				CAR SPACES	FECA	SUITES
GROUND FLOOR	COMMUNITY 1 - 38 BEDS	COMMUNITY 2 - 33 BEDS	COMMUNITY 3 - 35 BEDS		55		3
TOTAL	106 BEDS				55	6151 SQM	3
					52%	58%	2.8%

REV	DATE	ISSUED FOR	DRAWN	CHECKED
01	12/03/2026	FOR COORDINATION	ED	AL
02	26/03/2026	FOR COORDINATION	PO	DS

REV	DATE	ISSUED FOR	DRAWN	CHECKED

TELHA CLARKE
ARCHITECTURE & DESIGN

TELHA CLARKE PTY LTD.
59 GARDEN STREET
SOUTH YARRA VIC 3141

PH: 03 8872 5999
E: contact@telhaclarke.com.au
ABN 68 368 535 545

We respectfully acknowledge the Traditional Custodians of the land on which we connect, create and work.

CONDITIONS/NOTES

The builder/contractor shall verify project dimensions prior to commencing work on site. Each user must use figured dimensions only. Any discrepancy within drawings or any other documentation must be referred to TELHA CLARKE Pty Ltd

PROJECT	**Arcare Lovely Banks** 215 & 217-227 Purnell Road, Lovely Banks Geelong, Victoria, 3213. Wadawurrung
CLIENT	**KNOWLES GROUP**
DRAWING TITLE	**GROUND FLOOR PLAN**
PROJECT STATUS	**FOR COORDINATION**
SCALE	**1:250@A1**
DRAWN	**PO**
DATE	**26/03/2026**
CHECKED	**DS**
PROJECT NO.	**25033**
DRAWING NO.	**TP.100**
REVISION	**02**

Appendix G: Waste Management Plan Excerpt

6 WASTE MANAGEMENT

6.1 General

It is proposed to utilise a private contractor to manage the collection and disposal of all waste streams associated with the development.

Smaller bins will be placed throughout the building to ensure the separation of waste streams at the time of disposal. Staff or the appointed cleaning contractor will be responsible for disposing the different waste streams into the appropriate waste bins located within the bin storage room.

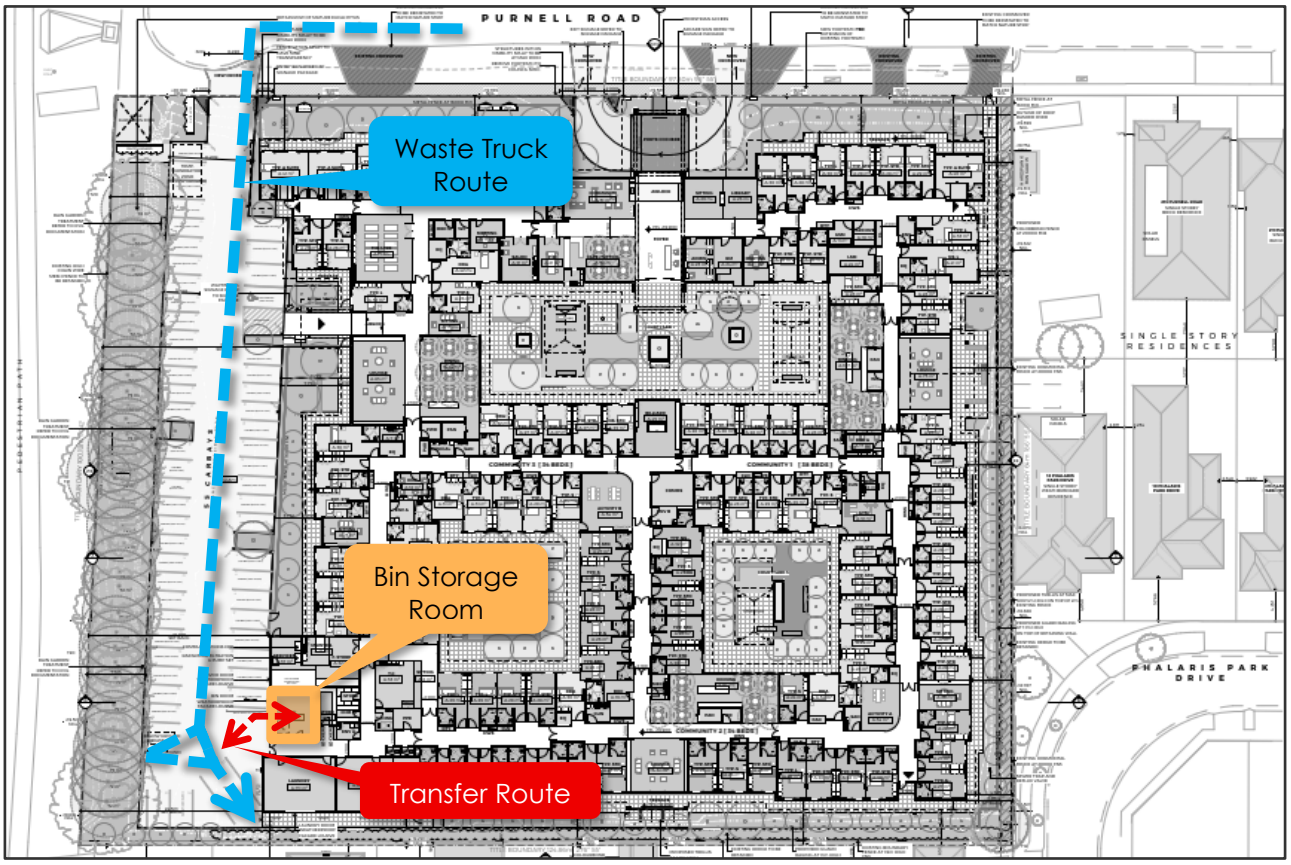
Clinical waste (medical, infectious, sharps, chemical, pharmaceutical, radioactive, etc.) shall be managed in accordance with the Industry Code of Practice for the Management of Biohazardous Waste (including Clinical & Related wastes).

A dedicated bin storage room is provided in the southwest corner of the proposed building, adjacent to the on-site loading area. The waste collection vehicle will enter the site and prop adjacent the bin store, from where the bins will be transferred directly to the waiting truck for emptying. The bins will be returned to the bin storage area immediately following collection, and the waste collection vehicle will exit the site in a forward direction.

Swept path diagrams showing the movements of the waste collection vehicle are attached in Appendix A.

The bin storage room, loading area, and expected waste vehicle collection/bin transfer routes are shown in Figure 3 below.

Figure 3 Bin Storage Room and Collection Details



6.2 Waste Streams

6.2.1 Garbage

The garbage stream comprises of non-recyclable materials which is to be disposed of in landfill and is one of the four primary waste streams identified by Recycling Victoria and forms part of the standard commercial collection system.

Mobile garbage bins will be provided for the collection and disposal of garbage.

6.2.2 Organic (Food) Waste

A proportion of waste generated by the proposed use is anticipated to consist of organic (food) waste, which is one of the four primary waste streams identified by Recycling Victoria and forms part of the standard commercial collection system.

Arcare (the operator) prepare all meals for residents on-site.

Mobile garbage bins will be provided for the collection and disposal of organic (food) waste.

Additionally, a worm farm and/or compost bin could also be provided for use by staff/residents, with the resulting waste able to be utilised on landscaping areas or taken home by staff for use on their gardens. It is expected though that a dedicated organic waste service will still be required to accommodate the commercial volumes of waste generated.

6.2.3 Recycling

The commingled recycling stream is a mixed material stream consisting of paper, cardboard, cans, plastics, and glass (where not collected as part of a separate glass collection service) and is one of the four primary waste streams identified by Recycling Victoria and forms part of the standard commercial collection system.

Mobile garbage bins will be provided for the collection and disposal of recycling.

6.2.4 Glass Recycling

A proportion of waste generated by the proposed use is anticipated to comprise of glass, which is one of the four primary waste streams identified by Recycling Victoria and forms part of the standard commercial collection system.

It is understood that Council will transition to separate glass recycling collection by 2027, and at that time, it is recommended that this Waste Management Plan, and the private waste collection, be updated to include separate glass recycling.

Sufficient space is provided within the bin storage room for the provision of a glass recycling bin, if required, noting the provision of separate glass waste collection would result in the reduction of weekly recycling generation.

Alternatively, the operator can collect and dispose of appropriate glass containers at one of the Container Deposit Scheme (CDS) depots (refer below), or within the recycling bin.

6.2.5 Medical Waste

Medical waste (infectious, sharps, chemical, pharmaceutical, etc.) shall be managed in accordance with the Industry Code of Practice for the Management of Biohazardous Waste (including Clinical & Related wastes).

The applicant has provided information that these waste streams will be collected daily by a separate contractor directly from treatment spaces. Therefore, it is not considered relevant to list the total waste generation or specific bin storage for these medical waste streams.

6.2.6 Clinical Waste

Clinical waste streams in the context of an aged-care facility include those elements of waste generated in the process of healthcare and treatment not identified within the Medical Waste categories above.

This may include contaminated gloves, masks, bandages, needles, sanitary products, diapers, soiled bedding and anything else contaminated with blood or bodily fluids.

As identified above, a specific clinical waste service is proposed for this stream, undertaken by a specialist contractor.

6.2.7 Container Deposit Scheme (CDS)

On 1 November 2023, Victoria's Container Deposit Scheme (CDS) commenced, which marked a significant milestone towards Victoria achieving its Circular Economy goal.

The CDS rewards Victorians with a 10 c refund for all eligible cans, cartons and bottles that are returned. Most aluminium, glass, plastic, and liquid paperboard (carton) drink containers, between 150 mL and 3 L are eligible, with a 10 c mark provided on the drink container label, often located near the barcode. Container lids are able to be kept on, as they can also recycled.

There are multiple ways to receive the 10 c refund, including vouchers, which can be spent and participating shops, cash, electronic payment, and the option to donate the refund to charities and community groups. The eligible containers can be returned to several different types of container refund points, in many locations across Victoria, with the number of locations expected to continue to grow. Typical refund points include the following:

- Reverse Vending Machines (RVMs) – Typically located in shopping centre and supermarket car parks, eligible containers are inserted into the machine, where the containers are scanned and verified;
- Depots – Larger refund points which typically offer a walk-in or drive-through services to get containers counted and refunded on the spot. Best suited for larger loads;
- Over the counter (OTC) – Some small businesses or organisations provide over-the-counter services, which essentially work like a miniature depot; and
- Pop-ups – Zone operators may offer pop-up services or events, that will have set times and locations that drinks containers can be returned.

The locations of the CDS refund points are provided at https://cdsvic.org.au/locations.

Staff should be encouraged to contribute to the CDS, with provision of specific CDS bins throughout the building to assist in separating eligible containers, and the operator to organise for the containers to be taken to a refund point on a regular or as/needed basis.

6.2.8 Green (Garden) Waste

Given the nature of the proposed development, it is expected that green waste generation will be minimal or negligible, and therefore a separate green waste collection service is not expected to be required.

It is expected that any maintenance and gardening undertaken on on-site will be managed by a contractor appointed by the operator. The appointed contractor will be responsible for the disposal of any green waste accumulated during the course of their duties.

6.2.9 Hard Waste

It is anticipated that hard waste generation will be minimal considering the proposed residential aged care use. Regardless, hard waste services will be provided by the private contractor on an as-needs basis. The operator should also be encouraged to offer items which are still in good usable condition to be offered to local charity organisations or for free pickup on social media, before being sent for disposal.

6.2.10 Electronic Waste (E-Waste)

E-waste includes all manner of electronic waste, such as televisions, computers, cameras, phones, household electronic equipment, batteries, and light bulbs. E-waste contains valuable materials that can be recovered and reused such as tin, nickel, zinc, aluminium, copper, silver, and gold.

On 1st July 2019, the disposal of E-waste to landfill was banned by the Victorian Government.

A large number of e-waste collection points are available in Victoria and private contractors are equipped with the resources to undertake E-waste collections.

All E-waste generated by the development will be managed by the operator with either coordinated collections of E-waste by a private contractor, or taken to an appropriate collection centre, as described below:

- Geelong Resource Recovery Centre (interim), which is currently located at 21 Slevin Street, North Geelong, until the main site at 100 Douro Street, North Geelong, is being redeveloped, accepts all e-waste item except large appliances such as fridges and washing machines;
- Drysdale Resource Recovery Centre, located at Becks Road Drysdale, accepts all e-waste items;
- Planet Ark operate a number of e-waste recycling drop-off locations throughout Victoria (https://recyclingnearyou.com.au/electrical);
- Officeworks stores accept small amounts of personal E-waste;
- Aldi stores accept batteries; and
- Some Bunnings Warehouse stores accept batteries.

Additional recycling locations are provided at www.recyclemate.com.au, or https://recyclingnearyou.com.au/.

6.2.11 Sanitary Waste

Sanitary waste bins are to be provided within the toilets for the disposal of appropriate sanitary waste. Sanitary waste bins will be exchanged for a clean bin as required by a private sanitary waste contractor.

6.2.12 Secure Document Disposal

The engaged private waste contractor will provide lockable waste bins to accommodate sensitive and confidential documents. The bins will be stored within the office/administration areas of the site and transferred to and collected from the basement loading area on a scheduled or as required based, under the management of the operator.

6.2.13 Grease Trap

Any grease traps associated with the commercial kitchen should be provided with regular maintenance, emptying and cleaning to prevent blockages and keep the system running efficiently.

The frequency of collection is highly dependent on the specific operation of the commercial kitchen servicing the aged care facility, as well as the size and type of the grease trap provided. As such, it is recommended that an inspection and assessment be undertaken by a grease trap collection service upon construction of the residential aged care facility, to determine the recommended frequency of cleaning and collection.