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Think Sustainability. Live Comfortably.

SUSTAINABILITY MANAGEMENT PLAN

101-105 Clayton Road, Oakleigh East

Revision C

27/01/2023

PREPARED BY

The Urban Leaf
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COMPANY PROFILE – The Urban Leaf Pty Ltd

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Mission Statement

We are a team of professionals, dedicated to encouraging sustainable design within the building industry and its related businesses.

We provide clients with reports that comprehensively outline, describe and recommend ecological solutions for different stages of the construction process.

Our team’s professional and personal growth is fostered within a positive working environment. Our innovative, original thinking works diligently towards ensuring the social, economic and environmental needs of our community are met and enjoyed by future generations.

Company Philosophy

Our philosophy and motivation is simple. We believe everyone has a responsibility to protect the Earth’s eco-systems.

By preserving natural resources, we can guarantee that communities will continue to benefit from an uncompromised quality of life.

In addition, conserving natural resources within our lifetime ensures the legacy we leave for future generations is one that advocates respect for our environment as well as for each other.

Our role in assessing and encouraging sustainable design within the building industry is an important one because it supports ecologically-sound practises.

Our work enables us to promote more efficient use of ecological resources and reduce unnecessary environmental impact.

Services

All of our services are connected to our company’s philosophy and contribute to supporting a sustainable environment. We pride ourselves on delivering professional, independent, objective appraisals and reports. Any recommendations we make are underpinned by legislative and regulatory compliance.



1. PROJECT INFORMATION

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The Urban Leaf Pty Ltd has been engaged by Pellicano Superannuation Pty Ltd to prepare a Sustainability Management Plan (SMP) for the proposed development.

Municipality:	City of Monash
Site Address:	101-105 Clayton Road, Oakleigh East
Total Site Area:	2219.5 m²
Site Coverage:	1107.4 m²
Project Description:	Residential development of 10 townhouses
TUL Reference Number:	K42
Assessment Completed by:	Febria Margaretha (M. Arch, BESS Trained Professional) Tushar Hanashi (B.Arch, MEESB)

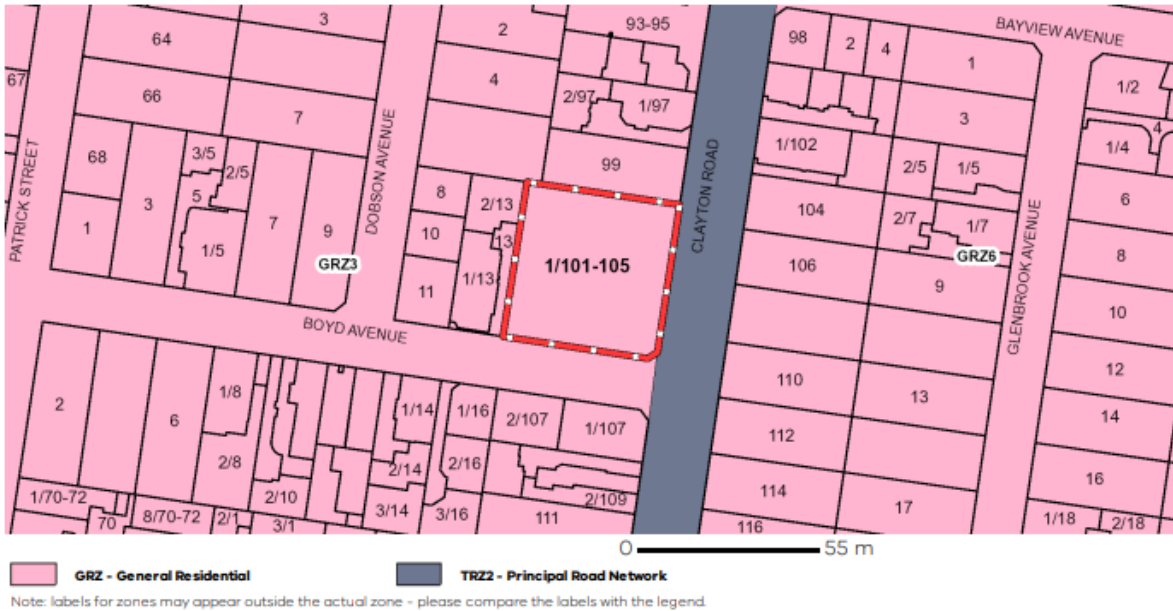


Figure 1: Site location (source: planning.vic.gov.au)

All results generated by this report are based on Town Planning Drawings prepared by RPC Architects, Issue/ P11, 19.07.2022.

Note: ESD initiatives must be shown on the endorsed plan or be included in a schedule to the plan. Additionally, the drawings shall be read in conjunction with the endorsed SMP report.

Disclaimer- This report contains guidelines and recommendations to assist the specified project meet ESD requirements. It is the responsibility of the Owner/Builder to apply said specifications in the later stages of the development to ensure compliance. It is not the responsibility of The Urban Leaf Pty Ltd

1.1 SITE AND DEVELOPMENT DESCRIPTION

The proposed development is located within the General Residential Zone (GRZ) of the Monash City Council. It is approximately 22km south-east of Melbourne's CBD and is currently surrounded by residential buildings. The subject site is currently occupied by 9 single storey brick dwellings which will be demolished prior to commencing the construction. In total, the proposed development will consist of **10 triple storey townhouses**.

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 Within the General Residential Zone (GRZ) of the Monash City Council. It is approximately 22km south-east of Melbourne's CBD and is currently surrounded by residential buildings. The subject site is currently occupied by 9 single storey brick dwellings which will be demolished prior to commencing the construction. In total, the proposed development will consist of **10 triple storey townhouses**.



Figure 2 – Proposed North Elevation (source: RPC Architects)

2. BUILT ENVIRONMENT SUSTAINABILITY SCORECARD (BESS)

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Sustainable design is a critical intervention in today’s-built environment to protect the environment and living standards, as well as future proofing the coming generations. The Sustainable Management Plan contains a summary of environmental initiatives integrated into the design of the subject development, whilst providing information ensuring the following:

- New buildings to meet acceptable environmental performance standards
- Outline environmental objectives and standards required by Council
- Consistent and fair approach to the associated environmental impact
- Flexible methods of meeting environmental standards
- Promote the benefit of sustainability within the development

All information and calculations necessary to produce the report are provided by using version 1.7.0 of the Built Environment Sustainability Scorecard (BESS). The BESS tool (**Appendix A**) assesses energy and water efficiency, thermal comfort, and overall environmental sustainability performance of new buildings or alterations.

There are four mandatory categories with minimum score: Indoor Environment Quality (IEQ), Energy, Water, and Stormwater. The final BESS overall score is determined by the individual category scores:

- ‘Best Practice’ is defined within BESS as an overall score of 50% or above.
- ‘Excellence’ is defined within BESS as an overall score of 70%.

The development has achieved the following BESS scores:

BESS Category	Required Score	Project Score	Compliance
Management	0%	0%	Yes
Water	50%	50%	Yes
Energy	50%	50%	Yes
Stormwater	100%	100%	Yes
IEQ	50%	60%	Yes
Transport	0%	66%	Yes
Waste	0%	50%	Yes
Urban Ecology	0%	37%	Yes
Innovation	0%	0%	Yes
Total Score		52%	Best Practice



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3. CONSTRUCTION AND BUILDING MANAGEMENT

Environmentally Sustainable Design (ESD) Principle – Construction and Building Management should be integrated into the design of the proposed development. These principles will inspire a holistic and integrated design and construction process. It also encourages ongoing high performance.

Key elements may include:

- Environmental Credentials of Project Team; Construction and Operation
- Environmental Management Plan
- Effective Metering

ISSUES	POTENTIAL IMPACT	STRATEGIES AND INNOVATION
Environmental Credentials of Project Team Environmental Management Plan; Construction and Operation	Adopt a formal environmental management system in line with established guidelines during construction.	<ul style="list-style-type: none"> ▪ Appointed contractors will have valid environmental credentials (e.g. ISO 14001 Environmental Management System accreditation, Green Star Accredited Professional and Certified Green Plumber). ▪ A project specific Environmental Management Plan will be implemented during the operation phase.
Effective Metering	Effective metering and monitoring of water and energy consumption will reduce the energy and water consumption in the development.	<ul style="list-style-type: none"> ▪ Utility meters shall be provided for all individual dwellings.

4. WATER RESOURCES

Environmentally Sustainable Design (ESD) Principle - Water resources and its key elements should be integrated into the design of the proposed development. These principles contribute to efficient water usage by reducing total operating potable water use, promoting the collection and re-use of rainwater and stormwater, consequently helping to conserve precious water resources and minimising associated water costs.

Key elements include:

- Fixtures and Fittings
- Appliances
- Landscaping

The following table summarises the approach taken to reduce portable (drinkable) water use by residential and/or non-residential areas within the development. Information below is supported by the following resources: **BESS report (Appendix A)**.



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ISSUES	POTENTIAL IMPACT	STRATEGIES AND INNOVATION
Efficient Fittings & Appliances	Highly efficient fittings and appliances can reduce water use by 50% or more.	<ul style="list-style-type: none"> Showerhead: 3 Star WELS* (>=7.5 but <=9.0) Taps & Basins: 5 Star WELS Toilets: 4 Star WELS Dishwasher: 5 Star WELS All other appliances if provided by the developer will be within one WELS star of the best available.
Efficient Landscaping	Reduces total operating potable water use	<ul style="list-style-type: none"> Water efficient landscaping shall be installed in common garden areas within the development. A water efficient garden should have no irrigation system and not require watering after an initial period when plants are getting established. Native and draught tolerant plants recommended.

5. ENERGY EFFICIENCY

Environmentally Sustainable Design (ESD) Principle - Energy and its main elements contribute to reducing greenhouse emissions by utilising energy efficient appliances, energy conservation measures and renewable energy. In addition to maintaining and improving comfort levels, efficient energy use is vitally important to reduce energy costs and the associated environmental impacts.

- Heating
- Cooling
- Lighting
- Appliances
- Hot water services

The following table summarises energy efficient approach of residential and/or non-residential areas within the development. Information below is supported by the following resources: the **FirstRate 5 assessment software (Appendix D)** and **BESS report (Appendix A)**.

ISSUES	POTENTIAL IMPACT	STRATEGIES AND INNOVATION
Energy Rating	A higher rated dwelling indicates a higher level of thermal energy efficiency, therefore requires less	<ul style="list-style-type: none"> Preliminary energy assessment has been performed on a sample set of 2 thermally unique dwellings within the proposed development. Please refer to Appendix D for

¹ Water Efficiency Labelling and Standards (WELS). Refer to www.waterrating.gov.au for further details.

		ADVERTISED COPY - CITY OF MONASH This copied document is made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act. The document must not be used for any purpose which may breach copyright.												
	heating and cooling during its operational period.	<table border="1"> <thead> <tr> <th></th> <th>Rating</th> <th>Heating</th> <th>Cooling</th> </tr> </thead> <tbody> <tr> <td>Unit 02</td> <td>6.3</td> <td>105.7</td> <td>9.7</td> </tr> <tr> <td>Unit 07</td> <td>6.2</td> <td>101.6</td> <td>14.9</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Energy rating will be completed at the building approval stage. A commitment has been made for the dwelling to have a minimum of 6 Star energy rating. 		Rating	Heating	Cooling	Unit 02	6.3	105.7	9.7	Unit 07	6.2	101.6	14.9
	Rating	Heating	Cooling											
Unit 02	6.3	105.7	9.7											
Unit 07	6.2	101.6	14.9											
Efficient HVAC	Heating and cooling systems may account for up to 40% of a household's energy use, hence efficient systems can significantly reduce the household's carbon footprint and bills.	<ul style="list-style-type: none"> Reverse cycle space heating system (minimum 5 Stars) will be provided in the proposed development. Refrigerative space cooling system (minimum 5 Stars) will be provided in the proposed development. 												
Hot Water System	Accounts for up to 21% of a household's energy use.	<ul style="list-style-type: none"> Gas instantaneous system (minimum 5 Stars) will be provided in the proposed development. 												
Efficient Lighting	Lighting contributes significantly to a dwelling's energy use.	<ul style="list-style-type: none"> LEDs – garage, living areas, kitchen, bedroom, bathroom, laundry, storage, outdoors LEDs or Solar – garden lighting The development shall achieve a maximum illumination power density of 4W/m² or less. 												
Efficient Lighting Design	Common area lighting often runs 24/7, 365 days a year and contributes significantly to a building's energy use.	<ul style="list-style-type: none"> Two-way switching- hallways, stairwells. External lighting to be controlled by motion detectors. Dimmers – bedroom, living areas. 												
Fixed Clothes Lines/Racks	Reduces energy consumption associated with clothes drying.	<ul style="list-style-type: none"> Private outdoor clothesline has been allocated in each dwelling's private open space. 												
Efficient Appliances	Highly efficient appliances can significantly reduce energy consumption.	<ul style="list-style-type: none"> Fridge/freezer (min. 3 stars). All appliances if provided by the developer will be within one energy star of the best available. 												

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6. STORMWATER MANAGEMENT

Environmentally Sustainable Design (ESD) Principle – Melbourne’s rapid urbanisation in recent times has resulted in a significant increase in hard and impervious areas. Efficient Water Sensitive Urban Design (WSUD) ensures natural systems are protected and enhanced whilst promoting on-site detention. Key elements may include:

- Porous paving
- Rain gardens
- Rainwater storage tanks
- Irrigation system

The following table summarises the approach taken to improve stormwater quality and to reduce peak and total stormwater run-off produced by the residential and/or non-residential areas within the development. Information below is supported by the following resources: **STORM report (Appendix B)**.

ISSUES	POTENTIAL IMPACT	STRATEGIES AND INNOVATION
STORM Rating	Complying with best practice guidelines as set by Melbourne Water	<ul style="list-style-type: none"> ▪ The STORM assessment achieves a score of 100%, which satisfies the required minimum.
Stormwater Treatment	Reduction in volume of stormwater and maintaining integrity of stormwater infrastructure is protected. Mains consumption reduced by on-site reuse	<ul style="list-style-type: none"> ▪ 80% of the roof areas for Unit 1 to Unit 10 are to be connected to minimum 2,500L rainwater tanks (10 x 2,500L) for toilet flushing purposes and irrigation area. ▪ 2m2 raingarden on ground level, connected from Unit 10’s balcony catchment area. ▪ The specified capacity above is exclusive for reuse within the building – any detention requirement is additional. ▪ Pathways and pedestrian pavers in common accessway to be permeable pavers. ▪ Trafficable areas, such as balconies and uncovered rooftop areas, have been excluded from rainwater collection areas, as these typically contain more contaminants.
Irrigation System	Increases onsite re-use of collected stormwater	<ul style="list-style-type: none"> ▪ The proposed rainwater tank in each unit shall be used to irrigate the respective SPOS.
Maintenance	Ensures the efficiency and longevity of stormwater interventions	<ul style="list-style-type: none"> ▪ The stormwater management assets are to be maintained periodically as according to the manufacturer’s guidelines or the generic maintenance schedule provided within the Appendix C. ▪ It will be the responsibility of the Owners Corporation to organise the required maintenance and upgrades when required. This includes engaging an appropriate, qualified contractor to conduct the necessary tasks.



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7. INDOOR ENVIRONMENT QUALITY

Environmentally Sustainable Design (ESD) Principle – The key elements of Indoor Environment Quality play a significant role in the health, wellbeing and satisfaction of the development’s occupants. Ensuring a naturally comfortable indoor environment means less dependence on building services such as artificial lighting, mechanical ventilation and heating and cooling devices.

Key elements may include:

- Daylight
- Ventilation
- Thermal Comfort
- Hazardous Materials and VOC

ISSUES	POTENTIAL IMPACT	STRATEGIES AND INNOVATION
Daylight	Access to daylight has physical and mental health benefits for occupants, particularly important for living spaces	<ul style="list-style-type: none"> ▪ Each habitable room will satisfy the minimum NCC Part 3.8.4 light requirement through windows & doors shown on elevations. ▪ No borrowed light to bedrooms.
Ventilation	Reduces demand for mechanical cooling and prevent build-up of indoor pollutants.	<ul style="list-style-type: none"> ▪ All kitchens are ventilated with dedicated and separated extract fans. ▪ Energy efficient mechanical heating and cooling system provided for days with extreme temperatures.
Effective Glazing	Glazing has significant impact on heating and cooling loads of the dwelling.	<ul style="list-style-type: none"> ▪ Double glazed windows shall be installed to all habitable areas. This will provide passive heat gains and reduce energy consumptions. ▪ Glazing to comply with energy report specifications at the building approval stage.
Thermal Comfort	Good thermal comfort enhances health and well being of building occupants while reduces the necessity for heating and cooling.	<ul style="list-style-type: none"> ▪ At least 50% of the living areas of Unit 1 - Unit5, Unit 9 are orientated towards the north. ▪ Good insulation levels will maintain comfortable temperature within the proposed development.



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8. MATERIALS

Environmentally Sustainable Design (ESD) Principle – Materials selection should be integrated into the design of the proposed development. The criteria for appropriate materials used are based on economic and environmental cost.

These key elements include:

- Low VOC
- Concrete
- Best Practice PVC
- Recycled Materials
- Flooring
- Joinery

An analysis of material selection and its impact on the comfort, cost effectiveness and energy efficiency should be assessed. Its aim is to ensure materials selected, and their associated environmental impact are minimised. In addition, consideration for lifecycle of a material, their associated processes and air pollution amounts.

ISSUES	POTENTIAL IMPACT	STRATEGIES AND INNOVATION
Low Volatile Organic Compounds (VOC) Materials	Reduction of ‘off-gassing’ and associated health issues from products with high levels of VOCs	<ul style="list-style-type: none"> ▪ Low VOC paints and flooring. ▪ Low VOC wall and ceiling coverings. ▪ Low VOC adhesives and sealants.
Concrete	Reduces embodied energy in concrete by replacing the cement or aggregate by recycled products.	<ul style="list-style-type: none"> ▪ The development will reduce the quantity of cement by substituting it with industrial waste product or oversized aggregate by 30% for in situ concrete, 20% for pre-cast concrete and 15% for stressed concrete ▪ 20% of all aggregate used for structural purposes is recycled ▪ No natural aggregates are used in non-structural uses
Best Practice PVC	Reduces the environmental and health impacts of Polyvinyl Chloride (PVC) by encouraging the use of PVC material, which adheres to best practice guidelines.	<ul style="list-style-type: none"> ▪ All PVC use and suppliers in the development will meet the ‘Best Practice Guidelines for PVC in the built environment’. This includes cables, pipes, conduits, flooring and blinds. ▪ The usage of PVC in the development, particularly in sanitary plumbing and electrical wiring, shall be minimised. ▪ Use of High-density polyethylene (HDPE) piping for water delivery shall be considered.
Recycled Materials	Decreases the consumption of natural resources and energy.	<ul style="list-style-type: none"> ▪ All timber used in the project will be either plantation or recycled timber. All other timber imports to be FSC2 or AFS3 certified. ▪ All insulation installed within the development

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Flooring	Increases usage of environmentally preferable products.	<ul style="list-style-type: none"> All flooring installed in the development will have Ecospecifier², Green Tag³, Carpet Institute of Australia⁴ or GECA certification⁵.
Joinery	Increases usage of environmentally preferable products.	<ul style="list-style-type: none"> All Joinery installed in the development will have Ecospecifier, Green Tag, or GECA certification.

9. TRANSPORT

Environmentally Sustainable Design (ESD) Principle – Green, or “eco-friendly” buildings encourage people to use modes of transport other than cars to reduce urban air pollution and the generation of greenhouse gas emissions. Alternative transportation can be facilitated by incorporating cyclist facilities and access to public transport networks into the building’s design.

Key elements may include:

- Limited Car Parking
- Bicycle Parking
- Public Transport
- Walk Score
- Trip Reduction – Nearby Amenities

ISSUES	POTENTIAL IMPACT	STRATEGIES AND INNOVATION
Car Parking	Limits the number of car parking spaces provided on site	<ul style="list-style-type: none"> Onsite resident parking space is available and is limited to two car space per unit. Two onsite visitor parking spaces have been provided for the development. Additional visitor parking available on clayton Rd and Bond Av.
Bicycle Parking	Reduces demand on car transport and general public transport, while promoting active and cost effective transportation option	<ul style="list-style-type: none"> 10 secure residential bicycle parking spaces will be provided as required in the BESS assessment. Additionally, 2 secure visitor bicycle parking spaces will be provided as required in the BESS assessment. Refer to architectural drawings for locations.
Public Transport	Acts as an alternative to private vehicle use	<ul style="list-style-type: none"> Approximately 1.8Km to Huntingdale railway station.

²Ecospecifier is a data base of sustainable products. <http://www.ecospecifier.com.au>

³Green Tag is a global product certification organisation. <http://www.Globalgreentage.com>

⁴Carpet Institute of Australia (CIAL) represents carpet manufactures, retailers and suppliers. <http://www.carpetinstitute.com.au>

⁵Good Environmental Choice Australia (GECA) – eco labelling program. <http://geca.org.au>

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Walk Score	A strategically located development may reduce reliance on private vehicles and reduces fossil fuel consumption.	<ul style="list-style-type: none"> The development has achieved a walk score of 79%, which reflects its convenient access to public transport and proximity to multiple amenities.
Trip Reduction – Nearby Amenities	Reduces travel and promotes health and environmental benefits	<ul style="list-style-type: none"> The develop is within close proximities of: Australia Post (450 m) Coles (2.6 Km)

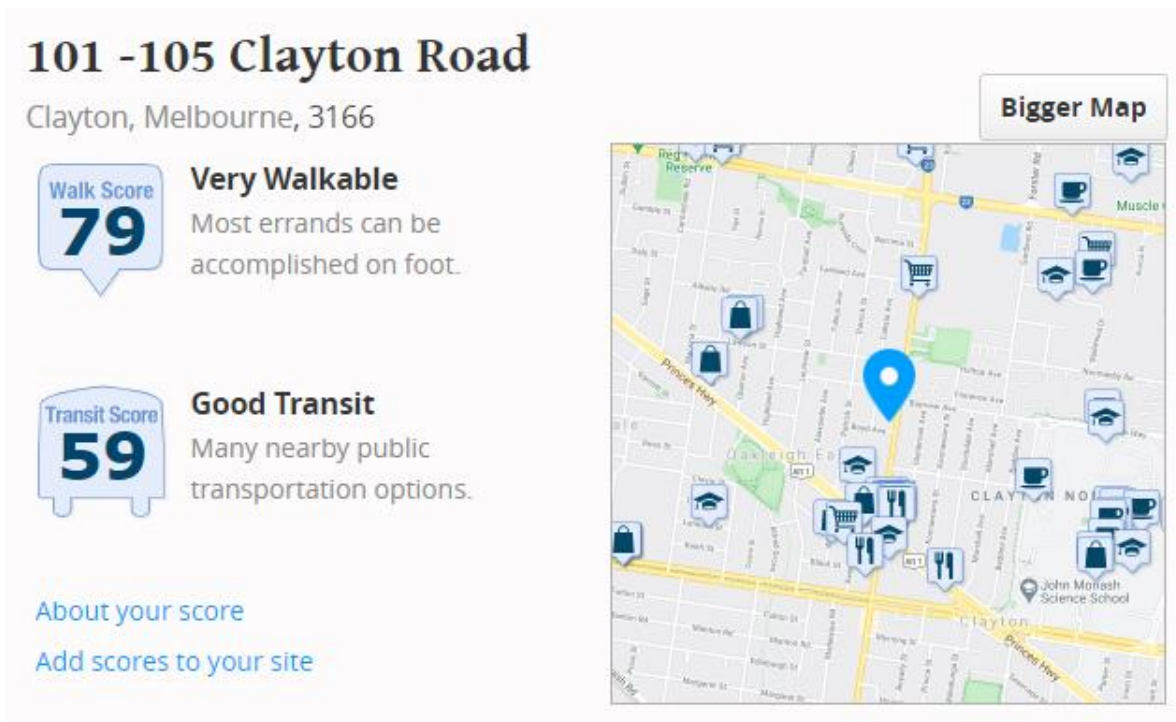


Figure 4: Walk Score (source: walkscore.com)

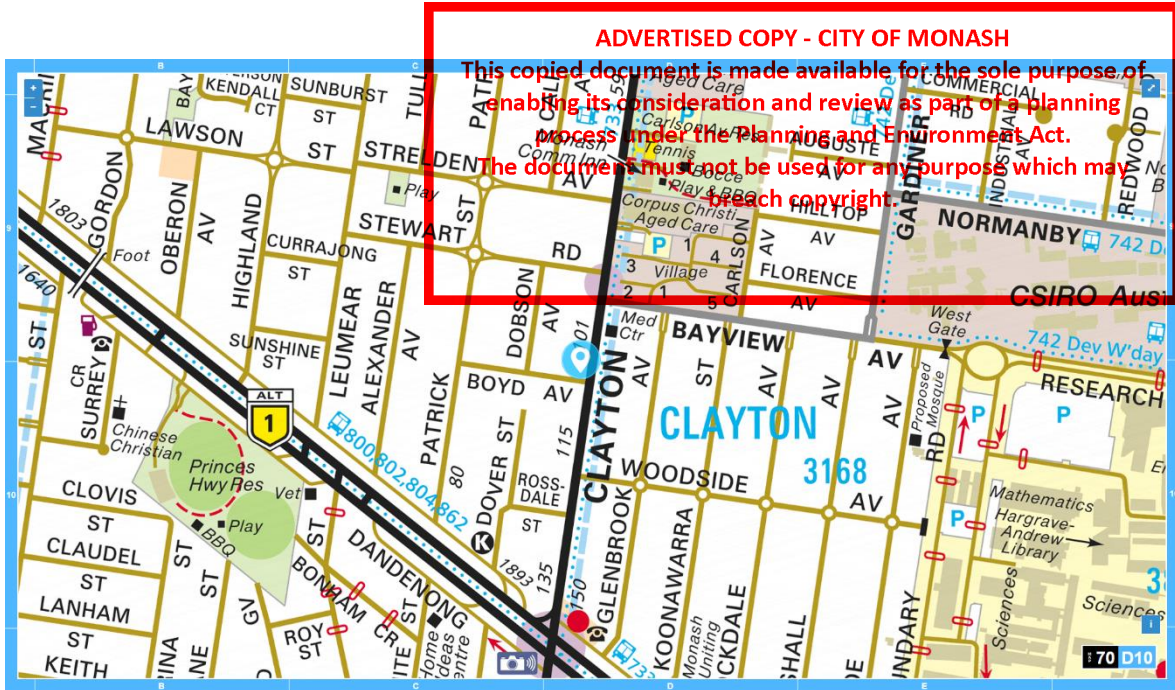


Figure 5: Site Location (source: Melway Online)

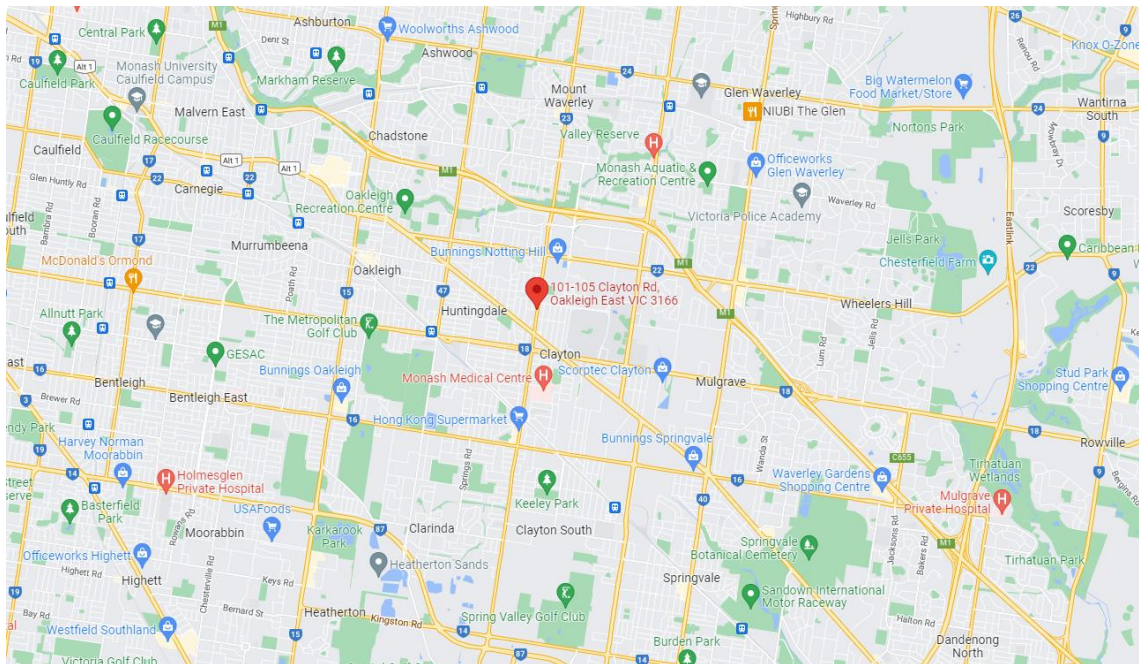


Figure 6: Site Location (source: Google Maps)

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10. WASTE MANAGEMENT

Environmentally Sustainable Design (ESD) Principle – A waste management plan should be incorporated into the design of the proposed development to ensure minimal waste is transported to landfill by means of disposal, recycling and on-site waste storage and/or collection methods.

Key elements may include:

- Operational Waste Management Plan
- Storage of Waste, Recycling and Green Waste

ISSUES	POTENTIAL IMPACT	STRATEGIES AND INNOVATION
Operation Waste Management Plan	Efficient waste practices reduce the amount of waste going to landfill.	<ul style="list-style-type: none"> ▪ The Owners Corporation will implement a waste management plan that retains waste records and annual reports to residents, occupants and owners.
Allocated Spaces for General Waste, Recycle Waste and Green Waste	Ensures waste avoidance and efficient reuse and recycling during the operational life of the building.	<ul style="list-style-type: none"> ▪ Space allocation for waste streams are indicated on plans; a separate WMP report will be prepared.
Food and Garden Waste		<ul style="list-style-type: none"> ▪ The development will be serviced by food and garden waste collection service. This can help to minimise the amount of waste leaving the development.

11. URBAN ECOLOGY

Environmentally Sustainable Design (ESD) Principle – Urban Ecology and its fundamental principles aim to promote and protect ecosystems and biodiversity. Urban and agricultural developments should aim to enhance Urban Ecology by decreasing hard or impervious areas and at the same time increasing vegetation and landscaping opportunities.

Key elements may include:

- Reuse of developed Land
- Maintaining Ecological Value

ISSUES	POTENTIAL IMPACT	STRATEGIES AND INNOVATION
Re-use of Land	Increased density within an established urban area will reduce urban sprawl	<ul style="list-style-type: none"> ▪ The development is a redevelopment of an existing established site.
Maintaining	Encourages the use of	<ul style="list-style-type: none"> ▪ Approximately 26% of the site is covered with

Ecological Value	vegetation and landscaping throughout the development.	<p style="text-align: center;">ADVERTISED COPY - CITY OF MONASH</p> <p>This copied document is made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act. The document must not be used for any purpose which may breach copyright.</p>
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12. IMPLEMENTATION & COMMISSIONING

Implementation of the ESD initiatives outlined in this report requires the following processes:

- Full integration with architectural plans and specifications
- Full integration with building services design drawings and specifications
- Endorsement of the ESD Report with town planning drawings
- ESD initiatives to be included in plans and specifications for building approval
- Submission of a compliance report after construction to ensure no initiatives is omitted.

ASPECT	REQUIREMENT	RESPONSIBILITY
Metering	Install separate utility meters to each individual townhouse	Services Engineer, Builder
Showers	3 star WELS (7.5L/min)	Architect, Builder
Taps	5 star WELS	Architect, Builder
Toilets	4 star WELS	Architect, Builder
Dishwashers	5 star WELS	Architect, Builder
Other Appliances	If provided by developer, specify and install appliances with WELS and energy rating within 1 star of the best available.	Architect, Builder
Water Efficient Landscaping	Water efficient landscaping to be installed.	Landscape Architect, Builder
Rainwater Tank	Specify and install 2,500L tanks to dwelling roofs. Refer to Section 6 of this report for full/partial roof connection.	Architect, Services Engineer, Builder
Energy Assessment	Minimum 6-star energy rating to each dwelling at building permit stage	ESD Consultant, Architect
HVAC	Specify and install reverse cycle heating system (min 5 stars) and refrigerative space cooling system (min 5 stars)	Services Engineer, Builder
Hot Water System	Gas instantaneous hot water system (min 5 stars)	Services Engineer, Builder
Clothes Drying	Foldaway clotheslines to be installed in each dwelling's POS	Architect, Builder

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Lighting	<p>LED, external lighting to be controlled by a motion detector.</p> <p>Each dwelling will achieve a maximum illumination power density of 4W / m² or less.</p>	Services Engineer, Builder
Glazing	Double Glazing (or better) to all habitable areas.	Architect, Energy Rater, Builder
Insulation & Sealing	To be specified according to energy rating and NCC requirements	Architect, Builder
Air Quality	<p>All paints, adhesives, carpet, and engineered wood must meet the maximum total indoor pollutant emission limits.</p> <p>Specified products must meet the relevant certifications.</p>	Architect, Builder
Low VOC Materials	Use low VOC paints, flooring, wall and ceiling coverings, adhesives, and sealant	Builder
PVC	<p>All major PVC use and suppliers to meet best practice guidelines.</p> <p>Usage of PVC in the development, particularly in sanitary plumbing and electrical wiring, to be minimised. Use of HDPE piping for water delivery preferred.</p>	Builder
Recycled Materials	<p>All insulation to contain a minimum of 50% recycled glass and no formaldehyde binder.</p> <p>A minimum of 20% of cement must be replaced with SCM, recycled aggregate and 50% recycled water.</p>	Builder
Timber	All timber used in the project will be either plantation or recycled timber. All other timber imports to be FSC2 or AFS3 certified.	Builder
Flooring	All flooring to have Ecospecifier, Green Tag, Carpet Institute of Australia or GECA certification	Builder

Joinery	All joinery to have Ecospecifier, Green Tag or GECA certification	Builder
Construction Management Plan	Prepare Construction Waste Management Plan prior to construction	Builder
Food & Garden Waste	<p>Ensure the development has access to City of Monash’s food and garden waste collection or private waste collection.</p> <p>Recommended to install facilities to manage food and garden waste onsite, such as compost bins or the like.</p>	<p>Owners Corporation</p> <p>Architect, Builder</p>
Ecological Value	At least 26% of the overall site to be covered with vegetation.	Landscape Architect, Architect, Builder
Bicycle Storage	Specify and install 1 secure bicycle parking for each unit and 2 secure visitor bicycle parking spaces in the development.	Architect, Builder

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Appendix A – BESS Summary Report

Appendix B – STORM Report

Appendix C – Stormwater Asset Maintenance Schedule

Appendix D – Preliminary Energy Rating

Appendix E – SMP Documentation Checklist

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**Appendix A:
BESS Summary Report**

BESS Report

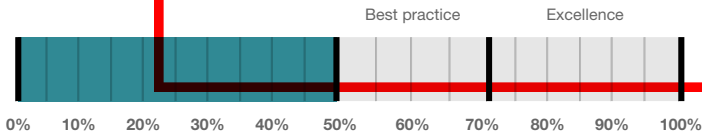
Built Environment Sustainability Scorecard



This BESS report outlines the sustainable design commitments of the proposed development at 101-105 Clayton Rd Oakleigh East VIC 3166. The BESS report and accompanying documents and evidence are submitted in response to the requirement for a Sustainable Design Assessment or Sustainability Management Plan at Monash **ADVERTISED COPY - CITY OF MONASH**

Note that where a Sustainability Management Plan is required, the BESS report must be accompanied by a report that further demonstrates the development's potential to achieve the relevant environmental performance outcomes and documents the means by which the performance outcomes can be achieved. **This copied document is made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act. The document must not be used for any purpose which may breach copyright.**

Your BESS Score



52%

Project details

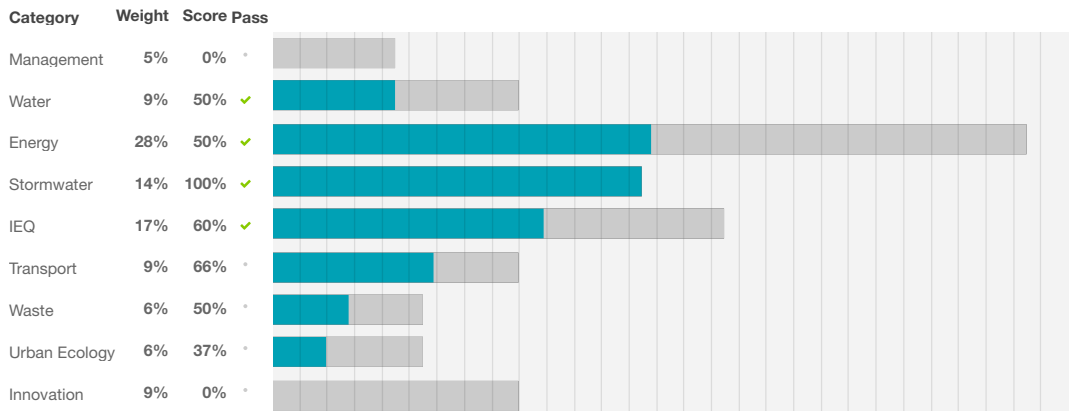
Address 101-105 Clayton Rd Oakleigh East VIC 3166
Project no DA738CE4-R1
BESS Version BESS-6

Site type Multi dwelling (dual occupancy, townhouse, villa unit etc)
Account energy@tul.net.au
Application no.
Site area 2,219.00 m²
Building floor area 1,991.00 m²
Date 23 August 2022
Software version 1.7.0-B.388



Performance by category

● Your development ● Maximum available



Dwellings & Non Res Spaces

Dwellings

Name	Quantity	Area	% of total area
Townhouse			
Townhouse 10	1	201 m ²	10%
Townhouse 9	1	201 m ²	10%
Townhouse 4	1	201 m ²	10%
Townhouse 3	1	201 m ²	10%
Townhouse 2	1	201 m ²	10%
Townhouse 1	1	206 m ²	10%
Townhouse 8	1	192 m ²	9%
Townhouse 7	1	194 m ²	9%
Townhouse 6	1	188 m ²	9%
Townhouse 5	1	199 m ²	9%
Total	10	1,991 m²	100%

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Supporting information

Floorplans & elevation notes

Credit	Requirement	Response	Status
Water 3.1	Water efficient garden annotated	To be printed Refer to submitted documents	✓
Energy 3.3	External lighting sensors annotated	To be printed Refer to submitted documents	✓
Energy 3.4	Clothes line annotated (if proposed)	To be printed Refer to submitted documents	✓
Stormwater 1.1	Location of any stormwater management systems used in STORM or MUSIC modelling (e.g. Rainwater tanks, raingarden, buffer strips)	To be printed Refer to submitted documents	✓
IEQ 3.1	Glazing specification to be annotated	To be printed Refer to submitted documents	✓
IEQ 3.3	North-facing living areas	To be printed Refer to submitted documents	✓
Transport 1.1	All nominated residential bicycle parking spaces	To be printed Refer to submitted documents	✓
Transport 1.2	All nominated residential visitor bicycle parking spaces	To be printed Refer to submitted documents	✓
Waste 2.1	Location of food and garden waste facilities	To be printed Refer to submitted documents	✓
Urban Ecology 2.1	Vegetated areas	To be printed Refer to submitted documents	✓

Supporting evidence

Credit	Requirement	Response	Status
Energy 3.5	Provide a written description of the average lighting power density to be installed in the development and specify the lighting type(s) to be used.	To be printed Architectural Plans Refer to submitted documents	✓
Stormwater 1.1	STORM report or MUSIC model	To be printed STORM Calculator Refer to submitted documents	✓

Credit	Requirement	Response	Status
IEQ 3.1	Reference to floor plans or energy modelling showing the glazing specification (U-value and Solar Heat Gain Coefficient, SHGC)	To be printed Green Star Certificate Refer to submitted documents	✓
IEQ 3.3	Reference to the floor plans showing living areas orientated to the north.	To be printed Architectural Plans Refer to submitted documents	✓

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Credit summary

Management Overall contribution 4.5%

Item	Contribution	Percentage
1.1 Pre-Application Meeting		0%
2.2 Thermal Performance Modelling - Multi-Dwelling Residential		0%
4.1 Building Users Guide		0%

Water Overall contribution 9.0%

Item	Contribution	Percentage	Requirement	Status
			Minimum required 50%	50% ✓ Pass
1.1 Potable water use reduction		40%		
3.1 Water Efficient Landscaping		100%		

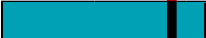




Energy Overall contribution 27.5%

Item	Contribution	Percentage	Requirement	Status
			Minimum required 50%	50% ✓ Pass
1.2 Thermal Performance Rating - Residential		0%		
2.1 Greenhouse Gas Emissions		100%		
2.2 Peak Demand		0%		
2.3 Electricity Consumption		100%		
2.4 Gas Consumption		100%		
2.5 Wood Consumption		N/A		✚ Scoped Out
No wood heating system present				
3.2 Hot Water		100%		
3.3 External Lighting		100%		
3.4 Clothes Drying		100%		
3.5 Internal Lighting - Residential Single Dwelling		100%		
4.4 Renewable Energy Systems - Other		0%		⊘ Disabled
No other (non-solar PV) renewable energy is in use.				
4.5 Solar PV - Houses and Townhouses		0%		⊘ Disabled
No solar PV renewable energy is in use.				

Stormwater Overall contribution 13.5%

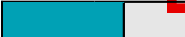



		Minimum required 100%	100%	✓ Pass
1.1 Stormwater Treatment			100%	

IEQ Overall contribution 16.5%




		Minimum required 60%	60%	✓ Pass
2.2 Cross Flow Ventilation			0%	
3.1 Thermal comfort - Double Glazing			100%	
3.2 Thermal Comfort - External Shading			0%	
3.3 Thermal Comfort - Orientation			100%	

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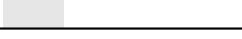
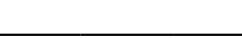
Transport Overall contribution 9.0%

			66%	
1.1 Bicycle Parking - Residential			100%	
1.2 Bicycle Parking - Residential Visitor			100%	
2.1 Electric Vehicle Infrastructure			0%	

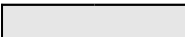
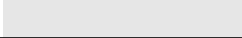
Waste Overall contribution 5.5%

			50%	
1.1 - Construction Waste - Building Re-Use			0%	
2.1 - Operational Waste - Food & Garden Waste			100%	

Urban Ecology Overall contribution 5.5%

			37%	
2.1 Vegetation			75%	
2.2 Green Roofs			0%	
2.3 Green Walls and Facades			0%	
2.4 Private Open Space - Balcony / Courtyard Ecology			0%	
3.1 Food Production - Residential			0%	

Innovation Overall contribution 9.0%

			0%	
1.1 Innovation			0%	

Credit breakdown

Management Overall contribution 0%

1.1 Pre-Application Meeting		0%
Score Contribution	This credit contributes 50.0% towards the category score.	
Criteria	Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?	
Question	Criteria Achieved ?	
Project	No	
2.2 Thermal Performance Modelling - Multi-Dwelling Residential		0%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	Have preliminary NatHERS ratings been undertaken for all thermally unique dwellings?	
Question	Criteria Achieved ?	
Townhouse	No	
4.1 Building Users Guide		0%
Score Contribution	This credit contributes 16.7% towards the category score.	
Criteria	Will a building users guide be produced and issued to occupants?	
Question	Criteria Achieved ?	
Project	No	

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Water Overall contribution 4% Minimum required 50%

Water Approach	
What approach do you want to use for Water?:	Use the built in calculation tools
Project Water Profile Question	
Do you have a reticulated third pipe or an on-site water recycling system?:	No
Are you installing a swimming pool?:	No
Are you installing a rainwater tank?:	Yes
<p>Water fixtures, fittings and connections</p> <p>Showerhead: All 3 Star WELS (>= 7.5 but <= 9.0) (minimum requirement)</p> <p>Bath: All Medium Sized Contemporary Bath</p> <p>Kitchen Taps: All >= 5 Star WELS rating</p> <p>Bathroom Taps: All >= 5 Star WELS rating</p> <p>Dishwashers: All >= 5 Star WELS rating</p> <p>WC: All >= 4 Star WELS rating</p> <p>Urinals: All Scope out</p> <p>Washing Machine Water Efficiency: All Occupant to Install</p>	
Which non-potable water source is the dwelling/space connected to?:	
Townhouse 1	Unit 1
Townhouse 2	Unit 2
Townhouse 3	Unit 3
Townhouse 4	Unit 4
Townhouse 5	Unit 5
Townhouse 6	Unit 6
Townhouse 7	Unit 7
Townhouse 8	Unit 8
Townhouse 9	Unit 9
Townhouse 10	Unit 10
Non-potable water source connected to Toilets: All	Yes
Non-potable water source connected to Laundry (washing machine): All	No
Non-potable water source connected to Hot Water System: All	No
Rainwater Tanks	

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What is the total roof area connected to the rainwater tank?:

Unit 1	84.4 m ²
Unit 2	85.7 m ²
Unit 3	84.7 m ²
Unit 4	85.4 m ²
Unit 5	86.3 m ²
Unit 6	72.9 m ²
Unit 7	75.3 m ²
Unit 8	75.4 m ²
Unit 9	83.2 m ²
Unit 10	79.8 m ²

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Tank Size:

Unit 1	2,500 Litres
Unit 2	2,500 Litres
Unit 3	2,500 Litres
Unit 4	2,500 Litres
Unit 5	2,500 Litres
Unit 6	2,500 Litres
Unit 7	2,500 Litres
Unit 8	2,500 Litres
Unit 9	2,500 Litres
Unit 10	2,500 Litres

Irrigation area connected to tank:

Unit 1	59.3 m ²
Unit 2	48.0 m ²
Unit 3	38.7 m ²
Unit 4	41.1 m ²
Unit 5	35.8 m ²
Unit 6	28.4 m ²
Unit 7	26.2 m ²
Unit 8	23.5 m ²
Unit 9	26.4 m ²
Unit 10	52.3 m ²

Is connected irrigation area a water efficient garden?:

Unit 1	Yes
Unit 2	Yes
Unit 3	Yes
Unit 4	Yes
Unit 5	Yes
Unit 6	Yes
Unit 7	Yes
Unit 8	Yes
Unit 9	Yes
Unit 10	Yes

Other external water demand connected to tank?:	
Unit 1	0.0 Litres/Day
Unit 2	0.0 Litres/Day
Unit 3	0.0 Litres/Day
Unit 4	0.0 Litres/Day
Unit 5	0.0 Litres/Day
Unit 6	0.0 Litres/Day
Unit 7	0.0 Litres/Day
Unit 8	0.0 Litres/Day
Unit 9	0.0 Litres/Day
Unit 10	0.0 Litres/Day

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1.1 Potable water use reduction		40%
Score Contribution	This credit contributes 83.3% towards the category score.	
Criteria	What is the reduction in total potable water use due to efficient fixtures, appliances, rainwater use and recycled water use? To achieve points in this credit there must be >25% potable water reduction.	
Output	Reference	
Project	2487 kL	
Output	Proposed (excluding rainwater and recycled water use)	
Project	2190 kL	
Output	Proposed (including rainwater and recycled water use)	
Project	1835 kL	
Output	% Reduction in Potable Water Consumption	
Project	26 %	
Output	% of connected demand met by rainwater	
Project	95 %	
Output	How often does the tank overflow?	
Project	Very Often	
Output	Opportunity for additional rainwater connection	
Project	892 kL	

3.1 Water Efficient Landscaping		100%
Score Contribution	This credit contributes 16.7% towards the category score.	
Criteria	Will water efficient landscaping be installed?	
Question	Criteria Achieved ?	
Project	Yes	

Energy Overall contribution 14% Minimum required 50%

Dwellings Energy Approach	
What approach do you want to use for Energy?:	Use the built in calculation tools
Project Energy Profile Question	
Are you installing any solar photovoltaic (PV) system(s)?:	No
Are you installing any other renewable energy system(s)?:	No
Gas supplied into building:	Natural Gas
Dwelling Energy Profiles	
Below the floor is: All	Ground or Carpark
Above the ceiling is: All	Outside
Exposed sides:	
Townhouse 1	3
Townhouse 5	
Townhouse 6	
Townhouse 2	2
Townhouse 3	
Townhouse 4	
Townhouse 7	
Townhouse 8	
Townhouse 9	
Townhouse 10	
NatHERS Annual Energy Loads - Heat:	
Townhouse 1	112 MJ/sqm
Townhouse 9	
Townhouse 10	
Townhouse 2	106 MJ/sqm
Townhouse 3	
Townhouse 4	
Townhouse 5	
Townhouse 6	102 MJ/sqm
Townhouse 7	
Townhouse 8	
NatHERS Annual Energy Loads - Cool:	
Townhouse 1	13.0 MJ/sqm
Townhouse 9	
Townhouse 10	
Townhouse 2	9.7 MJ/sqm
Townhouse 3	
Townhouse 4	
Townhouse 5	
Townhouse 6	14.9 MJ/sqm
Townhouse 7	
Townhouse 8	


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NatHERS star rating:	
Townhouse 1	6.0
Townhouse 9	
Townhouse 10	
Townhouse 2	6.3
Townhouse 3	
Townhouse 4	
Townhouse 5	
Townhouse 6	6.2
Townhouse 7	
Townhouse 8	
Type of Heating System: All	D Reverse cycle space
Heating System Efficiency: All	5 Star
Type of Cooling System: All	Refrigerative space
Cooling System Efficiency: All	5 Stars
Type of Hot Water System: All	I Gas Instantaneous 5 star
% Contribution from solar hot water system: All	0 %
Is the hot water system shared by multiple dwellings?: All	No
Clothes Line: All	D Private outdoor clothesline
Clothes Dryer: All	A No clothes dryer

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1.2 Thermal Performance Rating - Residential		0%
Score Contribution	This credit contributes 30.0% towards the category score.	
Criteria	What is the average NatHERS rating?	
Output	Average NATHERS Rating (Weighted)	
Townhouse	6.2 Stars	

2.1 Greenhouse Gas Emissions		100%
Score Contribution	This credit contributes 10.0% towards the category score.	
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?	
Output	Reference Building with Reference Services (BCA only)	
Townhouse	98,202 kg CO2	
Output	Proposed Building with Proposed Services (Actual Building)	
Townhouse	30,688 kg CO2	
Output	% Reduction in GHG Emissions	
Townhouse	68 %	

2.2 Peak Demand		0%
Score Contribution	This credit contributes 5.0% towards the category score.	
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?	
Output	Peak Thermal Cooling Load - Baseline	
Townhouse	120 kW	
Output	Peak Thermal Cooling Load - Proposed	
Townhouse	120 kW	
Output	Peak Thermal Cooling Load - % Reduction	
Townhouse	0 %	
2.3 Electricity Consumption		100%
Score Contribution	This credit contributes 10.0% towards the category score.	
Criteria	What is the % reduction in annual electricity consumption against the benchmark?	
Output	Reference	
Townhouse	86,190 kWh	
Output	Proposed	
Townhouse	21,210 kWh	
Output	Improvement	
Townhouse	75 %	
2.4 Gas Consumption		100%
Score Contribution	This credit contributes 10.0% towards the category score.	
Criteria	What is the % reduction in annual gas consumption against the benchmark?	
Output	Reference	
Townhouse	200,160 MJ	
Output	Proposed	
Townhouse	176,159 MJ	
Output	Improvement	
Townhouse	11 %	
2.5 Wood Consumption		N/A  Scoped Out
This credit was scoped out	No wood heating system present	
3.2 Hot Water		100%
Score Contribution	This credit contributes 5.0% towards the category score.	
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?	
Output	Reference	
Townhouse	55,600 kWh	
Output	Proposed	
Townhouse	49,601 kWh	
Output	Improvement	
Townhouse	10 %	

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3.3 External Lighting		100%
Score Contribution	This credit contributes 5.0% towards the category score.	
Criteria	Is the external lighting controlled by a motion detector?	
Question	Criteria Achieved ?	
Townhouse	Yes	
3.4 Clothes Drying		100%
Score Contribution	This credit contributes 5.0% towards the category score.	
Criteria	Does the development have a clothes drying system (gas and electricity) from a main or separate meter, with a maximum energy consumption benchmark?	
Output	Refer to the Planning and Environment Act	
Townhouse	7,558 kWh	
Output	Proposed	
Townhouse	1,512 kWh	
Output	Improvement	
Townhouse	80 %	
3.5 Internal Lighting - Residential Single Dwelling		100%
Score Contribution	This credit contributes 5.0% towards the category score.	
Criteria	Does the development achieve a maximum illumination power density of 4W/sqm or less?	
Question	Criteria Achieved?	
Townhouse	Yes	
4.4 Renewable Energy Systems - Other		0% <input type="checkbox"/> Disabled
This credit is disabled	No other (non-solar PV) renewable energy is in use.	
4.5 Solar PV - Houses and Townhouses		0% <input type="checkbox"/> Disabled
This credit is disabled	No solar PV renewable energy is in use.	

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Stormwater Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using?:		Melbourne Water STORM tool
1.1 Stormwater Treatment		100%
Score Contribution	This credit contributes 100.0% towards the category score.	
Criteria	Has best practice stormwater management been demonstrated?	
Question	STORM score achieved	
Project	100	
Output	Min STORM Score	
Project	100	

IEQ Overall contribution 10% Minimum required 50%

2.2 Cross Flow Ventilation		0%
Score Contribution	This credit contributes 20.0% towards the category score.	
Criteria	Are all habitable rooms designed to achieve natural cross flow ventilation?	
Question	Criteria Achieved ?	
Townhouse	No	
3.1 Thermal Comfort - Double Glazing		100%
Score Contribution	This credit contributes 40.0% towards the category score.	
Criteria	Is double glazing (or better) used to all habitable areas?	
Question	Criteria Achieved ?	
Townhouse	Yes	
3.2 Thermal Comfort - External Shading		0%
Score Contribution	This credit contributes 20.0% towards the category score.	
Criteria	Is appropriate external shading provided to east, west and north facing glazing?	
Question	Criteria Achieved ?	
Townhouse	No	
3.3 Thermal Comfort - Orientation		100%
Score Contribution	This credit contributes 20.0% towards the category score.	
Criteria	Are at least 50% of living areas orientated to the north?	
Question	Criteria Achieved ?	
Townhouse	Yes	

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Transport Overall contribution 6%

1.1 Bicycle Parking - Residential		100%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	How many secure and undercover bicycle spaces are there per dwelling for residents?	
Question	Bicycle Spaces Provided ?	
Townhouse	10	
Output	Min Bicycle Spaces Required	
Townhouse	10	
1.2 Bicycle Parking - Residential Visitor		100%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	How many secure bicycle spaces are there per 5 dwellings for visitors?	
Question	Visitor Bicycle Spaces Provided ?	
Townhouse	2	
Output	Min Visitor Bicycle Spaces Required	
Townhouse	2	
2.1 Electric Vehicle Infrastructure		0%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	Are facilities provided for the charging of electric vehicles?	
Question	Criteria Achieved ?	
Project	No	

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Waste Overall contribution 3%

1.1 - Construction Waste - Building Re-Use		0%
Score Contribution	This credit contributes 50.0% towards the category score.	
Criteria	If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used?	
Question	Criteria Achieved ?	
Project	No	
2.1 - Operational Waste - Food & Garden Waste		100%
Score Contribution	This credit contributes 50.0% towards the category score.	
Criteria	Are facilities provided for on-site management of food and garden waste?	
Question	Criteria Achieved ?	
Project	Yes	

Urban Ecology Overall contribution 2%

2.1 Vegetation		75%
Score Contribution	This credit contributes 50.0% towards the category score.	
Criteria	How much of the site is covered with vegetation, expressed as a percentage of the total site area?	
Question	Percentage Achieved ?	
Project	26 %	
2.2 Green Roofs		0%
Score Contribution	This credit contributes 12.5 % towards the category score.	
Criteria	Does the development incorporate a green roof?	
Question	Criteria Achieved ?	
Project	No	
2.3 Green Walls and Facades		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Does the development incorporate a green wall or green façade?	
Question	Criteria Achieved ?	
Project	No	
2.4 Private Open Space - Balcony / Courtyard Ecology		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Is there a tap and floor waste on every balcony / in every courtyard?	
Question	Criteria Achieved ?	
Townhouse	No	
3.1 Food Production - Residential		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	What area of space per resident is dedicated to food production?	
Question	Food Production Area	
Townhouse	0.0 m²	
Output	Min Food Production Area	
Townhouse	9 m²	

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Innovation Overall contribution 0%

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

Disclaimer

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

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**Appendix B:
STORM Report**



STORM Rating Report

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TransactionID: 1435888
Municipality: MONASH
Rainfall Station: MONASH
Address: 101-105 Clayton Road

Oakleigh East
VIC 3166

Assessor: The Urban Leaf
Development Type: Residential - Multiunit
Allotment Site (m2): 2,219.60
STORM Rating %: 100

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
80% Roof Area Unit 1 to Unit 10 (RWT)	813.11	Rainwater Tank	25,000.00	35	164.00	80.80
Untreated Roof Area Unit 1 to Unit 10	203.27	None	0.00	0	0.00	0.00
Unit 6 to Unit 9 Balconies (Untreated)	77.11	None	0.00	0	0.00	0.00
Concrete Driveway	251.54	None	0.00	0	0.00	0.00
Unit 10 Balcony (Raingarden)	18.70	Raingarden 100mm	2.00	0	134.00	0.00

Date Generated: 23-Aug-2022

Program Version: 1.0.0

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Appendix C: Stormwater Treatment Maintenance Schedule

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Once endorsed, it is the responsibility of the Owners Corporation to ensure that the stormwater treatment assets are maintained as according to the maintenance schedule provided by the manufacturer’s guidelines or the schedule proposed below:

Rainwater Tank

Description	Action	Maintenance Frequency
Gutter guards	<ul style="list-style-type: none"> Inspection & cleaning 	Every 6 months
Leaf diverters	<ul style="list-style-type: none"> Inspection & cleaning 	Every 6 months
First flush diverters	<ul style="list-style-type: none"> Inspection & cleaning 	Every 6 months
Water tank	<ul style="list-style-type: none"> Prune overhanging tree branches and foliage Inspection for defects and repair or replace as required. 	Every 6 months
Water tank	<ul style="list-style-type: none"> Monitoring sediment build-up & cleaning 	1 – 2 years

Raingardens

Description	Action	Maintenance Frequency
Litter and organics	<ul style="list-style-type: none"> Litter removal Check for algal biofilms that may cause clogging issues 	Every 3 months
Vegetation	<ul style="list-style-type: none"> Weeds removal Dead plants replacement Prune and water plants 	Every 3 months
Mulch	<ul style="list-style-type: none"> Replace or top up mulch Check depth of mulch Making sure that mulch is distributed evenly 	Every 3 months
Civil components	<ul style="list-style-type: none"> Inspect functional elements for damage and repair as required. Check and clear sediment, litter and debris in inlet and outlet points. 	Every 3 months

Permeable Pavement

Description	Action	Maintenance Frequency
Inflow to porous joints and/or permeable pavers	<ul style="list-style-type: none"> Re-profile the surface with hand tools and top up joint and drainage layer material Remove rubbish, leaf litter or sediment 	Every 3 months
Blocked pavement	<ul style="list-style-type: none"> Remove sediment build up by vacuum sweeping or manually sweeping. Once removed, dispose of sediment in nearby grassed areas or garden beds. 	Every 3 months



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Soggy and boggy soils	<ul style="list-style-type: none"> Ensure that bedding and drainage layer contain appropriate material and haven't become blocked by fines. Replace the material as needed. 	Every 3 months
Underdrainage	<ul style="list-style-type: none"> Ensure that the water is flowing in the underdrain following rainfall by lifting pavers and inspect for blockages 	Every 3 months

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**Appendix D:
Preliminary Energy Rating**

Summary

The following summary outlines the inclusions and allowances made to design. To achieve the above results, these are to be included on building plans and any relevant specification, and also read in conjunction with any relevant NCC 2019 Amendment 1 provisions.

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Floor:

- Concrete slab on ground with R1.1 insulation in Unit 07, excluding garage and Unit 02.
- Timber floor with R2.5 bulk insulation in Unit 07, excluding Unit 02.
- Where no floor coverings are specified, NatHERS default values have been applied.

Internal Walls – internal walls adjacent to garage and bathroom:

- Internal Plasterboard Stud Wall (INT) with minimum R2.5 bulk insulation.

External Walls:

- Brick Veneer (BV) with R2.5 bulk insulation & reflective foil (E=0.05/0.9).
- Double Brick (DB) without insulation to external garage walls.
- Fibro Clad Framed (FC) with R2.5 bulk insulation & reflective foil (E=0.05/0.9).
- Party walls with R2.0 bulk insulation to both sides.

Roof/Ceiling:

- Flat-flat framed (metal deck) roof with
 - Ceiling level – a minimum of R4.0 bulk insulation.

Insulation general:

Where required, insulation must comply with AS/NZS 4859.1 and be installed so that it –

- Abuts or overlaps adjoining insulation; and
- Forms a continuous barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and
- Does not affect the safe or effective operation of a service or fitting.

Where required, reflective insulation must be installed with –

- The necessary airspace to achieve the required R-Value between a reflective side of the reflective insulation and a building lining or cladding; and
- The reflective insulation closely fitted against any penetration, door or window opening; and
- The reflective insulation adequately supported by framing members; and
- Each adjoining sheet of roll membrane being overlapped not less than 50 mm; or taped together.

Where required, bulk insulation must be installed so that

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- It maintains its position and thickness, other than where it crosses roof battens, water pipes, electrical cabling or the like;
- And so that in a ceiling, where there is no bulk insulation or reflective insulation in the wall beneath, it overlaps the wall by not less than 50mm.

Glazing:

Window type	Total System U-Value	Total System SHGC	Windows applied to
Aluminium double-glazed	4.80	0.51	All awning windows and casement glazed doors in Unit 02.
	4.80	0.59	All fixed and sliding windows in U02.
Aluminium double-glazed	4.10	0.47	All awning windows in Unit 07.
	4.10	0.52	All fixed and sliding windows in U07.
Aluminium double-glazed skylight	2.53	0.21	Openable skylights.
Aluminium double-glazed skylight	2.58	0.24	Fixed skylights.

All system values published on www.wers.net or refer to window manufacturer's tested data.

- **Window substitutions need to be of lower U-value and within +5%/-5% range for the SHGC value specified above.**
- Window manufacturers' tested data is to be sought to ensure compliance with the above figures.
- All glazed units are to have a seal to restrict air infiltration to each edge of an opening window sash

Doors:

External swing doors to be fitted with a draught protection device to the bottom edge of each leaf.

Artificial Lighting:

- The NCC 2019 Amendment 1 incorporates provision to address the artificial lighting including any lamps, ballasts current regulators and control device in W/m².
- Approved fireproof downlight covers, which can be fully covered by insulation will be specified.
- All recessed down lights must be sealed against air leakage into attic/roof spaces.

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- As according to the NCC 2019 Amendment 1 Part 3.12.5.5, the lamp power density or illumination power density of artificial lighting, excluding heaters that emit light, must not exceed the allowance of
 - i. 5 W/m² in Class 1 building; and
 - ii. 4 W/m² on a verandah, balcony or the like attached to Class 1 building
 - iii. 3 W/m² in a class 10 building associated with Class 1 building.

Service:

- Refer to NCC 2019 Amendment 1 3.12.5 for details of insulation to hot water service and heating and cooling ducting.

This document forms part of the energy rating reports and town planning documentation. It is to be included in all document submissions. Assessed plans are to be submitted to council for town planning approval. Any variation from approved rated plans, without further written approval from The Urban Leaf P/L make the previous reports and plans outdated and cannot be used for a town planning submission.

Nationwide House Energy Rating Scheme

NatHERS Certificate No. F4DZK5AZCU

Generated on 24 Aug 2022 using FirstRate5: 5.3.2b (3.21)

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6.3
The more stars the more energy efficient.
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Property

Address 02, 101-105 Clayton Rd, Oakleigh East, VIC, 3166
Lot/DP -
NCC Class* Class 1a
Type New Home

Plans

Main plan RPC Architects
Prepared by P8/19.07.2022

115.4 MJ/m²

Predicted annual energy load for heating and cooling based on standard occupancy assumptions.

For more information on your dwelling's rating see:
www.nathers.gov.au

Construction and environment

Assessed floor area (m²)*		Exposure type
Conditioned*	159.9	suburban
Unconditioned*	42.5	NatHERS climate zone
Total	202.4	62 Moorabbin Airport
Garage	36.1	

Thermal performance

Heating	Cooling
105.7	9.7
MJ/m²	MJ/m²

About the rating

NatHERS software models the expected thermal energy loads using information about the design and construction, climate and common patterns of household use. The software does not take into account appliances, apart from the airflow impacts from ceiling fans.

Verification

To verify this certificate, scan the QR code or visit www.FR5.com.au When using either link, ensure you are visiting



Accredited assessor

Name	Crystal Ter
Business name	The Urban Leaf
Email	Energy@tul.net.au
Phone	03 8899 6149
Accreditation No.	DMN/10/2014
Assessor Accrediting Organisation	Design Matters National
Declaration of interest	Declaration completed: no conflicts

National Construction Code (NCC) requirements

The NCC's requirements for NatHERS-rated houses are detailed in 3.12.0(a)(i) and 3.12.5 of the NCC Volume Two. For apartments the requirements are detailed in J0.2 and J5 to J8 of the NCC Volume One.

In NCC 2019, these requirements include minimum star ratings and separate heating and cooling load limits that need to be met by buildings and apartments through the NatHERS assessment. Requirements additional to the NatHERS assessment that must also be satisfied include, but are not limited to: insulation installation methods, thermal breaks, building sealing, water heating and pumping, and artificial lighting requirements. The NCC and NatHERS Heating and Cooling Load Limits (Australian Building Codes Board Standard) are available at www.abcb.gov.au.

State and territory variations and additions to the NCC may also apply.

* Refer to glossary.

Certificate Check

Ensure the dwelling is designed and then built as per the NatHERS Certificate. While you need to check the accuracy of the whole Certificate, the following spot check covers some important items impacting the dwelling's rating.

Genuine certificate

Does this Certificate match the one available at the web address or QR code in the verification box on the front page?
Does the set of NatHERS-stamped plans for the dwelling have a Certificate number on the stamp that matches this Certificate?

Ceiling penetrations*

Does the 'number' and 'type' of ceiling penetrations (e.g. downlights, exhaust fans, etc) shown on the stamped plans or installed, match what is shown in this Certificate?

Windows

Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate? Substituted values must be based on the Australian Fenestration Rating Council (AFRC) protocol.

Apartment entrance doors

Does the 'External Door Schedule' show apartment entrance doors? Please note that an "external door" between the modelled dwelling and a shared space, such as an enclosed corridor or foyer, should not be included in the assessment (because it overstates the possible ventilation) and would invalidate the Certificate.

Exposure*

Has the appropriate exposure level (terrain) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".

Provisional* values

Have provisional values been used in the assessment and, if so, noted in "additional notes" below?

Additional Notes

Window and glazed door *type and performance*

Default* windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
ALM-003-01 A	Aluminium A DG Air Fill Clear-Clear	4.8	0.51	0.48	0.54
ALM-004-01 A	Aluminium B DG Air Fill Clear-Clear	4.8	0.59	0.56	0.62

Custom* windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

Window and glazed door *Schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orientation	Window shading device*
Kitchen/Living	ALM-003-01 A	Opening 17	1600	950	awning	90.0	N	No
Kitchen/Living	ALM-004-01 A	Opening 16	2400	3800	sliding	45.0	N	No
Ens 1	ALM-003-01 A	Opening 18	1540	1200	awning	90.0	N	No
Bed 1	ALM-004-01 A	Opening 28	1540	350	fixed	0.0	N	No

* Refer to glossary.

Bed 1	ALM-003-01 A	Opening 19	2400	900	awning	60.0	N	No
Bed 1	ALM-003-01 A	Opening 20	2400	820	casement	90.0	N	No
Ens 2	ALM-003-01 A	Opening 27	600	1400	awning	90.0	S	No
Bed 2	ALM-003-01 A	Opening 26	1450	2400	awning	45.0	S	No
Bed 3	ALM-003-01 A	Opening 22	600	2200	awning	45.0	W	No
Bed 3	ALM-003-01 A	Opening 21	1540	2400	awning	30.0	N	No
Bath	ALM-003-01 A	Opening 25	600	1400	awning	90.0	S	No
Kids Retreat	ALM-003-01 A	Opening 23	1540	1100	awning	60.0	N	No
Bed 4	ALM-003-01 A	Opening 24	1540	2400	awning	30.0	S	No

Roof window type and performance value

Default* roof windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

Custom* roof windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
Velux:VEL-011-01 W	VELUX FS - Fixed Skylight DG 3mm LoE 366 / 8.5mm Argon Gap / 5.36mm Clear La	2.58	0.24	0.23	0.25
Velux:VEL-010-01 W	VELUX VS - Ventilating Skylight DG 3mm LoE 366 / 8.5mm Argon Gap / 5.36mm Clear La	2.53	0.21	0.2	0.22

Roof window schedule

Location	Window ID	Window no.	Opening %	Area (m ²)	Orientation	Outdoor shade	Indoor shade
Ens 1	Velux:VEL-011-01 W	Element 1	0.0	0.5	N	None	None
Kids Retreat	Velux:VEL-010-01 W	Element 2	15.0	0.6	E	None	None

Skylight type and performance

Skylight ID	Skylight description
No Data Available	

Skylight schedule

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m ²)	Orientation	Outdoor shade	Skylight shaft reflectance
No Data Available							

External door schedule

Location	Height (mm)	Width (mm)	Opening %	Orientation
Garage	2200	4800	100.0	S

Entry	2340	920	100.0	S
-------	------	-----	-------	---

External wall type

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Wall ID	Wall type	Solar absorptance (colour)	Wall shade	Bulk insulation (R-value)	Reflective wall wrap*
1	FR5 - Double Brick	0.5	Medium	Glass fibre batt: R2.0 (R2.0)	No
2	E - Partition Wall	0.5	Medium	Glass fibre batt: R2.0 (R2.0)	No
3	FR5 - Brick Veneer	0.5	Medium	Glass fibre batt: R2.5 (R2.5)	Yes
4	FR5 - Fibro Clad Framed	0.5	Medium	Glass fibre batt: R2.5 (R2.5)	Yes

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Garage	1	2700	5538	S	0	Yes
Garage	1	2700	1200	E	0	Yes
Garage	2	2700	6811	W	5500	Yes
Ldry	2	2700	1944	W	0	No
Pwd	2	2700	840	W	0	No
Entry	3	2700	1286	S	1594	Yes
Entry	2	2700	4444	E	5500	Yes
Entry	2	2700	2214	E	0	No
Kitchen/Living	2	2700	4286	W	0	No
Kitchen/Living	2	2700	6246	E	0	No
Kitchen/Living	3	2700	2299	N	0	Yes
Kitchen/Living	3	2700	4129	N	1979	Yes
Kitchen/Living	3	2700	528	N	1979	Yes
Ens 1	2	2700	3994	W	0	No
Ens 1	4	2700	1324	N	0	Yes
Ens 1	4	2700	470	N	0	No
Bed 1	4	2700	432	W	0	Yes
Bed 1	2	2700	1919	E	0	No
Bed 1	4	2700	591	N	0	Yes
Bed 1	2	2700	2501	E	0	Yes
Bed 1	4	2700	4420	N	0	Yes
Ens 2	4	2700	2805	S	0	Yes
Ens 2	4	2700	1790	E	0	Yes
Cpd	4	2700	508	S	0	Yes
Cpd	2	2700	1292	E	0	No
Bed 2	2	2700	4189	W	0	No
Bed 2	4	2700	3507	S	0	Yes

* Refer to glossary.

Bed 2	4	2700	701	E	0	Yes
Study Nook	2	2700	2288	W	0	No
Study Nook	2	2700	2584	E	0	No
Bed 3	4	2400	3986	W	0	Yes
Bed 3	4	2400	3983	E	0	Yes
Bed 3	4	2400	4515	N	1640	Yes
Bath	4	2400	1575	S	0	Yes
Bath	4	2400	1867	E	0	Yes
Bath	4	2400	521	S	0	Yes
Bath	2	2400	1595	E	0	No
Kids Retreat	2	2400	2294	W	0	No
Kids Retreat	4	2400	1012	S	0	Yes
Kids Retreat	2	2400	2242	E	0	No
Kids Retreat	4	2400	522	N	0	Yes
Kids Retreat	4	2400	1887	N	0	Yes
Bed 4	4	2400	3493	W	0	Yes
Bed 4	4	2400	3702	S	0	Yes

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Internal wall type

Wall ID	Wall type	Area (m ²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	44.5	Glass fibre batt: R2.5 (R2.5)
2	FR5 - Internal Plasterboard Stud Wall	117.8	

Floor type

Location	Construction	Area (m ²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Garage	FR5 - CSOG: Slab on Ground	32.4	Enclosed	R0.0	none
Garage	FR5 - CSOG: Slab on Ground	3.8	Enclosed	R0.0	none
Ldry	FR5 - CSOG: Slab on Ground	3.1	Enclosed	R0.0	Tiles
Pwd	FR5 - CSOG: Slab on Ground	1.7	Enclosed	R0.0	Tiles
Entry	FR5 - CSOG: Slab on Ground	0.7	Enclosed	R0.0	Timber
Entry	FR5 - CSOG: Slab on Ground	10.8	Enclosed	R0.0	Timber
Kitchen/Living	FR5 - CSOG: Slab on Ground	24.5	Enclosed	R0.0	Timber
Kitchen/Living	FR5 - CSOG: Slab on Ground	17.6	Enclosed	R0.0	Timber
Ens 1	FR5 - Timber Lined	7.2	Enclosed	R0.0	Tiles
Bed 1	FR5 - Timber Lined	19.3	Enclosed	R0.0	Carpet
Bed 1	FR5 - Timber Lined	1.2	Enclosed	R0.0	Carpet
WIR 1	FR5 - Timber Lined	2.7	Enclosed	R0.0	Carpet
Ens 2	FR5 - Timber Lined	5	Enclosed	R0.0	Tiles
Cpd	FR5 - Timber Lined	1.9	Enclosed	R0.0	Carpet
Bed 2	FR5 - Timber Lined	9.7	Enclosed	R0.0	Carpet
Bed 2	FR5 - Timber Lined	5	Enclosed	R0.0	Carpet

Study Nook	FR5 - Timber Lined	16.5	Enclosed	R0.0	Carpet
Bed 3	FR5 - Timber Lined	18	Enclosed	R0.0	Carpet
Bath	FR5 - Timber Lined	6.3	Enclosed	R0.0	Tiles
Kids Retreat	FR5 - Timber Lined	10.1	Enclosed	R0.0	Carpet
Bed 4	FR5 - Timber Lined	12.6	Enclosed	R0.0	Carpet

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Ceiling type

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Garage	FR5 - Timber Lined	R0.0	No
Garage	Plasterboard	R4.0	No
Ldry	FR5 - Timber Lined	R0.0	No
Pwd	FR5 - Timber Lined	R0.0	No
Entry	Plasterboard	R4.0	No
Entry	FR5 - Timber Lined	R0.0	No
Kitchen/Living	FR5 - Timber Lined	R0.0	No
Kitchen/Living	Plasterboard	R4.0	No
Ens 1	Plasterboard	R4.0	No
Bed 1	FR5 - Timber Lined	R0.0	No
Bed 1	Plasterboard	R0.0	No
Bed 1	Plasterboard	R4.0	No
WIR 1	FR5 - Timber Lined	R0.0	No
Ens 2	FR5 - Timber Lined	R0.0	No
Cpd	FR5 - Timber Lined	R0.0	No
Bed 2	FR5 - Timber Lined	R0.0	No
Bed 2	Plasterboard	R4.0	No
Study Nook	FR5 - Timber Lined	R0.0	No
Bed 3	Plasterboard	R4.0	No
Bath	Plasterboard	R4.0	No
Kids Retreat	Plasterboard	R4.0	No
Bed 4	Plasterboard	R4.0	No

Ceiling penetrations*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Ldry	1	Downlights	100	Sealed
Pwd	1	Exhaust Fans	250	Sealed
Pwd	1	Downlights	100	Sealed
Entry	2	Downlights	100	Sealed
Kitchen/Living	1	Exhaust Fans	250	Sealed
Kitchen/Living	4	Downlights	100	Sealed
Ens 1	1	Exhaust Fans	250	Sealed
Ens 1	1	Downlights	100	Sealed

* Refer to glossary.

Bed 1	2	Downlights	100	Sealed
WIR 1	1	Downlights	100	Sealed
Ens 2	1	Exhaust Fans	250	Sealed
Ens 2	1	Downlights	100	Sealed
Cpd	1	Downlights	100	Sealed
Bed 2	2	Downlights	100	Sealed
Study Nook	2	Downlights	100	Sealed
Bed 3	4	Downlights	100	Sealed
Bath	1	Exhaust Fans	250	Sealed
Bath	1	Downlights	100	Sealed
Kids Retreat	2	Downlights	100	Sealed
Bed 4	4	Downlights	100	Sealed

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Ceiling fans

Location	Quantity	Diameter (mm)
No Data Available		

Roof type

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Framed:Flat - Flat Framed (Metal Deck)	0.0	0.3	Light
Ceil: Ceiling	0.0	0.5	Medium

Explanatory Notes

About this report

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Ratings are based on a unique climate zone where the home is located and are generated using standard assumptions, including occupancy patterns and thermostat settings. The actual energy consumption of a home may vary significantly from the predicted energy load, as the assumptions used in the rating will not match actual usage patterns. For example, the number of occupants and personal heating or cooling preferences will vary.

While the figures are an indicative guide to energy use, they can be used as a reliable guide for comparing different dwelling designs and to demonstrate that the design meets the energy efficiency requirements in the National Construction Code. Homes that are energy efficient use less energy, are warmer on cool days, cooler on hot days and cost less to run. The higher the star rating the more thermally efficient the dwelling is.

Accredited assessors

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Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
Assessed floor area	the floor area modelled in the software for the purpose of the NatHERS assessment. Note, this may not be consistent with the floor area in the design documents.
Ceiling penetrations	features that require a penetration to the ceiling, including downlights, vents, exhaust fans, rangehoods, chimneys and flues. Excludes fixtures attached to the ceiling with small holes through the ceiling for wiring, e.g. ceiling fans; pendant lights, and heating and cooling ducts.
Conditioned	a zone within a dwelling that is expected to require heating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
Custom windows	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
Default windows	windows that are representative of a specific type of window product and whose properties have been derived by statistical methods.
Entrance door	these signify ventilation benefits in the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 building.
Exposure category - exposed	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
Exposure category - open	terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors).
Exposure category - suburban	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
Exposure category - protected	terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas.
Horizontal shading feature	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.

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Opening Percentage	the openability percentage of operable (moveable) area of doors or windows that is used in ventilation calculations.
Provisional value	an assumed value that does not represent an actual value. For example, if the wall colour is unspecified in the documentation, a provisional value of 'medium' must be modelled. Acceptable provisional values are outlined in the NatHERS Technical Note and can be found at www.nathers.gov.au
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	for NatHERS this is typically an operable window (i.e. can be opened), will have a plaster or similar light well if there is an attic space, and generally does not have a diffuser.
Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	the fraction of incident solar radiation admitted through a window, both directly transmitted as well as absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits.
Skylight (also known as roof lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
Unconditioned	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions.
Vertical shading features	provides shading to the building in the vertical plane and can be parallel or perpendicular to the subject wall/window. Includes privacy screens, other walls in the building (wing walls), fences, other buildings, vegetation (protected or listed heritage trees).

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Nationwide House Energy Rating Scheme

NatHERS Certificate No. YTHP23NDIW

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6.2
The more stars the more energy efficient

Property

Address 07, 101-105 Clayton Rd, Oakleigh East, VIC, 3166
Lot/DP -
NCC Class* Class 1a
Type New Home

Plans

Main plan RPC Architects
Prepared by P6/01.06.2022

116.5 MJ/m²

Predicted annual energy load for heating and cooling based on standard occupancy assumptions.

For more information on your dwelling's rating see:
www.nathers.gov.au

Construction and environment

Assessed floor area (m ²)*	Exposure type
Conditioned* 154	suburban
Unconditioned* 46.3	NatHERS climate zone
Total 200.3	62 Moorabbin Airport
Garage 41	

Thermal performance

Heating	Cooling
101.6	14.9
MJ/m ²	MJ/m ²

About the rating

NatHERS software models the expected thermal energy loads using information about the design and construction, climate and common patterns of household use. The software does not take into account appliances, apart from the airflow impacts from ceiling fans.



Accredited assessor

Name	Crystal Ter
Business name	The Urban Leaf
Email	Energy@tul.net.au
Phone	03 8899 6149
Accreditation No.	DMN/10/2014
Assessor Accrediting Organisation	Design Matters National
Declaration of interest	Declaration completed: no conflicts

Verification

To verify this certificate, scan the QR code or visit www.FR5.com.au When using either link, ensure you are visiting www.FR5.com.au.

National Construction Code (NCC) requirements

The NCC's requirements for NatHERS-rated houses are detailed in 3.12.0(a)(i) and 3.12.5 of the NCC Volume Two. For apartments the requirements are detailed in J0.2 and J5 to J8 of the NCC Volume One.

In NCC 2019, these requirements include minimum star ratings and separate heating and cooling load limits that need to be met by buildings and apartments through the NatHERS assessment. Requirements additional to the NatHERS assessment that must also be satisfied include, but are not limited to: insulation installation methods, thermal breaks, building sealing, water heating and pumping, and artificial lighting requirements. The NCC and NatHERS Heating and Cooling Load Limits (Australian Building Codes Board Standard) are available at www.abcb.gov.au.

State and territory variations and additions to the NCC may also apply.

Certificate Check

Ensure the dwelling is designed and then built as per the NatHERS Certificate. While you need to check the accuracy of the whole Certificate, the following spot check covers some important items impacting the dwelling's rating.

Genuine certificate

Does this Certificate match the one available at the web address or QR code in the verification box on the front page?
Does the set of NatHERS-stamped plans for the dwelling have a Certificate number on the stamp that matches this Certificate?

Ceiling penetrations*

Does the 'number' and 'type' of ceiling penetrations (e.g. downlights, exhaust fans, etc) shown on the stamped plans or installed, match what is shown in this Certificate?

Windows

Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate? Substituted values must be based on the Australian Fenestration Rating Council (AFRC) protocol.

Apartment entrance doors

Does the 'External Door Schedule' show apartment entrance doors? Please note that an "external door" between the modelled dwelling and a shared space, such as an enclosed corridor or foyer, should not be included in the assessment (because it overstates the possible ventilation) and would invalidate the Certificate.

Exposure*

Has the appropriate exposure level (terrain) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".

Provisional* values

Have provisional values been used in the assessment and, if so, noted in "additional notes" below?

Additional Notes

Window and glazed door *type and performance*

Default* windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
ALM-005-03 A	Aluminium A DG Argon Fill High Solar Gain low-E -Clear	4.1	0.47	0.45	0.49
ALM-006-03 A	Aluminium B DG Argon Fill High Solar Gain low-E -Clear	4.1	0.52	0.49	0.55

Custom* windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

Window and glazed door *Schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orientation	Window shading device*
Ens	ALM-005-03 A	Opening 2	600	1200	awning	90.0	S	No
Bed 2	ALM-005-03 A	Opening 1	1540	2400	awning	30.0	S	No
Entry	ALM-006-03 A	Opening 26	2400	300	fixed	0.0	S	No

* Refer to glossary.

Kitchen/Living	ALM-006-03 A	Opening 4	2400	5100	sliding	45.0	N	No
Living	ALM-005-03 A	Opening 5	1540	1000	awning	90.0	S	No
Living	ALM-005-03 A	Opening 3	1540	3600	awning	40.0	S	No
Bed 3	ALM-005-03 A	Opening 11	1540	2400	awning	30.0	E	No
Bath	ALM-005-03 A	Opening 10	600	1400	awning	45.0	E	No
Bed 4	ALM-005-03 A	Opening 6	1540	2400	awning	30.0	S	No
Study Nook	ALM-005-03 A	Opening 8	1540	500	awning	90.0	N	No
Study Nook	ALM-005-03 A	Opening 7	1540	500	awning	90.0	S	No
Study Nook	ALM-005-03 A	Opening 9	1540	700	awning	90.0	N	No

Roof window type and performance value

Default* roof windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

Custom* roof windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
Velux:VEL-011-01 W	VELUX FS - Fixed Skylight DG 3mm LoE 366 / 8.5mm Argon Gap / 5.36mm Clear La	2.58	0.24	0.23	0.25
Velux:VEL-010-01 W	VELUX VS - Ventilating Skylight DG 3mm LoE 366 / 8.5mm Argon Gap / 5.36mm Clear La	2.53	0.21	0.2	0.22

Roof window schedule

Location	Window ID	Window no.	Opening %	Area (m ²)	Orientation	Outdoor shade	Indoor shade
Ptry	Velux:VEL-011-01 W	Element 1	0.0	0.3	E	None	None
Study Nook	Velux:VEL-010-01 W	Element 2	15.0	0.6	E	None	None

Skylight type and performance

Skylight ID	Skylight description
No Data Available	

Skylight schedule

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m ²)	Orientation	Outdoor shade	Skylight shaft reflectance
No Data Available							

External door schedule

Location	Height (mm)	Width (mm)	Opening %	Orientation
Garage	2200	4800	100.0	N

Entry	2340	920	100.0	S
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External wall type

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 Solar Wall shade absorbance (colour) Bulk insulation (R-value) Glass fibre batt: R2.0
 Medium (R2.0); Glass fibre batt: R2.0

Wall ID	Wall type	Solar absorbance (colour)	Wall shade	Bulk insulation (R-value)	Reflective wall wrap*
1	E - Partition Wall	0.5	Medium	Glass fibre batt: R2.0 (R2.0)	No
2	FR5 - Double Brick	0.5	Medium		No
3	FR5 - Brick Veneer	0.5	Medium	Glass fibre batt: R2.5 (R2.5)	Yes
4	FR5 - Fibro Clad Framed	0.5	Medium	Glass fibre batt: R2.5 (R2.5)	Yes

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Garage	1	2700	5204	W	6883	Yes
Garage	1	2700	5947	E	6923	Yes
Garage	2	2700	6236	N	1298	Yes
Garage	2	2700	743	W	0	Yes
Garage	2	2700	761	N	0	Yes
Study	1	2700	2796	E	0	No
Ens	3	2700	1749	S	552	Yes
Ens	1	2700	4192	E	0	No
Bed 2	3	2700	3384	S	558	Yes
Bed 2	3	2700	942	W	0	Yes
Ldry	1	2700	1560	W	0	No
Entry	3	2700	1615	S	2276	Yes
Entry	1	2700	4402	W	0	No
Kitchen/Living	1	2700	4130	W	0	No
Kitchen/Living	1	2700	4129	E	0	No
Kitchen/Living	4	2700	199	N	0	No
Kitchen/Living	4	2700	6464	N	306	Yes
Kitchen/Living	4	2700	282	N	0	No
Ptry	1	2700	1584	E	0	No
Living	4	2700	3473	E	0	Yes
Living	4	2700	1126	S	0	Yes
Living	1	2700	2544	E	0	No
Living	1	2700	6142	W	0	No
Living	4	2700	667	S	0	Yes
Living	4	2700	1595	W	0	Yes
Living	4	2700	5130	S	0	Yes
Bed 3	4	2400	4217	W	0	Yes

* Refer to glossary.

Bed 3	4	2400	4217	E	0	Yes
Bed 3	4	2400	4273	N	0	Yes
Bath	4	2400	1772	E	0	Yes
Bed 4	4	2400	3095	W	0	Yes
Bed 4	4	2400	4442	S	927	Yes
Bed 4	4	2400	3095	E	0	Yes
Study Nook	4	2400	1892	W	0	Yes
Study Nook	4	2400	674	N	0	Yes
Study Nook	1	2400	2279	W	0	No
Study Nook	4	2400	671	S	0	Yes
Study Nook	4	2400	709	S	0	Yes
Study Nook	4	2400	2279	E	0	Yes
Study Nook	4	2400	867	N	0	Yes

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Internal wall type

Wall ID	Wall type	Area (m ²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	37.1	Glass fibre batt: R2.5 (R2.5)
2	FR5 - Internal Plasterboard Stud Wall	107.8	

Floor type

Location	Construction	Area (m ²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Garage	FR5 - CSOG: Slab on Ground	29.8	Enclosed	R0.0	none
Garage	FR5 - CSOG: Slab on Ground	11.2	Enclosed	R0.0	none
Study	FR5 - CSOG: Slab on Ground	10.2	Enclosed	R1.1	Carpet
Ens	FR5 - CSOG: Slab on Ground	2.6	Enclosed	R1.1	Tiles
Ens	FR5 - CSOG: Slab on Ground	4.7	Enclosed	R1.1	Tiles
Bed 2	FR5 - CSOG: Slab on Ground	13.7	Enclosed	R1.1	Carpet
Ldry	FR5 - CSOG: Slab on Ground	3.5	Enclosed	R1.1	Tiles
Entry	FR5 - CSOG: Slab on Ground	10.7	Enclosed	R1.1	Timber
Kitchen/Living	FR5 - Timber Lined	7.5	Enclosed	R2.5	Timber
Kitchen/Living	FR5 - Timber Lined	19.6	Enclosed	R2.5	Timber
Kitchen/Living	FR5 - Timber Lined	2.2	Enclosed	R2.5	Timber
Pwd	FR5 - Timber Lined	2.4	Enclosed	R2.5	Tiles
Ptry	FR5 - Timber Lined	2.9	Enclosed	R2.5	Timber
Ptry	FR5 - Timber Lined	1.8	Enclosed	R2.5	Timber
Living	FR5 - Timber Lined	0.8	Enclosed	R2.5	Timber
Living	FR5 - Timber Lined	2.4	Elevated	R2.5	Timber
Living	FR5 - Timber Lined	1.6	Enclosed	R2.5	Timber
Living	FR5 - Timber Lined	32	Enclosed	R2.5	Timber
Living	FR5 - Timber Lined	2.4	Enclosed	R2.5	Timber
Living	FR5 - Timber Lined	0.7	Elevated	R2.5	Timber

Bed 3	FR5 - Timber Lined	17.4	Enclosed	R2.5	Carpet
Bed 3	FR5 - Timber Lined	0.0	Elevated	R2.5	Carpet
Bath	FR5 - Timber Lined	5.3	Enclosed	R2.5	Tiles
Bed 4	FR5 - Timber Lined	13.0	Enclosed	R2.5	Carpet
Study Nook	FR5 - Timber Lined	15.5	Enclosed	R2.5	Carpet

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Ceiling type

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Garage	FR5 - Timber Lined	R2.5	No
Garage	Plasterboard	R4.0	No
Study	FR5 - Timber Lined	R2.5	No
Ens	Plasterboard	R4.0	No
Ens	FR5 - Timber Lined	R2.5	No
Bed 2	FR5 - Timber Lined	R2.5	No
Ldry	FR5 - Timber Lined	R2.5	No
Entry	FR5 - Timber Lined	R2.5	No
Kitchen/Living	Plasterboard	R4.0	No
Kitchen/Living	FR5 - Timber Lined	R2.5	No
Kitchen/Living	Plasterboard	R4.0	No
Pwd	FR5 - Timber Lined	R2.5	No
Ptry	Plasterboard	R4.0	No
Ptry	FR5 - Timber Lined	R2.5	No
Living	Plasterboard	R4.0	No
Living	Plasterboard	R4.0	No
Living	Plasterboard	R4.0	No
Living	FR5 - Timber Lined	R2.5	No
Living	Plasterboard	R0.0	No
Living	Plasterboard	R4.0	No
Living	FR5 - Timber Lined	R2.5	No
Bed 3	Plasterboard	R4.0	No
Bed 3	Plasterboard	R4.0	No
Bath	Plasterboard	R4.0	No
Bed 4	Plasterboard	R4.0	No
Study Nook	Plasterboard	R4.0	No

Ceiling penetrations*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Garage	1	Downlights	100	Sealed
Study	1	Downlights	100	Sealed
Ens	1	Exhaust Fans	250	Sealed
Bed 2	3	Downlights	100	Sealed

* Refer to glossary.

Ldry	1	Downlights	100	Sealed
Entry	1	Downlights	100	Sealed
Kitchen/Living	1	Exhaust Fans	250	Sealed
Kitchen/Living	4	Downlights	100	Sealed
Pwd	1	Exhaust Fans	250	Sealed
Pwd	1	Downlights	100	Sealed
Ptry	1	Downlights	100	Sealed
Living	4	Downlights	100	Sealed
Bed 3	4	Downlights	100	Sealed
Bath	1	Exhaust Fans	250	Sealed
Bath	1	Downlights	100	Sealed
Bed 4	4	Downlights	100	Sealed
Study Nook	2	Downlights	100	Sealed

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Ceiling fans

Location	Quantity	Diameter (mm)
No Data Available		

Roof type

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Framed:Flat - Flat Framed (Metal Deck)	0.0	0.3	Light
Ceil: Ceiling	0.0	0.5	Medium
Cont:Attic-Continuous	0.0	0.3	Light

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Provisional value	an assumed value that does not represent an actual value. For example, if the wall colour is unspecified in the documentation, a provisional value of 'medium' must be modelled. Acceptable provisional values are outlined in the NatHERS Technical Note and can be found at www.nathers.gov.au
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	for NatHERS this is typically an operable window (i.e. can be opened), will have a plaster or similar light well if there is an attic space, and generally does not have a diffuser.
Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	the fraction of incident solar radiation admitted through a window, both directly transmitted as well as absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits.
Skylight (also known as roof lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
Unconditioned	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions.
Vertical shading features	provides shading to the building in the vertical plane and can be parallel or perpendicular to the subject wall/window. Includes privacy screens, other walls in the building (wing walls), fences, other buildings, vegetation (protected or listed heritage trees).

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