LINCOLN PEARCE

FUTURE HOMES
SUSTAINABILITY MANAGEMENT PLAN

8-10 Middleton Street, Braybrook

1009-RPT-SMP-G Date 31 January 2025

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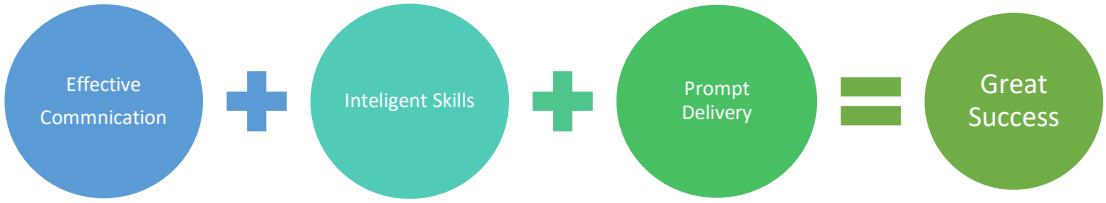

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		Green Travel Plans
	Daylight Modelling	Site Management Plans
	NatHERS Rating	Section J DtS
	Section J J1V3 Modelling	
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Revision Schedule

Issue	Date	Description	Author
A	17/07/2024	Issued for Comment	Komal Teni
B	08/08/2024	Issued for Town Planning Application	Komal Teni
C	13/08/2024	Issued for Town Planning Application	Komal Teni
D	03/10/2024	Final	Komal Teni
E	20/12/2024	Updated according to the latest drawings	Komal Teni
F	20/01/2025	Updated in accordance with the DTP's comments dated 16/01/2025	Komal Teni
G	31/01/2025	Updated in accordance with the DTP's comments dated 31/01/2025	Komal Teni

1 Project Introduction

1.1 Site Location, Master Plan and Staging

The Project comprises the development of a 3-story building with sixteen apartments (7 x 2 bedrooms and 9 x 1- bedrooms) on 8-10 Middleton Street, Braybrook.

For specific construction details for the Project, refer to the Project Documentation inclusive of Architectural and Structural Engineering documents and associated Specifications.

The following documents have been provided to establish the development parameters on which this report is based.

1.2 Scope and Intention of Documents

The following Sustainability Management Plan is a summary of the requirements of the service to assist with the town planning application This written document shall be read in conjunction with each other to be fully converse with the requirements.

1.3 Stakeholder Confirmation

This document is Lincoln Pearce's recommendations given the information provided and requires the Client, Architect and other Stakeholders to review and confirm their methodology and understanding is in agreeance to implement. If no comments are raised, then Lincoln Pearce shall continue to develop with these methodologies.

Please provide comments within 5 working days of this report and drawings.

1.4 Authorities and Standards

All requirements shall be in accordance with:

a) The requirements of the Statutory Authorities having Jurisdiction over the Project.
b) Regulations, Codes, Standards and Documents having Jurisdiction over the Project.
c) The requirements of the Building Regulations covering the Project

1.5 Project Documentation

The Design Team Members shall make themselves aware of the contents of all Project Documents and Project Requirements. Project Documentation includes:

a) Building Service Documentation for Mechanical, Electrical, Hydraulic, Fire and Vertical Transportation Services inclusive of Drawings, Specifications and Reports.
b) Sustainability Documentation inclusive of Reports, alternate solutions, and advice
c) Architectural Documentation inclusive of Drawings and Specifications.
d) Structural Documentation.
e) Civil Documentation
f) Project Fire Engineering and Acoustic Documentation inclusive of Reports, Briefs and Correspondence
g) Reports and all other related Project Documentation forming part of the Project's Contractual Documentation.

1.6 Disclaimer

The documents outline the Project requirements inclusive of the finishes and the performance of the systems documented. Whilst every care has been taken in preparation of the information, no liability is assumed for the material contained herein. No warranty is provided or implied as to the accuracy of the whole or any part relative to the documentation.

1.7 Design Team Members

The following is a list of the design team members;

Role	Member
Client/ Principal:	**Homes Victoria** www.homes.vic.gov.au
Client Representative / Project Manager:	**Merkon** www.merkon .com.au
Building Services Engineer	**Lincoln Pearce** www.lincolnpearce.com.au
Sustainability Engineer	**Lincoln Pearce** www.lincolnpearce.com.au
Architect	**McGregor Westlake Architecture** www.mwarchitects.com.au

2 Introduction

Lincoln Pearce has been commissioned to undertake a Sustainability Management Plan for the proposed **Future Homes project** located at 8 -10 Middleton Street, Braybrook. This has been prepared to address the Maribyrnong City Council's sustainability requirements Planning Policy Clause 21.06-2 Environmentally Sustainable Development.

Within Clause 21.06-2, the City of Maribyrnong has identified the following key categories to be addressed:

- Energy Performance;
- Water Resources;
- Stormwater Management;
- Indoor Environment Quality;
- Construction, Building & Waste Management;
- Building Materials;
- Transport; and
- Urban Ecology.

3 Project Overview

The Future Homes project has developed scalable and replicable designs for apartment buildings that are great homes and great neighbours. It aims to encourage increased housing diversity, through the creation of apartment buildings that are world leading in their design quality, sustainability and liveability.

The State Government has developed four "Exemplar Designs", each representing design responses to the Future Homes brief. The schemes are made available for purchase by applicants to be adapted for their circumstances. The applicant is required to assure the State that once they have adapted their nominated scheme, it still meets or exceeds the sustainability requirements (among others) outlined in the Building Future Homes: Adaptation guide. The primary manner of providing this assurance is through submission of a Sustainability Management Plan – refer to 'Sustainability Management Plan submission requirements' contained in Appendix 6: Environmentally Sustainable Design of the Building Future Homes: Adaptation guide for further information.

4 Site Description

The proposed site is located at 8-10 Middleton Street, Braybrook. The 1,208m^2 site is currently occupied by a single-storey house which is proposed to be demolished before the construction of the development. It is located approximately 12 km north-west of the Melbourne CBD.

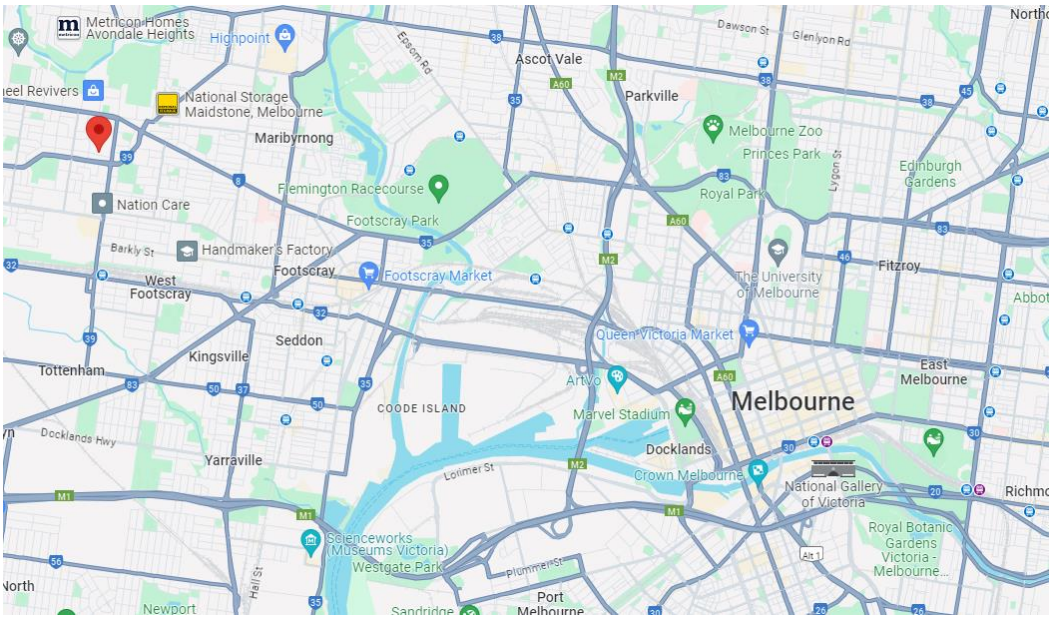


Figure 1: Location of the proposed development in Braybrook with relation to Melbourne CBD (Source: Google Maps)

4.1 Proposed Development

The proposed development consists of:

- Three-story apartment development with 16 apartments (9 x 1-bedroom and, 7 x 2-bedroom)
- Ground floor level will include a car park comprising 9 car spaces
- Central waste storage area
- 16 Bicycle spaces for residents and 4 bicycle spaces for visitors

5 ESD Initiatives

This section outlines the ESD initiatives included for the development. Aligning with the *Building Future Homes: Adaptation guide*, these are organised in the following categories:

- Climate and Carbon
- Energy Efficiency – Passive Systems
- Energy Efficiency – Active Systems
- Daylight, Solar Access and Mitigation
- Ventilation
- Heat Island
- Sustainable Transport
- Water
- Landscape and Biodiversity
- Materials and Construction
- Waste

Overall Target Topic	Initiative	Adaptation Response
Built Environment Sustainability Scorecard (BESS)	The project will achieve an "Excellence" score (>70%) under the BESS assessment tool or an equivalent score using an equivalent ESD assessment tool such as Green Star (minimum certified, 4 Star).	BESS assessment has been provided for the project incorporating all the mandatory ESD initiatives achieving a 71% score. Please refer to the BESS Assessment under **Appendix F.**

5.1 Climate and Carbon

Future Homes developments will adequately respond to the overarching threat of climate change, both through reducing the amount of greenhouse gas emitted by the building in operation (i.e. mitigation) and ensuring that the design of the project adequately accounts for the reality of a hotter, more extreme, climate (i.e. adaptation).

Commitment	Adaptation Response
No fossil fuel use on site (in operation)	Heating and cooling will be provided by energy-efficient air conditioners. Hot water will be provided with a central electric heat pump system. Cooktops and ovens will be all-electric. Induction cooktops are recommended for both efficiency and performance.
Climate Change Resilience: the scheme is designed to achieve a high degree of resilience to a changing climate, particularly heatwave events.	Native or drought-tolerant plants will be implemented for the landscaped areas on site and plentiful natural shade has been provided. Vegetated areas are provided in the proposed development reducing the heat island effect and improving the local habitat

5.2 Energy Efficiency – Passive Systems

Good passive design will help ensure Future Homes developments will be comfortable throughout the year without excessive demands on active systems, including helping prevent overheating during heatwave events. This is critical as both a climate change mitigation strategy and to ensure homes are liveable and help manage operational costs for residents.

Commitment	Adaptation Response
NatHERS Performance: • minimum 7.5 Star average across all dwellings • minimum 6.5 Star individual apartment - Maximum cooling loads for relevant NatHERS climate zone as per Table 1.18 in Part 1 of the Building Future Homes: Adaptation Guide	A minimum of 7.5 Star average across all apartments with no individual apartment scoring less than 6.5-Stars has been achieved in accordance to table 1.18 in Part 1 of the Building Future Homes – Adaptation guide. Refer to Appendix C for Technical Report(s) for details. Best efforts have been made in the exemplar design's NatHERS modelling to reduce required glazing performance to minimise costs, while still meeting the target. - Exemplar Design C: U2.4 / SHGC 0.4
Reduce the impact of thermal bridging	Through careful detailing during design finalisation, thermal bridging will be minimised within the thermal envelope. Thermally broken or timber window frames are not proposed in this development.

5.3 Energy Efficiency – Active Systems

Sustainable choices for active systems can help deliver highly efficient, low carbon emission Future Homes developments. Removal of fossil fuel systems on site reduces direct emissions (scope 1 as per National Greenhouse gases and Energy Reporting 'NGER'). Energy efficient systems minimise both running costs and offsite emissions associated with providing power to site (i.e. scope 2).

Commitment	Adaptation Response
Provide heating and cooling systems within 1 star of the most efficient appropriately sized unit available.	Heating and cooling will be provided by energy-efficient air conditioners with a minimum 3-star rating for both cooling and heating or within one star of the best available product at the time of purchase, whichever is greater. Split system units or variable refrigerant flow systems will be used for improved demand-based operation.
Provide heat pump domestic hot water with a minimum Coefficient of Performance of 3.5.	Hot water will be provided with a central electric heat pump system. The heat pump system with a minimum Coefficient of Performance of 3.5 will be implemented.
Provide a PV system with 30kW total system capacity and a method to equitably distribute that solar energy to residents (e.g. embedded network, direct cabling to dwellings, or a distribution system such as SolShare or equivalent). The PV system should be well located, appropriately orientated and unobstructed throughout the year.	A 32kW total capacity of solar photovoltaic for renewable energy generation will be installed on the roof of the development.
Maximum lighting density at least 20% lower than required by J6.2 of the NCC 2019 Vol 1 (Class 2-9)	Energy consumption from artificial lighting within the apartments will be reduced by using LED lighting. A lighting level of 4W/m2 will not be exceeded in the apartments. The use of light internal colours will improve daylight penetration thus reducing the need for artificial lighting.
Where feasible, refrigerant loads are to be reduced through reduced length of refrigerant pipe runs, and reduced Global Warming Potential (GWP) refrigerants are to be used.	Low GWP refrigerants (such as R32) will be adopted in this development.

Provide metering as follows: • PV • Common area lighting (by level) • Common area power (by level) • Common area mechanical systems (where provided) Carpark ventilation	Each apartment will be separately metered for potable water and energy. Effective metering ensures that residents/tenants are responsible for their consumption, and they can reduce their consumption.
Building User Guide	A Building User's Guide (BUG) will be developed and made available to all owners and occupants. Generally, the guide should include the following information: • A description of operational and maintenance requirements of the heat and cooling systems and hot water systems for efficient and safe use of these systems. • A description of operational and maintenance requirements of building initiatives to reduce energy and water use. • A description of operational and maintenance requirements of water-sensitive urban design features. • A description of operational and maintenance requirements of waste management strategy; and • Transport facilities including public transport information.

5.4 Daylight, Solar Access and Mitigation

The provision of adequate access to daylight throughout the year is an important consideration for apartment design. This must be done while achieving an effective balance between maximising useful solar penetration during winter and mitigating excess non-useful direct solar penetration in summer.

Commitment	Adaptation Response
Daylight Access: • Living/dining areas: 80% of living rooms achieve a high level of daylight Bedrooms: 80% of bedrooms achieve a high level of daylight	100% of the living areas and the bedrooms achieve the daylight factor greater than 1% through BESS pathway. Please refer to Appendix E for the preliminary daylight modelling attached.
Winter Sunlight: At least 70% of dwellings achieve 3hrs of direct sunlight in all living areas between 9am and 3pm in mid-winter	At least 70% of the apartments will achieve 3hrs of direct sunlight in all living areas between 9 am and 3 pm in mid-winter.
Other daylight criteria: • Ensure single-aspect habitable rooms comply with the room depth requirements outlined in Chapter 3.4 of the *Building Future Homes: Adaptation Guide* • All bedrooms to have an external window. • Minimise south-facing apartments Maximise north facing living spaces, and north-facing glazing generally	All the apartment ensures that the habitable rooms comply with the room depth requirement outlined in Chapter 3.4 of the *Building Future Homes: Adaptation Guide*. All the bedrooms have an external window. The development has maximized on the north-facing living spaces and north facing glazing.

5.5 Ventilation

The provision of adequate fresh air is a central requirement for human health and wellbeing in internal spaces. Ventilation increases oxygen levels, while flushing out unwanted humidity, carbon dioxide and other pollutants. It is particularly critical in airtight apartments to integrate an effective ventilation strategy, due to the absence of uncontrolled ventilation through the building fabric.

Commitment	Adaptation Response
All apartments will achieve effective natural ventilation, as defined under BESS (cross-ventilation, single sided ventilation, or mechanically assisted ventilation). Where effective natural ventilation cannot be achieved, apartments must be provided with mechanical ventilation with heat/energy recovery. Effective cross ventilation is the preferred solution to provide natural ventilation.	All kitchens will have a separate dedicated exhaust fan (range-hood) which will be directly exhausted out of the building. External windows in the apartments will generally include an operable component. This will help introduce fresh air to the residents and, when weather conditions are suitable, reduce the need for mechanical cooling. All apartments (100%) will have access to effective cross-flow ventilation with the implementation of windows in opposing or adjacent walls. Window locks and door catches will be included to encourage and improve natural ventilation in the dwellings. Please refer to Appendix D for cross ventilation pathway.

5.6 Heat Island

The heat island effect is the localised heating of open space, suburbs and cities due to heat absorption/radiation by thermally massive concrete or similar heavy-weight materials. Developments can address this effect through a combination of external materials, planting, and shading.

Commitment	Adaptation Response
A minimum of 75% of the site area consists of materials that minimise the impact of the heat island effect.	Most of the site will use light-coloured materials to reduce the heat island effect and heat loads. This development incorporated a green wall on levels 1 and 2 helping in mitigating the urban heat island.

5.7 Sustainable transport

Transport to and from home is a substantial component of the environmental impact of residents. A Future Home development should support residents making more sustainable (and healthy) transport decisions.

Commitment	Adaptation Response
Provide the following bike parking: • Minimum 1 bicycle park per dwelling • Minimum 1 visitor bicycle park per 5 dwellings	Residents will be able to securely park their bicycle in the dedicated bicycle storage areas provided in the ground floor car park. This will be protected from weather and theft. A total of A total of 16 bicycle racks are provided for the development for residents and 4 spaces for visitors.
Electric Vehicles: • A GPO should be conveniently located near at least 5% of bike parking for charging of electrical bicycles. • Provide adequate spacing for future installation of electrical car charging system.	At least one charging infrastructure (minimum Level 2 – 32amp) for electric vehicle will be provided in tssshe car park.

5.8 Stormwater

Uncontrolled urban stormwater runoff poses a risk to the ecological value of waterways and bays, and to human health. Modelling suggests the total area of impervious surfaces and stormwater runoff will almost double by 2051 if urban growth is accommodated in a business-as-usual approach. Developments can minimise the impact of runoff and associated harms through maximising permeable surfaces (primarily through maximises landscape areas), providing onsite rainwater retention and re-use (through a rainwater tank) and/or incorporating water sensitive urban design treatment systems such as raingardens.

Commitment	Adaptation Response
Site will achieve a 100% STORM score (or equivalent level of performance) A minimum of 20% of the site area will be permeable	The proposed development achieves a 100% STORM rating on the calculator provided by Melbourne Water. Please refer to the results under Appendix A.

5.9 Potable Water

Access to safe and reliable drinking water supplies and sanitation is critical to our heath and supports community wellbeing. Future Homes developments can reduce pressure on potable water resources through a range of building and landscape design measures, including provision of rainwater storage and re-use; and selection of efficient fixtures.

Commitment	Adaptation Response
Provide high water efficiency fittings, fixtures and appliances throughout, including: • Showers: ≤ 7.5 L/min • Taps: ≥ 5 star WELS • Dishwashers: ≥ 5 star WELS • WC: ≥ 4 star WELS • Washing machines (where provided): ≥ 5 star WELS	The development will include efficient fittings and fixtures to reduce the volume of mains water used in the development. The following WELS star ratings will be specified; (Please refer to the BESS assessment under Appendix E) • Toilets – 4 Star; • Taps (bathroom and kitchen) – 5 Star; • Showerhead – 4 Star with aeration device (6.0-7.5L/min) • Dishwasher – 5 Star; and • Washing Machines:- 5 Star.
Provide an adequately sized rainwater tank supplying water to toilets and irrigation. 2kL per dwelling is recommended, however reduction from that amount may be permitted based on a performance-based approach.	Rainwater runoff from the part of the roof area of the development will be collected and stored in rainwater tanks. With a total effective capacity of 10,000L. Rainwater collected will be used for toilet flushing in all apartments. These initiatives will reduce significantly the stormwater impacts of the development and help achieve compliance with the STORM calculator. Please refer to the STORM assessment under Appendix A.

5.10 Landscape and Biodiversity

Landscaping plays a critical role in delivery healthy, comfortable and resilient places to live. Landscape in a Future Home development provides amenity, improves local biodiversity and helps protect the site amenity during high and extreme temperature events.

Commitment	Adaptation Response
Vegetation: At least 35% of the site is garden area, with canopy cover and deep soil maximised.	A minimum of 43% of the site is covered with a garden area.
Private open space: Private open space (including balconies and courtyards) are provided with tap and drainage point(s).	Each apartment will have a tap and floor waste in its private open space or on their balcony.
Canopy cover and deep soil planting: Canopy cover and deep soil requirements must be provided as per chapter 5.2 in Part 1 of the Building Future Homes: Adaptation guide	This design meets the canopy cover and deep soil requirements must be provided as per chapter 5.2 in Part 1 of the building Future Homes: Adaptation guide.
Landscaping is climate responsive, drought tolerant and reduces urban heat. Landscaping supports biodiversity, wellbeing and amenity.	Native or drought-tolerant plants will be implemented for the landscaped areas on site. Use of water or irrigation will not be required after an initial period when plants are getting established. If irrigation is required, it will be connected to rainwater tanks.

5.11 Materials

Material selection is a major contributor to the overall sustainability impact of a project. This is not only in terms of embodied impact (carbon, water and waste) but the deleterious health impacts that material selection can have on occupants due to off gassing.

Commitment	Adaptation Response
The development addresses embodied energy, carbon and water costs of the materials used in the building through the following: • Nomination of low impact materials (such as sustainably sourced timber); and/or • Careful and efficient design (particularly structure) to minimise overall material usage compared to standard practice	All timber used in the development will be Stewardship Council (FSC) or Program for the Endorsement of Forest Certification (PEFC) certified or recycled / reused. The use of timber flooring will be preferred for all living areas and bedrooms. Wherever possible, flooring will be selected from products/materials certified under any of the following: Carpet Institute of Australia Limited, Environmental Certification Scheme (ECS). Global GreenTag - https://www.globalgreentag.com/; and/or Good Environmental Choice (GECA). Alternatively, flooring must be durable, include some eco-preferred content, be modular, and/or come from a manufacturer with a product stewardship program and ISO 14001 certification. Forest
The environmental impact of building materials used in the development will be addressed through: • "Common uses of PVC" (as defined in Green Star) will either not contain PVC, or comply with the Green Building Council of Australia's best Practice Guidelines for PVC • All timber used on site (including hoarding and the like) will be from either PEFC or FSC certified sources; or re-used. All steel used on site will be sourced from a Responsible Steel Maker, as defined under Green Star	Wherever possible, steel for the development will be sourced from a Responsible Steel Maker. Reinforcing steel for the project will be manufactured using energy-reducing processes commonly used by large manufacturers such as Bluescope or OneSteel. 

All materials and finishes should be of very low toxicity, such that:

- All internally applied adhesives, sealants and carpets will meet Green Star limits on Volatile Organic Compound (VOC) content
- All internally applied paints will be zero VOC or contain a Total VOC content <5g/L

All engineered wood products used on site will meet the total formaldehyde limits set in Green Star

All paints, adhesives and sealants and flooring will have low VOC content. Alternatively, products will be selected with no VOCs. Paints such as eColour, or equivalent should be considered. Please refer to Appendix B for VOC limits.

All engineered wood products will have 'low' formaldehyde emissions, certified as E0 or better. Alternatively, products will be specified with no Formaldehyde. Products such as ecological panel – 100% post-consumer recycled wood (or similar) will be considered for use within the development. Please refer to Appendix B for formaldehyde limits.

5.12 Waste

Victorian households produce significant amounts of waste annually, and waste-to-landfill reduction is one of the most directly controllable sustainability impacts by residents. A Future Home development will be designed to support residents in making sustainable choices in disposing of their waste.

Commitment	Adaptation Response
Waste: • Waste areas and access pathways sized to account for likely future authority waste streams including glass, organic and e-waste streams. • Waste areas located with convenient access to the curb for collection. • Provide sufficient space in kitchen cabinetry to allow for waste separation, including kitchen organics, landfill, commingled recycling and glass. • Waste areas located conveniently in order to maximise their utility by people with limited / reduced mobility. • Non-landfill waste streams are at least as conveniently located as landfill waste streams. Provide facilities for on-site processing of organic waste.	The development will be provided with a central waste storage room on the ground floor. The waste storage room will have facilities for general waste recycling, FOGO, and glass waste. Recycle bins will be provided next to general waste bins in kitchens. Please refer to the Waste Management Plan for further details.

6 Appendix A WSUD Assessment

New development must comply with the best practice performance targets for suspended solids, total phosphorous and total nitrogen, as set out in the Urban Stormwater Best Practice Environmental Management Guidelines, Victoria Stormwater Committee 1999. Currently, these water quality performance targets require:

- Suspended Solids - 80% retention of typical urban annual load.
- Total Nitrogen - 45% retention of typical urban annual load.
- Total Phosphorus - 45% retention of typical urban annual load.
- Litter - 70% reduction of typical urban annual load.

The STORM tool, an industry accepted tool, was used to assess the development and ensure that the best practice targets described above are met. A minimum compliance score of 100% is required to achieve for the development.

Site Delineation

For the assessment, the development has been delineated into the following surface types:

- Site area of 1,208m^2;
- Entire roof area runoff of 598m^2 which will be diverted into rainwater tank(s);
- Permeable area of 299m^2 comprised of landscaped area and the entire exposed ground floor play area;
- Remainder of impervious areas of 311m^2 comprised of the terraces and other impervious areas around the site.

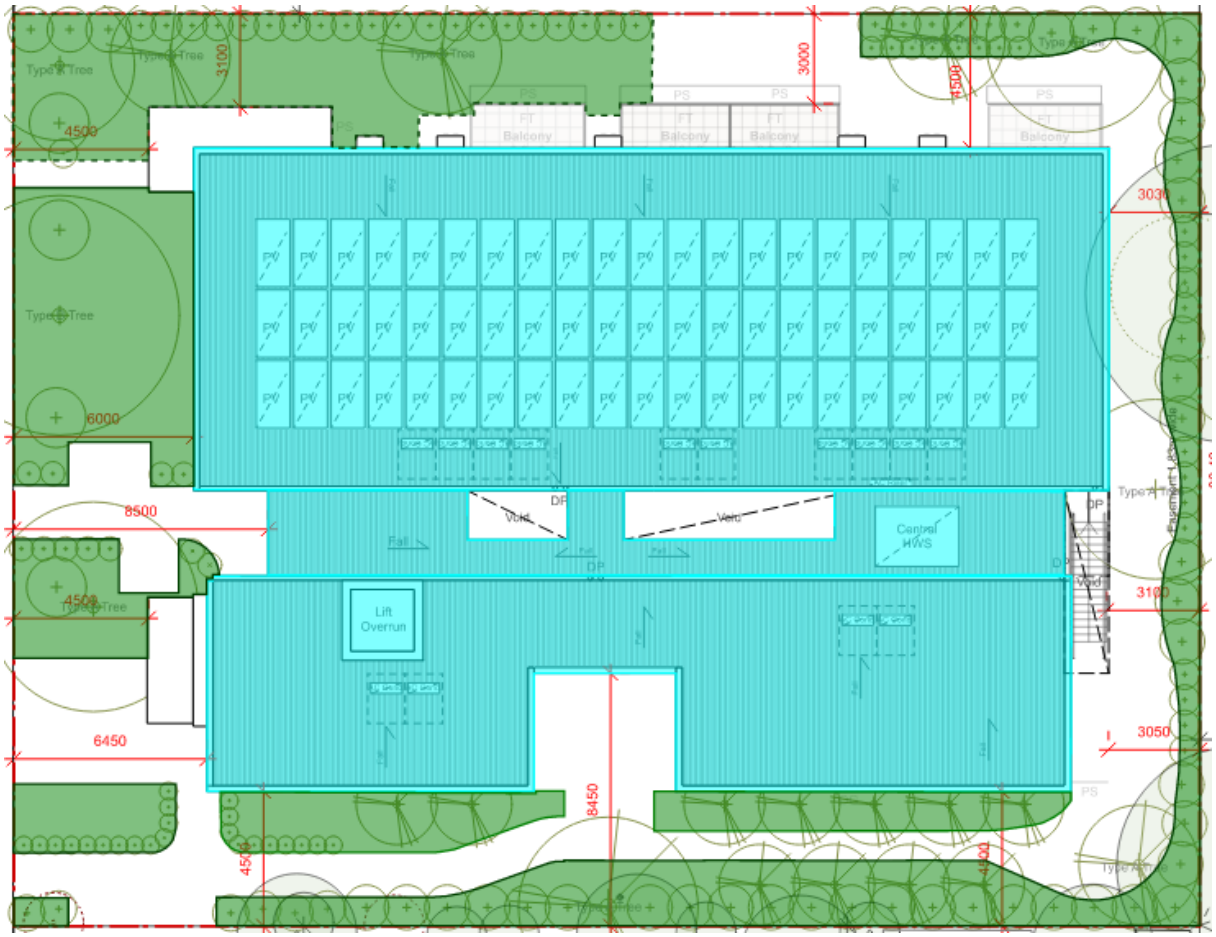


Figure 3: Roof catchment to RWT (blue) and permeable surfaces (green)

Stormwater initiatives

Rainwater Tank
(Rainwater tank for toilet flushing)

The roof catchment area (as described above) will be diverted to 10,000L rainwater tanks. The rainwater collected will be used for toilet flushing.

If required, a charged pipe system or multiple tanks will be installed to collect water from part of the roof of each dwelling.

The remainder of impervious areas will directly be released at the legal point of discharge on site.

Permeable areas are excluded from the STORM assessment.

It should be noted that permeable areas have been maximised in the development which will reduce the overall stormwater outflows from the site. Vegetated areas are provided in the proposed development reducing the heat island effect and improving the local habitat.

Stormwater Results

The initiatives and areas described above have been applied to the STORM calculator and the proposed development has achieved a score of 100%.

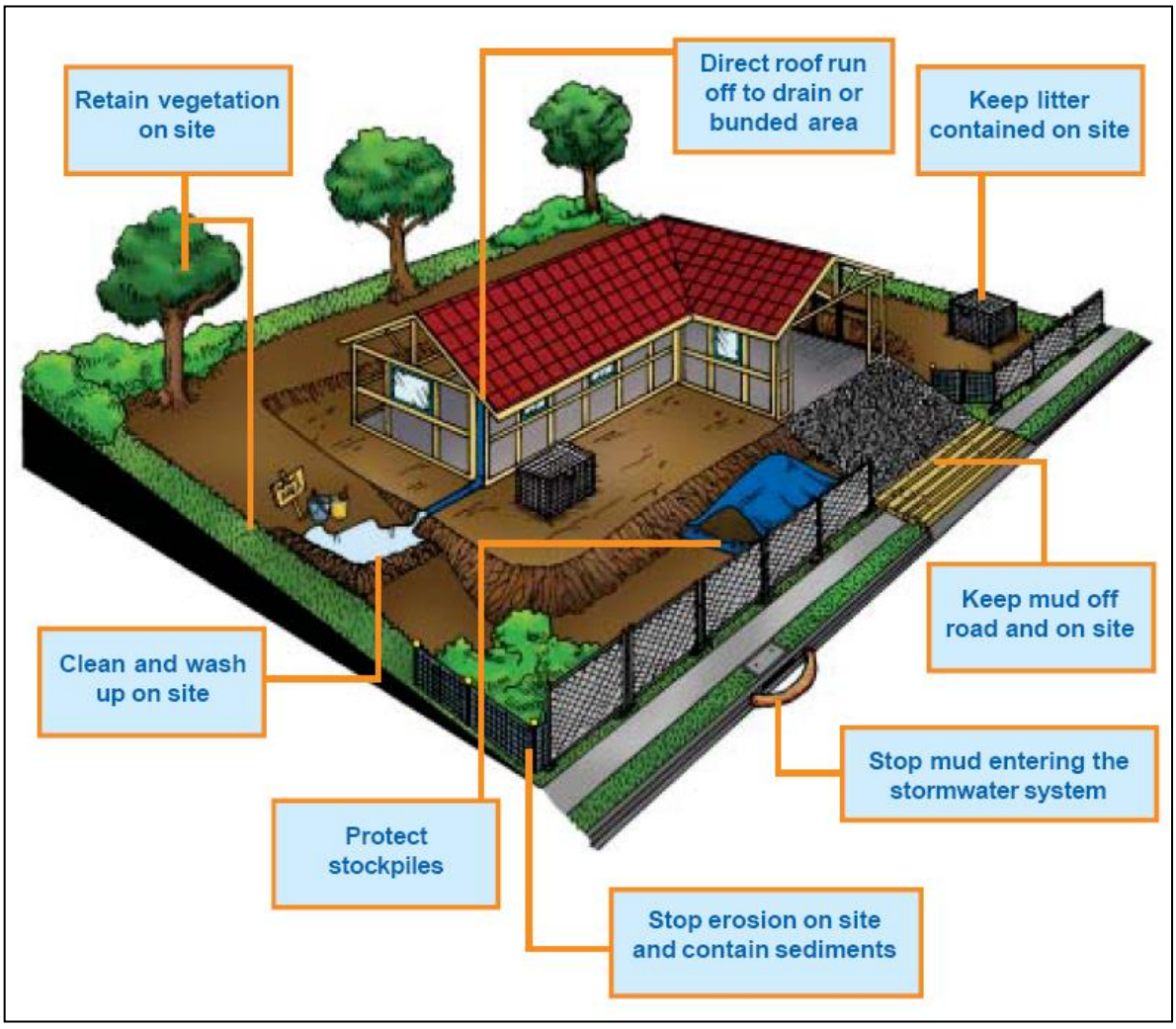
Melbourne Water **STORM Rating Report**

TransactionID:	0
Municipality:	MARIBYRNONG
Rainfall Station:	MARIBYRNONG
Address:	8 Middleton St
	Braybrook
	VIC 3019
Assessor:	Lincoln Pearce - Komal Teni
Development Type:	Residential - Multiunit
Allotment Site (m2):	1,208.00
STORM Rating %:	100

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Roof Catchment Area to RWT	598.00	Rainwater Tank	10,000.00	25	151.60	74.40
Other Impervious Areas	311.00	None	0.00	0	0.00	0.00

Stormwater Management at Construction Site

To manage stormwater management in the construction stage, measures will be put in place to minimise the likelihood of contaminating stormwater. This will mean ensuring buffer strips are in place, sediment traps are installed, and the site will be kept clean from any loose rubbish. The builder will follow the process outlined in "Keeping Our Stormwater Clean – A Builder's Guide" by Melbourne Water.



Copies of "Keeping Our Stormwater Clean – A Builder's Guide" booklet can be downloaded from the following website.

https://www.clearwatervic.com.au/resource-library/guidelines-and-strategy/keeping-our-stormwater-clean-a-builders-guide.php

7 Appendix B Low-Toxicity Materials

The following table are an extract of the Green Star Design and as built submission guidelines:

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

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

The product complies with the Total VOC (TVOC) limits specified in the Table below.

Carpet Test Standards and TVOC Emissions Limits

Test protocol	Limit
ASTM D5116 - Total VOC limit	0.5mg/m^2 per hour
ASTM D5116 - 4-PC (4-Phenylcyclohexene)	0.05mg/m^2 per hour
ISO 16000 / EN 13419 - TVOC at three days	0.5 mg/m^2 per hour
ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5mg/m^2 per hour

Table 13.2: Formaldehyde Emission Limit Values for Engineered Wood Products

Test Protocol	Emission Limit/ Unit of Measurement
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	≤1mg/ L
AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.5 mg/L
AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1mg/ L
AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/ L
Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL	≤1mg/ L
JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	≤0.1 mg/m²hr*
ASTM D5116 (applicable to high pressure laminates and compact laminates)	≤0.1 mg/m²hr
ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	≤0.1 mg/m²hr (at 3 days)
ASTM D6007	≤0.12mg/m³**
ASTM E1333	≤0.12mg/m³***
EN 717-1 (also known as DIN EN 717-1)	≤0.12mg/m³
EN 717-2 (also known as DIN EN 717-2)	≤3.5mg/m²hr

*mg/m²hr may also be represented as mg/m²/hr.

8 Appendix C Preliminary NatHERS Assessment

A preliminary energy rating has been prepared for dwellings 1, 2, 3 & 4 to determine how the dwellings will achieve the 7.5 Star average commitments with no individual apartment scoring less than 6.5-Stars.

The results are as follows:

Apartment	Star Rating	Energy use (MJ/m2)	Heating Energy (MJ/m2)	Cooling Energy (MJ/m2)
G-01	8.1	66.5	62.0	4.5
G-02	7.7	77.0	72.1	4.9
1-01	8.6	50.8	40.1	10.7
1-02	8.9	42.7	37.2	5.5
1-03	8.9	42.8	37.3	5.6
1-04	8.7	48.9	43.5	5.5
1-05	8.8	46.1	37.8	8.3
1-06	7.5	83.3	75.6	7.7
1-07	7.7	76.7	58.3	18.4
2-01	7.6	81.3	60.7	20.6
2-02	7.8	74.2	61.1	13.0
2-03	7.8	76.4	63.8	12.6
2-04	7.8	74.1	61.2	12.9
2-05	7.8	73.7	56.7	17.1
2-06	6.9	99.4	85.7	14.0
2-07	6.9	101.0	79.3	21.7

This result has been achieved with the following building fabric:

CEILINGS

- **R4.0** insulation to ceiling areas with roof on the second floor.

FLOORS

Units G-01 & G-02

- **R1.0** insulation to the concrete slab on ground throughout excluding the garage.

Units 1-02,1-03,1-04,1-05,1-06 &1-07

- **R2.0** insulation to ceiling above the garage.

WALLS

- All external walls to have **R2.5** insulation;
- All internal walls to neighbours to have **R2.5** insulation to each side of party wall;
- Internal walls to have **R2.0** insulation as follows:
    - Garage, Laundry, WC & Bath
- Note: insulation cannot be compressed to fit cavity; cavity must accommodate specified thickness of insulation given below

WINDOWS

- For all the Unit's windows and glazed doors are to be aluminium framed double glazed clear glass with a minimum U- value & SHGC as listed below

WINDOW TYPE	U-VALUE	SHGC
Awning, Casement	2.48	0.43
Fixed, Sliding, Double Hung	2.48	0.43

AIR LEAKAGE

- All doors, windows, exhaust fans and openings will be sealed so as to not allow for air infiltration into the apartments.

LIGHTS

- All recessed down light fittings that have openings allowing air to pass through to a ceiling cavity (e.g. Adjustable down lights) shall be fitted with a cover that allows for ceiling insulation to closely enclose the sides and top of the down light.

ASSUMPTIONS

- Where windows to internal south/north elevation are not shown, heights have been assumed based on similar zone window types, heights & worst case for that orientation.
- Where the width of an elevation differs to the floor plan, the elevation overrides.

Please note that the building fabric described above may change as the full building rating is prepared and plans are updated for building approval, however a minimum energy rating performance average of 6.5 Stars will be maintained as a minimum for the development.

Residential energy rating report - Non-accredited No.

Class 2 summary

Generated on 31 Jan 2025 using Hero 4.1

This report was created using NatHERS accredited software but the non-accredited assessor (rater) is not accredited under NatHERS and this report is not accredited as being compliant with NatHERS.
Reliance on this report is accordingly at your own risk.

Property

Address 8-10 Middleton Street, Braybrook, VIC, 3019

Lot/DP

NatHERS climate zone 60 - Tullamarine

Rater*

Name Komal Teni

Business name Lincoln Pearce

Email komal.teni@lincolnpearce.com.au

Phone +61 431325991

Verification

DRAFT PREVIEW ISSUE - NOT TO BE USED FOR CERTIFICATION

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J3D3 and J3D15 of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance Star rating

8.0

Average star rating

The rating above is the average of all dwellings in this summary

NCC heating and cooling maximum loads MJ/m².yr

Limits taken from ABCB Standard 2022

	Heating	Cooling
Average load	58.3	11.4
Maximum load	85.4	21.7
Average limit	88.0	48.0
Maximum limit	103.0	49.0

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate or not completed for all dwellings.

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (MJ/m².yr)	Cooling load (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
	1-01	40.1 (103)	10.7 (49)	50.8	8.6	n/a
	1-02	37.2 (103)	5.5 (49)	42.7	8.9	n/a
	1-03	37.3 (103)	5.6 (49)	42.8	8.9	n/a
	1-04	43.5 (103)	5.5 (49)	48.9	8.7	n/a
	1-05	37.8 (103)	8.3 (49)	46.1	8.8	n/a

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (MJ/m².yr)	Cooling load (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
	1-06	75.6 (103)	7.7 (49)	83.3	7.5	n/a
	1-07	58.3 (103)	18.4 (49)	76.7	7.7	n/a
	2-01	60.7 (103)	20.6 (49)	81.3	7.6	n/a
	2-02	61.1 (103)	13.0 (49)	74.2	7.8	n/a
	2-03	63.8 (103)	12.6 (49)	76.4	7.8	n/a
	2-04	61.2 (103)	12.9 (49)	74.1	7.8	n/a
	2-05	56.7 (103)	17.1 (49)	73.7	7.8	n/a
	2-06	85.4 (103)	14.0 (49)	99.4	6.9	n/a
	2-07	79.3 (103)	21.7 (49)	101.0	6.9	n/a
	G-01	62.0 (103)	4.5 (49)	66.5	8.1	n/a
	G-02	72.1 (103)	4.9 (49)	77.0	7.7	n/a
Averages	16x (Total)	58.3	11.4	69.7	8.0	n/a
Maximum Loads and Minimum Ratings		85.4	21.7	101.0	6.9	n/a

Explanatory notes

About the ratings

The thermal performance star rating in this Report is the average rating of all NCC Class 2 dwellings in an apartment block. The Whole of Home performance rating in this Report is the lowest rating for the apartment block. Individual unit ratings are listed in the *'Summary of all dwellings'* section of this Report.
NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the energy loads and societal cost. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy production and storage to estimate the homes societal cost.
For more details about an individual dwelling's assessment, refer to the individual dwelling's NatHERS Certificate (accessible via link).

Rater

Non-accredited assessors (Raters) are not required to have any formal qualifications, insurance, ongoing professional development or quality assurance checks on their ratings. This is distinct from NatHERS accredited assessors who are required to have qualifications, ongoing professional development and have quality assurance checks on their ratings.

For quality assured NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Any questions or concerns about this report should be directed to the rater in the first instance. If the rater is unable to address these questions or concerns, the state or territory building code authority should be contacted.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in the certificate is entered by the rater. It is the rater's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce this report.

The predicted annual energy load, cost and greenhouse gas emissions are not part of a non-accredited report. In a NatHERS Certificate these are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the rater who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the rater using the NatHERS accredited software tool are presented in this report and further details or data files may be obtained from the rater.

Residential energy rating report Non-accredited No.

Generated on 31 Jan 2025 using Hero 4.1

This report was created using NatHERS accredited software but the non-accredited assessor (rater) is not accredited under NatHERS and this report is not accredited as being compliant with NatHERS.
Reliance on this report is accordingly at your own risk.

Property

Address	G-01, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	1 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	59.3	Suburban
Unconditioned*	7.9	**NatHERS climate zone**
Total	67.3	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

8.1

star rating

66.5 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	**Cooling**
Modelled	62.0	4.5
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			

Other NCC requirements

Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Kitchen/Living 1	Kitchen/Living	29.00
Bedroom 1	Bedroom	12.09
Bedroom 2	Bedroom	11.25
Bathroom	Unconditioned	4.21
Laundry	Unconditioned	3.72
Corridor	Day Time	6.98

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	AI Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Bedroom 1	A&L-026-020	W06	1800	900	Casement	90	W	None
Bedroom 2	A&L-026-020	W07	1800	900	Casement	90	W	None
Kitchen/Living 1	A&L-026-020	W02	2700	2500	Sliding	45	N	None
Kitchen/Living 1	A&L-026-020	W03	2700	700	Casement	90	N	None
Kitchen/Living 1	A&L-026-020	W04	2700	900	Fixed	0	W	None
Kitchen/Living 1	A&L-026-020	W01	1800	900	Casement	90	N	None
Kitchen/Living 1	A&L-026-020	W05	1050	1800	Sliding	45	W	None

* Refer to glossary.

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade
None								

Skylight *type and performance*

Skylight ID	Skylight description
None	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance
None								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Corridor	2100	920	90	S

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
BV-REFL-CAV-A	Brick Veneer Stud Wall with Reflective Sarking	0.30	Light	2.50	Yes
BV-REFL-CAV-B	Brick Veneer Stud Wall with Reflective Sarking	0.50	Medium	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bedroom 1	BV-REFL-CAV-A	2700	2995	W		Yes
Bedroom 2	BV-REFL-CAV-A	2700	2989	W		Yes
Bedroom 2	BV-REFL-CAV-A	2700	3618	S		Yes
Bedroom 2	BV-REFL-CAV-B	2700	233	E		No
Corridor	BV-REFL-CAV-B	2700	1593	S		No
Kitchen/Living 1	BV-REFL-CAV-A	2700	3977	N	2584	Yes
Kitchen/Living 1	BV-REFL-CAV-A	2700	1182	W	5508	Yes
Kitchen/Living 1	BV-REFL-CAV-A	2700	3012	N	1402	Yes
Kitchen/Living 1	BV-REFL-CAV-A	2700	1960	E	7175	Yes
Kitchen/Living 1	BV-REFL-CAV-A	2700	3432	W		Yes
Laundry	BV-REFL-CAV-B	2700	1507	S		No

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	22.5	2.50
INT-PB	Internal Plasterboard Stud Wall	38.3	0.00
INT-PB	Internal Plasterboard Stud Wall	14.8	2.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bathroom	CSOG-100: Concrete Slab on Ground (100mm)	4.2	N/A	0.00	Timber (12mm)
Bedroom 1	CSOG-100: Concrete Slab on Ground (100mm)	12.1	N/A	0.00	Timber (12mm)
Bedroom 2	CSOG-100: Concrete Slab on Ground (100mm)	11.3	N/A	0.00	Timber (12mm)
Corridor	CSOG-100: Concrete Slab on Ground (100mm)	7.0	N/A	0.00	Timber (12mm)
Kitchen/Living 1	CSOG-100: Concrete Slab on Ground (100mm)	29.0	N/A	0.00	Timber (12mm)
Laundry	CSOG-100: Concrete Slab on Ground (100mm)	3.7	N/A	0.00	Timber (12mm)

* Refer to glossary.

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
None			

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Kitchen/Living 1	1	Exhaust Fan	350	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
None		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
None			

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)
None				

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]
No Whole of Home Data				

* Refer to glossary.

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity

No Whole of Home Data

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]

No Whole of Home Data

Battery *schedule*

Type	Storage Capacity [kWh]

No Whole of Home Data

* Refer to glossary.

Explanatory Notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

Accredited assessors

For quality assured NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

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Disclaimer

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Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
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EER	Energy Efficiency Ratio, measure of how much cooling can be achieved by an air conditioner for a single kWh of electricity input
Energy use	This is your homes rating without solar or batteries.
Energy value	The net cost to society including, but not limited to, costs to the building user, the environment and energy networks (as defined in the ABCB Housing Provisions Standard).
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.
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Exposure category - exposed	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
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Residential energy rating report Non-accredited No.

Generated on 31 Jan 2025 using Hero 4.1

This report was created using NatHERS accredited software but the non-accredited assessor (rater) is not accredited under NatHERS and this report is not accredited as being compliant with NatHERS.
Reliance on this report is accordingly at your own risk.

Property

Address	G-02, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	1 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	49.9	Suburban
Unconditioned*	4.2	**NatHERS climate zone**
Total	54.0	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

7.7

star rating

77.0 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	**Cooling**
Modelled	72.1	4.9
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			

Other NCC requirements

Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Bedroom 1	Bedroom	12.60
Kitchen/Living	Kitchen/Living	33.66
Corridor	Day Time	3.61
Toilet	Unconditioned	4.16

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	Al Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Bedroom 1	A&L-026-020	W01	1800	1800	Casement	45	N	None
Bedroom 1	A&L-026-020	W04	2700	900	Fixed	0	W	None
Kitchen/Living	A&L-026-020	W02	2700	2900	Sliding	45	N	None
Kitchen/Living	A&L-026-020	W03	2700	700	Fixed	0	N	None

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

* Refer to glossary.

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade
None								

Skylight *type and performance*

Skylight ID	Skylight description
None	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance
None								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Kitchen/Living	2100	870	90	S

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
BV-REFL-CAV-A	Brick Veneer Stud Wall with Reflective Sarking	0.30	Light	2.50	Yes
BV-REFL-CAV-B	Brick Veneer Stud Wall with Reflective Sarking	0.50	Medium	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bedroom 1	BV-REFL-CAV-A	2700	3410	N	1515	Yes
Bedroom 1	BV-REFL-CAV-B	2700	3691	E		No
Bedroom 1	BV-REFL-CAV-B	2700	2981	S		No
Bedroom 1	BV-REFL-CAV-A	2700	245	N		Yes
Bedroom 1	BV-REFL-CAV-A	2700	1960	W	3498	Yes

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Corridor	BV-REFL-CAV-B	2700	1309	S		No
Kitchen/Living	BV-REFL-CAV-A	2700	4351	N	3475	Yes
Kitchen/Living	BV-REFL-CAV-B	2700	1913	S		No
Kitchen/Living	BV-REFL-CAV-B	2700	6963	E		No
Toilet	BV-REFL-CAV-B	2700	1508	S		No

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	11.5	0.00
INT-PB	Internal Plasterboard Stud Wall	22.5	2.50
INT-PB	Internal Plasterboard Stud Wall	9.8	2.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bedroom 1	CSOG-100: Concrete Slab on Ground (100mm)	12.6	N/A	0.00	Timber (12mm)
Corridor	CSOG-100: Concrete Slab on Ground (100mm)	3.6	N/A	0.00	Timber (12mm)
Kitchen/Living	CSOG-100: Concrete Slab on Ground (100mm)	33.7	N/A	0.00	Timber (12mm)
Toilet	CSOG-100: Concrete Slab on Ground (100mm)	4.2	N/A	0.00	Timber (12mm)

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
None			

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Kitchen/Living	1	Exhaust Fan	350	Sealed

* Refer to glossary.

Ceiling *fans*

Location	Quantity	Diameter (mm)
None		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
None			

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)
None				

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]
No Whole of Home Data				

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data			

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]
No Whole of Home Data		

* Refer to glossary.

Battery *schedule*

Type	Storage Capacity [kWh]
No Whole of Home Data	

Explanatory Notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

Accredited assessors

For quality assured NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

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* Refer to glossary.

Residential energy rating report Non-accredited No.

Generated on 31 Jan 2025 using Hero 4.1

This report was created using NatHERS accredited software but the non-accredited assessor (rater) is not accredited under NatHERS and this report is not accredited as being compliant with NatHERS.
Reliance on this report is accordingly at your own risk.

Property

Address	1-01, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	2 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	59.0	Suburban
Unconditioned*	7.8	**NatHERS climate zone**
Total	66.9	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

8.6

star rating

50.8 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	**Cooling**
Modelled	40.1	10.7
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			

Other NCC requirements

Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Kitchen/Living 4	Kitchen/Living	28.90
Bedroom 1	Bedroom	11.98
Bedroom 2	Bedroom	11.22
Bathroom	Unconditioned	4.15
Laundry	Unconditioned	3.67
Corridor	Day Time	6.92

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	Al Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Bedroom 1	A&L-026-020	W02	1800	900	Casement	90	W	None
Bedroom 2	A&L-026-020	W01	1800	900	Casement	90	W	None
Kitchen/Living 4	A&L-026-020	W05	2700	2400	Sliding Door	45	N	None
Kitchen/Living 4	A&L-026-020	W06	2700	600	Fixed	0	N	None
Kitchen/Living 4	A&L-026-020	W04	2700	900	Fixed	0	W	None
Kitchen/Living 4	A&L-026-020	W07	1800	900	Casement	90	N	None
Kitchen/Living 4	A&L-026-020	W03	1050	1800	Sliding Door	45	W	None

* Refer to glossary.

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade
None								

Skylight *type and performance*

Skylight ID	Skylight description
None	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance
None								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Corridor	2100	920	90	S

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
MC-REFL-CAV-A	Metal Clad Battened (Refl Cavity) Stud Wall	0.30	Light	2.50	Yes
MC-REFL-CAV-B	Metal Clad Battened (Refl Cavity) Stud Wall	0.50	Medium	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bedroom 1	MC-REFL-CAV-A	2700	2972	W		Yes
Bedroom 2	MC-REFL-CAV-A	2700	3616	S	1646	Yes
Bedroom 2	MC-REFL-CAV-A	2700	2985	W		Yes
Bedroom 2	MC-REFL-CAV-B	2700	238	E		No
Corridor	MC-REFL-CAV-B	2700	1586	S		No
Kitchen/Living 4	MC-REFL-CAV-A	2700	3991	N	2677	Yes
Kitchen/Living 4	MC-REFL-CAV-A	2700	1177	W	5221	Yes
Kitchen/Living 4	MC-REFL-CAV-A	2700	3001	N	623	Yes
Kitchen/Living 4	MC-REFL-CAV-A	2700	3422	W		Yes
Laundry	MC-REFL-CAV-B	2700	1491	S		No

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	27.9	2.50
INT-PB	Internal Plasterboard Stud Wall	38.2	0.00
INT-PB	Internal Plasterboard Stud Wall	14.6	2.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bathroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	4.1	N/A	0.00	Timber (12mm)
Bedroom 1	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	12.0	N/A	0.00	Timber (12mm)
Bedroom 2	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	11.2	N/A	0.00	Timber (12mm)
Corridor	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	6.9	N/A	0.00	Timber (12mm)
Kitchen/Living 4	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	28.9	N/A	0.00	Timber (12mm)
Laundry	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	3.7	N/A	0.00	Timber (12mm)

* Refer to glossary.

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
None			

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Kitchen/Living 4	1	Exhaust Fan	350	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
None		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
None			

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)
None				

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]
No Whole of Home Data				

* Refer to glossary.

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data			

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]
No Whole of Home Data		

Battery *schedule*

Type	Storage Capacity [kWh]
No Whole of Home Data	

* Refer to glossary.

Explanatory Notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

Accredited assessors

For quality assured NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in the certificate is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

The predicted annual energy load, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the assessor using the NatHERS accredited software tool are presented in this report and further details or data files may be obtained from the assessor.

Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
AFRC	Australian Fenestration Rating Council
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, range hoods, 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.
COP	Coefficient of performance
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.
EER	Energy Efficiency Ratio, measure of how much cooling can be achieved by an air conditioner for a single kWh of electricity input
Energy use	This is your homes rating without solar or batteries.
Energy value	The net cost to society including, but not limited to, costs to the building user, the environment and energy networks (as defined in the ABCB Housing Provisions Standard).
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	see exposure categories below
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.
National Construction Code (NCC) Class	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
Net zero home	a home that achieves a net zero energy value*.
Opening percentage	the openability percentage or 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
Recommended capacity	this is the capacity or size of equipment that is recommended by NatHERS to achieve the desired comfort conditions in the zone or zones serviced. This is a recommendation and the final selection sizing should be confirmed by a suitably qualified person.
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 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.
STCs	Small-scale Technology Certificates, certificates created by the REC registry for renewable energy technologies that may be bought and sold as part of the Small-scale Renewable Energy Scheme operated by the Clean Energy Regulatory
Thermal breaks	are materials with an R-value greater than or equal to 0.2 that must separate the metal frame from the cladding. This includes, but is not limited to, materials such as timber battens greater than or equal to 20mm thick, continuous thermal breaks such as polystyrene insulation sheeting, plastic strips or furring channels.
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).
Window shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes horizontal* or vertical shading features* (eg eaves and balconies)

* Refer to glossary.

Residential energy rating report Non-accredited No.

Generated on 31 Jan 2025 using Hero 4.1

This report was created using NatHERS accredited software but the non-accredited assessor (rater) is not accredited under NatHERS and this report is not accredited as being compliant with NatHERS.
Reliance on this report is accordingly at your own risk.

Property

Address	1-02, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	2 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	42.7	Suburban
Unconditioned*	6.0	**NatHERS climate zone**
Total	48.7	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

8.9

star rating

42.7 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	**Cooling**
Modelled	37.2	5.5
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
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Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			

Other NCC requirements

Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Kitchen/Living 6	Kitchen/Living	31.29
Bathroom	Unconditioned	6.01
Bedroom	Bedroom	11.40

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	Al Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Kitchen/Living 6	A&L-026-020	W01	1800	900	Casement	90	N	None
Kitchen/Living 6	A&L-026-020	W02	2700	2100	Sliding Door	45	N	None
Kitchen/Living 6	A&L-026-020	W03	2700	600	Fixed	0	N	None

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

* Refer to glossary.

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit

None

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade

None

Skylight *type and performance*

Skylight ID	Skylight description

None

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance

None

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Kitchen/Living 6	2100	870	90	S

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
MC-REFL-CAV-A	Metal Clad Battened (Refl Cavity) Stud Wall	0.30	Light	2.50	Yes
MC-REFL-CAV-B	Metal Clad Battened (Refl Cavity) Stud Wall	0.50	Medium	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bedroom	MC-REFL-CAV-B	2700	2991	S		No
Kitchen/Living 6	MC-REFL-CAV-A	2700	2042	N	623	Yes

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Kitchen/Living 6	MC-REFL-CAV-A	2700	906	E	3616	Yes
Kitchen/Living 6	MC-REFL-CAV-A	2700	2953	N	2493	Yes
Kitchen/Living 6	MC-REFL-CAV-B	2700	1893	S		No

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	53.3	2.50
INT-PB	Internal Plasterboard Stud Wall	22.6	2.00
INT-PB	Internal Plasterboard Stud Wall	7.3	0.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bathroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	6.0	N/A	0.00	Timber (12mm)
Bedroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	8.8	N/A	0.00	Timber (12mm)
Bedroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	2.6	N/A	2.00	Timber (12mm)
Kitchen/Living 6	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	13.4	N/A	2.00	Timber (12mm)
Kitchen/Living 6	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	17.9	N/A	0.00	Timber (12mm)

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
None			

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Kitchen/Living 6	1	Exhaust Fan	350	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)

* Refer to glossary.

Ceiling *fans*

Location	Quantity	Diameter (mm)
None		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
None			

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)
None				

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]
No Whole of Home Data				

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data			

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]
No Whole of Home Data		

Battery *schedule*

Type	Storage Capacity [kWh]

* Refer to glossary.

Battery *schedule*

Type	Storage Capacity [kWh]
No Whole of Home Data	

Explanatory Notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

Accredited assessors

For quality assured NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in the certificate is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

The predicted annual energy load, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the assessor using the NatHERS accredited software tool are presented in this report and further details or data files may be obtained from the assessor.

Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
AFRC	Australian Fenestration Rating Council
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, range hoods, 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.
COP	Coefficient of performance
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.
EER	Energy Efficiency Ratio, measure of how much cooling can be achieved by an air conditioner for a single kWh of electricity input
Energy use	This is your homes rating without solar or batteries.
Energy value	The net cost to society including, but not limited to, costs to the building user, the environment and energy networks (as defined in the ABCB Housing Provisions Standard).
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	see exposure categories below
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.
National Construction Code (NCC) Class	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
Net zero home	a home that achieves a net zero energy value*.
Opening percentage	the openability percentage or 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
Recommended capacity	this is the capacity or size of equipment that is recommended by NatHERS to achieve the desired comfort conditions in the zone or zones serviced. This is a recommendation and the final selection sizing should be confirmed by a suitably qualified person.
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 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.
STCs	Small-scale Technology Certificates, certificates created by the REC registry for renewable energy technologies that may be bought and sold as part of the Small-scale Renewable Energy Scheme operated by the Clean Energy Regulatory
Thermal breaks	are materials with an R-value greater than or equal to 0.2 that must separate the metal frame from the cladding. This includes, but is not limited to, materials such as timber battens greater than or equal to 20mm thick, continuous thermal breaks such as polystyrene insulation sheeting, plastic strips or furring channels.
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).
Window shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes horizontal* or vertical shading features* (eg eaves and balconies)

* Refer to glossary.

Residential energy rating report Non-accredited No.

Generated on 31 Jan 2025 using Hero 4.1

This report was created using NatHERS accredited software but the non-accredited assessor (rater) is not accredited under NatHERS and this report is not accredited as being compliant with NatHERS.
Reliance on this report is accordingly at your own risk.

Property

Address	1-03, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	2 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	42.2	Suburban
Unconditioned*	6.0	**NatHERS climate zone**
Total	48.3	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

8.9

star rating

42.8 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	**Cooling**
Modelled	37.3	5.6
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			

Other NCC requirements

Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Kitchen/Living 7	Kitchen/Living	30.88
Bathroom	Unconditioned	6.04
Bedroom	Bedroom	11.37

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	Al Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Kitchen/Living 7	A&L-026-020	W02	2700	2100	Sliding Door	45	N	None
Kitchen/Living 7	A&L-026-020	W03	2700	600	Fixed	0	N	None
Kitchen/Living 7	A&L-026-020	W01	1800	900	Casement	90	N	None

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

* Refer to glossary.

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit

None

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade
None								

Skylight *type and performance*

Skylight ID	Skylight description
None	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance
None								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Kitchen/Living 7	2100	920	90	S

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
MC-REFL-CAV-A	Metal Clad Battened (Refl Cavity) Stud Wall	0.30	Light	2.50	Yes
MC-REFL-CAV-B	Metal Clad Battened (Refl Cavity) Stud Wall	0.50	Medium	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bedroom	MC-REFL-CAV-B	2700	2974	S		No
Kitchen/Living 7	MC-REFL-CAV-A	2700	906	E	6616	Yes

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Kitchen/Living 7	MC-REFL-CAV-A	2700	2974	N	2601	Yes
Kitchen/Living 7	MC-REFL-CAV-B	2700	1838	S		No
Kitchen/Living 7	MC-REFL-CAV-A	2700	2010	N		Yes
Kitchen/Living 7	MC-REFL-CAV-A	2700	906	W	3173	Yes

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	50.8	2.50
INT-PB	Internal Plasterboard Stud Wall	22.5	2.00
INT-PB	Internal Plasterboard Stud Wall	7.2	0.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bathroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	6.0	N/A	2.00	Timber (12mm)
Bedroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	11.4	N/A	2.00	Timber (12mm)
Kitchen/Living 7	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	30.9	N/A	2.00	Timber (12mm)

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
None			

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Kitchen/Living 7	1	Exhaust Fan	350	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
None		

* Refer to glossary.

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
None			

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)
None				

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]
No Whole of Home Data				

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data			

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]
No Whole of Home Data		

Battery *schedule*

Type	Storage Capacity [kWh]
No Whole of Home Data	

* Refer to glossary.

Explanatory Notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

Accredited assessors

For quality assured NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in the certificate is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

The predicted annual energy load, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the assessor using the NatHERS accredited software tool are presented in this report and further details or data files may be obtained from the assessor.

Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
AFRC	Australian Fenestration Rating Council
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, range hoods, 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.
COP	Coefficient of performance
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.
EER	Energy Efficiency Ratio, measure of how much cooling can be achieved by an air conditioner for a single kWh of electricity input
Energy use	This is your homes rating without solar or batteries
Energy value	The net cost to society including, but not limited to, costs to the building user, the environment and energy networks (as defined in the ABCB Housing Provisions Standard).
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	see exposure categories below
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.
National Construction Code (NCC) Class	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
Net zero home	a home that achieves a net zero energy value*.
Opening percentage	the openability percentage or 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
Recommended capacity	this is the capacity or size of equipment that is recommended by NatHERS to achieve the desired comfort conditions in the zone or zones serviced. This is a recommendation and the final selection sizing should be confirmed by a suitably qualified person.
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 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.
STCs	Small-scale Technology Certificates, certificates created by the REC registry for renewable energy technologies that may be bought and sold as part of the Small-scale Renewable Energy Scheme operated by the Clean Energy Regulatory
Thermal breaks	are materials with an R-value greater than or equal to 0.2 that must separate the metal frame from the cladding. This includes, but is not limited to, materials such as timber battens greater than or equal to 20mm thick, continuous thermal breaks such as polystyrene insulation sheeting, plastic strips or furring channels.
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).
Window shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes horizontal* or vertical shading features* (eg eaves and balconies)

* Refer to glossary.

Residential energy rating report Non-accredited No.

Generated on 31 Jan 2025 using Hero 4.1

This report was created using NatHERS accredited software but the non-accredited assessor (rater) is not accredited under NatHERS and this report is not accredited as being compliant with NatHERS.
Reliance on this report is accordingly at your own risk.

Property

Address	1-04, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	2 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	42.1	Suburban
Unconditioned*	6.1	**NatHERS climate zone**
Total	48.2	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

8.7

star rating

48.9 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	**Cooling**
Modelled	43.5	5.5
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			

Other NCC requirements

Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Kitchen/Living	Kitchen/Living	30.84
Bedroom	Bedroom	11.29
Bathroom	Unconditioned	6.08

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	Al Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Kitchen/Living	A&L-026-020	W02	2700	2400	Sliding Door	45	N	None
Kitchen/Living	A&L-026-020	W03	2700	600	Fixed	0	N	None
Kitchen/Living	A&L-026-020	W01	1800	900	Casement	90	N	None

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

* Refer to glossary.

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit

None

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade
None								

Skylight *type and performance*

Skylight ID	Skylight description
None	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance
None								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Kitchen/Living	2100	920	90	S

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
MC-REFL-CAV-A	Metal Clad Battened (Refl Cavity) Stud Wall	0.50	Medium	2.50	Yes
MC-REFL-CAV-B	Metal Clad Battened (Refl Cavity) Stud Wall	0.30	Light	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bedroom	MC-REFL-CAV-A	2700	2955	S		No
Kitchen/Living	MC-REFL-CAV-A	2700	1824	S		No

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Kitchen/Living	MC-REFL-CAV-B	2700	3003	N	2601	Yes
Kitchen/Living	MC-REFL-CAV-B	2700	906	W	6567	Yes
Kitchen/Living	MC-REFL-CAV-B	2700	1998	N	623	Yes

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	53.3	2.50
INT-PB	Internal Plasterboard Stud Wall	22.7	2.00
INT-PB	Internal Plasterboard Stud Wall	7.2	0.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bathroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	6.1	N/A	2.00	Timber (12mm)
Bedroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	11.3	N/A	2.00	Timber (12mm)
Kitchen/Living	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	30.8	N/A	2.00	Timber (12mm)

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
None			

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Kitchen/Living	1	Exhaust Fan	350	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
None		

* Refer to glossary.

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
None			

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)
None				

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]
No Whole of Home Data				

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data			

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]
No Whole of Home Data		

Battery *schedule*

Type	Storage Capacity [kWh]
No Whole of Home Data	

* Refer to glossary.

Explanatory Notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

Accredited assessors

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Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the assessor using the NatHERS accredited software tool are presented in this report and further details or data files may be obtained from the assessor.

Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
AFRC	Australian Fenestration Rating Council
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, range hoods, 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.
COP	Coefficient of performance
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.
EER	Energy Efficiency Ratio, measure of how much cooling can be achieved by an air conditioner for a single kWh of electricity input
Energy use	This is your homes rating without solar or batteries
Energy value	The net cost to society including, but not limited to, costs to the building user, the environment and energy networks (as defined in the ABCB Housing Provisions Standard).
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	see exposure categories below
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.
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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.
National Construction Code (NCC) Class	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
Net zero home	a home that achieves a net zero energy value*.
Opening percentage	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
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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.
STCs	Small-scale Technology Certificates, certificates created by the REC registry for renewable energy technologies that may be bought and sold as part of the Small-scale Renewable Energy Scheme operated by the Clean Energy Regulatory
Thermal breaks	are materials with an R-value greater than or equal to 0.2 that must separate the metal frame from the cladding. This includes, but is not limited to, materials such as timber battens greater than or equal to 20mm thick, continuous thermal breaks such as polystyrene insulation sheeting, plastic strips or furring channels.
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).
Window shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes horizontal* or vertical shading features* (eg eaves and balconies)

* Refer to glossary.

Residential energy rating report Non-accredited No.

Generated on 31 Jan 2025 using Hero 4.1

This report was created using NatHERS accredited software but the non-accredited assessor (rater) is not accredited under NatHERS and this report is not accredited as being compliant with NatHERS.
Reliance on this report is accordingly at your own risk.

Property

Address	1-05, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	2 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	58.7	Suburban
Unconditioned*	7.9	**NatHERS climate zone**
Total	66.6	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

8.8

star rating

46.1 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	**Cooling**
Modelled	37.8	8.3
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			

Other NCC requirements

Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Kitchen/Living 9	Kitchen/Living	28.73
Bedroom 1	Bedroom	11.90
Bedroom 2	Bedroom	11.08
Toilet	Unconditioned	4.18
Laundry	Unconditioned	3.70
Corridor	Day Time	7.03

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	Al Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Bedroom 1	A&L-026-020	W05	1800	900	Casement	90	E	None
Bedroom 2	A&L-026-020	W06	1800	900	Casement	90	E	None
Kitchen/Living 9	A&L-026-020	W07	2700	900	Fixed	0	E	None
Kitchen/Living 9	A&L-026-020	W02	2700	2400	Sliding Door	45	N	None
Kitchen/Living 9	A&L-026-020	W03	2700	600	Fixed	0	N	None
Kitchen/Living 9	A&L-026-020	W04	1050	1800	Sliding	45	E	None
Kitchen/Living 9	A&L-026-020	W01	1800	900	Casement	90	N	None

* Refer to glossary.

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade
None								

Skylight *type and performance*

Skylight ID	Skylight description
None	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance
None								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Corridor	2100	870	90	S

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
MC-REFL-CAV-A	Metal Clad Battened (Refl Cavity) Stud Wall	0.30	Light	2.50	Yes
MC-REFL-CAV-B	Metal Clad Battened (Refl Cavity) Stud Wall	0.50	Medium	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bedroom 1	MC-REFL-CAV-A	2700	2988	E		Yes
Bedroom 2	MC-REFL-CAV-A	2700	2985	E		Yes
Bedroom 2	MC-REFL-CAV-B	2700	3568	S		No
Bedroom 2	MC-REFL-CAV-B	2700	238	W		No
Corridor	MC-REFL-CAV-B	2700	1588	S		No
Kitchen/Living 9	MC-REFL-CAV-A	2700	1177	E	3663	Yes
Kitchen/Living 9	MC-REFL-CAV-A	2700	3919	N	2764	Yes
Kitchen/Living 9	MC-REFL-CAV-A	2700	3422	E		Yes
Kitchen/Living 9	MC-REFL-CAV-A	2700	3016	N	623	Yes
Laundry	MC-REFL-CAV-B	2700	1501	S		No

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	27.9	2.50
INT-PB	Internal Plasterboard Stud Wall	38.2	0.00
INT-PB	Internal Plasterboard Stud Wall	15.0	2.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bedroom 1	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	11.9	N/A	2.00	Timber (12mm)
Bedroom 2	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	11.1	N/A	2.00	Timber (12mm)
Corridor	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	7.0	N/A	2.00	Timber (12mm)
Kitchen/Living 9	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	28.7	N/A	2.00	Timber (12mm)
Laundry	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	3.7	N/A	2.00	Timber (12mm)
Toilet	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	4.2	N/A	2.00	Timber (12mm)

* Refer to glossary.

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
None			

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Kitchen/Living 9	1	Exhaust Fan	350	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
None		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
None			

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)
None				

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]
No Whole of Home Data				

* Refer to glossary.

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity

No Whole of Home Data

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]

No Whole of Home Data

Battery *schedule*

Type	Storage Capacity [kWh]

No Whole of Home Data

* Refer to glossary.

Explanatory Notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

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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.
STCs	Small-scale Technology Certificates, certificates created by the REC registry for renewable energy technologies that may be bought and sold as part of the Small-scale Renewable Energy Scheme operated by the Clean Energy Regulatory
Thermal breaks	are materials with an R-value greater than or equal to 0.2 that must separate the metal frame from the cladding. This includes, but is not limited to, materials such as timber battens greater than or equal to 20mm thick, continuous thermal breaks such as polystyrene insulation sheeting, plastic strips or furring channels.
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).
Window shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes horizontal* or vertical shading features* (eg eaves and balconies)

* Refer to glossary.

Residential energy rating report Non-accredited No.

Generated on 31 Jan 2025 using Hero 4.1

This report was created using NatHERS accredited software but the non-accredited assessor (rater) is not accredited under NatHERS and this report is not accredited as being compliant with NatHERS.
Reliance on this report is accordingly at your own risk.

Property

Address	1-06, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	2 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	64.4	Suburban
Unconditioned*	4.2	**NatHERS climate zone**
Total	68.6	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

7.5

star rating

83.3 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	**Cooling**
Modelled	75.6	7.7
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			
Other NCC requirements					
Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.					

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Corridor	Day Time	9.98
Kitchen/Living 10	Kitchen/Living	30.97
Bedroom 1	Bedroom	11.04
Bedroom 2	Bedroom	12.39
Toilet	Unconditioned	4.17

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	Al Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Bedroom 1	A&L-026-020	W02	1800	1800	Casement	45	S	None
Bedroom 2	A&L-026-020	W01	1800	1800	Casement	45	S	None
Kitchen/Living 10	A&L-026-020	W06	1050	1800	Sliding	45	E	None
Kitchen/Living 10	A&L-026-020	W04	2700	2700	Sliding Door	45	E	None
Kitchen/Living 10	A&L-026-020	W05	2700	600	Fixed	0	E	None
Kitchen/Living 10	A&L-026-020	W03	1050	1800	Casement	45	S	None

* Refer to glossary.

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade
None								

Skylight *type and performance*

Skylight ID	Skylight description
None	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance
None								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Corridor	2100	820	90	N

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
MC-REFL-CAV-A	Metal Clad Battened (Refl Cavity) Stud Wall	0.50	Medium	2.50	Yes
MC-REFL-CAV-B	Metal Clad Battened (Refl Cavity) Stud Wall	0.30	Light	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bedroom 1	MC-REFL-CAV-B	2700	3645	S		No
Bedroom 2	MC-REFL-CAV-B	2700	3027	S		No
Bedroom 2	MC-REFL-CAV-B	2700	4028	W		Yes
Bedroom 2	MC-REFL-CAV-A	2700	1794	N		No
Corridor	MC-REFL-CAV-A	2700	2114	N		No
Corridor	MC-REFL-CAV-A	2700	2297	W		No
Kitchen/Living 10	MC-REFL-CAV-B	2700	3070	E	1266	Yes
Kitchen/Living 10	MC-REFL-CAV-B	2700	1669	S	2914	Yes
Kitchen/Living 10	MC-REFL-CAV-B	2700	3391	E	2935	Yes
Kitchen/Living 10	MC-REFL-CAV-B	2700	4001	S		No
Kitchen/Living 10	MC-REFL-CAV-A	2700	5670	N		No
Toilet	MC-REFL-CAV-A	2700	2772	N		No

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	14.0	2.00
INT-PB	Internal Plasterboard Stud Wall	34.7	0.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bedroom 1	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	11.0	N/A	2.00	Timber (12mm)
Bedroom 2	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	12.4	N/A	2.00	Timber (12mm)
Corridor	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	10.0	N/A	2.00	Timber (12mm)
Kitchen/Living 10	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	31.0	N/A	2.00	Timber (12mm)
Toilet	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	4.2	N/A	2.00	Timber (12mm)

* Refer to glossary.

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
None			

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Kitchen/Living 10	1	Exhaust Fan	350	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
None		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
None			

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)
None				

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]
No Whole of Home Data				

* Refer to glossary.

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity

No Whole of Home Data

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]

No Whole of Home Data

Battery *schedule*

Type	Storage Capacity [kWh]

No Whole of Home Data

* Refer to glossary.

Explanatory Notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

Accredited assessors

For quality assured NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in the certificate is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

The predicted annual energy load, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the assessor using the NatHERS accredited software tool are presented in this report and further details or data files may be obtained from the assessor.

Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
AFRC	Australian Fenestration Rating Council
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, range hoods, 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.
COP	Coefficient of performance
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.
EER	Energy Efficiency Ratio, measure of how much cooling can be achieved by an air conditioner for a single kWh of electricity input
Energy use	This is your homes rating without solar or batteries
Energy value	The net cost to society including, but not limited to, costs to the building user, the environment and energy networks (as defined in the ABCB Housing Provisions Standard).
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	see exposure categories below
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.
National Construction Code (NCC) Class	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
Net zero home	a home that achieves a net zero energy value*.
Opening percentage	the openability percentage or 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
Recommended capacity	this is the capacity or size of equipment that is recommended by NatHERS to achieve the desired comfort conditions in the zone or zones serviced. This is a recommendation and the final selection sizing should be confirmed by a suitably qualified person.
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 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.
STCs	Small-scale Technology Certificates, certificates created by the REC registry for renewable energy technologies that may be bought and sold as part of the Small-scale Renewable Energy Scheme operated by the Clean Energy Regulatory
Thermal breaks	are materials with an R-value greater than or equal to 0.2 that must separate the metal frame from the cladding. This includes, but is not limited to, materials such as timber battens greater than or equal to 20mm thick, continuous thermal breaks such as polystyrene insulation sheeting, plastic strips or furring channels.
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).
Window shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes horizontal* or vertical shading features* (eg eaves and balconies)

* Refer to glossary.

Residential energy rating report Non-accredited No.

Generated on 31 Jan 2025 using Hero 4.1

This report was created using NatHERS accredited software but the non-accredited assessor (rater) is not accredited under NatHERS and this report is not accredited as being compliant with NatHERS.
Reliance on this report is accordingly at your own risk.

Property

Address	1-07, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	2 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	47.4	Suburban
Unconditioned*	4.0	**NatHERS climate zone**
Total	51.4	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

7.7

star rating

76.7 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	**Cooling**
Modelled	58.3	18.4
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			
Other NCC requirements					
Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.					

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Bedroom	Bedroom	12.95
Bathroom	Unconditioned	3.99
Living/Kitchen	Kitchen/Living	34.42

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	Al Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Bedroom	A&L-026-020	W05	2700	1800	Casement	45	S	None
Living/Kitchen	A&L-026-020	W06	600	820	Casement	90	N	None
Living/Kitchen	A&L-026-020	W04	1800	900	Casement	90	S	None
Living/Kitchen	A&L-026-020	W01	2700	2700	Sliding	45	W	None
Living/Kitchen	A&L-026-020	W02	2700	700	Fixed	0	W	None
Living/Kitchen	A&L-026-020	W03	1800	900	Casement	90	W	None

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit

* Refer to glossary.

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade
None								

Skylight *type and performance*

Skylight ID	Skylight description
None	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance
None								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Living/Kitchen	2100	900	90	N

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
MC-REFL-CAV	Metal Clad Battened (Refl Cavity) Stud Wall	0.30	Light	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bathroom	MC-REFL-CAV	2700	2619	N		Yes

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bedroom	MC-REFL-CAV	2700	3110	N		Yes
Bedroom	MC-REFL-CAV	2700	4164	E		Yes
Bedroom	MC-REFL-CAV	2700	3110	S		No
Living/Kitchen	MC-REFL-CAV	2700	4217	N	1682	Yes
Living/Kitchen	MC-REFL-CAV	2700	2359	E		Yes
Living/Kitchen	MC-REFL-CAV	2700	7122	S		No
Living/Kitchen	MC-REFL-CAV	2700	6461	W	1929	Yes

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	13.6	2.00
INT-PB	Internal Plasterboard Stud Wall	4.9	0.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bathroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	4.0	N/A	2.00	Timber (12mm)
Bedroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	13.0	N/A	2.00	Timber (12mm)
Living/Kitchen	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	34.4	N/A	2.00	Timber (12mm)

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
None			

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Living/Kitchen	1	Exhaust Fan	350	Sealed

* Refer to glossary.

Ceiling *fans*

Location	Quantity	Diameter (mm)
None		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
None			

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)
None				

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]
No Whole of Home Data				

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data			

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]
No Whole of Home Data		

* Refer to glossary.

Battery *schedule*

Type	Storage Capacity [kWh]
No Whole of Home Data	

Explanatory Notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

Accredited assessors

For quality assured NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in the certificate is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

The predicted annual energy load, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the assessor using the NatHERS accredited software tool are presented in this report and further details or data files may be obtained from the assessor.

Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
AFRC	Australian Fenestration Rating Council
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, range hoods, 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.
COP	Coefficient of performance
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.
EER	Energy Efficiency Ratio, measure of how much cooling can be achieved by an air conditioner for a single kWh of electricity input
Energy use	This is your homes rating without solar or batteries
Energy value	The net cost to society including, but not limited to, costs to the building user, the environment and energy networks (as defined in the ABCB Housing Provisions Standard).
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	see exposure categories below
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.
National Construction Code (NCC) Class	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
Net zero home	a home that achieves a net zero energy value*.
Opening percentage	the openability percentage or 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
Recommended capacity	this is the capacity or size of equipment that is recommended by NatHERS to achieve the desired comfort conditions in the zone or zones serviced. This is a recommendation and the final selection sizing should be confirmed by a suitably qualified person.
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 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.
STCs	Small-scale Technology Certificates, certificates created by the REC registry for renewable energy technologies that may be bought and sold as part of the Small-scale Renewable Energy Scheme operated by the Clean Energy Regulatory
Thermal breaks	are materials with an R-value greater than or equal to 0.2 that must separate the metal frame from the cladding. This includes, but is not limited to, materials such as timber battens greater than or equal to 20mm thick, continuous thermal breaks such as polystyrene insulation sheeting, plastic strips or furring channels.
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).
Window shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes horizontal* or vertical shading features* (eg eaves and balconies)

* Refer to glossary.

Residential energy rating report Non-accredited No.

Generated on 31 Jan 2025 using Hero 4.1

This report was created using NatHERS accredited software but the non-accredited assessor (rater) is not accredited under NatHERS and this report is not accredited as being compliant with NatHERS.
Reliance on this report is accordingly at your own risk.

Property

Address	2-01, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	3 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	58.7	Suburban
Unconditioned*	7.8	**NatHERS climate zone**
Total	66.5	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

7.6

star rating

81.3 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	**Cooling**
Modelled	60.7	20.6
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			

Other NCC requirements

Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Bedroom 1	Bedroom	11.89
Bathroom	Unconditioned	4.13
Laundry	Unconditioned	3.65
Corridor	Day Time	6.83
Bedroom 2	Bedroom	11.13
Living/Kitchen	Kitchen/Living	28.84

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	AI Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Bedroom 1	A&L-026-020	W02	1800	900	Casement	90	W	None
Bedroom 2	A&L-026-020	W01	1800	900	Casement	90	W	None
Living/Kitchen	A&L-026-020	W06	2700	2400	Sliding Door	45	N	None
Living/Kitchen	A&L-026-020	W07	2700	600	Fixed	0	N	None
Living/Kitchen	A&L-026-020	W04	2700	900	Fixed	0	W	None
Living/Kitchen	A&L-026-020	W05	1800	900	Fixed	0	N	None
Living/Kitchen	A&L-026-020	W03	1050	1800	Sliding Door	45	W	None

* Refer to glossary.

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade
None								

Skylight *type and performance*

Skylight ID	Skylight description
None	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance
None								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Corridor	2100	870	90	S

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
MC-REFL-CAV-A	Metal Clad Battened (Refl Cavity) Stud Wall	0.30	Light	2.50	Yes
MC-REFL-CAV-B	Metal Clad Battened (Refl Cavity) Stud Wall	0.50	Medium	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bedroom 1	MC-REFL-CAV-A	2700	2958	W		Yes
Bedroom 2	MC-REFL-CAV-A	2700	3601	S	1670	Yes
Bedroom 2	MC-REFL-CAV-A	2700	2972	W		Yes
Bedroom 2	MC-REFL-CAV-A	2700	239	E		Yes
Corridor	MC-REFL-CAV-B	2700	1566	S		No
Laundry	MC-REFL-CAV-B	2700	1486	S		No
Living/Kitchen	MC-REFL-CAV-A	2700	3990	N	2710	Yes
Living/Kitchen	MC-REFL-CAV-A	2700	1171	W	5553	Yes
Living/Kitchen	MC-REFL-CAV-A	2700	2994	N	1539	Yes
Living/Kitchen	MC-REFL-CAV-A	2700	3422	W		Yes

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	27.9	2.50
INT-PB	Internal Plasterboard Stud Wall	37.7	0.00
INT-PB	Internal Plasterboard Stud Wall	14.7	2.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bathroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	4.1	N/A	0.00	Timber (12mm)
Bedroom 1	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	11.9	N/A	0.00	Timber (12mm)
Bedroom 2	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	11.1	N/A	0.00	Timber (12mm)
Corridor	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	6.8	N/A	0.00	Timber (12mm)
Laundry	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	3.7	N/A	0.00	Timber (12mm)
Living/Kitchen	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	28.8	N/A	0.00	Timber (12mm)

* Refer to glossary.

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
Bathroom	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Bedroom 1	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Bedroom 2	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Corridor	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Laundry	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Living/Kitchen	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Living/Kitchen	1	Exhaust Fan	350	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
None		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	0.00	0.50	Medium

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)
None				

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

* Refer to glossary.

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]
No Whole of Home Data				

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data			

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]
No Whole of Home Data		

Battery *schedule*

Type	Storage Capacity [kWh]
No Whole of Home Data	

* Refer to glossary.

Explanatory Notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

Accredited assessors

For quality assured NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in the certificate is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

The predicted annual energy load, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the assessor using the NatHERS accredited software tool are presented in this report and further details or data files may be obtained from the assessor.

Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
AFRC	Australian Fenestration Rating Council
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, range hoods, 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.
COP	Coefficient of performance
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.
EER	Energy Efficiency Ratio, measure of how much cooling can be achieved by an air conditioner for a single kWh of electricity input
Energy use	This is your homes rating without solar or batteries
Energy value	The net cost to society including, but not limited to, costs to the building user, the environment and energy networks (as defined in the ABCB Housing Provisions Standard).
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	see exposure categories below
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.
National Construction Code (NCC) Class	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
Net zero home	a home that achieves a net zero energy value*.
Opening percentage	the openability percentage or 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
Recommended capacity	this is the capacity or size of equipment that is recommended by NatHERS to achieve the desired comfort conditions in the zone or zones serviced. This is a recommendation and the final selection sizing should be confirmed by a suitably qualified person.
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 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.
STCs	Small-scale Technology Certificates, certificates created by the REC registry for renewable energy technologies that may be bought and sold as part of the Small-scale Renewable Energy Scheme operated by the Clean Energy Regulatory
Thermal breaks	are materials with an R-value greater than or equal to 0.2 that must separate the metal frame from the cladding. This includes, but is not limited to, materials such as timber battens greater than or equal to 20mm thick, continuous thermal breaks such as polystyrene insulation sheeting, plastic strips or furring channels.
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).
Window shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes horizontal* or vertical shading features* (eg eaves and balconies)

* Refer to glossary.

Residential energy rating report Non-accredited No.

Generated on 31 Jan 2025 using Hero 4.1

This report was created using NatHERS accredited software but the non-accredited assessor (rater) is not accredited under NatHERS and this report is not accredited as being compliant with NatHERS.
Reliance on this report is accordingly at your own risk.

Property

Address	2-02, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	3 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	42.5	Suburban
Unconditioned*	6.0	**NatHERS climate zone**
Total	48.5	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

7.8

star rating

74.2 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	**Cooling**
Modelled	61.1	13.0
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			

Other NCC requirements

Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Kitchen/Living 14	Kitchen/Living	31.10
Bedroom 1	Bedroom	11.36
Bathroom	Unconditioned	6.01

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	Al Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Kitchen/Living 14	A&L-026-020	W01	1800	900	Fixed	0	N	None
Kitchen/Living 14	A&L-026-020	W02	2700	2100	Sliding Door	45	N	None
Kitchen/Living 14	A&L-026-020	W03	2700	600	Fixed	0	N	None

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

* Refer to glossary.

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit

None

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade

None

Skylight *type and performance*

Skylight ID	Skylight description

None

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance

None

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Kitchen/Living 14	2100	870	90	S

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
MC-REFL-CAV-A	Metal Clad Battened (Refl Cavity) Stud Wall	0.30	Light	2.50	Yes
MC-REFL-CAV-B	Metal Clad Battened (Refl Cavity) Stud Wall	0.50	Medium	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bedroom 1	MC-REFL-CAV-B	2700	2983	S		No
Kitchen/Living 14	MC-REFL-CAV-A	2700	2032	N	1622	Yes

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Kitchen/Living 14	MC-REFL-CAV-A	2700	901	E		Yes
Kitchen/Living 14	MC-REFL-CAV-A	2700	2951	N	2523	Yes
Kitchen/Living 14	MC-REFL-CAV-B	2700	1880	S		No

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	53.3	2.50
INT-PB	Internal Plasterboard Stud Wall	22.3	2.00
INT-PB	Internal Plasterboard Stud Wall	7.4	0.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bathroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	6.0	N/A	0.00	Timber (12mm)
Bedroom 1	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	11.4	N/A	0.00	Timber (12mm)
Kitchen/Living 14	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	31.1	N/A	0.00	Timber (12mm)

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
Bathroom	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Bedroom 1	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Kitchen/Living 14	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Kitchen/Living 14	1	Exhaust Fan	350	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)

* Refer to glossary.

Ceiling *fans*

Location	Quantity	Diameter (mm)
None		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	0.00	0.50	Medium

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)
None				

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]
No Whole of Home Data				

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data			

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]
No Whole of Home Data		

Battery *schedule*

Type	Storage Capacity [kWh]

* Refer to glossary.

Battery *schedule*

Type	Storage Capacity [kWh]
No Whole of Home Data	

Explanatory Notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

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Not all assumptions made by the assessor using the NatHERS accredited software tool are presented in this report and further details or data files may be obtained from the assessor.

Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
AFRC	Australian Fenestration Rating Council
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, range hoods, 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.
COP	Coefficient of performance
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.
EER	Energy Efficiency Ratio, measure of how much cooling can be achieved by an air conditioner for a single kWh of electricity input
Energy use	This is your homes rating without solar or batteries
Energy value	The net cost to society including, but not limited to, costs to the building user, the environment and energy networks (as defined in the ABCB Housing Provisions Standard).
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	see exposure categories below
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.
National Construction Code (NCC) Class	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
Net zero home	a home that achieves a net zero energy value*.
Opening percentage	the openability percentage or 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
Recommended capacity	this is the capacity or size of equipment that is recommended by NatHERS to achieve the desired comfort conditions in the zone or zones serviced. This is a recommendation and the final selection sizing should be confirmed by a suitably qualified person.
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 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.
STCs	Small-scale Technology Certificates, certificates created by the REC registry for renewable energy technologies that may be bought and sold as part of the Small-scale Renewable Energy Scheme operated by the Clean Energy Regulatory
Thermal breaks	are materials with an R-value greater than or equal to 0.2 that must separate the metal frame from the cladding. This includes, but is not limited to, materials such as timber battens greater than or equal to 20mm thick, continuous thermal breaks such as polystyrene insulation sheeting, plastic strips or furring channels.
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).
Window shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes horizontal* or vertical shading features* (eg eaves and balconies)

* Refer to glossary.

Residential energy rating report Non-accredited No.

Generated on 31 Jan 2025 using Hero 4.1

This report was created using NatHERS accredited software but the non-accredited assessor (rater) is not accredited under NatHERS and this report is not accredited as being compliant with NatHERS.
Reliance on this report is accordingly at your own risk.

Property

Address	2-03, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	3 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	42.1	Suburban
Unconditioned*	6.0	**NatHERS climate zone**
Total	48.1	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

7.8

star rating

76.4 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	Cooling
Modelled	63.8	12.6
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			
Other NCC requirements					
Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.					

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Kitchen/Living	Kitchen/Living	30.72
Bathroom	Unconditioned	6.03
Bedroom	Bedroom	11.33

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	Al Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Kitchen/Living	A&L-026-020	W01	2700	2100	Sliding Door	45	N	None
Kitchen/Living	A&L-026-020	W02	2700	600	Fixed	0	N	None
Kitchen/Living	A&L-026-020	W03	1800	900	Fixed	0	N	None

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

* Refer to glossary.

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit

None

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade

None

Skylight *type and performance*

Skylight ID	Skylight description

None

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance

None

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Kitchen/Living	2100	870	90	S

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
MC-REFL-CAV-A	Metal Clad Battened (Refl Cavity) Stud Wall	0.30	Light	2.50	Yes
MC-REFL-CAV-B	Metal Clad Battened (Refl Cavity) Stud Wall	0.50	Medium	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bedroom	MC-REFL-CAV-B	2700	2972	S		No
Kitchen/Living	MC-REFL-CAV-A	2700	901	E		Yes

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Kitchen/Living	MC-REFL-CAV-A	2700	2972	N	2523	Yes
Kitchen/Living	MC-REFL-CAV-B	2700	1827	S		No
Kitchen/Living	MC-REFL-CAV-A	2700	2004	N	1622	Yes
Kitchen/Living	MC-REFL-CAV-A	2700	901	W		Yes

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	50.8	2.50
INT-PB	Internal Plasterboard Stud Wall	22.3	2.00
INT-PB	Internal Plasterboard Stud Wall	7.4	0.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bathroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	6.0	N/A	0.00	Timber (12mm)
Bedroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	11.3	N/A	0.00	Timber (12mm)
Kitchen/Living	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	30.7	N/A	0.00	Timber (12mm)

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
Bathroom	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Bedroom	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Kitchen/Living	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Kitchen/Living	1	Exhaust Fan	350	Sealed

* Refer to glossary.

Ceiling *fans*

Location	Quantity	Diameter (mm)

None

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	0.00	0.50	Medium

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)

None

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity

No Whole of Home Data

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity

No Whole of Home Data

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]

No Whole of Home Data

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity

No Whole of Home Data

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]

No Whole of Home Data

* Refer to glossary.

Battery *schedule*

Type	Storage Capacity [kWh]
No Whole of Home Data	

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Ceiling penetrations	features that require a penetration to the ceiling, including downlights, vents, exhaust fans, range hoods, 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.
COP	Coefficient of performance
Custom windows	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
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EER	Energy Efficiency Ratio, measure of how much cooling can be achieved by an air conditioner for a single kWh of electricity input
Energy use	This is your homes rating without solar or batteries
Energy value	The net cost to society including, but not limited to, costs to the building user, the environment and energy networks (as defined in the ABCB Housing Provisions Standard).
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	see exposure categories below
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.
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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.
National Construction Code (NCC) Class	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
Net zero home	a home that achieves a net zero energy value*.
Opening percentage	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
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Property

Address	2-04, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	3 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	41.9	Suburban
Unconditioned*	6.1	**NatHERS climate zone**
Total	48.0	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

7.8

star rating

74.1 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	**Cooling**
Modelled	61.2	12.9
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			
Other NCC requirements					
Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.					

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Kitchen/Living 15	Kitchen/Living	30.65
Bathroom	Unconditioned	6.06
Bedroom	Bedroom	11.26

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	Al Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Kitchen/Living 15	A&L-026-020	W02	2700	600	Fixed	0	N	None
Kitchen/Living 15	A&L-026-020	W03	2700	2100	Sliding Door	45	N	None
Kitchen/Living 15	A&L-026-020	W01	1800	900	Casement	90	N	None

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

* Refer to glossary.

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit

None

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade

None

Skylight *type and performance*

Skylight ID	Skylight description

None

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance

None

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Kitchen/Living 15	2100	870	90	S

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
MC-REFL-CAV-A	Metal Clad Battened (Refl Cavity) Stud Wall	0.30	Light	2.50	Yes
MC-REFL-CAV-B	Metal Clad Battened (Refl Cavity) Stud Wall	0.50	Medium	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bedroom	MC-REFL-CAV-B	2700	2951	S		No
Kitchen/Living 15	MC-REFL-CAV-A	2700	3003	N	2523	Yes

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Kitchen/Living 15	MC-REFL-CAV-A	2700	901	W		Yes
Kitchen/Living 15	MC-REFL-CAV-A	2700	1989	N	1622	Yes
Kitchen/Living 15	MC-REFL-CAV-B	2700	1809	S		No

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	53.3	2.50
INT-PB	Internal Plasterboard Stud Wall	22.3	2.00
INT-PB	Internal Plasterboard Stud Wall	7.2	0.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bathroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	6.1	N/A	0.00	Timber (12mm)
Bedroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	11.3	N/A	0.00	Timber (12mm)
Kitchen/Living 15	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	30.7	N/A	0.00	Timber (12mm)

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
Bathroom	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Bedroom	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Kitchen/Living 15	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Kitchen/Living 15	1	Exhaust Fan	350	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)

* Refer to glossary.

Ceiling *fans*

Location	Quantity	Diameter (mm)
None		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	0.00	0.50	Medium

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)
None				

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]
No Whole of Home Data				

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data			

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]
No Whole of Home Data		

Battery *schedule*

Type	Storage Capacity [kWh]

* Refer to glossary.

Battery *schedule*

Type	Storage Capacity [kWh]
No Whole of Home Data	

Explanatory Notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

Accredited assessors

For quality assured NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in the certificate is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

The predicted annual energy load, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the assessor using the NatHERS accredited software tool are presented in this report and further details or data files may be obtained from the assessor.

Glossary

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* Refer to glossary.

Residential energy rating report Non-accredited No.

Generated on 31 Jan 2025 using Hero 4.1

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Reliance on this report is accordingly at your own risk.

Property

Address	2-05, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	3 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	58.6	Suburban
Unconditioned*	7.8	**NatHERS climate zone**
Total	66.4	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

7.8

star rating

73.7 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	**Cooling**
Modelled	56.7	17.1
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			
Other NCC requirements					
Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.					

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Kitchen/Living 16	Kitchen/Living	28.67
Bedroom 1	Bedroom	11.88
Bedroom 2	Bedroom	11.04
Laundry	Unconditioned	3.68
Bathroom	Unconditioned	4.16
Corridor	Day Time	6.98

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	Al Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Bedroom 1	A&L-026-020	W02	1800	900	Casement	90	E	None
Bedroom 2	A&L-026-020	W01	1800	900	Casement	90	E	None
Kitchen/Living 16	A&L-026-020	W07	1800	900	Casement	90	N	None
Kitchen/Living 16	A&L-026-020	W06	2700	900	Fixed	0	E	None
Kitchen/Living 16	A&L-026-020	W04	2700	600	Fixed	0	N	None
Kitchen/Living 16	A&L-026-020	W05	2700	2400	Sliding Door	45	N	None
Kitchen/Living 16	A&L-026-020	W03	1050	1800	Sliding	45	E	None

* Refer to glossary.

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade
None								

Skylight *type and performance*

Skylight ID	Skylight description
None	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance
None								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Corridor	2100	870	90	S

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
MC-REFL-CAV-A	Metal Clad Battened (Refl Cavity) Stud Wall	0.30	Light	2.50	Yes
MC-REFL-CAV-B	Metal Clad Battened (Refl Cavity) Stud Wall	0.50	Medium	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bedroom 1	MC-REFL-CAV-A	2700	2984	E		Yes
Bedroom 2	MC-REFL-CAV-A	2700	2972	E		Yes
Bedroom 2	MC-REFL-CAV-B	2700	3574	S		No
Bedroom 2	MC-REFL-CAV-B	2700	239	W		No
Corridor	MC-REFL-CAV-B	2700	1583	S		No
Kitchen/Living 16	MC-REFL-CAV-A	2700	3010	N	1622	Yes
Kitchen/Living 16	MC-REFL-CAV-A	2700	1171	E	3875	Yes
Kitchen/Living 16	MC-REFL-CAV-A	2700	3917	N	2793	Yes
Kitchen/Living 16	MC-REFL-CAV-A	2700	3422	E		Yes
Laundry	MC-REFL-CAV-B	2700	1498	S		No

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	27.9	2.50
INT-PB	Internal Plasterboard Stud Wall	37.8	0.00
INT-PB	Internal Plasterboard Stud Wall	14.8	2.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bathroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	4.2	N/A	0.00	Timber (12mm)
Bedroom 1	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	11.9	N/A	0.00	Timber (12mm)
Bedroom 2	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	11.0	N/A	0.00	Timber (12mm)
Corridor	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	7.0	N/A	0.00	Timber (12mm)
Kitchen/Living 16	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	28.7	N/A	0.00	Timber (12mm)
Laundry	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	3.7	N/A	0.00	Timber (12mm)

* Refer to glossary.

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
Bathroom	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Bedroom 1	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Bedroom 2	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Corridor	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Kitchen/Living 16	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Laundry	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Kitchen/Living 16	1	Exhaust Fan	350	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
None		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	0.00	0.50	Medium

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)
None				

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

* Refer to glossary.

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]
No Whole of Home Data				

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data			

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]
No Whole of Home Data		

Battery *schedule*

Type	Storage Capacity [kWh]
No Whole of Home Data	

* Refer to glossary.

Explanatory Notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

Accredited assessors

For quality assured NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in the certificate is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

The predicted annual energy load, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the assessor using the NatHERS accredited software tool are presented in this report and further details or data files may be obtained from the assessor.

Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
AFRC	Australian Fenestration Rating Council
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, range hoods, 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.
COP	Coefficient of performance
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.
EER	Energy Efficiency Ratio, measure of how much cooling can be achieved by an air conditioner for a single kWh of electricity input
Energy use	This is your homes rating without solar or batteries
Energy value	The net cost to society including, but not limited to, costs to the building user, the environment and energy networks (as defined in the ABCB Housing Provisions Standard).
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	see exposure categories below
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.
National Construction Code (NCC) Class	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
Net zero home	a home that achieves a net zero energy value*.
Opening percentage	the openability percentage or 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
Recommended capacity	this is the capacity or size of equipment that is recommended by NatHERS to achieve the desired comfort conditions in the zone or zones serviced. This is a recommendation and the final selection sizing should be confirmed by a suitably qualified person.
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 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.
STCs	Small-scale Technology Certificates, certificates created by the REC registry for renewable energy technologies that may be bought and sold as part of the Small-scale Renewable Energy Scheme operated by the Clean Energy Regulatory
Thermal breaks	are materials with an R-value greater than or equal to 0.2 that must separate the metal frame from the cladding. This includes, but is not limited to, materials such as timber battens greater than or equal to 20mm thick, continuous thermal breaks such as polystyrene insulation sheeting, plastic strips or furring channels.
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).
Window shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes horizontal* or vertical shading features* (eg eaves and balconies)

* Refer to glossary.

Residential energy rating report Non-accredited No.

Generated on 31 Jan 2025 using Hero 4.1

This report was created using NatHERS accredited software but the non-accredited assessor (rater) is not accredited under NatHERS and this report is not accredited as being compliant with NatHERS.
Reliance on this report is accordingly at your own risk.

Property

Address	2-06, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	3 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	64.0	Suburban
Unconditioned*	4.2	**NatHERS climate zone**
Total	68.2	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

6.9

star rating

99.4 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	**Cooling**
Modelled	85.4	14.0
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			
Other NCC requirements					
Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.					

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Living / Kitchen	Kitchen/Living	30.83
Bathroom	Unconditioned	4.17
Corridor	Day Time	9.90
Bedroom 1	Bedroom	12.33
Bedroom 2	Bedroom	10.94

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	Al Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Bedroom 1	A&L-026-020	W01	1800	1800	Casement	45	S	None
Bedroom 2	A&L-026-020	W02	1800	1800	Casement	45	S	None
Living / Kitchen	A&L-026-020	W06	1050	1800	Sliding	45	E	None
Living / Kitchen	A&L-026-020	W04	2700	2400	Sliding Door	45	E	None
Living / Kitchen	A&L-026-020	W05	2700	600	Fixed	0	E	None
Living / Kitchen	A&L-026-020	W03	1050	1800	Casement	45	S	None

* Refer to glossary.

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade
None								

Skylight *type and performance*

Skylight ID	Skylight description
None	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance
None								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Corridor	2100	900	90	N

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
MC-REFL-CAV-A	Metal Clad Battened (Refl Cavity) Stud Wall	0.50	Medium	2.50	Yes
MC-REFL-CAV-B	Metal Clad Battened (Refl Cavity) Stud Wall	0.30	Light	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bathroom	MC-REFL-CAV-A	2700	2766	N		No
Bedroom 1	MC-REFL-CAV-A	2700	1798	N		No
Bedroom 1	MC-REFL-CAV-B	2700	3019	S		No
Bedroom 1	MC-REFL-CAV-B	2700	4016	W		Yes
Bedroom 2	MC-REFL-CAV-B	2700	3637	S		No
Corridor	MC-REFL-CAV-A	2700	2106	N		No
Corridor	MC-REFL-CAV-A	2700	2294	W		No
Living / Kitchen	MC-REFL-CAV-A	2700	5660	N		No
Living / Kitchen	MC-REFL-CAV-B	2700	3059	E	1436	Yes
Living / Kitchen	MC-REFL-CAV-B	2700	1671	S	3247	Yes
Living / Kitchen	MC-REFL-CAV-B	2700	3388	E	3107	Yes
Living / Kitchen	MC-REFL-CAV-B	2700	3989	S		No

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	29.7	0.00
INT-PB	Internal Plasterboard Stud Wall	13.9	2.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bathroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	4.2	N/A	0.00	Timber (12mm)
Bedroom 1	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	12.3	N/A	0.00	Timber (12mm)
Bedroom 2	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	10.9	N/A	0.00	Timber (12mm)
Corridor	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	9.9	N/A	0.00	Timber (12mm)
Living / Kitchen	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	30.8	N/A	0.00	Timber (12mm)

* Refer to glossary.

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
Bathroom	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Bedroom 1	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Bedroom 2	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Corridor	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Living / Kitchen	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Living / Kitchen	1	Exhaust Fan	350	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
None		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	0.00	0.50	Medium

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)
None				

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity

* Refer to glossary.

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]
No Whole of Home Data				

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data			

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]
No Whole of Home Data		

Battery *schedule*

Type	Storage Capacity [kWh]
No Whole of Home Data	

* Refer to glossary.

Explanatory Notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

Accredited assessors

For quality assured NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in the certificate is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

The predicted annual energy load, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the assessor using the NatHERS accredited software tool are presented in this report and further details or data files may be obtained from the assessor.

Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
AFRC	Australian Fenestration Rating Council
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, range hoods, 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.
COP	Coefficient of performance
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.
EER	Energy Efficiency Ratio, measure of how much cooling can be achieved by an air conditioner for a single kWh of electricity input
Energy use	This is your homes rating without solar or batteries
Energy value	The net cost to society including, but not limited to, costs to the building user, the environment and energy networks (as defined in the ABCB Housing Provisions Standard).
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	see exposure categories below
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.
National Construction Code (NCC) Class	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
Net zero home	a home that achieves a net zero energy value*.
Opening percentage	the openability percentage or 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
Recommended capacity	this is the capacity or size of equipment that is recommended by NatHERS to achieve the desired comfort conditions in the zone or zones serviced. This is a recommendation and the final selection sizing should be confirmed by a suitably qualified person.
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 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.
STCs	Small-scale Technology Certificates, certificates created by the REC registry for renewable energy technologies that may be bought and sold as part of the Small-scale Renewable Energy Scheme operated by the Clean Energy Regulatory
Thermal breaks	are materials with an R-value greater than or equal to 0.2 that must separate the metal frame from the cladding. This includes, but is not limited to, materials such as timber battens greater than or equal to 20mm thick, continuous thermal breaks such as polystyrene insulation sheeting, plastic strips or furring channels.
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).
Window shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes horizontal* or vertical shading features* (eg eaves and balconies)

* Refer to glossary.

Residential energy rating report Non-accredited No.

Generated on 31 Jan 2025 using Hero 4.1

This report was created using NatHERS accredited software but the non-accredited assessor (rater) is not accredited under NatHERS and this report is not accredited as being compliant with NatHERS.
Reliance on this report is accordingly at your own risk.

Property

Address	2-07, 8-10 Middleton Street, Braybrook, VIC, 3019
Lot/DP	
NCC Class*	2
Floor/all Floors	3 of 1 floors
Type	New

Plans

Main Plan

Prepared by

Construction and environment

Assessed floor area (m²)*		**Exposure Type**
Conditioned*	47.1	Suburban
Unconditioned*	4.0	**NatHERS climate zone**
Total	51.1	60 - Tullamarine
Garage	0.0	

Rater**

Name	Komal Teni
Business name	Lincoln Pearce
Email	komal.teni@lincolnpearce.com.au
Phone	+61 431325991
Declaration of interest	No Conflict of Interest

NCC Requirements

BCA provisions	Volume 1
State/Territory variation	No

National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J2D2(2)(a) and (3) of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance star rating

6.9

star rating

101.0 MJ/m2

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

Thermal performance (MJ/m²)

Limits taken from ABCB Standard 2022

	Heating	**Cooling**
Modelled	79.3	21.7
Load limits	103	49

Features determining load limits

Floor type (lowest conditioned area)	CSOG
NCC climate zone 1 or 2	N
Outdoor living area	N
Outdoor living area ceiling fan	N

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

* Refer to glossary.

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating and Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting options:

Floor type:

- CSOG - Concrete Slab on Ground
- SF - Suspended Floor (or a mixture of CSOG and SF)
- NA - Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA - Not Applicable

Outdoor living area:

- Yes
- No
- NA - Not Applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA - Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar.

Energy use:

No Whole of Home performance assessment conducted for this certificate.

Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

Cost:

No Whole of Home performance assessment conducted for this certificate.

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'External wall type table'* on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certifi cate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown on the NatHERS-stamped plans?	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval stage		Construction stage		
	Assessor checked	Consent authority/ surveyor checked	Builder checked	Consent authority/ surveyor checked	Occupancy/other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below?	☐	☐			
Other NCC requirements					
Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.					

* Refer to glossary.

Room *schedule*

Room	Zone Type	Area (m²)
Kitchen/Living 17	Kitchen/Living	34.25
Bathroom	Unconditioned	4.00
Bedroom	Bedroom	12.87

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-026-020	Al Boutique Fixed Lite Window	2.48	0.43	0.41	0.45

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient-ation	Shading device*
Bedroom	A&L-026-020	W05	1800	1800	Casement	45	S	None
Kitchen/Living 17	A&L-026-020	W06	600	900	Casement	90	N	None
Kitchen/Living 17	A&L-026-020	W04	1800	900	Casement	90	S	None
Kitchen/Living 17	A&L-026-020	W01	1800	900	Casement	90	W	None
Kitchen/Living 17	A&L-026-020	W02	1050	700	Sliding Door	45	W	None
Kitchen/Living 17	A&L-026-020	W03	2700	2700	Sliding Door	45	W	None

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit

* Refer to glossary.

Roof window *type and performance value*

Default* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Custom* roof windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orient-ation	Outdoor shade	Indoor shade
None								

Skylight *type and performance*

Skylight ID	Skylight description
None	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orient-ation	Outdoor shade	Diffuser	Shaft Reflectance
None								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Kitchen/Living 17	2100	900	90	N

External wall *type*

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
MC-REFL-CAV-A	Metal Clad Battened (Refl Cavity) Stud Wall	0.30	Light	2.50	Yes
MC-REFL-CAV-B	Metal Clad Battened (Refl Cavity) Stud Wall	0.50	Medium	2.50	Yes

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orient-ation	Horizontal shading feature* projection (mm)	Vertical shading feature
Bathroom	MC-REFL-CAV-B	2700	2614	N		No
Bedroom	MC-REFL-CAV-A	2700	4153	E		Yes
Bedroom	MC-REFL-CAV-A	2700	3098	S		No
Bedroom	MC-REFL-CAV-B	2700	3098	N		No
Kitchen/Living 17	MC-REFL-CAV-A	2700	4201	N	1664	Yes
Kitchen/Living 17	MC-REFL-CAV-B	2700	2356	E		No
Kitchen/Living 17	MC-REFL-CAV-A	2700	7111	S		No
Kitchen/Living 17	MC-REFL-CAV-A	2700	6447	W	2137	Yes

Internal wall *type*

Wall ID	Wall Type	Area (m^2)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	13.8	2.00
INT-PB	Internal Plasterboard Stud Wall	4.9	0.00

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bathroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	4.0	N/A	0.00	Timber (12mm)
Bedroom	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	12.9	N/A	0.00	Timber (12mm)
Kitchen/Living 17	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	34.3	N/A	0.00	Timber (12mm)

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
Bathroom	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Bedroom	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes
Kitchen/Living 17	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	4.00	Yes

* Refer to glossary.

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
Kitchen/Living 17	1	Exhaust Fan	350	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
None		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	0.00	0.50	Medium

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions (height x width, mm)	Frame spacing (mm)	Steel thickness (BMT mm)	Thermal Break (R-value)
None				

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Cooling system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Heating system

Type	Location	Fuel Type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data				

Hot water system

Type	Fuel type	Hot Water CER Zone	Minimum efficiency / STC	Assessed daily load [litres]
No Whole of Home Data				

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity

* Refer to glossary.

Pool / spa equipment

Type	Fuel type	Minimum efficiency / performance	Recommended capacity
No Whole of Home Data			

Onsite Renewable Energy *schedule*

Type	Orientatation	Generation Capacity [kW]
No Whole of Home Data		

Battery *schedule*

Type	Storage Capacity [kWh]
No Whole of Home Data	

* Refer to glossary.

Explanatory Notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

Accredited assessors

For quality assured NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in the certificate is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

The predicted annual energy load, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the assessor using the NatHERS accredited software tool are presented in this report and further details or data files may be obtained from the assessor.

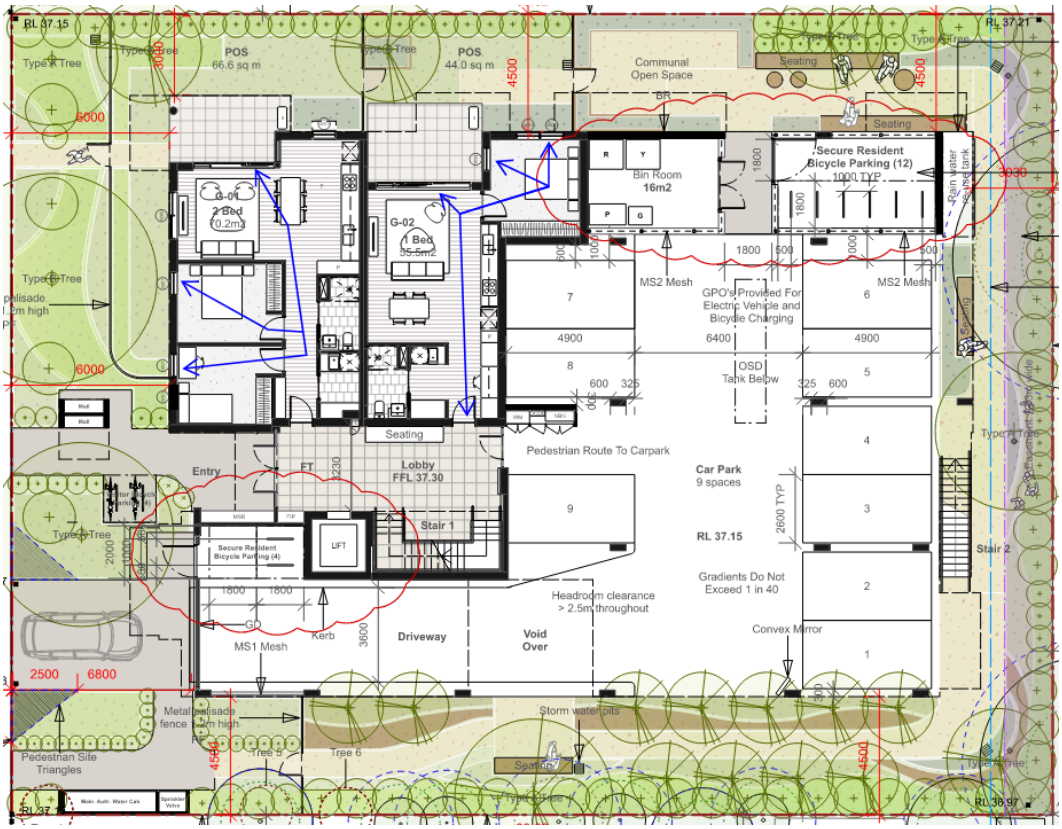
Glossary

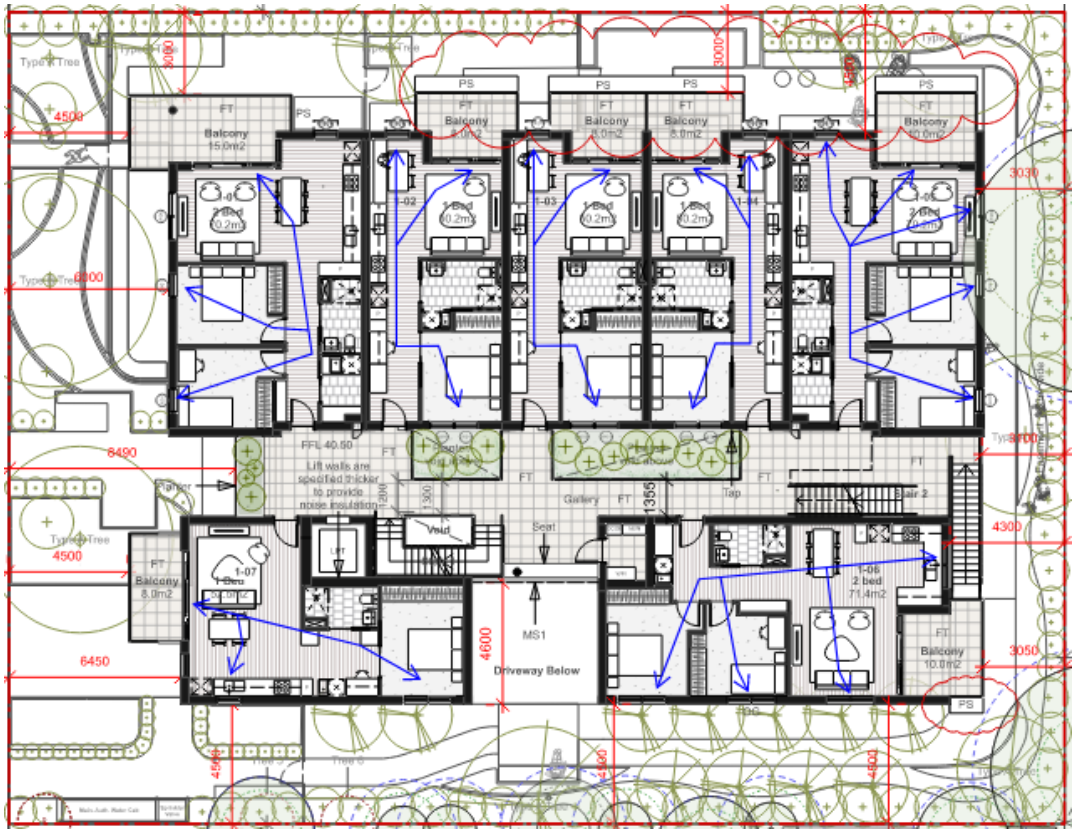
Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
AFRC	Australian Fenestration Rating Council
Assessed floor area	the floor area modelled in the software for the purpose of the NatHERS assessment. Note, this may not be consistent with the floor area in the design documents.
Ceiling penetrations	features that require a penetration to the ceiling, including downlights, vents, exhaust fans, range hoods, 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.
COP	Coefficient of performance
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.
EER	Energy Efficiency Ratio, measure of how much cooling can be achieved by an air conditioner for a single kWh of electricity input
Energy use	This is your homes rating without solar or batteries
Energy value	The net cost to society including, but not limited to, costs to the building user, the environment and energy networks (as defined in the ABCB Housing Provisions Standard).
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	see exposure categories below
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.
National Construction Code (NCC) Class	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
Net zero home	a home that achieves a net zero energy value*.
Opening percentage	the openability percentage or 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
Recommended capacity	this is the capacity or size of equipment that is recommended by NatHERS to achieve the desired comfort conditions in the zone or zones serviced. This is a recommendation and the final selection sizing should be confirmed by a suitably qualified person.
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 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.
STCs	Small-scale Technology Certificates, certificates created by the REC registry for renewable energy technologies that may be bought and sold as part of the Small-scale Renewable Energy Scheme operated by the Clean Energy Regulatory
Thermal breaks	are materials with an R-value greater than or equal to 0.2 that must separate the metal frame from the cladding. This includes, but is not limited to, materials such as timber battens greater than or equal to 20mm thick, continuous thermal breaks such as polystyrene insulation sheeting, plastic strips or furring channels.
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).
Window shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes horizontal* or vertical shading features* (eg eaves and balconies)

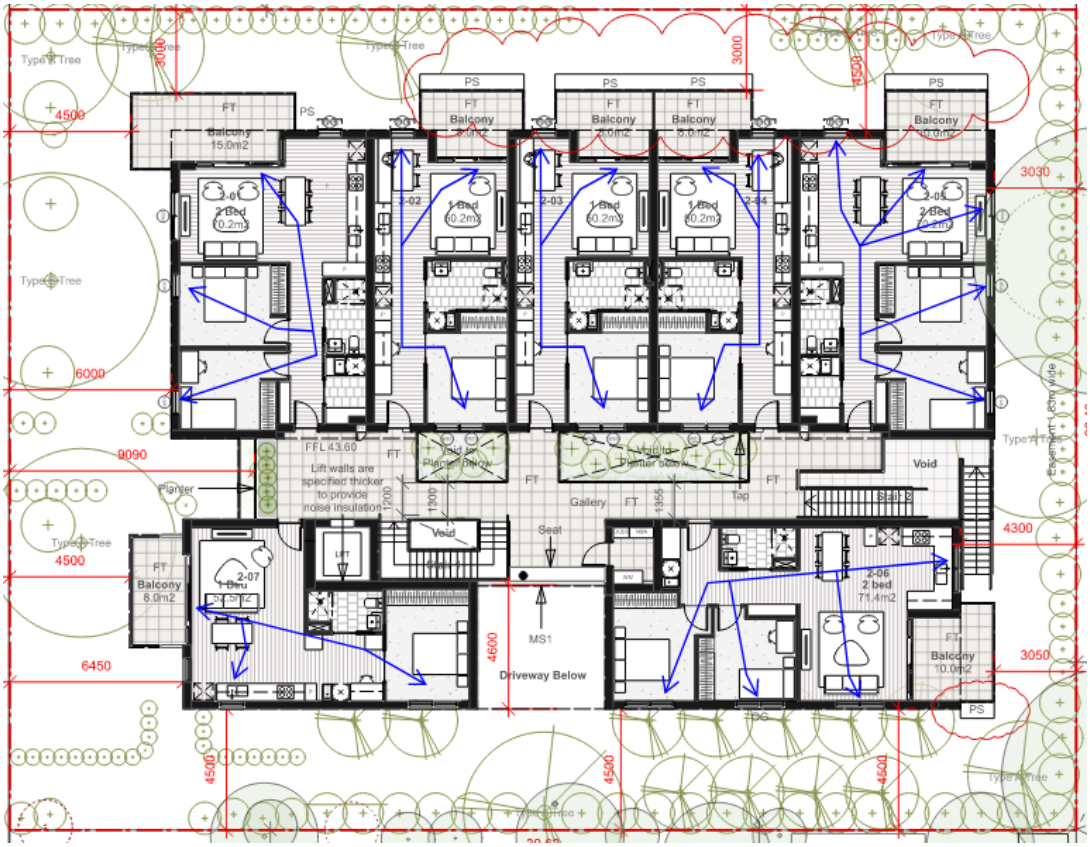
* Refer to glossary.

9 Appendix D Cross Flow Ventilation Pathway

Ventilation openings in all habitable rooms have been sized to ensure that the opening is 2% of the floor area or > 1m^2 (whichever is greater). See below for an example of cross-flow ventilation with a breeze path of 15m or less:







Breeze paths within the apartments on the ground, first and second floor.

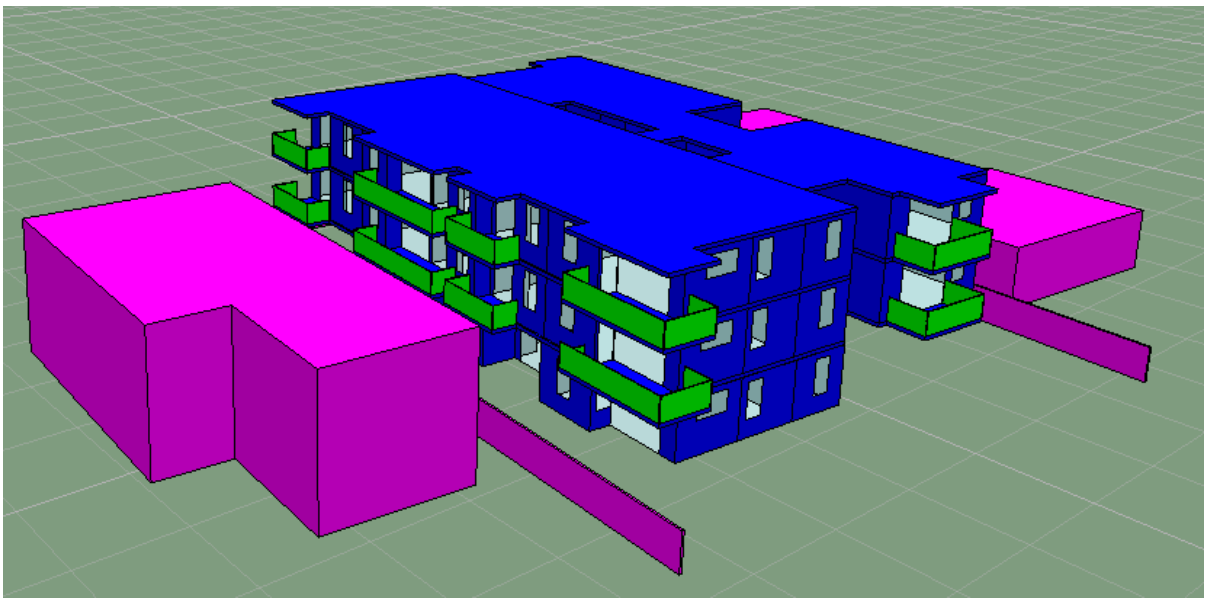
10 Appendix E Preliminary Daylight Modelling

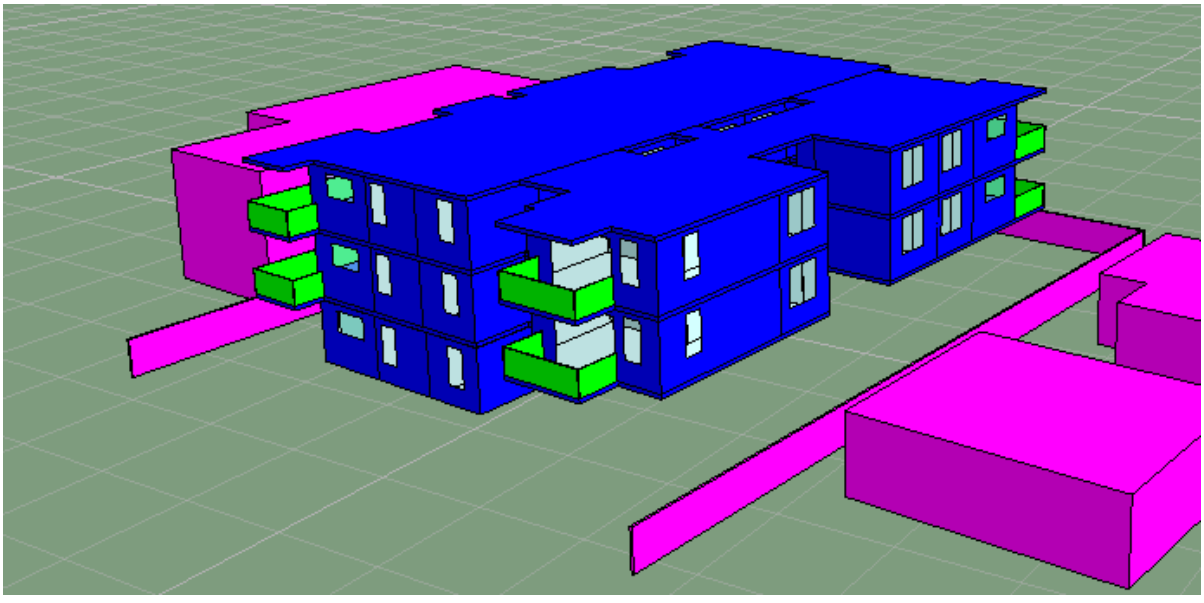
Lincoln Pearce has been tasked with conducting preliminary daylight modeling for the development located at 8-10 Middleton Street, Braybrook. This comprehensive assessment aims to evaluate the effectiveness of the proposed architectural design in providing sufficient natural daylight throughout the entire development. The modeling will take various factors into account, including the building's orientation, placement of windows, and potential obstructions, to ensure optimal daylight penetration.

The development at 8-10 Middleton Street, Braybrook, has been modelled using IES Virtual Environment 2024 and the radiance IES plugin.

At this stage, bedrooms and living rooms for all apartments have been modelled an assessed as the apartment layouts and glazing orientation differ on each level.

The apartments have been modelled to determine if there are risks associated with the current design, particularly with the respect to meeting the desired daylight factors referenced in the sustainability Management Plan in the Planning Process (SDAPP) Indoor Environment Quality guidelines and BESS tool.





Design and Performance

We have assumed that the windows will be clear glazing (Visual Light Transmittance (VLT) of 70%).

The balcony/terraces were modelled with a reflectivity of 0.3 (30%) as is typical for external floor tile.

Internal floor were modelled with a reflectivity of 0.3(30%) for a medium coloured carpet.

The external walls were modelled with a reflectivity of 0.5(50%) and the internal walls modelled as having a reflectivity of 0.7(70%) which is in line with white painted walls.

Ceilings were assumed as white with a reflectivity of 0.8(80%).

Window heights and ceiling heights are modelled as measured from the provided floor plans and elevations.

The apartments have been modelled in detail with the internal walls and windows built into the model. All elements that could overshadow or reflect light into the bedrooms and living rooms are deemed important for the assessment and were included in the model. All balustrades were included. External shading structures such as fences, retaining walls and neighbouring dwellings have also been taken into considered in the assessment. External shading structures such as fences, retaining walls and neighbouring dwellings have also been considered in the assessment.

The modelling was undertaken using 10KCIE overcast sky which is used to generate daylight factors across the bedrooms facing into the light courts and living zones.

The desired daylight factor for a bedroom as outlined in the SDAPP guidelines and BESS tool is 0.5% achieved across 90% of the floor area of the room. For living zones the desired daylight factor 1% achieved across 90% of the floor area of the rooms.

Please see the results of the modelling below for confirmation of the predicted daylight factors within the development and an analysis of the predicted daylight factors within the development and an analysis of the appropriateness of the design to provide good internal daylight amenity and energy efficiency (i.e not relying on artificial lighting during the day).

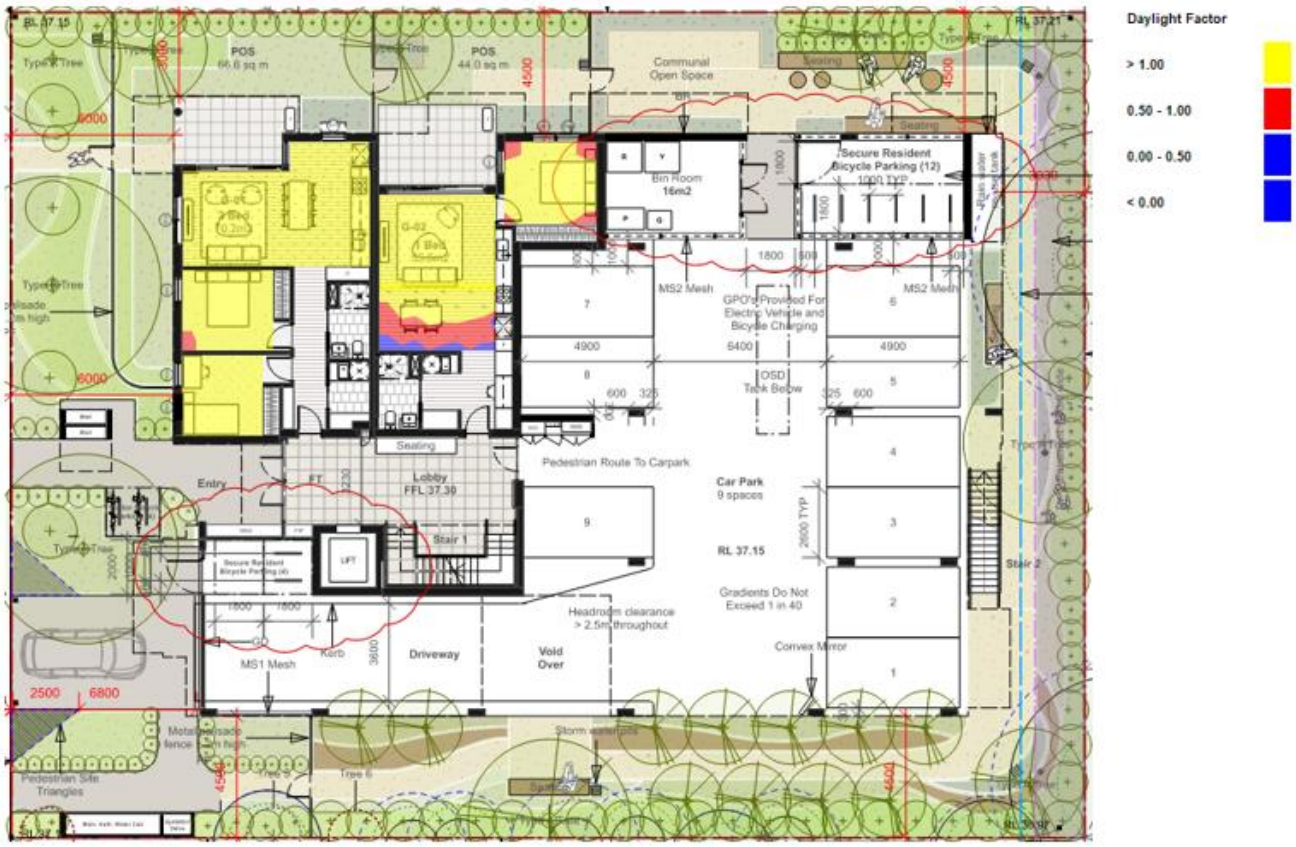
In the results below please note that all common areas, wardrobes, bathrooms and corridors have been removed from the results for clarity.

Results

It should be notes that the results figures below have the following colour scale :

- Yellow over 1% daylight factor – Living spaces must have 90% of floor area to be yellow to comply.
- Red 0.5%-1% daylight factor – Bedroom must have 90% of floor area to be yellow or red to comply.
- Blue <0.5% daylight factor.

Please see below overall results overlay :



	Living (>1%)	Compliance (Y/N)	Bedroom 1 (>0.5%)	Compliance (Y/N)	Bedroom 2 (>0.5%)	Compliance (Y/N)
G01	100%	Y	98%	Y	100%	Y
G02	72%	N	91%	Y	-	-
101	100%	Y	97%	Y	100%	Y
102	93%	Y	32%	N	-	-
103	91%	Y	36%	N	-	-
104	93%	Y	36%	N	-	-
105	100%	Y	98%	Y	96%	Y
106	99%	Y	100%	Y	100%	Y
107	100%	Y	100%	Y	-	-
201	100%	Y	97%	Y	100%	Y
202	100%	Y	100%	Y	-	-
203	100%	Y	99%	Y	-	-
204	100%	Y	98%	Y	-	-
205	92%	Y	96%	Y	99%	Y
206	97%	Y	100%	Y	100%	Y
207	100%	Y	100%	Y	-	-

Analysis of Results

Living Areas –

Daylight access for 96% of the Kitchen/Living areas of the Apartments are compliant with SDAPP requirements with 90% of the floor area achieving 1% DF. This can be attributed to large, glazed areas towards Southern orientations and limited shading obstructions such as balcony overhangs and eaves.

Bedrooms

Daylight access of 93% of the Bedrooms for all the Apartments are complaint with SDAPP requirements with above 99% floor areas achieving 0.5% DF. This can be attributed to large, glazed areas towards the Southern orientations and limited shading obstructions such as balcony overhangs and eaves.

Overall results above show that 96% of living rooms and 93% bedrooms will comply with SDAPP guidlelines. These results obtained are considered as acceptable and the results have been input on BESS with regards to daylight access.

11 Appendix F BESS Assessment

BESS Report

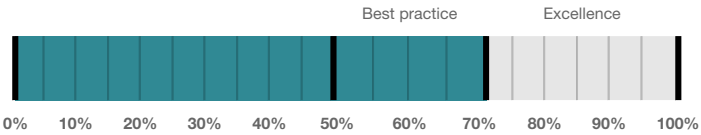
Built Environment Sustainability Scorecard

CITY OF MARIBYRNONG
ADVERTISED PLAN

This BESS report outlines the sustainable design commitments of the proposed development at 8 Middleton St Braybrook Victoria 3019. 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 Maribyrnong City Council.

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

Your BESS Score

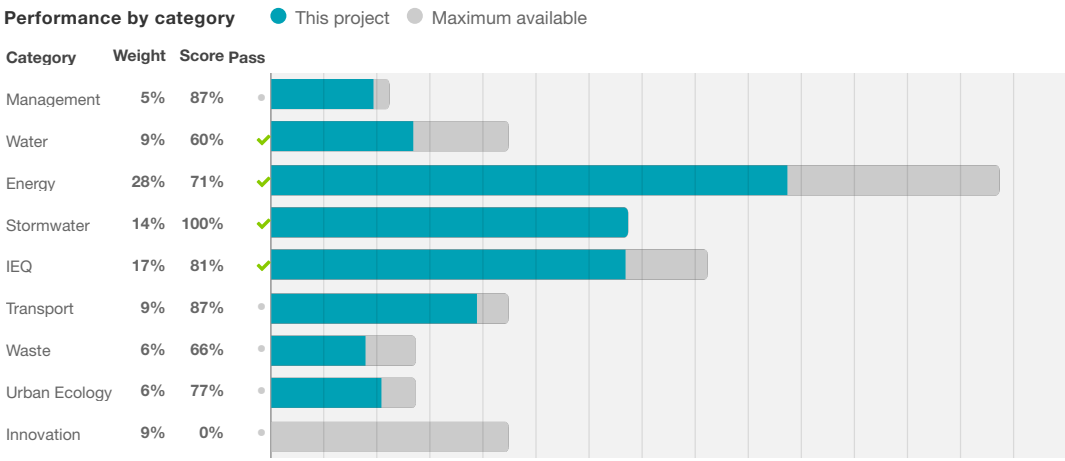


71%

Project details

Name	8 Middleton St, Braybrook VIC 3019, Australia
Address	8 Middleton St Braybrook Victoria 3019
Project ID	628D949C-R10
BESS Version	BESS-8
Site type	Multi unit development (apartment building)
Account	komal.teni@lincolnpearce.com.au
Application no.	
Site area	1,208 m²
Building floor area	955 m²
Date	31 January 2025
Software version	2.0.1-B.574

Performance by category



Buildings

Name	Height	Footprint	% of total footprint
Apartment	3	953 m²	100%

Dwellings & Non Res Spaces

Dwellings

Name	Quantity	Area	Building	% of total area
Apartment				
2-02, 2-03, 2-04	3	50.2 m²	Apartment	15%
1-02, 1-03, 1-04	3	50.2 m²	Apartment	15%
2-01, 2-05	2	70.2 m²	Apartment	14%
1-01,1-05	2	70.2 m²	Apartment	14%
2-06	1	71.4 m²	Apartment	7%
1-06	1	71.4 m²	Apartment	7%
G-01	1	70.2 m²	Apartment	7%
2-07	1	52.5 m²	Apartment	5%
1-07	1	52.5 m²	Apartment	5%
G-02	1	55.5 m²	Apartment	5%
Total	**16**	**955 m²**	**100%**	

Supporting Evidence

Shown on Floor Plans

Credit	Requirement	Response	Status
Management 3.1	Annotation: Individual utility meters to be provided to all individual dwellings		-
Water 3.1	Annotation: Water efficient garden details		-
Energy 3.1	Carpark with natural ventilation or CO monitoring system		-
Energy 4.2	Location and size of solar photovoltaic system		-
Stormwater 1.1	Location of any stormwater management systems (rainwater tanks, raingardens, buffer strips)		-
IEQ 1.1	If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.		-
IEQ 1.2	If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.		-
IEQ 1.3	If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.		-
IEQ 1.5	Floor plans with compliant bedrooms marked		-
IEQ 2.1	Dwellings meeting the requirements for being 'naturally ventilated'		-
Transport 1.1	Location of residential bicycle parking spaces		-
Transport 1.2	Location of residential visitor bicycle parking spaces		-
Transport 1.3	Residential bicycle parking spaces at ground level		-
Transport 2.1	Location of electric vehicle charging infrastructure		-
Waste 2.1	Location of food and garden waste facilities		-

Credit	Requirement	Response	Status
Waste 2.2	Location of recycling facilities		-
Urban Ecology 1.1	Location and size of communal spaces		-
Urban Ecology 2.1	Location and size of vegetated areas		-
Urban Ecology 2.3	Location and size of green facade		-
Urban Ecology 2.4	Location of taps and floor waste on balconies / courtyards		-

Supporting Documentation

Credit	Requirement	Response	Status
Management 2.2	Preliminary NatHERS assessments		-
Energy 3.1	Details of either the fully natural carpark ventilation or CO monitoring system proposed		-
Energy 3.6	Average lighting power density and lighting type(s) to be used		-
Energy 4.2	Specifications of the solar photovoltaic system(s)		-
Stormwater 1.1	STORM report or MUSIC model		-
IEQ 1.1	If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.		-
IEQ 1.2	If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.		-
IEQ 1.3	If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.		-
IEQ 1.5	A list of compliant bedrooms		-
IEQ 2.1	A list of naturally ventilated dwellings		-

Credit summary

Management Overall contribution 4.5%

87%

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

Water Overall contribution 9.0%

Minimum required 50% **60%** ✔ **Pass**

1.1 Potable Water Use Reduction	52%	
3.1 Water Efficient Landscaping	100%	
4.1 Building Systems Water Use Reduction	N/A	Scoped Out
		No Sprinkler system

Energy Overall contribution 27.5%

	Minimum required 50%	71%	Pass
1.2 Thermal Performance Rating - Residential		70%	Achieved
2.1 Greenhouse Gas Emissions		0%	
2.6 Electrification		100%	
2.7 Energy consumption		100%	
3.1 Carpark Ventilation		100%	
3.4 Clothes Drying		0%	
3.6 Internal Lighting - Apartments		100%	
4.2 Renewable Energy Systems - Solar		100%	
4.4 Renewable Energy Systems - Other		N/A	Scoped Out
No other (non-solar PV) renewable energy is in use.			

Stormwater Overall contribution 13.5%

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

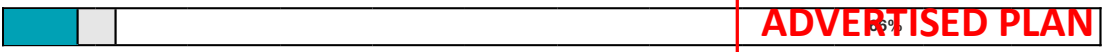
IEQ Overall contribution 16.5%

	Minimum required 50%	81%	Pass
1.1 Daylight Access - Living Areas		66%	
1.2 Daylight Access - Bedrooms		66%	
1.3 Winter Sunlight		100%	
1.5 Daylight Access - Minimal Internal Bedrooms		100%	
2.1 Effective Natural Ventilation		100%	

Transport Overall contribution 9.0%

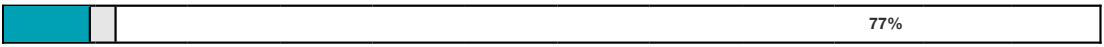
	87%
1.1 Bicycle Parking - Residential	100%
1.2 Bicycle Parking - Residential Visitor	100%
1.3 Bicycle Parking - Convenience Residential	100%
2.1 Electric Vehicle Infrastructure	100%
2.2 Car Share Scheme	N/A Scoped Out
	N/A
2.3 Motorbikes / Mopeds	0%

Waste Overall contribution 5.5%



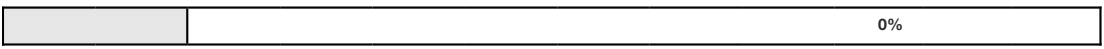
1.1 - Construction Waste - Building Re-Use	0%
2.1 - Operational Waste - Food & Garden Waste	100%
2.2 - Operational Waste - Convenience of Recycling	100%

Urban Ecology Overall contribution 5.5%



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

Innovation Overall contribution 9.0%



1.1 Innovation	0%

Credit breakdown

Management Overall contribution 4.5%

87%

1.1 Pre-Application Meeting	100%
Score Contribution	This credit contributes 37.5% towards the category score.
Criteria	Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?
Question	Criteria Achieved ?
Project	Yes
2.2 Thermal Performance Modelling - Multi-Dwelling Residential	100%
Score Contribution	This credit contributes 25% towards the category score.
Criteria	Have preliminary NatHERS ratings been undertaken for all thermally unique dwellings?
Question	Criteria Achieved ?
Apartment	Yes
3.1 Metering - Residential	100%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Have utility meters been provided for all individual dwellings?
Question	Criteria Achieved ?
Apartment	Yes
3.3 Metering - Common Areas	0%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Have all major common area services been separately submetered?
Question	Criteria Achieved ?
Apartment	No
4.1 Building Users Guide	100%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Will a building users guide be produced and issued to occupants?
Question	Criteria Achieved ?
Project	Yes

Water Overall contribution 9.0%

Minimum required 50% 60% ✔ Pass

Water Approach	
What approach do you want to use for Water?:	Use the built in calculation tools
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
Fixtures, fittings & connections profile	
Showerhead: All	4 Star WELS (>= 6.0 but <= 7.5)
Bath: All	Medium Sized Contemporary Bath
Kitchen Taps: All	>= 5 Star WELS rating
Bathroom Taps: All	>= 5 Star WELS rating
Dishwashers: All	>= 5 Star WELS rating
WC: All	>= 4 Star WELS rating
Urinals: All	Scope out
Washing Machine Water Efficiency: All	>= 5 Star WELS rating
Which non-potable water source is the dwelling/space connected to?: All	Combined RWT
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 tank profile	
What is the total roof area connected to the rainwater tank?: Combined RWT	598 m^2
Tank Size: Combined RWT	10,000 Litres
Irrigation area connected to tank: Combined RWT	-
Is connected irrigation area a water efficient garden?: Combined RWT	-
Other external water demand connected to tank?: Combined RWT	-
1.1 Potable Water Use Reduction	52%

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	1764 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	1311 kL
Output	Proposed (including rainwater and recycled water use)
Project	1154 kL
Output	% Reduction in Potable Water Consumption
Project	34 %
Output	% of connected demand met by rainwater
Project	100 %
Output	How often does the tank overflow?
Project	Very Often
Output	Opportunity for additional rainwater connection
Project	468 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

4.1 Building Systems Water Use Reduction N/A Scoped Out

No Sprinkler system

This credit was scoped out	No Sprinkler system

Energy Overall contribution 27.5%

		Minimum required 50%	71% of Base

Dwellings Energy Approach	
What approach do you want to use for Dwellings?:	Use the built in calculation tools
Are you installing any solar photovoltaic (PV) system(s)?:	Yes
Are you installing any other renewable energy system(s)?:	No
Energy Supply:	All-electric

Dwelling Energy Profiles	
Building: All	Apartment
Below the floor is:	
G-01 G-02	Ground or Carpark
1-01,1-05 1-02, 1-03, 1-04 1-06 1-07 2-01, 2-05 2-02, 2-03, 2-04 2-06 2-07	Another Occupancy
Above the ceiling is: All	Another Occupancy
Exposed sides:	
G-01 1-01,1-05 2-01, 2-05	2
G-02 1-02, 1-03, 1-04 2-02, 2-03, 2-04	1
1-06 1-07 2-06 2-07	3
NatHERS Annual Energy Loads - Heat:	
G-01	72.1 MJ/sqm
G-02 2-02, 2-03, 2-04	62.0 MJ/sqm
1-01,1-05	39.0 MJ/sqm
1-02, 1-03, 1-04	39.3 MJ/sqm
1-06	75.6 MJ/sqm
1-07	58.3 MJ/sqm
2-01, 2-05	58.7 MJ/sqm
2-06	85.4 MJ/sqm
2-07	79.3 MJ/sqm

NatHERS Annual Energy Loads - Cool:	
G-01	4.9 MJ/sqm
G-02	4.5 MJ/sqm
1-01,1-05	9.5 MJ/sqm
1-02, 1-03, 1-04	5.5 MJ/sqm
1-06	7.7 MJ/sqm
1-07	18.4 MJ/sqm
2-01, 2-05	18.9 MJ/sqm
2-02, 2-03, 2-04	12.8 MJ/sqm
2-06	14.0 MJ/sqm
2-07	21.7 MJ/sqm
NatHERS star rating:	
G-01 1-07 2-01, 2-05	7.7
G-02	8.1
1-01,1-05	8.7
1-02, 1-03, 1-04	8.8
1-06	7.5
2-02, 2-03, 2-04	7.8
2-06 2-07	6.9
Type of Heating System: All	Reverse cycle space
Heating System Efficiency: All	3 Stars (2019 MEPS)
Type of Cooling System: All	Refrigerative space
Cooling System Efficiency: All	3 Stars (2019 MEPS)
Type of Hot Water System: All	Electric Heat Pump Band 1
Is the hot water system shared by multiple dwellings?: All	Yes
Clothes Line: All	No drying facilities
Clothes Dryer: All	Occupant to install
Solar Photovoltaic system profile	
System Size (lesser of inverter and panel capacity): Solar PV	32.0 kW peak
Orientation (which way is the system facing)?: Solar PV	North
Inclination (angle from horizontal): Solar PV	15.0 Angle (degrees)

1.2 Thermal Performance Rating - Residential — 70% ✔ Achieved

Score Contribution	This credit contributes 17.6% towards the category score.
Criteria	What is the average NatHERS rating?
Output	Average NATHERS Rating (Weighted)
Apartment	7.9 Stars

2.1 Greenhouse Gas Emissions — 0%

Score Contribution	This credit contributes 17.6% towards the category score.
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?
Output	Reference Building with Reference Services (BCA only)
Apartment	26,526 kg CO2
Output	Proposed Building with Proposed Services (Actual Building)
Apartment	25,486 kg CO2
Output	% Reduction in GHG Emissions
Apartment	3 %

2.6 Electrification 100%

Score Contribution	This credit contributes 17.6% towards the category score.
Criteria	Is the development all-electric?
Question	Criteria Achieved?
Project	Yes

2.7 Energy consumption 100%

Score Contribution	This credit contributes 23.5% towards the category score.
Criteria	What is the % reduction in annual energy consumption against the benchmark?
Output	Reference Building with Reference Services (BCA only)
Apartment	234,775 MJ
Output	Proposed Building with Proposed Services (Actual Building)
Apartment	107,942 MJ
Output	% Reduction in total energy
Apartment	54 %

3.1 Carpark Ventilation 100%

Score Contribution	This credit contributes 5.9% towards the category score.
Criteria	If you have an enclosed carpark, is it: (a) fully naturally ventilated (no mechanical ventilation system) or (b) 40 car spaces or less with Carbon Monoxide monitoring to control the operation and speed of the ventilation fans?
Question	Criteria Achieved ?
Project	Yes

3.4 Clothes Drying 0%

Score Contribution	This credit contributes 5.9% towards the category score.
Criteria	What is the % reduction in annual energy consumption (gas and electricity) from a combination of clothes lines and efficient driers against the benchmark?
Output	Reference
Apartment	5,437 kWh
Output	Proposed
Apartment	5,437 kWh
Output	Improvement
Apartment	0 %

3.6 Internal Lighting - Apartments 100%

Score Contribution	This credit contributes 5.9% towards the category score.
Criteria	Is the maximum illumination power density (W/m2) in at least 90% of the relevant building class at least 20% lower than required by clause J7D3(1)(a) and Table J6.2a of the NCC 2022 Vol 1 (Class 2-9)?
Question	Criteria Achieved ?
Apartment	Yes

4.2 Renewable Energy Systems - Solar 100%

Score Contribution	This credit contributes 5.9% towards the category score.
Criteria	What % of the estimated energy consumption of the building class it supplies does the solar power system provide?
Output	Solar Power - Energy Generation per year
Apartment	39,821 kWh
Output	% of Building's Energy
Apartment	132 %

4.4 Renewable Energy Systems - Other N/A Scoped Out

No other (non-solar PV) renewable energy is in use.

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

Stormwater Overall contribution 13.5%

Minimum required 100% **100%** ✔ **Pass**

Which stormwater modelling software are you using?:	Melbourne Water STORM tool

1.1 Stormwater Treatment 100%

Score Contribution	This credit contributes 100% 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 16.5%

	Minimum required 50%	81%	Pass

Use the BESS Deemed to Satisfy (DtS) method for daylight to Dwellings?:	No
What approach do you want to use for daylight to Dwellings?:	Provide our own calculations

1.1 Daylight Access - Living Areas	66%
Score Contribution	This credit contributes 27.3% towards the category score.
Criteria	What % of living areas achieve a daylight factor greater than 1%
Annotation	Refer to Daylight modelling under Appendix E
Question	Percentage Achieved ?
Apartment	96 %

1.2 Daylight Access - Bedrooms	66%
Score Contribution	This credit contributes 27.3% towards the category score.
Criteria	What % of bedrooms achieve a daylight factor greater than 0.5%
Annotation	Refer to Daylight modelling under Appendix E
Question	Percentage Achieved ?
Apartment	93 %

1.3 Winter Sunlight	100%
Score Contribution	This credit contributes 9.1% towards the category score.
Criteria	Do 70% of dwellings receive at least 3 hours of direct sunlight in all Living areas between 9am and 3pm in mid-winter?
Question	Criteria Achieved ?
Apartment	Yes

1.5 Daylight Access - Minimal Internal Bedrooms	100%
Score Contribution	This credit contributes 9.1% towards the category score.
Criteria	Do at least 90% of dwellings have an external window in all bedrooms?
Question	Criteria Achieved ?
Apartment	Yes

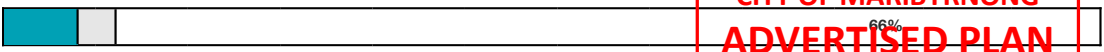
2.1 Effective Natural Ventilation	100%
Score Contribution	This credit contributes 27.3% towards the category score.
Criteria	What % of dwellings are effectively naturally ventilated?
Question	Percentage Achieved?
Apartment	100 %

Transport Overall contribution 9.0%

82%

1.1 Bicycle Parking - Residential		100%
Score Contribution	This credit contributes 25% towards the category score.	
Criteria	How many secure and undercover bicycle spaces are there for residents?	
Question	Bicycle Spaces Provided ?	
Apartment	16	
Output	Min Bicycle Spaces Required	
Apartment	16	
1.2 Bicycle Parking - Residential Visitor		100%
Score Contribution	This credit contributes 25% towards the category score.	
Criteria	How many secure bicycle spaces are there for visitors?	
Question	Visitor Bicycle Spaces Provided ?	
Apartment	4	
Output	Min Visitor Bicycle Spaces Required	
Apartment	4	
1.3 Bicycle Parking - Convenience Residential		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Are bike parking facilities for residents located at ground or entry level?	
Question	Criteria Achieved ?	
Apartment	Yes	
2.1 Electric Vehicle Infrastructure		100%
Score Contribution	This credit contributes 25% towards the category score.	
Criteria	Are facilities provided for the charging of electric vehicles?	
Question	Criteria Achieved ?	
Project	Yes	
2.2 Car Share Scheme		N/A Scoped Out
		N/A
This credit was scoped out	N/A	
2.3 Motorbikes / Mopeds		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Are a minimum of 5% of vehicle parking spaces designed and labelled for motorbikes (must be at least 5 motorbike spaces)?	
Question	Criteria Achieved ?	
Project	No	

Waste **Overall contribution 5.5%**



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

Urban Ecology Overall contribution 5.5%

7%

1.1 Communal Spaces		100%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Is there at least the following amount of common space measured in square meters : * 1m² for each of the first 50 occupants * Additional 0.5m² for each occupant between 51 and 250 * Additional 0.25m² for each occupant above 251?	
Question	Common space provided	
Apartment	70.0 m²	
Output	Minimum Common Space Required	
Apartment	25 m²	
2.1 Vegetation		100%
Score Contribution	This credit contributes 44.4% towards the category score.	
Criteria	How much of the site is covered with vegetation, expressed as a percentage of the total site area?	
Question	Percentage Achieved ?	
Project	43 %	
2.2 Green Roofs		0%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Does the development incorporate a green roof?	
Question	Criteria Achieved ?	
Project	No	
2.3 Green Walls and Facades		100%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Does the development incorporate a green wall or green façade?	
Question	Criteria Achieved ?	
Project	Yes	
2.4 Private Open Space - Balcony / Courtyard Ecology		100%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Is there a tap and floor waste on every balcony and courtyard (including any roof terraces)?	
Question	Criteria Achieved ?	
Apartment	Yes	
3.1 Food Production - Residential		0%

Score Contribution	This credit contributes 11.1% towards the category score.
Criteria	What area of space per resident is dedicated to food production?
Question	Food Production Area
Apartment	0.0 m²
Output	Min Food Production Area
Apartment	7 m²

Innovation **Overall contribution 9.0%**

	0%

1.1 Innovation	0%
Score Contribution	This credit contributes 100% towards the category score.
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?

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Blooming Tree Group

OPEN SPACE MANAGEMENT

Arboricultural Impact Assessment Report

8-10 Middleton Street, Braybrook, VIC 3019

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Version 1.0
October 7, 2024

TABLE OF CONTENTS

REPORT TYPE Arboricultural Impact Assessment Report.
SITE ADDRESS 8-10 Middleton Street, Braybrook, VIC 3019
AUTHOR Brayden Lane, Consulting Arborist, Blooming Tree Group
DATE October 7, 2024

CONTACT

Should you have any questions, please contact:

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QUALIFICATIONS
Dip. Arb. Melbourne Polytechnic 2018
Grad. Dip. Arb. University of Melbourne 2021

REVISION HISTORY

VERSION	DATE	AUTHOR	DESCRIPTION OF CHANGES
1.0	4rd of October 2024	Brayden Lane	Inception of report

SUMMARY

Blooming Tree Group has been engaged by Merkon to undertake an Arboricultural Impact Assessment Report for the proposed multi-unit residential development of 8-10 Middleton Street, Braybrook VIC 3019.

A ground-based visual inspection was conducted on Saturday, August the 10th, 2024, by Brayden Lane, a Consulting Arborist with Blooming Tree Group.

THE KEY OBJECTIVES OF THIS ASSIGNMENT ARE:

- To attend the study site and undertake an arboricultural inspection to identify, record, and assess trees on the subject site and adjacent land the could potentially be impacted by the development.
- To conduct a computer-based arboricultural impact assessment to understand the theoretical impacts upon retained trees using collected data, tree protection requirements, and the proposed design plans.
- To provide recommendations for mitigating tree impacts while adhering to Australian Standard AS4970:2009 Protection of Trees on Development Sites and other site protections.

Twenty-six trees were assessed. All assessed vegetation is planted with retention values ranging from Moderate B to Very Low. All vegetation within the site is proposed for removal to accommodate this development.

These trees can be removed at the owner's discretion as they are not subject to any vegetation protection laws.

TREE 1, a public natures trip tree is proposed for removal.

Five trees, TREES 7, 8, 9, 15 and 23, will be impacted by this development. With the implementation of mitigation measures and tree protections, these encroachments are supportable.

DOCUMENTS REFERENCED

1. Australian Standard AS4373:2007 - Pruning of Amenity Trees
2. Australian Standard AS4970:2009 - Protection of Trees on Development Sites
3. Design Plans for 8-10 Middleton Street, Braybrook VIC 3019.
   Prepared by McGregor Westlake Architecture. Revision A dated 06/08/2024.

METHODOLOGY

An ground-based visual assessment of the trees was conducted on Saturday, August 10th, 2024, by a qualified arborist from Blooming Tree Group. Basic hand tools, including shovels, measuring tapes, and sounding hammers, were used to supplement visual observations. Advanced diagnostic techniques, such as aerial inspection or trunk radar, were not employed for this assessment.

Comprehensive data was gathered for each assessed tree, including precise location coordinates, species identification, condition ratings, dimensions, detailed observations, and supporting photographic evidence. Site-specific environmental factors influencing tree health and growth were also documented.

Tree health, structure, and potential risks were evaluated based on observed conditions. The Australian Standard AS4970:2009 Protection of Trees on Development Sites provided a framework for assessing potential impacts and developing appropriate protection measures. Recommendations for tree protection and mitigation strategies were formulated based on the assessment observations, vegetation protections, and industry best practices.

REPORT EXCLUSIONS

This Report will not include the following assessments unless otherwise stated:

- Aerial based visual assessment.
- Soil profile and condition testing
- Absolute identification of abiotic disorders such as soil contaminations, leaks, poisonings etc. Related to this commission.
- Absolute identification of biotic disorders related to this commission.

VEGETATION PROTECTIONS

MARIBYRNONG CITY COUNCIL - SIGNIFICANT TREE REGISTER

The City of Maribyrnong's Significant Tree Register safeguards the city's natural and cultural heritage by protecting valuable trees that meet specific criteria. This register identifies and protects trees on private land with significant horticultural, historical, or environmental value. The register also outlines specific planning controls that apply to these trees, requiring permission for removal, destruction, or major pruning. Trees identified as significant are protected through the Environmental Significance Overlay.

None of the trees impacted by this development are listed on the Significant Tree Register.

SITE DETAILS

The area of study comprises two lots, 8 and 10 Middleton Street, Braybrook, located in a general residential zone surrounded by other residential dwellings. The study area falls within the Maribyrnong City Council jurisdiction.

Trees assessed included private trees on the subject site, neighboring properties, and nature strip trees. Twenty-six individual trees were assessed. The vegetation retention values ranged from Moderate B to Very Low.

STUDY AREA

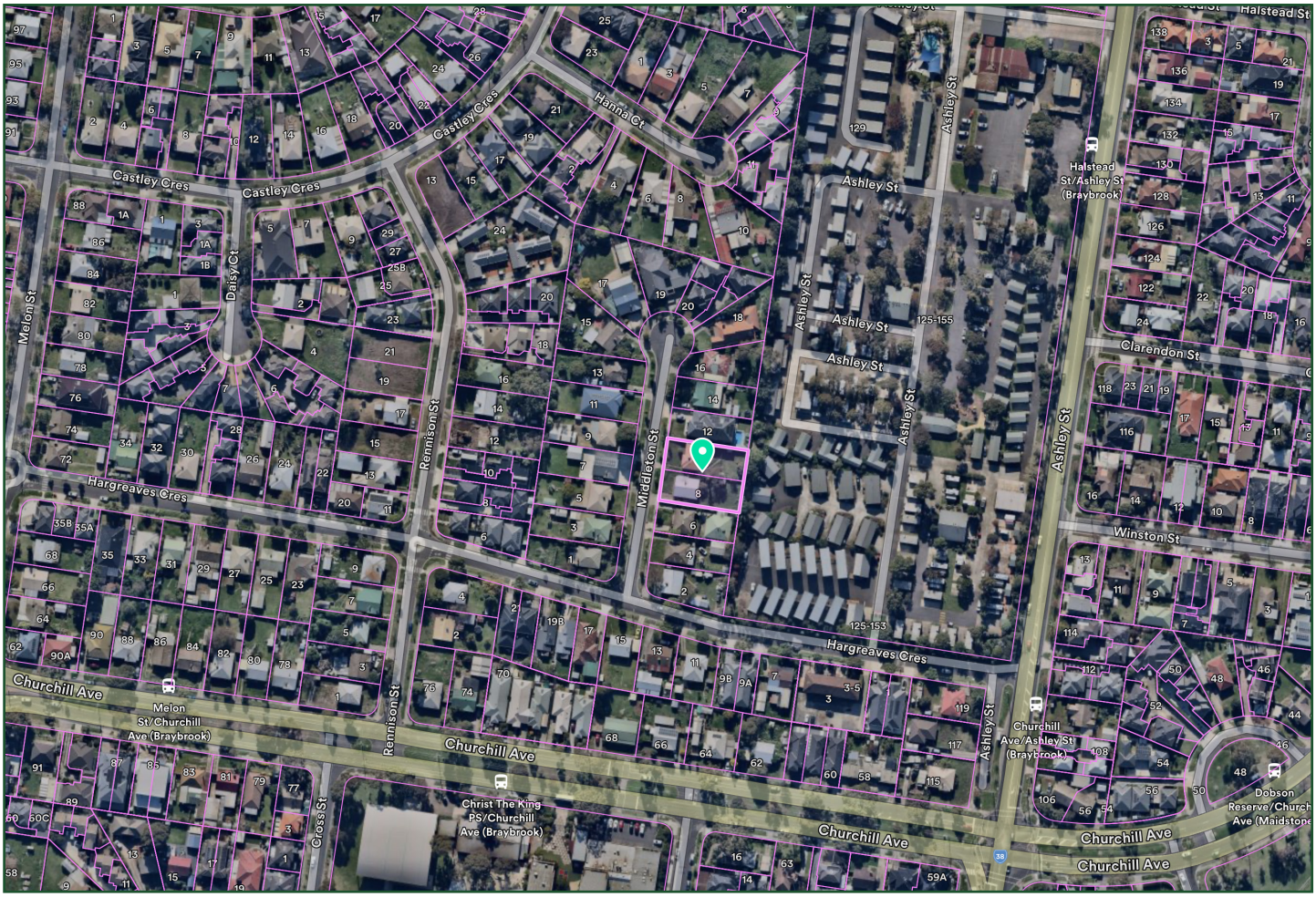


Figure 1: Location of the site.

TREE LOCATIONS

Figure 2: Vegetation Assessment Map - This map displays the locations of assessed vegetation, their respective retention values, and proposed removal status. It also illustrates the influence of tree protection zones on the study site.

TREE DATA

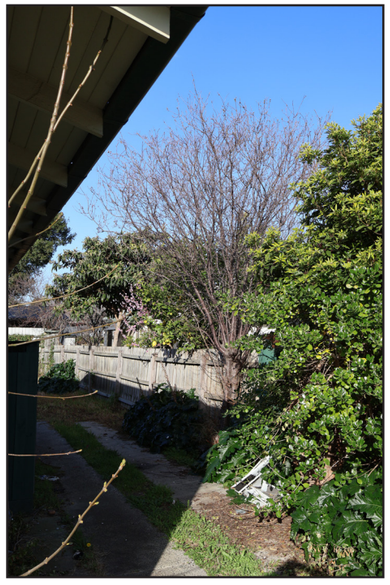
Asset Number: TREE 1
Species: *Callistemon salignus*
Origin: Australian native
Tree Height: 3.0 m
Tree Health: Good
Life Expectancy: Moderate
TPZ: 2.0 m
Retention Value: Low
Observations:
Age: Semi-mature
Canopy Width: 1.0 m
Tree Structure: Good
DBH at 1.4m: 10 cm
SRZ: 1.5 m

Asset Number: TREE 2
Species: *Callistemon salignus*
Origin: Australian native
Tree Height: 3.0 m
Tree Health: Good
Life Expectancy: Moderate
TPZ: 2.0 m
Retention Value: Low
Observations:
Age: Semi-mature
Canopy Width: 1.0 m
Tree Structure: Good
DBH at 1.4m: 8 cm
SRZ: 1.5 m

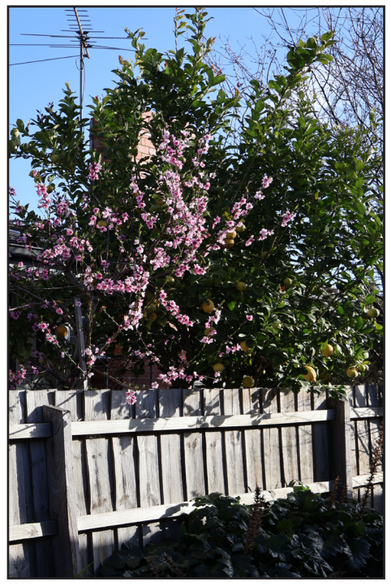
Asset Number: TREE 3
Species: *Callistemon salignus*
Origin: Australian native
Tree Height: 3.0 m
Tree Health: Good
Life Expectancy: Moderate
TPZ: 2.0 m
Retention Value: Low
Observations:
Age: Semi-mature
Canopy Width: 1.0 m
Tree Structure: Good
DBH at 1.4m: 7 cm
SRZ: 1.5 m

Asset Number: TREE 4
Species: *Viburnum tinus*
Origin: Evergreen exotic
Tree Height: 1.0 m
Tree Health: Good
Life Expectancy: Short
TPZ: 2.0 m
Retention Value: Very low
Observations:
Age: Mature
Canopy Width: 2.0 m
Tree Structure: Fair
DBH at 1.4m: 10 cm
SRZ: 1.5 m

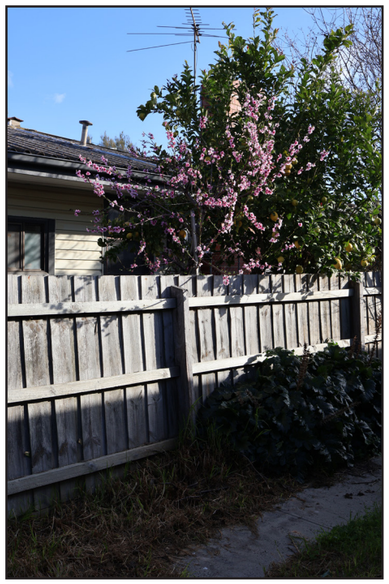
Asset Number: TREE 5
Species: *Pittosporum undulatum*
Origin: Evergreen exotic
Tree Height: 3.0 m
Tree Health: Good
Life Expectancy: Short
TPZ: 2.0 m
Retention Value: Very low
Observations:
Age: Semi-mature
Canopy Width: 2.0 m
Tree Structure: Fair
DBH at 1.4m: 10 cm
SRZ: 1.5 m



Asset Number: TREE 6
Species: *Prunus* sp.
Origin: Deciduous exotic
Tree Height: 4.0 m
Tree Health: Good
Life Expectancy: Short
TPZ: 2.5 m
Retention Value: Very low
Observations:
Age: Mature
Canopy Width: 2.0 m
Tree Structure: Poor
DBH at 1.4m: 12, 17 cm
SRZ: 1.71 m



Asset Number: TREE 7
Species: *Citrus* x limon
Origin: Evergreen exotic
Tree Height: 3.0 m
Tree Health: Good
Life Expectancy: Remove
TPZ: 2.0 m
Retention Value: Very low
Observations:
Age: Over-mature
Canopy Width: 2.0 m
Tree Structure: Poor
DBH at 1.4m: 15 cm
SRZ: 1.5 m



Asset Number: TREE 8
Species: *Prunus* sp
Origin: Deciduous exotic
Tree Height: 2.0 m
Tree Health: Good
Life Expectancy: Short
TPZ: 2.0 m
Retention Value: Very Low
Observations:
Age: Mature
Canopy Width: 1.0 m
Tree Structure: Poor
DBH at 1.4m: 10 cm
SRZ: 1.5 m

Asset Number: TREE 9
Species: *Citrus x sinensis*
Origin: Evergreen exotic
Tree Height: 1.0 m
Tree Health: Good
Life Expectancy: Short
TPZ: 2.0 m
Retention Value: Very low
Observations:
Age: Semi-mature
Canopy Width: 1.0 m
Tree Structure: Fair
DBH at 1.4m: 8 cm
SRZ: 1.5 m

Asset Number: TREE 10
Species: *Eriobotrya japonica*
Origin: Evergreen exotic
Tree Height: 4.0 m
Tree Health: Good
Life Expectancy: Short
TPZ: 2.38 m
Retention Value: Very low
Observations:
Age: Semi-mature
Canopy Width: 2.0 m
Tree Structure: Fair
DBH at 1.4m: 14, 14 cm
SRZ: 1.68 m

Asset Number: TREE 11
Species: *Malus* sp.
Origin: Deciduous exotic
Tree Height: 2.0 m
Tree Health: Good
Life Expectancy: Short
TPZ: 2.0 m
Retention Value: Very low
Observations:
Age: Semi-mature
Canopy Width: 1.0 m
Tree Structure: Fair
DBH at 1.4m: 10 cm
SRZ: 1.5 m

Asset Number: TREE 12
Species: *Malus* sp.
Origin: Deciduous exotic
Tree Height: 4.0 m
Tree Health: Good
Life Expectancy: Short
TPZ: 2.0 m
Retention Value: Very low
Observations:
Age: Mature
Canopy Width: 2.0 m
Tree Structure: Poor
DBH at 1.4m: 14 cm
SRZ: 1.5 m

Asset Number: TREE 13
Species: *Malus* sp.
Origin: Deciduous exotic
Tree Height: 3.0 m
Tree Health: Good
Life Expectancy: Short
TPZ: 2.0 m
Retention Value: Very low
Observations:
Age: Mature
Canopy Width: 1.0 m
Tree Structure: Poor
DBH at 1.4m: 14 cm
SRZ: 1.5 m

Asset Number: TREE 14
Species: *Prunus* sp.
Origin: Evergreen exotic
Tree Height: 4.0 m
Tree Health: Fair
Life Expectancy: Short
TPZ: 2.16 m
Retention Value: Very low
Observations:
Age: Mature
Canopy Width: 2.0 m
Tree Structure: Poor
DBH at 1.4m: 18 cm
SRZ: 1.61 m

Asset Number: TREE 15
Species: *Syzygium australe*
Origin: Australian native
Tree Height: 9.0 m
Tree Health: Good
Life Expectancy: Moderate
TPZ: 4.68 m
Retention Value: Moderate B
Observations:
Age: Mature
Canopy Width: 4.0 m
Tree Structure: Fair
DBH at 1.4m: 39 cm
SRZ: 2.23 m

Asset Number: TREE 16
Species: *Hesperocyparis macrocarpa*
Origin: Evergreen exotic
Tree Height: 3.0 m
Tree Health: Dead
Life Expectancy: Short
TPZ: 6.0 m
Retention Value: Very low
Observations: Stagged tree
Age: Over-mature
Canopy Width: 1.0 m
Tree Structure: Poor
DBH at 1.4m: 50 cm
SRZ: 2.47 m

Asset Number: TREE 17
Species: *Buddleja davidii*
Origin: Evergreen exotic
Tree Height: 2.0 m
Tree Health: Fair
Life Expectancy: Short
TPZ: 2.0 m
Retention Value: Very low
Observations:
Age: Over-mature
Canopy Width: 3.0 m
Tree Structure: Poor
DBH at 1.4m: 15 cm
SRZ: 1.5 m

Asset Number: TREE 18
Species: *Acacia pycnantha*
Origin: State native
Tree Height: 5.0 m
Tree Health: Fair
Life Expectancy: Short
TPZ: 3.79 m
Retention Value: Low
Observations:
Age: Mature
Canopy Width: 5.0 m
Tree Structure: Poor
DBH at 1.4m: 18,26 cm
SRZ: 2.04 m

Asset Number: TREE 19
Species: *Washingtonia robusta*
Origin: Exotic monocot
Tree Height: 7.0 m
Tree Health: Good
Life Expectancy: Moderate
TPZ: 5.76 m
Retention Value: Low
Observations:
Age: Semi-mature
Canopy Width: 1.0 m
Tree Structure: Fair
DBH at 1.4m: 48 cm
SRZ: 2.43 m

Asset Number: TREE 20
Species: *Ulmus* sp.
Origin: Deciduous exotic
Tree Height: 3.0 m
Tree Health: Good
Life Expectancy: Short
TPZ: 2.85 m
Retention Value: Very Low
Observations:
Age: Semi-mature
Canopy Width: 2.0 m
Tree Structure: Poor
DBH at 1.4m: 13,15,13 cm
SRZ: 1.81 m

Asset Number: TREE 21
Species: *Melia azedarach*
Origin: Australian native
Tree Height: 3.0 m
Tree Health: Good
Life Expectancy: Short
TPZ: 2.0 m
Retention Value: Low
Observations:
Age: Semi-mature
Canopy Width: 1.0 m
Tree Structure: Good
DBH at 1.4m: 15 cm
SRZ: 1.5 m

Asset Number: TREE 22
Species: *Pittosporum undulatum*
Origin: Evergreen exotic
Tree Height: 5.0 m
Tree Health: Good
Life Expectancy: Short
TPZ: 3.48 m
Retention Value: Very low
Observations:
Age: Semi-mature
Canopy Width: 3.0 m
Tree Structure: Fair
DBH at 1.4m: 29 cm
SRZ: 1.97 m

Asset Number: TREE 23
Species: *Syzygium australe*
Origin: Australian native
Tree Height: 11.0 m
Tree Health: Fair
Life Expectancy: Low
TPZ: 5.4 m
Retention Value: Moderate C
Observations:
Age: Mature
Canopy Width: 5.0 m
Tree Structure: Poor
DBH at 1.4m: 45 cm
SRZ: 2.37 m

Asset Number: TREE 24
Species: Schinus molle
Origin: Evergreen exotic
Tree Height: 6.0 m
Tree Health: Good
Life Expectancy: Moderate
TPZ: 3.36 m
Retention Value: Very low
Observations:
Age: Semi-mature
Canopy Width: 3.0 m
Tree Structure: Fair
DBH at 1.4m: 28 cm
SRZ: 1.94 m

Asset Number: TREE 25
Species: *Lophostemon confurtus*
Origin: Australian native
Tree Height: 2.0 m
Tree Health: Poor
Life Expectancy: Short
TPZ: 2.0 m
Age: Semi-mature
Canopy Width: 1.0 m
Tree Structure: Poor
DBH at 1.4m: 10 cm
SRZ: 1.5 m
Retention Value: Very low
Observations: Re-shot stump, entire canopy is re-growth

Asset Number: TREE 26
Species: *Prunus* sp.
Origin: Deciduous exotic
Tree Height: 5.0 m
Tree Health: Good
Life Expectancy: Short
TPZ: 2.0 m
Age: Semi-mature
Canopy Width: 2.0 m
Tree Structure: Poor
DBH at 1.4m: 15 cm
SRZ: 1.5 m
Retention Value: Very low
Observations:

AS4970:2009 - PROTECTION OF TREES ON DEVELOPMENT SITES

Australian Standard AS4970 offers guidelines for protecting trees during development. This standard assists in assessing potential tree impacts, categorizing tree values, and implementing protective measures to safeguard tree health and well-being. It serves as a valuable resource for arborists, developers, and construction professionals.

Establishing healthy trees takes many years, while damage can occur rapidly. Tree canopies and root systems can significantly influence site planning due to their size. Encroachment into tree protection zones should be avoided whenever possible. If unavoidable, low-impact construction methods should be employed to minimize harm.

MINOR ENCROACHMENT

Where the proposed encroachment is less than 10% of the area of the tree protection zone and is outside the structural root zone, detailed root investigations should not be required. Where possible, the area lost to this encroachment should be compensated for elsewhere and be contiguous with the tree protection zone.

MAJOR ENCROACHMENT

Where proposed encroachment is greater than 10% of the measured tree protection zone or is within the structural root zone, the project arborist must demonstrate to the responsible authority that the tree will remain viable. Where possible, the area lost to this encroachment should be compensated for elsewhere and be contiguous with the tree protection zone. Major encroachments may require design alterations or protection measures to reduce impacts.

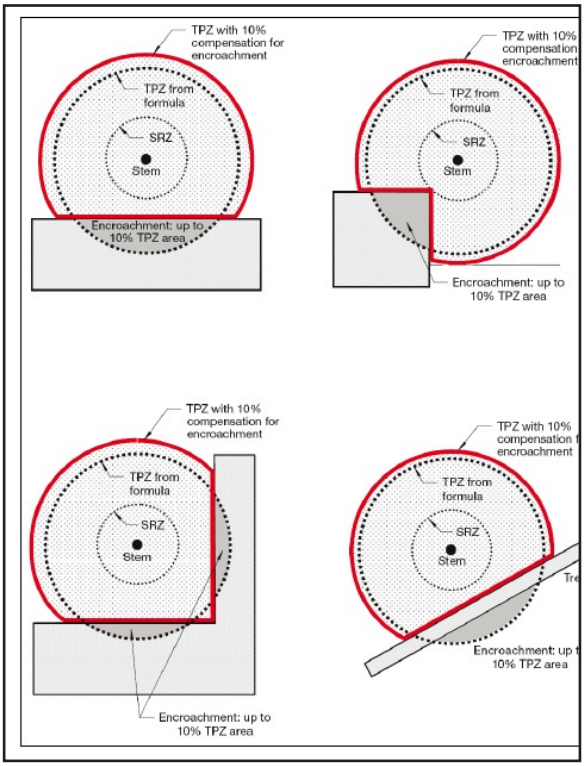


Figure 3: *Example of compensation for encroachment into a tree protection zone as per AS4970.*

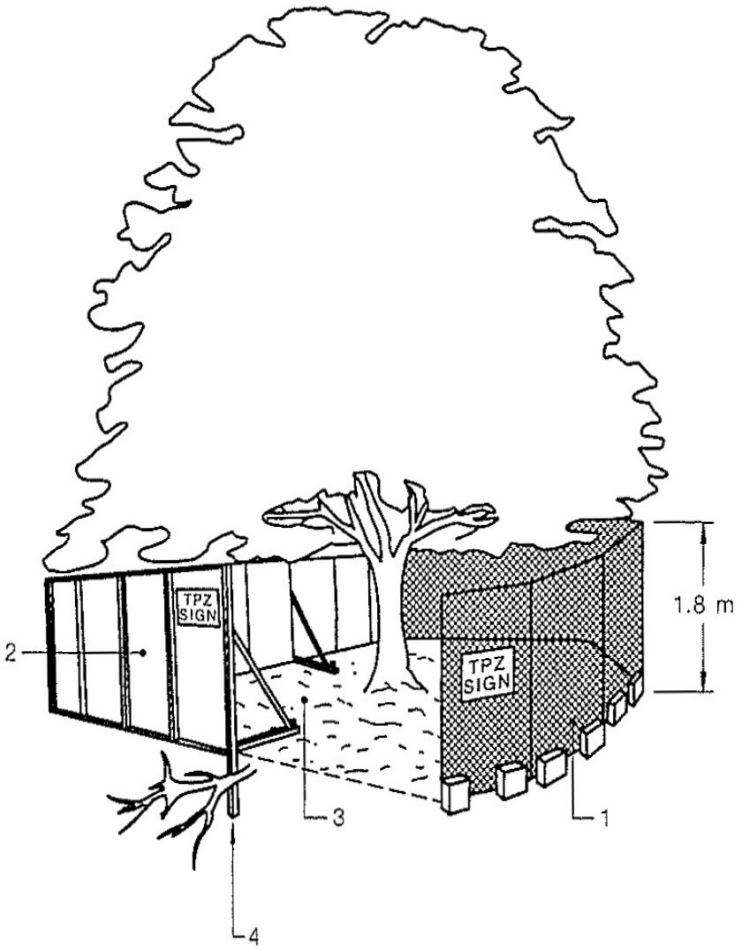
TREE PROTECTION FENCING

Tree protection fencing is the primary means for tree protection on development sites as per the Australian Standards AS4970. Fencing creates an area of exclusion to restrict access during development.

Fencing should be constructed of chain wire mesh and covered by screening or shade cloth to help protect the tree. Existing fencing or structures may be incorporated as sections of a tree protection zone.

Tree Protection fencing must be erected and secure 2 weeks prior to any machinery or materials are delivered to the site. Once erected, the fencing must not be removed or altered without the prior approval from the project Arborist.

In certain scenarios where the protection zones does not directly impose on the developing area, fencing alternatives such as parawebbing or barricade bunting can be used.



LEGEND:

1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2 Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

Figure 4: *Tree protection fencing specification as per AS4970.*

TREE PROTECTION SIGNS

Tree protection zone signs identify the restricted area. They should be placed on the exterior of the tree protection fencing and be visible from within the development site.

Tree protection zone signage must be displayed concurrently with tree protection fencing.

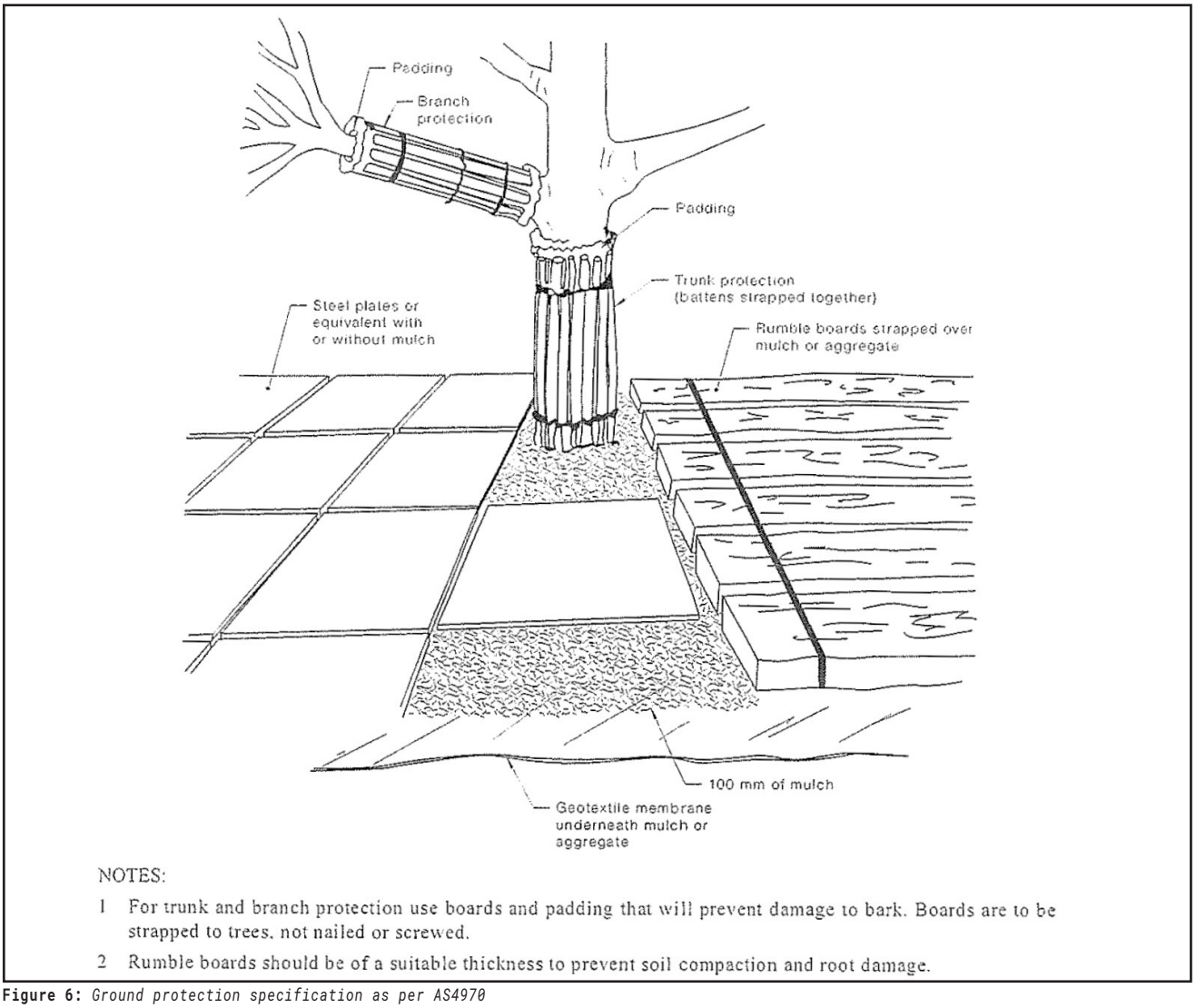
Tree Protection Signage can be made available upon request.

Figure 5: *Tree protection Signage*

GROUND PROTECTION

In areas where tree protection fencing cannot be installed, or when temporary machine access is needed, ground protection measures will be required. The purpose of ground protection is to prevent ground disturbance, root damage and compaction of the soil.

Ground protection should be layered with 100mm of organic mulch and capped with a secured, sturdy surface such as rumble boards or steel plating. Protection must be thick and secured so that it does not move under use.



NOTES:

1 For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.

2 Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

Figure 6: *Ground protection specification as per AS4970*

SCAFFOLDING AND TREES

Where scaffolding is to be installed within the tree protection zone, it should be erected as far away from the tree as possible and be installed on top of ground protection, topped with boarding or plates. Canopy interference should be resolved by tying of branches and pruning should be avoided where possible. The installation of scaffolding within a tree protection zone should be supervised by a suitably qualified arborist.

Where tree pruning is required to accommodate scaffolding, approval must first be sought from the responsible authority if required under vegetation protections. Pruning must be performed in accordance with the Australian Standards AS4373 Pruning of Amenity Trees as detailed in this report.

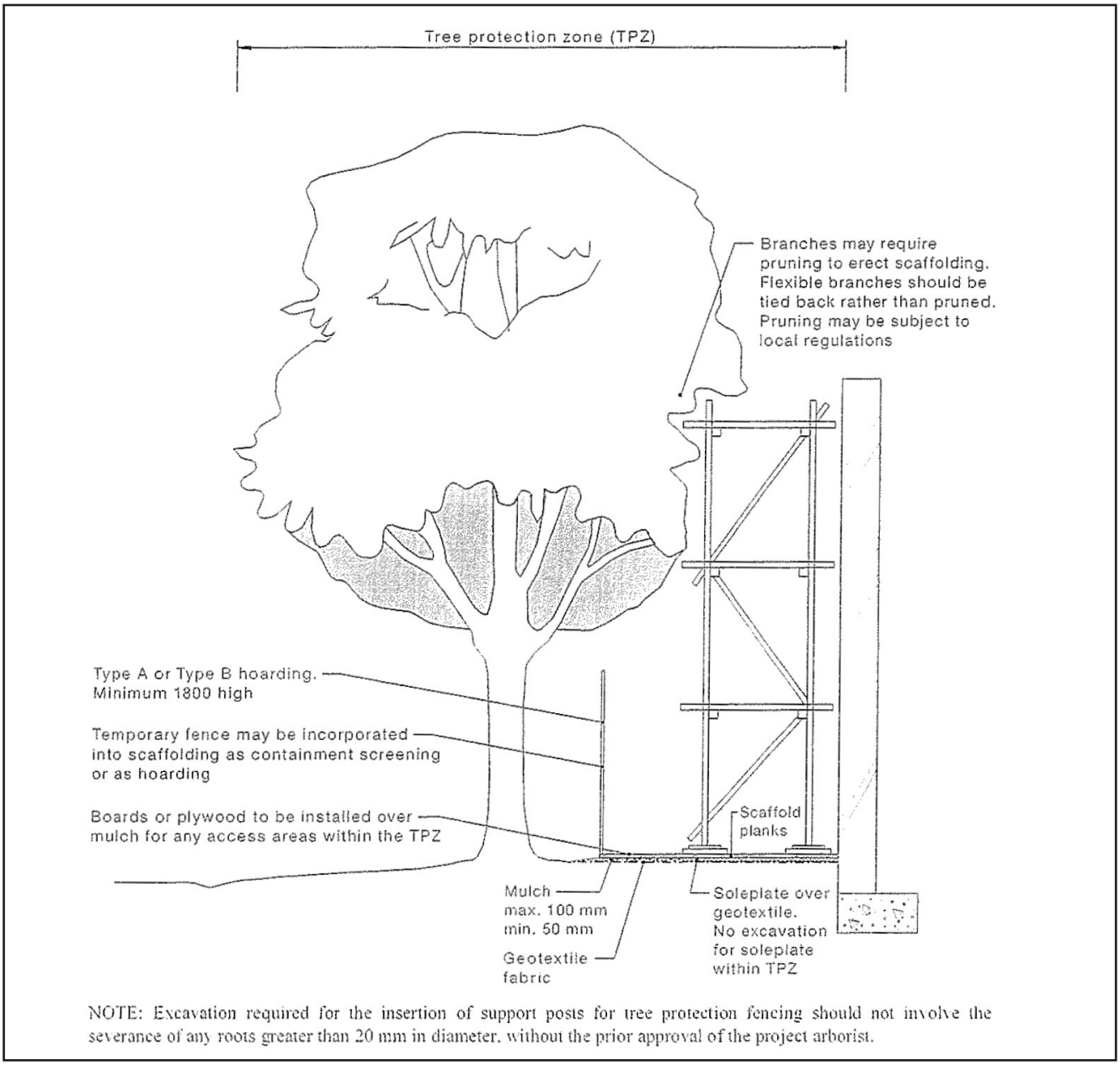


Figure 7: *Scaffolding within tree protection zone specification as per AS4970*

TREES AND FOOTINGS

Footings within tree protection zones can significantly impact tree life expectancy. Where possible, footings should be excluded or minimized within these areas. If minimal encroachment is not feasible, tree-sensitive footing options should be explored. These methods aim to preserve tree health and structural integrity by avoiding root damage and minimizing soil compaction.

Common tree-sensitive construction methods include suspended footings, cantilevered footings, and root bridging.

All tree-sensitive construction methods require consultation with a qualified arborist. Additional investigations, such as root mapping or non-destructive digging, may be necessary to determine feasibility.

USE OF PERMEABLE MATERIALS

Permeable materials around tree protection zones play a crucial role in maintaining the health and vitality of trees during construction or development projects. Materials, such as permeable paver, or no fines aggregate concrete, allow water and air to pass through the surface and reach the tree's root system, ensuring proper moisture levels and gas exchange.

WORKING AT GRADE WITHIN THE TREE PROTECTION ZONE

Working at or above the current soil grade helps protect tree root systems during construction or development projects. By avoiding excavation or disturbance below the existing soil level, the integrity and functionality of the tree's root system can be preserved.

NON-DESTRUCTIVE EXCAVATION WITHIN TREE PROTECTION ZONE

Non-destructive excavation is used to protect and preserve tree roots during investigation or construction projects. This method involves using pneumatic, hydraulic, or hand tools to precisely expose and identify tree roots. This technique is particularly beneficial in urban areas where trees are often surrounded by infrastructure or where major impacts are proposed on tree roots.

Non-destructive excavation must be supervised by a suitably qualified consulting arborist, and often will require a subsequent root mapping report to provide evidence of findings.

TREES AND CONCRETE

Concrete can poison trees. Where concrete is to be laid in direct contact with tree roots within a trees protection zone, a clear barrier between the tree roots and the concrete should be installed. This can be achieved by using geo-textiles or impermeable membranes between exposed tree roots and the concrete, while implementing good construction practices to minimize spills within the tree protection zone and diligently cleaning up any residue or spills promptly.

UTILITIES AND TREES

The installation of underground utilities should be kept outside tree protection zones. If underground services must be routed through a tree protection zone, they should be installed by directional drilling or manual excavation of trenches at the advice of the project arborist.

Directional boring must be at a minimum depth of 600mm, with entry and exit pits located outside the tree protection zone where possible. If excavation is required within the tree protection zone, section 6.11.4. of this report is to be considered.

TREE PRUNING

Tree pruning should be on a 'as needs' basis and prune only what is required to facilitate the development while maintaining a structurally sound, healthy tree. Over pruning can lead to future structural concerns for trees and will deplete energy reserves.

Tree pruning must be performed by a suitably qualified pruning Arborist with a minimum qualification AQF level 3 in Arboriculture and comply with Australian Standards AS4373:2007 Pruning of Amenity Trees.

Trees on public land can only be pruned at the direction of the responsible authority.

TREE REMOVAL

Trees should be removed by a competent and insured contractor. Removal should include dismantling, chipping, and disposal of wood including the stump to a minimum of 300mm below grade. Where practical, hollow wood or areas for future wildlife habitat should be retained in the landscape as a reduced form or re-located locally for habitat purposes and not removed from the site.

If tree removal work is to be undertaken by persons without a recognized Arboriculture qualification, then the works must be supervised by a suitably qualified consulting arborist

DISCUSSION

No trees within the site or on neighboring private properties are protected under any vegetation protection laws.

Trees located on the adjacent nature strip are protected and managed by the local government agency and cannot be pruned or removed without prior consent from Maribyrnong City Council.

All trees within the study site are of low or very low value and will be removed to accommodate the development. These trees can be removed at the discretion of the property owner and are not subject to any legal protections.

TREE 1, a nature strip tree, would be significantly impacted by underground impacts caused by the proposed crossover relocation. Considering the tree's size and low retention value due to its age, removal of this tree to facilitate the development could be considered. Therefore, it will be requested for removal to facilitate the development. This tree is managed by the Maribyrnong City Council and must have formal approval from the council before removal.

All trees on neighboring private properties will be retained. TREES 7, 8, 9, 15, and 23 will be impacted by the proposed development. The proposed design seeks to minimize impacts on existing trees, with soft landscaping reducing encroachments within tree protection zones where possible.

TREES 23 would incur a major encroachment within its tree protection zones, from a proposed footpath and concrete padding for a rainwater tank. The impact has been calculated as 18.96%, however as the proposed footpath is to be constructed of crushed granite gravel, the true impact has been calculated as 2.16%.

TREES 7, 8, 9 and 15 would incur minor encroachments within their tree protection zones. Due to the minor nature of these encroachments and the existing conditions of the trees, no further investigation is required. However, tree protection fencing and signage are recommended to prevent inadvertent impacts during demolition and construction.

TREE IMPACTS

TREE 1

Impact	Encroachment Type	Encroachment Percentage	Mitigation Measures
Entire impact	Full	100%	1. Tree would not tolerate the proposed design. Approval for removal to be sought from Maribyrnong City Council.

TREE 7

Impact	Encroachment Type	Encroachment Percentage	Mitigation Measures
Proposed walking path	Minor	5.16%	1. Path to be constructed of crushed granite gravel 2. Install tree protection and signage.

TREE 8			
Impact	**Encroachment Type**	**Encroachment Percentage**	**Mitigation Measures**
Proposed footpath	Minor	9.75%	1. Path to be constructed of crushed granite gravel 2. Install tree protection and signage.

TREE 9			
Impact	**Encroachment Type**	**Encroachment Percentage**	**Mitigation Measures**
Proposed footpath	Minor	1.79%	1. Path to be constructed of crushed granite gravel 2. Install tree protection and signage.

TREE 15			
Impact	**Encroachment Type**	**Encroachment Percentage**	**Mitigation Measures**
Proposed footpath	Minor	4.83%	1. Path to be constructed of crushed granite gravel 2. Install tree protection and signage.

TREE 23			
Impact	**Encroachment Type**	**Encroachment Percentage**	**Mitigation Measures**
1. Proposed footpath 2. Concrete pad for rainwater tank.	Minor	18.96% True impact is 2.16%	3. Path to be constructed of crushed granite gravel 4. Install tree protection and signage.

TREE PROTECTION MEASURES

All work-related activities that enter the tree protection zone of retained trees are to be carried out in a manner that is sensitive to retained trees and their protection zones.

TREE MANAGEMENT PLAN

A tree management plan is to be prepared by the project arborist post planning permit, that indicates and outlines specific hold points for the project where the protection of retained trees needs to be considered.

THE FOLLOWING MATTERS ARE TO BE CONSIDERED BEFORE, DURING, AND AFTER CONSTRUCTION:

1. Engage the project arborist to supervise the excavation and boxing out of the crossover for the site where it encroaches within the tree protection zone of TREE 1
2. Engage the project arborist to supervise the excavation and boxing out of the footpath where it encroaches within the tree protection zones of TREE 7 & 9
3. Install and maintain tree protection fencing and signage for retained trees as outlined within a Tree Protection Management Plan.

4. Activities generally excluded from the tree protection zone include but are not limited to:

   I. Machine excavation including trenching, without pre-approval from the responsible authority, and supervision from a suitably qualified arborist.

   II. Excavation for silt fencing, without pre-approval from the responsible authority, and supervision from a suitably qualified arborist.

   III. Cultivation

   IV. Storage

   V. Preparation of chemicals, including preparation of cement products

   VI. Parking of vehicles and plant

   VII. Refuelling

   VIII. Dumping of waste

   IX. Washing down and cleaning of equipment

   X. Placement of fill

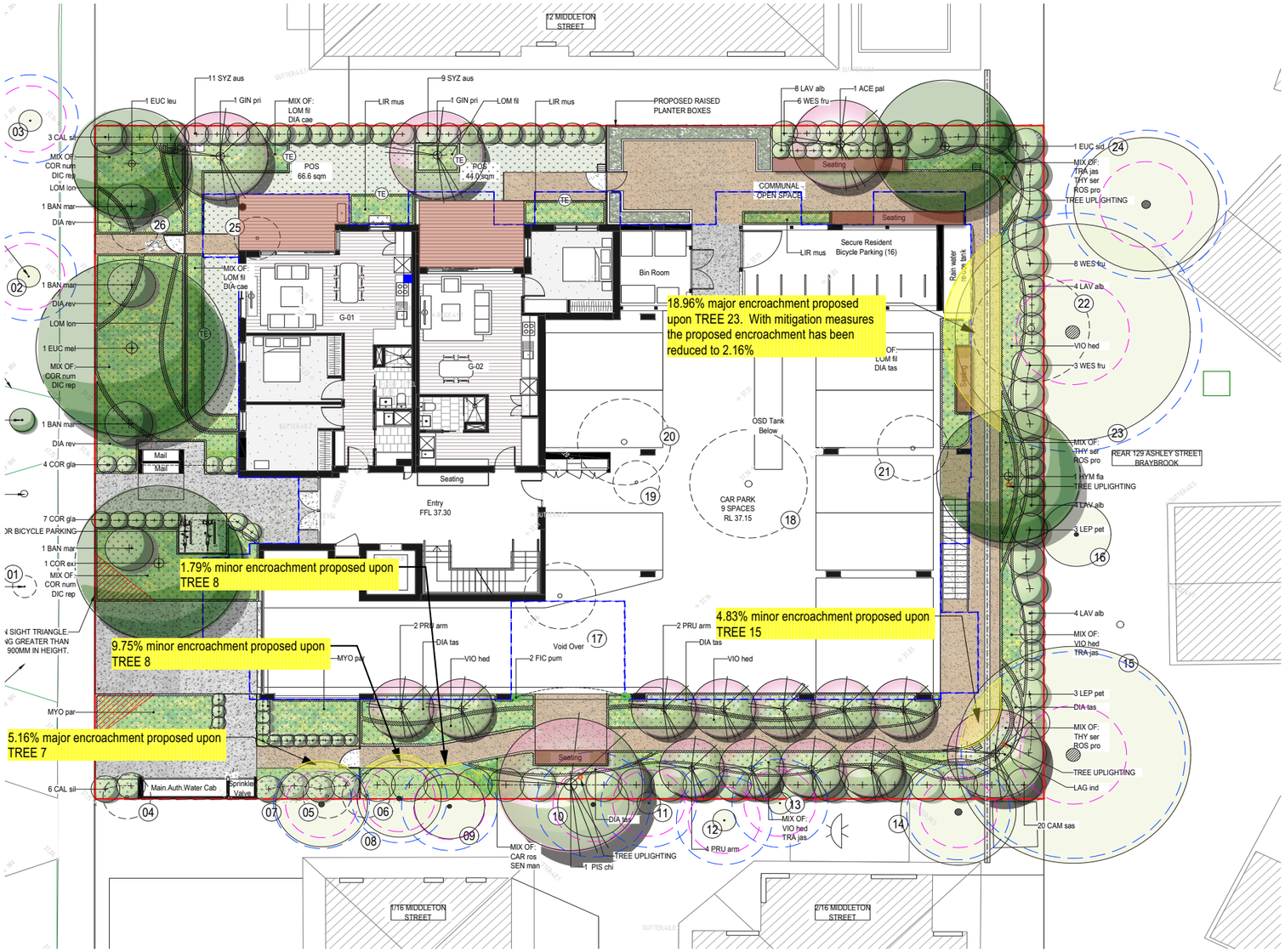
   XI. Lighting of fires

   XII. Soil level changes, without pre-approval from the responsible authority, and supervision from a suitably qualified arborist

   XIII. Temporary or permanent installation of utilities and signs, without pre-approval from the responsible authority, and supervision from a suitably qualified arborist

   XIV. Physical damage to the tree

SITE PLANS & TREE IMPACTS








WARNING

BEWARE OF UNDERGROUND SERVICES. THE LOCATIONS OF UNDERGROUND SERVICES ARE INDICATIVE ONLY. THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. DIAL B4 U DIG PH: 1100

CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK. REPORT ALL DISCREPANCIES TO SUPERINTENDENT PRIOR TO CONSTRUCTION. FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALED DRAWINGS. ALL DRAWINGS MAY NOT BE REPRODUCED OR DISTRIBUTED WITHOUT PRIOR PERMISSION FROM THE LANDSCAPE ARCHITECT.

STATUS

FOR TOWN PLANNING
NOT FOR CONSTRUCTION

NO.	REVISION	DATE
P	FOR TOWN PLANNING	07/08/2024
P1	FOR TOWN PLANNING	28/08/2024
P2	FOR TOWN PLANNING	01/10/2024

LEGEND

REFER TO EXISTING AND PROPOSED PLANT SCHEDULES.

- EXTENT OF WORKS (E.O.W)
- BUILDING OVERHEAD
- EASEMENT
- PROPOSED EVERGREEN TREES
- PROPOSED DECIDUOUS TREES
- EXISTING TREE TO BE RETAINED AND PROTECTED (01)
- EXISTING TREE TO BE REMOVED (02)
- TREE PROTECTION ZONE (TPZ)
- STRUCTURAL ROOT ZONE (SRZ)
- PROPOSED SHRUBS
- PROPOSED CLIMBERS
- PROPOSED GARDEN BED PLANTING
- CONCRETE PAVING
- CRUSHED GRANITE GRAVEL
- TIMBER DECK
- LAWN
- DRAINAGE PIT
- TIMBER BENCH
- RAISED PLANTER BOX
- TIMBER GARDEN BED EDGE (TE)
- LOW VOLTAGE LED LIGHT

DRAFT

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CLIENT
Merkon Constructions
Ground Floor, 479 Warrigal Road
Moorabbin VIC 3189

PROJECT
8-10 Middleton Street
Braybrook VIC 3019

DRAWING TITLE
Landscape Plan
Ground Floor

DRAWN	CHECKED	SCALE A1	SCALE A3
SY	LD	1:100	1:200

0 1 3 5
0.5 2 4 7.5m

PLOT DATE	JOB NUMBER	CLIENT REF
	2024.320	-

DRAWING NUMBER REV

LCD-001 P2

RECOMMENDATIONS

1. Request approval from Maribyrnong City Council to have TREE 1 removed to facilitate the relocation of the crossover
2. Consider and implement the listed mitigation measures to assist in reducing the proposed impacts of TREES 1, 7, 8, 9, 15 & 23.
3. Commission a Tree Protection Management Plan to protect retained trees for the life of the development.

Blooming Tree Group or Brayden Lane can be made available at any point to elaborate on matters arising from this report and is contactable via phone or email.

Sincerely,

Brayden Lane
Lead Consultant
Blooming Tree Group
0456 874 142
brayden@bloomingtreegroup.com
bloomingtreegroup.com

TERMS OF ADVICE & SERVICE

This assessment and subsequent report findings are the culmination of research combined with the professional opinion of a qualified consulting arborist. Our consultants pride themselves on independent reporting. This report has not been produced to support a particular motive, a desired value, or predict a desired occurrence. All findings are reported without bias towards certain parties or results.

Tree assessments are of a visual nature and therefore cannot identify defects that are not readily visible. Blooming Tree Group therefore cannot wholly guarantee the condition and safety of the trees inspected beyond what is reasonable from the methods stipulated in the methodology. Trees are living organisms and are subject to natural or third-party influences such as extreme weather conditions or changes to its surrounding environment. Trees should be regularly inspected for risks.

To the authors knowledge, all facts, assessment techniques and material presented is current and accurately researched. Opinions expressed within this report are supported by current research.

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DESCRIPTORS

ORIGIN

Indigenous	Remnant, or naturally occurring within the locality or region of the subject site.
State Native	Naturally occurring not exclusively within some part of the State. Is not indigenous due genetic differences or being planted.
Australian Native	Naturally occurs within multiple States of Australia
Evergreen Exotic	A tree not naturally occurring from within Australia that seasonal retains its leaf.
Deciduous Exotic	A tree not naturally occurring from within Australia that seasonal sheds its leaf.
Native Palm	A woody monocotyledon that occurs naturally within Australia.
Exotic Palm	A woody monocotyledon that does not naturally occur within Australia.

AGE

Young	Newly planted tree approximately 1-7 years old
Semi-Mature	Tree is still actively in its growing stages, has not reached expected size.
Mature	Tree has reached expected size with reduction in growth rate.
Over-Mature	Tree has reached maturity and is becoming senescent.

LIFE EXPECTANCY

Remove	Trees in this category are beyond saving due to severe damage, disease, or decay. They pose a significant safety risk and must be removed to protect people and property.
Short	Trees in this category have a relatively short lifespan, typically less than 30 years. They often exhibit rapid growth but are susceptible to a range of factors affecting their health and longevity. Regular monitoring and care are crucial for maximizing their lifespan.
Moderate	These trees have an average lifespan ranging from 30 to 75 years. While generally healthy, they may be more susceptible to pests, diseases, or environmental stressors compared to long-life expectancy trees. Proper care and maintenance are essential for maximizing their lifespan.
Long	Trees in this category are typically characterized by slow growth, robust health, and a long lifespan, often exceeding 75 years. They are well-suited to various environmental conditions and exhibit strong resistance to pests and diseases

HEALTH

Dead	Tree is dead. No signs of living tissue.
Poor	Tree is under a high amount of stress and could be showing one or more signs of: Canopy dieback, thinning of canopy foliage, large unnatural deadwood, low to no vigour, signs of pests and/or diseases, slow callusing of wounds, epicormic growth.
Fair	Tree is showing minor signs of stress. Could be presenting one or more signs of: Canopy dieback, thinning of canopy, signs of pests and/or diseases.
Good	Tree is presenting as typical for species. Foliage is of normal colour and size, good shoot growth, no presence of pests or diseases responding well to previous wounds with callusing growth.

STRUCTURE

Hazardous	Tree presents as an immediate hazard with extensive defects that cannot be resolved. Tree is likely a risk to property or life where the risk cannot be resolved by other manners such as exclusion zones or relocation of assets. Removal of tree or suppression of hazard should be performed as soon as possible.
Poor	Tree is showing low structural integrity and/or defective sections. Tree may still be viable in some form if maintenance is performed.
Fair	Tree has minor defect(s) that may cause future problems if not managed. Could be typical for species.
Good	Structure is exceptional for species. Tree is showing no defective areas.

RETENTION VALUE

High		Tree of high quality in good to fair condition; good vigour. Generally a prominent arboricultural/landscape feature. Particularly good example of the species; rare or uncommon. Tree may have significant conservation or other cultural value. These trees have the potential to be a medium- to long-term components of the landscape.
Moderate	A	Moderate to large, maturing tree. Contributes to the landscape character. Tree may have conservation or other cultural value.
	B	Moderate sized, established tree, > 50% of attainable age/size. Contributes to the landscape character. Maturing tree with amenity value but with identified deficiencies.
	C	Small and/or semi-mature tree, established, >5 years in the location. May not be a dominant canopy. No special qualities. Maturing tree with accumulating deficiencies.
Low		Unremarkable tree of low quality or little amenity value. Tree in either poor health or with poor structure or a combination. Short to transitory useful life expectancy. Tree is not significant because of either its size or age, such as young trees with a stem diameter below 15 cm.
Very Low		Trees of low quality with a brief to no remaining life expectancy (<5 years). Tree cannot realistically be retained and should be considered for removal.

TREE PROTECTION ZONE

The tree protection zone (TPZ) is the principal means of protecting trees on development sites. The tree protection zone is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance so that the tree remains viable. The tree protection zone is to be maintained for the duration of development except where pre-approved impacts are to occur.

The Tree Protection Zone radius is measured from the centre of the stem at ground level.

STRUCTURAL ROOT ZONE

The structural root zone (SRZ) is the area required for a tree to remain stable. It is measured as a hypothetical radius where structural roots are likely to be found. Any impact within the structural root zone is considered a major encroachment and will require further investigation. Removal of tree roots within the structural root zone is rarely allowed. Environmental factors can influence where structural roots establish.

The Structural Root Zone radius is measured from the centre of the stem at ground.

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Report No.: R240706 Date: 08/07/2024

Geotechnical Investigation Report

Job No.	240706
Report No.	R240706
Client	Merkon
Date of Investigation	03 July 2024
Project	8 - 10 Middleton St, Braybrook VIC 3019

Table of Contents

1 INTRODUCTION

Merkon engaged Geotechnical Engineering Services (GES) to undertake a geotechnical investigation for a proposed residential construction at 8 & 10 Middleton St, Braybrook VIC 3019. GES were provided some preliminary drawings for the proposed constructions prior to the investigation.

2 SCOPE OF WORK

GES understood that the proposed construction is included a residential dwelling. Geotechnical site investigation was carried out to provide the following information:

- Site classification and soil profile.
- Hazard factor for earthquake load (as per AS1170.4).
- Recommended footing systems and bearing pressure
- Design parameters for bored piers.
- Field CBR testing results and recommendations for subgrade preparation.
- Retaining wall design parameters.
- Recommendation for temporary batter angle for excavation.

The investigation included drilling and logging test boreholes. These details findings of works are provided in this report.

3 SITE DESCRIPTION

As per the property report of land channel the site is a lot with 1208 m^2 area on the approx. eastern side of the Middleton Street (Figure 1). The lot in approx. south and eastern sides of the site are occupied by a single storey residential dwelling. Whereas a double storey residential dwelling was found to exist in the northern lot of the site.

The noted features of the site at the time of the field investigation are shown below:

- The site is currently occupied single storey residential dwellings, sheds and which will be demolished before actual construction.
- Trees are present at the site.
- Trees were removed from the site.
- The drainage condition of the site was poor.

Figure 1: approximate location of the site, image from Google Earth (Not in Scale)

4 SITE GEOLOGY

Reference to the GeoVic 1:313 scale indicates that the surface geology of the site is Newer Volcanic Group - basalt flows (Neo) as shown in the Figure 2. The geological description of the deposit is an olivine tholeiite, quartz tholeiite, basanite, basaltic icelandite, hawaiite, mugearite, minor scoria and ash, fluvial sediments: tholeiitic to alkaline; includes sheet flows and valley flows and intercalated gravel, sand, clay

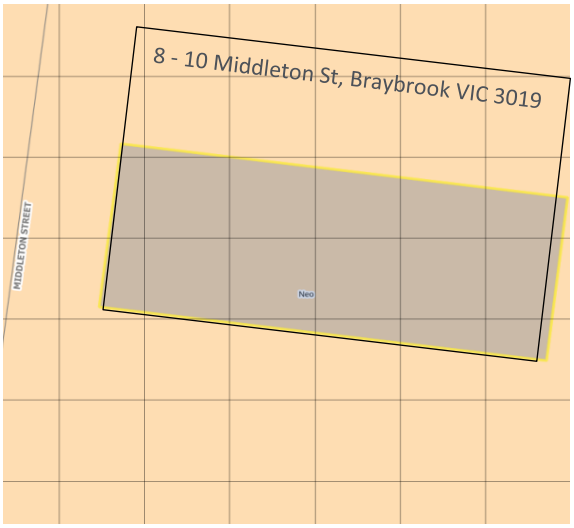


Figure 2: Extract from GeoVic (Geological unit 250K) (Not in Scale)

5 INVSETIGATION METHOD

Six (6) geotechnical boreholes drilling were conducted on 3rd of July 2024. A Ute mounted drilling rig with 90 mm diameter auger was used for drilling as marked on bore log plan provided in the Enclosure. Disturbed samples were collected from different layers. Pocket Cone Penetrometer (pp) and Dynamic Cone Penetrometer (DCP) tests were conducted at the different locations. The soil

profiles, pp and DCP tests were logged by competent GES Geotechnical Engineer in according with AS 1726. The bore logs are presented in the Encloser.

6 FIELD TEST RESULTS

6.1 Subsurface Conditions

The subsurface conditions observed in the bores is shown in the attached borehole logs in Enclosure. From the bores log it was observed that after 0.1 m topsoils, the "FILLING" comprises of silty clay up to 0.3 m, 0.4 m, 0.4 m, 0.5 m, 0.6 m & 0.6 m depth in the borehole 1, 2, 3, 4, 5 & 6 respectively. The fill material was followed by a grey colour silty clay layer. The borehole 1, 2, 3, 4, 5 & 6 were terminated at 0.7 m, 3 m, 3 m, 0.8 m, 2.5 m & 2.5 m depths respectively.

6.2 Soil Moisture / Groundwater

The fill material and natural soil profile is described as very firm to stiff conditions.

No water table was encountered during the borehole log. However, during rainy season, or due to the significant rainfall events, groundwater may occur, which may result a localized wetting or saturation of fill materials.

6.3 Climatic zone

As per AS2870-2011 (Figure D2-Victorian Climate Zone) the site is within under climatic zone 3. In this zone the depth of design suction change is 2.3 m as per AS2870-2011 (Table 2.5).

6.4 Site classification

In accordance with AS2870- "Residential Slabs and Footings - Construction" a site classification of Class "P" is applicable due to the following reasons

I. Abnormal moisture conditions due to the presence of fill.
II. Abnormal moisture conditions due to the presence of trees.
III. Abnormal moisture situations due to the removal of trees.
IV. Abnormal moisture situations due to demolition of existing properties.

Based on the findings of this investigation, the soil profile combined with this writer's local knowledge and experience, the characteristic surface movement (Ys) of the underlined natural soils, has been assessed to be in the range of 60 mm to 75 mm under normal condition.

In accordance with AS2870-2011 "Residential Slabs and Footings - Construction" a site classification of Class "H2". A very highly reactive clay site which may experience very high ground movement from moisture changes.

However, this soil movement may increase due to the presence of excessive amount of fill within the suction zone.

Any site cutting of fill replacement may alter areas of the site which may potential to affect soil moisture conditions which may alter the appropriate footing types. Therefore, where cut or fill works undertaken, this office must be supplied with accurate details to ensure that the site classification and footing recommendation remain appropriate.

6.5 Earthquake Classification

The earthquake classification conducted as per the method outlined in the AS 1170.4 – 2007 (incorporating amend 1 & 2/2018), 'Structural Design Actions, Part 4: Earthquake Actions in

Australia' outlines the methods for assessing the sites Sub-soil Class. According to the Borehole Logs, stratigraphy and figure 3.2, we recommend the following site factor and Hazard Factor are adopted:

- Sub-soil Class Ce– Shallow soil site
- Hazard Factor (Z): 0.09

7 SITE PREPARATION

7.1 General

According the borehole logs, the site comprises of topsoil, fill materials and natural clay soils. Existing structure and footing to be sufficiently removed so that it will not interfere with new footings.

Any excavation or surface trimming required to achieve design grade levels, stripping off any vegetation, root zone material & any obviously low strength or unworkable surface materials should be completed across site areas to be occupied by floor slabs, vehicles or 'pedestrian pavements' & associated kerbs & channels.

Where trees are to be removed from the area of the proposed construction works it must be ensured that, tree stumps should be removed at the same time that trees are felled, and stump excavations immediately backfilled with competent fill materials (i.e., granular materials or low-medium plasticity clays), placed in lifts of 150 mm maximum with each lift being well compacted. In relation to the presence of trees, the provisions for an effective root barrier and/or deepening/stiffening of the footings to be ensured to compensate the potential ground movements caused by the trees.

Footing constructed along an easement or excavation should be deepened such that the projection from the underside of the footing to the bottom of the excavations makes an angle not exceeding 30 degrees in sandy soils and 45 degrees in clayey soils (This angle is measured from the horizontal).

Care shall be taken with surface drainage of the allotment from the start of construction and the site must be well drained so that water cannot pond beside or adjacent to footings.

7.2 Sub-grade Preparation

It will be difficult to prepare subgrade and fill placement when trying to achieve optimum moisture contents and density. Therefore, it is highly recommended that the earth filling work to be undertaken during the direr periods.

Preparation of subgrade to be included of stripping of grass, root zone material, the surface fill material, and topsoils to expose the silty clay (or weathered rock) subgrade. In this case, first 200 mm from the existing ground not to be considered as fill materials due to presence of extensive grass root. The exposed surface should be proof rolled with the aim of achieving a dry density ratio of 98% as measured by standard compaction (AS1289 5.1.1). If there is any soft, wet, or loose material which does not suitable for achieving compaction an additional excavation to be conducted to expose a firm working base. Areas of over-excavation should be backfilled using class CLASS 2 or CLASS 3, 20-40mm, clay and silt fines <30%, liquid limit <35%, QUARRY PRODUCT or

equivalent CRUSHED CONCRETE PRODUCTS and compacted to 98% modified dry density as measured by standard compaction.

7.3 DCP Testing and in-situ CBR

Dynamic Cone Penetrometer (DCP) tests were conducted at five boreholes and are shown in boring logs. A summary of DCP results is shown in Table 1.

Table 1: DCP Results

Bore Hole	Depth (m)	Description	DCP Penetration (mm/blow)	In Situ CBR (%)
DCP1	0.1-0.3	FILL	17	10
	0.3 - 0.7	Silty clay	18	10
DCP2	0.1-0.4	FILL	10	15
DCP3	0.1-0.5	FILL	33	5
	0.5 - 0.8	Silty clay	10	15
DCP4	0.1-0.6	FILL	24	6
	0.6 - 0.8	Silty clay	25	6

8 FOOTING DESIGN RECOMMENDATIONS

8.1 Slab on ground

GES is recommending a footing system of slab on ground for this site. Anticipated maximum design surface movement (Ys) = 75mm. Edge and internal beams should be penetrated through any fill material and be founded at least 200 mm into the founding soils.

Slab panels and non-heavily loaded internal beams can be founded in the natural soil profile or in compacted surface filling. If existing site fill and compacted fill material make up part or all the foundation, this fill must be placed and compacted as per specifications for Controlled or Rolled fill in accordance with AS2870 – 2011, Cl.6 .4.2. Allowable bearing capacity founding soils is shown in the Table 2.

Table 2: Allowable bearing capacity of founding soils

Borehole no	Minimum depth of founding (m)	Founding soils	Allowable bearing capacity (kPa)
1	0.3	Silty clay	100
2 & 3	0.4	Silty clay	100
4	0.5	Silty clay	100
5 & 6	0.6	Silty clay	100

8.2 Pad and strip footing

The Pad and strip footing system to be designed in accordance with engineering principle. A minimum depth of 1.5 m from existing ground level or up to confirmed rock layer of founding depth can be adopted for pad footing system. The minimum required allowable bearing capacity of 150 kPa can be adopted at this depth.

8.3 Geotechnical Parameters for Bored piles

Based on the limited approach of field investigations and visual inspection the following geotechnical design parameters are estimated as show in Table 3.

Table 3:Geotechnical Parameters for Bored piles

Boreholes	Materials	Allowable end bearing pressure (kPa)	Allowable skin friction (kPa)
1 & 4	Fill	0	0
	Silty CLAY (up to 0.8 m)	100	0
2, 3, 4, 5 & 6	Fill	0	0
	Silty CLAY (up to 1 m)	100	0
	Silty CLAY (1.5 m to 3 m)	150	15
	Silty CLAY (1.5 m to 3 m)	200	15

To achieve the end bearing at corresponding layers same materials must exist below the pile toe until minimum 3 times pile diameter.

8.4 Vehicular pavement design

Pavement design can be based on the following C.B.R. value shown in the Table 4.

Table 4: Pavement design CBR value

Option	Subgrade Material	Design C.B.R.
1	Successfully proof rolled imported fill materials (minimum 300mm) over natural silty clay.	5%
2	Successfully proof rolled natural silty clay.	3%

Differential movement of the expansive clay soils may induce pavement distortion, longitudinal cracking at pavement edges and ‘rolling out’ of kerbs. The following measures may be adopted to minimise such movement:

- The moisture content of the clay subgrade to be slightly wet and to be in optimum moisture content before & during construction.
- Continue sub-base crushed rock at least 500 mm past kerbs.
- Avoid garden beds which can act as a conduit for rainfall (or watering) causing wetting of subgrade clays to adjacent paving.

- Install perimeter cut-off drains at the edge of pavements. Soils drains should penetrate to approx. 200mm below the clay interface & be connected to drainage points.
- Ensure that tree planting does not promote drying of subgrade clays to adjacent pavements.

8.5 Batter angle for excavation

Recommended safe batter slope angle for the soils on site are provided in the Table 5. These batter angles are for slopes up to 3 m height.

Table 5: Batter angle for excavation

Soil Type	Safe batter slope angles degrees (°)	
	Short Term	Long Term
FILLING	25 to 30°	25 to 30°
stiff silty CLAY	45°	30°
Rock, basalt*	55°	30°

Without engineered support the crest of any excavation should not be within 2.0 m of any existing or adjacent footings without written approval from this office.

*Safe batter angles will depend on discontinuities (e.g., joints) in the rock mass. Steeper batter angles may be possible within the rock subject to jointing characteristics within the rock mass; and would require further detailed investigation incorporating the excavation of test pits and logging of the rock mass.

8.6 Retaining Walls

All the design parameters for retaining wall are provided in the Appendix 3. In addition, the design and installation of the retaining walls should comply with the following.

- The sides of the excavation will be required to be battered back as per the recommendations above to ensure the stability of excavations during construction.

- Proper drainage and tanking should be installed behind the if required. The clay can be considered impermeable at the foundation level because low hydraulic conductivity. Any type of AG pipe needs to be covered with a geotextile filter to prevent the entering of silt and fines and granular backfilling to be used around the pipe. Provision for 'flush' is also recommended that these subsurface pipes are accessible.

- Any drainage to retaining walls should be designed to avoid saturation of the foundation zone soils by either placing the back-wall drainage on a concrete lined spoon drain or grading the natural silty clay away from the edge of the foundation and off- setting the subsurface drainage pipes from the edge of the foundations. High seepage flows to sub-surface drains should be anticipated during the winter months.

- Granular material with less than 5% fines should be used as backfilling against the wall should not be compacted, or the lateral pressures will change during the placing. The final 15% of the total height of the wall of filling can comprise of on-site excavated soils which should be

placed wet of optimum moisture content. Scoria is an excellent light weight backfilling material.

- Any additional surcharges should be added to the lateral earth pressure. Note that AS4678-2002 recommends a minimum 5kPa surcharge loading to all walls.

- Should adequate drainage of the walls not be guaranteed water pressure should also be included in the lateral earth pressure, and the buoyant unit weight of the soils adopted for the lateral pressures.

- Should sloping backfill be proposed behind the walls, the lateral earth pressure should be calculated accordingly.

Please note that trees may have deleterious effects on the retaining walls from the penetration of root systems, these may include increased loading on the structure and penetration of roots into joints or drainage systems. BS 8002 (2015) recommends that trees should not be permitted within a distance from the retaining wall equal to half the mature height of the tree.

9 CONDITIONS OF THE USE OF THIS REPORT

9.1 Copyright

This soil testing report has been prepared explicitly for the client for the sole purpose of constructing the structure described in the plans and specifications. This report is copyright to Geotechnical Engineering Services. No part of this report including the whole of same shall be used for any other purpose or by any third party without the prior written permission of Geotechnical Engineering Services. The client is defined as the person or persons named in this report or the person or persons for whom the named building company is acting as agent.

9.2 Report Limitations

- The descriptions of the soils encountered in the boreholes closely follow those outlined in AS1726; Geotechnical Site Investigations. Colour descriptions can vary with soil moisture content and individual interpretation. It should be noted that colour and shade descriptions outlined in this report are made when the soil is in a moist condition, colour alone should not be used to identify soils.
- The report assumes that the soil profile observed in the boreholes is representative of the entire site. If the soil profile and site conditions appear to differ substantially from those reported, Geotechnical Engineering Services should be contacted immediately and this report may need to be reviewed if necessary.
- It is expected that all relevant information regarding the site, for example previous filling, old water courses etc., has been investigated by the client and this information has been supplied to GES, even if it is after the report has been written. Consequently, Geotechnical Engineering Services reserves the right to amend the initial report on receipt of

supplementary and relevant information. In the event of an amended report for such reasons, Geotechnical Engineering Services will not accept responsibility for any financial loss consequential or otherwise.

- Whilst every effort is made to identify fill material across the site, the difficulties in determining fill material when utilising a small diameter auger, which is standard geotechnical practice, must be understood and accepted. Consequently, Geotechnical Engineering Services emphasises again we will not be responsible for any financial losses, consequently or otherwise, that may occur as a result of no accurately determining the depth of fill across the site.

9.3 Variations from this Report

It is neither economically feasible nor practical to determine every subsurface feature on the site. Studies have shown that a large number of boreholes lead to only slight increase in probability of detecting hidden site features (such as filled well or cellar) in the foundation soils. As such, any variations, or discrepancies in soil type, colour, or horizon depth must be reported to the Engineer immediately so that potential influence on the footing may assessed.

For and on behalf of
Geotechnical Engineering Services Pty. Ltd.

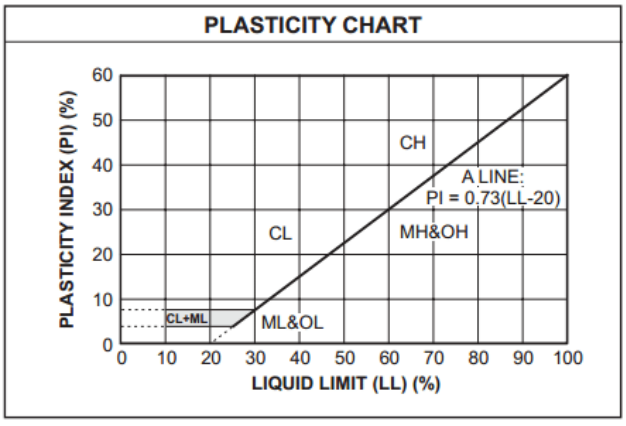
Md Shahidul Islam, MIEAust, BLA (PE0002345)
PhD (Geotech), M. Eng. (Geotech), B. Eng. (Civil)

APPENDIX 1

DESCRIPTION OF SOILS

Description of Soils: Refer AS1726-2017 Sheet 1 of 2

Major Divisions		Particle Size (mm)	USCS Group Symbol	Typical Names	Laboratory Classification			
COARSE GRAINED SOILS (More than half of material less than 63mm is larger than 0.075mm)	BOULDERS	200			% <0.075 mm	Plasticity of Fine Fraction	[F]	[F]
	COBBLES	63						
	GRAVELS (more than half of coarse fraction is larger than 2.36mm)	Coarse 20 Medium 6 Fine 2.36	GW	Gravel & gravel-sand mixtures, little or no fines	0-5	-	>4	Between 1 & 3
			GP	Gravel & gravel sand mixtures, little or no fines, uniform gravels	0-5	-	Fails to comply with above	
			GM	Gravel-silt mixtures & gravel-sand-silt mixtures	12-50	Below 'A' line or PI<4	-	-
			GC	Gravel-clay mixtures & gravel-sand-clay mixtures	12-50	Above 'A' line and PI>7	-	-
	SANDS (more than half of coarse fraction is smaller than 2.36mm)	Coarse 0.6 Medium 0.2 Fine 0.075	SW	Sand & gravel-sand mixtures, little or no fines	0-5	-	>6	Between 1 & 3
			SP	Sand & gravel-sand mixtures, little or no fines	0-5	-	Fails to comply with above	
			SM	Sand-silt mixtures	12-50	Below 'A' line or PI<4	-	-
			SC	Sand-clay mixtures	12-50	Above 'A' line & PI >7	-	-
FINE GRAINED SOILS (more than half of material less than 63mm is smaller than 0.075mm)	SILTS & CLAYS (Liquid Limit ≤50%)		ML	Inorganic silt & very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity				
			CL Cl	Inorganic clay of low to medium plasticity, gravelly clay, sandy clay				
			OL	Organic silt				
	SILTS & CLAYS (Liquid limit >50%)		MH	Inorganic silt				
			CH	Inorganic clay of high plasticity				
			OH	Organic clay of medium to high plasticity, organic silt				
	HIGHLY ORGANIC SOILS		Pt	Peat, highly organic soil				



Secondary & Minor Soil Components			
Term	**% Fines For Coarse Grained Soils**	**% Coarse For Fine Grained Soils**	**Field Assessment**
Trace	≤ 5	≤ 15	Presence just detectable by feel or eye. Properties little or no different to those of primary soil.
With	> 5 ≤ 12	> 15 ≤ 30	Presence easily detected by feel or eye. Properties little or no different to those of primary soil.
Prefix as silty / sandy, as applicable	> 12	> 30	Presence obvious by feel or eye. Properties of soil are altered from those of the primary soil.

Description of Soils: Refer AS1726-2017 Sheet 1 of 2

Soil Moisture Condition		
Term	**Log Symbol**	**Description**
Dry	**D**	Cohesive soils; hard and friable or powdery, well dry of plastic limit. Granular soils; non-cohesive and free-running
Moist	**M**	Soil feels cool, darkened in colour. Cohesive soils can be moulded. Granular soils tend to stick together.
Wet	**W**	Soil feels cool, darkened in colour. Cohesive soils usually weakened and free water forms when handling. Granular soils tend to stick together and free water forms when handling.

Ground Water	
▼	Standing Water Level (dark)
◀	Inflow
▶	Outflow
NOT OBSERVED	Ground water observation not possible. Ground water may or may not be present
NOT ENCOUNTERED	Ground water was not evident during excavation or a short time after completion

Sampling & Testing	
BS	Bulk Sample
DS	Disturbed Sample
U60	Thin walled tube sample. Number indicates nominal sample diameter in mm
ES	Environmental Sample
SPT	Standard Penetrometer Test
PP=145kPa	Pocket Penetrometer Test. Result expressed in kPa
DCP	Dynamic Cone Penetrometer Test

Consistency – Essentially Cohesive Soils				
Term	**Field Assessment**	**Log Symbol**	**Undrained Shear Strength S_u (kPa)**	**Unconfined Compressive Strength q_u (kPa)**
Very soft	Sticks between fingers when squeezed in hand	**Vs**	< 12	< 25
Soft	Easily moulded with fingers	**S**	12-25	25-50
Firm	Can be moulded by strong pressure of fingers	**F**	25-50	50-100
Stiff	Not possible to mould with fingers	**St**	50-100	100-200
Very stiff		**VSt**	100-200	200-400
Hard	Can be indented with difficulty by thumb nail	**H**	> 200	> 400
Friable	Can be easily crumbled or broken into small pieces by hand	**Fr**	-	-

Consistency – Non-Cohesive Soils		
Term	**Log Symbol**	**Density Index (%)**
Very loose	**VL**	0-15
Loose	**L**	15-35
Medium dense	**MD**	35-65
Dense	**D**	65-85
Very dense	**VD**	85-100

Standard Penetration Test (SPT): Refer to AS1289.6.3.1-2004		
Log Symbol	**Penetration Resistance (N)**	**Explanation / Comment**
4, 7, 11	N=18	Full penetration; N is reported on engineering borehole log
4, 18, 30-15mm	N=R	30 blows causes less than 100mm penetration (3rd interval) – test discontinued
30/80mm	N=R	30 blows causes less than 100mm penetration (1st interval) – test discontinued
rw	N<1	Rod weight only causes full penetration
hw	N<1	Hammer and rod weight only causes full penetration
hb	N=R	Hammer bouncing for 5 consecutive blows with no measurable penetration – test discontinued

APPENDIX 2

SITE PLAN & BOREHOLE LOGS

BOREHOLES PLAN

Borehole Log

Location: 8 - 10 Middleton St, Braybrook VIC 3019

Hole No: BH1
Position: as per drawings
Hole Dia: 90 mm
Drilled by: SI | **Date: 03/07/24**
Client: MERKON | **Logged by: SI** | **Final depth 0.7 m**
UTE MOUNTED DRILLING RIG | **Checked by: SI**

Method	Depth (m)	Water table	Graphic log	Sample	Classification symbol	Material Description	Moisture / Weathering	Density / Consistency	Comments and Test results
AUGERING	0.5				CL	**Sandy CLAY**, grey, dark, very soft, moist, low plasticity	Moist	VS	TOP SOIL
					CH	**Silty CLAY** , grey, firm, high plasticity, moist, near plastic limit	w=PL	F	FILL
	1.0				CH	**Silty CLAY,** grey, stiff, high plasticity, moist, near plastic limit	w=PL	St	A
	1.5					Hole terminated at 0.7 m depth , refusal basalt (moderatly weathered)			
	2.0								
	2.5								
	3.0								

pp resu — 150 kPa

DCP results From GL

0-100 mm	
100 to 200 mm	7
200 to 300 mm	5
300 to 400 mm	4
400 to 500 mm	6
500 to 600 mm	7
600 to 700 mm	
700 to 800 mm	

Sample Type	**Moisture Condition**	**Consistency**	**Relative Density**	**Testing**
U Undisturbed SampleD Disturbed Sample SPT *SPT Sample U50 Tube SampleU63 Tube Sample	D – Dry M – Moist W – Wet Seepage Entry Standing Water Level	VS – Very Soft S – Soft F – Firm St – Stiff VSt – Very Stiff H – Hard Fr - Friable	VL – Very Loose L – Loose MD – Moderately Dense D – Dense VD – Very Dense	PP – Pocket Penetrometer VSH – Vane Shear DCP – Dynamic Cone Penetrometer *SPT – Standard Penetrometer Test

Borehole Log

Location: 8 - 10 Middleton St, Braybrook VIC 3019

Hole No: BH2
Position: as per drawings
Hole Dia: 90 mm
Drilled by: SI
Date: 03/07/24
Client: MERKON
Logged by: SI
Final depth 3 m
UTE MOUNTED DRILLING RIG
Checked by: SI

Method	Depth (m)	Water table	Graphic log	Sample	Classification symbol	Material Description	Moisture / Weathering	Density / Consistency	Comments and Test results		
AUGERING	0.0				CL	**Sandy CLAY** , grey, dark, very soft, moist, low	Moist	VS	TOP SOIL	pp result	DCP results From GL
					CH	**Silty CLAY** , grey, firm, moist, near plastic limit, high plasticity	w=PL	F	FILL		
	0.5				CH	**Silty CLAY,** grey, stiff, high plasticity, moist, near plastic limit	w=PL	St	A	150 kPa	0-100 mm 100 to 200 mm 11 200 to 300 mm 10 300 to 400 mm 400 to 500 mm 500 to 600 mm
	1.0										
	1.5				CH	**Silty CLAY,** grey, very stiff, high plasticity, moist, near plastic limit	w=PL	VSt	B	200 kPa	600 to 700 mm 700 to 800 mm
	2.0										
	2.5										
	3.0					Hole terminated at 3 m depth , no refusal					

Sample Type	Moisture Condition	Consistency	Relative Density	Testing
U Undisturbed SampleD Disturbed Sample SPT *SPT Sample U50 Tube SampleU63 Tube Sample	D – Dry M – Moist W – Wet Seepage Entry Standing Water Level	VS – Very Soft S – Soft F – Firm St – Stiff VSt – Very Stiff H – Hard Fr - Friable	VL – Very Loose L – Loose MD – Moderately Dense D – Dense VD – Very Dense	PP – Pocket Penetrometer VSH – Vane Shear DCP – Dynamic Cone Penetrometer *SPT – Standard Penetrometer Test

Borehole Log

Location: 8 - 10 Middleton St, Braybrook VIC 3019	Hole No: BH3	
	Position: as per drawings	
	Hole Dia: 90 mm	
	Drilled by: SI	Date: 03/07/24
	Logged by: SI	Final depth 3 m
	Checked by: SI	

Method	Depth (m)	Water table	Graphic log	Sample	Classification symbol	Material Description	Moisture / Weathering	Density / Consistency	Comments and Test results		
AUGERING	0.5				CL	**Sandy CLAY** , grey, dark, very soft, moist, low	Moist	VS	TOP SOIL	pp resu..	DCP results From GL
	1.0				CH	**Silty CLAY** , grey, firm, moist, near plastic limit, high plasticity	w=PL	F	FILL		
	1.5				CH	**Silty CLAY,** grey, stiff, high plasticity, moist, near plastic limit	w=PL	St	A	150 kPa	0-100 mm 100 to 200 mm 200 to 300 mm 300 to 400 mm 400 to 500 mm 500 to 600 mm
	2.0				CH	**Silty CLAY,** grey, very stiff, high plasticity, moist, near plastic limit	w=PL	VSt	B	200 kPa	600 to 700 mm 700 to 800 mm
	2.5										
	3.0					Hole terminated at 3 m depth , no refusal					

Sample Type	Moisture Condition	Consistency	Relative Density	Testing
U Undisturbed SampleD Disturbed Sample SPT *SPT Sample U50 Tube SampleU63 Tube Sample	D – Dry M – Moist W – Wet Seepage Entry Standing Water Level	VS – Very Soft S – Soft F – Firm St – Stiff VSt – Very Stiff H – Hard Fr - Friable	VL – Very Loose L – Loose MD – Moderately Dense D – Dense VD – Very Dense	PP – Pocket Penetrometer VSH – Vane Shear DCP – Dynamic Cone Penetrometer *SPT – Standard Penetrometer Test

Borehole Log

Location: 8 - 10 Middleton St, Braybrook VIC 3019		Hole No: BH4	
		Position: as per drawings	
		Hole Dia: 90 mm	
		Drilled by: SI	Date: 24/04/24
	Client: MERKON	Logged by: SI	Final depth 0.8 m
	UTE MOUNTED DRILLING RIG	Checked by: SI	

Method	Depth (m)	Water	Graphic log	Sample	Classification symbol	Material Description	Moisture / Weathering	Density / Consistency	Comments and Test results		
AUGERING	0.5				CL	**Sandy CLAY** , grey, dark, very soft, moist, low	Moist	VS	TOP SOIL	pp result	DCP results From GL
					CH	**Silty CLAY** , grey, firm, moist, near plastic limit, high plasticity	w=PL	F	FILL		0-100 mm
	1.0				CH	**Silty CLAY,** grey, stiff, high plasticity, moist, near plastic limit	w=PL	St	A	150 kPa	100 to 200 mm 3
	1.5					Hole terminated at 0.8 m depth , refusal basalt(moderatly weathered)					200 to 300 mm 3 300 to 400 mm 3 400 to 500 mm 4 500 to 600 mm 4 600 to 700 mm 6 700 to 800 mm 6
	2.0										
	2.5										
	3.0										

Sample Type	Moisture Condition	Consistency	Relative Density	Testing
U Undisturbed SampleD Disturbed Sample SPT *SPT Sample U50 Tube SampleU63 Tube Sample	D – Dry M – Moist W – Wet Seepage Entry Standing Water Level	VS – Very Soft S – Soft F – Firm St – Stiff VSt – Very Stiff H – Hard Fr - Friable	VL – Very Loose L – Loose MD – Moderately Dense D – Dense VD – Very Dense	PP – Pocket Penetrometer VSH – Vane Shear DCP – Dynamic Cone Penetrometer *SPT – Standard Penetrometer Test

Borehole Log

Location: 8 - 10 Middleton St, Braybrook VIC 3019

Hole No: BH5
Position: as per drawings
Hole Dia: 90 mm
Drilled by: SI
Date: 16/05/24
Client: MERKON
Logged by: SI
Final depth 2.5 m
UTE MOUNTED DRILLING RIG
Checked by: SI

Method	Depth (m)	Water table	Graphic log	Sample	Classification symbol	Material Description	Moisture / Weathering	Density / Consistency	Comments and Test results		
AUGERING	0.5				CL	**Sandy CLAY** , grey, dark, very soft, moist, low	Moist	VS	TOP SOIL	pp result	DCP results From GL
	1.0				CH	**Silty CLAY** , grey, firm, moist, near plastic limit, high plasticity	w=PL	F	FILL		0-100 mm
	1.5				CH	**Silty CLAY,** grey, stiff, high plasticity, moist, near plastic limit	w=PL	St	A	150 kPa	100 to 200 mm 2 200 to 300 mm 7 300 to 400 mm 4 400 to 500 mm 4 500 to 600 mm 4
	2.0				CH	**Silty CLAY,** grey, very stiff, high plasticity, moist, near plastic limit	w=PL	VSt	B	200 kPa	600 to 700 mm 4 700 to 800 mm 4
	2.5					Hole terminated at 2.5 m depth , refusal basalt(moderatly weathered)					
	3.0										

Sample Type	**Moisture Condition**	**Consistency**	**Relative Density**	**Testing**
U Undisturbed SampleD Disturbed Sample SPT *SPT Sample U50 Tube SampleU63 Tube Sample	D – Dry M – Moist W – Wet Seepage Entry Standing Water Level	VS – Very Soft S – Soft F – Firm St – Stiff VSt – Very Stiff H – Hard Fr - Friable	VL – Very Loose L – Loose MD – Moderately Dense D – Dense VD – Very Dense	PP – Pocket Penetrometer VSH – Vane Shear DCP – Dynamic Cone Penetrometer *SPT – Standard Penetrometer Test

Borehole Log

Location: 8 - 10 Middleton St, Braybrook VIC 3019

Hole No: BH6
Position: as per drawings
Hole Dia: 90 mm
Drilled by: SI | **Date: 03/07/24**
Client: MERKON | **Logged by: SI** | **Final depth 2.5 m**
UTE MOUNTED DRILLING RIG | **Checked by: SI**

Method	Depth (m)	Water table	Graphic log	Sample	Classification symbol	Material Description	Moisture / Weathering	Density / Consistency		Comments and Test results	
AUGERING	0.5				CL	**Sandy CLAY** , grey, dark, very soft, moist, low	Moist	VS	TOP SOIL	pp resu..	DCP results From GL
					CH	**Silty CLAY** , grey, firm, moist, near plastic limit, high plasticity	w=PL	F	FILL		0-100 mm
	1.0				CH	**Silty CLAY,** grey, stiff, high plasticity, moist, near plastic limit	w=PL	St	A	150 kPa	100 to 200 mm 200 to 300 mm 300 to 400 mm 400 to 500 mm
	1.5				CH	**Silty CLAY,** grey, very stiff, high plasticity, moist, near plastic limit	w=PL	VSt	B	200 kPa	500 to 600 mm 600 to 700 mm 700 to 800 mm
	2.0										
	2.5					Hole terminated at 2.5 m depth , refusal basalt(moderatly weathered)					
	3.0										

Sample Type	**Moisture Condition**	**Consistency**	**Relative Density**	**Testing**
U Undisturbed SampleD Disturbed Sample SPT *SPT Sample U50 Tube SampleU63 Tube Sample	D – Dry M – Moist W – Wet Seepage Entry Standing Water Level	VS – Very Soft S – Soft F – Firm St – Stiff VSt – Very Stiff H – Hard Fr - Friable	VL – Very Loose L – Loose MD – Moderately Dense D – Dense VD – Very Dense	PP – Pocket Penetrometer VSH – Vane Shear DCP – Dynamic Cone Penetrometer *SPT – Standard Penetrometer Test

APPENDIX 3: DESIGN PARAMETERS FOR RETAINING WALL

Material	Design Parameters						Poisson's Ratio	Drained Young's Modulus E′ (MPa)	K_0	K_p	K_a
	Drained		Undrained		Moist bulk weight γ (kN/m³)	Saturated bulk weight γ_{sat} (kN/m³)			$(1 - \sin\phi')$	$(1 + \sin\phi')/(1 - \sin\phi')$	$(1 - \sin\phi')/(1 + \sin\phi')$
	c′ (kPa)	ϕ′ (°)	C_u (kPa)	ϕ′ (°)							
FILL (firm)	0	28	0	28	17	20	0.1-0.2	1-5	0.53	2.77	0.36
silty CLAY (stiff)	2	25	100	0	19	19	0.2-0.4	8-15	0.58	2.46	0.41
Distinctly weathered basaltic ROCK (moderately weathered)	0 (joint strength)	35 (joint strength)	0	35	26	26	0.27-0.32	17-103	0.43	3.65	0.27

SITE IMAGES

	
Proposed site, front of the no 8 looking from approx. west	Proposed site, rear of the no 8 looking from approx. east
	
Proposed site, rear of the no 8 looking from approx. southeast	Proposed site, front of the no 10 looking from approx. west
	
Proposed site, rear of the no 10 looking from approx. east	Proposed site, rear of the no 10 looking from approx. southwest

ENGINEERING
FOLK

CITY OF MARIBYRNONG
ADVERTISED PLAN

PROJECT NAME
8-10 MIDDLETON ST,
BRAYBROOK

PROJECT NUMBER
22236

REVISION
A

DATE
22.07.24

PROJECT STATUS
PRELIMINARY

CLIENT/ARCHITECT

McGregor
Westlake
Architecture

ABN 74 090 136 066

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GENERAL NOTES

1. ALL LEVELS ARE IN METRES TO AUSTRALIAN HEIGHT DATUM (A.H.D.).
2. NATURAL SURFACE LEVELS ARE FROM THE DIGITAL TERRAIN MODEL SUPPLIED BY PROJECT SURVEYOR:
3. ALL DIMENSIONS SHOWN ARE IN METRES UNLESS NOTED OTHERWISE.
4. ALL WORKS TO BE COMPLETED IN ACCORDANCE WITH THE COUNCIL AND VICROADS REQUIREMENTS.
5. CONTRACTORS MUST ASCERTAIN THE PRECISE LOCATION OF ALL EXISTING SERVICES WHICH COULD BE AFFECTED BY THE WORKS AND CONTACT ALL RELEVANT AUTHORITIES BEFORE COMMENCING ANY EXCAVATION. EXISTING SERVICES MAY EXIST THAT ARE NOT SHOWN AND MAY EXIST IN LOCATIONS DIFFERING FROM LOCATIONS SHOWN.
6. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL OTHER PROJECT DRAWINGS, SCHEDULE OF QUANTITIES, JOB SPECIFICATIONS AND ANY OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE WORK. ALL DISCREPANCIES SHALL BE REFERRED TO THE SUPERINTENDENT FOR DISCUSSION BEFORE PROCEEDING WITH THE WORK.
7. DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING EXCAVATIONS IN A STABLE CONDITION.
8. ALL CONSTRUCTION UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE CURRENT WORKPLACE HEALTH AND SAFETY ACT.
9. ALL STANDARDS (LOCAL AUTHORITY STANDARDS, AUSTRALIAN STANDARDS ETC.) REFERRED TO IN THESE PLANS SHALL BE THE LATEST EDITION AT THE TIME OF TENDERING.
10. LEVELS SHOWN ARE TO BE CONFIRMED ON SITE PRIOR TO COMMENCING WORK AND CONFLICTS OR DISCREPANCIES SHALL BE ADVISED TO THE SUPERINTENDENT IN WRITING IMMEDIATELY.
11. ALL BENCH MARKS TO BE LEVEL CHECKED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF CONSTRUCTION.
12. SURVEY SETOUT INFORMATION WILL BE PROVIDED IN THE FORM OF AUTOCAD DRAWINGS ONLY, UNLESS SPECIFICALLY REQUESTED BY THE CONTRACTOR. SETOUT INFORMATION SHALL NOT BE OBTAINED BY SCALING FROM THESE DRAWINGS.
13. THE CONTRACTOR SHOULD REFER TO LOCAL AUTHORITY AND AUSTRALIAN STANDARDS.
14. ALL DIMENSIONS RELEVANT TO SETTING OUT SHALL BE CONFIRMED AND VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION IS COMMENCED. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE SUPERINTENDENT.
15. ALL TREES AND SHRUBS ARE TO BE RETAINED UNLESS OTHERWISE SHOWN OR DIRECTED BY THE SUPERINTENDENT/OR THEIR REPRESENTATIVE.
16. AT THE COMPLETION OF ALL WORKS, ALL RUBBISH, DEBRIS AND SURPLUS SPOIL SHALL BE REMOVED OFF SITE AND THE SITE SHALL BE CLEARED TO THE SATISFACTION OF THE SUPERINTENDENT/OR THEIR REPRESENTATIVE.
17. ALL REDUNDANT ASSETS AND THEIR ASSOCIATED INFRASTRUCTURE (I.E PIPE WORK/MANHOLE ETC) ARE TO BE REMOVED AND DISPOSED OF. OFF SITE AT THE CONTRACTOR EXPENSE.
18. CONTRACTOR IS TO ALLOW FOR BACK FILLING ASSOCIATED TRENCHES IN ACCORDANCE WITH THE CIVIL SPECIFICATION / RELEVANT DRAWINGS.

ATTENTION TO CONTRACTOR

1. THE CONTRACTOR MUST ARRANGE THE REQUISITE INSPECTIONS OF THE WORKS WITH THE SUPERINTENDENT/OR THEIR REPRESENTATIVE AS PER THE SPECIFICATIONS.
2. PRIOR TO COMMENCEMENT OF WORKS ON SITE, THE CONTRACTOR MUST ENSURE THAT ALL MATTERS RELATING TO THE OCCUPATIONAL HEALTH AND SAFETY ACT 2004, HAVE BEEN AND WILL BE COMPLIED WITH.
3. IN ACCORDANCE WITH CLAUSE 15 OF AS4000-1997, THE CONTRACTOR MUST ENSURE THE SAFETY OF THE CONTRACTOR¶S EMPLOYEES AND ALL OTHER PEOPLE WHO ARE ON OR ADJACENT TO THE SITE. THE CONTRACTOR MUST COMPLY WITH THE VICTORIAN OCCUPATIONAL HEALTH & SAFETY ACT.
4. THE CONTRACTOR MUST ENSURE THAT ALL PEOPLE EMPLOYED ON THE SITE WEAR APPROVED SAFETY APPAREL. THIS INCLUDES SAFETY HELMETS, VESTS, SAFETY BOOTS, EYE AND EAR PROTECTION WHERE APPROPRIATE.
5. THE CONTRACTOR SHALL REINSTATE ANY EFFECTED FOOTPATH, VEHICLE CROSSINGS AND NATURE STRIP TO THE REQUIREMENTS OF THE RELEVANT AUTHORITY.
6. THE CONTRACTOR IS DIRECTLY RESPONSIBLE FOR THE SETOUT. SHOULDACTUAL SITE CONDITIONS CONFLICT IN ANY WAY WITH THAT DOCUMENTED, THE CONTRACTOR MUST CONTACT THE OFFICE OF THE CONSULTANT FOR CLARIFICATION BEFORE PROCEEDING.
7. CONTRACTOR TO INTRODUCE MANUAL HANDLING PROCEDURES PRIOR TO CONSTRUCTION AND MAINTENANCE WORKS.
8. CONTRACTOR TO INTRODUCE SAFE MAINTENANCE PROCEDURES PRIOR TO UNDERTAKING MAINTENANCE WORKS ON THESE ASSETS.

EXISTING SERVICES NOTES

1. THE CONSULTING ENGINEERS ACCEPT NO RESPONSIBILITIES IN RELATION TO EXTENT AND LOCATION OF EXISTING SERVICES IN THE VICINITY OF THE SITE.
2. LOCATIONS AND ALIGNMENTS OF EXISTING SERVICES ARE INDICATIVE ONLY. CONTRACTOR TO VERIFY EXISTING SERVICES ON SITE PRIOR TO COMMENCEMENT OF WORKS BASED ON DIAL BEFORE YOU DIG INFORMATION AND OTHER MEANS AS REQUIRED.
3. IT IS THE CONTRACTORS RESPONSIBILITY TO CONTACT THE RELEVANT AUTHORITIES TO ARRANGE AND COORDINATE FOR ANY ADDITIONAL SERVICE RELOCATIONS OR ADJUSTMENTS NOT SHOWN ON THE DRAWINGS.THE AUTHORITY CHARGES RELATING TO THESE SHALL BE AT THE EXPENSE OF THE PRINCIPAL.
4. THE CONTRACTOR SHALL LIAISE WITH ALL RELEVANT SERVICE AUTHORITIES WITH RESPECT TO ANY SERVICE ALTERATIONS OR FOR WORKS IN VICINITY OR CLOSE PROXIMITY TO EXISTING SERVICES. THE CONTRACTOR SHALL BE REQUIRED TO SEEK CLEARANCE, PROGRAM AND COORDINATE THESE WORKS WITH THE RELEVANT SERVICE AUTHORITY AND THEIR CONTRACTORS. THE CONTRACTOR MUST ALSO ARRANGE FOR RELOCATION AND / OR PROTECTION OF EXISTING SERVICES AS REQUIRED TO SUIT SURROUNDING NEW WORK, CONSTRUCTION LOADINGS AND TO SUIT FINAL FINISHED SURFACE LEVELS AND GRADES.
5. ANY INFRASTRUCTURE DAMAGE DURING THE DEFECTS LIABILITY PERIOD IS THE RESPONSIBILITY OF THE CONTRACTOR AND IS TO BE REINSTATED TO THE SATISFACTION OF THE SUPERINTENDENT OR THEIR REPRESENTATIVE.
6. ALL SERVICE CONDUITS TRENCHES UNDER ROAD PAVEMENTS ARE TO BE BACKFILLED AS PER THE REQUIREMENTS OF RELEVANT AUTHORITY STANDARD ROAD OPENING CONDITIONS.
7. ALL TABLE DRAINS AND VERGES ARE TO BE REINSTATED UPON COMPLETION OF WORKS TO THE SATISFACTION OF THE SUPERINTENDENT/OR THEIR REPRESENTATIVE.
8. ALL TRENCHING WORKS TO BE IN ACCORDANCE WITH THE RELEVANT ACT AND REGULATIONS.
9. ALL EXISTING ASSETS AFFECTED BY THE WORKS; EG SIGNS, VEHICLE CROSSINGS, FOOTPATHS, KERB AND LINEMARKING SHALL BE REINSTATED BY THE CONTRACTOR PRIOR TO THE COMPLETION OF THE WORKS TO THE SATISFACTION OF THE SUPERINTENDENT/OR THEIR REPRESENTATIVE.

LOCATIONS AND ALIGNMENTS OF EXISTING SERVICES ARE INDICATIVE ONLY. CONTRACTOR TO VERIFY EXISTING SERVICES ON SITE PRIOR TO COMMENCEMENT OF WORKS BASED ON DIAL BEFORE YOU DIG INFORMATION AND OTHER MEANS AS REQUIRED.

EARTHWORKS NOTES

1. THE STANDARD FOR THE PROVISION OF EARTHWORKS ARE TO BE IN ACCORDANCE WITH AUSTRALIAN STANDARD AS 3798 "GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS", MODIFIED TO SUIT ALL LOCAL CONDITIONS, PRACTICES AND LOCAL AUTHORITY STANDARDS AS REQUIRED AND AS APPROVED IN WRITING BY THE SUPERINTENDENT.
2. SUPERVISION, INSPECTION AND TESTING IS TO BE CARRIED OUT IN ACCORDANCE WITH SECTION 8 AND APPENDIX B OF AS 3798. FOR ALL STRUCTURAL FILL THE SCOPE OF SERVICES TO BE PROVIDED BY THE GEOTECHNICAL TESTING AUTHORITY IS TO BE IN ACCORDANCE WITH LEVEL 1 OR LEVEL 2 AS DETAILED IN APPENDIX B AND IN ACCORDANCE WITH LOCAL AUTHORITY REQUIREMENTS. LEVEL 3 SUPERVISION IS NOT PERMITTED FOR STRUCTURAL FILL, BUT IS ACCEPTABLE FOR NONSTRUCTURAL FILL.
3. CLEARED VEGETATION SHALL BE MULCHED AND DISPOSED OF OFFSITE. BURNING OFF IS NOT CONSIDERED AN ACCEPTABLE MEANS OF DISPOSAL AND WILL NOT BE APPROVED.
4. EARTHWORKS LEVELS SHOWN ON DRAWINGS ARE TO FINISHED SURFACE LEVEL AND ARE TO INCLUDE TOPSOIL WHERE APPROPRIATE.
5. TOPSOIL SHALL BE STRIPPED ACROSS THE ENTIRE LIMIT OF THE EARTHWORKS CUT AND FILL AREAS AS DIRECTED BY GEOTECHNICAL CONSULTANT AND SHALL BE STOCKPILED IN A LOCATION APPROVED BY THE SUPERINTENDENT. THE EXISTING STRATA IS TO BE TREATED IN ACCORDANCE WITH THE SPECIFICATION PRIOR TO PLACING ANY FILL.

GEOTECHNICAL NOTES

1. THE CONTRACTOR IS TO REVIEW THE GEOTECHNICAL REPORT AND CIVIL SPECIFICATION FOR SUBGRADE PREPARATION, SOIL PARAMETERS AND CONSTRUCTION METHODOLOGY TO SUIT THE CONDITIONS ONSITE. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENT TO STRIP THE EXISTING NATURAL TOPSOIL FILLING AND FOUND WORKS ON NATURAL UNDISTURBED STIFF CLAY OR THE UNDERLYING BASALT ROCK.
2. CONTRACTOR TO REFER TO THE FOLLOWING GEOTECHNICAL INVESTIGATION REPORT:

PREPARED BY	MELBOURNE GEOTECHNICS
REPORT NUMBER	211282
ISSUE DATE	16/11/2021

3. A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER (AT CONTRACTOR EXPENSE) IS TO BE ENGAGED BY THE CONTRACTOR TO WITNESS AND APPROVE THE SUBGRADE PREPARATION WORKS AND FINAL PROOF ROLLING AS ADEQUATE FOR CONSTRUCTION.

6. TOPSOIL AND SUBSOIL SHOULD BE STOCKPILED SEPARATELY.
7. THE ROAD PAVEMENT DEPTHS ALLOWED IN EARTHWORKS CALCULATIONS ARE BASED ON THE MINIMUM PAVEMENT THICKNESS FOR THE LOCAL AUTHORITY. THESE DEPTHS ARE PROVISIONAL ONLY AND ARE SUBJECT TO SOIL TESTING OF SUBGRADE MATERIALS AND LOCAL AUTHORITY APPROVAL.
8. ALL FOOTPATHS, BATTERS, ALLOTMENT FILL AREAS AND DISTURBED AREAS SHALL BE TOPSOILED FROM ONSITE STOCKPILES. THE TOPSOIL SHALL BE SCREENED PRIOR TO PLACING.
9. ALL EARTHWORKS TESTING IS TO BE IN ACCORDANCE WITH LOCAL AUTHORITY AND AUSTRALIAN STANDARDS AS1289 AND AS1726 AS APPLICABLE.
10. EARTHWORK SPOIL IN EXCESS OF SITE FILL REQUIREMENTS SHALL BE DISPOSED OFF SITE. CONTRACTOR TO ALLOW FOR ALL ENVIRONMENTAL TESTING ASSOCIATED WITH REMOVAL OF SPOIL FROM SITE.
11. TOPSOIL TO BE STOCKPILED FOR FUTURE LANDSCAPING USE. THE LOCATION OF TOPSOIL STOCKPILE SHALL BE AS APPROVED OR DIRECTED BY THE SUPERINTENDENT. SUBJECT TO THE SUPERINTENDENTS APPROVAL TOPSOIL IN EXCESS TO SITE REQUIREMENTS SHALL BE DISPOSED OFF SITE.
12. PRIOR TO EARTH FILLING WORKS ALL VEGETATION AND TOPSOIL SHALL BE STRIPPED. THE EXPOSED EMBANKMENT FOUNDATION SHALL BE MOISTURE CONDITIONED AND COMPACTED TO A MINIMUM OF 98% STANDARD COMPACTION PRIOR TO FILLING OR PAVEMENT CONSTRUCTION.
13. ANY SOFT OR WEAK AREAS IDENTIFIED DURING THE COMPACTION PROCESS THAT DO NOT RESPOND TO FURTHER COMPACTION, SHOULD BE REMOVED AND REPLACED WITH SELECT FILL IN LAYERS NOT EXCEEDING 200mm LOOSE THICKNESS AND EACH LAYER COMPACTED TO ACHIEVE A DRY DENSITY RATIO OF 98%.
14. DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTING AND MAINTAINING A TEMPORARY SITE DRAINAGE SYSTEM AND TO MAINTAIN THE SITE IN A DRY AND STABLE CONDITION. DETAILS OF THE DRAINAGE SYSTEM SHALL BE SUBMITTED FOR THE APPROVAL OF THE SUPERINTENDENT.
15. ALL COMPACTION TO BE CARRIED OUT IN ACCORDANCE WITH COMPACTION PROCEDURES AS DEFINED IN AS-1289 5.2.1 TEST PROCEDURE. CERTIFICATION IS TO BE AN INDEPENDENT GEOTECHNICAL ENGINEER (AT CONTRACTORS EXPENSE).
16. BENEATH PAVEMENTS A NON-EXPANSIVE APPROVED SELECT FILL SHALL BE PLACED WHERE REQUIRED IN UNIFORM LAYERS NOT TO EXCEEDING 200mm LOOSE THICKNESS AND COMPACTED TO ACHIEVE A MINIMUM DRY DENSITY RATIO OF 98%. REFER TO RELEVANT SECTION IN CIVIL SPECIFICATION.

EROSION AND SEDIMENT CONTROL NOTES

1. PRIOR TO ANY WORKS COMMENCING ON SITE THE CONTRACTOR SHALL ESTABLISH, MANAGE, MAINTAIN AND MONITOR ALL PROPOSED EROSION & SEDIMENT CONTROL MEASURES (INCLUDING BUT NOT LIMITED TO SEDIMENT FENCES, SEDIMENT BASINS, DIVERSION DRAINS, ETC.) AND MODIFY OR INSTALL ADDITIONAL OR ALTERNATIVE MEASURES DURING THE CONSTRUCTION AND MAINTENANCE PERIODS AS REQUIRED TO COMPLY WITH:
   - THE APPROVED DRAWINGS
   - LOCAL AUTHORITY STANDARDS, GUIDELINES AND REQUIREMENTS
   - INTERNATIONAL EROSION CONTROL ASSOCIATION (IECA) STANDARDS AND GUIDELINES
   - ALL STATUTORY REQUIREMENTS
   - ANY ADDITIONAL DIRECTIONS FROM THE SUPERINTENDENT
2. SOIL EXPOSURE SHOULD BE LIMITED, IN ORDER OF PRIORITY, BY:
   - a) MAINTAINING EXISTING GRASSED AREAS CLEAR OF EARTHWORKS,
   - b) MINIMISING THE EXTENT OF DISTURBANCE WORKS TO EXISTING STABILISED SURFACES,
   - c) STAGING WORKS TO MINIMISE THE TOTAL AREA THAT IS EXPOSED AT ANY ON TIME, NOTING THE MAXIMUM ALLOWABLE AREA THAT CAN BE DISTURBED AT ANY ONE TIME IN ACCORDANCE WITH THE LOCAL AUTHORITY REQUIREMENTS,
   - d) EFFECTIVELY STABILISING OPEN AREAS PRIOR TO RAINFALL IF WORKS ARE DELAYED OR NOT INTENDED TO OCCUR IMMEDIATELY,
   - e) EFFECTIVELY ESTABLISHING GROUND COVER SUFFICIENT TO RESTRAIN EROSION (MINIMUM 80% COVERAGE OF ALL SOIL) MUST BE PROVIDED WITHIN 30 CALENDAR DAYS FROM COMPLETION OF ANY WORKS WHERE THE SOIL IS AT RISK OF ACCELERATED EROSION. DURING THE INTERIM PERIOD BETWEEN COMPLETION OF WORKS AND THE ESTABLISHMENT OF AT LEAST 80% GROUND COVER, E.S.C. MEASURES WILL BE REQUIRED (EG. SEDIMENT FENCES).
3. AT ALL TIMES DURING CONSTRUCTION ADJACENT PROPERTIES, WATER COURSES, AND DRAINAGE SYSTEMS ARE TO BE PROTECTED AGAINST SEDIMENT RUN-OFF BY THE APPLICATION OF SEDIMENT CONTROL MEASURES. ANY DAMAGE INCURRED TO THESE AREAS AS A RESULT OF THE CONTRACTORS WORKS SHALL BE RECTIFIED BY THE CONTRACTOR AT NO COST TO THE PRINCIPAL.
4. SUITABLE ACCESS SHALL BE PROVIDED AND MAINTAINED AT ALL TIMES TO ALLOW MAINTENANCE OF ALL SEDIMENT CONTROL DEVICES. CLEARING SHALL ONLY OCCUR IN AREAS WHERE THERE IS NO OTHER ALTERNATIVE TO GAIN ACCESS TO THE LOCATION OF THE APPROVED SEDIMENT CONTROL DEVICES. (CONTRACTOR SHOULD NOTE THE LOCATION OF EXISTING TREES TO BE RETAINED & VEGETATION PROTECTION AREAS).
5. ALL PERMANENT AND TEMPORARY SEDIMENT CONTROL DEVICES ARE TO BE MAINTAINED FREE OF SEDIMENT. SUCH DEVICES ARE TO BE CHECKED BY THE CONTRACTOR AT LEAST DAILY (WHEN WORK IS OCCURRING ONSITE) OR WEEKLY (WHEN WORK IS NOT OCCURRING ONSITE); WITHIN 24 HOURS OF EXPECTED RAIN AND WITHIN 18 HOURS OF A RAINFALL EVENT (I.E. AN EVENT OF SUFFICIENT INTENSITY AND DURATION TO MOBILISE SEDIMENT ONSITE). MAINTENANCE FOR E.S.C. MEASURES IS TO BE COMPLETED BY THE END OF THE DAY WHEN THEIR CAPACITY FALLS BELOW 75%.
6. THE CONTRACTOR SHALL ENSURE THAT ALL REASONABLE MEASURES ARE TAKEN TO PREVENT DUST POLLUTION IN ACCORDANCE WITH LOCAL AUTHORITY STANDARDS.
7. STOCKPILES OF TOPSOIL, SAND, AGGREGATE, SPOIL OR OTHER MATERIAL CAPABLE OF BEING MOVED BY THE ACTION OF WIND OR RUNNING WATER SHALL BE STORED CLEAR OF DRAINAGE PATHS, WITH APPROPRIATE MEASURES TO PREVENT ENTRY INTO EITHER THE ROAD AND/OR DRAINAGE SYSTEMS, INCLUDING, BUT NOT LIMITED TO CONSTRUCTION OF A SEDIMENT FENCE AROUND THE BOTTOM OF THE STOCKPILE.

STORMWATER NOTES

1. MANHOLES ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE LOCAL AUTHORITY STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE SHOWN OR DIRECTED ON SITE.
2. THE CONTRACTOR IS TO EXERCISE DUE CARE AND ATTENTION DURING PIPE INSTALLATION ENSURING PIPES ARE NOT DAMAGED DURING CONSTRUCTION AND CONSTRUCTION TRAFFIC DOES NOT EXCEED THE LOAD SPECIFIED FOR THE PIPE PROPOSED. IF THE PROPOSED PIPE CLASS WILL NOT WITHSTAND CONSTRUCTION LOAD, CONTRACTOR IS TO UPGRADE PIPE CLASSES TO SUIT ATNO COST TO THE PRINCIPAL.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE RELEVANT AUTHORITIES FOR ANY ADDITIONAL INSTALLATIONS NOT SHOWN ON THE DRAWINGS AND TO ENSURE THAT THE EXISTING SERVICES ARE NOT DAMAGED OR DISTURBED IN ANY WAY DURING CONSTRUCTION.
4. ALL CONNECTIONS TO EXISTING DRAINAGE PITS SHALL BE MADE IN A TRADESMAN-LIKE MANNER AND THE INTERNAL WALL OF THE PIT AT THE POINT OF ENTRY SHALL BE CEMENT RENDERED TO ENSURE A SMOOTH FINISH.
5. ALL REINFORCED CONCRETE PIPES ARE TO BE INSTALLED USING TYPE 'HS2' SUPPORT AS DEFINED IN AS 3725 - LOADS ON BURIED CONCRETE PIPES. IF ALTERNATIVE BEDDING METHODS ARE TO BE USED THE PIPE CLASS MUST BE REVIEWED.
6. CONTRACTOR IS TO ENSURE ALL STORMWATER DRAINAGE STRUCTURES ARE ADEQUATELY REINFORCED AND SHALL PROVIDE DESIGN CERTIFICATION FOR ALL REINFORCED CONCRETE LIDS.
7. ALL STORMWATER MATERIAL AND WORKMANSHIP IS TO BE SUPPLIED AND UNDERTAKEN IN ACCORDANCE WITH THE LOCAL AUTHORITY AND AUSTRALIAN STANDARD AS3500.3 AS APPLICABLE.
8. ALL STORMWATER DRAINS ARE TO BE CLASS 2 RC PIPES UNLESS NOTED OTHERWISE. ALL PIPES ARE TO BE RUBBER RING JOINTED. ALTERNATIVE PIPE MATERIALS MAY BE USED SUBJECT TO APPROVAL BY THE SUPERINTENDENT.
9. ALL STORMWATER DRAINAGE PIPES 225Ø OR LESS TO BE SEWER QUALITY UPVC WITH SOLVENT WELDED JOINTS, UNLESS NOTED OTHERWISE.
10. SUBSOIL DRAINS ARE TO BE INSTALLED BEHIND ALL NEW KERBS IN ACCORDANCE WITH THE LOCAL AUTHORITY GUIDELINES U.N.O. PIPE TO BE 90Ø PERFORATED CORRUGATED CLASS 1000. FLUSHING POINT RISER AND CAP TO BE PLACED IN ACCORDANCE WITH LOCAL AUTHORITY STANDARDS OR AT MAXIMUM 60m INTERVALS.
11. ALL DRAINS BEHIND KERB AND CHANNELS SHALL BE BACKFILLED TO MATCH PAVEMENT SUBGRADE LEVEL WITH 20mm CLASS 2 FCR. COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY VALUE.
12. ALL GARDEN BEDS ARE TO BE PROVIDED WITH AG PIPES AND CONNECTED TO THE NEAREST STORMWATER DRAINAGE PIT U.N.O.
13. PIT COVER LEVELS TO MATCH SURROUNDING FINISHED LEVELS. PIT SETOUT COORDINATES ARE TO THE CENTRE OF THE PIT.
14. PIT COVERS SHALL BE GALVANISED CAST IRON, PRECAST CONCRETE COVERS OR GRATINGS AND SHALL BE CONSTRUCTED AND FIXED TO PITS IN ACCORDANCE WITH MANUFACTURERS' SPECIFICATIONS. CONCRETE INFILL FOR CAST IRON COVERS SHALL BE N32 WITH MAX AGGREGATE SIZE.
15. GRATED COVERS TO COMPLY WITH AS1428.1-2009. CIRCULAR AND SLOTTED OPENINGS SHALL NOT BE GREATER 13mm DIAMETER AND WIDTH RESPECTIVELY.
16. ALL GRATED COVERS IN PEDESTRIAN WALKWAYS SHALL COMPLY WITH AS4586 AND HAVE GRATES SET PERPENDICULAR TO EXPECTED PATH OF TRAVEL.
17. STORMWATER PIT COVERS TO COMPLY WITH AS AS3996 FOR:

	LOAD CLASS - TYPICAL USE
JUNCTION PITS	B - LIGHT DUTY PEDESTRIAN/LANDSCAPE AREAS ONLY
	D - HEAVY DUTY ROADS OPEN TO COMMERCIAL VEHICLES
GRATED PITS	B - LIGHT DUTYPEDESTRIAN/LANDSCAPE AREAS ONLY
	D - HEAVY DUTY ROADS OPEN TO COMMERCIAL VEHICLES

18. REFER TO TABLE BELOW FOR MINIMUM PIT DIMENSIONS.

DEPTH TO INVERT	WIDTH	LENGTH
LESS THAN 600mm	450mm	450mm
FROM 600mm TO 900mm	600mm	600mm
FROM 900mm TO 1200mm	600mm	900mm
MORE THAN 1200mm	900mm	900mm

19. PROVIDE 20mm DIAMETER GALVANISED M.S. STEP IRONS IN ALL PITS GREATER THAN 1000mm DEEP SET INTO WALLS AT 300mm CTS. PIT TO HAVE 150mm THICK RC WALL AND BASE SL92 CENTRAL AS A MINIMUM. CORBEL TOP WALLS TO SUIT COVER FRAME. PRECAST PITS MAY BE USED SUBJECT TO SUPERINTENDENT APPROVAL. CONCRETE SHALL BE NORMAL CLASS N32 STANDARD STRENGTH GRADE OR HIGHER COMPLYING WITH AS 1379. EXPOSURE CLASSIFICATION UP TO AND INCLUDING B1.
20. ALL DOWNPIPE CONNECTIONS TO BE MINIMUM 150Ø OR EQUAL TO DOWNPIPE DIAMETER, UNLESS OTHERWISE NOTED. ALL PIPES TO BE SEWER QUALITY UPVC, WITH SOLVENT WELDED JOINTS AT 1 IN 100 MIN GRADE.
21. EXISTING STORMWATER PIPE TO BE ABANDONED IS TO BE CUT AND SEALED WITH CONCRETE AT BOTH ENDS.
22. ALL TRENCHING WORKS TO BE IN ACCORDANCE WITH THE RELEVANT ACT AND REGULATIONS. DRAINAGE TRENCHES AND EXCAVATIONS BENEATH PAVEMENTS ARE TO BE BACKFILLED WITH CLASS 2 CRUSHED ROCK (20mm SIZE) AND COMPACTED TO 98 % MODIFIED DRY DENSITY OR AS SPECIFIED.
23. BACKFILL UNDER EXISTING ROADS SHALL BE AS PER REQUIREMENTS OF THE RELEVANT ROAD AUTHORITY'S STANDARD ROAD OPENING CONDITIONS.
24. ROAD RESERVE BACKFILL TO BE CLASS 2 WET-MIX CRUSHED ROCK PLACED AND COMPACTED IN SUCCESSIVE LIFTS OF NOT GREATER THAN 100mm LIFTS.
25. THE CONTRACTOR SHALL OBTAIN A ROAD OPENING PERMIT FOR ANY WORKS WITHIN THE ROAD RESERVE AND COMPLY WITH ALL REQUIREMENTS OF THE ROAD OWNER.

DESIGN FINISHED SURFACE LEVELS OF STRUCTURES ARE FOR THE CONTRACTOR'S GUIDANCE ONLY. ACTUAL FINISHED LEVELS SHALL BE SET OUT AS DIRECTED ON-SITE IN KEEPING WITH THE REQUIREMENTS AND SPECIFICATIONS OF THE LOCAL AUTHORITY AND ACTUAL FINISHED GROUND LEVELS.

ROADWORKS & PAVEMENT NOTES

1. SETOUT INFORMATION INCLUDING KERB DETAILING AND RADII FOR THE WORKS WILL BE PROVIDED IN DIGITAL (DWG) FORMAT. THE CONTRACTOR IS TO ADVISE IF A SETOUT TABLE INCLUSIVE OF EASTING AND NORTHINGS IS REQUIRED TO COMPLETE SETOUT.
2. UNLESS STATED OTHERWISE, SET OUT DIMENSIONS ARE TO THE NOMINAL FACE OF KERB. IF THERE IS NO KERB, THEN TO THE EDGE OF SEAL, WHICHEVER IS APPLICABLE.
3. ALL LINEMARKING AND SIGNAGE SHALL CONFORM WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND LOCAL AUTHORITY REQUIREMENTS.
4. ALL SIGNS TO BE CLASS 1 HIGH INTENSITY TYPE AND TO COMPLY WITH THE REQUIREMENTS OF A.S.1743 - 2001.
5. ALL LINE MARKING TO BE SOLVENT BASED PAINT OF LONG LIFE QUALITY IN ACCORDANCE WITH VIC ROADS REQUIREMENTS AND AS1742.
6. ROAD PAVEMENT MARKINGS TO BE MARKED OUT WITH 100mm WHITE LINES UNLESS DENOTED OTHERWISE. CAR PARKING BAYS MARKINGS ARE TO BE 80mm WIDE LINES.
7. AT LIMITS OF CONSTRUCTION/STAGE BOUNDARIES, INTERFACES TO BE MADE FREE DRAINING AND GRADE AT MAX 1:4, MIN 1:100. UNLESS SHOWN OTHERWISE.
8. ANY DAMAGE TO EXISTING KERB AND CHANNEL OR FOOTPATH IS TO BE REPAIRED, INCLUDING REMOVAL OF CONCRETE SLURRY FROM FOOTPATHS, ROADS, KERB AND CHANNEL, STORMWATER PITS AND DRAIN LINES.
9. ROAD DIMENSIONS ARE TO THE NOMINAL KERB LINE OR IF NO KERB, THEN TO THE EDGE OF SEAL, WHICHEVER IS APPLICABLE. SETOUT COORDINATES FOR KERB LINES ARE TO THE LIP OF KERB U.N.O.
10. ALL ACTIVITIES WITHIN ROAD RESERVE SHALL BE ARRANGED TO MINIMISE THE EFFECT ON TRAFFIC AND PEDESTRIAN ADJACENT TO THE WORKS. BARRIERS AND TRAFFIC CONTROL SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH VIC ROADS REQUIREMENTS, WORKPLACE HEALTH AND SAFETY LEGISLATION AND LOCAL AUTHORITY REQUIREMENTS. THE CONTRACTOR IS TO ORGANISE NECESSARY APPROVALS AND PLANS IN CONJUNCTION WITH ANY WORKS WITHIN OR ADJACENT TO ROAD RESERVES.
11. EXISTING SERVICES INCLUDING MANHOLE COVERS SHALL BE RAISED OR LOWERED TO SUIT THE NEW FINISHED SURFACE LEVEL.
12. WHERE NEW ASPHALT, CONCRETE KERB & CHANNEL, PATHS AND DRIVEWAYS MATCH INTO EXISTING, THE EXISTING SURFACE IS TO BE SAW CUT AND MATCHED NEATLY.
13. PAVEMENT DEPTH SPECIFIED IS A MINIMUM DEPTH AND MAY BE VARIED BY THE SUPERINTENDENT/OR THEIR REPRESENTATIVE. SOFT SPOTS SHALL BE EXCAVATED TO A PROOF ROLLED BASE AND BACKFILLED WITH APPROVED MATERIAL COMPACTED IN 150mm LAYERS TO ACHIEVE TO A DENSITY NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY VALUE DETERMINED BY THE STANDARD COMPACTION TEST IN ACCORDANCE WITH A.S.1289.5.1.1-2003.
14. THE CONTRACTOR SHALL ENSURE THAT THE SITE IS DRAINED SUCH THAT WATER CANNOT POND AGAINST OR NEAR THE BUILDING. THE PAVING IMMEDIATELY ADJACENT OR NEAR THE BUILDING SHALL BE GRADED AT 1:40 AWAY FROM THE BUILDING U.N.O.
15. AGRICULTURAL DRAINS ARE TO BE PLACED BEHIND ALL KERB AND CHANNEL, KERB ONLY AND EDGE STRIPS IN ACCORDANCE WITH STANDARD DRAWINGS.
16. PEDESTRIAN CROSSING TO CONFORM TO AS 1428.1 AND TO THE RELEVANT AUTHORITY STANDARD DETAILS WHERE APPLICABLE.

THE CONTRACTOR SHALL CHECK AND CONFIRM "AS CONSTRUCTED" LEVELS AND DETAILS OF EXISTING CONNECTING WORKS AND CROSSINGS PRIOR TO COMMENCEMENT OF NEW WORK. IF A VARIATION OCCURS CONTACT CIVIL ENGINEER PRIOR TO CONSTRUCTION.
THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE HYDRAULIC, ELECTRICAL AND IRRIGATION RETICULATION PLANS. THE CONTRACTOR SHALL ENSURE THAT ALL ROAD CROSSING CONDUITS ARE INSTALLED PRIOR TO CONSTRUCTION OF ANY PAVEMENTS. CONTACT THE SUPERINTENDENT IF A VARIATION OR CLASH OCCURS.

COUNCIL REQUIREMENTS

1. ALL WORKS IN WHICH COUNCIL HAS JURISDICTION OVER TO BE CONDUCTED IN ACCORDANCE WITH COUNCIL REQUIREMENTS.
2. THE CONTRACTOR MUST OBTAIN AND SUBMIT TRAFFIC/PEDESTRIAN MANAGEMENT PLANS TO THE COUNCIL PRIOR TO WORKS AND OBTAIN APPROVAL FROM COUNCIL FOR SAME.
3. ALL AREAS AFFECTED BY WORKS ARE TO BE MINIMIZED AT ALL TIMES AND BE MADE GOOD AT COMPLETION OF WORKS TO THE SATISFACTION OF THE SUPERINTENDENT AND THE COUNCIL.
4. COUNCIL WILL REQUIRE THAT A TRAFFIC MANAGEMENT PLAN BE SUBMITTED FOR APPROVAL WHEN A ROAD IS CLOSED, WHEN WORKS ARE AT AN INTERSECTION, TRAFFIC LANES ARE EFFECTED BY THE WORKS OR WHEN FOOTPATHS ARE CLOSED.
5. 1500mm MIN FOOTPATHS ARE TO BE MAINTAINED AT ALL TIMES AND IF WIDTH NOT AVAILABLE PROVIDE ADVISORY SIGNS REQUESTING PEDESTRIANS TO USE OPPOSITE FOOTPATH.
6. CONTRACTOR TO MEET ALL ABUTTING PROPERTIES REASONABLE ACCESS REQUIREMENTS THAT THEY MAY HAVE.
7. THE WORKS/INSTALLATION SHALL NOT INTERFERE WITH COUNCILS AND PRIVATE DRAINAGE INFRASTRUCTURE INCLUDING SURFACE DRAINS.
8. IF COUNCILS INFRASTRUCTURE SUCH AS PARKING SIGNS, ROAD OR LINE MARKINGS, PARKING METERS TICKET MACHINES OR SUPPORTING CABLES/CONDUITS, IRRIGATION PIPES OR STREET FURNITURE ARE REMOVED OR DAMAGED AS A RESULT OF THE WORKS THE CONTRACTOR SHALL, AT COMPLETION OR WORKS, ARRANGE AND PAY FOR THEIR REINSTATEMENT.

CITY OF MARIBYRNONG
ADVERTISED PLAN

REV	DESCRIPTION	BY	APPD	DATE
A	PRELIMINARY DESIGN	GAS	GAS	22.07.24

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PROJECT
8-10 MIDDLETON ST,
BRAYBROOK

PROJECT NO. 22236

TITLE
GENERAL NOTES SHEET

DRAWING NO. C-001
SCALE @ A1

ISSUE STATUS
REVISION B

PRELIMINARY

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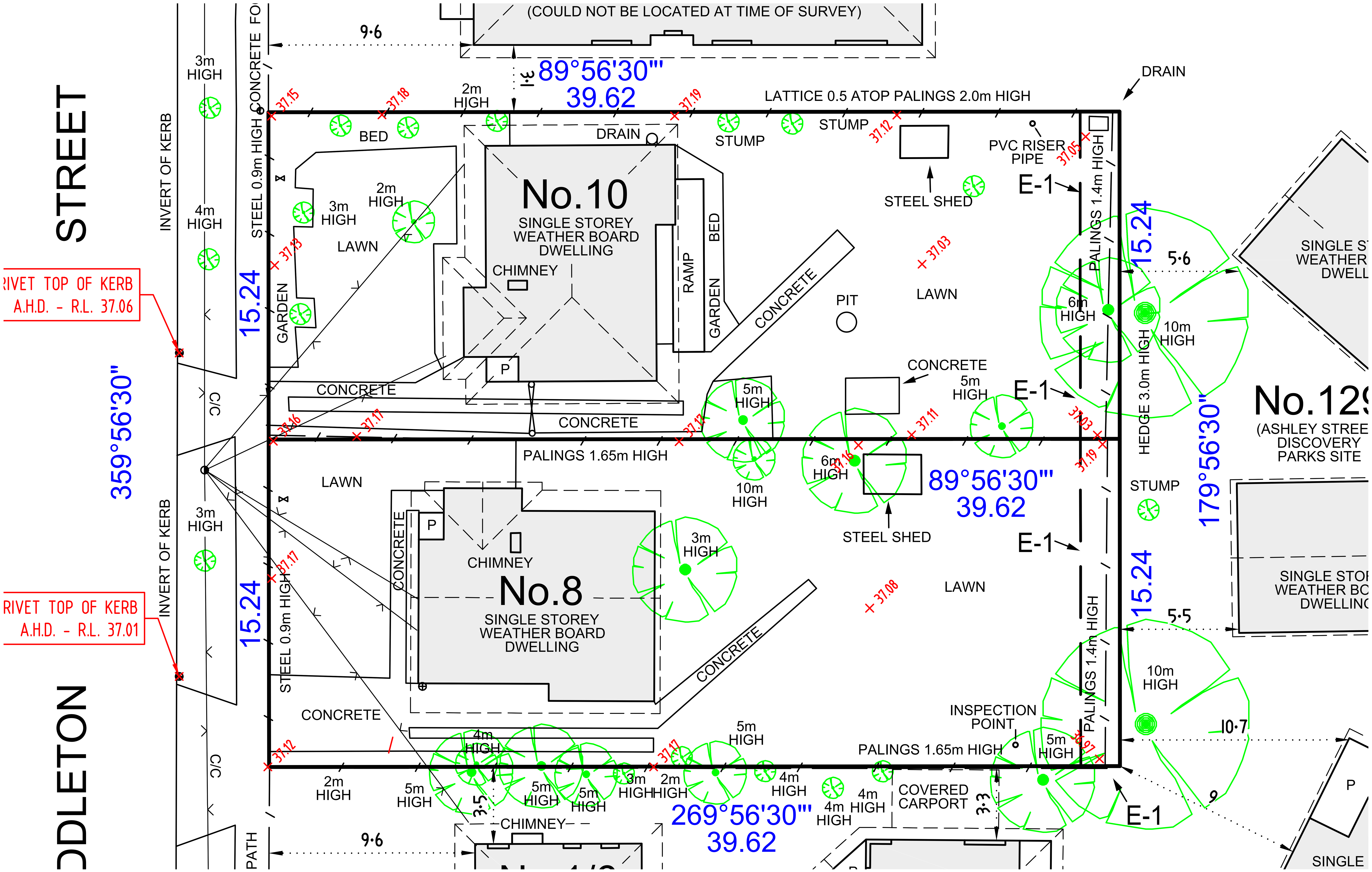

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PROJECT
8-10 MIDDLETON ST,
BRAYBROOK

PROJECT No. 22236

TITLE
EXISTING CONDITIONS PLAN

DRAWING NO.
C-002

SCALE
@ A1

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B

EXISTING JUNCTION PIT AND 450 DIAM COUNCIL STORMWATER PIPE WITHIN EASEMENT IS THE ASSUMED LPOD. EXISTING JUNCTION PIT COVER LEVEL 37.05, PIT INVERT LEVEL HAS BEEN MEASURED ON SITE AND THE INVERT LEVEL IS 35.41 (1.64m BELOW NGL).

DENOTES EXISTING SEWER PIPE. APPROX PIPE IL 35.450, EXACT LOCATION TBC

8.5kL ABOVE GROUND RAINWATER TANK. OVERFLOW INTO OSD TANK

8kL UNDERGROUND CONCRETE OSD TANK, 1.2x1.2x 5.5m LONG (INTERNAL DIMENSION).

INTERNAL SAW CUT JOINT LOCATIONS TBC

INTERNAL PAVEMENTS TO FALL TOWARDS GRATED PITS. FINAL COVER AND INVERT LEVELS T.B.C FOR ALL DRAINAGE

REMOVE EXISTING CROSSOVER TO 10 MIDDLETON SITE AND REINSTATE FOOTPATH IN ACCORDANCE WITH COUNCIL DETAILS.

REMOVE EXISTING SHARED CROSSOVER TO 8 MIDDLETON SITE AND REINSTATE FOOTPATH IN ACCORDANCE WITH COUNCIL DETAILS.

NEW CROSSOVER TO BE PROVIDED IN THE LOCATION SHOWN IN ACCORDANCE WITH COUNCIL TYPICAL DETAILS.

EXTERNAL DRAINAGE PIT AND UNDERGROUND PIPE INVERT LEVELS TBC FURTHER.

— AG — AG — DENOTES 90mm AGI PIPE WRAPPED IN GEOFABRIC

CITY OF MARIBYRNONG
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PROJECT
8-10 MIDDLETON ST, BRAYBROOK

PROJECT NO. 22236

TITLE
GROUND FLOOR DRAINAGE/PAVEMENT PLAN

DRAWING NO. C-010

SCALE 1:100 @A1

ISSUE STATUS **PRELIMINARY**

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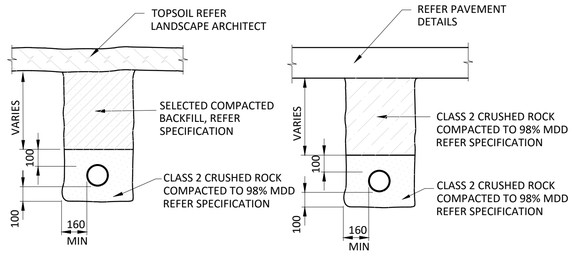
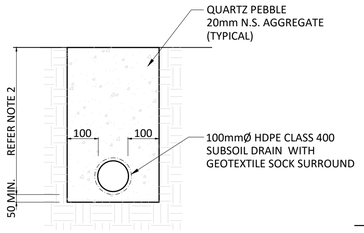
REVISION A



PIPE BEDDING DETAIL UNDER NON-PAVED AREAS

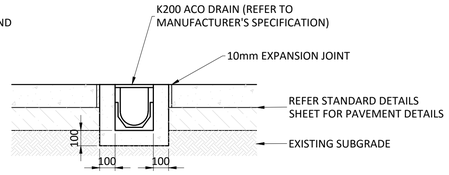
PIPE BEDDING DETAIL UNDER PAVED AREAS



NOTES:
1. THE INVERT LEVEL OF THE PIPES SHALL NOT BE LESS THAN:
   500mm BELOW FINISHED SURFACE or
   200mm BELOW PAVEMENT SUBGRADE
2. UNDER PAVEMENT BACKFILL TO BE NO FINE CONCRETE - CLASS 1000.
3. SCORIA AGGREGATE IS NOT PERMITTED FOR USE.

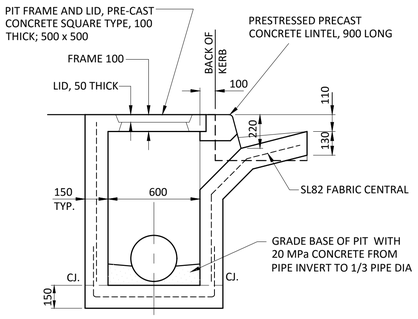
TYPICAL SUBSOIL DRAIN DETAILS

SCALE 1:10



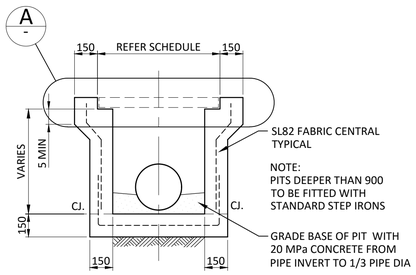
TRENCH GRATE DETAIL

SCALE 1:20

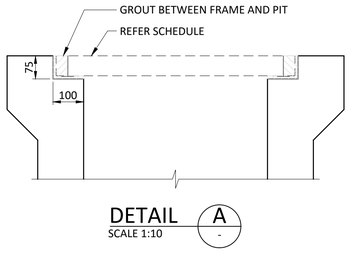


TYPICAL SIDE ENTRY PIT DETAIL

NOTES
1. PITS TO BE CAST INSITU
2. PIPE TO BE INSTALLED PRIOR TO CASTING PIT WALLS TO ENSURE PIPES ARE SEALED TO WALL
3. PITS DEEPER THAN 900mm TO BE FITTED WITH STANDARD STEP IRONS



TYPICAL JUNCTION PIT DETAIL
TYPICAL GRATED PIT DETAIL SIMILAR



DETAIL A
SCALE 1:10

CITY OF MARIBYRNONG
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PROJECT
8-10 MIDDLETON ST, BRAYBROOK

PROJECT NO. 22236

TITLE
TYPICAL DETAILS SHEET

DRAWING NO. C-020

SCALE @A1

ISSUE STATUS

REVISION A

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