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BUPA MORPHETTVILLE

29-31 Austral Terrace, Morphettville SA 5043

Environmentally Sustainable Design Initiatives Report

Job no: SH366285

DOCUMENT CONTROL

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1. Executive Summary

SUHO has been engaged to prepare this Sustainability Assessment Report for the proposed development. The report has been prepared to support the planning application by benchmarking the project's sustainability initiatives against the **Green Building Council of Australia's Green Star Buildings v1.1** framework.

Unlike a formal Green Star certification process, this assessment has been undertaken as an **informal benchmarking exercise only**. The project is **not registered with the Green Building Council of Australia (GBCA)**, and no Green Star certification is being sought. Instead, the Green Star Buildings v1.1 framework has been adopted as an industry-recognised benchmark to evaluate the project's sustainability performance and identify opportunities to incorporate best-practice environmental design principles throughout the development.

The assessment has been based on the architectural documentation and project information available at the time of preparation, together with information provided by the project team through the project's sustainability scorecard. Where sufficient information has been available, the proposed initiatives have been benchmarked against the relevant Green Star Buildings v1.1 credits. For several initiatives, detailed design information has not yet been finalised. These items have therefore been identified as proposed strategies or subject to further design development.

Based on the information currently available, the project demonstrates a strong commitment to sustainable design and demonstrates sustainability initiatives broadly consistent with the intent of an **informal Green Star Buildings v1.1 4 Star benchmark**, representing **Australian Best Practice**, provided that the nominated sustainability initiatives are incorporated into the detailed design and construction phases.

This report summarises the sustainability initiatives currently proposed across the Green Star Buildings v1.1 categories, identifies areas requiring further design development, and provides a structured framework to assist the project team in delivering a high-performance, environmentally responsible development.

Table 1: Green Star Buildings v1.1 Benchmark Summary

Green Star Buildings v1.1 Category	Overall Assessment	Summary
Responsible	Strong	The project demonstrates a strong commitment to responsible project delivery through sustainability leadership, responsible construction practices, operational waste management, commissioning and whole-of-life environmental assessment. Several responsible product initiatives remain opportunities for consideration during detailed design.
Healthy	Strong	The development incorporates initiatives that support occupant health and wellbeing, including indoor air quality, daylight, acoustic comfort, low-emission materials and access to landscaped outdoor areas and external views.
Resilient	Moderate	The project includes climate change pre-screening as part of its sustainability strategy. Additional resilience initiatives relating to climate adaptation, operational resilience, heat resilience and grid resilience are not currently

		targeted but may be considered during future design development.
Positive	Strong	The project demonstrates a strong commitment to reducing operational environmental impacts through an all-electric building strategy, improved operational energy performance, reduced upfront embodied carbon, future-ready refrigerant systems and water-efficient fixtures.
Places	Good	The development provides accessible communal spaces and incorporates facilities that support active transport while promoting resident wellbeing and a high-quality living environment. Further place-making initiatives may be considered during detailed design.
People	Good	The project promotes inclusive and accessible design appropriate for a residential aged care facility. Broader initiatives relating to workforce wellbeing, First Nations inclusion and social procurement are not currently included within the project scope.
Nature	Limited	The project includes landscaping appropriate for the development; however, dedicated Green Star initiatives relating to biodiversity enhancement, ecological connectivity and nature stewardship are not currently targeted.
Leadership	Limited	The project is not currently targeting Green Star Market Transformation initiatives. The Leadership Challenge for Responsible Products (Finishes) remains an optional opportunity for consideration during detailed design and specification.

Table 2: Overall Benchmark Assessment

Item	Assessment
Assessment Framework	Green Star Buildings v1.1
Assessment Type	Informal sustainability benchmarking
Formal GBCA Registration	No
Green Star Certification	Not Sought
Benchmark Outcome	Equivalent to an Informal 4 Star Green Star Buildings Benchmark*
Purpose	Demonstrate alignment with industry best practice sustainability principles for planning purposes

*The benchmark outcome represents SUHO's professional assessment based on the information available at the time of preparing this report. It is not a Green Star rating or certification issued by the Green Building Council of Australia.

2. BACKGROUND

2.1 Project Overview

SUHO was engaged to undertake a sustainability assessment for the proposed development located at 29-31 Austral Terrace, Morphettville SA 5043.

The proposed development comprises a 144-bed aged care facility distributed over five levels. Ground Level to Level 2 accommodate 36-bed care units on each floor. Level 3 incorporates a 36-bed secure wing (2x18 care units) and Level 4 offers activity area and communal terrace.

In addition to resident accommodation, the facility includes a range of administrative and operational support spaces. These comprise the main entry and waiting areas, reception, administrative support offices, records archive, fire indicator panel (FIP) room, mobile equipment bay, general manager's office, care manager's office, greeting/meeting room, and accessible sanitary facilities. A suite of wellbeing and therapeutic spaces is also provided to support resident care and lifestyle needs, including assisted bathing facilities, staff station/reception areas, consulting rooms, hairdressing and spa amenities, function storage, education and therapy rooms, and a dedicated multipurpose function room. Back-of-house and staff support areas are also incorporated within the design, including staff amenities, staff lounge, laundry facilities, IT room, and general storage areas.

The development has been assessed against the Green Building Council of Australia's **Green Star Buildings v1.1** framework as an industry-recognised sustainability benchmark.

The purpose of this assessment is to demonstrate how the proposed development incorporates environmentally sustainable design initiatives that align with contemporary industry best practice. The assessment has been prepared to support the planning approval process by identifying the sustainability measures incorporated into the project and benchmarking them against the Green Star Buildings v1.1 rating tool.

This report is intended solely as an informal benchmarking assessment. The project is **not registered with the Green Building Council of Australia (GBCA)** and does **not** seek formal Green Star certification. References to Green Star Buildings v1.1 throughout this report are provided to demonstrate alignment with recognised sustainability principles and to assist the project team in delivering a high-performing development.

The sustainability initiatives presented in this report have been developed based on the current stage of design and the information available at the time of assessment. As the project progresses through detailed design, additional sustainability initiatives may be incorporated, refined or confirmed.

Table 3: Site area breakdown

Description	Area
Site area	12,736 m ²
Built-up area	9,136 m ²

The development is in NCC Climate Zone 5. The following images indicate the street view and location of the site.

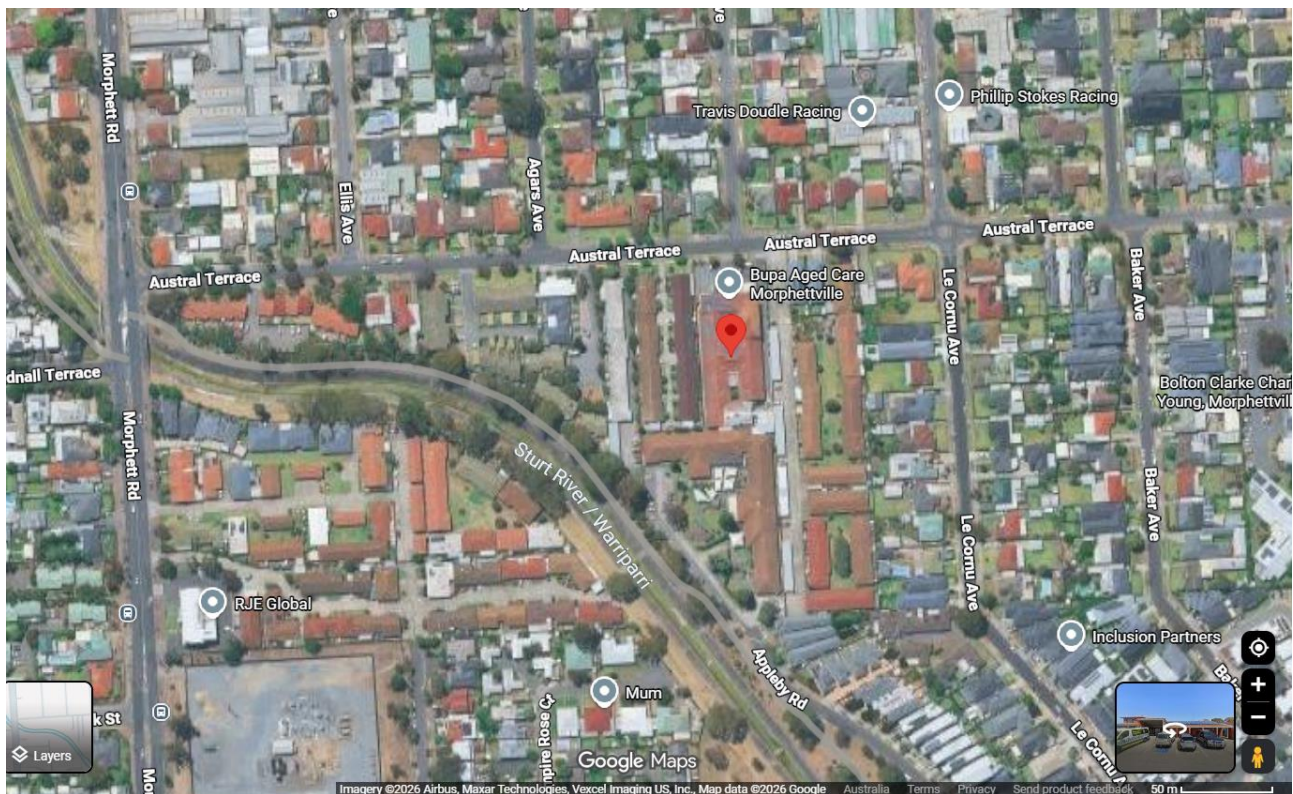


Figure 1: Location of site

2.2 Purpose of the Report

This report has been prepared to document the environmentally sustainable design (ESD) initiatives proposed for the development and to benchmark the project's sustainability performance against the Green Building Council of Australia's Green Star Buildings v1.1 framework.

The objectives of this report are to:

- document the proposed sustainability initiatives incorporated into the development;
- benchmark the project against recognised Green Star Buildings v1.1 sustainability principles;
- identify opportunities for achieving industry best practice environmental performance;
- provide a consolidated sustainability reference document for the planning authority and project team; and
- support the planning application by demonstrating the project's commitment to sustainable design outcomes.

As this assessment is not part of the formal Green Star certification process, the findings presented in this report represent SUHO's professional assessment based on the information available at the time of preparation and should not be interpreted as a certified Green Star rating or assessment.

2.3 Assessment Methodology

The assessment has been undertaken using the **Green Building Council of Australia's Green Star Buildings v1.1 Submission Guidelines** as the primary sustainability benchmarking framework.

Project documentation, consultant information and the project's sustainability scorecard were reviewed to determine the extent to which the proposed development aligns with the intent of the Green Star Buildings v1.1 credits. Each sustainability initiative has been assessed based on the information available at the time of preparing this report.

Where sufficient information has been provided, the relevant Green Star Buildings v1.1 initiatives have been identified as incorporated within the current design. Where detailed design information is not yet available, the report identifies the relevant sustainability measures as proposed initiatives or subject to future confirmation.

This assessment is intended solely as an industry benchmark and has not been prepared for submission to, or certification by, the Green Building Council of Australia. Consequently, references to Green Star Buildings v1.1 throughout this report should be interpreted as a voluntary benchmarking exercise rather than a formal Green Star certification assessment.

2.4 Assessment Documentation

This report is based on the following drawing set provided by Walter Brooke:

Table 4: Documents

Drawing & Description	Date
25-1070 – Austral Terrace, Morphettville SA 5043 – Planning Approval – Rev [B]	26/03/2026
BACA Morphettville Draft Dev Brief	03/07/2025

2.1. Green Star Buildings v1.1 Benchmark Assessment

The proposed development has been benchmarked against the **Green Building Council of Australia's Green Star Buildings v1.1** framework to evaluate the extent to which the current design aligns with recognised sustainability best practice.

The assessment has been undertaken using the available project documentation and sustainability information provided by the project team. Where sufficient information has been available, the proposed initiatives have been benchmarked against the intent of the relevant Green Star Buildings v1.1 credits. Where design information has not yet been finalised, the corresponding initiatives have been identified as proposed measures or subject to future confirmation during the detailed design and construction phases.

It should be noted that Green Star Buildings v1.1 is being used solely as an **industry-recognised sustainability benchmark**. This report does not constitute a formal Green Star submission, assessment or certification by the Green Building Council of Australia.

The following sections summarise the sustainability initiatives proposed for the development under each of the Green Star Buildings v1.1 categories and identify how the current design responds to the relevant sustainability objectives.

3. GREENSTAR BUILDING V1.1 CATEGORIES

3.1 Responsible

The Responsible category of Green Star Buildings v1.1 recognises initiatives that promote responsible decision-making throughout the design, procurement, construction, commissioning and handover of the development. It encourages effective project governance, responsible procurement, environmental management during construction, verification of building performance, and the provision of information that supports the efficient long-term operation and maintenance of the building.

The proposed development incorporates a range of sustainability initiatives that support responsible project delivery and align with the intent of the Responsible category. Where sufficient information has been provided, the initiatives have been benchmarked against the relevant Green Star Buildings v1.1 credits. Some measures have already been incorporated into the current design, while others are recommended for implementation or confirmation during the detailed design, procurement, construction and handover phases.

The following table summarises the project's benchmark assessment against the Green Star Buildings v1.1 Responsible category.

Table 5: Responsible Category Benchmark Assessment

Green Star Credit	Sustainability Objective	Project Response	Status
Industry Development	Integrate qualified sustainability expertise into the project and support the effective implementation of the project's sustainability objectives.	SUHO has been engaged to provide sustainability consulting services for the project, with Green Star Buildings v1.1 adopted as the project's sustainability benchmarking framework. Sustainability objectives have been established during the design phase to guide the environmental performance of the development.	Confirmed
Responsible Construction	Minimise the environmental impacts of construction through effective environmental management, waste diversion and sustainability training.	The appointed builder or head contractor is proposed to implement an environmental management system and a project-specific Environmental Management Plan covering the construction works. The construction strategy will also target the diversion of at least 80% of construction and demolition waste from landfill and include training for relevant personnel on the project's sustainability requirements. The higher 90% waste-diversion pathway is not currently targeted.	Proposed
Verification & Handover	Support efficient ongoing building operation through metering,	Energy and water metering is proposed for common uses, major uses and major consumption sources. Building services are to be commissioned and tuned during design,	Proposed

	commissioning, tuning and appropriate handover information.	construction, practical completion and the post-completion period. Operations and maintenance information, a building logbook and relevant building-user information are also to be provided to the owner and facilities management team at handover to support the efficient long-term operation of the facility.	
Responsible Resource Management	Facilitate the safe and effective separation, storage and collection of operational waste and recyclable materials.	The development is to provide waste-separation facilities for general waste, recycling and food-organics streams. Bins, containers or chute intake points are to be clearly labelled, readily accessible and located as close as practical to the point of waste generation. The dedicated waste-storage area is to be sized for at least one full collection cycle based on advice from a suitably qualified waste consultant. Waste storage areas and collection arrangements will be coordinated with the appointed waste contractor during detailed design.	Proposed
Responsible Procurement	Improve environmental, social and ethical outcomes through a structured responsible procurement process.	A formal responsible procurement risk and opportunity assessment and procurement plan in accordance with ISO 20400 are not currently included in the preliminary sustainability strategy. A formal responsible procurement framework in accordance with ISO 20400 has not been identified within the current project documentation and is therefore not included within this benchmark assessment.	Not Targeted
Responsible Structure	Reduce the environmental impacts associated with structural materials through the selection of responsibly sourced products.	The current design documentation does not include a commitment to the Green Star responsible-products requirements for structural components. No commitment has currently been made to achieve the nominated Responsible Products Value thresholds for structural steel, concrete, timber or other load-bearing elements.	Not Targeted
Responsible Envelope	Reduce the environmental impacts of façade, roofing, insulation and other building-envelope components through responsible product	The current design documentation does not target the Green Star responsible-products requirements for building-envelope components. The nominated Responsible Products Value thresholds for façade, roofing, insulation, shading and associated envelope products are therefore not currently included as	Not Targeted

	selection.	project commitments.	
Responsible Systems	Reduce the environmental impacts of mechanical, electrical, hydraulic and vertical-transportation systems through responsible product selection.	The current design documentation does not target the Green Star responsible-products requirements for active building systems. No project commitment has currently been made to achieve the nominated Responsible Products Value thresholds for mechanical, electrical, hydraulic or vertical-transportation systems.	Not Targeted
Responsible Finishes	Encourage the use of responsibly sourced and independently certified internal finishes.	The project proposes the responsible-finishes credit as an optional initiative. Where adopted, the specification would require at least 40% of internal finishes by cost to meet the applicable Green Star Responsible Products Value threshold. Proposed product categories include GECA-certified plasterboard, flooring, carpets, paints, coatings, adhesives, fillers and sealants, or equivalent products supported by an accepted third-party certification pathway. The feasibility of this initiative is to be confirmed during specification development and product selection.	Subject to Detailed Design
Impacts Disclosure	Improve transparency regarding the whole-of-life environmental impacts of the proposed development.	A whole-of-building Life Cycle Assessment (LCA) is proposed to assess the environmental impacts of the development over its life cycle and report the results using the Green Star Buildings Impacts Disclosure Template.	Not Targeted

The proposed development demonstrates a strong commitment to responsible project delivery through the integration of sustainability objectives, construction environmental management, commissioning, operational waste management and whole-of-life environmental assessment. While several responsible product initiatives are not currently included within the project scope, opportunities to incorporate responsibly sourced finishes and further reduce the environmental impacts of building materials will continue to be considered during detailed design and specification development.

Refer to Appendix A for the detailed Green Star Buildings v1.1 Scorecard for further information.

The following are the key ESD initiatives proposed in this category:

- SUHO will manage the Green Star Accredited Professional (GSAP) role during the design phase of the project
- The project team will need to provide the GBCA with information on the costs associated with the project's sustainable design, construction, and documentation by completing the required financial disclosure template

- The project team will need to promote and communicate the project's sustainability initiatives, achievements, and benefits
- Builder or head contractor to set up an environmental management system in place to manage its environmental impacts on site
- Have an environmental management plan to cover the scope of construction activities
- Divert at least 80% of construction and demolition waste from landfill
- Provide training on the sustainability targets of the buildings
- Energy and water metering will need to be provided for all common uses, major uses, and major sources.
- Commissioning and tuning will need to be performed prior to construction, during construction, practical completion and after practical completion
- The project team must provide operations and maintenance information for all nominated building systems, building log book and building user information to the building owner and facilities management team
- Waste separation area are to be provided that allow for separation of general waste, recycling, food and organics (FOGO)
- The chute intakes, bins or storage containers need to be provided ensuring the applicable waste streams are collected separately as close to its point of generation as possible. The chute intakes, bins or storage containers must be labelled and easily accessible
- The storage area must be sized to accommodate all bins or containers, for all applicable waste streams, for at least one collection cycle
- The calculations used to demonstrate that the area provided is adequately sized to handle the recyclable waste streams specified must be based on advice from an appropriately qualified waste consultant
- A sign-off from the waste contractor on the designs is required confirming they are adequately sized and located for the safe and convenient storage and collection of the waste streams identified
- All plasterboard will need to be specified to be GECA Panel Board
- All flooring (carpets and resilient) will need to be specified from GECA Carpets and Floor Coverings
- All paints and coatings will need to be specified from GECA Paints and Coatings or Green Rate Level B+
- All Adhesives, fillers and sealants will need to be specified from GECA Adhesives, Fillers and Sealants or Green Rate Level B+
- 40% (or 60% if Leadership is pursued) of internal finishes including plasterboard, flooring (carpets and floor coverings), paints and coatings, and adhesives, fillers, and sealants will need to be selected from products holding third-party certification within the below listed certification schemes.
 - Aluminium Stewardship Initiative (ASI)
 - Australasian Certification Authority for Reinforcing and Structural Steels (ACRS)
 - Australasian Furnishing Research and Development Institute (AFRDI)
 - Blue Angel
 - BRE Global
 - BSI Group
 - Carpet Institute of Australia
 - Chartered Institution of Building Services Engineers
 - Climate Active
 - Cradle to Cradle Products Innovation Institute
 - Eco Choice Aotearoa (ECA)
 - Environmental Product Declaration
 - EPD Australasia
 - Forest Stewardship Council (FSC)
 - GEV-Emicode

- Global GreenTag International (GGT)
- Good Environmental Choice Australia (GECA)
- Greenguard Environmental Institute
- International Organisation for Standardisation
- Living Future
- Plastics Industry Pipe Association of Australia (PIPA)
- Product Carbon Footprint
- Programme for the Endorsement of Forest Certification (PEFC)
- Responsible Wood
- Responsible Steel
- Reused products or building components
- Science Based Targets Initiative
- Steel Sustainability Australia (SSA)
- Sustainable Steel Council NZ
- TCO Certified
- Vinyl Council of Australia

3.2 Healthy

The **Healthy** category of Green Star Buildings v1.1 recognises initiatives that promote the health, wellbeing and comfort of building occupants through improved indoor environmental quality, access to natural light, acoustic performance, healthy materials and connections with nature. These initiatives aim to create indoor environments that support occupant comfort while reducing exposure to pollutants and enhancing overall quality of life.

The proposed residential aged care facility incorporates a range of initiatives intended to support the health, wellbeing and comfort of residents, staff and visitors. Where sufficient information has been provided, these initiatives have been benchmarked against the relevant Green Star Buildings v1.1 Healthy credits. Some initiatives have already been incorporated into the current design, while others will be further developed and confirmed during detailed design.

The following table summarises the project's benchmark assessment against the Green Star Buildings v1.1 Healthy category.

Table 6: Healthy Category Benchmark Assessment

Green Star Credit	Sustainability Objective	Project Response	Status
Clean Air	Promote healthy indoor environments through effective ventilation and pollutant control.	The project proposes mechanical ventilation systems that satisfy the Green Star minimum requirements for ventilation system attributes, outdoor air delivery and exhaust of indoor pollutants. Appropriate separation between outside air intakes and pollutant sources will be incorporated into the design. Enhanced ventilation pathways, including increased outdoor air rates and continuous indoor air quality monitoring, are not currently targeted.	Proposed
Light Quality	Improve occupant wellbeing through appropriate daylight access and lighting quality.	The project targets the Green Star minimum requirements relating to lighting quality, glare reduction and access to natural daylight. Building layouts and façade design seek to maximise daylight to regularly occupied spaces while maintaining appropriate visual comfort. Enhanced daylight performance pathways will be considered during detailed design where practical.	Proposed
Acoustic Comfort	Provide comfortable indoor environments through appropriate acoustic design.	An acoustic strategy is proposed to guide the design and provide appropriate acoustic separation and internal comfort for residents, staff and visitors. The project is not currently targeting the enhanced Green Star acoustic performance pathway.	Proposed

Exposure to Toxins	Reduce occupant exposure to harmful substances through the selection of healthier building materials.	The project proposes the specification of low-emission materials, including paints, coatings, adhesives, sealants, carpets and engineered timber products with reduced formaldehyde emissions. The project also proposes post-construction indoor air quality testing in accordance with the Green Star Buildings requirements.	Proposed
Amenity & Comfort	Encourage comfortable, accessible and functional indoor environments that support occupant wellbeing.	The development incorporates communal resident spaces, staff facilities and accessible circulation appropriate for a residential aged care facility. However, the optional Green Star credit relating to dedicated wellbeing spaces is not currently targeted as part of the project's sustainability strategy.	Not Targeted
Connection to Nature	Enhance occupant wellbeing through views and access to landscaped environments.	The project proposes access to quality external views from regularly occupied spaces and incorporates landscaped outdoor areas that contribute to resident wellbeing. The enhanced Green Star pathway relating to biodiversity and advanced biophilic design is not currently targeted.	Proposed

The proposed development demonstrates a strong commitment to providing a healthy indoor environment for residents, staff and visitors through initiatives addressing indoor air quality, lighting quality, acoustic design, healthier building materials and access to external views. While enhanced performance pathways are not currently proposed for several Healthy credits, the adopted initiatives provide a solid foundation for occupant wellbeing and may be further refined during detailed design.

Refer to Appendix A for the detailed Green Star Buildings v1.1 Scorecard for further information.

The following are the key ESD initiatives proposed in this category:

- The minimum separation distances between pollution sources and outdoor air intakes must be followed as per either Table 5-1 in ASHRAE Standard 62.1:2022 – Ventilation for Acceptable Indoor Air Quality or Table 2.1 in AS 1668.2:2024
- Outside air to regularly occupied areas will need to be 50% increased on AS1668.2.2012 (or)
- The development must maintain CO2 levels to <700PPM
- Sources of pollutants include printing and photocopying equipment, cooking processes and equipment and vehicles. Pollutants must be exhausted directly to the outside of the project in accordance with AS 1668.2:2024, AS 1668.4:2024 and/or physically separated from occupants
- Lighting within the building must meet the following requirements:
- All LED lighting installed across the whole project has no observable effect as per the standard IEEE 1789-2015 - IEEE Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers

- Light sources must have a minimum Colour Rendering Index (CRI) 85 or higher, in all internal and external applications
- All light sources must have a MacAdam Ellipse or a Standard Deviation Colour Matching (SDCM) of 3 or lower.
- Higher quality lighting must be used to achieve CRI 85+ and less than 3 Macadam's steps (colour difference perception)
- Glare from light sources must be limited within the regularly occupied areas. For LED luminaires the Unified Glare Rating (UGR), as estimated from the manufacturers data sheets for a standard room, must not exceed the maximum values listed in Table 8.2 of AS/NZS 1680.1:2006
- Daylight modelling has been undertaken to establish the daylight strategy
- An Acoustic Comfort Strategy must be prepared describing how the building design will deliver acoustic comfort to the building occupants
- The following requirements are to be addressed:
 - Quiet enjoyment of space
 - Functional use of space
 - Control of intrusive or high levels of noise
 - Privacy
 - Noise transfer
 - Speech intelligibility
- At least 95% of internally applied paints, adhesives, sealants (by volume) and carpets (by area) must meet stipulated 'Total Volatile Organic Compounds (TVOC) Limits'
- All engineered wood products meet specified formaldehyde emission limits for at least 95% (by area)
- As there are no existing buildings on the site, the Banned or Highly Toxic Materials criterion is exempt
- A post completion test of 3 areas must be undertaken to verify that the TVOC and formaldehyde levels are within the concentration limits stipulated (TVOC - <0.27ppm, Formaldehyde- <0.02ppm)
- The development design achieves 60% external views compliance
- The current design provides a total planted area exceeding 5% of the building's regular occupied area to support connection with nature
- An ongoing maintenance plan must be established to ensure plant health is maintained

Light Quality: Daylight simulation calculations have been undertaken using Design Builder v7, which uses the Radiance Daylighting simulation engine. The Design Builder Radiance simulation provides a detailed multi-zone physics-based calculation of illumination levels on the working plane of a building. The calculations allow light to be transmitted through exterior and interior windows, and the shading and reflective effect of local shading devices and component/assembly blocks is included.

Modelling parameters and assumptions are generally based on Green Star IEQ-4 requirements as follows:

- Annual CIE Sky
- Internal floor reflectance = 30%
- Internal wall reflectance = 70%
- Internal ceiling reflectance = 80%
- Working plane defined as 0.7m

Glazing light transmittance assumptions were as follows:

- High-Performance Double Glazing with following values
- Visible Light Transmittance = 60% for windows

32% of the floor area achieves a target lux level of 160, thereby complying with the daylight requirement.

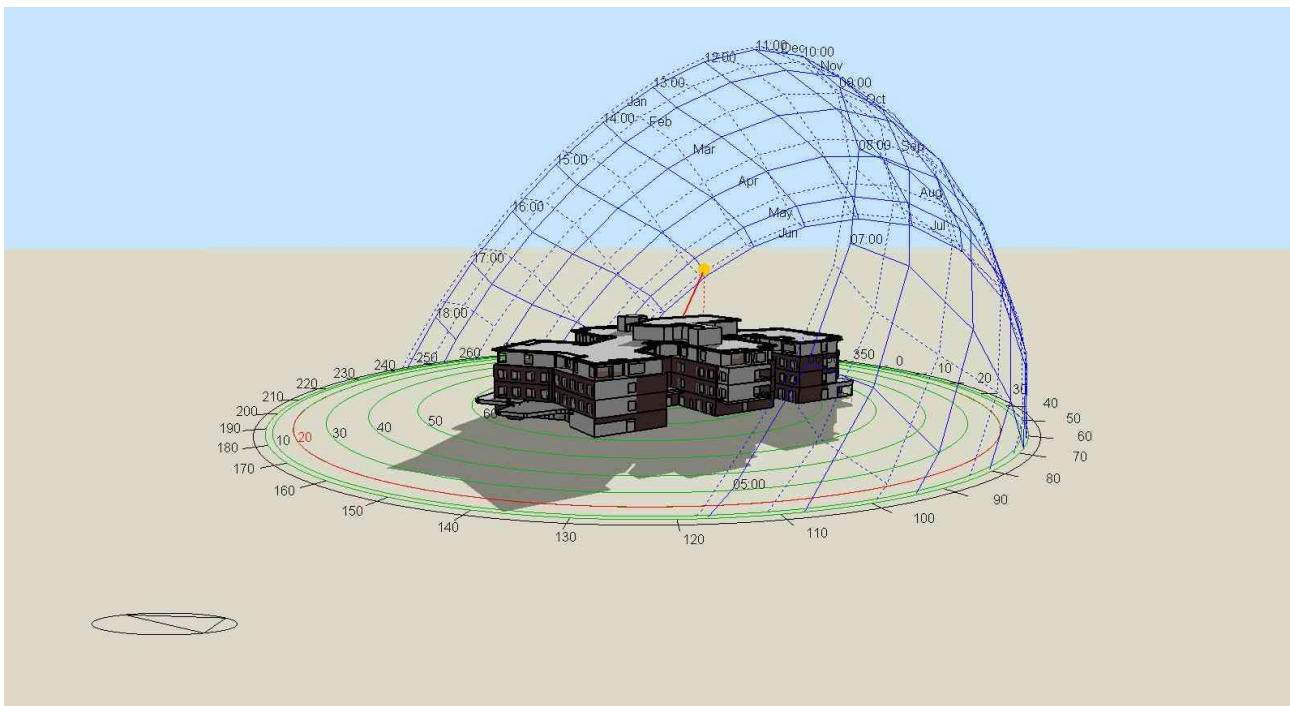


Figure 2. Model Geometry used for Daylight Modelling

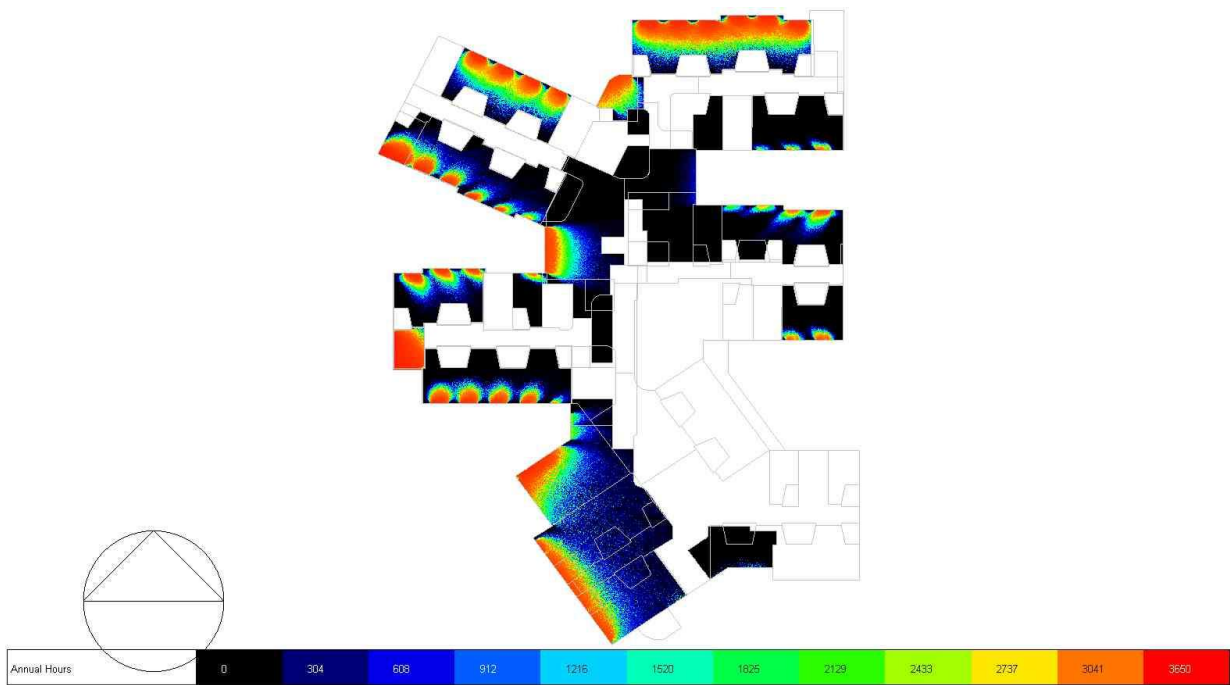


Figure 3: Daylight Map for Ground Floor

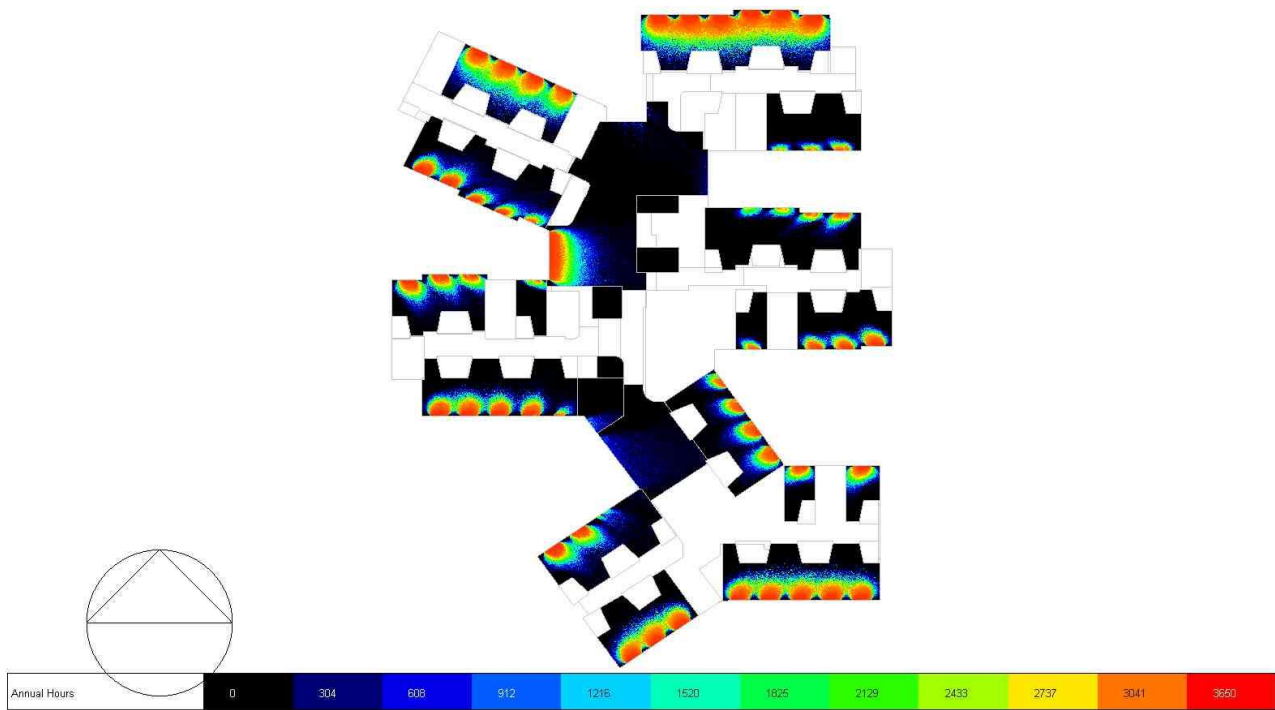


Figure 4: Daylight Map for Level 01

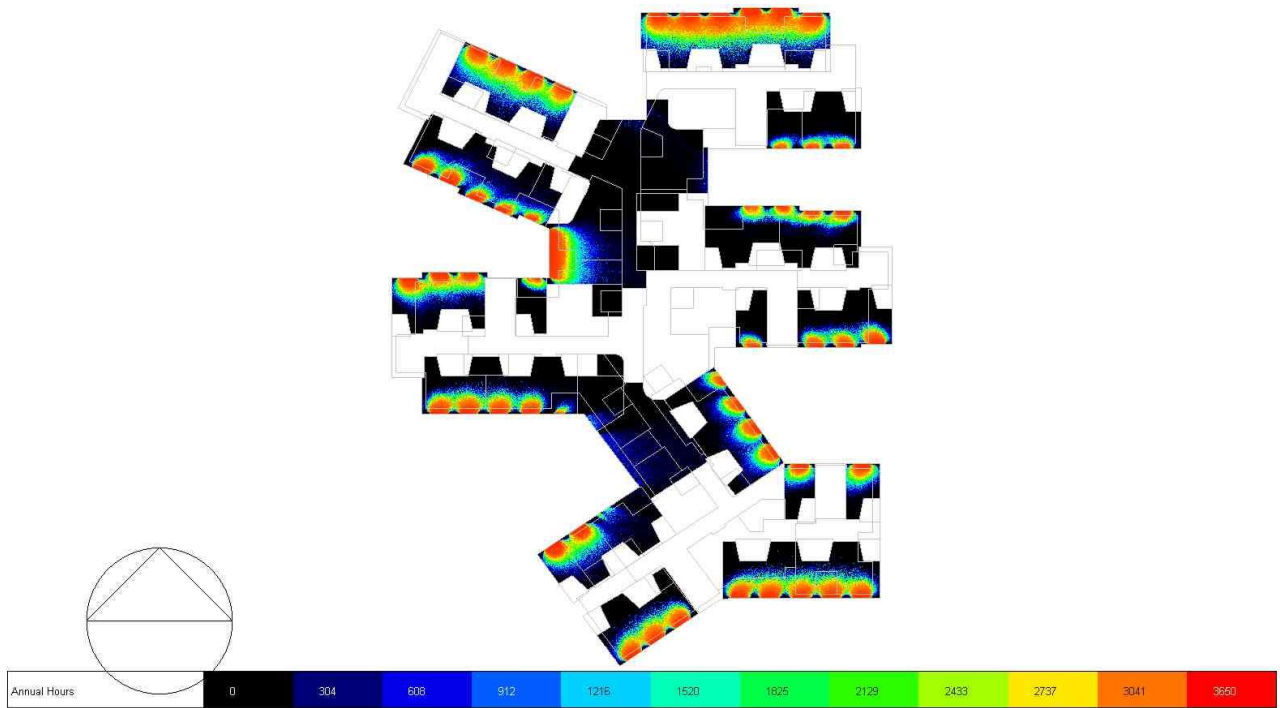


Figure 5: Daylight Map for Level 02

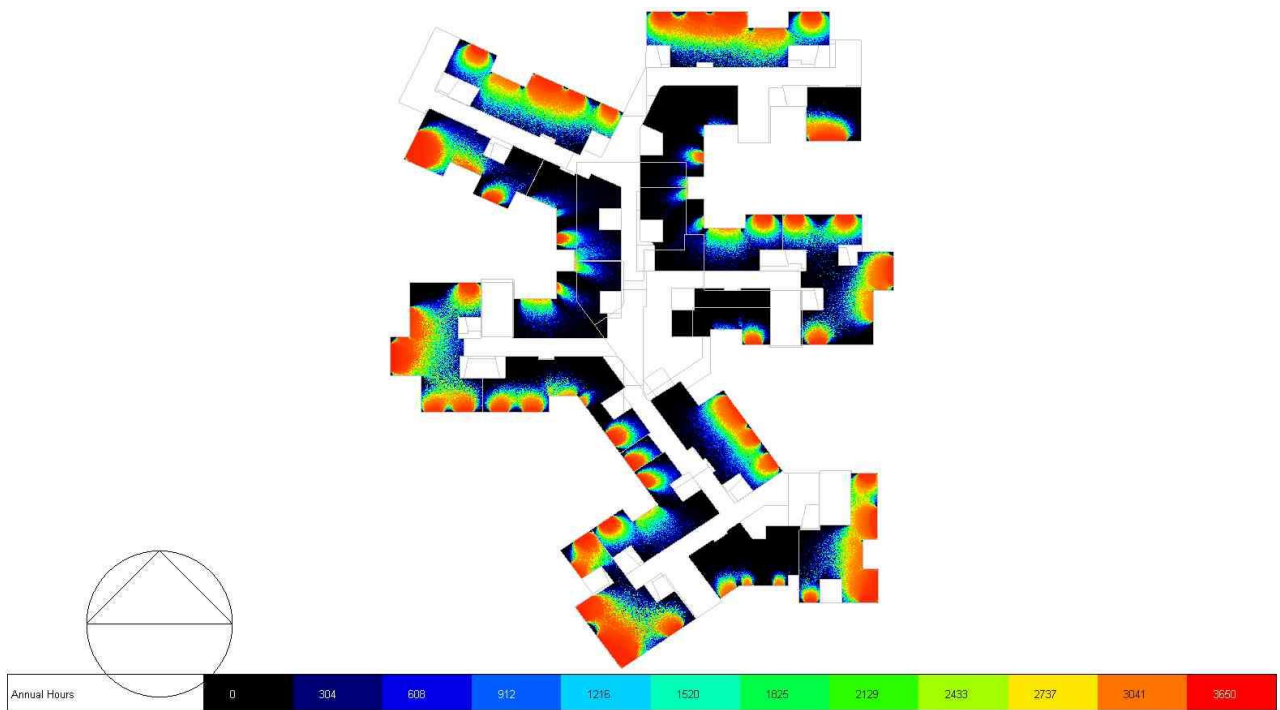


Figure 6: Daylight Map for Level 03

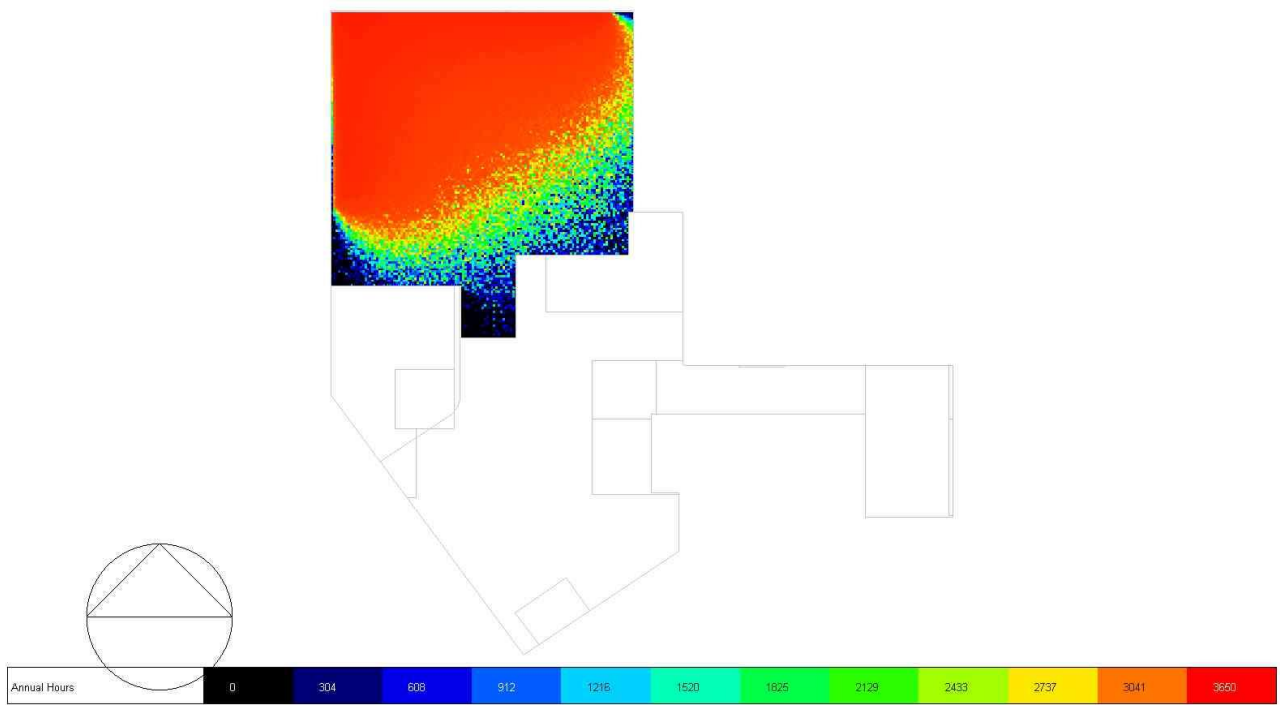


Figure 7: Daylight Map for Level 04

Table 7: Daylight modelling result

Block	Zone	Floor area (m ²)	SDA area in range (m ²)	SDA area in range (%)	ASE area in range (m ²)	ASE area in range (%)
Ground level	Consult. & Comms.	23.0	0.0	0.0	23.0	100.0
	6 x Bed 2	109.7	21.3	19.4	109.7	100.0
	GM Office	18.3	0.8	4.6	17.7	97.0
	4 x Bed	87.8	8.4	9.5	79.3	90.3
	Dining & Lounge	124.0	0.0	0.0	124.0	100.0
	Dining & Lounge	144.8	19.7	13.6	123.4	85.2
	Meeting	15.3	0.0	0.0	15.3	100.0
	3 x Bed 1	66.5	2.2	3.3	66.5	100.0
	1 x Bed 1	21.9	0.0	0.0	21.9	100.0
	Function. Cafe & Welcome hub	333.6	78.0	23.4	284.7	85.3
	2 x Bed	44.8	4.3	9.6	44.8	100.0
	Staff Lounge	51.5	0.1	0.1	51.5	100.0
	Sitting	20.9	20.4	97.4	2.9	14.0
	3 x Bed	65.9	14.5	22.1	51.9	78.8
	1 x Bed	22.3	1.9	8.3	20.7	93.0
	6 x Bed	131.7	31.9	24.2	117.1	88.9
	4 x Bed 1	85.7	47.5	55.5	52.0	60.7
	Manager Office	8.9	0.0	0.0	8.9	100.0
	Sitting 1	24.2	16.8	69.2	14.6	60.4
	6 x Bed 1	130.3	86.9	66.7	68.7	52.7
Level 01	5 x Bed 1	110.4	17.9	16.2	104.7	94.9
	4 x Bed 1	84.8	41.8	49.2	56.8	67.0
	Lounge & Dining	244.3	18.7	7.6	224.5	91.9
	3 x Bed	67.1	4.1	6.1	67.1	100.0
	Lifestyle	11.5	0.0	0.0	11.5	100.0
	5 x Bed 2	113.1	7.9	7.0	106.4	94.0
	6 x Bed	130.1	79.1	60.8	75.2	57.8
	1 x Bed 1	23.0	1.7	7.4	23.0	100.0
	3 x Bed 2	66.1	11.2	16.9	66.1	100.0
	4 x Bed 2	85.3	16.7	19.6	74.2	87.0
	Lounge & Sitting	97.4	0.0	0.0	97.4	100.0
	1 x Bed 2	20.7	4.4	21.2	16.7	80.7
	1 x Bed 3	22.5	5.8	25.6	17.8	78.8
	5 x Bed 3	110.4	40.2	36.4	110.4	100.0
	3 x Bed 3	68.3	22.9	33.5	68.3	100.0
	4 x Bed	86.7	13.2	15.2	70.9	81.8
	5 x Bed	110.4	24.8	22.5	110.4	100.0
	Manager Office	8.8	0.0	0.0	8.8	100.0
	Multipurpose & Activity	31.1	0.0	0.1	31.1	100.0
	3 x Bed	65.3	15.4	23.6	51.8	79.3
	1 x Bed	21.3	1.5	6.9	20.1	94.2

	Meeting	14.5	0.0	0.0	14.5	100.0
	Training	15.9	0.0	0.0	15.9	100.0
Level 02	5 x Bed 1	110.4	22.7	20.6	104.6	94.8
	4 x Bed 1	84.8	43.2	50.9	55.5	65.5
	Lounge & Dining	244.3	20.5	8.4	223.8	91.6
	3 x Bed 1	67.1	8.1	12.0	67.1	100.0
	Lifestyle	11.5	0.0	0.0	11.5	100.0
	5 x Bed 2	113.1	17.4	15.4	98.5	87.1
	6 x Bed	130.1	79.2	60.8	75.1	57.7
	1 x Bed 1	23.0	2.8	12.0	23.0	100.0
	3 x Bed 2	66.1	15.3	23.2	66.1	100.0
	4 x Bed 2	85.3	20.7	24.3	71.7	84.0
	Lounge & Sitting	97.4	0.0	0.0	97.4	100.0
	1 x Bed 2	20.7	5.7	27.7	15.2	73.3
	1 x Bed 3	22.5	7.0	31.0	16.1	71.5
	5 x Bed 3	110.4	40.0	36.3	110.4	100.0
	3 x Bed 3	68.3	23.0	33.7	68.3	100.0
	4 x Bed	86.7	18.2	20.9	67.6	78.0
	5 x Bed	110.4	28.9	26.2	110.4	100.0
	Manager Office	8.8	0.0	0.0	8.8	100.0
	Multipurpose & Activity	31.1	0.0	0.1	31.1	100.0
	3 x Bed	65.3	22.1	33.8	44.3	67.9
	1 x Bed	21.3	2.8	13.1	18.8	88.2
	Meeting	14.5	0.0	0.0	14.5	100.0
	Training	15.9	0.0	0.0	15.9	100.0
Level 03	Apartment 11	107.4	26.3	24.5	102.5	95.4
	Apartment 12	119.2	69.4	58.2	75.9	63.7
	Apartment 13	82.1	7.2	8.7	75.9	92.4
	Apartment 5	60.3	4.2	7.0	60.3	100.0
	Apartment 4	134.6	52.9	39.3	110.9	82.4
	Apartment 6	94.4	32.0	33.9	70.1	74.2
	Apartment 14	81.0	4.5	5.6	75.4	93.1
	Apartment 3	108.3	16.2	14.9	93.7	86.5
	Apartment 2	94.9	3.1	3.3	94.3	99.3
	Apartment 15	85.9	33.9	39.5	63.5	73.8
	Apartment 16	115.6	65.6	56.8	76.7	66.4
	Lobby & Lounge	41.6	12.6	30.3	41.6	100.0
	Apartment 1	116.0	74.6	64.4	69.4	59.9
	Apartment 7	92.1	56.7	61.6	72.0	78.2
	Apartment 8	77.2	6.2	8.0	77.2	100.0
	Apartment 9	105.4	70.0	66.4	69.0	65.4
	Apartment 10	83.2	19.7	23.6	63.4	76.2
	Library	11.3	5.3	47.0	8.3	73.5
Level 04	Activity	152.7	122.6	80.3	64.9	42.5
Total		6512.5	2094.4	32.2	5522.9	84.8

3.3 Resilient

The **Resilient** category of Green Star Buildings v1.1 recognises initiatives that improve a building's ability to respond to climate-related risks, acute shocks and long-term environmental stresses. It considers climate adaptation, continuity of operations, community resilience, heat-island impacts and the capacity of the building to respond to electricity-grid constraints.

For the proposed development, the Green Star climate change pre-screening requirement is included within the preliminary sustainability strategy. The enhanced resilience credits relating to detailed climate adaptation, operational resilience, community resilience, heat-island reduction and electricity-grid responsiveness are not currently targeted.

The following table summarises the project's benchmark assessment against the Green Star Buildings v1.1 **Resilient** category.

Table 8: Resilient Category Benchmark Assessment

Green Star Credit	Sustainability Objective	Project Response	Status
Climate Resilience	Identify potential climate-related risks that may affect the development and inform future design responses.	A Green Star climate change pre-screening checklist is to be completed to identify relevant climate hazards and determine whether further project-specific assessment or design consideration is required. A comprehensive Climate Change Risk and Adaptation Assessment, including formal treatment of identified high or extreme risks, is not currently targeted.	Proposed
Operations Resilience	Improve the building's ability to continue operating or maintain essential functions during acute shocks and chronic stresses.	A comprehensive Operations Resilience Assessment, including evaluation of acute shocks, chronic stresses and shelter-in-place capability during power loss, is not currently included within the project's sustainability strategy.	Not Targeted
Community Resilience	Support the resilience of the surrounding community through project-specific planning and design responses.	A formal Community Resilience Plan and associated community needs analysis are not currently proposed for the development.	Not Targeted
Heat Resilience	Reduce the contribution of the development to the urban heat-island effect.	The Green Star heat-island reduction credit, which requires at least 75% of the site to incorporate compliant heat-mitigation strategies, is not currently targeted. The scorecard notes that areas allocated to solar photovoltaic panels and solar thermal systems	Not Targeted

		may affect the available compliant site area and would require further review if this credit were pursued.	
Grid Resilience	Support electricity-grid stability through demand reduction and passive design measures.	The project is not currently targeting the Green Star demand-response requirement for reducing peak electricity demand by at least 10%. The associated passive-design pathway requiring a 10% façade improvement over a reference building is also not currently targeted.	Not Targeted

The preliminary benchmark assessment includes completion of the Green Star climate change pre-screening checklist to identify climate-related risks relevant to the development. The enhanced Resilient category credits relating to detailed climate adaptation, continuity of operations, community resilience, heat-island mitigation and electricity demand response are not currently included within the project scope. These matters may nevertheless be considered through the broader design development and risk-management process where relevant.

Refer to Appendix A for the detailed Green Star Buildings v1.1 Scorecard for further information.

The following are the key ESD initiatives proposed in this category:

- The climate change pre-screening checklist will need to be completed, and the building's exposure to climate change risks will need to be communicated to the occupier during design stage.

3.4 Positive

The **Positive** category of Green Star Buildings v1.1 recognises initiatives that reduce the environmental impacts of buildings through improved energy performance, lower greenhouse gas emissions, reduced embodied carbon, efficient water use and the adoption of low-carbon building services. These initiatives contribute to reducing the whole-of-life environmental footprint of the development while supporting Australia's transition towards a more sustainable built environment.

The proposed development incorporates a range of initiatives that align with the intent of the Positive category. Where sufficient information has been provided, these initiatives have been benchmarked against the relevant Green Star Buildings v1.1 credits. Some measures have already been incorporated into the current design, while others will be further developed during detailed design.

The following table summarises the project's benchmark assessment against the Green Star Buildings v1.1 Positive category.

Table 9: Positive Category Benchmark Assessment

Green Star Credit	Sustainability Objective	Project Response	Status
Energy Source	Reduce operational greenhouse gas emissions through building electrification and renewable energy.	The project proposes an all-electric building with no gas infrastructure for domestic hot water, space heating or cooking. All operational energy is intended to be supplied by electricity, with renewable electricity incorporated as part of the project's sustainability strategy to support low-carbon building operation.	Proposed
Energy Use	Improve operational energy performance beyond the minimum requirements of NCC 2022.	The preliminary Section J (J1V3) assessment indicates the proposed development is expected to achieve approximately 18% lower operational energy use than the NCC 2022 reference building, satisfying the Green Star minimum pathway and supporting the targeted 20% improvement pathway. The enhanced 30% improvement pathway is not currently targeted.	Proposed
Upfront Carbon Reduction	Reduce embodied carbon associated with building construction.	The project proposes to achieve at least a 10% reduction in upfront embodied carbon emissions compared with a reference building. Opportunities to increase this reduction during detailed design will be investigated by the design team; however, the higher Green Star reduction pathways are not currently targeted.	Proposed
Upfront Carbon	Compensate remaining upfront embodied	Compensation of upfront embodied carbon emissions is not currently included within the	Not

Compensation	carbon emissions.	project scope. The Builder and Structural Engineer may review opportunities during detailed design; however, this initiative is not currently targeted as part of the benchmark assessment.	Targeted
Refrigerant Systems Impacts	Reduce greenhouse gas emissions associated with refrigerant systems and support future low-GWP refrigerants.	The mechanical services design will incorporate Green Star future-ready refrigerant requirements, including preparation of a Future-ready Refrigerant Design Review and Inventory to support future adoption of ultra-low global warming potential refrigerants.	Proposed
Low-Emissions Transport	Encourage lower-emission transport options for building users.	Electric vehicle charging infrastructure may be considered during detailed design, subject to client requirements and project feasibility. No formal commitment has currently been made to this Green Star credit.	Subject to Detailed Design
Design for Circularity	Promote circular economy principles through adaptable and reusable building design.	Circular economy initiatives, including design for disassembly, adaptability and material reuse, have not currently been identified within the project's sustainability strategy and are therefore not included within this benchmark assessment.	Not Targeted
Water Use	Reduce potable water consumption through efficient fixtures and fittings.	The project proposes water-efficient sanitary fixtures and appliances that satisfy the Green Star minimum requirements. Higher potable water reduction pathways are not currently included within the project sustainability strategy.	Proposed

The proposed development demonstrates a strong commitment to reducing its environmental impacts through an all-electric building strategy, improved operational energy performance, reduced upfront embodied carbon, future-ready refrigerant systems and water-efficient fixtures. The preliminary Section J assessment indicates an estimated **18% reduction in operational energy use** relative to the NCC 2022 reference building, providing a strong foundation for improved operational performance. While additional initiatives such as upfront carbon compensation, circular economy strategies and enhanced transport infrastructure are not currently targeted, these may be reviewed as the project progresses through detailed design.

Refer to Appendix A for the detailed Green Star Buildings v1.1 Scorecard for further information.

Refer to Appendix B & C for the Section J J1V3 report and Net Zero report for further information.

The following are the key ESD initiatives proposed in this category:

- All energy supplied to the development will be electric
- No gas connections for DHW or HHW supplies
- The Net Zero Operational Carbon Building Assessment has been undertaken for the development outlining how the proposed building will reduce and ultimately eliminate greenhouse gas emissions, aiming for net zero carbon
- An onsite solar PV system of 99 kW has been proposed for the development, which is expected to supply approximately 22% of the building's electricity demand
- The remaining emissions are proposed to be offset through the procurement of off-site renewable energy via GreenPower, supporting the development's transition towards net zero operational emissions
- As per the preliminary Section J J1V3 assessment, the building uses 18% less energy compared to a reference building
- This is achieved through high-efficiency design measures, including mechanical systems (fans, chillers, heat pumps, pumps and motors) selected to exceed NCC 2022 Deemed-to-Satisfy efficiency requirements, alongside improved lighting performance and reduced lighting power density at >20% below NCC 2022 J6 & J7
- No specific target for heat pump COP but good design would be >3.5 COP
- Automated lighting controls to meet NCC2022 J7 lighting requirements
- Site external lighting to be high efficiency LED type
- Adoption of insulation for roof and walls >10% above NCC2022 J3
- A comparative Life Cycle Assessment (LCA) must be conducted to demonstrate the compliance with this credit
- The project must demonstrate a 10% reduction in life cycle impacts when compared to standard practice and additional points are awarded when the development achieves 20% reduction.
- There are a few different options to target this but one easy approach to reduce the Upfront carbon as follows. All concrete to meet supplementary cementitious materials (SCM) target >30% project as follows
 - >30% for precast
 - >40% for piling
 - >40% for walls and beams and slabs
 - >40% for all hardstand pavement
- FSC timber to be utilised
- Construction phase electricity can be purchased from Greenpower
- The Future-ready Refrigerant Design Review and Inventory template must be completed by the mechanical engineer and included in the operations and maintenance information and provided to the building owner
- The total weighted average of refrigerant Global Warming Potential (GWP) in the building is below or equal to 700
- No hydrochlorofluorocarbons (HCFCs) are used in any systems in the building
- Leak detection systems are provided where required in accordance with AS/NZS 5149:2016
 - The EV parking requirement for the development are as follows:
Ready to charge EV charging points with a capacity of 7 kW (32 A) to at least 15% of all car parking spaces, in total 11 carparks
 - Electrical infrastructure and a load management plan must be prepared to allow for future installation of additional 5% (4) carparks with charging equipment with a minimum capacity of 7 kW v 22 kW
 - A dedicated, safe, unobstructed route from the electrical supply point which allows for the future provision of all necessary electrical cabling without the need for substantial builders work in connection to the electrical cabling installation

- All fixtures and water-using appliances installed must, at a minimum, meet the following WELS ratings:
 - Taps (hand wash basins), Urinals and Dishwashers 5 star
 - Taps (kitchen and laundry sink), Toilets and washing machines 4 star
 - Showers 3 star (≤ 7.5 l/min)

3.5 Places

The **Places** category of Green Star Buildings v1.1 recognises initiatives that create attractive, inclusive and connected places that contribute positively to the surrounding community. It encourages developments that support sustainable transport, provide high-quality communal spaces, respond to their urban context and celebrate local identity.

The proposed development incorporates a number of initiatives that support the intent of the Places category. Where sufficient information has been provided, these initiatives have been benchmarked against the relevant Green Star Buildings v1.1 credits. Some measures have already been incorporated into the current design, while others remain subject to further design development and project confirmation.

Table 10: Place Category Benchmark Assessment

Green Star Credit	Sustainability Objective	Project Response	Status
Movement and Place	Encourage sustainable transport and provide safe, accessible facilities that support active travel.	The project proposes end-of-trip facilities, including showers and changing facilities, in accordance with the Green Star minimum requirements. These facilities will be designed to be accessible, inclusive and safely located. A Sustainable Transport Plan and enhanced active transport initiatives, including bicycle parking and electric vehicle charging, are not currently committed as part of the project strategy.	Proposed
Enjoyable Places	Create attractive, safe and inclusive communal spaces that encourage social interaction and enhance occupant wellbeing.	The development incorporates communal indoor and outdoor spaces that support resident wellbeing, visitor interaction and staff amenity, while contributing positively to the overall character of the site. These spaces are intended to provide safe, inclusive and functional environments for residents, visitors and staff. A formal activation strategy to support ongoing placemaking following project completion has not currently been identified.	Proposed
Contribution to Place	Enhance the surrounding urban environment through context-sensitive design.	A formal urban context analysis or independent design review demonstrating contribution to the wider public realm has not currently been identified as part of the project's sustainability strategy.	Not Targeted
Culture, Heritage and Identity	Reflect and celebrate local identity, history and community values through the design of the development.	The project has not currently committed to the Green Star pathway requiring documented engagement with local community groups to inform the celebration of local identity, heritage and culture within the building design.	Not Targeted

The proposed development demonstrates a commitment to providing functional and inclusive communal spaces while incorporating end-of-trip facilities that support active travel for staff. The project does not currently target the enhanced Green Star initiatives relating to sustainable transport planning, urban context analysis or local identity and cultural engagement. Opportunities to strengthen these initiatives may be considered during detailed design where appropriate.

Refer to Appendix A for the detailed Green Star Buildings v1.1 Scorecard for further information.

The following are the key ESD initiatives proposed in this category:

- Staff occupancy <200 = 4 showers need to be provided. For staff occupancy >200 = additional 1 per 200 occupants above 200 staff
- One locker must be provided for every eight staff. The lockers must be secure and located in the changing rooms
- Access to the facilities must be well lit between entryway to bike parking
- All regular building occupants or staff must have easy access to lockers, showers, and building entry.
- Occupants must be able to find the facilities through clear signage throughout the building and access points
- The ground floor café will be publicly accessible and designed to serve as a key area for social interaction and community engagement within the development
- An activation strategy must be developed addressing the proposed activities, timing, targeted audiences and communication channels

3.6 People

The **People** category of Green Star Buildings v1.1 recognises initiatives that promote social sustainability by creating inclusive, accessible and equitable environments while supporting positive outcomes for workers, building users and the broader community. The category encourages developments that foster diversity, improve accessibility and strengthen community wellbeing throughout the design and construction process.

The proposed development has incorporated selected initiatives that align with the intent of the People category. Where sufficient information has been provided, these initiatives have been benchmarked against the relevant Green Star Buildings v1.1 credits. The project currently focuses on inclusive design, while broader workforce, social procurement and First Nations initiatives are not presently included within the preliminary sustainability strategy.

The following table summarises the project's benchmark assessment against the Green Star Buildings v1.1 **People** category.

Table 11: People Category Benchmark Assessment

Green Star Credit	Sustainability Objective	Project Response	Status
Inclusive Construction Practices	Promote a safe, respectful and healthy workplace during construction.	The current project documentation does not include Green Star initiatives relating to workforce diversity, anti-discrimination policies, physical and mental health programs or post-construction evaluation of workforce wellbeing. These initiatives may be considered by the appointed contractor but are not currently included within the benchmark assessment.	Proposed
First Nations Inclusion	Encourage meaningful participation of First Nations peoples through cultural capability and inclusive design practices.	The project does not currently include commitments relating to cultural capability training, a Reconciliation Action Plan or the application of Indigenous Design and Planning principles. These initiatives have not been adopted as part of the current sustainability strategy.	Not Targeted
Procurement and Workforce Inclusion	Improve social outcomes through inclusive procurement and employment opportunities.	A formal social procurement strategy and employment targets for disadvantaged or under-represented groups have not been identified within the current project documentation. Accordingly, this initiative is not currently targeted within the benchmark assessment.	Not Targeted
Design for Equity	Create an inclusive environment that provides equitable access and supports the	The project proposes to incorporate inclusive design principles beyond the minimum requirements of the National Construction Code, including equitable access, accessible	Proposed

	needs of a diverse range of users.	circulation, inclusive wayfinding and spaces that support residents, staff and visitors. Achievement of this Green Star credit is subject to confirmation that the development includes the eligible publicly accessible spaces required by the Green Star Buildings criteria, together with any additional accessibility measures identified during detailed design.	
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The proposed development demonstrates a commitment to inclusive and accessible design appropriate for a residential aged care facility through the adoption of equitable design principles. Broader initiatives relating to workforce wellbeing, First Nations inclusion and social procurement are not currently included within the project scope. As the design progresses, opportunities to enhance accessibility and confirm compliance with the Green Star Design for Equity requirements may be further explored during detailed design.

Refer to Appendix A for the detailed Green Star Buildings v1.1 Scorecard for further information.

The following are the key ESD initiatives proposed in this category:

- The head contractor must ensure the following is provided, or available, on-site:
 - Separate gender inclusive bathroom facilities
 - Diverse gender-specific fit-for-purpose PPE
- The head contractor must:
 - Policies to address issues of discrimination, racism, and bullying on-site;
 - On-site redress procedures for any relevant breaches
 - Diverse lead team to manage
 - Training to all contractors and sub-contractors
- The development must be design for -
 - Equal access to the building: Provide equitable, appealing, safe, and secure access in a manner that does not segregate or stigmatise users through all principal entrance points and main thoroughfares inside and outside the building
 - Diverse wayfinding: Introduce visual, physical, olfactory, and auditory solutions to help individuals navigate the site in a safe and enjoyable manner
 - Inclusive spaces: Introduce internal and external spaces for a diverse range of users, including parents, family restrooms, emergency rooms, quiet rooms, and social interaction rooms. These rooms must be accessible to all users
- The cafe and lobby on the ground level are a publicly accessible with bathroom facilities for staff and visitors. These facilities also service the café and other ground floor functions room
- The design will include a hearing augmentation system within the adjacent multi-purpose hall area (also on ground floor), compliance luminance contrast and wayfinding elements. Seating within the café will be accessible for wheelchair visitors and there will be accessible paths of travel for ease of access

3.7 Nature

The **Nature** category of Green Star Buildings v1.1 recognises initiatives that protect, restore and enhance biodiversity while encouraging developments to positively contribute to natural ecosystems. The category promotes ecological connectivity, nature-positive design, habitat restoration and transparent reporting of nature-related impacts.

The proposed development has been benchmarked against the relevant Green Star Buildings v1.1 Nature credits based on the information currently available. While the project incorporates landscaped areas appropriate for a residential aged care development, the enhanced biodiversity and nature-positive initiatives recognised under the Green Star Buildings Nature category are not currently included within the project's sustainability strategy.

The following table summarises the project's benchmark assessment against the Green Star Buildings v1.1 Nature category.

Table 12: Nature Category Benchmark Assessment

Green Star Credit	Sustainability Objective	Project Response	Status
Impacts to nature	Sensitive Sites and Species Protection, Metrics Disclosure & Managing Light Pollution Impacts.	The project team assesses the site to determine whether the project's site or adjacent sites, within 100m, has a risk of containing sensitive sites or sensitive species. Metrics related to land/freshwater-use change are disclosed. The project proposes disclosure of nature-related metrics in accordance with the Green Star Buildings Nature Metrics Disclosure requirements or the Taskforce on Nature-related Financial Disclosures (TNFD) framework. The project's light pollution is minimised.	Proposed
Biodiversity Enhancement	Increased Biodiversity and Biodiversity Management Plan	External landscape at a ratio of either 15% /30% of the site area or at a ratio of 1:500 of GFA, whichever is larger. Vertical or horizontal landscapes are acceptable. Greater than 60% /80% of plants must be indigenous and include 1 significant tree per 500m ² /250m ² landscape. A Biodiversity Management Plan must be developed.	Subject to Detailed Design
Nature Connectivity	Improve ecological connectivity by providing habitat and landscape features that support the movement of native species.	The current project documentation does not include dedicated biodiversity corridors, habitat connections or ecological infrastructure intended to improve species movement beyond the project boundary in accordance with the Green Star Buildings Nature Connectivity credit.	Not Targeted

Nature Stewardship	Support biodiversity conservation through ecological restoration or protection activities beyond the project boundary.	The project does not currently include commitments to undertake off-site ecological protection or habitat restoration activities as recognised by the Green Star Nature Stewardship credit.	Not Targeted
Waterway Protection	Meet pollution reduction targets and Manage stormwater volume.	Demonstrate an annual average flow reduction (ML/yr) of 30% compared to pre-development levels and meets specified pollution targets, Total Suspended Solids (TSS) - 85%, Gross Pollutants - 90%, Total Nitrogen (TN) - 45%, Total Phosphorus (TP) - 65%. Demonstrate an annual average flow reduction (ML/yr) of 30% compared to pre-development levels and meets above specified pollution targets.	Not Targeted

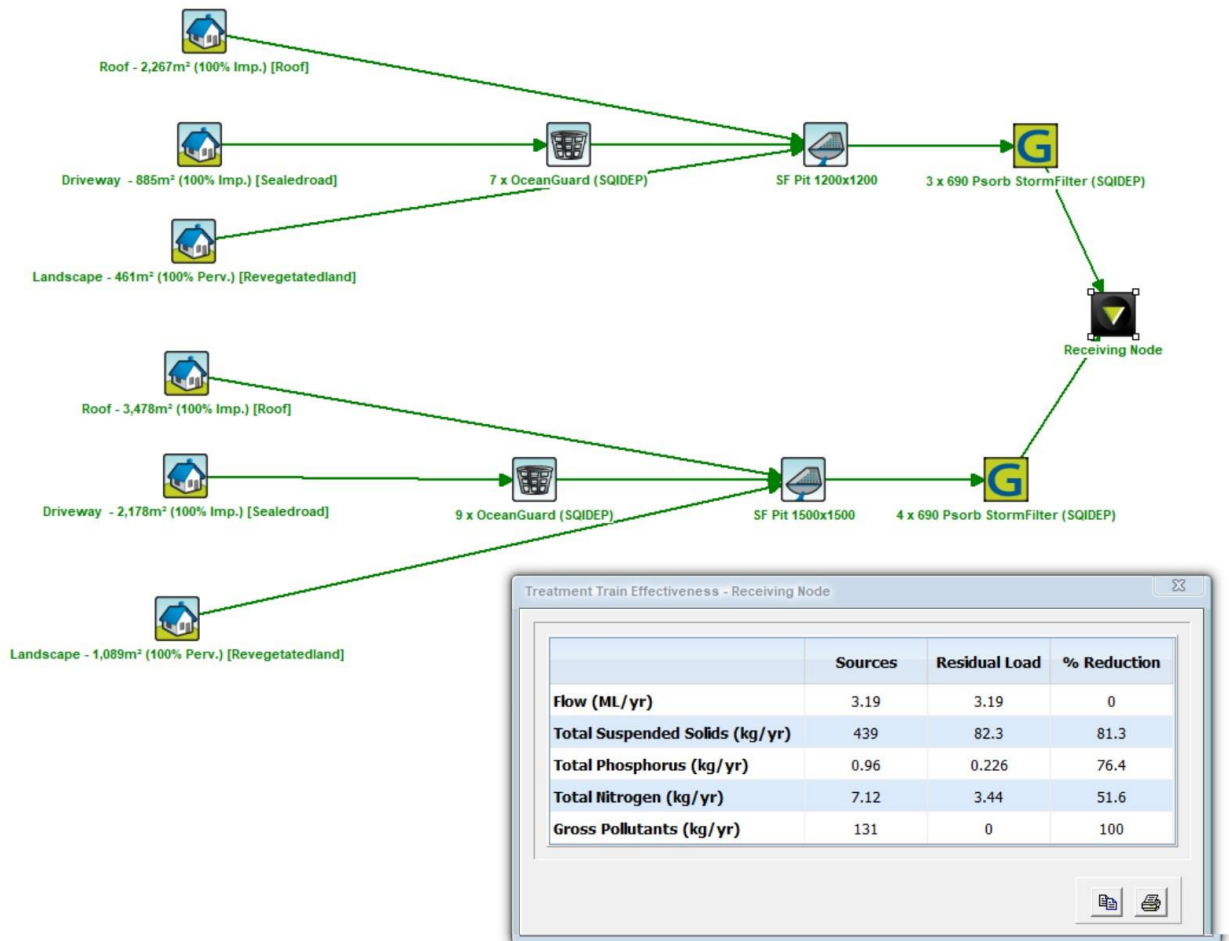
The current project documentation does not identify any targeted initiatives under the Green Star Buildings **Nature** category. While the development includes landscaping appropriate for a residential aged care facility, the project is not presently pursuing the enhanced biodiversity, ecological restoration, biophilic design or nature-related disclosure initiatives recognised by Green Star Buildings. Should the project sustainability objectives evolve during detailed design, opportunities to strengthen ecological outcomes may be considered.

Refer to Appendix A for the detailed Green Star Buildings v1.1 Scorecard for further information.

The following are the key ESD initiatives proposed in this category:

- As no risks of sensitive sites or sensitive species have been identified, this criterion is considered met
- The following metrics are disclosed as defined by the Taskforce for Nature Financial Disclosure (TNFD):
 - Total spatial footprint (km²)
 - Extent of land/freshwater ecosystem use change (km²)
 - Extent of land/freshwater ecosystem conserved or restored (km²)
 - Extent of land/freshwater ecosystem that is sustainably managed (km²)
- Light pollution minimised
- All external lighting on the project complies with all lighting parameters in both Table 3.2 and Table 3.3 from AS/NZS 4282:2023
- Direct illuminance from all external lighting on the project produces a maximum initial point illuminance value no greater than:
 - 0.5 Lux to the site boundary
 - 0.1 Lux to 4.5 metres beyond the site into the night sky, when modelled using a calculation plane set at the highest point of the building
- The development is compliant with this requirement, as the landscaped area constitutes 32% of the total site area

- The landscape consultant needs to confirm the plant selection
- The design must incorporate more than 60% indigenous plant species
- At least one significant tree per 500m² of landscaped area needs to be provided
- Site-specific Biodiversity Management Plan needs to be conducted by ecologist outlining actions to maintain the ecological integrated of biodiversity on the site after practical completion
- The landscape consultant needs to confirm the plant selection
- The design must incorporate more than 80% indigenous plant species
- At least one significant tree per 250m² of landscaped area needs to be provided
- MUSIC modelling has been completed for this credit. The assessment shows that the development can achieve the required stormwater pollutant reduction targets by installing a proprietary stormwater treatment system. A GPT has been provided within the southern carpark to meet the pollutant requirements for the site.



3.8 Leadership

The **Leadership** category of Green Star Buildings v1.1 recognises projects that demonstrate exemplary sustainability outcomes beyond the standard Green Star credit requirements. Leadership challenges reward initiatives that exceed industry best practice and showcase innovation, ambitious environmental performance and sector leadership.

The proposed development has been benchmarked against the relevant Green Star Buildings Leadership challenge based on the information currently available. At this stage, the project has not committed to pursuing the Leadership challenge, although opportunities to incorporate enhanced responsible product selection may be considered during detailed design.

The following table summarises the project's benchmark assessment against the Green Star Buildings v1.1 Leadership category.

Table 13: Leadership Category Benchmark Assessment

Green Star Credit	Sustainability Objective	Project Response	Status
Market Transformation	Recognise innovative design solutions or project approaches that demonstrate industry leadership beyond current best practice.	The current project documentation does not identify any innovative technology, process or design initiative proposed specifically to satisfy the Green Star Market Transformation credit. Accordingly, this initiative has not been included within the benchmark assessment.	Not Targeted
Leadership Challenge – Responsible Products (Finishes)	Demonstrate industry leadership through the specification of internal finishes with exemplary environmental performance.	The project has identified the Leadership Challenge for Responsible Products (Finishes) as an optional initiative. If pursued, at least 10% of internal finishes (by cost) would be required to achieve a Responsible Products Value (RPV) of 12 or greater , together with 60% of internal finishes achieving an RPV of 7 or greater . This would require the specification of independently certified products, such as GECA-certified plasterboard, flooring, paints, coatings, adhesives, fillers and sealants, or equivalent recognised third-party certification schemes. The feasibility of achieving these requirements will be confirmed during detailed design and product specification.	Proposed

The current project does not include initiatives targeting the Green Star **Market Transformation** credit. However, the **Leadership Challenge for Responsible Products (Finishes)** has been identified as a potential opportunity to further strengthen the project's sustainability outcomes through the specification of independently certified, low-impact building products. Whether this initiative is pursued will be confirmed during detailed design, taking into consideration product availability, specification requirements and overall project objectives.

Refer to Appendix A for the detailed Green Star Buildings v1.1 Scorecard for further information.

The following are the key ESD initiatives proposed in this category:

- 60% of internal finishes including plasterboard, flooring (carpets and floor coverings), paints and coatings, and adhesives, fillers, and sealants will need to be selected from products holding third-party certification within the below listed certification schemes.
 - Aluminium Stewardship Initiative (ASI)
 - Australasian Certification Authority for Reinforcing and Structural Steels (ACRS)
 - Australasian Furnishing Research and Development Institute (AFRDI)
 - Blue Angel
 - BRE Global
 - BSI Group
 - Carpet Institute of Australia
 - Chartered Institution of Building Services Engineers
 - Climate Active
 - Cradle to Cradle Products Innovation Institute
 - Eco Choice Aotearoa (ECA)
 - Environmental Product Declaration
 - EPD Australasia
 - Forest Stewardship Council (FSC)
 - GEV-Emicode
 - Global GreenTag International (GGT)
 - Good Environmental Choice Australia (GECA)
 - Greenguard Environmental Institute
 - International Organisation for Standardisation
 - Living Future
 - Plastics Industry Pipe Association of Australia (PIPA)
 - Product Carbon Footprint
 - Programme for the Endorsement of Forest Certification (PEFC)
 - Responsible Wood
 - Responsible Steel
 - Reused products or building components
 - Science Based Targets Initiative
 - Steel Sustainability Australia (SSA)
 - Sustainable Steel Council NZ
 - TCO Certified
 - Vinyl Council of Australia

4. CONCLUSION

This report presents a preliminary sustainability benchmark assessment for the proposed BUPA Aged Care, Morphettsville development against the principles and credits of Green Star Buildings v1.1. The assessment has been undertaken to identify sustainability opportunities that may be incorporated into the project and to benchmark the proposed development against a recognised industry sustainability framework. This assessment is provided as an informal benchmark only and does not constitute a Green Star Buildings certification submission.

The assessment indicates that the proposed development incorporates a range of sustainability initiatives across the Green Star Buildings categories, with particular strengths in responsible project delivery, healthy indoor environments, operational energy performance, building electrification, renewable electricity, reduced upfront embodied carbon and inclusive building design. These initiatives provide a strong foundation for improving the environmental performance and long-term operational efficiency of the development and promotes the development to achieve **informal Green Star Buildings v1.1 4 Star benchmark**.

Several Green Star Buildings initiatives, including enhanced climate resilience, circular economy strategies, biodiversity outcomes, social procurement and Leadership challenges, are not currently included within the project scope. These initiatives represent opportunities that may be considered during future design development should the client wish to pursue sustainability outcomes beyond the current project objectives.

Overall, the proposed development demonstrates a clear commitment to sustainable design principles that are appropriate for a contemporary residential aged care facility. Continued refinement of the design, product selection and building systems during the detailed design phase will provide further opportunities to enhance environmental performance, occupant wellbeing and long-term building resilience while remaining aligned with the project's functional, operational and budgetary requirements.

5. LIMITATIONS

This report has been prepared by **SUHO** for the exclusive use of the client in relation to the proposed **BUPA Aged Care, Morphetville** development. The assessment has been undertaken using the project information available at the time of preparation together with the preliminary **Green Star Buildings v1.1** scorecard and supporting design documentation provided by the project team.

This report provides an **informal benchmark assessment** against the intent of the Green Star Buildings v1.1 rating tool and is intended to identify sustainability opportunities and assist the design team during project development. It **does not constitute a Green Star Buildings certification assessment, pre-certification review or certification submission** to the Green Building Council of Australia (GBCA).

The findings and recommendations presented in this report are based on the documentation available at the time of assessment. As the project progresses through detailed design, procurement and construction, further information may become available that could influence the benchmark outcomes presented in this report.

Several initiatives identified within this assessment are noted as **Proposed** or **Subject to Detailed Design**. The implementation of these initiatives will depend on future design development, client approval, product selection, consultant coordination and construction-stage decisions. Accordingly, inclusion of these initiatives within this report should not be interpreted as confirmation that they will ultimately be incorporated into the completed development.

This report should be read in conjunction with the latest architectural, landscape, services and other relevant project documentation. SUHO accepts no responsibility for decisions made using this report where subsequent design changes have not been reviewed.

Appendix A – Green Star Buildings V1.1 Scorecard

Project Name	BUPA Morphetville
Date	3/08/2026
Created By	Punitha Subramani

Green Star Buildings v1.1

ME	Minimum Expectation - compulsory to enable certification
CA	Credit Achievement - beyond and in addition to ME
EP	Exceptional Performance - beyond and in addition to CA

15+ points =	4 Star
35+ points =	5 Star
70+ points =	6 Star



Category	Credit Name	Credit Number	Level	Sub Credits	Criteria	Available Points	Strategy Included	Architect	Mechanical	Electrical	Hydraulic	Fire	Façade	Structural	Civil	Waste	Environmental	Ecologist	Landscape & Irrigation	Acoustic	Owner	ICA	Traffic	Vertical	ESD	Operator	Builder	Achievability / Risk level			Credit achievement summary			
																												Low	Med	High				
RESPONSIBLE	Industry development	1	CA	Green Star Accredited Professional	Engage a Green Star Accredited Professional contractually engaged as part of the core project team for the duration of the project.	1	Y																						SUHO will manage the Green Star Accredited Professional (GSAP) role during the design phase of the project.					
				Financial Transparency	Disclosure project cost and marketing information to the GBCA.																											The project team will need to provide the GBCA with information on the costs associated with the project's sustainable design, construction, and documentation by completing the required financial disclosure template.		
				Marketing Excellence	The project's sustainability achievements are marketed publicly.																											The project team will need to promote and communicate the project's sustainability initiatives, achievements, and benefits.		
	Responsible construction	2	ME	Environmental Management System	Environmental Management System (EMS) in place to manage its environmental impacts on site.	-	Y																							Builder or head contractor to set up an environmental management system in place to manage its environmental impacts on site.				
				Environmental Management Plan	Environmental Management Plan (EMP) covering the scope of construction activities.																										Have an environmental management plan to cover the scope of construction activities.			
				Construction and Demolition Waste Diversion	Divert 80% of construction and demolition waste from landfill.																										Divert at least 80% of construction and demolition waste from landfill.			
				Sustainability Training	The head contractor provides training on the sustainability targets of the building.																										Provide training on the sustainability targets of the buildings.			
			CA	Increased construction and demolition waste diversion	Diverting at least 90% of its construction and demolition waste from landfill. Compliance with Waste Reporting Criteria.	1	N																								1	Not Targeted		
	Verification & Handover	3	ME	Building Information	The building is set up for optimum ongoing management due to its appropriate metering and monitoring systems.	-	Y	X	X	X	X	X	X																		Energy and water metering will need to be provided for all common uses, major uses, and major sources.			
				Commissioning and Tuning	The building has set environmental performance targets, designed and tested for airtightness, been commissioned, and will be tuned.																											Commissioning and tuning will need to be performed prior to construction, during construction, practical completion and after practical completion.		
				Building Information	The project team create and deliver operations and maintenance information to the facilities management team at the time of handover. Information is available to building users on how to best use the building.																											The project team must provide operations and maintenance information for all nominated building systems, building log book and building user information to the building owner and facilities management team.		
			CA	Independent Commissioning Agent	An independent level of verification is provided to the commissioning and tuning activities through the involvement of an independent commissioning agent. (or)	1	N																									1	Not Targeted. The builder would need to appoint an ICA to oversee the commissioning of the building.	
				Soft landings Approach	Through a soft landings approach that involves the future facilities management team. Soft landings required for larger projects.																											Not Targeted		
	Responsible resource management	4	ME	Collection of Waste Streams	The project is designed for the collection of separate waste and resource streams.	-	Y																									– Waste separation area are to be provided that allow for separation of general waste, recycling, food and organics (FOGO). – The chute intakes, bins or storage containers need to be provided ensuring the applicable waste streams are collected separately as close to its point of generation as possible. The chute intakes, bins or storage containers must be labelled and easily accessible.		
				Dedicated Waste Storage Area	The building provides a dedicated and adequately sized waste and resource storage area.			X																									– The storage area must be sized to accommodate all bins or containers, for all applicable waste streams, for at least one collection cycle. – The calculations used to demonstrate that the area provided is adequately sized to handle the recyclable waste streams specified must be based on advice from an appropriately qualified waste consultant.	
				Safe and Efficient Access to Waste Storage	Ensuring easy and safe access to waste storage areas for both occupants and waste collection contractors.																												A sign-off from the waste contractor on the designs is required confirming they are adequately sized and located for the safe and convenient storage and collection of the waste streams identified.	
	Responsible procurement	5	CA	Risk and Opportunity Assessment	Procurement process must follow ISO 20400 Guidelines and the project must demonstrate active efforts to address at least one identified risk and opportunity in its supply chain.	1	N																									1	Not Targeted	
				Responsible Procurement Plan	A responsible procurement plan is developed to mitigate risks and implement opportunities identified in the assessment.																													
	Responsible structure	6	CA	Good Practice Products	50% of all structural components by cost must meet the Responsible Products Value (RPV) of at least 10. The structure is defined as load bearing and stability components of a building, including steel, timber, concrete load bearing elements.	2	N	X							X																	2	Not Targeted	
			EP	Best Practice Products	10% of all products in the structure by cost each have a RPV of at least 15. (or)	2	N	X																									2	Not Targeted
				Good Practice Products	80% of all products in the structure by cost have a RPV of at least 10 .			X																										

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35+ points =	5 Star
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Category	Credit Name	Credit Number	Level	Sub Credits	Criteria	Available Points	Strategy Included	Architect	Mechanical	Electrical	Hydraulic	Fire	Façade	Structural	Civil	Waste	Environmental	Ecologist	Landscape & Irrigation	Acoustic	Owner	ICA	Traffic	Vertical	ESD	Operator	Builder	Achievability / Risk level			Credit achievement summary
	Responsible envelope	7	CA	Good Practice Products	30% of all components in the building envelope by cost must meet the Responsible Products Value (RPV) of 10. The envelope is defined as the elements that surround a building such as the façade, and all façade components such as external shading and insulation, suspended slabs, as well as roofing systems.	2	N	X					X	X							X						X			2	Not Targeted
			EP	Best Practice Products	10% of all products in the envelope by cost each have a RPV of at least 15. (or)	2	N	X					X	X							X						X			2	Not Targeted
				Good Practice Products	60% of all products in the envelope by cost have a RPV of at least 10 .								X	X																	
	Responsible systems	8	CA	Good Practice Products	20% of all mechanical, hydraulic, transportation, and electrical systems by cost meet the Responsible Products Value (RPV) of 6. Active building systems are characterised by energy and movement, and include all mechanical, hydraulic, transportation and electrical systems present in the building. Passive systems such as a façade shading device are not included.	1	N		X	X	X												X			X			1	Not Targeted	
			EP	Best Practice Products	5% of all products in the systems by cost each have a RPV of at least 11. (or)	1	N		X	X	X											X			X			1	Not Targeted		
				Good Practice Products	35% of all systems by cost have a RPV of at least 6.																										
	Responsible finishes	9	CA	Good Practice Products	40% of all internal building finishes by cost must meet the Responsible Products Value (RPV) of 7. Internal finishes include flooring, plasterboard, paints, ceilings, partitions, doors, internal windows or similar. Where a component faces two spaces (e.g. a door), it is counted once for each space. Joinery used as part of a wall finish may be counted, e.g. wall-mounted lockers. Loose furniture is not included.	1	Y	X													X					X			1	~ All plasterboard will need to be specified to be GECA Panel Board ~ All flooring (carpets and resilient) will need to be specified from GECA Carpets and Floor Coverings ~ All paints and coatings will need to be specified from GECA Paints and Coatings or Green Rate Level B+ ~ All Adhesives, fillers and sealants will need to be specified from GECA Adhesives, Fillers and Sealants or Green Rate Level B+ 40% (or 60% if Leadership is pursued) of internal finishesincluding plasterboard, flooring (carpets and floor coverings), paints and coatings, and adhesives, fillers, and sealants will need to be selected from products holding third-party certification within the below listed certification schemes. Aluminium Stewardship Initiative (ASI) Australasian Certification Authority for Reinforcing and Structural Steels (ACRS) Australasian Furnishing Research and Development Institute (AFRDI) Blue Angel BRE Global BSI Group Carpet Institute of Australia Chartered Institution of Building Services Engineers Climate Active Cradle to Cradle Products Innovation Institute Eco Choice Aotearoa (ECA) Environmental Product Declaration EPD Australasia Forest Stewardship Council (FSC) GEV-Emicode Global GreenTag International (GGTI) Good Environmental Choice Australia (GECA) Greenguard Environmental Institute International Organisation for Standardisation Living Future Plastics Industry Pipe Association of Australia (PIPA) Product Carbon Footprint Programme for the Endorsement of Forest Certification (PEFC) Responsible Wood ResponsibleSteel Reused products or building components Science Based Targets Initiative Steel Sustainability Australia (SSA) Sustainable Steel Council NZ TCO Certified Vinyl Council of Australia	
			EP	Best Practice Products	10% of all internal building finishes by cost have a RPV of at least 12. (or)	1	N	X														X					X			1	Not Targeted
				Good Practice Products	60% of all internal building finishes by cost have a RPV of at least 7.																										
	Impacts Disclosure	10	CA	Life Cycle Impacts Disclosure (or)	Life cycle impacts from a whole-of-building, whole-of-life (cradle to grave) Life Cycle Assessment (LCA) are included in the assessment and reported individually in the Impacts Disclosure Template. (or)	1	N	X																X		X	1		Not Targeted		
Pollution and Resource Use Metrics Disclosure				Metrics related to pollution and resource use defined by the Taskforce for Nature Financial Disclosure (TNFD) are disclosed to the GBCA by completing the Impacts Disclosure Template.																											
			ME	Ventilation System Attributes	The building's ventilation system must meet minimum separation distances between pollution sources and outdoor air intakes in 95% of the regularly occupied areas.	-	Y	X																						The minimum separation distances between pollution sources and outdoor air intakes must be followed as per either Table 5-1 in ASHRAE Standard 62.1:2022 – Ventilation for Acceptable Indoor Air Quality or Table 2.1 in AS 1668.2:2024.	
				Provision of Outdoor Air	Outdoor air is provided at a rate 50% greater than the minimum required by AS 1668.2:201, (or) CO2 concentrations are maintained below 800ppm.																							Required	– Outside air to regularly occupied areas will need to be 50% increased on AS1668.2.2012 (or) – The development must maintain CO₂ levels to <700PPM		

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						105	15																													
Category	Credit Name	Credit Number	Level	Sub Credits	Criteria	Available Points	Strategy Included	Architect	Mechanical	Electrical	Hydraulic	Fire	Façade	Structural	Civil	Waste	Environmental	Ecologist	Landscape & Irrigation	Acoustic	Owner	ICA	Traffic	Vertical	ESD	Operator	Builder	Achievability / Risk level			Credit achievement summary					
HEALTHY	Clean air	11		Exhaust or Elimination of Pollutants	Pollutants are exhausted directly to the outside of the project.																										Sources of pollutants include printing and photocopying equipment, cooking processes and equipment and vehicles. Pollutants must be exhausted directly to the outside of the project in accordance with AS 1668.2:2024, AS 1668.4:2024 and/or physically separated from occupants.					
			CA	Ventilation System Attributes	The building's ventilation system has adequate access to both sides of all moisture and debris-catching components for maintenance within the air distribution system. (and)	2	N	X																					2	Not targeted. As the measures to satisfy this credit requirement is onerous, this credit is not targeted.						
				Provision of Outdoor Air	Outdoor air is provided at a rate 100% greater than the minimum required by AS 1668.2:2012, (or) CO2 concentrations are maintained below 700ppm																				Not targeted. As the measures to satisfy this credit requirement is onerous, this credit is not targeted.											
	Light quality	12	ME	Lighting Comfort	Lighting within the building meets minimum comfort requirements.	-	Y	X	X																	X		X	Required			Lighting within the building must meet the following requirements: – All LED lighting installed across the whole project has no observable effect as per the standard IEEE 1789-2015 - IEEE Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers – Light sources must have a minimum Colour Rendering Index (CRI) 85 or higher, in all internal and external applications – All light sources must have a MacAdam Ellipse or a Standard Deviation Colour Matching (SDCM) of 3 or lower. Note: Higher quality lighting must be used to achieve CRI 85+ and less than 3 Macadam's steps (colour difference perception).				
				Glare from Light Sources	Good lighting levels suitable for the typical tasks in each space are available.																											Glare from light sources must be limited within the regularly occupied areas. For LED luminaires the Unified Glare Rating (UGR), as estimated from the manufacturers data sheets for a standard room, must not exceed the maximum values listed in Table 8.2 of AS/NZS 1680.1:2006.				
				Daylight Strategy	The building aims to maximise access to daylight.																											Daylight modelling has been undertaken to establish the daylight strategy.				
			CA	Daylight	For non-residential buildings, at least 40% of the principle averaged across the building must receive high levels of daylight with no less than 20% on any floor or tenancy (whichever is smaller). (or)	2	N	X																	X					1	Not Targeted					
				Artificial lighting	The artificial lighting in the task areas including kitchen and study areas and other regularly occupied areas provides high quality light exposure that supports task visibility, visual comfort and well-being.																									1	Not Targeted					
			EP	Daylight	Achieves both Credit achievements for credit 12.	2	N	X																			X				2	Not Targeted				
				Artificial lighting																																
	Acoustic Comfort	13	ME	Acoustic Comfort Strategy	An Acoustic Comfort Strategy is prepared to describe how the building and acoustic design aims to deliver acoustic comfort to the building occupants.	-	Y	X	X												X									Required	An Acoustic Comfort Strategy must be prepared describing how the building design will deliver acoustic comfort to the building occupants. The following requirements are to be addressed: – Quiet enjoyment of space – Functional use of space – Control of intrusive or high levels of noise – Privacy – Noise transfer – Speech intelligibility					
			CA	Acoustic Performance	The project achieves best practice performance for maximum internal noise levels, acoustic separation and impact noise transfer through floors. Noise levels in bedroom or sleeping spaces do not exceed recommended Sleep Disturbance criteria as defined in the NSW Road Noise Policy 2011.	2	N	X	X												X									2	Not Targeted					
	Exposure to toxins	14	ME	Paints, Adhesives, Sealants, and Carpets	The building's paints adhesives, sealants, carpets, and engineered wood products are low or non-toxic.	-	Y	X																							Required	At least 95% of internally applied paints, adhesives, sealants (by volume) and carpets (by area) must meet stipulated 'Total Volatile Organic Compounds (TVOC) Limits'.				
				Engineered Wood Products	The building's engineered wood products are low in toxins or non-toxic.																									All engineered wood products meet specified formaldehyde emission limits for at least 95% (by area).						
				Banned or Highly Toxic Materials	Occupants are not exposed to banned or highly toxic materials in the building.																									As there are no existing buildings on the site, the Banned or Highly Toxic Materials criterion is exempt.						
			CA	VOC and Formaldehyde Levels	Onsite test meeting following limits: TVOC = 0.27ppm; Formaldehyde = 0.02ppm. 3 test locations, 3 per floor	2	option	X																					X	2	A post completion test of 3 areas must be undertaken to verify that the TVOC and formaldehyde levels are within the concentration limits stipulated (TVOC - <0.27ppm, Formaldehyde- <0.02ppm)					

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Category	Credit Name	Credit Number	Level	Sub Credits	Criteria	105	15	Architect	Mechanical	Electrical	Hydraulic	Fire	Façade	Structural	Civil	Waste	Environmental	Ecologist	Landscape & Irrigation	Acoustic	Owner	ICA	Traffic	Vertical	ESD	Operator	Builder	Achievability / Risk level			Credit achievement summary
						Available Points	Strategy Included																								
	Amenity and comfort	15	CA	Comfortable amenity rooms	Provide either a 15m ² meditation room or 25m ² of exercise room with an additional 5m ² per 200 occupants above 200 to promote inclusivity, mindfulness or exercise.	2	N	X																			X		2		Not Targeted
	Connection to nature	16	CA	Views	At least 60% of the nominated area has a clear line of sight to a high quality internal or external view. (and)	1	Y	X											X								X		1		The development design achieves 60% external views compliance.
				Plants	The total planted area is equivalent to 5% of the building's regular occupied area utilised for connection to nature including vertical or horizontal planted areas outdoors that are physically accessible by building occupants. (or)																									– The current design provides a total planted area exceeding 5% of the building's regular occupied area to support connection with nature. – An ongoing maintenance plan must be established to ensure plant health is maintained.	
				Nature-inspired design	The building's design incorporates at least five biophilic design strategies.																										Not Targeted
			EP	Plants	5% of the site area utilised for connection to nature including vertical or horizontal planted areas outdoors that are physically accessible by building occupants. (and)	1	N	X											X							X				1	Not Targeted
				Nature-inspired design	The building's design incorporates at least five biophilic design strategies.																										
RESILIENT	Climate resilience	17	ME	Climate Change Pre-screening Checklist	The project team completes the climate change pre-screening checklist. The project team communicates the building's exposure to climate change risks to the applicant.	-	Y	X	X	X	X			X											X			Required			The climate change pre-screening checklist will need to be completed, and the building's exposure to climate change risks will need to be communicated to the occupier during design stage.
			CA	Climate Change Risk and Adaptation Assessment	Comprehensive project-specific climate change risk and adaptation assessment must be developed for the project. (and)	1	N	X	X	X	X			X											X					1	Not Targeted
				Managing Risks	Extreme and high risks are addressed.																										
	Operations resilience	18	CA	Operations Resilience Assessment	The project team undertakes a comprehensive review of the acute shocks and chronic stresses likely to influence future building operations.	2	N			X															X	X				2	Not Targeted
				Managing Risks	The building's design and future operational plan addresses any high or extreme system-level interdependency risks.																										
				Power Loss for Shelter in Place	The building's design maintains a level of survivability and design purpose in a blackout.																										
	Community Resilience	19	CA	Community Resilience Plan	The project team undertakes a needs analysis of the community, identifies shocks and stresses that impact the building's ability to service the community, and develops responses to manage these. Read credit achievement and guidance section for this credit in Green Star Buildings Submission Guidelines	1	N	X											X				X		X			1	Not Targeted		
	Heat Resilience	20	CA	Heat Island Reduction	At least 75% of the whole site area comprises of one or a combination of strategies that reduce the heat island effect.	1	N	X											X											1	Not Targeted. – For the UHIE calculation, areas allocated for solar PV and solar hot water systems on the site may be excluded from both the site area and roof area. – For a 99 kW solar PV system, the approximate roof area required is about 250 m ² . – To achieve this credit, both the roof (SRI 82) and driveway (SRI 35) would need to incorporate a lighter finish. However, as a moderately darker roof finish (Jasper) is preferred for occupant visual comfort, this credit is not achievable.
	Grid Resilience	21	CA	Demand response	The development has the capacity to reduce its electricity peak demand by 10% of the building's annual peak electricity demand for at least a one-hour period. The peak demand reduction will occur through renewable on-site generation on site. The building management system (BMS) must include a demand management dashboard that shows the peak demand target, current, historical demand, alongside the critical performance characteristics. The BMS must also have the capacity to accept external control signals to enable signing up to current or future demand response programs. The active demand management strategies must also be tested and commissioned prior to occupancy, assuming a full load profile on a peak day. (or)	2	N		X	X										X							X			2	Not Targeted. The regularly occupied areas are more than 3,000m ² , therefore passive design solutions pathway is not applicable.
				Passive design solutions	The facade demonstrates a 10% improvement over a reference building.																										
			ME	All-electric Building Services	The building is all-electric and has no infrastructure for fossil fuels for hot water, space heating and cooking.	-	Y	X	X	X	X		X							X					X	X	X	Required		– All energy supplied to the development will be electric – No gas connections for DHW or HHW supplies	

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			CA	Low Initial Charge	The Total System Direct Environmental Impact (TSDEI) of the refrigerant systems in the building are below 20. (and)	1	N	X	X																X	X			1	Not Targeted		
				Compensation for Refrigerant Emissions	All emissions from the initial refrigerant charge are offset.																											
			EP	Low GWP Limits	All new refrigeration equipment uses refrigerants with a GWP below the high performance limits. (or)	2	N	X	X																	X	X			2	Not Targeted	
				Low Initial Charge	The Total System Direct Environmental Impact (TSDEI) of the refrigerant systems in the building are below 10.																											
	Low-emissions transport	27	CA	Electric Vehicle Charging	The building has facilities to support the use of electric vehicles.	1	Y	X		X														X		X	X		1	The EV parking requirement for the development are as follows: – Ready to charge EV charging points with a capacity of 7 kW (32 A) to at least 15% of all car parking spaces, in total 11 carparks. – Electrical infrastructure and a load management plan must be prepared to allow for future installation of additional 5% (4) carparks with charging equipment with a minimum capacity of 7 kW v 22 kW. – A dedicated, safe, unobstructed route from the electrical supply point which allows for the future provision of all necessary electrical cabling without the need for substantial builders work in connection to the electrical cabling installation.		
	Design for circularity	28	CA	Circular Design Strategies	Prior to construction, a feasibility study of circular design strategies is completed including strategies like dematerialisation, reuse and adaptive reuse and product-as-a-service, design for disassembly, lifespan flexibility and modularity. One end-of-use strategy must be identified and one resource efficiency strategy that is not business as usual practice to be integrated into the design. As well as setting measurable targets for the identified strategies. (or)	2	N	X						X	X						X				X		X		2	Not Targeted		
				Circularity Measurement	The circularity of the three most significant materials (by mass, cost, or volume) within three building layers selected from Structure, Envelope, Finishes, or Systems needs to be assessed.																											
			EP	Circularity Improvement	The building is at least 10% circular.	1	N	X							X	X							X			X	X		1	Not Targeted		
	Water use	29	ME	Sanitary Fixture and Appliance Efficiency	All fixtures and water-using appliances installed have a minimum WELS ratings. (or)	-	Y	X			X											X				X		Required		All fixtures and water-using appliances installed must, at a minimum, meet the following WELS ratings: – Taps (hand wash basins), Urinals and Dishwashers - 5 star – Taps (kitchen and laundry sink), Toilets and washing machines - 4 star – Showers - 3 star (<=7.5l/min)		
				Reducing water use	15% reduction in potable water usage when compared to a reference building.																											
			CA	Reducing water use	25%/35%/45% reduction in potable water usage when compared to a reference building. (and)	3	N	X			X												X				X		3	Not Targeted		
				Recycled water infrastructure	The building has infrastructure installed for recycled water if located in the recycled water infrastructure zone.																											
			EP	Reducing water use	55%/65%/75% reduction in potable water usage when compared to a reference building	3	N	X			X													X				X		3	Not Targeted	
	Movement and Place	30	ME	Changing Facilities	The building includes showers and changing facilities for building occupants. (and)	-	Y	X																		X	Required		– Staff occupancy <200 = 4 showers needs to be provided. For staff occupancy >200 = additional 1 per 200 occupants above 200 staff. – One locker must be provided for every eight staff. The lockers must be secure and located in the changing rooms.			
				Safe Ingress	The changing facilities are accessible, inclusive and located in a safe and protected space.																									– Access to the facilities must be well lit between entryway to bike parking. – All regular building occupants or staff must have easy access to lockers, showers, and building entry. – Occupants must be able to find the facilities through clear signage throughout the building and access points.		
			CA	Sustainable Transport	A Sustainable Transport Plan has been prepared and implemented.	2	N	X		X														X			X		2	Not targeted		

Project Name	BUPA Morphetville
Date	3/08/2026
Created By	Punitha Subramani

Green Star Buildings v1.1

ME	Minimum Expectation - compulsory to enable certification
CA	Credit Achievement - beyond and in addition to ME
EP	Exceptional Performance - beyond and in addition to CA

15+ points =	4 Star
35+ points =	5 Star
70+ points =	6 Star



						105	15	Architect	Mechanical	Electrical	Hydraulic	Fire	Façade	Structural	Civil	Waste	Environmental	Ecologist	Landscape & Irrigation	Acoustic	Owner	ICA	Traffic	Vertical	ESD	Operator	Builder	Achievability / Risk level			Credit achievement summary
Category	Credit Name	Credit Number	Level	Sub Credits	Criteria	Available Points	Strategy Included																								
PLACES				Active Transport Facilities	– The building’s access prioritises cycling and includes bicycle parking facilities. – The building has EV charging capabilities. – Transport options that reduce the need for private fossil fuel powered vehicles are prioritised.																										
		Encouraging Walkability		The building’s design and location encourage walking																											
	Enjoyable places	31	CA	Publicly Accessible Spaces	The building delivers memorable, beautiful, vibrant communal and public accessible places where people want to gather and participate in the community. The spaces are inclusive, safe, flexible and enjoyable. 0.25 m²/ occupant or 2.5% of GFA, whichever is greater shall be dedicated for this purpose.	2	Y	X												X							X		2		The ground floor café will be publicly accessible and designed to serve as a key area for social interaction and community engagement within the development.
				Activation Strategy	An activation strategy has been developed to ensure placemaking continues after practical completion.																										
	Contribution to place	32	CA	Contribution to Urban Context	The building’s design contributes to the liveability of the wider urban context and enhances the public realm demonstrated by an urban context analysis or independent design review.	2	N	X													X						X		2		Not targeted
	Culture, Heritage and Identity	33	CA	Local Identity	The building’s design reflects and celebrates local demographics and identities, the history of the place, and any hidden or minority entities. This celebration was arrived through meaningful engagement with community groups early in the design process.	1	N	X													X					X	X		1		Not targeted
PEOPLE	Inclusive Construction Practices	34	ME	Facilities and Equipment	During the building’s construction, the head contractor provides gender inclusive facilities and protective equipment.	-	Y																				X	Required			The head contractor must ensure the following is provided, or available, on-site: – Separate gender inclusive bathroom facilities – Diverse gender-specific fit-for-purpose PPE
				Policies, and Training	The head contractor also installs policies on-site to increase awareness and reduces instances of discrimination, racism, and bullying.																								The head contractor must: – Policies to address issues of discrimination, racism, and bullying on-site; – On-site redress procedures for any relevant breaches – Diverse lead team to manage – Training to all contractors and sub-contractors		
			CA	Physical and Mental Health Programs	Promote positive mental and physical health outcomes of the site activities and culture of site workers, through programs and solutions on site that address at least 5 areas.	1	N																		X	1			Not targeted		
				Program Evaluation	An evaluation report of the programs must be in place including information on the programs or initiatives, feedback and recommendations.																										
	First Nations Inclusion	35	CA	Cultural Capability	Cultural competency training is undertaken by First Nations Peoples and/or an accredited training provider for the design and construction stage of the project. (and)	2	N	X												X									2		Not targeted
				Reconciliation Action Plan	Playing an active role in the organisational Reconciliation Action Plan. (or)																										
				Inclusion of First Nations Design	Incorporating design elements using the Indigenous Design and Planning principle.																										
	Procurement and Workforce Inclusion	36	CA	Procurement of goods and services	The project team must develop and implement a social procurement strategy or plan (this can be part of an overall project procurement plan/strategy).	2	N													X							X		2		Not targeted
				Employment Opportunities	At least 1%/2% of the building’s total contract value to generate employment opportunities for disadvantaged and under-represented groups.																										
			EP	Employment Opportunities	At least 4% of the building’s total contract value to generate employment opportunities for disadvantaged and under-represented groups.	1	N														X			X	X		1		Not Targeted		

Project Name	BUPA Morphetville
Date	3/08/2026
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Green Star Buildings v1.1

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						105	15																									
Category	Credit Name	Credit Number	Level	Sub Credits	Criteria	Available Points	Strategy Included	Architect	Mechanical	Electrical	Hydraulic	Fire	Facade	Structural	Civil	Waste	Environmental	Ecologist	Landscape & Irrigation	Acoustic	Owner	ICA	Traffic	Vertical	ESD	Operator	Builder	Achievability / Risk level			Credit achievement summary	
	Nature Stewardship	41	CA	Protection and Restoration Activities	The building owner undertakes activities to protect and/or restore ecosystems outside the site boundary. The area of restoration or protection is at least 50% of the total GFA of the building or at least 50% of the area within the project boundary, whichever is greater.	1	N	X										X							X					1	Not Targeted	
			EP	Increased Protection and Restoration Activities	The area of restoration or protection is equivalent to the total GFA of the building or the area within the project boundary, whichever is greater.	1	N	X											X						X					1	Not Targeted	
	Waterway Protection	42	CA	Pollution Reduction Targets	Demonstrate an annual average flow reduction (ML/yr) of 30% compared to pre-development levels and meets specified pollution targets, • Total Suspended Solids (TSS) - 85% • Gross Pollutants - 90% • Total Nitrogen (TN) - 45% • Total Phosphorus (TP) - 65%	2	N																		X				2	MUSIC modelling has been completed for this credit. The assessment shows that the development can achieve the required stormwater pollutant reduction targets by installing a proprietary stormwater treatment systems. A GPT has been provided within the southern carpark to meet the pollutant requirements for the site.		
				Stormwater Volume Management	Demonstrate an annual average flow reduction (ML/yr) of 30% compared to pre-development levels and meets above specified pollution targets.																											
LEADERSHIP	Market Transformation	43	CA	Market Transformation	The project demonstrates: How a building solution or process is considered leading in their targeted sector, nationally or globally; or That the technology or process is not commonly used within Australia’s building industry; or globally, depending on the context of the innovation claimed.	4	N																						4	Not Targeted		
	Leadership Challenges	44	CA	Responsible Products - Finishes	The building has both Best Practice Products and a high amount of Good Practice Products for finishes. – 10% of all internal building finishes by cost have a RPV of at least 12 & – 60% of all internal building finishes by cost have a RPV of at least 7.	1	Y	X													X								1	– All plasterboard will need to be specified to be GECA Panel Board – All flooring (carpets and resilient) will need to be specified from GECA Carpets and Floor Coverings – All paints and coatings will need to be specified from GECA Paints and Coatings or Green Rate Level B+ – All Adhesives, fillers and sealants will need to be specified from GECA Adhesives, Fillers and Sealants or Green Rate Level B+ 40% (or 60% if Leadership is pursued) of internal finishesincluding plasterboard, flooring (carpets and floor coverings), paints and coatings, and adhesives, fillers, and sealants will need to be selected from products holding third-party certification within the below listed certification schemes. Aluminium Stewardship Initiative (ASI) Australasian Certification Authority for Reinforcing and Structural Steels (ACRS) Australasian Furnishing Research and Development Institute (AFRDI) Blue Angel BRE Global BSI Group Carpet Institute of Australia Chartered Institution of Building Services Engineers Climate Active Cradle to Cradle Products Innovation Institute Eco Choice Aotearoa (ECA) Environmental Product Declaration EPD Australasia Forest Stewardship Council (FSC) GEV-Emicode Global GreenTag International (GGTI) Good Environmental Choice Australia (GECA) Greenguard Environmental Institute International Organisation for Standardisation Living Future Plastics Industry Pipe Association of Australia (PIPA) Product Carbon Footprint Programme for the Endorsement of Forest Certification (PEFC) Responsible Wood ResponsibleSteel Reused products or building components Science Based Targets Initiative Steel Sustainability Australia (SSA) Sustainable Steel Council NZ TCO Certified Vinyl Council of Australia		
Total Points Available																										17	22	66				
105																																

Appendix B – NCC 2022 Section J J1V3 Report



13/5/2026

BUPA Morphettville

**29-31 Austral Terrace, Morphettville SA
5043**

NCC Section J Energy Efficiency – J1V3 Assessment Report | Part J4 – J5 Compliance

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[TABLE A] – Document Control

Project:	BUPA Morphettville	SUHO ref: SH366285
Project Address	29-31 Austral Terrace, Morphettville SA 5043	
Building Class	9c (primary)	
NCC Version	Code of Australia 2022, Volume 1 (Amendment 2)	
Council	Marion	
Report commissioned by	Capital Project Control Pty Ltd	
Client reference	BUPA Morphettville	

Date:	Version:	Prepared by:	Checked by:	Drawing no:
13/5/2026	1	Punitha Subramani	-	25-1070(DA01-DA14) (Rev B)
24/6/2026	2	Punitha Subramani	-	25-1070(DA01-DA14) (Rev B)

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1. ACTION SUMMARY

All actions/items mentioned in '1. Action Summary' must be met to comply with the Performance Requirements of Section J (JP1 - Energy Use).

Specification Upgrades

The following performance upgrades must be made to the supplied building specification in order to achieve compliance:

1. J5 All envelope doors and openable windows or the like must be sealed.
2. J5 All doors or openable windows in climate zones 4, 5, 6, 7, and 8 must be sealed in accordance J5D5 (3).
3. J5 All entrance to the building to a conditioned space of greater than 50m², must have an airlock, self-closing door, rapid roller door, revolving door or the like.
4. J5 Exhaust fans in conditioned spaces or habitable rooms (in climate zones 4 - 8) must be fitted with a sealing device such as a self closing damper or the like.
5. J5 Ceilings, walls and floors to be enclosed by internal (close fitting) lining systems or constructed at junctions and penetrations to minimise air leakage in accordance with requirements of J5D7 (2)(a).
6. J5 Openings in ceilings, walls and floors are to be constructed to minimise air leakage at junctions and penetrations in accordance with J5D7 (2)(b)

Additional Compliance Requirements

Insufficient information was provided to verify the following items. These must be adopted in order to achieve compliance:

1. J4D3 All insulation should be both tested and labelled in accordance with in accordance with AS4859.1 and installed to the requirement of J4D3 (1) and (3).
2. J4D3 All reflective insulation must be installed in accordance with the requirements of J4D3 (2) for compliance

Thermal Comfort Requirements

A prescribed thermal comfort level must be achieved to the building's occupied zones during its hour of operation. Appendix TCA of this report includes the thermal comfort assessment details and results.

For Relevant BCA Clauses

For the full statement of specific BCA clauses refer to the NCC Volume One online version located at <https://www.abcb.gov.au/ncc-online/NCC>.



2. COMPLIANCE REPORT

2.1 INTRODUCTION

SUHO was engaged by Capital Project Control Pty Ltd to assess the proposed BUPA Morphetville building for compliance with Section J - Energy Efficiency of the National Construction Code (NCC) 2022, Volume 1 (Amendment 2).

The building is located at 29-31 Austral Terrace, Morphetville SA 5043 (NCC Climate Zone 5) and has been classified as a Class 9c Building.

There are minor amendments listed in NCC Volume 1, Schedule 1 – State & Territory appendices, that apply specifically to the Section J requirements for this building; J1.3 (SA Variation)

2.2 COMPLIANCE SUMMARY

The Performance Requirement J1P1 must be satisfied by complying with J2D2 under Application of Section J.

J1P1

This report shows compliance using a Performance Solution. It uses a combination of 'Assessments Methods' including:

1. Verification Method J1V3, facilitated for parts J4 and
2. A 'Deemed-to-Satisfy' (DTS) comparison for Parts J5 – J9 (as applicable).

Building Fabric

For a Class 9c (primary) Building, thermal performance and the necessary level of human comfort required of the building fabric, is covered by NCC Volume 1, Parts J4 (Building Fabric), and J5 (Building Sealing), in accordance with Part J2 Energy Efficiency, J2D2(1).

Building Services

Additionally, the operational energy efficiency of the building services is covered by J6 (Air-conditioning and ventilation services), J7 (Artificial lighting and power), J8 (Heated water supply and swimming pool and spa pool plant) and J9 (Facilities for energy monitoring), also in accordance with J2D2(1) – (4).

However, the following building services as required by Section J, are to be assessed by another consultant.

- > J6 – Air-conditioning and ventilation services
- > J7 – Artificial Lighting and power
- > J8 – Heated water supply and swimming pool and spa pool plant
- > J9 – Energy monitoring and on-site distributed energy resources

A full list of actions and items requiring further detail to achieve compliance with the Performance requirements is provided in part '1. Action Summary' on page 1 of this report.

Notes:



1. The verification process does not assess all items required by Section J in calculating the GHG theoretical estimate for the building. All DTS requirements, including those required by Part J1, have been satisfied or otherwise documented, except where review of that part has been completed by others.
2. The content of this report stipulates the minimum requirements to achieve compliance with the NCC 2022 Section J Energy Efficiency. It should not be interpreted as sustainable advice.

Greenhouse Gas Emissions

The thermal performance of this building is quantified as the energy consumed by the operation of the building's services, conveyed as an annual (theoretical) amount of greenhouse gas emissions for state/ territory of SA.

Under the J1V3 Verification Method, the greenhouse gas (GHG) emissions of a reference building (based on the Deemed-to-Satisfy Provisions for both envelope and minimum services) is modelled. This sets a target amount of energy consumption that the proposed building must not exceed. The simulated energy consumption of the Reference Building is expressed as the maximum allowable annual GHG emissions and are calculated to be **399791** kgCO₂-e/annum for this building.

The material construction (or fabric) of the proposed building envelope is modelled with the same building services. Compliance is verified when it is determined that the annual greenhouse gas emissions of the proposed building, is not more than reference building. The proposed GHG emissions is calculated to be **391578** kgCO₂- e/annum. This is an overall **2%** reduction in greenhouse gas emissions from the reference building.

As part of the Green Star energy modelling, the proposed building has been modelled with improved services, also referred to as proposed services, through enhanced mechanical and lighting system efficiencies. The building with its proposed services, must also demonstrate that it produces less annual GHG emissions than the reference building. In this case calculated to be **332618** kgCO₂-e/annum. This is an overall **17%** reduction in greenhouse gas emissions from the reference building.



Figure 1 – Energy Plus (Design Builder) energy modelling



Thermal Comfort Assessment

The proposed building with the proposed services, must also achieve thermal comfort.

The code requirement for a thermal comfort level of between a Predicted Mean Vote of -1 to +1, is achieved across not less than 95% of the floor area of all occupied zones for not less than 98% of the annual hours of operation of the building, meaning the thermal comfort compliance requirement is satisfied. (See Appendix TCA for further details.)

The combined Thermal Comfort results for all Room/Spaces are **98.2%**. Thermal comfort modelling results for the nominated areas are shown in the table below.

[TABLE 3] – Thermal Comfort Results

Room/Space	Average PMV	PMV % in range	Compliance Achieved
01XFIRSTFLOORBLOCK: TRAINING	0.210	100.0	YES
01XFIRSTFLOORBLOCK: LIFESTYLE	0.167	99.7	YES
02XSECONDFLOORBLOCK: LOUNGE & SITTING	0.049	99.6	YES
01XFIRSTFLOORBLOCK: 3 X BED	0.003	99.4	YES
02XSECONDFLOORBLOCK: 1 X BED 2	0.239	99.5	YES
02XSECONDFLOORBLOCK: 1 X BED 3	0.180	99.2	YES
01XFIRSTFLOORBLOCK: LOUNGE & DINING	0.000	97.3	NO
02XSECONDFLOORBLOCK: 5 X BED 3	0.100	99.7	YES
01XFIRSTFLOORBLOCK: 4 X BED 1	0.162	99.0	YES
02XSECONDFLOORBLOCK: 3 X BED 3	0.070	99.6	YES
02XSECONDFLOORBLOCK: 4 X BED	0.066	99.9	YES



00GROUND FLOOR LEVEL: 6 X BED 1	-0.051	99.0	YES
02XSECOND FLOOR BLOCK: 5 X BED	0.065	99.8	YES
02XSECOND FLOOR BLOCK: 4 X BED 2	0.153	98.4	YES
02XSECOND FLOOR BLOCK: MANAGER OFFICE	0.232	100.0	YES
01XFIRST FLOOR BLOCK: 5 X BED	-0.001	99.3	YES
00GROUND FLOOR LEVEL: MANAGER OFFICE	-0.081	94.4	NO
02XSECOND FLOOR BLOCK: 3 X BED	0.135	99.4	YES
00GROUND FLOOR LEVEL: 4 X BED 1	-0.060	99.0	YES
02XSECOND FLOOR BLOCK: 1 X BED	0.145	99.9	YES
02XSECOND FLOOR BLOCK: MEETING	0.401	100.0	YES
00GROUND FLOOR LEVEL: 6 X BED	0.104	99.2	YES
01XFIRST FLOOR BLOCK: 5 X BED 1	0.242	99.4	YES
02XSECOND FLOOR BLOCK: 3 X BED 2	0.337	99.0	YES
01XFIRST FLOOR BLOCK: 6 X BED	0.335	96.6	NO
02XSECOND FLOOR BLOCK: 1 X BED 1	0.364	99.7	YES
01XFIRST FLOOR BLOCK: MANAGER OFFICE	0.446	100.0	YES



01XFIRSTFLOORBLOCK: 3 X BED 3	0.245	99.3	YES
01XFIRSTFLOORBLOCK: MULTIPURPOSE & ACTVTY	0.254	100.0	YES
01XFIRSTFLOORBLOCK: 5 X BED 3	0.317	99.3	YES
01XFIRSTFLOORBLOCK: 3 X BED 1	0.297	98.0	NO
01XFIRSTFLOORBLOCK: 1 X BED	0.355	99.5	YES
01XFIRSTFLOORBLOCK: 1 X BED 3	0.386	97.5	NO
01XFIRSTFLOORBLOCK: MEETING	0.397	100.0	YES
01XFIRSTFLOORBLOCK: 1 X BED 2	0.427	97.6	NO
00GROUNDLEVEL: CONSULT & COMMS	0.219	99.5	YES
01XFIRSTFLOORBLOCK: 5 X BED 2	0.319	98.4	YES
02XSECONDFLOORBLOCK: 5 X BED 1	0.289	99.5	YES
02XSECONDFLOORBLOCK: 4 X BED 1	0.386	96.3	NO
01XFIRSTFLOORBLOCK: 4 X BED 2	0.415	95.4	NO
03THIRDFLOORBLOCK: APARTMENT 15	0.268	96.7	NO
03THIRDFLOORBLOCK: APARTMENT 11	0.292	98.3	YES
03THIRDFLOORBLOCK: APARTMENT 7	0.368	90.9	NO



03THIRDFLOORBLOCK: APARTMENT 16	0.383	93.3	NO
00GROUNDLEVEL: MEETING	0.251	99.4	YES
03THIRDFLOORBLOCK: APARTMENT 1	0.365	94.2	NO
03THIRDFLOORBLOCK: LOBBY & LOUNGE	0.089	99.9	YES
00GROUNDLEVEL: FUNCTION	0.153	99.3	YES
03THIRDFLOORBLOCK: APARTMENT 6	0.445	90.2	NO
03THIRDFLOORBLOCK: APARTMENT 9	0.276	95.4	NO
03THIRDFLOORBLOCK: LIBRARY	0.135	100.0	YES
00GROUNDLEVEL: 6 X BED 2	0.157	98.7	YES
03THIRDFLOORBLOCK: APARTMENT 12	0.276	95.9	NO
00GROUNDLEVEL: 3 X BED	0.218	98.5	YES
00GROUNDLEVEL: GM OFFICE	0.213	99.6	YES
03THIRDFLOORBLOCK: APARTMENT 13	0.366	99.3	YES
03THIRDFLOORBLOCK: APARTMENT 10	0.289	98.1	YES
00GROUNDLEVEL: STAFF LOUNGE	0.166	99.2	YES
03THIRDFLOORBLOCK: APARTMENT 5	0.366	99.1	YES



00GROUNDLEVEL: DINING & LOUNGE	0.183	99.1	YES
02XSECONDFLOORBLOCK: LOUNGE & DINING	0.034	99.4	YES
02XSECONDFLOORBLOCK: 3 X BED 1	0.052	99.9	YES
01XFIRSTFLOORBLOCK: 3 X BED 2	0.052	99.6	YES
02XSECONDFLOORBLOCK: LIFESTYLE	0.196	100.0	YES
01XFIRSTFLOORBLOCK: 1 X BED 1	0.126	99.9	YES
02XSECONDFLOORBLOCK: 5 X BED 2	0.127	99.4	YES
02XSECONDFLOORBLOCK: 6 X BED	0.195	98.5	YES
02XSECONDFLOORBLOCK: TRAINING	0.229	100.0	YES
01XFIRSTFLOORBLOCK: LOUNGE & SITTING	0.043	98.8	YES
00GROUNDLEVEL: 1 X BED	-0.127	95.9	NO
02XSECONDFLOORBLOCK: MULTIPURPOSE & ACTIVITY	0.089	99.9	YES
01XFIRSTFLOORBLOCK: 4 X BED	0.012	99.9	YES
03THIRDFLOORBLOCK: APARTMENT 14	0.103	99.7	YES
00GROUNDLEVEL: CORRIDOR 1	-0.128	93.4	NO
03THIRDFLOORBLOCK: APARTMENT 3	0.170	99.3	YES



00 GROUND FLOOR LEVEL: 1 X BED1	-0.194	93.5	NO
03 THIRD FLOOR BLOCK: APARTMENT 8	0.107	98.9	YES
03 THIRD FLOOR BLOCK: APARTMENT 2	0.131	99.3	YES
00 GROUND FLOOR LEVEL: 3 X BED1	-0.184	94.2	NO
00 GROUND FLOOR LEVEL: 4 X BED	-0.168	94.5	NO
00 GROUND FLOOR LEVEL: 2 X BED	-0.219	93.6	NO
03 THIRD FLOOR BLOCK: APARTMENT 4	0.094	98.2	YES
00 GROUND FLOOR LEVEL: DINING, LOUNGE & SITTING	-0.213	90.1	NO
Overall Result	0.170	98.2	YES

Performance Solutions – Duty of Care Statement

The intent of this Verification Method is to demonstrate that a Performance Solution meets the Performance Requirements, providing flexibility from prescriptive Deemed-to-Satisfy (DTS) provisions, where they are not mandatory under Specification 3.3.

The trade-off is that performance solutions derived in this report must not have unintended consequences on any other Section or Part of the NCC. In satisfying the requirements, all practitioners and stakeholder utilising the outcomes of this report, should exercise a duty of care.



3. FINAL BUILDING SPECIFICATION

3.1 STRUCTURE

Envelope Description

The following describes the building envelope to be assessed:

The building envelope is defined as illustrated in the plans attached to this report.

[TABLE 2] – Parts

Ground level

Qty	Name	Classification of Part	Floor Area (m ²)
1	Ground level - Residential aged care facility	9c - aged care	3073.0
Total area of parts:			3073.0

Level 1

Qty	Name	Classification of Part	Floor Area (m ²)
1	First level - Residential aged care facility	9c - aged care	2991.0
Total area of parts:			2991.0

Level 2

Qty	Name	Classification of Part	Floor Area (m ²)
1	Second level - Residential aged care facility	9c - aged care	2991.0
Total area of parts:			2991.0



Level 3

Qty	Name	Classification of Part	Floor Area (m ²)
1	Third level - Residential aged care facility	9c - aged care	2491.0
Total area of parts:			2491.0

Level 4

Qty	Name	Classification of Part	Floor Area (m ²)
1	Fourth level - Residential aged care facility	9c - aged care	398.0
Total area of parts:			398.0

Total area of building: 11943.0



3.2 J4 FABRIC

The following items apply to the elements forming the building envelope of the Parts of the building listed in the table above.

J4D3 – Thermal construction - general

Refer to Part 1. Action Summary, 'Additional Compliance Requirements'.

J4D4 – Roofs and Ceilings Constructions

The proposed roofs in the building envelope must achieve the minimum R-value shown in the calculations below.

[TABLE 4] - Primary Roof, Skillion, Non ventilated

Outer solar absorptance: 0.67 (Jasper or similar)

Layer	Specification	R-Value [Downwards] (m ² .K/w)
External Air Film	Wind speed: Up to 3 m/s	0.03
Roof Sheeting - Steel	Conductivity: 47.5 W/m.K, Thickness: 0.42 mm, Material Density: 7850	0
R1.8 Roof Blanket - Compressed (Foil Face Down)	Achieved R-Value of 1.25 K.m ² /W	1.25
Reflective Air Gap	Thickness: 300mm, not ventilated, Emissivity: 0.05, Foil Face Down - Assumed the airspace thickness	Combined in bridged layer
R3.0 Insulation Batts	Achieved R-Value of 2.88 K.m ² /W [Bridged layer]	3.08
Ceiling Lining - Plasterboard	Conductivity: 0.17 W/m.K, Thickness: 10 mm, Material Density: 880	0.06
Internal Air Film	Wind speed: Still - 0m/s	0.16
Bridging Framing (mm):	600 c/c, 100 W, 250 D, 1.9 Web	Total: 4.6



[TABLE 5] - Secondary Roof, Flat roof and ceiling, Non ventilated

Outer solar absorptance: 0.5 (Medium or similar)

Layer	Specification	R-Value [Downwards] (m ² .K/w)
External Air Film	Wind speed: Up to 3 m/s	0.03
Roof covering - Vinyl floor tiles	Conductivity: 0.79 W/m.K, Thickness: 2 mm, Material Density: 2050	0
Roof slab - Solid concrete	Conductivity: 1.44 W/m.K, Thickness: 150 mm, Material Density: 2400	0.1
R3.65 insulation - 80mm	Achieved R-Value of 3.65 K.m ² /W	3.65
Air Space	Emittance: 0.9 out- 0.05 in, Thickness 150 mm	1.3
Ceiling lining - Gypsum plasterboard	Conductivity: 0.17 W/m.K, Thickness: 10 mm, Material Density: 880	0.06
Internal Air Film	Wind speed: Still - 0m/s	0.16
		Total: 5.3

J4D5 – Roof Lights

There are no roof light/s in the nominated building envelope.



J4D6 – Walls

The proposed walls in the building envelope must achieve the minimum R-value shown in the calculations below.

[TABLE 6] - Metal Clad Wall - 01 (external)

Outer solar absorptance: 0.67 (Jasper or similar)

Layer	Specification	R-Value [Inwards] (m ² .K/w)
External Air Film	Wind speed: Up to 3 m/s	0.03
External Cladding - Steel sheeting	Conductivity: 47.5 W/m.K, Thickness: 0.42 mm, Material Density: 7850	0
Thermal break	Inwards R:0.2, Continuous, R0.2 Thermal strip (assumed)	Combined in bridged layer
R2.5 Insulation Batts	Achieved R-Value of 2.38 K.m ² /W [Bridged layer]	1.44
Internal Lining - Plasterboard	Conductivity: 0.17 W/m.K, Thickness: 13 mm, Material Density: 880	0.08
Internal Air Film	Wind speed: Still - 0m/s	0.12
Bridging Framing (mm):	400 c/c, 36 W, 92 D, 0.75 Web Noggings 1350 c/c	Total: 1.7

[TABLE 7] - Metal Clad Wall - 01a (external)

Outer solar absorptance: 0.33 (Surfmist or similar)

Layer	Specification	R-Value [Inwards] (m ² .K/w)
External Air Film	Wind speed: Up to 3 m/s	0.03
External Cladding - Steel sheeting	Conductivity: 47.5 W/m.K, Thickness: 0.42 mm, Material Density: 7850	0
Thermal break	Inwards R:0.20, Continuous, R0.2 Thermal strip (assumed)	Combined in bridged layer
R2.5 Insulation Batts	Achieved R-Value of 2.38 K.m ² /W [Bridged layer]	1.43
Internal Lining - Plasterboard	Conductivity: 0.17 W/m.K, Thickness: 13 mm, Material Density: 880	0.08
Internal Air Film	Wind speed: Still - 0m/s	0.12
Bridging Framing (mm):	400 c/c, 36 W, 92 D, 0.75 Web Noggings 1300 c/c	Total: 1.7



[TABLE 8] - Brick Veneer Stud Wall - 02 (external)

Outer solar absorptance: 0.33 (Surfmist or similar)

Layer	Specification	R-Value [Inwards] (m ² .K/w)
External Air Film	Wind speed: Up to 3 m/s	0.03
External Lining - Brick	Conductivity: 0.78 W/m.K, Thickness: 110 mm, Material Density: 1950	0.14
Thermal break	Inwards R:0.20, Continuous, R0.2 Thermal strip (assumed)	Combined in bridged layer
R2.5 Insulation Batts	Achieved R-Value of 2.38 K.m ² /W [Bridged layer]	1.37
Air Space	Emittance: None, Thickness 20 mm	0.16
Internal Lining - Plasterboard	Conductivity: 0.17 W/m.K, Thickness: 13 mm, Material Density: 880	0.08
Internal Air Film	Wind speed: Still - 0m/s	0.12
Bridging Framing (mm):	400 c/c, 36 W, 92 D, 0.75 Web Noggings 1350 c/c	Total: 1.9

J4D6 – Glazing

Glazing (including all glazed door elements) in the building envelope must be equal to or better than the following proposed values (U-value and SHGC) as per the table below.

Compliant Minimum Proposed Glazing Specification

[TABLE 9] – Ground level – Level 4

Window ID./ Name	Description	Total System U-value	SHGC
All windows	Window	<=3.2	<=0.3

Note: These proposed minimum values are derived from thermal modelling based the J1V3 Verification Method. The DTS glazing values applied in the reference building simulation are found in Appendix C.



J4D7 – Floors

The proposed floors in the building envelope must achieve the minimum R-value shown in the calculations below.

[TABLE 14] – Ground Floor, Concrete Slab on Ground

Layer	Specification	R-Value [Downwards] (m ² .K/w)
Internal Air Film	Wind speed: Still - 0m/s	0.16
Floor covering - Vinyl floor tiles	Conductivity: 0.79 W/m.K, Thickness: 2 mm, Material Density: 2050	0
Floor - Concrete Slab	Conductivity: 1.44 W/m.K, Thickness: 150 mm, Material Density: 2400	0.1
Soil	Soil Contact Resistance	3.95
		Total: 4.2

[TABLE 15] – Suspended Concrete Floor – Exposed to outside

Layer	Specification	R-Value [Downwards] (m ² .K/w)
Internal Air Film	Wind speed: Still - 0m/s	0.16
Floor Covering - Vinyl floor tiles	Conductivity: 0.79 W/m.K, Thickness: 2 mm, Material Density: 2050	0
Floor - Concrete Slab	Conductivity: 0.79 W/m.K, Thickness: 150 mm, Material Density: 2400	0.19
R2.05 Insulation - 45mm	Achieved R-Value of 2.05 K.m ² /W	2.05
Air Space	Emittance: 0.05 in/0.9 down, Thickness 150 mm	1.08
Fibre-cement	Conductivity: 0.25 W/m.K, Thickness: 9 mm, Material Density: 1360	0.04
External Air Film	Wind speed: Up to 3 m/s	0.03
		Total: 3.6



Building Fabric (Additional)

There are “non-envelope” fabrics. The specifications below must be met in order to ensure compliance is satisfied.

[TABLE 16] - Non-Envelope Fabric

Type	Description	R value
Internal Wall	All internal walls	Nil
Internal Floor	All internal floors	Nil



3.3 J5 BUILDING SEALING

The following items apply to the elements forming the envelope of the following parts of the building:

1. Ground – Level 04 - Residential aged care facility, Class 9c - Aged care & Class 9b – Communal areas

J5D2 – APPLICATION OF PART

There are no exemptions under this Part.

J5D3 – CHIMNEYS AND FLUES

There are no open solid-fuel burning appliances with a chimney or flue that is to be sealed under the requirements of J5D3.

J5D4 – ROOF LIGHTS

There are no roof lights in a conditioned space or a habitable room to be sealed under the requirement of J5D4

J5D5 – WINDOWS AND DOORS

The sealing requirements of Section J5D5 are not met. Refer to the Specification Upgrades on page 4

There are no loading dock entrances required to meet the requirements of J5D5.

J5D6 – EXHAUST FANS

The sealing requirements of Section J5D6 are not met. Refer to the Specification Upgrades on page 4.

J5D7 – CONSTRUCTION OF CEILING, WALLS AND FLOORS

The sealing requirements of Section J5D7 are not met. Refer to the Specification Upgrades on page 4.

J5D8 – EVAPORATIVE COOLERS

There are no evaporative coolers.

For further details on Building Sealing go to:

www.airtightness.com.au – or contact SUHO for more information on air tightness testing.



3.4 J6 AIR CONDITIONING AND VENTILATION SYSTEMS

This section is to be provided in a separate report by their nominated consultant, therefore it has been excluded from this report.

3.5 J7 ARTIFICIAL LIGHTING AND POWER

This section is to be provided in a separate report by their nominated consultant, therefore it has been excluded from this report.

3.6 J8 HEATED WATER SUPPLY

This section is to be provided in a separate report by their nominated consultant, therefore it has been excluded from this report.

3.7 J9 ENERGY MONITORING and ON-SITE DISTRIBUTED ENERGY RESOURCES

This section is to be provided in a separate report by their nominated consultant, therefore it has been excluded from this report.



4. APPENDIX JP1- ENERGY USE

4.1 PERFORMANCE REQUIREMENT J1P1

A building, other than a *sole-occupancy* unit of a Class 2 building or a Class 4 part of a building, including its *services*, must have features that facilitate the efficient use of energy appropriate to

- - (a) the function and use of the building; and
 - (b) the level of human comfort required for the building use; and
 - (c) solar radiation being—
 - (i) utilised for heating; and
 - (ii) controlled to minimise energy for cooling; and
 - (d) the energy source of the services; and
 - (e) the sealing of the building envelope against air leakage; and
 - (f) for a *conditioned space*, achieve an hourly *regulated energy* consumption, average over the annual *hours of operation*, of not more than –
 - (i) for a class 6 building, 80 kJ/m².hr, and
 - (ii) for a Class 5, 7b, 8, 9a building other than a *ward area*, or a Class 9b *school*, 43 kJ/m².hr, and
 - (iii) for all other building classifications, other than a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building, 15 kJ/m².hr.

Assessment Method – NCC Volume 1, Part A2G4

The building has been assessed using a combination of Performance and Deemed-to-Satisfy Solutions including; Verification Method J1V3 (using a modelled reference building) and the Deemed-to-Satisfy (DTS) provisions, as provided for in the NCC (Part A2G2).

Thermal modelling simulations were conducted with EnergyPlus software, compliant with ANSI/ASHRAE Standards 140, 'Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs'.

Specifications for the 'required' modelling parameter, have been used for calculating the annual greenhouse gas emissions of a building as per 'Specification 34' – 'Modelling parameters'. A summary of the parameters can be found in the 'Fixed Inputs' below.

Additional Requirements – NCC Volume 1, Specification 33

In addition to modelling requirements, a building must also comply with the requirements of Specification 33. These additional requirements are not executed within the energy modelling; therefore, it must be properly demonstrated that the project documentation meets the DTS Provisions.

These additional requirements have been assessed, and the appropriate observations recorded based on the extent of the works commissioned, as described under Part 2. COMPLIANCE REPORT, 'Scope of Assessment'.



4.2 J1P4 – RENEWABLE ENERGY AND ELECTRIC VEHICLE CHARGING

A building must have features that facilitate the future installation of on-site renewable energy generation and storage and electric vehicle charging equipment.



Fixed Inputs

The following table lists the fixed input data used to establish J1V3 annual greenhouse gas emission calculations. This data is from Specification 34 and 35 of NCC 2022, unless otherwise stated.

[TABLE 17] – Fixed Inputs Data

Input	Specification
Common Inputs:	
Weather file selection:	Adelaide Airport
Infiltration Rate:	0.7 ac/hr – when there is no mechanically outdoor air supply; 0.35 ac/hr at all other times.
Conditioned Space Temperature Settings:	21-24°C for 98% of annual hours of operation – (18-25°C for conditioned transitory occupancy)
External Shading:	As per drawing and specification.
Class 9C Aged Care - Inputs:	
Occupancy and operation profiles:	As per Table S35C2k, Specification 35, Modelling profiles for J1V9b.
Internal heat gains from appliances and equipment:	As per Table S35C2l, Specification 35, Modelling profiles – 160W/room.
Internal heat gains for occupants and hot meals:	As per Table S35C2n, Specification 35, Modelling profiles - 130W (75 W sensible heat and 55W latent heat).
Number of Persons accommodated:	As per Table D2D18 of part D1 - Area per person according to usage.
Heated (daily) water supply consumption rates:	As per Table S35C2m, Specification 35, Modelling profiles – 3.4L/m ² .
Outside air cycle:	As per minimum mechanical ventilation required by Part F6.
Lighting Power Density (LPD) for DtS services:	5 W/m ² as per NCC 2022 Section J Part J7
Lighting Power Density (LPD) for Proposed services as part of Greenstar energy modelling	4 W/m ² - 20% efficient than the minimum requirement
Mechanical system configuration for DtS services	Autosized based on the building use and total area. Coefficient of Performance (CoP) & Energy Efficiency Ratio (EER): 2.9
Mechanical system configuration for proposed services as part of Greenstar energy modelling	Efficient system configuration ; Coefficient of Performance (CoP) & Energy Efficiency Ratio (EER): 4.5



Variable Inputs

This following table compares the differences between the proposed building and the Deemed-to-Satisfy (DTS) compliant 'reference building' assessed using Verification Method J1V3.

[TABLE 18] - Variable Inputs Data

Construction Type	Proposed Fabric	Reference Fabric
J4D4 Roof & Ceilings:		
Primary Roof	4.6	3.7
Secondary Roof	5.3	3.7
J4D6 Walls:		
Metal Clad Wall - 01 (external) -	1.7	See Appendix C.
Brick Veneer Stud Wall - 02 (external) -	1.9	See Appendix C.
Metal Clad Wall - 01a (external) -	1.7	See Appendix C.
J4D6 Glazing:	U-value / SHGC	U-value / SHGC
All windows	3.2 / 0.3	See Appendix C.
All windows	3.2 / 0.3	See Appendix C.
All windows	3.2 / 0.3	See Appendix C.
All windows	3.2 / 0.3	See Appendix C.
All windows	3.2 / 0.3	See Appendix C.
J4D7 Floors:		
Ground Floor	4.2	2.0
Suspended Concrete Floor	3.6	2.0

Notes:

1. Proposed roof and external wall colours have been simulated as per the solar absorptances in Part 3 Final Building Specification. The reference inputs for solar absorptances have been input as 0.6 for External Walls (Specification 34) and roof solar absorptance of 0.45.



Reference Information:

The values in the Variable Input table above, were calculated in accordance with:

1. Specification 36, Table S36C2a – S36C2e for material properties.
2. AS/NZS 4859.2 for roof and floor (including allowance for thermal bridging).
3. Specification 37 for wall-glazing construction (AS/NZS 4859.2, (including allowance for thermal bridging)).
4. Specification 38 for spandrel panels.
5. Specification 39 for soil and or sub-floor spaces.
6. Glazing proposed values are calculated from the thermal performance model and are summarized under 'GLAZING' in the Part 3. Final Building Specification.
7. Glazing reference values are calculated for each facade and storey and are presented in J4D6 Wall-Glazing Calculations in Appendix C.
8. As per clause S34C2(f) of Specification 34, where services are not covered by Parts J6 and Parts J8, MEPS must be applied.
9. As per Part J6D12, as described in the Energy Efficiency Vol. 1 Handbook, unitary equipment with capacity of less than 65kW, must comply with MEPS, the national Minimum Energy Performance Standards. For further details see:
<https://www.energyrating.gov.au/products-0>



4.3 SIMULATION OUTPUTS

The greenhouse gas emissions calculated in the following table are generated using design conditions and calculations methods as required by Verification Method J1V3 and requirements stipulated by Specification 34 Modelling parameters and represents theoretical values for the operation of the building. These values provide a means for the comparison of the building fabric (and services) performance, against the minimum DTS requirements of Section J.

[TABLE 19] – GHG Emission Simulation Outputs

Energy Use Components	Green Star Energy modelling - Proposed Fabric Proposed Services ¹	Section J Compliance - Proposed Fabric DTS Services	Reference Building
Heating	41925	63141	73045
Cooling	27020	43394	41704
Internal Lighting	85479	106848	106848
Domestic Hot Water	97637	97637	97637
Internal Equipment	60825	60825	60825
Auxiliary Energy	19732	19732	19732
Total Annual GHG Emissions (KgCO₂-e/annum)	332618	391578	399791

Note: Not all Energy Use Components as identified in Section J are represented in the table above. As compliance has been undertaken as a Performance Solution, some energy use components may have either been assessed to DTS requirements or assessed by other consultants. Refer to Part 2.2 Compliance Summary, 'J1P1' for clarification.

¹ Enhance Mechanical & Lighting Systems has been modelled for Greenstar Energy modelling as per the inputs presented in the Table 17



5. APPEXDIX B – THERMAL COMFORT ASSESSMENT

This Appendix explains how a mandatory Thermal Comfort Assessment is undertaken, required for all J1V3 – J1V3 Verification assessments under Section J.

5.1 BACKGROUND

The aim of Thermal Comfort of NCC2022 is to ensure that projects achieve a minimum benchmark for the occupant thermal comfort, equivalent to $\geq 75\%$ of all occupants being satisfied in the space.

This project is demonstrating compliance via the “Verification using a reference building” pathway which has the following requirements:

- > The space must meet specified prescriptive criteria for Thermal Comfort, or the Predicted Mean Vote (PMV) levels are between -1 and +1 (1 point);
- > PMV levels are calculated in accordance with either ASHRAE Standard 55-2013 or ISO 7730-2005;
- > PMV levels to be met for each room or space and not averaged;
- > Modelling carried out in accordance with ASHRAE Standard 55-2013 and justified and sourced from either ASHRAE Standard 55-2013 or ISO 7730-2005.

Predicted Mean Vote

The Predicated Mean Vote (PMV) is a measure of how satisfied a typical occupant would be with the thermal conditions based on the following Fanger PMV scale:

Predicted Mean Vote (PMV)	Sensation
+3	Hot
+2	Warm
+1	Slightly Warm
0	Neutral
-1	Slightly Cool
-2	Cool
-3	Cold

The PMV calculation is based on the following factors:

- > Air Temperature (Dry Bulb)
- > Mean Radiant Temperature
- > Relative Humidity
- > Air Velocity



- > Metabolic Rate
- > Clothing Resistance to Heat Transfer

Achieving Compliance

To achieve compliance under NCC2022, the proposed building must achieve a thermal comfort level between a PMV of -1 to +1. This should be achieved across $\geq 95\%$ of the floor area of all occupied zones, for $\geq 98\%$ of the building's annual operational hours.

5.2 METHOD

The thermal comfort simulation was performed using Design Builder which uses the Energy Plus simulation engine. The proposed model and services from the energy simulations are used. This model considers construction types, materials, internal loads, occupancy profile and local weather data. It also factors in occupant activity, clothing levels, and relative air velocities.

In line with the credit requirements the following modelling and design parameters were included:

- > All perimeter zones modelled with a maximum depth of 4m;
- > Perimeter zones are reported independently of interior zones;
- > Zoning to match the air conditioning zones (except for perimeter zones which must be 4m in depth) with exceptions permitted for small enclosed spaces at the discretion of the mechanical engineer (e.g., a small perimeter office);
- > Modelling of Inter-zone virtual partitions;
- > Perimeter air conditioning zones not exceeding 75m²;
- > Model completed with all systems assessed simultaneously;
- > Comfort predictions measured at the midpoint of each zone (i.e., 2m from the perimeter in a 4m deep zone) and at a height of between 0.8m and 1.5m above FFL, or comfort predictions shall be taken as an average across the zone.

The nominated areas for which the PMV calculations have performed are based on the NCC 2022 definitions of occupied zone.

ASHRAE Standard 55-2013 has been used to source and justify values throughout the assessment. The following outlines the inputs used:

- > Metabolic Rates of Occupants:
 - » 77 W/m² (Sedentary activity - office, dwelling, school, laboratory)
- > Skin Surface Areas of Occupants (to determine metabolic rate per person)
 - » Adults: 1.80m²
- > Clothing of Occupants:
 - » Summer: 0.36 CLO (walking shorts, short-sleeve shirt)
 - » Winter: 1.37 CLO (Trousers, Long-sleeve shirts, long-sleeve sweater)
- > Air Velocity:
 - » 0.2 m/s
- > Hours of Operation:
 - » The number of hours when occupancy of the building is greater than 20% of the peak occupancy
- > Occupancy Profile:
 - » Is expressed as a percentage of the maximum number of people that can be accommodated in that building class.
- > HVAC Selection:



- > Design Temperature Setpoints
 - » Summer Cooling Setpoint: 24°C
 - » Winter Heating Setpoint: 21°C
- > Internal Loads:
 - » As per NCC Section J.

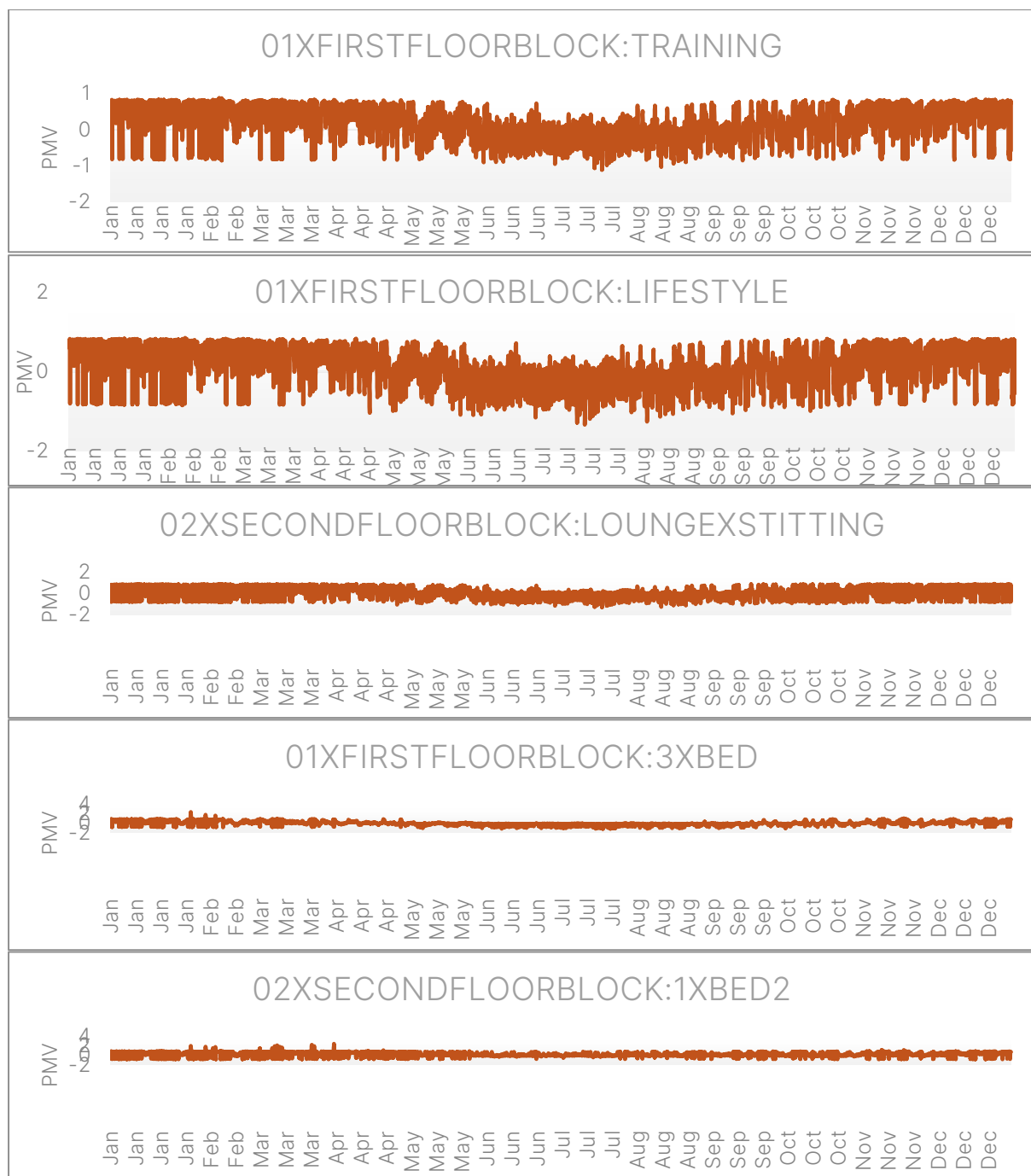


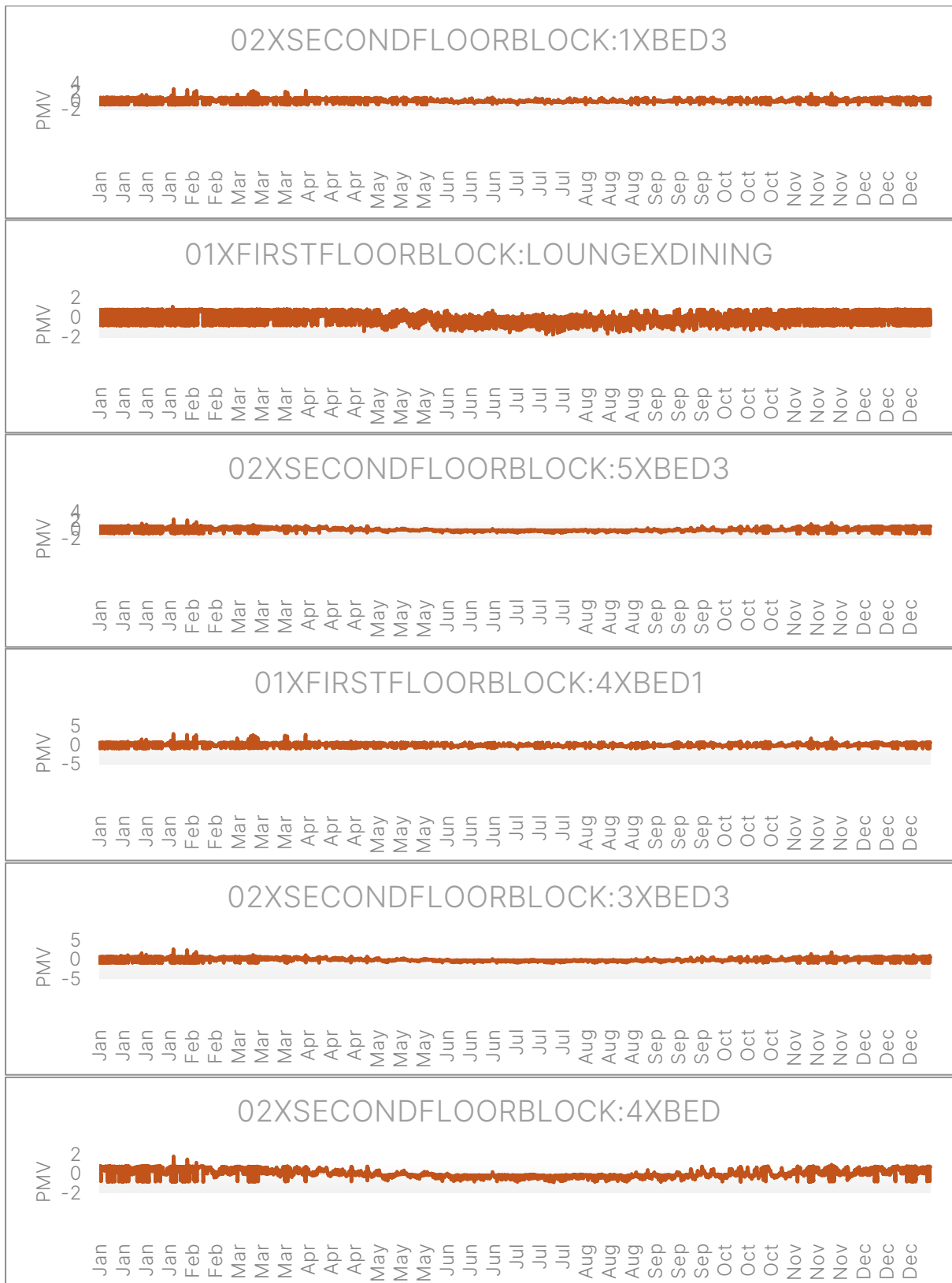
5.3 RESULTS

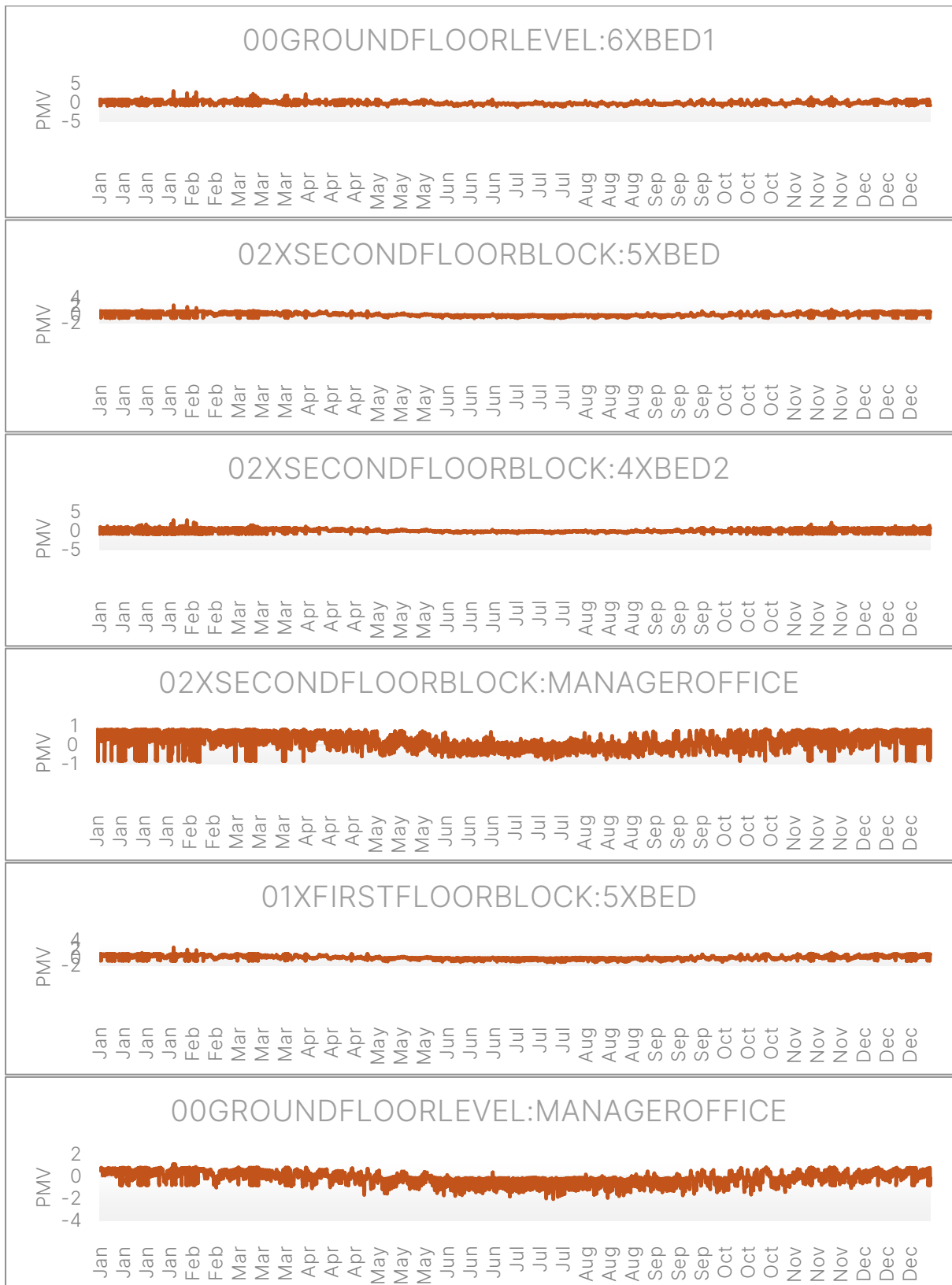
The building maintains a PMV of between -1 and +1 for **98.2%** of the nominated area. The Thermal comfort results for each of the zones assessed are included in Part 2: Compliance Summary of this report.

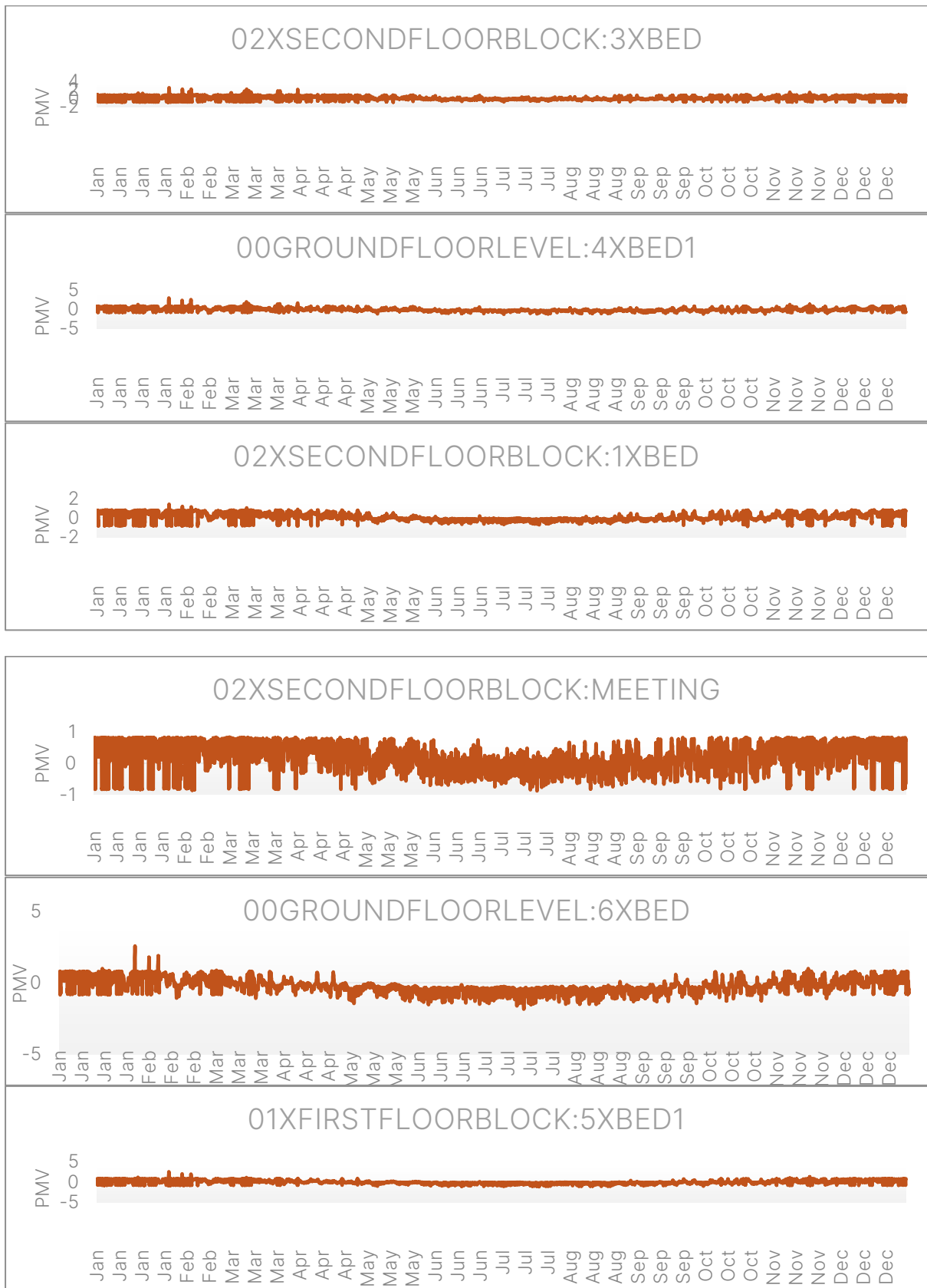
Thermal comfort graphs

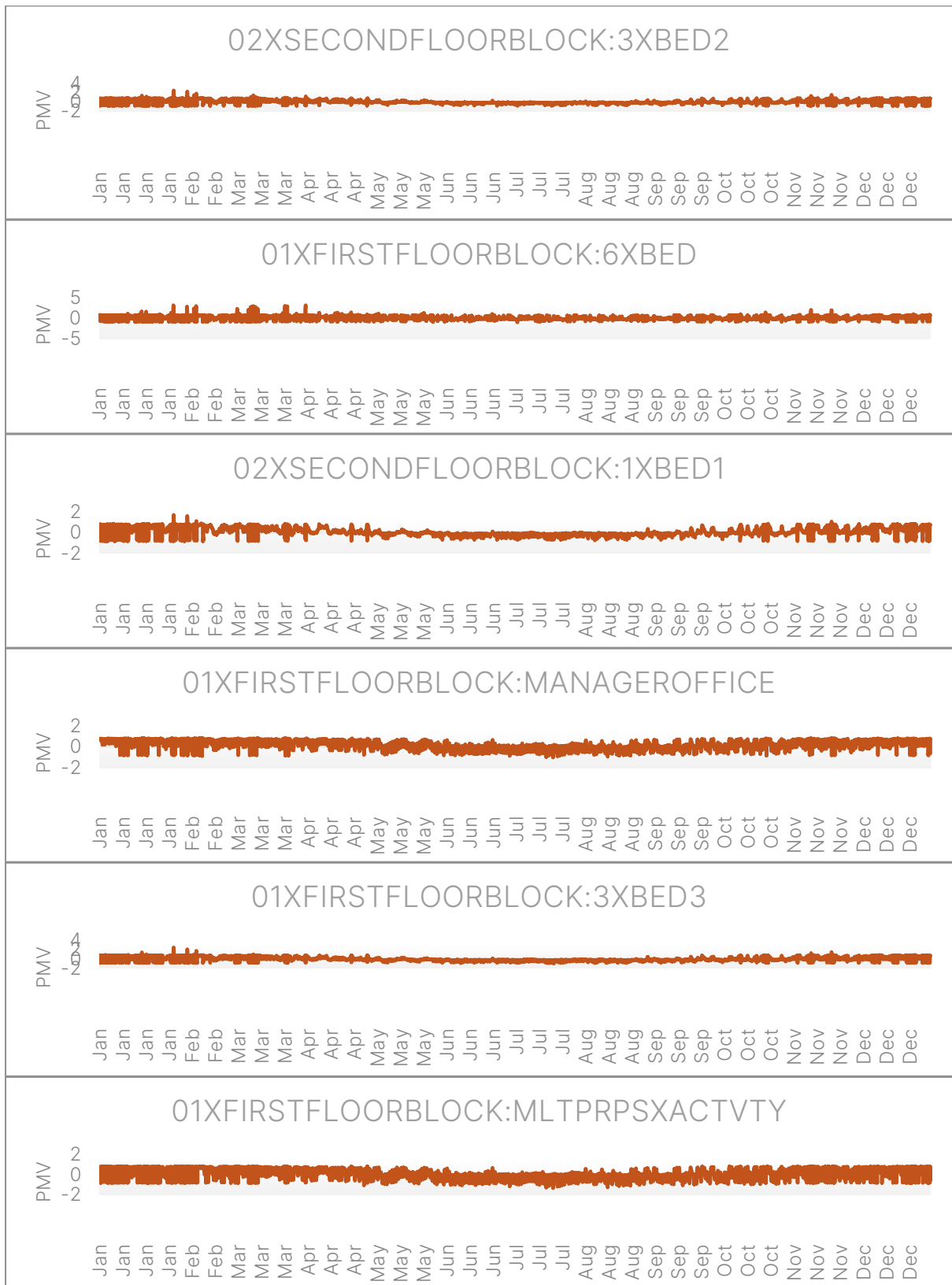
The following graphs display the PMV that the building maintains for each room or space at each Level of the building.

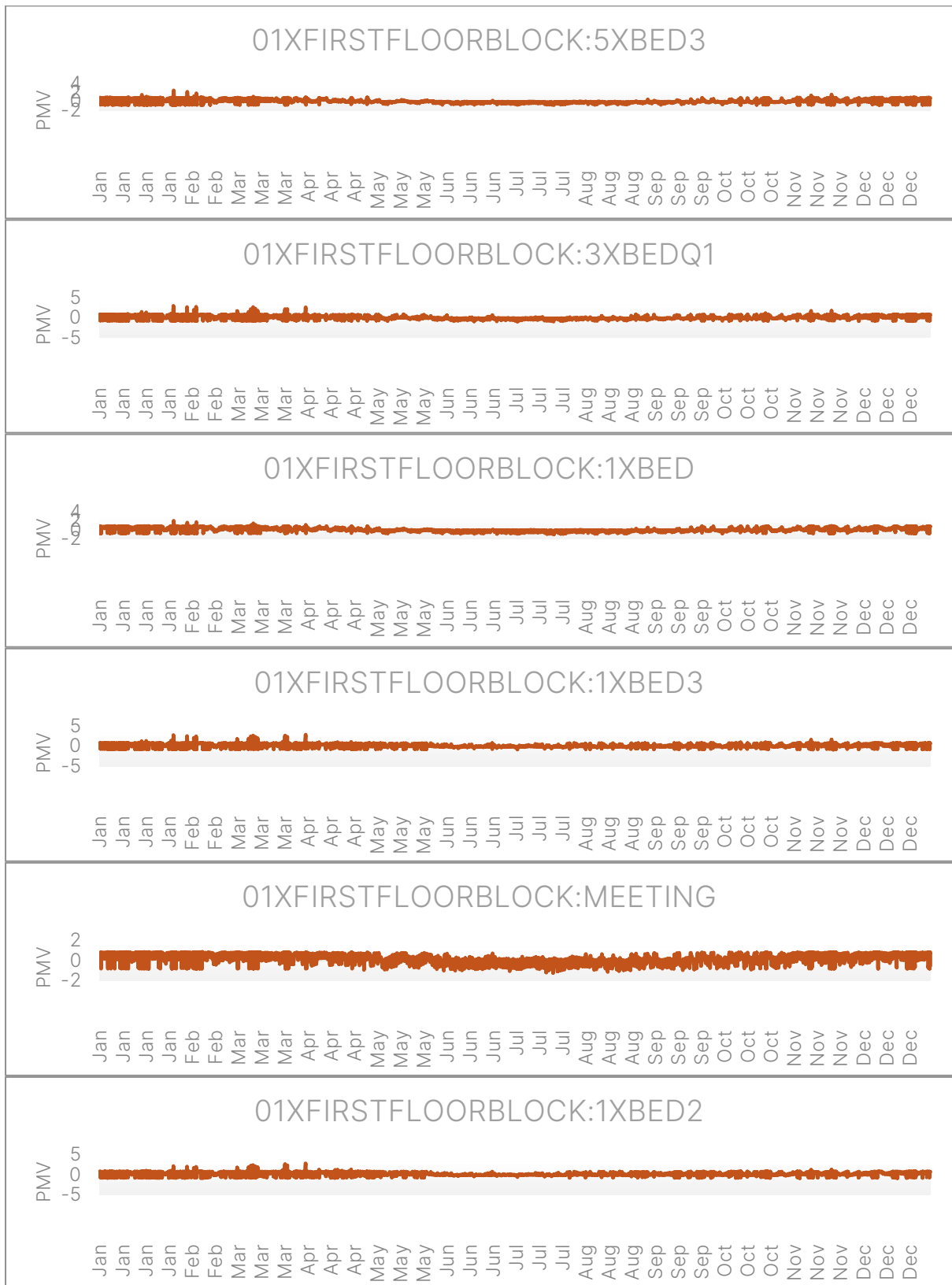


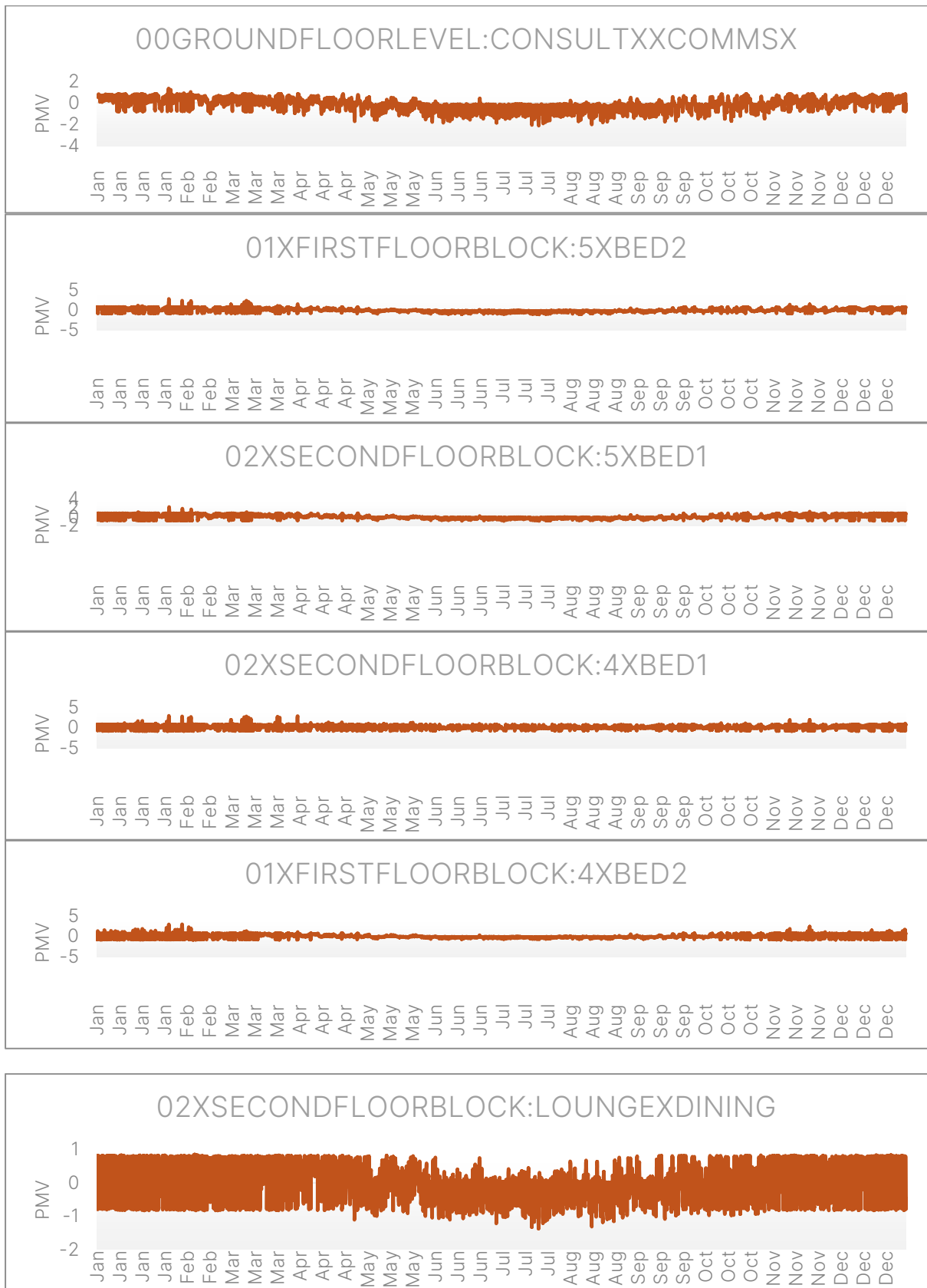


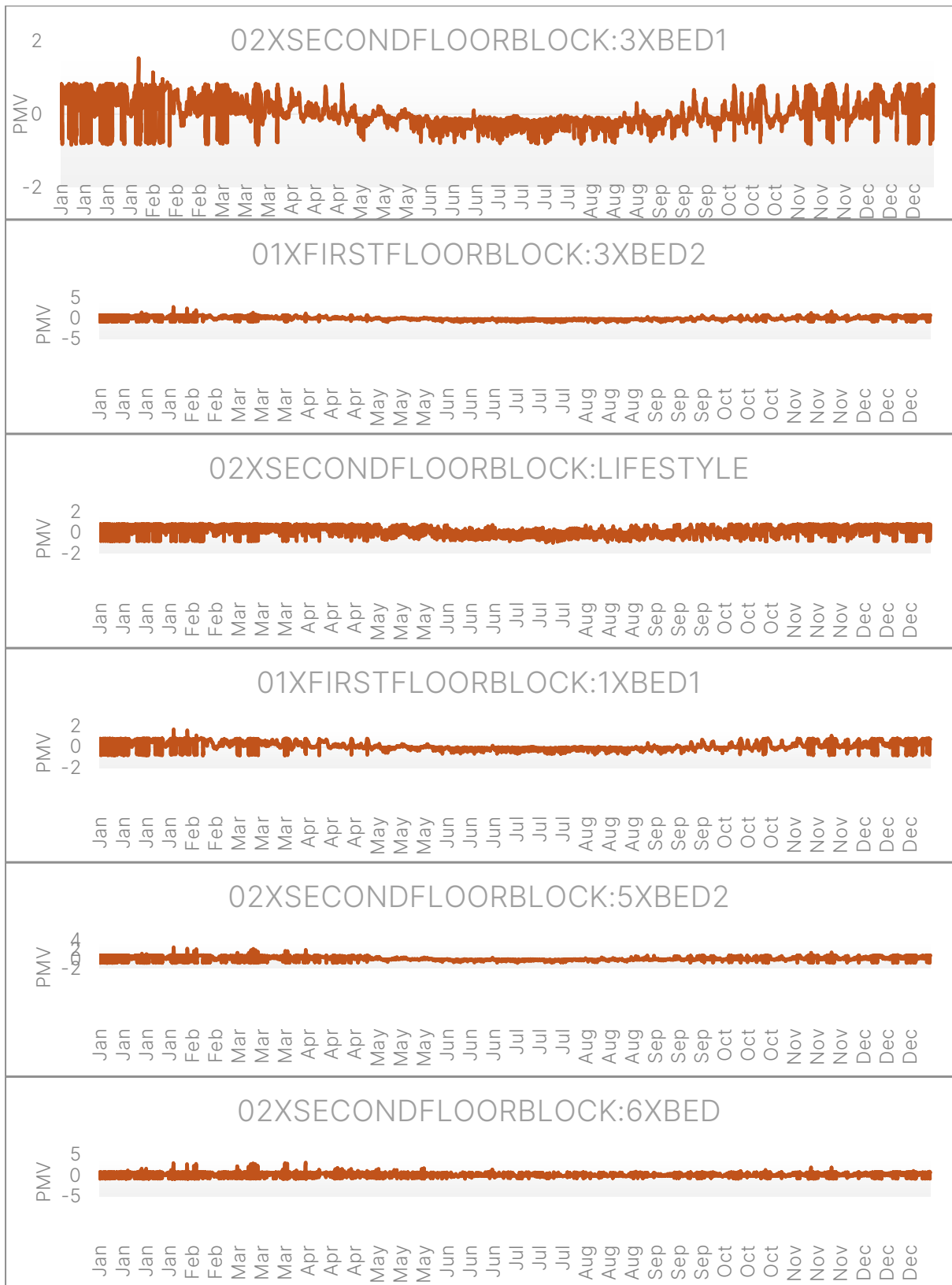


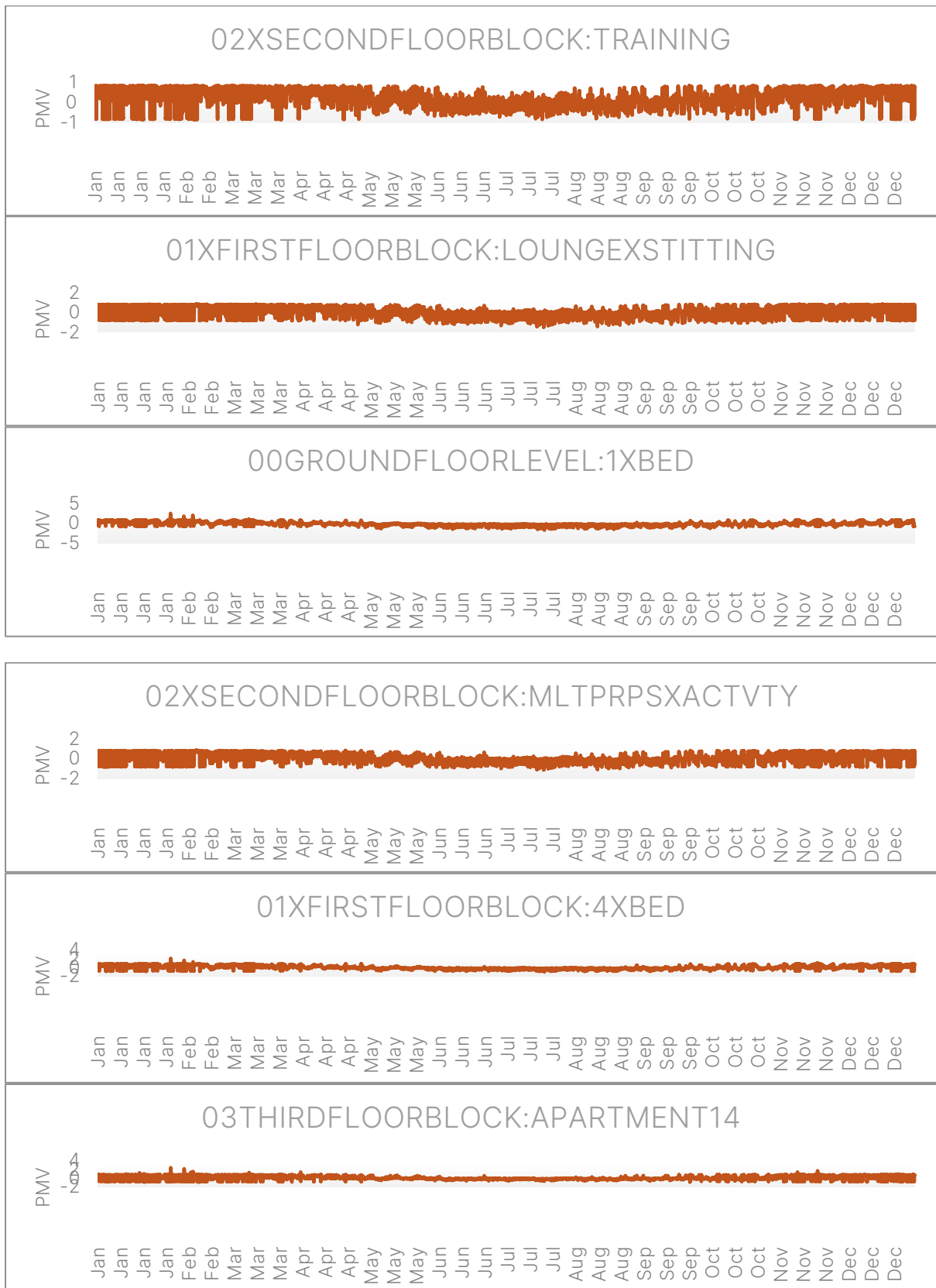




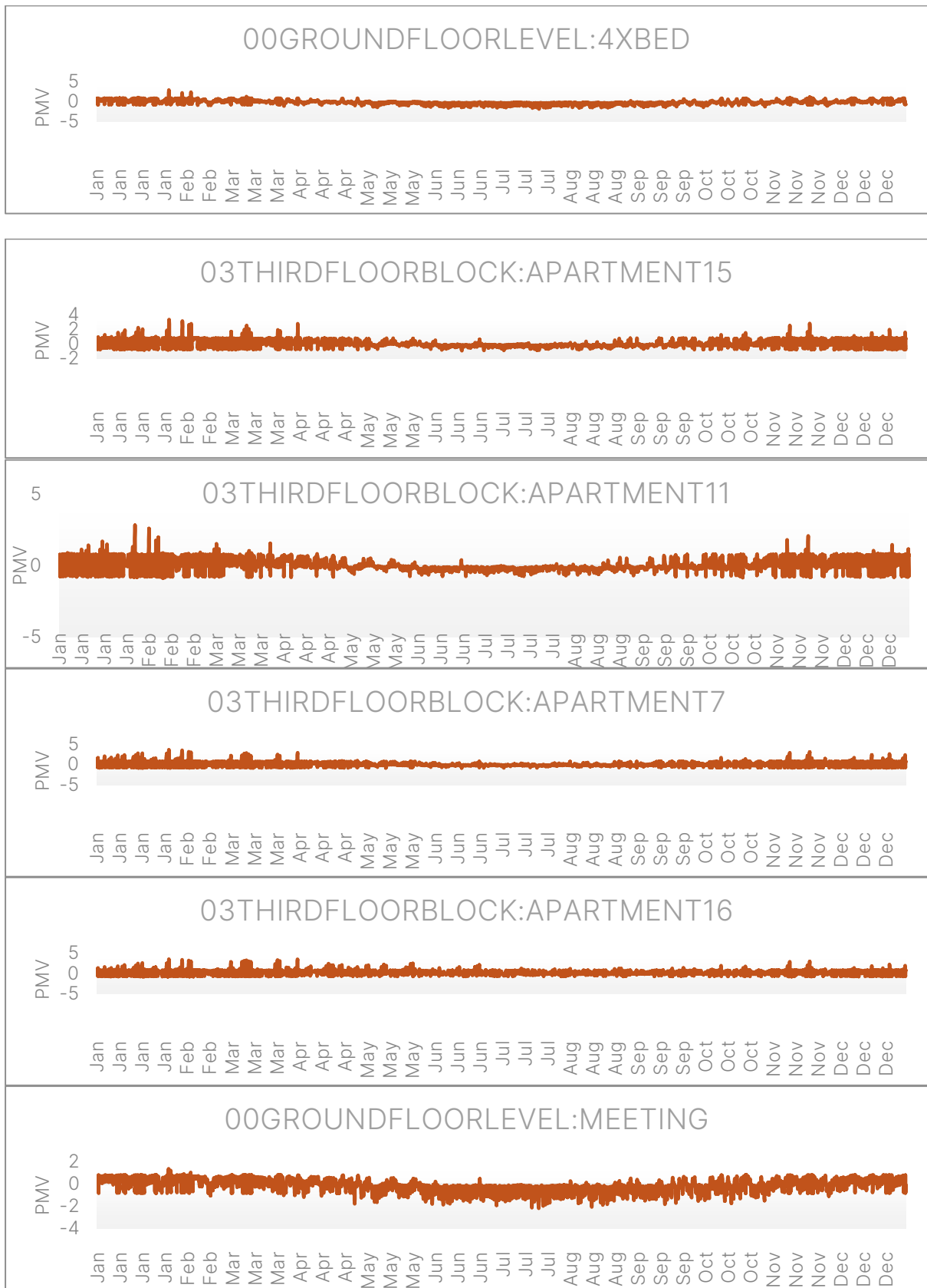




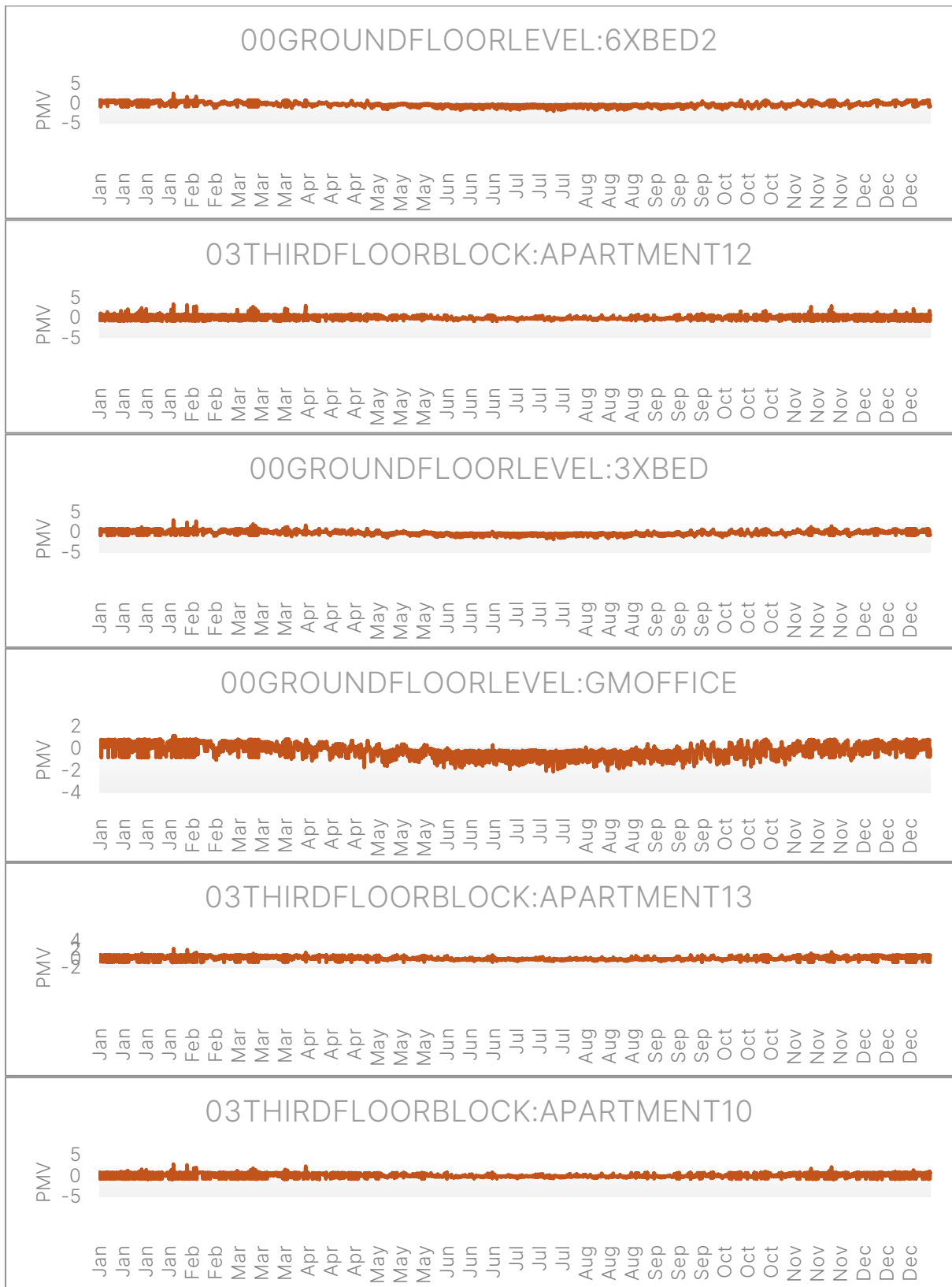














6. APPENDIX C – CODE COMPLIANCE CALCULATIONS

This Appendix includes derived calculations undertaken to determine minimum DTS reference building requirements for assessment.

J4D6 – WALLS AND GLAZING

Project Name: BUPA - Morphettville SA 5043					SUHO Job #: 366285				Climate Zone: 5								
					Floor Level: GF, FF, SF, TF & FRF				Building Class: 3/9C/9A Ward								
Wall Details:					Total Façade Area Details (m²):								Door Details:				
		CPS Wall Name	Location	R-value	U-value	North		East		South		West		Name		Area (m²)	
Fabric 1	External Wall		External	1	1.00	1776.2		1350.4		1773.0		1439.5		North Door		2.1	
Fabric 2					0.00									East Door		16.0	
Fabric 3					0.00									South Door		8.5	
Fabric 4					0.00												
Fabric 5					0.00												
Fabric 6					0.00												
Fabric 7					0.00												
Fabric 8					0.00												
Glazing Details:																	
Window Entry										Proposed Values		Shading Entry		Factors			
Name		Orientation	Fabric #	Height (m)	Width (m)	Window Multiplier	Area (m²)	Proposed U-value	Proposed SHGC	P (m)	H (m)	Blind Factor	Display Glazing				
FF & SF windows with 0.4m overhang		N	Fabric 1	1.9	31.08		59.05			0.4	1.9						
FF & SF windows with 0.4m overhang		E	Fabric 1	1.9	5.6		10.64			0.4	1.9						
FF & SF windows with 0.4m overhang		S	Fabric 1	1.9	33.93684		64.48			0.4	1.9						
GF window with canopy		N	Fabric 1	2.6	3.035385		7.89			3.15	2.9						
GF window with canopy		W	Fabric 1	2.6	3.733462		9.71			3.6	2.9						
FF & SF window with canopy		N	Fabric 1	2.6	3.6		9.36			8.75	3.1						
GF window with balcony shade		W	Fabric 1	2.9	3.091034		8.96			3.35	2.9						
FF& SF window with balcony shade		W	Fabric 1	2.6	16.38615		42.60			6.9	2.6						
FF& SF window with balcony shade		N	Fabric 1	1.9	8.4		15.96			10.5	1.9						
FF& SF window with balcony shade		S	Fabric 1	1.9	4.2		7.98			12.9	1.9						
GF window with canopy		W	Fabric 1	2.9	7.3		21.17			6.7	2.9						
GF window with canopy		W	Fabric 1	2.9	16.1		46.69			3.2	2.9						
GF window with canopy		W	Fabric 1	3.4	2.623235		8.92			7.1	3.4						
GF window with canopy		S	Fabric 1	3.4	3.941176		13.40			0.4	3.4						
GF window with canopy		S	Fabric 1	2.9	2.9		8.41			11.8	2.9						
GF window with canopy		E	Fabric 1	3.4	3.129412		10.64			11.55	3.4						
GF window with canopy		S	Fabric 1	2.6	2.749231		7.15			10.05	2.9						
GF window with projected floor		E	Fabric 1	2.6	1.6		4.16			3.65	3.2						
GF window with balcony shade		E	Fabric 1	2.6	7.148962		18.59			3.4	3.2						
FF& SF window with balcony shade		E	Fabric 1	2.6	11.09846		28.86			3.4	2.7						
TF windows with 0.6m roof eaves		N	Fabric 1	2.25	50.66667		114.00			0.6	2.85						
TF windows with different roof eaves		N	Fabric 1	2.6	10.5		27.30			2.86	3.2						
							0.00										
TF windows with different roof eaves		N	Fabric 1	2.6	3.1		8.06			2.74	3.2						
TF windows with different roof eaves		N	Fabric 1	2.6	3.6		9.36			2.47	3.2						
TF windows with 0.6m roof eaves		E	Fabric 1	2.25	30.76725		69.23			0.6	2.85						
TF windows with different roof eaves		E	Fabric 1	2.6	3.1		8.06			2.74	3.2						
TF windows with different roof eaves		E	Fabric 1	2.1	1.1		2.31			4.26	2.7						
TF windows with different roof eaves		E	Fabric 1	2.6	3.7		9.62			2.74	3.2						
TF windows with different roof eaves		E	Fabric 1	1.9	2.873684		5.46			2.74	2.5						
TF windows with 0.6m roof eaves		S	Fabric 1	2.25	46.99696		105.74			0.6	2.85						
TF windows with different roof eaves		S	Fabric 1	2.6	16.2		42.12			2.88	3.2						
TF windows with different roof eaves		S	Fabric 1	1.9	4.196842		7.97			2.89	2.5						
TF windows with different roof eaves		W	Fabric 1	2.6	3.7		9.62			4.1	3.2						
TF windows with 0.6m roof eaves		W	Fabric 1	2.25	39.24374		88.30			0.6	2.85						
TF windows with different roof eaves		W	Fabric 1	1.9	2.851579		5.42			2.78	2.5						
TF windows with different roof eaves		W	Fabric 1	2.6	5.85		15.21			3.25	3.2						
All windows without shade		N	Fabric 1	2.25	212.2835		477.64										
All windows without shade		E	Fabric 1	2.25	83.24544		187.30										
All windows without shade		S	Fabric 1	2.25	200.1151		450.26										
All windows without shade		W	Fabric 1	2.25	143.3662		322.57										
GF windows with 0.4m overhang		N	Fabric 1	2.6	3.7		9.62			0.4	2.6						
GF windows with 0.4m overhang		W	Fabric 1	2.6	3.346923		8.70			0.4	2.6						
GF windows with 0.4m overhang		S	Fabric 1	2.6	10.5		27.30			0.4	2.6						



There are two methods of calculation provided under the NCC 2022 requirements. The following methodology has been used to calculate the minimum DTS reference requirements:

Method 2. Combines all four orientations to provide one combined performance requirement.

Method 2 - Combined	
Glazing Percentage (%)	38.1%
DTS Minimum Wall R-value	1.00
Achieved Wall R-value	1.00
Maximum Glazing U-value	3.62
Maximum SHGC	0.30



Appendix C – Net Zero Report



24 June 2026

BUPA MORPHETTVILLE

29-31 Austral Terrace, Morphettville SA 5043

Net Zero Operational Carbon Building Assessment

Job no: SH366285

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Member of BDAV, AIBA, HIA and MBA



Project		SUHO ref: SH366285
Project Address	29-31 Austral Terrace, Morphettville SA 5043	
Building Class	9c	
NCC Version	Code of Australia 2022, Volume 1 (Amendment 2)	
Council	City of Marion	
Report commissioned by	Capital Project Control Pty Ltd	
Client Reference	BUPA Morphettville	

Date	Version	Prepared by	Checked by	Drawing No
13/05/2026	1	Punitha Subramani	Rosa Yousefi	25-1070(DA01-DA14) (Rev B)
24/06/2026	2	Punitha Subramani	Rosa Yousefi	25-1070(DA01-DA14) (Rev B)



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The Report has been prepared by SUHO based on the information and drawings (25-1070 (DA01-DA14) (Rev B) – 24/03/2026) and the agreed scope of work in the fee proposal dated 25/03/2026.

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EXECUTIVE SUMMARY

SUHO was engaged by Capitol Project Control to provide a Net Zero Operational Carbon Building Assessment for a proposed BUPA aged care development (Class 9c) at 29-31 Austral Terrace, Morphettville SA 5043. The proposed development falls under the jurisdiction of Marion City Council and is situated in Climate Zone 5.

In alignment with the Bupa 2040 sustainability net zero targets, the development aims to achieve a net-zero ready performance outcome. This will be supported through the proposed future installation of a 99 kW rooftop solar photovoltaic (PV) system, which will generate renewable electricity for direct on-site consumption, thereby reducing greenhouse gas emissions associated with operational energy use. Any residual emissions that cannot be eliminated through on-site generation are intended to be addressed through GreenPower procurement.

The assessment will quantify the operational energy demand associated with the proposed development using a J1V3-compliant energy modelling methodology. As part of the Bupa 2040 sustainability net zero targets, all Scope 1 emission sources have been excluded from the proposed building design and are not incorporated within the current design documentation.

The study will further evaluate the role of on-site renewable energy generation in offsetting Scope 2 greenhouse gas emissions, with a focus on reducing reliance on grid-supplied electricity and improving overall operational carbon performance.

Based on the assessment outcomes, the proposed development is anticipated to achieve a payback period of 1.4 years through the installation of a 99 kW solar PV system (excluding battery cost). Over an assumed 25-year operational lifespan, the system is projected to deliver cumulative savings equivalent to approximately 978% of the gross investment.



PROJECT OVERVIEW

The proposed aged care development (Class 9c) is located at 29-31 Austral Terrace, Morphettville SA 5043.

The proposed development comprises a 144-bed aged care facility distributed over five levels. Ground Level to Level 2 accommodate 36-bed care units on each floor. Level 3 incorporates a 36-bed secure wing (2x18 care units) and Level 4 offers activity area and communal terrace.

In addition to resident accommodation, the facility includes a range of administrative and operational support spaces. These comprise the main entry and waiting areas, reception, administrative support offices, records archive, fire indicator panel (FIP) room, mobile equipment bay, general manager's office, care manager's office, greeting/meeting room, and accessible sanitary facilities. A suite of wellbeing and therapeutic spaces is also provided to support resident care and lifestyle needs, including assisted bathing facilities, staff station/reception areas, consulting rooms, hairdressing and spa amenities, function storage, education and therapy rooms, and a dedicated multipurpose function room. Back-of-house and staff support areas are also incorporated within the design, including staff amenities, staff lounge, laundry facilities, IT room, and general storage areas.

A summary of the floor area schedule is provided in the table below.

Description	Area
Site area	12,736 m ²
Built-up area	9,136 m ²

Table 1. Development area summary

The development is in NCC Climate Zone 5. The following aerial image shows the location of the site.



Figure 1. Locality plan illustrating the subject site and its surrounding context



Software and Tools

DesignBuilder energy simulation software has been used to model the operational energy demand associated with the proposed development in accordance with the J1V3 assessment methodology. The platform operates using the EnergyPlus simulation engine and is independently validated through BESTEST compliance, providing a robust and reliable basis for building performance analysis.

The PVWatts Calculator, which is a free online solar energy estimation tool developed by National Renewable Energy Laboratory (NREL), has been utilised to estimate the annual electricity output of the proposed grid-connected photovoltaic (PV) system. The tool applies hourly solar resource data specific to the project location to predict expected renewable energy generation performance.

Sources of Information

This assessment has been undertaken using the following design documentation and supporting technical information:

- Architectural drawings and associated documentation issued by Walter Brooke, dated 24/03/2026. Refer to Appendix A for the architectural drawing set attached along with the Section J report referred in the assessment.
- Proposed development energy consumption analysis completed by SUHO using J1V3 modelling in accordance with NCC 2022 Section J requirements. Refer to Appendix A for NCC 2022 Section J J1V3 Report.
- PVWatts calculator. Refer to Appendix B for PVWatts Calculator Result.
- BACA Morphettville Draft Dev Brief dated 03/07/2025.



ASSESSMENT SCOPE

The objective of this assessment is to undertake a Net Zero Operational Carbon Building Assessment for the proposed aged care development located at 29–31 Austral Terrace, Morphettville SA 5043.

As part of the study, a detailed evaluation of the proposed operational energy demand has been undertaken, together with an estimation of electricity generation from the proposed on-site solar photovoltaic (PV) system. The assessment also includes a payback analysis comparing the capital and operational costs of the PV system against estimated energy savings to determine the anticipated payback period.

Operational Net Zero refers to a long-term performance commitment in which a building balances the greenhouse gas (GHG) emissions associated with its operational activities through a combination of emissions reduction, on-site renewable energy generation, and, where necessary, high-quality offsets or carbon removal measures, resulting in a net zero emissions outcome.

In line with the project's sustainability strategy, all Scope 1 emission sources have been excluded from the proposed design. Accordingly, the focus of this assessment is on reducing and offsetting operational energy-related emissions, primarily Scope 2 emissions, through efficiency measures and renewable energy integration. This approach establishes a pathway toward achieving a net zero operational carbon outcome for the proposed redevelopment of BUPA Morphettville.

Furthermore, the analysis incorporates both the upfront capital expenditure and ongoing maintenance costs of the solar PV system over the course of its 25-year life span. These lifecycle costs are assessed against the cumulative financial benefits derived from energy generation to determine the overall economic performance and payback period of the proposed installation.



METHODOLOGY

The following methodology has been adopted to undertake the Net Zero assessment:

- **Building Energy Performance - NCC 2022 Section J J1V3 Energy Modelling** - The proposed building energy demand has been evaluated using energy modelling in accordance with the J1V3 methodology. Refer to Appendix A for NCC 2022 Section J J1V3 Report.
- **Onsite Solar Energy Generation** - Electricity generation from the proposed solar photovoltaic (PV) system has been estimated using the PVWatts Calculator, which predicts energy output based on location-specific solar resource data. Refer to Appendix B for PVWatts Calculator Result.
- **Investment Cost Analysis of the Proposed Solar PV System** - The payback analysis of the system has been undertaken by determining both capital expenditure (CAPEX) and operational expenditure (OPEX), with the payback period of the proposed solar PV system assessed accordingly.
- **Cumulative Savings Assessment** - A cumulative cost savings assessment has been undertaken to evaluate the long-term utility cost benefits of the proposed solar PV system over its 25 years operational life.
- **Operational Net Zero Calculation** - A Net Zero assessment has been conducted to evaluate the impact of on-site solar PV capacity and off-site renewable energy procurement, such as GreenPower, in achieving the target outcome.



BUILDING ENERGY PERFORMANCE - NCC 2022

SECTION J J1V3 ENERGY MODELLING

NCC 2022 Section J Compliance Methodology

This section summarises the building's energy demand in accordance with NCC 2022 Sections J1, J2, and J4, using the J1V3 Verification Method and a reference building approach.

Reference Building Model

The reference building has been modelled in accordance with the performance requirements of a Deemed-to-Satisfy (DtS), including DtS building fabric and services.

Proposed Building Model

The proposed building has been modelled using the proposed building fabric and glazing specifications. The assessment methodology incorporates standardised assumptions and requirements relating to NCC 2022 profiles and schedules, including:

- Occupancy profiles
- Operating schedules
- Internal heat gains

The proposed building model has been assessed using reference building services, including:

- Lighting heat gains
- Equipment loads
- Occupant loads
- Air-conditioning system efficiencies consistent with DtS-compliant equipment

Energy Modelling Assessment

The model has been simulated for annual energy consumption performance. The predicted operational energy use of the proposed building has been compared against the reference building model, which incorporates DtS-compliant fabric and equipment specifications.



Modelling Inputs

The following table lists the J1V3 modelling input data used to establish building energy demand and annual greenhouse gas emission calculations. These details are from Specification 34 and 35 of NCC 2022, unless otherwise stated.

Input	Specification
Common modelling inputs	
Weather file selection	Adelaide Airport
Infiltration Rate	0.7 ACH when there is no mechanically outdoor air supply; 0.35 ACH at all other times
Conditioned Space Temperature Settings	21°C-24°C for 98% of annual hours of operation – (18°C-25°C for conditioned transitory occupancy)
External Shading	As per drawing and specification
Modelling inputs as per Class 9C Aged Care	
Occupancy and operation profiles	As per NCC 2022 Table S35C2k, Specification 35, Modelling profiles for J1V3 9c.
Internal heat gains from appliances and equipment	As per NCC 2022 Table S35C2l, Specification 35, Modelling profiles – 160W/room.
Internal heat gains for occupants and hot meals	As per NCC 2022 Table S35C2n, Specification 35, Modelling profiles – 130W (75 W sensible heat and 55W latent heat).
Number of Persons accommodated	As per NCC 2022 Table D2D18 of Part D1 - Area per person according to usage.
Heated (daily) water supply consumption rates	As per NCC 2022 Table S35C2m, Specification 35, Modelling profiles – 50L/person.
Outside air cycle	As per minimum mechanical ventilation required by NCC 2022 Part F6.
Lighting Power Density (LPD) for DtS services:	5 W/m ² as per NCC 2022 Section J Part J7
Mechanical system configuration for DtS services	Autosized based on the building use and total area. Coefficient of Performance (CoP) & Energy Efficiency Ratio (EER): 2.9

Table 2. Model inputs used for preliminary J1V3 assessment



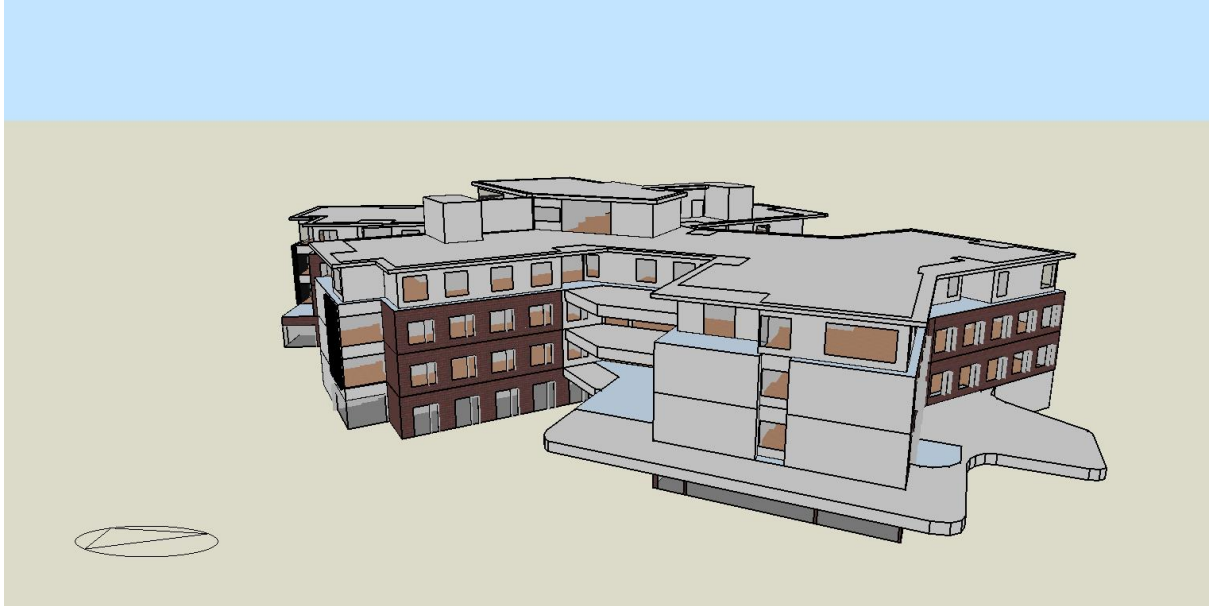


Figure 2: Southwest view of Energy Plus (Design Builder) energy modelling



Figure 3: Southeast view of Energy Plus (Design Builder) energy modelling



Building Fabric and Glazing Specification

The following building fabric parameters have been adopted for the J1V3 energy modelling of the proposed development. Refer to Appendix A for NCC 2022 Section J J1V3 Report.

Element	Construction Type	Specification
Roof	Metal Roof - Primary Roof	Roofing: Steel sheeting, Colour: SA = 0.67 (Jasper or similar)
		Roof Blanket: R1.8 roof blanket (compressed) (foil down)
		Ceiling Insulation: R3.0 insulation batts
		Ceiling Framing: 100W, 250D, 1.9 Web @600c/c
		Ceiling Lining: 10mm plasterboard
	Concrete Roof - Balcony/terrace areas	Roof Slab: 150mm concrete slab, Colour: SA = 0.5 (Medium or similar)
		Soffit Insulation: R3.65 soffit board ¹ (rigid foil down)
		Ceiling Lining: 10mm plasterboard
Walls	Metal Clad Stud Wall - External	External Cladding: 0.42mm metal sheet, Colour: SA = 0.67 (Jasper or similar); SA = 0.33 (Surfmist or similar)
		Insulation: R2.5 insulation batts with R0.20 thermal break strip
		Internal Lining: 13mm plasterboard
		Stud Framing: 36W, 92D, 0.75 Web @400c/c

¹ Assumed Insulation Product: 80mm Kingspan Kooltherm K10 G2 Soffit Board (<https://www.kingspan.com/au/en/products/insulation/roof-insulation/kooltherm-k10-g2-soffit-board/?s=t>). Product selections and performance claims are to be verified by the contractor/supplier/manufacturer. SUHO accepts no liability for product performance or installation outcomes.



Walls	Brick Veneer Stud Wall - External	External Cladding: 110mm brick, Colour: SA = 0.30 (Light or similar)
		Insulation: R2.5 insulation batts with R0.20 thermal break strip
		Internal Lining: 13mm plasterboard
		Stud Framing: 36W, 92D, 0.75 Web @400c/c
	Plasterboard Stud Wall - Internal	External & Internal Lining: 13mm plasterboard
		Airgap: 90mm non-reflective, non-ventilated airgap
Floor	Concrete Slab on Ground	Floor Slab: 150mm concrete slab
		No added insulation
	Suspended Concrete Slab - Exposed	Floor Slab: 150mm concrete slab
		Soffit Insulation: R2.05 soffit board ² (rigid foil down)
	Suspended Concrete Slab - Internal	Floor Slab: 150mm concrete slab
		No added insulation
Glazing	Performance requirements - External	U-value $\leq$ 3.20 (e.g. 3.0 acceptable)
		SHGC $\leq$ 0.30 (e.g. 0.28 acceptable)
		Changes to any of the above fabric specifications may impact glazing performance requirements.

Table 3. Building fabric and glazing specification from preliminary J1V3 assessment

² Assumed Insulation Product: 45mm Kingspan Kooltherm K10 G2 Soffit Board (<https://www.kingspan.com/au/en/products/insulation/roof-insulation/kooltherm-k10-g2-soffit-board/?s=t>). Product selections and performance claims are to be verified by the contractor/supplier/manufacturer. SUHO accepts no liability for product performance or installation outcomes.



Proposed Electricity Demand

If the overall energy consumption of the proposed building be equal or lower than that of the reference building, the design is considered compliant. The results for the proposed/refurbished building, assessed using the NCC Section J1V3 methodology, are summarised in the table below.

Energy Use Components	Reference Building (DtS Fabric & DtS Services) Energy Consumption (kWh)	Proposed Building (Proposed Fabric & DtS Services) Energy Consumption (kWh)
Heating	119354	104954
Cooling	68143	69842
Internal Lighting	174588	174588
Domestic Hot Water	159538	159538
Internal Equipment	99388	99388
Auxiliary Energy	32242	32242
Total Annual Energy Consumption (kWh)	653254	640553
Total Annual GHG Emissions (KgCO₂-e)	237523	232905

Table 4: Proposed building energy demand and greenhouse gas emissions

Note: The energy demand results for the Proposed Building presented in the table 6 above are based on the NCC Section J1V3 modelling. It should be noted that the values presented are derived from theoretical J1V3 simulation outcomes and do not represent the actual operational energy consumption of the building.

For the upcoming assessment, only the proposed building energy consumption and associated greenhouse gas (GHG) emissions have been considered in the calculations. The reference building results presented in the table above are provided for comparative and compliance demonstration purposes only, in accordance with the NCC Section J J1V3 methodology. These reference results will not be used in subsequent assessment stages moving forward.



ONSITE SOLAR ENERGY GENERATION

The following parameters have been adopted for the estimation of solar energy generation and associated cost savings:

Parameter	Assumption / Value
Proposed solar PV system capacity	99 kW
Individual panel capacity	400W - 600W per module
Total number of panels required	248 - 165 panels depend on the panel capacity
Site location coordinates	37.99° S, 138.54° E
Module tilt angle	30° from horizontal (roof-mounted configuration) as per the roof plan
Azimuth orientation	As Solar PV orientations vary between North, Northeast, Northwest, and East/West, the Northeast orientation has been modelled representing the average result
System configuration	Fixed roof-mounted array as per the roof plan
Base electricity tariff	\$0.434/kWh ³
Electricity price escalation rate	3.5% per annum ⁴
Analysis period	Assumed to be 25-year system life
Battery requirement	As the energy generated from the onsite system is intended to be fully utilised on the site (100%), a battery storage system is required to support this operating strategy ⁵

Table 5. Solar PV energy generation calculation inputs

³ Obtained via online resource for average estimated 2026 electricity price

⁴ Escalation rate has been considered based on market projections and from several price projection studies

⁵ The Electrical / Building Services Engineer will be responsible for providing detailed battery sizing based on the final load profile and system design requirements. Please



The proposed development has the capacity to accommodate a roof-mounted solar photovoltaic (PV) system of approximately 99 kW, with panels oriented towards the north, northeast, northwest, east, and west. Refer to Appendix A for Architectural drawing set - Proposed Roof/Fourth Floor Plan – DA07 attached along with the Section J report, for the proposed PV panel location. Given the variation in performance across different orientations, the northeast orientation, representing the average output, has been adopted for the calculation.

The table below presents the estimated annual energy generation, derived from an hourly performance simulation using the NREL PVWatts Calculator. Refer to Appendix C for the PVWatts results.

Month	Daily Average POA Irradiance (kWh/m ² /day)	DC Array Output (kWh)	AC System Output (kWh)
1	7.2	17281.8	16490.3
2	7.0	15098.2	14411.6
3	6.1	14829.5	14157.2
4	4.8	11432.2	10894.6
5	3.3	8463.1	8042.3
6	2.9	7291.8	6918.3
7	2.8	7362.1	6980.5
8	3.8	9806.5	9333.1
9	5.5	13446.5	12834.5
10	5.8	14268.3	13603.0
11	6.0	13982.8	13324.2
12	6.5	15580.4	14850.2

Table 6: Predicted solar energy generation

Based on the hourly solar generation results from the NREL PVWatts Calculator, the proposed solar PV system is expected to generate electricity between approximately 7:00 am and 5:00 pm throughout the year.



INVESTMENT COST ANALYSIS OF THE PROPOSED SOLAR PV SYSTEM

The following parameters have been considered for the calculation of the total investment cost⁶:

Parameter	Assumption / Value
PV system capital cost	\$1,000/kWp ⁶
Annual maintenance cost	\$30/kW (includes monitoring and routine inspections) ⁶
Maintenance escalation rate	3.5% per annum ⁶
Inverter replacement cost	\$300/kW ⁶
Inverter replacement allowance	Replacement assumed at Year 15 of operation ⁶
Deeming period ⁷	Four years, based on the assumption that the solar installation will take place in 2027
No. of calculated STC	547; Refer to Appendix C for the Small generation unit STC calculator results
STC price	40 \$/certificate (GST exclusive) ⁶

Table 7. Cost assessment calculation inputs

⁶ Due to the absence of project-specific data regarding solar panel costs, maintenance expenses, inverter replacement costs, STC price and system lifespan, relevant assumptions have been adopted based on the industry benchmarks and prior professional experience.

⁷ The deeming period is an estimate of the number of years a system will generate renewable energy, which determines how many Small-scale Technology Certificates (STCs) can be created upfront. This deeming period reduces by one year annually until 2030, when the scheme is scheduled to end. As a result, the number of available certificates and therefore the upfront rebate value decreases progressively each year as the scheme approaches its phase-out. For example, if the solar installation is planned for 2030, only one year of deeming would apply, significantly reducing the number of STCs available and, consequently, the upfront rebate value.



The table below summarises the total investment cost analysis for the proposed solar PV system, including both capital expenditure (CAPEX) and operational expenditure (OPEX) over the system's assumed 25-year lifecycle.

To estimate the capital costs of the solar PV installation, key inputs including panel cost, inverter costs, and maintenance requirements have been derived based on the industry benchmarks.

The capital cost of the proposed solar PV system is estimated at \$77,120.

Operational costs have been assumed to escalate at a fixed rate of 3.5% per annum. Based on analysis, the initial annual maintenance cost is estimated at \$2,970, resulting in a cumulative OPEX of \$115,681 over the 25-year assessment period. An additional \$29,700 allocated for inverter replacement at year 15. This results in a total OPEX of \$222,501.

Category	Item	Unit Rate	Value
System Capacity	Proposed Solar PV Capacity	–	99 kW
CAPEX	Solar Panels Cost	1,000 \$/kWp ⁸	\$99,000
	Calculated STC rebate	40 \$/STC ⁸	\$21,880
	Gross CAPEX (after STC rebate adjustment)		\$77,120
OPEX	Maintenance Cost	30 \$/kW ⁸	\$2,970 (Year 1)
	Maintenance escalation rate	3.5% per annum ⁸	
	Cumulative Maintenance Cost (25 years)	30 \$/kW ⁸	\$115,681 (Year 25)
	Inverter Replacement Cost (after 15 years)	300 \$/kW ⁸	\$29,700
	Gross OPEX (25 years)		\$145,381
Total Investment	CAPEX + OPEX (25 years)		\$222,501

Table 8: Investment Cost Analysis – Proposed Solar Photovoltaic System

Based on the assessment, the total investment cost of the proposed 99 kW solar PV system is estimated to be \$222,501 over its 25-year operational lifespan. Once further details become available at Stage 3, the calculations can be reviewed and revised accordingly.

⁸ Due to the absence of project-specific data regarding solar panel costs, maintenance expenses, inverter replacement costs, STC price and system lifespan, relevant assumptions have been adopted based on the industry benchmarks and prior professional experience.



CUMULATIVE SAVINGS ASSESSMENT

Based on the assumptions and inputs detailed in the earlier sections, a cumulative cost savings analysis for the proposed solar PV system has been undertaken and is presented in the table below.

It is assumed that 100% of the solar energy generated will be utilised onsite, with no surplus exported to the grid. Therefore, a battery storage system has been considered in the assessment to support full onsite energy utilisation and balance variations between energy generation and building demand. However, battery-related capital and replacement costs have not been included in the payback period assessment at this stage due to the preliminary nature of the battery sizing assumptions and the absence of detailed operational data. The Electrical / Building Services Engineer will be responsible for providing detailed battery sizing based on the final load profile and system design requirements.

The development is expected to achieve approximately \$61,559 in electricity cost savings in the first year following installation of the solar PV system (excluding battery cost), based on a base electricity tariff of \$0.434/kWh⁹.

Considering an annual electricity price escalation rate of 3.5%, the system is projected to generate total cumulative savings of approximately \$2,397,697 over its 25-year operational lifespan.

Energy & Tariff Inputs

Parameter	Value
Predicted solar energy generation	141,840 kWh
Onsite solar energy used on site	100%
Proposed building energy demand	639,833 kWh
Base electricity tariff	0.434 \$/kWh ⁹
Annual electricity price escalation	3.5% ¹⁰

Table 9: Energy & Tariff Inputs

Annual & Cumulative Savings over a 25-Year Period

Parameter	Value
Year 1 electricity cost savings	\$61,559
Cumulative electricity savings (25 years)	\$2,397,697

Table 10: Annual & Cumulative Savings over a 25-Year Period

⁹ Obtained via online resource for average estimated 2026 electricity price

¹⁰ Escalation rate has been considered based on market projections and from several price projection studies



Investment Cost & Payback Period Calculation

Parameter	Value
Total solar PV investment cost (25 years)	\$222,501
Savings-to-investment ratio	978%
Payback period (excluding battery cost)	1.4 Years

Table 11: Investment Cost & Payback Period Calculation

As shown in the table above, the cumulative savings generated by the solar PV system over its 25-year lifespan are estimated at \$2,397,697. The proposed installation (excluding battery cost) achieves a payback period of approximately 1.4 years.

The following table summarises the cumulative cost savings and investment cost analysis of the solar PV system, as presented in the previous section of this report.

Year	Cumulative savings – Conservative	Total Cost (CAPEX + OPEX)
1	\$61,559	\$80,090
2	\$125,272	\$83,164
3	\$191,215	\$86,345
4	\$259,466	\$89,638
5	\$330,106	\$93,047
6	\$403,218	\$96,574
7	\$478,889	\$100,225
8	\$557,209	\$104,004
9	\$638,270	\$107,914
10	\$722,168	\$111,962
11	\$809,002	\$116,152
12	\$898,876	\$120,488
13	\$991,895	\$124,976
14	\$1,088,170	\$129,621
15	\$1,187,814	\$164,128
16	\$1,290,946	\$169,104
17	\$1,397,688	\$174,254
18	\$1,508,166	\$179,584

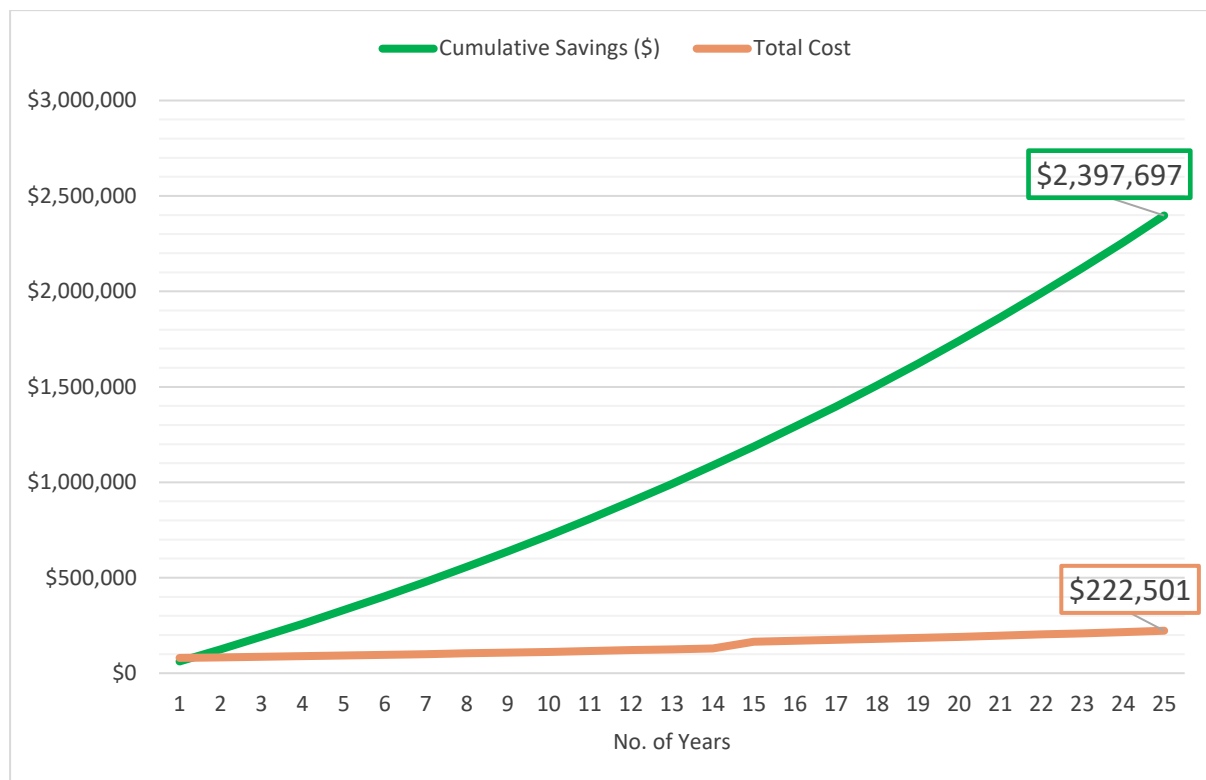


19	\$1,622,510	\$185,101
20	\$1,740,856	\$190,811
21	\$1,863,345	\$196,720
22	\$1,990,121	\$202,837
23	\$2,121,333	\$209,167
24	\$2,257,139	\$215,720
25	\$2,397,697	\$222,501
Cumulative Savings Equivalent to the Gross Investment		978%

Table 12: Payback Period Calculation Result



The graph below illustrates the results presented in table 12, showing the cost savings and investment cost analysis for the solar PV system. Based on the observed results, the system is expected to deliver cost savings of approximately 978% relative to its total investment cost. Additionally, the development is estimated to achieve a reduction in greenhouse gas (GHG) emissions of approximately 1,289 tonnes CO₂-e over the 25-year lifespan of the solar PV system.



Graph 1: Cumulative cost saving and total investment cost analysis



OPERATIONAL NET ZERO CALCULATION

Operational Emissions Scope

For the proposed development, operational greenhouse gas emissions comprise of scope 2 emissions, arising from the consumption of purchased electricity from the grid. As part of the Bupa 2040 sustainability net zero targets, all Scope 1 emission sources have been excluded from the proposed building design and are not incorporated within the current design documentation. Achieving net zero operational performance therefore requires a combination of demand reduction measures, energy efficiency improvements, and the integration of renewable energy sources, supplemented by GreenPower procurement.

Aged care centres are typically characterised by moderate to high energy demand due to continuous operation of key building services, including lighting systems, heating, ventilation and air-conditioning (HVAC), vertical transport, and tenancy-specific equipment. Increasingly, many sectors across Australia are adopting net zero or carbon reduction commitments in response to evolving investor expectations, tenant requirements, and regulatory drivers focused on decarbonisation.

Transitioning to net zero operations provide a range of strategic and operational benefits, including:

- Reduced operational expenditure through improved energy efficiency and on-site renewable energy generation
- Protection of long-term asset value as sustainability performance becomes a key leasing and investment consideration
- Reduced risk from increasingly stringent energy efficiency and emissions regulations
- Improved environmental performance and strengthened stakeholder and community perception



Net Zero Assessment Outcome

Based on the assumptions and inputs outlined in the earlier sections, together with the building energy demand and on-site renewable energy generation results, a net zero operational emissions assessment has been undertaken and is summarised below.

The analysis indicates that the proposed 99 kW on-site solar photovoltaic system is capable of offsetting a significant proportion of the development's annual electricity-related greenhouse gas emissions. It is estimated that approximately 22% of total annual operational emissions can be offset through on-site renewable energy generation.

The remaining 78% of emissions is proposed to be addressed through an off-site renewable energy procurement via GreenPower.

Particulars	Value
Total building annual energy demand	639,833 kWh
Total building annual greenhouse gas emission (GHGe)	232.6 tonne/yr
Predicted annual solar energy generation	141,840 kWh
Total annual greenhouse gas emission reduction through solar energy (GHGe)	51.6 tonne/yr
% of GHGe reduction by solar energy generated onsite	22%
Residual to be offset through offsite renewable energy procurement via GreenPower	78%

Table 13: Net Zero Operational Energy and Emissions Summary



CONCLUSION

The Net Zero Assessment demonstrates that the proposed installation of a 99 kW on-site solar photovoltaic (PV) system at the proposed aged care facility – BUPA Morphettville at 29–31 Austral Terrace, Morphettville SA 5043, will deliver significant environmental and financial benefits.

The proposed onsite solar PV system is estimated to reduce operational greenhouse gas emissions by approximately 51.6 tonnes CO₂-e per annum, offsetting around 22% of the development's total annual emissions through on-site renewable energy generation.

The remaining emissions are proposed to be addressed through an off-site renewable energy procurement via GreenPower, enabling the development to move towards a net zero operational emissions outcome.

The solar PV system (excluding battery cost) is expected to achieve a payback period of approximately 1.4 years, after which it will continue to deliver substantial ongoing cost savings. Over the 25-year assessment period, the system is estimated to generate savings equivalent to approximately 978% of the total capital investment, demonstrating strong economic viability in addition to its environmental performance.

Overall, the proposed solar PV installation provides a robust pathway towards decarbonisation of the asset, aligning with current sustainability targets, improving long-term operational efficiency, and enhancing overall asset value.



APPENDIX B – PVWATTS CALCULATOR RESULTS



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

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

RESULTS

141,840 kWh/Year*

Month	Solar Radiation (kWh / m ² / day)	AC Energy (kWh)
January	7.22	16,490
February	7.02	14,412
March	6.06	14,157
April	4.79	10,895
May	3.32	8,042
June	2.91	6,918
July	2.85	6,981
August	3.83	9,333
September	5.54	12,834
October	5.84	13,603
November	6.04	13,324
December	6.51	14,850
Annual	5.16	141,839

Location and Station Identification

Requested Location	29-31 Austral Terrace, Morphetville SA 5043
Solar Resource Data Location	NSRDB Lat/Lng: -34.99, 138.54
Latitude	34.99° S
Longitude	138.54° E

PV System Specifications

DC System Size	99 kW
Module Type	Standard
Array Type	Fixed (roof mount)
System Losses	14.08%
Array Tilt	30°
Array Azimuth	45°
DC to AC Size Ratio	1.2
Inverter Efficiency	96%
Ground Coverage Ratio	0.4
Albedo	From weather file
Bifacial	No (0)
Monthly Irradiance Loss	Jan Feb Mar Apr May June 0% 0% 0% 0% 0% 0%
	July Aug Sept Oct Nov Dec 0% 0% 0% 0% 0% 0%

Performance Metrics

DC Capacity Factor	16.4%
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APPENDIX C – SMALL GENERATION UNIT STC CALCULATOR RESULT





Small generation unit STC calculator

Calculate the number small-scale technology certificates (STCs) for small generation units (small-scale solar, wind or hydro systems)

Please note that STCs can only be created within 12 months of the installation of an eligible system. See [creating small-scale technology certificates](#) for more information.

Disclaimer

The small generation unit calculator (for small-scale solar panel, solar battery, wind and hydro systems) is designed to assist members of the public to determine the approximate number of small-scale technology certificates (STCs) that may be created under the Small-scale Renewable Energy Scheme (SRES) in relation to an installation. The calculator is designed as an approximate guide only, and does not provide an accurate assessment of the number of STCs that can be created for an installation.

You should be aware that:

- the calculator does not take into account all of the variables which may affect the calculation of the STCs for an installation, and
- the calculator is based on data which may be updated from time to time and therefore results using the calculator may vary over time.

In order to accurately calculate the number of STCs that can be created for an installation, you will need to consult the *Renewable Energy (Electricity) Act 2000* and the *Renewable Energy (Electricity) Regulations*.

What type is your Small Generation Unit? *.....

S.G.U. - solar (deemed)▼

What is the expected installation date of your system (dd/mm/yyyy)? *.....

1/6/2027

What is the rated power output (in kW) of your system? *.....

99.000

For what period would you like to calculate STCs? *.....

Refer to the [deeming period](#) page to find out more about the number of years you can claim STCs for your system.

Four years▼

What is the postcode of the installation address? *.....

5043

☐ Have you read and understood the disclaimer? * ...

Calculator result

System type:	Small generation unit
Postcode zone:	3
Number of STCs:	547

See [creating small-scale technology certificates](#) for more information