

SUSTAINABILITY MANAGEMENT PLAN

25 September 2022

for

HYGGE PROPERTY

development at

102-108 Humffray St South

DRAFT Issue - Revision 02

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PURPOSE OF THIS REPORT

The purpose of this report is to provide information to Ballarat City Council regarding the environmental initiatives pertinent to the development at 102-108 Humffray St South, Ballarat East. This report is also provided to demonstrate that the development meets or exceeds the Environmental and NatHERS requirements of the NCC (2019) and Property Council of Australia (PCA) Grade A Building requirements.

The commitments within the development address the concerns of Ballarat City Council for future housing issues and future climate issues. Amongst these is a voluntary aspiration that the dwellings achieve a minimum of 7 Stars on the NatHERS rating system. Other aspirations are outlined in this report to demonstrate an understanding of environmental considerations within the development prior to planning approval.

The City of Ballarat drives to deliver environments for people to 'live', 'work' and 'play'. This development demonstrates this drive. Beyond exceeding the council's requirements, the development seeks to benefit occupants economically, physically and socially.



Figure 1: Visualisation of development provided by Six Degrees Architects

The following documents were used in the preparation of this SMP:

- 1. 220829_Residential_Progress Print_PDF.pdf
 - Plans, Sections and Elevations
 - 23 PDFs
 - Six Degrees Architects
- 2. 220909 Architectural Drawing Update
 - Separate files (CAD and PDF) preparing for Town Planning
 - 61 individual references (CAD and PDF)
 - Six Degrees Architects
- 3. 11587-2022_09_02-Humffray St South-PV System Roof Layout.pdf
 - Roof Plan showing Solar PV
 - 1 page
 - BRT Consulting Engineers

This document contains information prepared only for the client. This report is confidential in nature and no information is to be release without the prior consent of Shared Space Architecture Pty Ltd.

Project Name: 102 - 108 Humffray St South

Project Number: 0118

Versions:

00	Draft Report	06/09/2022	AS
01	Draft Report to Consultants	13/09/2022	AS
02	Draft Report after Feedback	25/09/2022	AS

RELEVANT TEAM

Development Manager – Client Hygge Property. Primary POC –	@hygge.com.au.
Architecture Six Degrees Architects. Primary POC –	@sixdegrees.com.au. 03 9635 6000.
Landscape Architecture ACRE Studio. Primary POC –	@acre.com.au. 03 7018 3135.
Surveyor To be informed	
Traffic Engineer OMG. Primary POC –	@onemilegrid.com.au.
Civil Engineer To be informed	
Town Planning Niche Planning Studio Primary POC – Community .	@nicheplanningstudio.com.au.

CONTEXT

Site Location

102 Humffray St South, Bakery Hill is situated in the city of Ballarat. It is situated at the intersection between Humffray St S and Porter St, and 790 metres from Ballarat Railway Station.

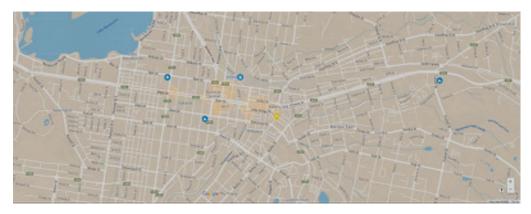


Figure 2: Site Context and Access to Facilities (view appendix 4 for larger image)

Ballarat has a projected population growth of 25% over the next 15 years. With a highly convenient location, this development has plenty of opportunity to benefit the community and occupants of the building.

Suburb Statistics

Bakery Hill is the suburb with the smallest area (0.2 square km) and population (171 people, 2016 census) in the city of Ballarat. The suburb is delineated by Peel, Mair, East, and Steinfield St. Parks make up 2.7% of the total area. The predominant age group in Bakery Hill is 20-29 years. The 2016 census found 46.7% of the homes in Bakery Hill were owner-occupied.

Building Occupation

The 102 Humffray St S development consists of 74 apartments, including two retail spaces in the same block and a second block, housing 7,500m² of office space.

Between the residential building and office building, there is a landscaped area with proposed trees, introducing natural light through the entire development and allowing connection between the buildings. This design considers open space as a priority.

The site has an area of 4,000m² and is in a Commercial 1 zone.

Environmentally Sustainable Design Drivers

The development is determined to tread as lightly as possible on the environment and the following are the major drivers which have been discussed with both the development manager and the architect.

- 1. All Electric
- 2. All Renewable
- 3. 100% Green Power
- 4. Responsible Low Carbon Materials
- 5. Waste Minimisation
- 6. Residential: NatHERS 7 Star minimum
- 7. Commercial: Property Council of Australia Grade A Building

Low Energy Use promotes a reduction before affording generation of energy for use. Around 40% of our energy use typically exists in space heating and cooling and a further 20% of our energy use in hot water production and storage.

By reducing the number of individual resources required to main a comfortable home and lifestyle, a shared scale of economy reduces the amount of resource required for each home in the residential building. Where possible, centralised systems have been aspired to.

The YourHome website demonstrates that materials contribute to around 50% of the embodied energy of a building for a lifecycle of 50 years. The initiative is to reduce this impact by sourcing materials which last longer, use less energy to produce and are as local as possible.

100% Green Power is easy to subscribe to and this development aspires to only use 100% Green Power for operational power when complete.

The following are the requirements from the Property Council of Australia based on the document 'A Guide to Office Building Quality, 3rd Edition', effective 1st July 2019:

For new Grade A buildings (commercial), environmental targets are:

A1. Environmental Rating, Green Star – Design & As Built v1.2 – 5 Star

A2. Energy (without green power), NABERS Office Energy (commitment) - 5.5 Star

A3. Water, Number of Water Points under Green Star – Design & As Built v1.2 – 3 points

A4. Waste, Green Star – Design & As Built v1.2 'Operational Waste' credit – 'Yes'

A5. Indoor Environment Quality, Percentage of minimum Indoor Environmental Quality

points under Green Star – Design & As Built v1.2, min. 60% including credits for

thermal comfort

A6. Climate Change adaptations and resilience, Green Star – Design & As Built v1.2

'Adaptation and Resilience' credit - 'Yes

These targets apply to the commercial building of the pair of buildings proposed for the development's completion.

BALLARAT CLIMATE

Ballarat is in a NatHERS climate zone 6. The following has been extracted from the Bureau of Meterology – Ballarat Aerodome.

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Y	ears
emperature															
Mean maximum temperature (°C)	26.2	25.7	22.9	18.4	14.2	11.3	10.5	11.8	14.1	17.3	20.5	23.4	18.0	29	199 202
Mean minimum temperature (°C)	11.6	11.6	9.9	7.0	5.1	3.6	3.0	3.1	4.4	5.9	8.0	9.4	6.9	29	199 202
Rainfall															
Mean rainfall (mm)	45.1	39.5	31.5	42.4	50.4	60.2	61.4	66.5	69.2	53.8	54.5	46.2	620.9	30	1991 2020
Decile 5 (median) rainfall (mm) 🥡	36.2	25.1	27.2	35.2	47.5	58.5	58.7	64.8	56.5	51.2	53.6	32.0	605.1	30	199 202
Mean number of days of rain ≥ 1 mm	5.2	4.1	5.1	7.1	9.1	11.5	12.6	12.6	11.3	9.3	7.4	6.2	101.5	30	199 202
Other daily elements															
Mean daily sunshine (hours)															
Mean number of clear days	6.5	6.7	6.5	5.6	3.4	2.8	3.4	3.6	2.7	3.8	3.9	5.2	54.1	17	199 201
Mean number of cloudy days	8.7	6.3	8.6	10.8	14.1	15.9	15.6	15.1	12.2	12.2	10.6	10.3	140.4	17	199 201

http://www.bom.gov.au/climate/averages/tables/cw_089002.shtml

The above image provides an overview of the hottest and coolest months, along with the wettest months and the mean number of clear and cloudy days. The mean minimum temperature is 3.0°C and the maximum temperature is 26.2°C.

Most of the wind comes from the North with the next most occurring between South-East and South-West.

Wind Rose

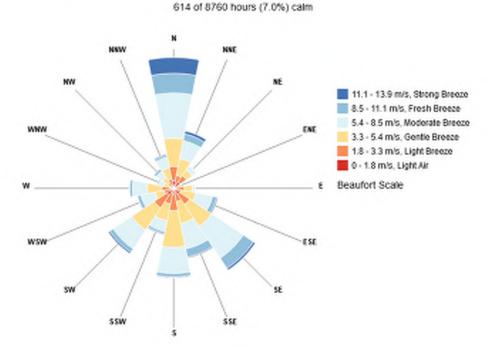
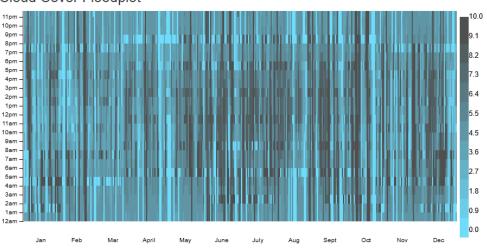
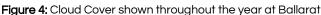


Figure 3: Windrose of Ballarat Climate File

Most cloud cover occurs in the latter part of the year. Ballarat can expect an average of 6.5 hours of Sunlight per day and a solar PV generation calculation should be made using a value of 4 to 4.5 hours per day as not all light is at 100% intensity.







Green Star Climate Change 'Adaptation and Resilience' Credit

The project demonstrates at least three design responses for increased resilience to future climates and natural disasters to meet the standard of a PCA grade A building and 5 Star Green Star. These are:

- 1. To address anticipated future temperature increases and a harsher climate, the approach is to incorporate increased passive shading components. Deep mullions have been allowed for to provide increased shading over curtain walls.
- 2. We expect a drier future climate for this project site due to its inland location. The project aims to optimise rainwater usage. The stormwater management plan has been developed to incorporate rainwater collection and water tank storage.
- 3. The project aims to increase density for commercial and residential occupation, in a suburb that is relatively sparse compared to its surrounding suburbs. This has the effect of reducing travel times and encouraging shared resources within the community.

ENERGY USE

The development inspires to a minimum NatHERS Star rating of 7 Stars and is situated in NatHERS Climate Zone 66 – Ballarat Aerodrome.

A selection of apartments has been modelled in HERO version 3.1.1 to gain an understanding of energy use and provide studies around the efficiency of the building envelope.

Beyond the scope of providing a better outcome for NatHERS ratings, this report demonstrates that the development directly answers Ballarat City Council's aim to "Protect, Maintain, Enhance Our Built and Natural Assets".

Renewable Energy Generation

The available roof area of the development is around 2,100m² (1,070 residential and 1,070 commercial). Solar PV panels are proposed for the roof and some areas are being retained for circulation and access to plant and equipment. BRT Consulting Engineers proposes an aim to reach 26kW of Solar PV on the residential roof and 32kW on the commercial roof.

The aspiration is to offset the energy usage of common space air conditioning in the residential building and hot water energy consumption in the commercial building. The development proposing 100% Green Power as another aspiration implies the intent is aspiration is renewable independent on the size of the Solar PV system.

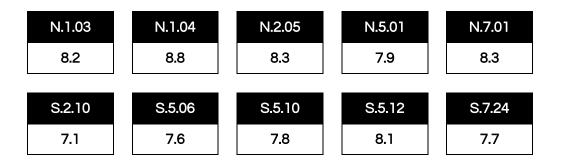
There is no requirement by Ballarat City Council to incorporate any renewable energy into a development and this guide is provided to show that this development sees the generation of renewable energy beneficial to the future of energy access.

The solar PV system of 26kW on the residential building would generate a yearly yield of 37,986 kWh with 4 hours of daylight per day. A 7 Star minimum throughout equates to an annual energy demand of 187,012kWh. The renewable Solar PV System covers 20.3% of this load.

Preliminary NatHERS Ratings

Below are ten preliminary NatHERS ratings. These ratings are unaccredited, though they confirm a rough estimate of the performance requirements for 10 units within the development.

Advice should be sought closer to the construction documentation stage to ensure a minimum NatHERS rating of 7 Stars is achieved prior to tendering.



Unaccredited 'Preview Certificates' have been included as attachments to this report as proof of calculation of unaccredited Star Ratings.

Property Council of Australia - Grade A Buildings

The following, are requirements from the Property Council of Australia for all PCA Grade A buildings. They have formed our calculation and our process with you.

For new Grade A buildings (commercial), environmental targets are:

- A1. Environmental Rating, Green Star Design & As Built v1.3 5 Star
- A2. Energy (without green power), NABERS Office Energy (commitment) 5.5 Star
- A3. Water, Number of Water Points under Green Star Design & As Built v1.3 3 points
- A4. Waste, Green Star Design & As Built v1.3 'Operational Waste' credit 'Yes'
- A5. Indoor Environment Quality, Percentage of minimum Indoor Environmental Quality points under Green Star Design & As Built v1.3, min. 60% including credits for thermal comfort
- A6. Climate Change adaptations and resilience, Green Star Design & As Built v1.3 'Adaptation and Resilience' credit – 'Yes'

Green Star Environmental Rating

A Property Council of Australia Grade A building requires a Green Star Rating of 5 Stars. To gain a 5 Star Green Star rating, the building needs to achieve 35 points. 15 of these can be

attributed to a net zero pathway, which it is an aspiration to undertake. The further 20 points have been selected from a number of categories, in particular the following points are required for a commercial building to be a PCA Grade A Building: (refer also to other sections of the report linked to the contents page)

- 3 Water Points: The project aspires to 3 of the following 4 water points:
 - All fixtures within 1 star of maximum available WELS ratings
 - o Harvested rainwater used for sub-soil drip irrigation with a moisture sensor
 - Storage for 80% of routine fire protection system text water and floor-by-floor isolation for sprinkler
- Waste: Operational Waste Credit: This project inspires to separate waste as follows:
 - o General Waste
 - Paper and Cardboard
 - o Glass
 - o Plastic
 - At least one other Waste Stream
- Indoor Environment Quality minimum of 60% of 17 available points, being 11 points. The points currently aspired to are:
 - Indoor Air Quality:
 - Ventilation System Attributes: Minimum separation and intakes and exhausts (ASHRAE 62.1) plus accessible for cleaning, and pre- cleaned prior to handover in accordance with relevant standards.
 - Provision of Outdoor Air:
 - 2 pts for 100% increase in outdoor air OR <700ppm CO2 cosensing. OR;
 - 2pts for natural vent compliant with AS1668.4 2012 (N/A for mixed-mode).
 - Exhaust or Elimination of Pollutants
 - Requires direct external exhaust (e.g. from printing or cooking equipment) OR;
 - compliant low-emission devices OR recirculating carbon-filters
 - Acoustic Comfort
 - Internal Noise Levels: Requires internal noise in nominated areas no more than 5dBA above 'Satisfactory' levels from Table 2 of S/NZS 2107:2016. (Measurements required in at least 10% of spaces, with windows open for nat-vent spaces, and windows closed for mixedmode or mech vent).
 - Reverberation: Reverberation times in nominated areas must be below maximum stated in Table 1 of AS/NZ 2107:2016. (Measurements required in at least 10% of spaces).
 - Acoustic Separation:
 - N/A to shell & core areas . Requires internal partitions have weighted sound reduction index of at least 45, OR
 - measured sound level difference between spaces + ambient noise level > 75.
 - Lighting Comfort
 - Minimum Lighting Comfort: Flicker-free luminaires/ballasts (>12 bit for LED drivers) + colour rendering index > 80.
 - General Illuminance and Glare Reduction: Requires best-practice light levels + glare elimination via baffles or Unified Glare Rating calculation.
 - Surface Illuminance: Requires average ceiling illuminance at least 30% of working plane + 90% of ceiling to have reflectance of at least 0.75. Also requires compliant Tenant lease clauses to have been executed. Requires white soffit to commercial spaces.

- Localised Lighting Control: Requires On/Off + brightness control within immediate environment. Also requires compliant Tenant lease clauses to have been executed.
- Visual Comfort
 - Glare Reduction: Requires fixed shading of direct sunlight for 80% of occupied hours or controllable blinds with VLT <10%. OR
 - equivalent glare modelling.
 - (Alternative point if preferred). Daylight: Requires 'Specified proportion' of primary spaces have Daylight Factor > 2% OR
 - Daylight Illuminance > 60 lux for 80% of occupied hours.
- o Indoor Pollutants
 - Paints, Adhesives and Sealants and Carpets:
 - Requires 95% comply with Total VOC limits prescribed. e.g. 16g/l for paints, 65g/l for primers, sealers & rep coats, 50g/l for general purpose adhesives and sealants.
 - Carpets <0.5mg/m² TVOC @ 3 days OR GECA/Green Tag certified.
 - Engineered Wood Products: Requires 95% comply with formaldehyde limits prescribed, typically <1mg/l.
- o Thermal Comfort
 - Mandatory for PCA 'A' Grade. Requires PMV between -1 & +1; OR ASHRAE 55 - 80% acceptability. OR
 - 20³-24³C + RH 40%-60% + air velocity < 0.2m/s + perimeter zones < 4m deep & <75m³.Innovation point for individual comfort control e.g. desk fans.
- Climate Change Adaptations and Resilience Credit: Referred to in an earlier part of the report.

A preliminary Green Star scorecard has been prepared as part of this report and is included in the appendix. The project has a targeted score of 35 to meet PCA Grade A Building requirement and it is planned to exceed this with a targeted score of 35.2. Points beyond the specific PCA Grade A Building requirement have been allocated as follows:

- Management:
 - Accredited Professional: Fulfilled by Shared Space Architecture being contractually engaged to provide advice, support and information related to Green Star principles, structure, timing and processes, at all stages of the project, leading to certification.
 - Environmental Building Performance: Covered by requirement to meet NABERS Office Energy 5.5 Star

Property Council of Australia Grade A Buildings form their requirement to have a 5 Star Green Star rating by engaging a Green Star Accredited professional, other points to meet the Green Star 5 Star rating are also outlined as PCA Grade A Building requirements.

The development aims to meet this PCA Grade A requirement and inspires to achieve a better Green Star rating (6 Star Green Star) if possible when other factors of the design are taken into account.

Further points which are likely to be awarded after planning permit are:

- Transport: 5 points
- Water: additional 2 points
- Materials: 9 points, including 6 points for a LCA assessment
- Land Use & Ecology: 3 points
- Emissions: 2 points

Details of the additional points are in the appendices at the end of this report. A total of 55.2 Green Star points are provisionally likely to be achieved. This falls short of the 6 Star Green Star requirement of 65 points and gives a relatively large buffer to achieve 5 Star Green Star and a decent aspiration for the project team to work towards a 6 Star Green Star rating. In the future further points will be targeted as part of the formal Green Star submission.

Preliminary JV3 Modelling

JV3 modelling has been conducted using Speckel for the two commercial zones on the ground floor [include commercial building here too]. A report has been attached to this SMP as an appendix. There is an overall reduction in building emissions of -6.45% from the model of a reference building, which deems the two spaces and the development complaint from an emissions perspective.

The specifications used in our JV3 model are:

- External Wall: 3.0
- Wall between zones (adiabatic): R2.2 (nulled due to neighbouring zone)
- Ceiling (adiabatic): R3.5 (nulled due to neighbouring zone)
- External Roof: R4.5
- Floor: R2.5
- Window Systems: U-Value: 2.0, SHGC: 0.35 and VLT: 0.6 (clear double-glazed)
- Shading except in stairwell windows is 250mm protruding on the Top, Left and Right frames of the windows with windows at 2 metre intervals on average
 - \circ $\,$ Shading on stairwells removes the top protrusion

On the Ground floor, window area sits at 28% and on floors about ground, window area sits at 60/61%.

Section J also addresses comfort and at this stage this has been left off from our JV3 modelling. BRT Consulting is able to provide this compliance for the building permit at a later date.

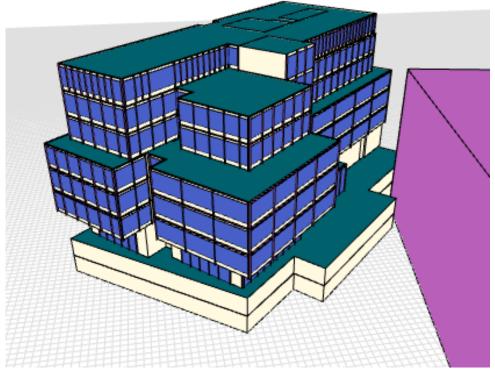


Figure 5: 3D view of JV3 Model

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NABERS Office Energy

A NABERS estimate has been carried out with the objective to achieve a NABERS 5.5 star rating. The NABERS Energy and Water for Offices Reverse Calculator report is attached as an appendix.

As per the reverse calculator, to achieve a 5.5 Star NABERS Office Energy rating, the target maximum electricity consumption is 738,268 kWh/a. Based on calculations, this building will fall within the maximum limit (see Figure 6). A detailed calculation is included in the appendices at the end of this report.

Note that we have used NABERS values for lighting electricity consumption, not the values from Speckel as there is a specific NABERS calculation method available.

The following graph should be read as a demonstration that the development can meet the requirements of a NABERS 5.5 Star Office Energy Rating through the interrogation of preliminary assumptions. A more detailed calculation will need to be undertaken by a qualified professional after planning to estimate power consumption beyond NABERS reverse calculation rules and metrics.

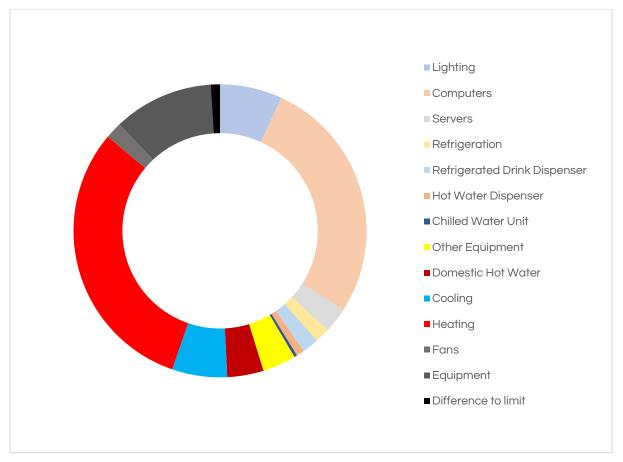


Figure 6: Summary of NABERS Electricity Consumption

A reduction in energy could be made with an improvement of the building envelope and a clarification of a total heating/cooling energy modelling after planning through values determined by a qualified mechanical engineer.

MATERIAL USE

There are currently no requirements from Ballarat City Council for the restriction of any materials to be used beyond the requirement of the NCC. The following commitments have been made in this development voluntarily to promote a sound environmental consideration.

Construction

- 1. Diversion and sorting of Construction Waste away from landfill, targeting a maximum of 50% waste in landfill
- 2. Specification and use of either re-used or certified timbers
- 3. Avoiding use of PVC, or where necessary, the use of PVC which fits the guidelines of the Green Building Council of Australia (GBCA)
- 4. Keeping materials as local as possible
- 5. FSC Certified Timbers only

Occupant (Indoor Environment Quality)

- 1. Use of ultra-low or zero VOC paints
- 2. Consideration of multiple Ventilation opportunities
- 3. An inclusion of at least double-glazing on all residential windows for both thermal and acoustic benefits to the occupants
- 4. Lighting is considered and glare is reduced
- 5. Views have been considered in the development from all occupied zones
- 6. Thermal comfort is maintained and specified as calculated and explained previously in this report

All the commitments listed above provide evidence that the development exceeds council's requirements.

Embodied Energy

50% of CO2 emissions is found to be embodied in the material used in construction. Studies into materials have formed the following aspirations:

- Flyash in concrete where possible (dependent on selected supplier of concrete)
- Source suppliers of polystyrene insulation with a waste-free or close to waste-free production line
- Insulated Truss and Rafter Roof over concrete slab
- Windows to maintain insulative properties of façade and a reduction in energy use (approach local manufacture first for costing and scope before approaching overseas imports). An imbalance between wall performance and window performance can decrease comfort levels in a home

WATER USE

In a similar vein, Water collection, use and re-use are considered for the development in Humffray St S. This demonstrates exceptional responsibility in maintaining a viable water source into the future. The following commitments are above and beyond the council requirements:

Water Reduction Strategies

- 1. Specification and Installation of highly efficient fixtures and fittings. WELS ratings for all fixtures are to be within 1 Star from the maximum available.
- 2. Sub-metering of water-use. Including per unit, for landscape and hot water (if centralised)

- 3. Rainwater to be used on site with landscaping and in the building for toilet flushing as a minimum. Plumbing to laundry for clothes washing should be considered (though not a commitment).
- 4. Focus on Native and low-water demand planting. Productive gardening must include wicking beds and mulch where practicable.

Stormwater

Maintaining a viable permeable connection to site is the most effective method to manage stormwater. In the event that most of the site is taken up by a building, provisions should be made to incorporate above slab landscaping, the development includes and is not limited to:

- Deep planting area between the two buildings where ground is free from basement carparking.
- Provision for some raingarden water treatment areas

The Melbourne Water's STORM tool has been used to assess site Stormwater strategies. This tool demonstrates compliance with a rating of **101%** and a block size of 5,000m². This demonstrated that there are enough stormwater strategies to minimise retention and collection on site.

30m² of 300mm raingardens have been included in the STORM calc to validate a 20,000L water tank. If the raingardens need to be reduced in depth, a larger water tank will be required to supply all the apartments in the residential block. Tank details are:

- Residential: 1 tank at 20,000L (or combined tank of similar volume)
- Commercial: none

A full report is available in the Appendices to this report and shows compliance. It also exceeds any requirement of Ballarat City Council.

ARCHITECTURE AND ECOLOGY

The Ballarat Planning Scheme states under 'Supply of urban land' that a development in an urban growth zone should consider 'Neighbourhood character and landscape considerations.' The calculations prepared for Melbourne Water's STORM tool demonstrate a necessity for water treatment beyond the rooftops.

The block is 5,000m² in size (for the purpose of calculating the footprint, vegetation and ratio of the development).

The following data demonstrates that landscaping has been considered and rationalised as part of the design of this Class 2 development.

Based on the block size of 5,000 m², the following ratios exist in the current design:

- Footprint of Residential Building: 1,000m² (20.0%)
- Footprint of the Office Building: 1,100m² (22.0%)
- Ground Floor Landscaping (including hard surfaces): 2,900m² (58.0%)



Figure 7: Existing site showing the current site permeability

Most of the site currently has an industrial building and no landscaped areas. The red line above demonstrates an approximate location of the subject site.

The addition of 74 new residences to highly sought-after property within close proximity to a complete suite of services speaks highly in favour of the site's potential.

Beyond that favour, it is recommended that this development considers natural access as a priority for future inhabitants with a minimum of 10% vegetated landscape on the ground floor.

Access to natural light is important and this development demonstrates that every dwelling has an external wall with a window to living spaces and bedrooms. Paths, forming part of the hard landscape have been interweaved amongst green spaces on site.

The following points demonstrate a precedent above any council requirements and if within budget these points are intended for the development:

- 1. Encouraging vegetated, deciduous facades and balcony landscaping. This provides opportunity to increase diversity in ecology, provide Summer shading and reduce urban heat impacts. This also reduces the visual bulk of the building.
- 2. Delivery of a high-quality, engaging street front to encourage the community to utilise the space and activating the local street.
- 3. Rain water capture in combination with considered landscaping, reduces stormwater runoff (in-line with the STORM tool as a minimum).

Window to Wall Area Ratio

A study has been undertaken using the DIN EN10077m compliant Passive House Planning Package (PHPP) to determine the level of heat loss and heat gain over each façade. The commercial building is oriented 46° from North and thus, PHPP orients the commercial building to the four cardinal directions as follows:

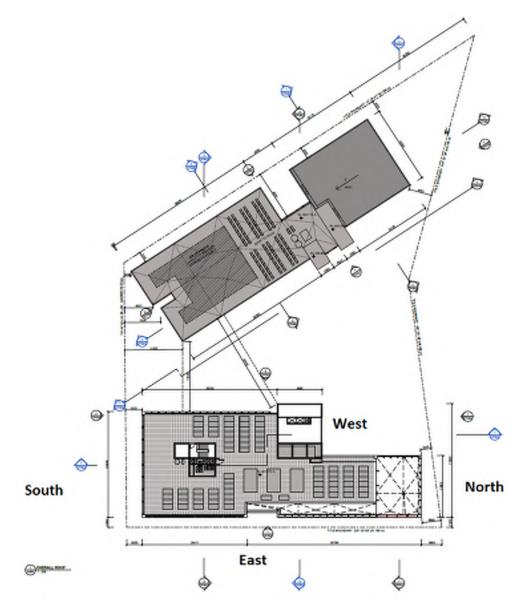


Figure 8: A Roof Plan showing the orientation of walls in the PHPP

The following results have been determined for each Cardinal Direction:

Direction	Losses in Heating Period	Gains in Heating Period
North	19%	33%
East	36%	24%
South	7%	5%
West	38%	38%

Specifications of the building envelope were made to match those in JV3 modelling, mentioned above and the window height was set at 2.5m and repeated window width set at 2.0m, allowing for 250mm shading as per JV3 modelling.

From the results determined by the PHPP we recommend that the window sizes of 2.5m high by 2.0m average wide is adequate for the purposes of determining an average heating and cooling load for the NABERS reverse calculator. The following may improve building performance:

- Low-E or Low SHGC glass on the Western Façade
- A slight reduction of the height of Western windows

It has been noted that there is little heat loss and gain from the South and the architecture of the building has been sensitive to the South as a façade where windows are not ideal. Further studies will need to be undertaken after the planning permit stage to determine the optimum clear glazing and spandrel panel ratio.

At this stage there is plenty of daylight on each floorplate and variation of the heights and sizes of the façade and in particular clear glazing, along with the type of glass will need to take into account the amount of daylight required for office spaces on each floor.

TRANSPORT AND ACCESS

The intent of a residential growth zone is to retain development in town centres where an increase in density can be handled by existing systems. This conduces that the outer urban areas of a city are less developed and natural habitat and resources are preserved for future generations to enjoy.

It is sensible to increase the density in a residential growth zone to that of a medium density building, as depicted in this proposal. No doubt, Ballarat is expecting an increase in population over the next decade and by working with existing infrastructure an efficient solution must be realised to sustain this growth.

Transport available to occupants of the development include both human powered and motorised options. The options available directly responds to the Ballarat Planning Scheme (dated 20/05/2021), part 11.01-1S stating: "Encourage a form and density of settlements that supports the sustainable transport to reduce greenhouse gas emissions".

Local Facilities and Attractions

The following facilities and attractions are available to occupants of the 102 Humffray St S development (distance 'as the crow flies'):

- Ballarat Train Station (730 metres)
- Nearest Bus Stop (85m)
- Various cinemas, galleries, cafés and restaurants
- Schools including Ballarat Primary School, Woodmans Hill Secondary College
- Shopping Precincts including Bridge Street Mall and Sturt Street

Human Powered Transport Options

The proposal aspires to incorporate 75 and 50 bike storage allowances for the residential and commercial buildings respectively. These parking spots would be located in the undercover garage.

End of Trip Facilities

The development aspires to provide the following end of trip facilities:

- Accessible showers at a ratio of 1 per 10 bicycle spaces
- Changing Facilities adjacent to showers
- One secure locker per bicycle space within the changing facilities
- One ironing station per change room
- One DDA compliant shower
- One Bicycle repair station

187m² has been allowed for, for end of trip facilities within the commercial building.

Walkscore

Walkscore gives an excellent rating for this site. It shows access to both activities within walking distance and great connections to transport modes. The highest walkscore a property can achieve is 100, so 84 demonstrates a very convenient area to live in without a car and generous access to facilities and a town centre.

Ballarat, Victor	ria, 3350	treet South	
Commute to Dev		at 🖉 9 min – View Routes	
♡ Favorite	🗇 Map	Rearby Apartments	
	re	e in be accomplished on foot.	
Anna an Anna a			
			Andrew Andrew Contraction

Figure 9: Walkscore demonstrating a high level of access

Walkscore is also able to demonstrate how far one can journey on a bicycle and in the diagram below, a limit of 20 minutes has been set as the extent of bicycle travel. This covers most of Central Ballarat and a bit further afield.

Travel Time Map

Add to your site

Explore how far you can travel by car, bus, bike and foot from 102 Humffray Street South.



Figure 10: Walkscore demonstrating an accessible area by bicycle from the site

Car Use and Parking

There are 74 dwellings in the proposal and 30 car parking places. This quantity is less than the census data of 1.6 cars per dwelling. However, residents are encouraged to use alternative greener transport options and the development is more dense than dwellings typical of the area.

The development includes 30 Car spaces and 75 Bicycle spaces.

A further 39 storage cages are being provided and can be used for bicycle storage as needed by the future residents.

Before the recommendations, the development still exceeds the expectation of the City of Ballarat's Planning Scheme as promotes the intent of the Ballarat Health, Knowledge and City Living precinct to promote accessible, friendly, safe and attractive environments for people of all ages ana abilities.

SOCIAL CONNECTION

The development has been designed to foster social connection on various levels. These include connection within the development and connection with the outside community.

Marcus Foth and Paul Sanders write in their paper 'Social Networks in Inner-City Apartment Complexes and the Implications for the Residential Architecture of Public Space'¹ that;

"One of the significant common denominators in well-functioning residential architecture is the provision of social spaces, interstitial places that offer opportunities for interaction, and exchange."

The development at Humffray St South demonstrates this with the addition of a community room and green spaces to sit and invite others into the community formed as part of the dwellings.

Although there is some provision to interact with people during the daily routine amongst residents, most of the social interaction occurs at the ground floor. A precedent which has been carefully compared is 4 – 6 Lyons Street North. With a very similar intent to Humffray Street South, Lyons Street North also opens up the adjacent street with the addition of at least one commercial space and associated outdoor sitting area. Humffray Street South has the addition of street facing amenity from the commercial building of the pair.

Another aspiration is to provide a carshare programme within Ballarat, as density is increasing and this encourages community interaction as mentioned earlier. Encouraging human-powered transport also assists to connect inhabitants of the development. An allowance for bicycle spaces is likely to increase the number of conversations as people are not closed off, entering their cars and further, the number of social connections between residents.

WASTE REDUCTION

At least 50% and an aspiration for 90% of construction waste is to be recycled and/or sorted throughout the construction process. This construction waste will thereby be diverted from landfill.

Waste Separation

Waste separation is occupant's responsibility and waste is to be disposed of within shared facilities on site. Also, within the home, smaller fridges reduce food waste and discourage over-purchase.

A precedent of Nightingale Ballarat (11 Davey Street) has been used to inform the waste streams within this development.

Green Star 'Operational Waste' Credit

We are committed to meet PCA Grade A building and Green Star Operational Waste credit. Waste storage bins will have good accessibility. Separate bin storage is proposed for general waste, paper & cardboard, glass, plastic, organics.

These commitments exceed any requirement stipulated by Ballarat City Council.

¹ https://eprints.qut.edu.au/1908/1/fothsanders_dc4_v8nc.pdf

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CONCLUSION

The development at 102-108 Humffray St South in Ballarat exceeds any requirement of Ballarat City Council and is exemplary in nature. Due diligence and care has been taken to consider the community, the environment and the inhabitants of the development before applying for a planning permit. In exceeding any environmental planning requirement, the development also exceeds any requirements stipulated in the NCC.

The following aspects have been explored and a one-line summary for each has been provided as a reference for the exploration and research taken to prepare this report:

- 1. Context: The site is located in an urban growth zone in Ballarat.
- 2. Ballarat Climate: The development is in NatHERS Climate Zone 66 and the NCC Climate Zone 7. Thermal performance of the proposed building envelope is adequate.
- **3. Energy:** The development seeks to achieve a minimum of 7 Stars across all dwellings. The commercial building seeks to engage a 5.5 NABERS Office Commitment to satisfy the requirement to achieve a PCA Grade A building.
- **4.** Material: There is a commitment to source materials with low-embodied carbon and low VOCs to sustainably source and avoid occupant discomfort.
- 5. Water Use: Highly-efficient fixtures are to be specified, rainwater collected and fire system discharge to be reused.
- 6. Architecture and Ecology: The development seeks to allow for 10% permeable area on the site and increases the potential for the site to be effective to the community with paths running through the common spaces on the ground level.
- 7. Transport and Access: The site is really well situated and provides adequate transport options for occupants. A Walkscore of 84 is achieved.
- 8. Social Connection: The landscaped ground floor provides ample community connection and moments within the design also provide space for people to connect.
- 9. Waste Reduction: A responsibility to used shared waste management is put on the owner and at least 50%, though aiming for 90% of construction waste to be recycled.
- 10. PCA Grade A Building Requirement: Satisfied (Commercial)

Ballarat is in the midst of a growing population with an expected increase of 25% over the next decade. It is imperative that developments seek to increase the number of people who can live conveniently in the city without detriment to the current town systems and infrastructure.

This development is a key player in the introduction of greater density in one of Ballarat's least dense areas. By keeping connection and allowing access to natural resources, the objective of the development is met by providing sustainable dwellings and commercial spaces for a community to grow into the future.

The Residential Building currently sustains a NatHERS minimum 7 Star rating, along with compliant commercial tenancies. The commercial building meets the PCA Grade A requirements after calculating these in a desktop study.

This development seeks to encourage a density in line with the vision of the Ballarat Planning Scheme for this zone and it goes above and beyond any environmental, community and affordability requirements of Ballarat City Council.

APPENDICES

NatHERS Results

HERO Software version 3.1.1 was used to run preliminary NatHERS ratings on a selection of apartments. The following tables show some results of the apartments chosen:



Figure 11: Graph from HERO Software showing a summary of results and an average 8.0 star rating

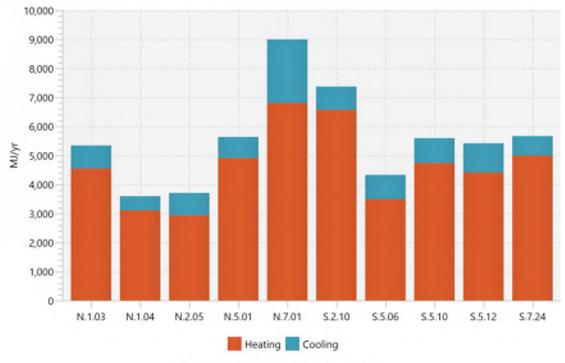




Figure 12: Graph from HERO Software showing the distribution of energy within the selection of apartments

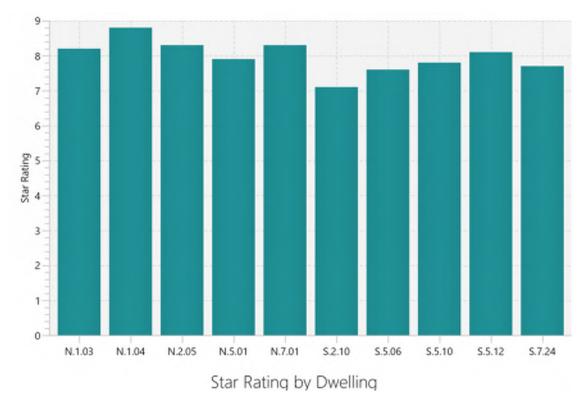
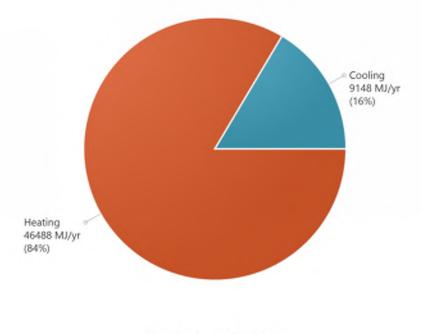


Figure 13: Square metre energy consumption per apartment selected



Heating vs Cooling

Figure 14: Ratio between heating and cooling energy

Dwelling	Rating	Rating Limit	Total (MJ/yr)	Total (MJ/m²yr)	Heating (MJ/yr)	Heating (MJ/m²yr)	Heating Limit (MJ/m²yr)	Cooling (MJ/yr)	Cooling (MJ/m²yr)	Cooling Limit (MJ/m²yr)
N.1.03	8.20	5.0	5340.00	80.90	4548.00	68.9	233.0	792.0	12.0	50.0
N.1.04	8.80	5.0	3593.00	52.20	3103.00	45.0	233.0	491.0	7.1	50.0
N.2.05	8.30	5.0	3706.00	73.60	2935.00	58.3	233.0	771.0	15.3	50.0
N.5.01	7.90	5.0	5634.00	91.70	4907.00	79.9	233.0	727.0	11.8	50.0
N.7.01	8.30	5.0	8995.00	76.80	6801.00	58.1	233.0	2194.0	18.7	50.0
S.2.10	7.10	5.0	7370.00	135.30	6567.00	120.6	233.0	803.0	14.7	50.0
S.5.06	7.60	5.0	4328.00	111.80	3489.00	90.1	233.0	838.0	21.7	50.0
S.5.10	7.80	5.0	5592.00	102.70	4735.00	86.9	233.0	857.0	15.7	50.0
S.5.12	8.10	5.0	5416.00	88.00	4409.00	71.7	233.0	1006.0	16.4	50.0
S.7.24	7.70	5.0	5663.00	106.90	4994.00	94.3	233.0	669.0	12.6	50.0

The individual apartment results are:

NatHERS Assumptions (Residential)

Floors

Concrete Slab on Ground (basement): Uninsulated Concrete Slab on Ground (ground): R2.0 added Suspended Concrete Slab (ground above basement): R2.0 added Intermediate Floors: R2.0 added (likely to be able to down-spec)

External Walls

Basement: Uninsulated External Walls Generally: 150mm Precast Concrete and R2.5 added insulation

Internal Walls

Neighbouring Walls: 150mm Precast Concrete and R2.5 insulation Internal Plasterboard Walls Generally: R2.0 min to unconditioned spaces (wet areas)

Ceilings

Ceiling of Basement: Uninsulated

External Ceilings Generally: R5.0 to ceiling, no sarking to roof (can be upgraded if required) Intermediate Ceilings: Uninsulated (modelled with R2.5 on the floor above, see above)

Windows

Generally: Average of U3.0 and SHGC of 0.5 (substitution range between 0.48 and 0.52)

Penetrations

All downlights and Exhaust fans sealed and insulated

Ceiling Fans

No Ceiling fans have been modelled however would be a good addition to all living areas and bedrooms

Melbourne Water's STORM Calculator Results

-						
TransactionID:	1453516					
Municipality:	BALLARAT					
Rainfall Station:	BALLARAT					
Address:	102-108 Humffray	Street South				
	BAKERY HILL					
	VIC	3350				
Assessor:						
Development Type:	Residential - Mixed	d Use				
Allotment Site (m2):	5,000.00					
STORM Rating %:	101					
Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%
Commercial Rooftop	1,100.00	None	0.00	0	0.00	0.00
Residential Rooftop West	690.00	Rainwater Tank	15,000.00	80	152.20	80.00
Residential Rooftop East	310.00	Rainwater Tank	5,000.00	45	139.20	76.00
Garden Area	2,900.00	Raingarden 300mm	30.00	0	122.60	0.00

Figure 15: Melbourne Water's STORM tool showing compliance

NABERS Calculation (Commercial)

Summary of Net Lettable Area:

Level	NLA Office	NLA Commercial
GROUND	485.1	218.3
LEVEL 1	1326.8	0
LEVEL 2	1250.9	0
LEVEL 3	1092.5	0
LEVEL 4	946.6	0
LEVEL 5	953.8	0
LEVEL 6	765.6	0
LEVEL B1	0	0
LEVEL B2	0	0
LEVEL MEZ	368.9	0
ROOF	0	0
	7190.2	218.3
TOTAL NLA	7408.5	
Default Occupancy	519	

Detailed calculation of electricity consumption:

Lighting	
Requirement (lux)	160
In Watts/m²	1.78
Total Area (m²)	9338
% of year lit	0.34
Carpark Lighting (lux)	10
In Watts/m² (carpark)	0.11
Carpark Area (m²)	3600
Total kW	50720.055

Computers	Qty	Peak Load (V	Off Peak Load (\	/Peak Hrs	Off Peak Hours	Total kW
Desktop	20	7 120	8	2160	6600	64584
Monitor	41	4 90	5	2160	6600	94143.6
Laptop	10	3 35	3	2160	6600	9826.2
Laptop Ext Screen	10	3 50	5	2160	6600	14523
Laptop + Ext Screen	10	3 65	5	2160	6600	17860.2
					Total	200937

Servers	
Servers per Level	4
Levels	7
Watts per Server	140
Computers (ALL)	519
Watts per Computer	4.5
TOTAL kW	20458.56

Refrigeration	Powe	ər
Refrigerators per level	2	
Levels	7	
Fridge Capacity	140	46
Freezer Capacity	70	52
TOTAL kW	12026.952	

2
_
7
13499.64

Hot Water Dispenser	
Dispensers per level	2
Levels	7
People	519
TOTAL KW	6483.8375

Chilled Water Unit	
Dispensers per level	2
Levels	7
TOTAL KW	2352

Other Equipment	Qty	Operation	Standby	Peak Hrs	Off-Peak Hours	Total kW
A4 Laser Printer	-	7 11) 22	2160	6600	2679.6
Fax/Inkjet Printer	() 2) 5	2160	6600	0
Copier	-	7 15) 5	2160	6600	2499
TV	14	4 6	5 5	2160	6600	2427.6
Shredder	-	7 1) 2	2160	6600	243.6
Electronic Whiteboard	14	1 1) 2	2160	6600	487.2
Scanner	-	7	8 8	2160	6600	490.56
Laminator	-	7 6	5 37.2	2160	6600	2701.44
Binder	-	7	3 2	2160	6600	213.36
Dishwasher	-	7 4	6 C	2160	6600	695.52
Oven	-	7 6	0 0	2160	6600	907.2
Microwave]4	1 6	2 2	2160	6600	2059.68
Small Kitchen Appliances	28	3 10	0 0	2160	6600	6048
Coffee Machine	-	7 15) (2160	6600	2268
Hot Water Service	2	2 20	200	2160	6600	3504
						27224.76

e:\ssa\01_projects\0118_humffray\06_smp\220923_smp_revision_02\220923_humffray_pla Page 30 nning_report_rev_02 - ew.docx Files attached below to this report:

220906_HUMFFRAY_NatHERS_Preview_Certificates_COMBINED.pdf 220913_HUMFFRAY_Resi-Section_J-r3.pdf 220924_HUMFFRAY_Commercial-Section_J-r3.pdf 220925_HUMFFRAY_Scorecard-SSA_Comments.pdf 220912_Reverse_CALC-Commercial-Office.pdf

Nationwide House Energy Rating Scheme — Class 2 Summary NatHERS Certificate No.

Generated on 06 Sept 2022 using Hero 3.0.1

Property

Address 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350 Lot/DP

NatHERS climate zone 66 - Ballarat Aerodrome

Accredited assessor



Shared Space Architecture Shared Space Architecture.com.au +61 406376341 Accreditation No. DMN/21/2003 Assessor Accrediting Organisation DMN

Verification

DRAFT PREVIEW ISSUE - NOT TO BE USED FOR CONTIFICATION

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (MJ/m²)	Cooling load (MJ/m²)	Total load (MJ/m²)	Star rating
	Unit 01	45.0	7.1	52.2	8.8
	Unit 02	68.9	12.0	80.9	8.2
	Unit 03	58.3	15.3	73.6	8.3
	Unit 04	120.6	14.7	135.3	7.1

National Construction Code (NCC) requirements

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

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

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



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

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (MJ/m²)	Cooling load (MJ/m²)	Total load (MJ/m²)	Star rating
	Unit 05	90.1	21.7	111.8	7.6
	Unit 06	86.9	15.7	102.7	7.8
	Unit 07	71.7	16.4	88.0	8.1
	Unit 08	79.9	11.8	91.7	7.9
	Unit 09	94.3	12.6	106.9	7.7
	Unit 10	58.1	18.7	76.8	8.3
Average	10x (Total)	77.4	14.6	92.0	8.0

Explanatory Notes

About this report

This summary rating is the average rating of all NCC Class 2 dwellings in a development. The individual dwellings' ratings are a comprehensive, dynamic computer modelling evaluation of a home, using the floorplans, elevations and specifications to estimate the energy load. It addresses the building layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings), but does not cover the water or energy use of appliances, or energy production of solar panels. For more details about an individual dwelling's assessment, refer to the individual dwelling's NatHERS Certificate (accessible via link).

Accredited Assessors

To ensure the NatHERS Certificate is of a high quality, always use an accredited or licen of assessor. NatHERS accredited assessors are members of a professional body called an Assessor Accrediting Organis tion (1.00). AAOs have specific quality assurance processes in place, and continuing professional development requirements, to maintain a high and consistent standard of assessments across the country.

Any questions or concerns about this report should be directed to the assessment in the first instance. If the assessor is unable to address these questions or concerns, the AAO specified on the front of this certificate should be contacted.

Disclaimer

The format of the NatHERS Certificate was developed by the NatHERS Administrator. However the content, input and creation of the NatHERS Certificate is by the assessor. It is the esponsibility of the assessor who prepared this certificate to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

Nationwide House Energy Rating Scheme NatHERS Certificate No.

Generated on 06 Sept 2022 using Hero 3.0.1

Property

Address	Unit 02, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350
Lot/DP	
NCC Class*	2
Туре	New

Plans

Phone

Main Plan	27 July 2022
Prepared by	Six Degrees Architecture

Construction and environment

Assessed floor area (m ²)	*	Exposure Type
Conditioned*	66.0	Suburban
Unconditioned*	5.4	NatHERS climate zone
Total	71.4	66 - Ballarat Aerodrome
Garage	0.0	
Accredite	d assessor	
Name		
Business name	Shared Space	reture
Email	eshare، p	acharchitecture.com.au



The more stars the more energy efficient

80.9 MJ/m² Predicted annual energy load for heating and cooling based on standard occupancy assumptions.

Thermal Performance Heating Cooling 68.9 12.0 MJ/m² MJ/m²

About the rating

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

Verification

DRAFT PREVIEW ISSUE - NOT TO BE USED FOR CERTIFICATION

National Construction Code (NCC) requirements

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

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

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

* Refer to glossary.

Certificate Check

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

Genuine certificate

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

Ceiling penetrations*

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

Windows

Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate?

Apartment entrance doors

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

Exposure*

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

Provisional* values

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

Window an	d glazed door type and perfe	riance			
Default* window Window ID	VS Window Description	Maximum	SHGC*	SHGC sub tolerance	
None		U-value*		lower limit	upper limit
Custom* windov	vs			SHGC sub	stitution
Window ID Windo	Window Description	Maximum	SHGC*	tolerance ranges	
		U-value*		lower limit	upper limit
A&L-004-06 A	AI Awning Window DG 3/12Ar/3Sn	2.98	0.50	0.47	0.53

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient- ation	Shading device*
BED 01	A&L-004-06 A	W06	2100	1200	Awning	60	Е	None
BED 02	A&L-004-06 A	W05	2100	1200	Awning	60	Ν	None
KIT/LIV/DIN	A&L-004-06 A	W01	2100	796	Awning	60	W	None

* Refer to glossary.

Generated on 06 Sept 2022 using Hero 3.0.1 for Unit 02, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350

NatHERS Certificate 8.2 Star Rating as of 06 Sept 2022

Window and glazed door schedule

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient- ation	Shading device*
KIT/LIV/DIN	A&L-004-06 A	W02	2100	3600	Sliding	34	W	None
KIT/LIV/DIN	A&L-004-06 A	W03	2100	1200	Awning	60	Ν	None
KIT/LIV/DIN	A&L-004-06 A	W04	2100	1200	Awning	60	Ν	None

Roof window type and performance value

Default* roof windows SHGC substitution Maximum tolerance ranges SHGC* Window ID Window Description U-value* lower limit upper limit None Custom* roof windows SHGC substitution Maximum tolerance ranges Window ID Window Description SHGC* U-value* lower limit upper limit None Roof window schedule Window Window 0µ Heigh Width **Orient-**Outdoor Indoor nir Location ID (mm) ation no. (mm) shade shade None Skylight type and perf Skylight ID vlight description None Skylight schedule Skylight Shaft Skylight Skylight shaft **Orient-**Outdoor Area Location Diffuser ID No. length (mm) (m²) ation shade Reflectance None External door schedule Location Height (mm) Width (mm) **Opening %** Orientation None

* Refer to glossary.

Generated on 06 Sept 2022 using Hero 3.0.1 for Unit 02, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350

External wall type

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
CONC-150-PB	Precast 150mm Concrete - Plasterboard Internally	0.50	Medium	2.50	No

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orient- ation	Horizontal shading feature* projection (mm)	Vertical shading feature
BATH	CONC-150-PB	2800	1655	W	2316	Yes
BED 01	CONC-150-PB	2800	3001	E		Yes
BED 02	CONC-150-PB	2800	3599	Ν	675	Yes
BED 02	CONC-150-PB	2800	3001	Е		Yes
BED 02	CONC-150-PB	2800	1151	W	7668	Yes
ENSUITE	CONC-150-PB	2800	1655	Е		Yes
KIT/LIV/DIN	CONC-150-PB	2800	6249	W	2316	Yes
KIT/LIV/DIN	CONC-150-PB	2800	250	Ν	1826	Yes
Internal wall	type					

Internal wall type

Internal wall <i>type</i>			
Wall ID	Wall Type	Area (m²)	Bulk insulation
INT-PB	Interna Plaste board atud Wall	57.5	2.00
INT-PB	Internet Plasterboard Stud Wall	23.5	0.00

Floor type

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
BATH	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	5.5	N/A	2.00	Timber
BED 01	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	12.0	N/A	2.00	Timber
BED 02	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	11.2	N/A	2.00	Timber
ENSUITE	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	5.3	N/A	2.00	Timber
KIT/LIV/DIN	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	37.4	N/A	2.00	Timber

* Refer to glossary.

Ceiling *type*

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
BED 01	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	0.00	No
BED 02	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	0.00	No

Ceiling penetrations*

Location	Quantity	Туре	Diameter (mm)	Sealed /unsealed
BATH	1	Downlight	100	Sealed
BED 01	2	Downlight	100	Sealed
BED 02	2	Downlight	100	Sealed
ENSUITE	1	Downlight	100	Sealed
KIT/LIV/DIN	5	Downlight	100	Sealed
KIT/LIV/DIN	1	Exhaust Fan	250	Sealed

Ceiling fans	Quantity	Diameter (n	nm)
None			
Roof <i>type</i>	\sim		
Construction	Added insulation (R-value)	Solar absorptance	Roof Colour
FLAT-01: Flat Framed / Skillion Me al Roof / Flat PB	Ceiling 0.00	0.50	Medium

Explanatory Notes

About this report

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

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

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The predicted annual energy load in this NatHERS Certificate is an estimate based on an assessment of the building by the assessor. It is not a prediction of actual energy use, but may be used to compare how other buildings 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, indoor air temperature and local climate.

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

Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
Assessed floor area	the floor area modelled in the software for the purpose of the Natter RS 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 downlight vents, exhaust fans, rangehoods, chimneys and flues. Excludes
	fixtures attached to the ceiling with small holes through the ceiling for hing, e.g. ceiling fans; pendant lights, and heating and cooling ducts.
Conditioned	a zone within a dwelling that is expected to require reating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
Custom windows	windows listed in NatHERS software the are vailable to the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
Default windows	windows that are representative of a specie type of window product and whose properties have been derived by statistical methods.
Entrance door	these signify ventilative benefit on the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Gime 2 bundle.
Exposure category - exposed	terrain an no obstactions g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
Exposure category - open	terrain whifew obstructions are a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, light vegetate bush blocks, elevated units (e.g. above 3 floors).
Exposure category - suburban	terrain with never as, 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)	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4
Class	buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
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
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	for NatHERS this is typically an operable window (i.e. can be opened), will have a plaster or similar light well if there is an attic space, and generally does not have a diffuser.
Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	the fraction of incident solar radiation admitted through a window, both directly transmitted as well as absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits.
Skulight (also known as reaf lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
Skylight (also known as roof lights) U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions
Unconditioned	
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).

Nationwide House Energy Rating Scheme NatHERS Certificate No.

Generated on 06 Sept 2022 using Hero 3.0.1

Property

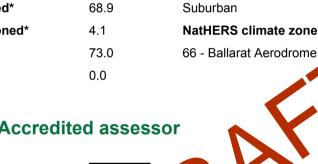
Address	Unit 01, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350
Lot/DP	
NCC Class*	2
Туре	New

Plans

Main Plan	27 July 2022
Prepared by	Six Degrees Architecture

Construction and environment

Assessed floor area (m ²)*			
Conditioned*	68.9		
Unconditioned* 4.1			
Total	73.0		
Garage 0.0			



Exposure Type

Name	
Business name	Sh
Email	
Phone	+6
Accreditation No.	D
Assessor Accrediting Organisation	DN
Declaration of interest	No

hared Space architecture.com.au ashare pa 63763 MN/2 ΜN No Conflict of Interest

The more stars the more energy efficient

> heating and cooling based on standard occupancy assumptions.

52.2 MJ/m² Predicted annual energy load for

Thermal Performance					
Heating	Cooling				
45.0	7.1				
MJ/m²	MJ/m²				

About the rating

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

Verification

DRAFT PREVIEW ISSUE - NOT TO BE USED FOR CERTIFICATION

National Construction Code (NCC) requirements

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

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

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

Certificate Check

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

Genuine certificate

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

Ceiling penetrations*

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

Windows

Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate?

Apartment entrance doors

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

Exposure*

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

Provisional* values

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

Window an	d glazed door type and perfe	riance			
Default* windows Window ID Window Description			SHGC*	SHGC substitution tolerance ranges	
None		U-value*		lower limit	upper limit
Custom* windov	vs			SHGC sub	stitution
Window ID	Window Description	Maximum	SHGC*		
		U-value*		lower limit	upper limit
A&L-004-06 A	AI Awning Window DG 3/12Ar/3Sn	2.98	0.50	0.47	0.53

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient- ation	Shading device*
BED 01	A&L-004-06 A	W04	2100	1200	Awning	60	Е	None
BED 02	A&L-004-06 A	W01	2100	1200	Awning	60	Ν	None
DIN/KIT/LIV	A&L-004-06 A	W03	2100	743	Awning	60	E	None

* Refer to glossary.

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Window and glazed door schedule

Location	Window	Window	Height	Width	Window	Opening	Orient-	Shading
	ID	no.	(mm)	(mm)	type	%	ation	device*
DIN/KIT/LIV	A&L-004-06 A	W02	2100	3490	Sliding	45	Ν	None

Roof window type and performance value

Default* roof windows SHGC substitution Maximum tolerance ranges Window ID Window Description SHGC* U-value* lower limit upper limit None Custom* roof windows SHGC substitution Maximum tolerance ranges SHGC* Window ID Window Description U-value* lower limit upper limit None Roof window schedule Window Window Opening Height Width **Orient-**Outdoor Indoor Location ID no. % nm) (mm) ation shade shade None Skylight type and performance Skylight es Skylight ID None Skylight schedule Skylight Skylig kylight shaft Area Orient-Outdoor Shaft Location Diffuser ID No. length (mm) (m²) ation shade Reflectance None External door schedule Location Height (mm) Width (mm) Orientation **Opening %** None

External wall type

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
CONC-150-PB	Precast 150mm Concrete - Plasterboard Internally	0.50	Medium	2.50	No

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orient- ation	Horizontal shading feature* projection (mm)	Vertical shading feature
BED 01	CONC-150-PB	2800	3658	E		Yes
BED 02	CONC-150-PB	2800	3650	Ν	819	Yes
BED 02	CONC-150-PB	2800	1642	E		Yes
DIN/KIT/LIV	CONC-150-PB	2800	4052	E		Yes
DIN/KIT/LIV	CONC-150-PB	2800	5203	Ν	2563	Yes

Internal wall type

Wall ID	Wall Type	Area (m²)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	47.3	0.00
INT-PB	Internal Plasterboard Stud Wall	47.3	2.00

Floor *type*

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
BATH	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	4.2	N/A	2.00	Timber
BED 01	SUSP-CONC-100: Suspenced Concrete Slab Floor (100mm)	11.8	N/A	2.00	Timber
BED 02	SUSP-CONC 50: Surbender Concrete Slab Floor (100mm)	10.3	N/A	2.00	Timber
DIN/KIT/LIV	SUST-CONC 100. Suspended Concrete Slab Floor, 100mm)	42.3	N/A	2.00	Timber
ENSUITE	SUSP-CONC 00: Suspended Concrete Slab Floor (10cm)	4.5	N/A	2.00	Timber

Ceiling type

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

Ceiling penetrations*

Location	Quantity	Туре	Diameter (mm)	Sealed /unsealed
BATH	1	Downlight	100	Sealed
BED 01	2	Downlight	100	Sealed
BED 02	1	Downlight	100	Sealed

* Refer to glossary.

Generated on 06 Sept 2022 using Hero 3.0.1 for Unit 01, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350

Ceiling penetrations*

Location	Quantity	Туре	Diameter (mm)	Sealed /unsealed
DIN/KIT/LIV	6	Downlight	100	Sealed
DIN/KIT/LIV	1	Exhaust Fan	250	Sealed
ENSUITE	1	Downlight	100	Sealed

Ceiling fans

Location	Quantity	Diameter (mm)
None		
Roof <i>type</i>		

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



Explanatory Notes

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Exposure category - exposed	terrain an no obstructions g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
Exposure category - open	terrain who few obstructions are a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, light vegetate bush blocks, elevated units (e.g. above 3 floors).
Exposure category - suburban	terrain with new ras, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
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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.
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).

Nationwide House Energy Rating Scheme NatHERS Certificate No.

Generated on 06 Sept 2022 using Hero 3.0.1

Property

Address	Unit 03, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350
Lot/DP	
NCC Class*	2
Туре	New

Plans

Main Plan	27 July 2022
Prepared by	Six Degrees Architecture

Construction and environment

Assessed floor area	Ex	
Conditioned*	50.4	Sul
Unconditioned*	5.4	Na
Total	55.7	66
Garage	0.0	
CCREDIP.		



Name	
Business name	Shared Space Arei
Email	esharet patharc
Phone	+61 4. 637634
Accreditation No.	DMN/2101-03
Assessor Accrediting Organisation	DMN
Declaration of interest	No Conflict of Interest

posure Type burban tHERS climate zone - Ballarat Aerodrome Accredited assessor

architecture.com.au



73.6 MJ/m² Predicted annual energy load for heating and cooling based on standard occupancy assumptions.

Thermal Performance Heating Cooling 58.3 15.3 MJ/m² MJ/m²

About the rating

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

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National Construction Code (NCC) requirements

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

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Ceiling penetrations*

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

Windows

Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate?

Apartment entrance doors

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

Exposure*

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

Provisional* values

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

Window an	nd glazed door <i>type and perfor</i>	nance			
Default* window Window ID	VS Window Description	Maximum	SHGC*	SHGC sub tolerance	
None		U-value*			upper limit
Custom* windov	ws			SHGC sub	stitution
Window ID	Window Description	Maximum	SHGC*	tolerance	ranges
		U-value*		lower limit	upper limi
A&L-004-06 A	AI Awning Window DG 3/12Ar/3Sn	2.98	0.50	0.47	0.53

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient- ation	Shading device*
BED 01	A&L-004-06 A	W02	2100	1200	Awning	60	Е	None
KIT/DIN/LIV	A&L-004-06 A	W01	2100	3300	Sliding	45	E	None

Roof window type and performance value

Default* roof windows SHGC substitution Maximum tolerance ranges SHGC* Window ID Window Description U-value* lower limit upper limit None Custom* roof windows SHGC substitution Maximum tolerance ranges Window Description SHGC* Window ID U-value* lower limit upper limit None Roof window schedule Window Width Window Opening Height **Orient-**Outdoor Location shade ID no. % (mm) (mm) ation None Skylight type and performance Skylight ID Skylight description None Skylight schedule Skylight Skylight Skylight share Orient-Outdoor Shaft Area Location Diffuser ID length (mm) shade Reflectance No. ation None External door sched de Location Height (mm) Width (mm) **Opening %** Orientation None

External wall type

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
CONC-150-PB	Precast 150mm Concrete - Plasterboard Internally	0.50	Medium	2.50	No
INT-PB	Internal Plasterboard Stud Wall	0.50	Medium	2.50	No

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orient- ation	Horizontal shading feature* projection (mm)	Vertical shading feature
BED 01	CONC-150-PB	2800	3010	E	1932	Yes

* Refer to glossary.

Generated on 06 Sept 2022 using Hero 3.0.1 for Unit 03, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350

Indoor

shade

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orient- ation	Horizontal shading feature* projection (mm)	Vertical shading feature
KIT/DIN/LIV	INT-PB	2800	8726	S		No
KIT/DIN/LIV	CONC-150-PB	2800	131	W		Yes
KIT/DIN/LIV	CONC-150-PB	2800	3399	E	1932	Yes
KIT/DIN/LIV	CONC-150-PB	2800	97	Ν		Yes

Internal wall type

Wall ID	Wall Type	Area (m²)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	53.1	2.00
INT-PB	Internal Plasterboard Stud Wall	17.8	0.00

Floor type

Location	Construction	Area (m²)	Sub-floor ventilatio	Added insulatior (R-value)	n Covering
BATH	SUSP-CONC-100: Suspended Concrete Sho Floor (100mm)	5.4	N/A	2.00	Timber
BED 01	SUSP-CONC-100: Suspended Corprete Slab Floor (100mm)	11.6	N/A	2.00	Timber
KIT/DIN/LIV	SUSP-CONC-100: Suspended Soncret Slab Floor (100mm)	32.9	N/A	2.00	Timber
STUDY	SUSP-CONC 00: Su pende Concrete Slab Floor (100mm)	6.0	N/A	2.00	Timber
Ceiling <i>type</i>				Bulk	
Location	Construction			insulation (R-value)	Reflective wrap*

None

Ceiling penetrations*

Location	Quantity	Туре	Diameter (mm)	Sealed /unsealed
BATH	1	Downlight	100	Sealed
BED 01	2	Downlight	100	Sealed
KIT/DIN/LIV	5	Downlight	100	Sealed
KIT/DIN/LIV	1	Exhaust Fan	250	Sealed
STUDY	1	Downlight	100	Sealed

Ceiling <i>fans</i>					
Location	Quantity	Diameter (n	Diameter (mm)		
None					
Roof <i>type</i>					
Construction	Added insulation (R-value)	Solar absorptance	Roof Colour		
None					

Explanatory Notes

About this report

A NatHERS rating is a comprehensive, dynamic computer modelling evaluation of a home, using the floorplans, elevations and specifications to estimate an energy load. It addresses the building layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings), but does not cover the water or energy use of appliances or energy production of solar panels.

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

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

Accredited assessors

To ensure the NatHERS Certificate is of a high quality, always use an accredited or licenced assessor. NatHERS accredited assessors are members of a professional body called an Assessor Accrediting Organisation (AAO).

Australian Capital Territory (ACT) licensed assessors may only produce assessments for regulatory purposes using software for which they have a licence endorsement. Licence endorsements can be confirmed on the ACT licensing register AAOs have specific quality assurance processes in place, and continuing professional development requirements, to maintain a high and consistent standard of assessments across the country. Non-accredited assessors do not have this level of quality assurance or any ongoing training requirements.

Any questions or concerns about this report should be directed to the assessor in the first instance. If the assessor is unable to address these questions or concerns, the AAO specified on the front of this certificate should be contacted.

Disclaimer

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The predicted annual energy load in this NatHERS Certificate is an estimate based on an assessment of the building by the assessor. It is not a prediction of actual energy use, but may be used to compare how other buildings 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, indoor air temperature and local climate.

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

Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
Assessed floor area	the floor area modelled in the software for the purpose of the Natter RS 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 downlight vents, exhaust fans, rangehoods, chimneys and flues. Excludes
	fixtures attached to the ceiling with small holes through the ceiling for hing, e.g. ceiling fans; pendant lights, and heating and cooling ducts.
Conditioned	a zone within a dwelling that is expected to require reating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
Custom windows	windows listed in NatHERS software the are vailable to the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
Default windows	windows that are representative of a specie type of window product and whose properties have been derived by statistical methods.
Entrance door	these signify ventilative benefit on the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Gime 2 bundle.
Exposure category - exposed	terrain an no obstactions g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
Exposure category - open	terrain whifew obstructions are a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, light vegetate bush blocks, elevated units (e.g. above 3 floors).
Exposure category - suburban	terrain with never as, 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)	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4
Class	buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
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
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	for NatHERS this is typically an operable window (i.e. can be opened), will have a plaster or similar light well if there is an attic space, and generally does not have a diffuser.
Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	the fraction of incident solar radiation admitted through a window, both directly transmitted as well as absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits.
Skulight (also known as reaf lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
Skylight (also known as roof lights) U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions
Unconditioned	
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).

Nationwide House Energy Rating Scheme NatHERS Certificate No.

Generated on 06 Sept 2022 using Hero 3.0.1

Property

Address	Unit 08, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350
Lot/DP	
NCC Class*	2
Туре	New

Plans

Main Plan	27 July 2022
Prepared by	Six Degrees Architecture

Construction and environment

Assessed floor area (m ²)*		Exposure Type
Conditioned*	61.4	Open
Unconditioned*	4.8	NatHERS climate zone
Total	66.3	66 - Ballarat Aerodrome
Garage	0.0	



Shared Space refine
esharet pathard
+61 4, 637634
DMN/210203
DMN
No Conflict of Interest

The more stars the more energy efficient

> 91.7 MJ/m² Predicted annual energy load for heating and cooling based on standard occupancy assumptions.

Thermal Performance							
Heating	Cooling						
79.9	11.8						
MJ/m²	MJ/m²						

About the rating

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

Verification

DRAFT PREVIEW ISSUE - NOT TO BE USED FOR CERTIFICATION

National Construction Code (NCC) requirements

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

architecture.com.au

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

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

Certificate Check

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

Genuine certificate

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

Ceiling penetrations*

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

Windows

Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate?

Apartment entrance doors

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

Exposure*

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

Provisional* values

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

Window an	d glazed door type and perfe	riance			
Default* window Window ID	VS Window Description	Maximum	SHGC*	SHGC sub tolerance	
None				lower limit	upper limit
Custom* windov	vs			SHGC sub	stitution
Window ID	Window Description	Maximum	SHGC*	tolerance	
		U-value*		lower limit	upper limit
A&L-004-06 A	AI Awning Window DG 3/12Ar/3Sn	2.98	0.50	0.47	0.53

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient- ation	Shading device*
BED 01	A&L-004-06 A	W02	2100	755	Awning	60	S	None
BED 01	A&L-004-06 A	W03	2100	800	Awning	60	W	None
BED 02	A&L-004-06 A	W05	2100	1200	Awning	60	W	None

* Refer to glossary.

Generated on 06 Sept 2022 using Hero 3.0.1 for Unit 08, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350

NatHERS Certificate 7.9 Star Rating as of 06 Sept 2022

Window and glazed door schedule

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient- ation	Shading device*
ENSUITE	A&L-004-06 A	W01	2100	760	Awning	60	S	None
KIT/DIN/LIV	A&L-004-06 A	W04	2100	3600	Sliding	30	W	None

Roof window *type and performance value*

Default* roof windows

Window ID	Wind	low Description	on			Maximum	SHGC*	SHGC substitution tolerance ranges	
		·				U-value*		lower limit	upper limi
None									
Custom* ro	of windows								
Window ID	Wind	low Descripti	n			Maximum	SHGC*	SHGC substitution tolerance ranges	
window iD	vvinc	iow Description				U-value*	U-value*		upper limi
None									
Roof wi	ndow <i>sc</i>	hedule							
Location	Wir ID	ndow	Window no.	Openiy %	g Height (mni	Width (mm)	Orient- ation	Outdoor shade	Indoor shade
None			•						
Skylight Skylight ID	t type an	d perfor	Marce Stalight d	scriptior	n				
None									
Skylight	t schedu	ile							
Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m²)	Orient- ation	Outdoor shade	Diffuser	Shaft Refle	ctance
None									

External door schedule

Location	Height (mm)	Width (mm)	Opening %	Orientation
None				

External wall type

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
CONC-150-PB	Precast 150mm Concrete - Plasterboard Internally	0.50	Medium	2.50	No

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orient- ation	Horizontal shading feature* projection (mm)	Vertical shading feature
BED 01	CONC-150-PB	2800	4001	S		Yes
BED 01	CONC-150-PB	2800	2998	W	2270	Yes
BED 02	CONC-150-PB	2800	3001	W	2270	Yes
ENSUITE	CONC-150-PB	2800	2900	S		Yes
KIT/DIN/LIV	CONC-150-PB	2800	3603	W	2270	Yes

Internal wall type

Wall ID	Wall Type	Area (m²)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	94.6	2.00

Floor type

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
BATH	SUSP-CONC-100: Suspended Concrete Stro Floor (100mm)	5.8	N/A	2.00	Timber
BED 01	SUSP-CONC-100: Suspended Coccrete Slab Floor (100mm)	12.7	N/A	2.00	Timber
BED 02	SUSP-CONC-100: Suspenced Concrete Slab Floor (100mm)	10.1	N/A	2.00	Timber
ENSUITE	SUSP-CONC 10: Surpender Concrete Slab Floor (100mm)	4.8	N/A	2.00	Timber
KIT/DIN/LIV	SUS -CONC 00. Ruspended Concrete Slab Floor 100mm)	32.8	N/A	2.00	Timber
Ceiling <i>type</i>					

Location	Construction	Bulk insulation Reflective wrap* (R-value)
News		

None

Ceiling penetrations*

Location	Quantity	Туре	Diameter (mm)	Sealed /unsealed
BATH	1	Downlight	100	Sealed
ВАТН	1	Exhaust Fan	250	Sealed
BED 01	2	Downlight	100	Sealed
BED 02	1	Downlight	100	Sealed

Ceiling penetrations*

Location	Quantity	Туре	Diameter (mm)	Sealed /unsealed
ENSUITE	1	Downlight	100	Sealed
ENSUITE	1	Exhaust Fan	250	Sealed
KIT/DIN/LIV	5	Downlight	100	Sealed
KIT/DIN/LIV	1	Exhaust Fan	250	Sealed

Ceiling fans

Location	Quantity	Diameter (mm)
None		

Roof *type*

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



Explanatory Notes

About this report

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Entrance door	these signify ventilation benefit on the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 bulk sign.
Exposure category - exposed	terraip can no obstructions g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
Exposure category - open	terrain who few obstructions are a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, light vegetate bush blocks, elevated units (e.g. above 3 floors).
Exposure category - suburban	terrain with meet as, 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)	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4
Class	buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
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
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	for NatHERS this is typically an operable window (i.e. can be opened), will have a plaster or similar light well if there is an attic space, and generally does not have a diffuser.
Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	the fraction of incident solar radiation admitted through a window, both directly transmitted as well as absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits.
Skylight (also known as roof lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
Unconditioned	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions
Vertical shading features	provides shading to the building in the vertical plane and can be parallel or perpendicular to the subject wall/window. Includes privacy screens, other walls in the building (wing walls), fences, other buildings, vegetation (protected or listed heritage trees).

Nationwide House Energy Rating Scheme NatHERS Certificate No.

Generated on 06 Sept 2022 using Hero 3.0.1

Property

Address	Unit 10, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350
Lot/DP	
NCC Class*	2
Туре	New

Plans

Main Plan	27 July 2022
Prepared by	Six Degrees Architecture

Construction and environment

Assessed floor area (m ²)	*	Exposure Type
Conditioned*	117.1	Open
Unconditioned*	2.4	NatHERS climate zone
Total	119.5	66 - Ballarat Aerodrome
Garage	0.0	
*SSESSOT	d assessoi	
Name		
Business name	Shared Space	rrture
Email	share، p	acharchitecture.com.au
Phone	+61 4 637634	
Accreditation No.	DMN/2102-03	

Declaration of interest No Conflict of Interest

DMN



76.8 MJ/m² Predicted annual energy load for heating and cooling based on standard occupancy assumptions.

Thermal Performance					
Heating	Cooling				
58.1	18.7				
MJ/m²	MJ/m²				

About the rating

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

Verification

DRAFT PREVIEW ISSUE - NOT TO BE USED FOR CERTIFICATION

National Construction Code (NCC) requirements

Assessor Accrediting

Organisation

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

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

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

Certificate Check

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

Genuine certificate

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

Ceiling penetrations*

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

Windows

Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate?

Apartment entrance doors

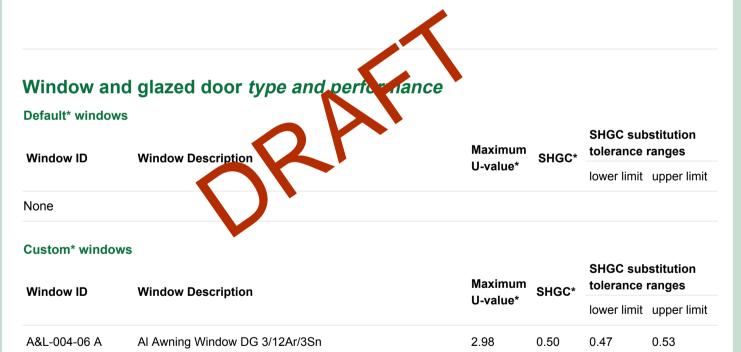
Does the 'External Door Schedule' show apartment entrance doors? Please note that an "external door" between the modelled dwelling and a shared space, such as an enclosed corridor or foyer, should not be included in the assessment (because it overstates the possible ventilation) and would invalidate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

Exposure*

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

Provisional* values

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



Window and glazed door schedule

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient- ation	Shading device*
BED 01	A&L-004-06 A	W01	2100	1200	Awning	60	W	None
BED 02	A&L-004-06 A	W02	2100	1200	Awning	60	W	None
BED 03	A&L-004-06 A	W03	2100	1200	Awning	60	W	None

* Refer to glossary.

Generated on 06 Sept 2022 using Hero 3.0.1 for Unit 10, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350

NatHERS Certificate 8.3 Star Rating as of 06 Sept 2022

Window and glazed door schedule

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient- ation	Shading device*
DIN/LIV/KIT	A&L-004-06 A	W04	2100	900	Awning	60	W	None
DIN/LIV/KIT	A&L-004-06 A	W05	2100	1200	Awning	60	W	None
DIN/LIV/KIT	A&L-004-06 A	W06	2100	3600	Sliding	45	Ν	None
DIN/LIV/KIT	A&L-004-06 A	W07	2100	1200	Awning	60	Ν	None

Roof window type and performance value

Window ID	Wind	ow Descriptio	n an			Maximum	SHGC*	SHGC sub tolerance	ostitution ranges
WINDOW ID	VVIIIdo	ow Description				U-value*	51160	lower limit	upper lim
None									
Custom* ro	of windows								
Window ID	Windo	ow Descriptic	on			Maximum	SHGC*	SHGC sub tolerance	
		•				U-value*		lower limit	upper lim
None									
Roof wi	ndow <i>scl</i>		1						
Location	Wind ID	wob	Window	%	Heigh (mm)	t Width (mm)	Orient- ation	Outdoor shade	Indoor shade
None					. ,	. ,			
	t type and	d perforr		scriptio	ı				
Skylight ID	t type and	d pelforr	nance Skylight de	scriptio	1				
Skylight ID None				scriptio	1				
Skylight ID None	t <i>type and</i> t <i>schedul</i> Skylight ID			scription Area (m²)	n Orient- ation	Outdoor shade	Diffuser	Shaft Refle	ctance
Skylight ID None Skylight	t <i>schedul</i> Skylight	le Skylight	Skylight de Skylight shaft	Area	Orient-		Diffuser		
Skylight ID None Skylight Location None	t <i>schedul</i> Skylight ID	e Skylight No.	Skylight de Skylight shaft	Area	Orient-		Diffuser		
Skylight ID None Skylight Location None	t <i>schedul</i> Skylight	e Skylight No.	Skylight de Skylight shaft	Area (m²)	Orient-	shade	Diffuser	Refle	

* Refer to glossary.

Generated on 06 Sept 2022 using Hero 3.0.1 for Unit 10, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350

External wall type

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
CONC-150-PB	Precast 150mm Concrete - Plasterboard Internally	0.50	Medium	2.50	No

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orient- ation	Horizontal shading feature* projection (mm)	Vertical shading feature
BED 01	CONC-150-PB	2800	5046	S		Yes
BED 01	CONC-150-PB	2800	3400	W		No
BED 02	CONC-150-PB	2800	2997	W		No
BED 03	CONC-150-PB	2800	3598	W		No
DIN/LIV/KIT	CONC-150-PB	2800	7511	W		No
DIN/LIV/KIT	CONC-150-PB	2800	6896	Ν		No
ENSUITE	CONC-150-PB	2800	1956	S		Yes
Internal wall	type		<			

Internal wall type

Wall ID	Wall Type	Area (m²)	Bulk insulation
INT-PB	Internal Plasterboar Stu Walk	71.9	2.00
INT-PB	Interna Plaste board atud Wall	73.5	0.00
Floor <i>type</i>		A -1-1-	

Floor *type*

BATHSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)7.0N/A2.00TimberBED 01SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)16.6N/A2.00TimberBED 02SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)10.6N/A2.00TimberBED 03SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)10.5N/A2.00TimberDIN/LIV/KITSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)62.6N/A2.00TimberDIN/LIV/KITSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)62.6N/A2.00TimberPANTRYSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)5.3N/A2.00TimberPOWDERSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)4.6N/A2.00Timber	Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
BED 01Floor (100mm)16.6N/A2.00TimberBED 02SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)10.6N/A2.00TimberBED 03SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)10.5N/A2.00TimberDIN/LIV/KITSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)62.6N/A2.00TimberDIN/LIV/KITSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)62.6N/A2.00TimberENSUITESUSP-CONC-100: Suspended Concrete Slab Floor (100mm)5.3N/A2.00TimberPANTRYSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)4.6N/A2.00TimberPOWDERSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)2.4N/A2.00Timber	BATH	·	7.0	N/A	2.00	Timber
BED 02Floor (100mm)10.6N/A2.00TimberBED 03SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)10.5N/A2.00TimberDIN/LIV/KITSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)62.6N/A2.00TimberENSUITESUSP-CONC-100: Suspended Concrete Slab Floor (100mm)5.3N/A2.00TimberPANTRYSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)5.3N/A2.00TimberPOWDERSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)4.6N/A2.00Timber	BED 01	-	16.6	N/A	2.00	Timber
BED 03Floor (100mm)10.5N/A2.00TimberDIN/LIV/KITSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)62.6N/A2.00TimberENSUITESUSP-CONC-100: Suspended Concrete Slab Floor (100mm)5.3N/A2.00TimberPANTRYSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)4.6N/A2.00TimberPOWDERSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)4.6N/A2.00Timber	BED 02	•	10.6	N/A	2.00	Timber
DIN/LIV/KITFloor (100mm)62.6N/A2.00TimberENSUITESUSP-CONC-100: Suspended Concrete Slab Floor (100mm)5.3N/A2.00TimberPANTRYSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)4.6N/A2.00TimberPOWDERSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)2.4N/A2.00Timber	BED 03	•	10.5	N/A	2.00	Timber
ENSUITEFloor (100mm)5.3N/A2.00TimberPANTRYSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)4.6N/A2.00TimberPOWDERSUSP-CONC-100: Suspended Concrete Slab Floor (100mm)2.4N/A2.00Timber	DIN/LIV/KIT	•	62.6	N/A	2.00	Timber
PANTRY Floor (100mm) SUSP-CONC-100: Suspended Concrete Slab 2.4 N/A 2.00 Timber	ENSUITE	·	5.3	N/A	2.00	Timber
POWDER 24 N/A 200 Limber	PANTRY	-	4.6	N/A	2.00	Timber
FIOOR (100mm)	POWDER	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	2.4	N/A	2.00	Timber

Ceiling type

Location	Construction	Bulk insulation (R-value)	Reflective wrap*
BATH	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	5.00	Yes
BED 01	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	5.00	Yes
BED 02	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	5.00	Yes
BED 03	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	5.00	Yes
DIN/LIV/KIT	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	5.00	Yes
ENSUITE	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	5.00	Yes
PANTRY	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	5.00	Yes
POWDER	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	5.00	Yes

Ceiling penetrations*

Location	Quantity	Туре	Diameter (mm)	Sealed /unsealed
BATH	1	Downight	100	Sealed
BED 01	2	Downwht	100	Sealed
BED 02	2	Downlight	100	Sealed
BED 03	1	Downlight	100	Sealed
DIN/LIV/KIT		Downlight	100	Sealed
DIN/LIV/KIT	1	Exhaust Fan	250	Sealed
ENSUITE	1	Downlight	100	Sealed
PANTRY	1	Downlight	100	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

Explanatory Notes

About this report

A NatHERS rating is a comprehensive, dynamic computer modelling evaluation of a home, using the floorplans, elevations and specifications to estimate an energy load. It addresses the building layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings), but does not cover the water or energy use of appliances or energy production of solar panels.

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

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

Accredited assessors

To ensure the NatHERS Certificate is of a high quality, always use an accredited or licenced assessor. NatHERS accredited assessors are members of a professional body called an Assessor Accrediting Organisation (AAO).

Australian Capital Territory (ACT) licensed assessors may only produce assessments for regulatory purposes using software for which they have a licence endorsement. Licence endorsements can be confirmed on the ACT licensing register AAOs have specific quality assurance processes in place, and continuing professional development requirements, to maintain a high and consistent standard of assessments across the country. Non-accredited assessors do not have this level of quality assurance or any ongoing training requirements.

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Disclaimer

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The predicted annual energy load in this NatHERS Certificate is an estimate based on an assessment of the building by the assessor. It is not a prediction of actual energy use, but may be used to compare how other buildings 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, indoor air temperature and local climate.

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Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
Assessed floor area	the floor area modelled in the software for the purpose of the Nathard 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 downlight, wents, exhaust fans, rangehoods, chimneys and flues. Excludes fixtures attached to the ceiling with small holes the reginner of the ceiling for the reginner of the region of the reginner of the reginner of the region of the reginner of the regin
Conditioned	a zone within a dwelling that is expected to require eating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
Custom windows	windows listed in NatHERS software the are vailable to the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
Default windows	windows that are representative of a spece c type of window product and whose properties have been derived by statistical methods.
Entrance door	these signify ventilative benefit on the movelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Giran 2 bulker 3.
Exposure category - exposed	terrain an no obstructions g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
Exposure category - open	terrain who few obstructions are a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, light vegetate bush blocks, elevated units (e.g. above 3 floors).
Exposure category - suburban	terrain with new ras, 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)	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4
Class	buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
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
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	for NatHERS this is typically an operable window (i.e. can be opened), will have a plaster or similar light well if there is an attic space, and generally does not have a diffuser.
Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	the fraction of incident solar radiation admitted through a window, both directly transmitted as well as absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits.
Skylight (also known as roof lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
Unconditioned	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions
Vertical shading features	provides shading to the building in the vertical plane and can be parallel or perpendicular to the subject wall/window. Includes privacy screens, other walls in the building (wing walls), fences, other buildings, vegetation (protected or listed heritage trees).

Nationwide House Energy Rating Scheme NatHERS Certificate No.

Generated on 06 Sept 2022 using Hero 3.0.1

Property

Address	Unit 04, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350
Lot/DP	
NCC Class*	2
Туре	New

Plans

Main Plan	27 July 2022
Prepared by	Six Degrees Architecture

Construction and environment

Assessed floor area (m ²)*		Exposure Type
Conditioned*	54.5	Suburban
Unconditioned*	5.4	NatHERS climate zone
Total	59.9	66 - Ballarat Aerodrome
Garage	0.0	
2 ED.		

Accredited assessor

Name	
Business name	Shared S
Email	sha ي
Phone	+61 4 63
Accreditation No.	DMN/21
Assessor Accrediting	DMN
Organisation	
Declaration of interest	No Confli



7.1 The more stars the more energy efficient



Thermal PerformanceHeatingCooling120.614.7MJ/m²MJ/m²

About the rating

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

Verification

DRAFT PREVIEW ISSUE - NOT TO BE USED FOR CERTIFICATION

National Construction Code (NCC) requirements

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

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

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

Certificate Check

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

Genuine certificate

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

Ceiling penetrations*

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

Windows

Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate?

Apartment entrance doors

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

Exposure*

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

Provisional* values

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



Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient- ation	Shading device*
BED 01	A&L-004-06 A	W03	2100	1200	Awning	60	S	None
BED 02	A&L-004-06 A	W01	2100	2100	Awning	30	W	None
KIT/LIV/DIN	A&L-004-06 A	W02	2100	3600	Sliding	45	W	None

* Refer to glossary.

Generated on 06 Sept 2022 using Hero 3.0.1 for Unit 04, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350

Roof window *type and performance value*

Default* roof windows SHGC substitution Maximum tolerance ranges Window ID SHGC* Window Description U-value* lower limit upper limit None Custom* roof windows SHGC substitution Maximum tolerance ranges SHGC* Window ID Window Description U-value* lower limit upper limit None Roof window schedule Window Width Window Opening Height **Orient-**Outdoor Indoor Location ID no. % (mm) (mm) ation shade shade None Skylight type and performance Skylight ID Skylight description None Skylight schedule Orient-Skylight Skylight Skylight share Outdoor Shaft Area Location Diffuser ID length (mm) shade Reflectance No. ation None External door sched de Location Height (mm) Width (mm) **Opening %** Orientation None

External wall type

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
CONC-150-PB	Precast 150mm Concrete - Plasterboard Internally	0.50	Medium	2.50	No

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orient- ation	Horizontal shading feature* projection (mm)	Vertical shading feature
BATH	CONC-150-PB	2800	1253	E		Yes
BED 01	CONC-150-PB	2800	4102	S		Yes

* Refer to glossary.

Generated on 06 Sept 2022 using Hero 3.0.1 for Unit 04, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orient- ation	Horizontal shading feature* projection (mm)	Vertical shading feature
BED 01	CONC-150-PB	2800	3002	E		Yes
BED 02	CONC-150-PB	2800	3599	W		Yes
BED 02	CONC-150-PB	2800	3001	S		Yes
KIT/LIV/DIN	CONC-150-PB	2800	4852	W		Yes

Internal wall type

Wall ID	Wall Type	Area (m²)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	53.2	2.00
INT-PB	Internal Plasterboard Stud Wall	18.5	0.00

Floor type

Location	Construction	Area (m²)	Sub-floor ventilatio	Added insulation (R-value)	Covering
BATH	SUSP-CONC-100: Suspended Concrete Sho Floor (100mm)	5.4	N/A	2.00	Timber
BED 01	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	13.0	N/A	2.00	Timber
BED 02	SUSP-CONC-100: Suspenced Concrete Slab Floor (100mm)	10.8	N/A	2.00	Timber
KIT/LIV/DIN	SUSP-CONC 100: Surbender Concrete Slab Floor (100mm)	30.6	N/A	2.00	Timber
Ceiling <i>type</i>				Dull	
Location	Construction			Bulk insulation (R-value)	Reflective wrap*

None

Ceiling penetrations*

Location	Quantity	Туре	Diameter (mm)	Sealed /unsealed
BATH	1	Downlight	100	Sealed
BED 01	2	Downlight	100	Sealed
BED 02	2	Downlight	100	Sealed
KIT/LIV/DIN	4	Downlight	100	Sealed
KIT/LIV/DIN	1	Exhaust Fan	250	Sealed

Ouertitu	Diamatan (n	
Quantity	Diameter (m	1m)
Added insulation (R-value)	Solar absorptance	Roof Colou
	insulation	Added insulation absorptance

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Entrance door	these signify ventilative benefit on the movelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Giran 2 bulker of
Exposure category - exposed	terrain an no obstructions g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
Exposure category - open	terrain why few obstructions are similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, light vegetate bush blocks, elevated units (e.g. above 3 floors).
Exposure category - suburban	terrain with meetings, 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.
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Nationwide House Energy Rating Scheme NatHERS Certificate No.

Generated on 06 Sept 2022 using Hero 3.0.1

Property

Address	Unit 05, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350
Lot/DP	
NCC Class*	2
Туре	New

Plans

Main Plan	27 July 2022
Prepared by	Six Degrees Architecture

Construction and environment

Assessed floor area	(m²)*	Exposu
Conditioned*	38.7	Open
Unconditioned*	5.2	NatHER
Total	43.9	66 - Ball
Garage	0.0	
Accred	ited asses	sor

Name	
Business name	Shared Space return
Email	esharet pathard
Phone	+61 4, 637634
Accreditation No.	DMN/210203
Assessor Accrediting Organisation	DMN
Declaration of interest	No Conflict of Interest

Exposure Type Open NatHERS climate zone 66 - Ballarat Aerodrome essor



111.8 MJ/m² Predicted annual energy load for heating and cooling based on standard occupancy assumptions.

Thermal PerformanceHeatingCooling90.121.7MJ/m²MJ/m²

About the rating

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

Verification

DRAFT PREVIEW ISSUE - NOT TO BE USED FOR CERTIFICATION

National Construction Code (NCC) requirements

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Ceiling penetrations*

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

Windows

Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate?

Apartment entrance doors

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

Exposure*

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

Provisional* values

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

Window an	nd glazed door <i>type and perfo</i> r	nance			
Default* window Window ID	VS Window Description	Maximum	SHGC*	SHGC sub tolerance	
None		U-value*		lower limit	upper limit
Custom* windov	ws			SHGC sub	stitution
Window ID	Window Description	Maximum	Maximum SHGC* to	tolerance ranges	
		U-value*		lower limit	upper limi
A&L-004-06 A	AI Awning Window DG 3/12Ar/3Sn	2.98	0.50	0.47	0.53

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient- ation	Shading device*
BED 01	A&L-004-06 A	W01	2100	2005	Sliding	45	Е	None
KIT/DIN/LIV	A&L-004-06 A	W02	2100	3287	Sliding	30	E	None

Roof window type and performance value

Default* roof windows SHGC substitution Maximum tolerance ranges SHGC* Window ID Window Description U-value* lower limit upper limit None Custom* roof windows SHGC substitution Maximum tolerance ranges SHGC* Window ID Window Description U-value* lower limit upper limit None Roof window schedule Window Width Window Opening Height **Orient-**Outdoor Location shade ID no. % (mm) (mm) ation None Skylight type and performance Skylight ID Skylight description None Skylight schedule Skylight Skylight Skylight share Orient-Outdoor Shaft Area Location Diffuser ID length (mm) shade Reflectance No. ation None External door sched de Location Height (mm) Width (mm) **Opening %** Orientation None

External wall type

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
CONC-150-PB	Precast 150mm Concrete - Plasterboard Internally	0.50	Medium	2.50	No
INT-PB	Internal Plasterboard Stud Wall	0.50	Medium	2.50	No

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orient- ation	Horizontal shading feature* projection (mm)	Vertical shading feature
BED 01	CONC-150-PB	2800	3036	E	2206	Yes

* Refer to glossary.

Generated on 06 Sept 2022 using Hero 3.0.1 for Unit 05, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350

Indoor

shade

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orient- ation	Horizontal shading feature* projection (mm)	Vertical shading feature
KIT/DIN/LIV	CONC-150-PB	2800	3338	Е	2206	Yes
KIT/DIN/LIV	INT-PB	2800	6851	Ν		No

Internal wall type

Wall ID	Wall Type	Area (m²)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	53.4	2.00

Floor type

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulatio (R-value)	•
BATH	SUSP-CONC-100: Suspended Concret Floor (100mm)	te Slab 5.2	N/A	2.00	Timber
BED 01	SUSP-CONC-100: Suspended Concret Floor (100mm)	te Slab 13.3	N/A	2.00	Timber
KIT/DIN/LIV	SUSP-CONC-100: Suspended Concret Floor (100mm)	te Slab 25.4	N/A	2.00	Timber
Ceiling <i>type</i>					
Location	Construction		i	Bulk nsulation R-value)	Reflective wrap*
			(ix-value)	
None	21		(it-value)	
None Ceiling <i>penetra</i>	ations		(n-value)	
	ations Quantity	Туре	Diameter	(mm) Se	ealed nsealed
Ceiling <i>penetra</i>		Type Downlight		(mm) /ui	
Ceiling penetra	Quantity		Diameter	(mm) Se Se	nsealed
Ceiling penetra Location BATH	Quantity 1	Downlight	Diameter 100	(mm) Se /ui Se Se	nsealed ealed
Ceiling penetra Location BATH BATH	Quantity 1 1	Downlight Exhaust Fan	Diameter 100 250	(mm) Se /ul Se Se Se	nsealed ealed ealed

Location	Quantity	Diameter (mm)	
None			

Roof type

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

Explanatory Notes

About this report

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

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

Accredited assessors

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The predicted annual energy load in this NatHERS Certificate is an estimate based on an assessment of the building by the assessor. It is not a prediction of actual energy use, but may be used to compare how other buildings 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, indoor air temperature and local climate.

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

Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
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Ceiling penetrations	features that require a penetration to the ceiling, including downlight vents, exhaust fans, rangehoods, chimneys and flues. Excludes
	fixtures attached to the ceiling with small holes through the ceiling for thing, e.g. ceiling fans; pendant lights, and heating and cooling ducts.
Conditioned	a zone within a dwelling that is expected to require eating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
Custom windows	windows listed in NatHERS software the are vailable to the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
Default windows	windows that are representative of a specie type of window product and whose properties have been derived by statistical methods.
Entrance door	these signify ventilation benefit on the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 bulk sign.
Exposure category - exposed	terraip can no obstructions g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
Exposure category - open	terrain who few obstructions are a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, light vegetate bush blocks, elevated units (e.g. above 3 floors).
Exposure category - suburban	terrain with meet as, 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)	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4
Class	buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
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
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	for NatHERS this is typically an operable window (i.e. can be opened), will have a plaster or similar light well if there is an attic space, and generally does not have a diffuser.
Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	the fraction of incident solar radiation admitted through a window, both directly transmitted as well as absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits.
Skylight (also known as roof lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
Unconditioned	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions
Vertical shading features	provides shading to the building in the vertical plane and can be parallel or perpendicular to the subject wall/window. Includes privacy screens, other walls in the building (wing walls), fences, other buildings, vegetation (protected or listed heritage trees).

Nationwide House Energy Rating Scheme NatHERS Certificate No.

Generated on 06 Sept 2022 using Hero 3.0.1

Property

Address	Unit 06, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350
Lot/DP	
NCC Class*	2
Туре	New

Plans

Main Plan	27 July 2022
Prepared by	Six Degrees Architecture

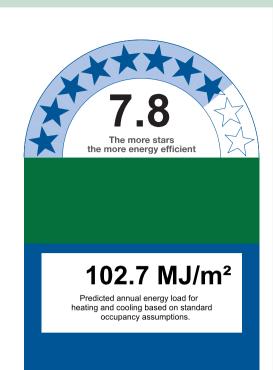
Construction and environment

Assessed floor area	(m²)*	Exposure Type
Conditioned*	54.5	Open
Unconditioned*	5.4	NatHERS climate zone
Total	59.9	66 - Ballarat Aerodrome
Garage	0.0	
CREDIA		



Name	
Business name	Shared Spac
Email	يshare،
Phone	+61 4 63763
Accreditation No.	DMN/21.2.0
Assessor Accrediting Organisation	DMN
Declaration of interest	No Conflict of





Thermal Performance					
Heating Cooling					
86.9	15.7				
MJ/m²	MJ/m²				

About the rating

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Verification

DRAFT PREVIEW ISSUE - NOT TO BE USED FOR CERTIFICATION

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

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Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate?

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Provisional* values

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

Window an	d glazed door type and perfe	riance			
Default* window Window ID	VS Window Description	Maximum	SHGC*	SHGC sub tolerance	
None		U-value*		lower limit	upper limit
Custom* windov	vs			SHGC sub	stitution
Window ID	ID Window Description	Maximum	SHGC*		
		U-value*		lower limit	upper limit
A&L-004-06 A	AI Awning Window DG 3/12Ar/3Sn	2.98	0.50	0.47	0.53

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient- ation	Shading device*
BED 01	A&L-004-06 A	W02	2100	1990	Sliding	45	W	None
BED 02	A&L-004-06 A	W01	2100	1200	Awning	60	S	None
KIT/LIV/DIN	A&L-004-06 A	W03	2100	3600	Sliding	30	W	None

* Refer to glossary.

Generated on 06 Sept 2022 using Hero 3.0.1 for Unit 06, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350

Roof window *type and performance value*

Default* roof windows SHGC substitution Maximum tolerance ranges Window ID SHGC* Window Description U-value* lower limit upper limit None Custom* roof windows SHGC substitution Maximum tolerance ranges SHGC* Window ID Window Description U-value* lower limit upper limit None Roof window schedule Window Width Window Opening Height **Orient-**Outdoor Indoor Location ID no. % (mm) (mm) ation shade shade None Skylight type and performance Skylight ID Skylight description None Skylight schedule Skylight Skylight Skylight share Orient-Outdoor Shaft Area Location Diffuser ID length (mm) shade Reflectance No. ation None External door sched de Location Height (mm) Width (mm) **Opening %** Orientation None

External wall type

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
CONC-150-PB	Precast 150mm Concrete - Plasterboard Internally	0.50	Medium	2.50	No

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orient- ation	Horizontal shading feature* projection (mm)	Vertical shading feature
BATH	CONC-150-PB	2800	1253	Е		Yes
BED 01	CONC-150-PB	2800	3599	W	2072	Yes

* Refer to glossary.

Generated on 06 Sept 2022 using Hero 3.0.1 for Unit 06, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orient- ation	Horizontal shading feature* projection (mm)	Vertical shading feature
BED 01	CONC-150-PB	2800	3001	S		Yes
BED 02	CONC-150-PB	2800	4102	S		Yes
BED 02	CONC-150-PB	2800	3002	Е		Yes
KIT/LIV/DIN	CONC-150-PB	2800	4852	W	2072	Yes

Internal wall type

Wall ID	Wall Type	Area (m²)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	71.9	2.00

Floor type

Location	Construction	Area (m²)	Sub-floor ventilatior	Added insulatio (R-value)	J
BATH	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	5.4	N/A	2.00	Timber
BED 01	SUSP-CONC-100: Suspended Concrete Stro Floor (100mm)	10.8	N/A	2.00	Timber
BED 02	SUSP-CONC-100: Suspended Couprete Stab Floor (100mm)	13.1	N/A	2.00	Timber
KIT/LIV/DIN	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	30.6	N/A	2.00	Timber
Ceiling <i>type</i>					
Location	Construction			Bulk insulation (R-value)	Reflective wrap*

None

Ceiling penetrations*

Location	Quantity	Туре	Diameter (mm)	Sealed /unsealed
BATH	1	Downlight	100	Sealed
BATH	1	Exhaust Fan	250	Sealed
BED 01	2	Downlight	100	Sealed
BED 02	2	Downlight	100	Sealed
KIT/LIV/DIN	4	Downlight	100	Sealed
KIT/LIV/DIN	1	Exhaust Fan	250	Sealed

* Refer to glossary.

Location	Quantity	Diameter (n	וm)
None			
Roof <i>type</i>			
Construction	Added insulation (R-value)	Solar absorptance	Roof Colou

Explanatory Notes

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Nationwide House Energy Rating Scheme NatHERS Certificate No.

Generated on 06 Sept 2022 using Hero 3.0.1

Property

Address	Unit 07, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350
Lot/DP	
NCC Class*	2
Туре	New

Plans

Main Plan	27 July 2022
Prepared by	Six Degrees Architecture

Construction and environment

Assessed floor area (m ²)*		Exposure Type
Conditioned*	61.5	Open
Unconditioned*	6.9	NatHERS climate zone
Total	68.4	66 - Ballarat Aerodrome
Garage	0.0	
CCREDINE.		

Accredite	ed
Name	
Business name	S
Email	
Phone	+
Accreditation No.	C

Assessor Accrediting

Declaration of interest

Organisation

Shared Space Produce ture Shared Space Producer ture Weight Shared Space Producer to the star Shared Space Produce ture (2000) Shared Space Ture (2000)

No Conflict of Interest

assessor

8.1 The more stars the more energy efficient

> 88.0 MJ/m² Predicted annual energy load for heating and cooling based on standard occupancy assumptions.

Thermal PerformanceHeatingCooling71.716.4MJ/m²MJ/m²

About the rating

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

Genuine certificate

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

Ceiling penetrations*

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

Windows

Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate?

Apartment entrance doors

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

Exposure*

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

Provisional* values

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

Window an	d glazed door type and perfe	riance				
Default* window Window ID	VS Window Description	Maximum	SHGC*	SHGC sub tolerance		
None		U-value*		lower limit	upper limit	
Custom* windov	vs			SHGC sub	stitution	
Window ID	Window Description	Maximum	SHGC*		SHGC substitution tolerance ranges	
		U-value*		lower limit	upper limit	
A&L-004-06 A	AI Awning Window DG 3/12Ar/3Sn	2.98	0.50	0.47	0.53	

Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient- ation	Shading device*
BED 01	A&L-004-06 A	W01	2100	1800	Sliding	45	W	None
BED 02	A&L-004-06 A	W03	2100	1200	Awning	60	W	None
BED 02	A&L-004-06 A	W04	2100	1200	Awning	60	Ν	None

* Refer to glossary.

Generated on 06 Sept 2022 using Hero 3.0.1 for Unit 07, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350

Window and glazed door schedule

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient- ation	Shading device*
ENSUITE 02	A&L-004-06 A	W05	2100	760	Awning	60	Ν	None
KIT/DIN/LIV	A&L-004-06 A	W02	2100	3475	Sliding	30	W	None

Roof window type and performance value

Default* roof windows

Window ID) Window Description		Maximum	SHGC*	SHGC substitution tolerance ranges				
		P				U-value*		lower limit	upper limit
None									
Custom* ro	of windows								
Window ID	Wing	low Descriptio				Maximum	SHGC*	SHGC sub tolerance	
window iD	winc	low Description	סח			U-value*	U-value*		upper limit
None									
Roof wii	ndow <i>sc</i>	hedule							
Location	Wir ID	ndow	Window no.	Openiz %	y H⊾ght (mm	Width (mm)	Orient- ation	Outdoor shade	Indoor shade
None			•						
Skylight Skylight ID	t type an	d perfori		scriptior					
None									
Skylight	t schedu	ile							
Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m²)	Orient- ation	Outdoor shade	Diffuser	Shaft Reflec	ctance
None									

External door schedule

Location	Height (mm)	Width (mm)	Opening %	Orientation
None				

External wall type

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
CONC-150-PB	Precast 150mm Concrete - Plasterboard Internally	0.50	Medium	2.50	No

External wall schedule

Wall ID	Height (mm)	Width (mm)	Orient- ation	Horizontal shading feature* projection (mm)	Vertical shading feature
CONC-150-PB	2800	3001	W	2072	Yes
CONC-150-PB	2800	3103	W	2072	Yes
CONC-150-PB	2800	4699	Ν		Yes
CONC-150-PB	2800	101	E		Yes
CONC-150-PB	2800	2299	Ν		Yes
CONC-150-PB	2800	3577	W	2072	Yes
	CONC-150-PB CONC-150-PB CONC-150-PB CONC-150-PB CONC-150-PB	Wall ID (mm) CONC-150-PB 2800 CONC-150-PB 2800 CONC-150-PB 2800 CONC-150-PB 2800 CONC-150-PB 2800 CONC-150-PB 2800	Wall ID (mm) (mm) CONC-150-PB 2800 3001 CONC-150-PB 2800 3103 CONC-150-PB 2800 4699 CONC-150-PB 2800 101 CONC-150-PB 2800 2299	Wall ID (mm) (mm) ation CONC-150-PB 2800 3001 W CONC-150-PB 2800 3103 W CONC-150-PB 2800 4699 N CONC-150-PB 2800 101 E CONC-150-PB 2800 2299 N	Wall IDHeight (mm)Width (mm)Orient- ationShading feature* projection (mm)CONC-150-PB28003001W2072CONC-150-PB28003103W2072CONC-150-PB28004699N2072CONC-150-PB2800101E2000CONC-150-PB28002299N2000

Internal wall type

Wall ID	Wall Type	Area (m²)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	97.5	2.00

Floor *type*

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
BED 01	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	10.8	N/A	2.00	Timber
BED 02	SUSP-CONC-100: Suspenced Soncrea Slab Floor (100mm)	14.6	N/A	2.00	Timber
ENSUITE	SUSP-CONC 50: Subende Concrete Slab Floor (100mm)	4.6	N/A	2.00	Timber
ENSUITE 02	SUST-CONC 100: Suspended Concrete Slab Floor (100mm)	6.9	N/A	2.00	Timber
KIT/DIN/LIV	SUSP-CONC 00: Suspended Concrete Slab Floor (10cmm)	31.5	N/A	2.00	Timber

Ceiling type

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

Ceiling penetrations*

Location	Quantity	Туре	Diameter (mm)	Sealed /unsealed
BED 01	2	Downlight	100	Sealed
BED 02	2	Downlight	100	Sealed
ENSUITE	1	Downlight	100	Sealed

Ceiling penetrations*

Location	Quantity	Туре	Diameter (mm)	Sealed /unsealed
ENSUITE	1	Exhaust Fan	250	Sealed
ENSUITE 02	1	Downlight	100	Sealed
ENSUITE 02	1	Exhaust Fan	250	Sealed
KIT/DIN/LIV	5	Downlight	100	Sealed
KIT/DIN/LIV	1	Exhaust Fan	250	Sealed

Ceiling fans

Location	Quantity	Diameter (mm)
None		

Roof type

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

Explanatory Notes

About this report

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

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

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Disclaimer

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The predicted annual energy load in this NatHERS Certificate is an estimate based on an assessment of the building by the assessor. It is not a prediction of actual energy use, but may be used to compare how other buildings 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, indoor air temperature and local climate.

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Glossary

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Exposure category - exposed	terrain an no obstructions g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
Exposure category - open	terrain why few obstructions are similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, light vegetate bush blocks, elevated units (e.g. above 3 floors).
Exposure category - suburban	terrain with meetings, 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)	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4
Class	buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
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
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.
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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.
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).

Nationwide House Energy Rating Scheme NatHERS Certificate No.

Generated on 06 Sept 2022 using Hero 3.0.1

Property

Address	Unit 09, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350
Lot/DP	
NCC Class*	2
Туре	New

Plans

Main Plan	27 July 2022
Prepared by	Six Degrees Architecture

Construction and environment

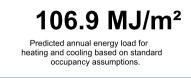
Assessed floor area (m²)*		Exposure Type
Conditioned*	53.0	Open
Unconditioned*	5.4	NatHERS climate zone
Total	58.4	66 - Ballarat Aerodrome
Garage	0.0	
Accred	lited asses	ssor

Name	
Business name	Shared Sp
Email	ع) sha
Phone	+61 4 637
Accreditation No.	DMN/210
Assessor Accrediting Organisation	DMN
Declaration of interest	No Conflic

ared Space vrouwerture Wysharewspace architecture.com.au 1 40637634 MV/210003

No Conflict of Interest





Thermal Performance				
Heating Cooling				
94.3	12.6			
MJ/m²	MJ/m²			

About the rating

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

Verification

DRAFT PREVIEW ISSUE - NOT TO BE USED FOR CERTIFICATION

National Construction Code (NCC) requirements

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

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

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

Certificate Check

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

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

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

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Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate?

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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.

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

Provisional* values

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



Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orient- ation	Shading device*
BED 01	A&L-004-06 A	W01	2100	1200	Awning	60	S	None
BED 02	A&L-004-06 A	W02	2100	1200	Awning	60	E	None
KIT/DIN/LIV	A&L-004-06 A	W03	2100	3600	Sliding	45	E	None

* Refer to glossary.

Generated on 06 Sept 2022 using Hero 3.0.1 for Unit 09, 102-108 Humffray Street South, BALLARAT EAST, VIC, 3350

Roof window *type and performance value*

Default* roof windows SHGC substitution Maximum tolerance ranges Window ID SHGC* Window Description U-value* lower limit upper limit None Custom* roof windows SHGC substitution Maximum tolerance ranges SHGC* Window ID Window Description U-value* lower limit upper limit None Roof window schedule Window Width Window Opening Height **Orient-**Outdoor Indoor Location ID no. % (mm) (mm) ation shade shade None Skylight type and performance Skylight ID Skylight description None Skylight schedule Skylight Skylight Skylight share Orient-Outdoor Shaft Area Location Diffuser ID length (mm) shade Reflectance No. ation None External door sched de Location Height (mm) Width (mm) **Opening %** Orientation None

External wall type

Wall ID	Wall Type	Solar absorptance	Wall Colour	Bulk insulation (R-value)	Reflective wall wrap*
CONC-150-PB	Precast 150mm Concrete - Plasterboard Internally	0.50	Medium	2.50	No

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orient- ation	Horizontal shading feature* projection (mm)	Vertical shading feature
BED 01	CONC-150-PB	2800	4000	S		Yes
BED 01	CONC-150-PB	2800	3002	W		Yes

* Refer to glossary.

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External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orient- ation	Horizontal shading feature* projection (mm)	Vertical shading feature
BED 01	CONC-150-PB	2800	122	Ν		Yes
BED 02	CONC-150-PB	2800	3603	Е	2130	Yes
BED 02	CONC-150-PB	2800	3002	S	780	Yes
KIT/DIN/LIV	CONC-150-PB	2800	4852	Е	2130	Yes

Internal wall type

Wall ID	Wall Type	Area (m²)	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	17.9	0.00
INT-PB	Internal Plasterboard Stud Wall	55.3	2.00

Floor type

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
BATH	SUSP-CONC-100: Suspended Concrete Sho Floor (100mm)	5.4	N/A	2.00	Timber
BED 01	SUSP-CONC-100: Suspended Coccrete Slab Floor (100mm)	12.7	N/A	2.00	Timber
BED 02	SUSP-CONC-100: Suspended Soncret, Slab Floor (100mm)	10.8	N/A	2.00	Timber
KIT/DIN/LIV	SUSP-CONC 00: Suppended Concrete Slab Floor (100mm)	29.5	N/A	2.00	Timber
Ceiling <i>type</i>				Dulk	
Location	Construction		i	Bulk insulation (R-value)	Reflective wrap*
BATH	FLAT-01: Flat Framed / Skillion Metal Root	3 Ceiling	5.00	Yes	

BATT		5.00	103
BED 01	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	5.00	Yes
BED 02	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	5.00	Yes
KIT/DIN/LIV	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	5.00	Yes

Ceiling penetrations*

Location	Quantity	Туре	Diameter (mm)	Sealed /unsealed
BATH	1	Downlight	100	Sealed
BED 01	2	Downlight	100	Sealed

Ceiling penetrations*

Location	Quantity	Туре	Diameter (mm)	Sealed /unsealed
BED 02	2	Downlight	100	Sealed
KIT/DIN/LIV	4	Downlight	100	Sealed
KIT/DIN/LIV	1	Exhaust Fan	250	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	



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Exposure category - exposed	terraip can no obstructions g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
Exposure category - open	terrain who few obstructions are a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, light vegetate bush blocks, elevated units (e.g. above 3 floors).
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Blades - Humffray Street South

JV3 Building Assessment

National Construction Code 2019 - Volume 1

Project	Blades - Humffray Street South
Address	102 Humffray St S, Bakery Hill VIC 3350, Australia (37.56° S, 143.86° E)
Date	2022-09-13, 02:52 AM
Author	@sharedspacearchitecture.com.au
Scope	National Construction Code 2019
Building Class	5
Performance Requirements	JP1 Energy Use
Assessment Process	Comparison with the Deemed-to-Satisfy Provisions
Climate Zone	7 0
Storeys	7 8
Floor to Floor Height	4000 mm

Using Speckel

Speckel provides various calculations in line with the National Construction Code 2019 - Volume 1 - Section J Energy Efficiency. These calculations are tested in line with all applicable NCC equations or NCC referenced primary or secondary documents, for them to represent an accurate Performance Solution against the Performance Requirements - JP1 Energy Use. A Performance Solution must be shown to comply with the relevant Performance Requirements through one or a combination of Assessment Methods. Speckel is a valid Assessment Method by comparison with the Deemed-to-Satisfy Provisions of each relevant area.

Blades - Humffray Street South

Results

The National Construction Code (NCC) specifies minimum performance standards for the energy efficiency of buildings through the Building Code of Australia (BCA) Volume 1, Section J.

To enable flexibility of the architectural design of the building, a Performance Solution has been used to comply with the Performance Requirement - JP1.

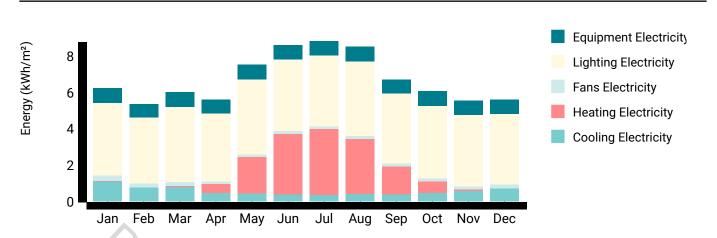
The Assessment Method, 'JV3 Verification using a reference building' has been used and is an Alternative Solution for the Building Fabric only. As such, a Proposed Building with the proposed fabric has been modelled as part of this approach, to compare against the Reference Building services.

To meet acceptance criteria, the Proposed Building with the proposed fabric GHG emissions must be no greater than the Reference Building services.

Proposed (kgCO2-e) Reference (kgCO2-e) Difference (%) 809520.84 Emissions 865297.03 -6.45 ased De **Building Energy** Equipment Electricity Lighting Electricity Reference **Fans Electricity** Heating Electricity **Cooling Electricity** Proposed 20 40 60 80 0 Energy (kWh/m²) Proposed

Building Emissions

Blades - Humffray Street South



Energy		0									kWh	kWh/m	۱²	MJ	MJ/m²
Cooling	g Electri	icity	0	~						594	436.0	6.	9	213969.7	24.8
Heating	g Electr	icity		5						128	659.4	14.	9	463173.9	53.6
Fans El	ectricit	у			2					18	528.2	2.	1	66701.4	7.7
Lights I	Electric	ity				0				4082	247.4	47.	3	1469690.5	170.1
Equipm	nent Ele	ctrici	ty			0				813	311.4	9.	4	292720.9	33.9
Referen	се						0	2							
								10						Equipment Ele	ectricity
Ű,														Lighting Elect	ricity
Energy (kWh/m²))			Fans Electrici	ty
ergy														Heating Elect	ricity
^{لن} 4											S	·		Cooling Elect	ricity
2												95			
			_										~		
0	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	0	h.	
				•	,			5	·					29	
Enorav											k\Wh	kWh/m	1 2	МТ	$M l/m^2$

Energy	kWh	kWh/m²	MJ	MJ/m²
Cooling Electricity	42211.8	4.9	151962.4	17.6
Heating Electricity	199479.6	23.1	718126.4	83.1
Fans Electricity	12899.4	1.5	46437.9	5.4
Lights Electricity	408247.4	47.3	1469690.5	170.1
Equipment Electricity	81311.4	9.4	292720.9	33.9

Building Comfort

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Blades - Humffray Street South

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Proposed

FIU	poseu					
#	Zone	Int. Floor (m ²)	Occupied (Hrs)	Comfortable (Hrs)	Ratio (%)	Pass
3	1. Commercial Space 1	279.60	2340	1920	82.05	×
3	3. Commercial Space 2	209.87	2340	1930	82.48	×
4	1. Office Zone 2	720.53	2340	2027	86.62	×
4	2. Office Zone 1	360.82	2340	2022	86.41	×
4	3. Office Zone 3	310.94	2340	2059	87.99	×
5	1. Office Zone 2	720.53	2340	2078	88.80	×
5	2. Office Zone 1	360.82	2340	2124	90.77	×
5	3. Office Zone 3	310.94	2340	2106	90.00	×
6	3. Office Zone 3	310.94	2340	2164	92.48	×
6	2. Office Zone 1	360.82	2340	2159	92.26	×
6	1. Office Zone 2	720.53	2340	2089	89.27	×
7	1. Office Area 2	530.14	2340	2091	89.36	×
7	2. Office Area 3	212.52	2340	2168	92.65	×
7	3. Office Area 1	192.73	2340	2079	88.85	×
8	1. Office Area 2	530.14	2340	2081	88.93	×
8	2. Office Area 3	212.52	2340	2178	93.08	×
8	3. Office Area 1	192.73	2340	2083	89.02	×
9	1. Office Area 1	523.49	2340	1976	84.44	×
9	2. Office Area 2	222.38	2340	2091	89.36	×
					Pass	×

Reference

# Zone	Int. Floor (m²)	Occupied (Hrs)	Comfortable (Hrs)	Ratio (%)	Pass
3 1. Commercial Space 1	279.60	2340	1452	62.05	×
3 3. Commercial Space 2	209.87	2340	1490	63.68	×
4 1. Office Zone 2	720.53	2340	1563	66.79	×
4 2. Office Zone 1	360.82	2340	1588	67.86	×

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# Zone	Int. Floor (m²)	Occupied (Hrs)	Comfortable (Hrs)	Ratio (%)	Pass
4 3. Office Zone 3	310.94	2340	1662	71.03	×
5 1. Office Zone 2	720.53	2340	1599	68.33	×
5 2. Office Zone 1	360.82	2340	1691	72.26	×
5 3. Office Zone 3	310.94	2340	1713	73.21	×
6 3. Office Zone 3	310.94	2340	1771	75.68	×
6 2. Office Zone 1	360.82	2340	1729	73.89	×
6 1. Office Zone 2	720.53	2340	1611	68.85	×
7 1. Office Area 2	530.14	2340	1603	68.50	×
7 2. Office Area 3	212.52	2340	1792	76.58	×
7 3. Office Area 1	192.73	2340	1613	68.93	×
8 1. Office Area 2	530.14	2340	1602	68.46	×
8 2. Office Area 3	212.52	2340	1811	77.39	×
8 3. Office Area 1	192.73	2340	1635	69.87	×
9 1. Office Area 1	523.49	2340	1496	63.93	×
9 2. Office Area 2	222.38	2340	1728	73.85	×
			0.0	Pass	×
			S. Gn Br	•	
			-	2	
				*	

Blades - Humffray Street South

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Method

Approach

- The National Construction Code (NCC) specifies minimum performance standards for the energy efficiency of buildings through the Building Code of Australia (BCA) Volume 1, Section J.
- To enable flexibility of the architectural design of the building, a Performance Solution has been used to comply with the Performance Requirement JP1.
- The Assessment Method, <u>JV3 Verification using a reference building</u> has been used and is an Alternative Solution for the Building Fabric only. As such, a Proposed Building with the proposed fabric has been modelled as part of this approach, to compare against the Reference Building services.
- To meet acceptance criteria, the Proposed Building with the proposed fabric <u>Greenhouse Gas</u> (<u>GHG</u>) emissions must be no greater than the Reference Building services.
- When the Simulated Shading Multipliers feature is enabled, each window is simulated in EnergyPlus twice, to compare a completely unshaded window, to a window affected by attached shading, building self-shading, and surrounding structures. The multiplier is based on the ratio of shaded versus unshaded annual average external incident solar radiation, limited between 0.0 and 1.0.

Assumptions / Limitations

- Parts J3 J8 are not part of this assessment.
- Specification JVa Additional Requirements Part 2. Additional Requirements General, is only met for provisions (a) General Thermal Construction, J1.2 and (b) for Floor Edge Insulation, J1.6(b) and J1.6(c). All other provisions (c - n) are not part of this assessment.
- Specification JVb Modelling Parameters Part 1. Scope, Part 2. Reference Building and Part 3 Proposed Building and Reference Building have been used to form the basis of the Method of Assessment.
- Specification JVb Modelling Parameters Part 4. Services proposed and reference building, are not part of this assessment as the minimum performance requirements of the services are not part of this assessment.
- To ensure the reference building can be calculated, windows are limited to a maximum of 99% window-to-wall ratio (WWR).

Blades - Humffray Street South

Inputs

The NCC 2019 - Vol 1 contains technical design and construction requirements for all commercial buildings and their associated structures. The following Building Classes have been adopted in this <u>assessment</u>.

Building Class	Wall A (r	rea n²)	Window Area (m²		of Area (m²)	Floo	r Area (m²)	Window-Wall Ratio
5	2182	.77	2291.84	4 1	545.47	16	86.74	0.51
Levels								
		#	Drawing	# Zones	Floor Ar	rea (m²)	Wall (m ²)	Window (m ²)
	. 0	1	Basement 2	1		1864.9	0.0	0.0
		2	Basement 1	1		1865.6	0.0	0.0
		3	Ground	13		1365.1	695.1	271.8
		4	Levels 1 - 3	7		1581.0	281.2	376.1
		5	Levels 1 - 3	7		1581.0	281.2	376.1
		6	Levels 1 - 3	7		1581.0	281.2	376.1
		7	Levels 4 - 5	07		1115.7	231.6	310.8
		8	Levels 4 - 5	7		1115.7	231.6	310.8
		9	Level 6	5		913.6	180.9	270.0
Zones					Ċ	S		
	Level	Zon	e	A	rea (m²)	Volume	e (m²) Trea	ated Area (m²)
	1	1. B	asement Carpa	ark B2	1864.90	540	08.20	0.00
	2	1. B	asement Carpa	ark 1	1865.58	559	96.74	0.00
	3	1. C	ommercial Spa	ace 1	279.60	14	56.69	279.60
	3	2. L	obby		218.99	114	40.96	218.99
	3	3. C	ommercial Spa	ace 2	209.87	109	93.42	209.87
	3	4. B	ack of House 1		204.53	10	65.58	204.53
	3	5. C	arpark Entry R	amp	110.88	5	77.68	0.00
	3	6. R	efuse Room		63.08	32	28.62	0.00
	3	7. S [.]	tore 2		61.95	3:	22.76	61.95

Blades - Humffray Street South

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Level	Zone	Area (m²)	Volume (m²)	Treated Area (m²)
3	8. Bike Storage	60.95	317.53	0.00
3	9. Lift and Stairs	60.89	317.26	60.89
3	10. Commercial Storage	31.08	161.93	31.08
3	11. Bathroom 1	24.65	128.45	24.65
3	12. Bathroom 2	24.32	126.72	24.32
3	13. Hallway	14.32	74.59	14.32
4	1. Office Zone 2	720.53	2161.58	720.53
4	2. Office Zone 1	360.82	1082.45	360.82
4	3. Office Zone 3	310.94	932.83	310.94
4	4. Core 1	64.68	194.04	0.00
4	5. Core 2	43.68	131.04	43.68
4	6. Female Toilet	43.35	130.05	43.35
4	7. Male Toilet	36.96	110.88	36.96
5	1. Office Zone 2	720.53	2161.58	720.53
5	2. Office Zone 1	360.82	1082.45	360.82
5	3. Office Zone 3	310.94	932.83	310.94
5	4. Core 1	64.68	194.04	0.00
5	5. Core 2	43.68	131.04	43.68
5	6. Female Toilet	43.35	130.05	43.35
5	7. Male Toilet	36.96	110.88	36.96
б	1. Office Zone 2	720.53	2161.58	720.53
6	2. Office Zone 1	360.82	1082.45	360.82
6	3. Office Zone 3	310.94	932.83	310.94
6	4. Core 1	64.68	194.04	0.00
6	5. Core 2	43.68	131.04	43.68
6	6. Female Toilet	43.35	130.05	43.35
6	7. Male Toilet	36.96	110.88	36.96
7	1. Office Area 2	530.14	1590.42	530.14

Blades - Humffray Street South

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Level	Zone	Area (m²)	Volume (m²)	Treated Area (m²)
7	2. Office Area 3	212.52	637.56	212.52
7	3. Office Area 1	192.73	578.18	192.73
7	4. Core 1	61.56	184.68	0.00
7	5. Core 2	41.92	125.75	41.92
7	6. Female Toilet	40.67	122.01	40.67
7	7. Male Toilet	36.12	108.36	36.12
8	1. Office Area 2	530.14	1590.42	530.14
8	2. Office Area 3	212.52	637.56	212.52
8	3. Office Area 1	192.73	578.18	192.73
8	4. Core 1	61.56	184.68	0.00
8	5. Core 2	41.92	125.75	41.92
8	6. Female Toilet	40.67	122.01	40.67
8	7. Male Toilet	36.12	108.36	36.12
9	1. Office Area 1	523.49	1570.53	523.49
9	2. Office Area 2	222.38	667.14	222.38
9	3. Toilets	65.97	197.92	65.97
9	4. Core 1	60.73	182.25	0.00
9	5. Core 2	41.00	123.00	41.00
		12983.32	5	8640.05
Walls			í O	

Walls

Total System R-values of all walls include the effects of thermal bridging, which are calculated in accordance with AS/NZS 4859.2 and NZ 4214:2006 (J1.2 Thermal construction - General (e)) or are stated values.

For the purpose of the Reference Building, the wall total system R-value of the wall-glazing construction has been calculated in accordance with J1.5 Walls and Glazing and Specification and J1.5a Calculation of U-Value and solar admittance.

Proposed	Title	Class	R-Value (m²K°/W)	Area (m²)
Exposed to Unconditioned	Concept	5	3.00	673.55
External	Concept	5	3.00	1509.22

Blades - Humffray Street South



Reference	Title	Class	R-Value (m²K°/W)	Area (m²)
Exposed to Unconditioned	Concept	5	3.00	673.55
External	Concept	5	3.00	1509.22

Roofs

Total system R-values of all roofs include the effects of thermal bridging are calculated in accordance with AS/NZS 4859.2 and NZ 4214:2006 (as per J1.2 Thermal Construction – General (e)) or are stated values.

For the purpose of the Reference Building, the roof total system R-value has been assumed in accordance with J1.3 Roof and ceiling construction.

Proposed	· / O.	Title	Class	R-Value (m²K°/W)	Area (m²)
External		Concept	5	3.50	692.60
Тор	2	Concept	5	4.50	852.87
Reference		Title	Class	R-Value (m²K°/W)	Area (m²)
External	2.2	Concept	5	3.70	692.60
Тор	6	Concept	5	3.70	852.87

Floors

Total system R-values of all floors include the effects of thermal bridging are calculated in accordance with AS/NZS 4859.2, NZ 4214:2006 and Section 3.5 of CIBSE Guide A (J1.2 Thermal construction — general (e)) or are stated values

For the purpose of the Reference Building, the floor total system R-value has been assumed in accordance with <u>J1.6 Floors</u>.

Proposed	Title	Class	R-Value (m²K°/W)	Area (m²)
Exposed to Unconditioned	Concept	5	2.50	1420.46
External	Concept	5	2.50	266.28
Reference	Title	Class	R-Value (m²K°/W)	Area (m²)
Exposed to Unconditioned	Concept	5	2.00	1420.46

Windows

Total system U-values of all windows include the effects of thermal bridging at the frame, which are calculated in accordance with ISO 15099, as per J1.2 Thermal Construction – General (e).

Blades - Humffray Street South

For the purpose of the Reference Building, the glazing total system U-value and solar admittance of the wall-glazing construction has been calculated in accordance with J1.5 Walls and Glazing and Specification J1.5a Calculation of U-Value and solar admittance.

Proposed	Title	Class	U-value	SHGC	Area (m²)
External	Concept	5	2.00	0.35	2291.84
Reference	Title	Class	U-value	SHGC	Area (m²)
External	Concept	5	3.59	0.22	2291.84

Location and Climate

This development is located at Ballarat AP,VIC AUS. The climate file used in all simulations was AUS_VIC_Ballarat.AP.948520_TMYx.2004-2018, sourced from Climate.OneBuilding, an online repository collated from public sources. <u>http://www.climate.onebuilding.org/</u>.

Emission Factors

Greenhouse gas emission factors are used according to NCC2019 – Vol 1 Specification JVb Modelling Parameters - <u>Table 3a Greenhouse Gas Emissions Factors (kgC02-e/GJ</u>). In the case of this project, 323 kgC02-e/GJ has been used for electricity only, based on the site location.

Occupants

Occupant density (m²/person) are stipulated in each thermal zone, subject to the function and purpose of the space. Internal heat gains for the Reference and Proposed Reference Building occupant densities are identical.

Building Class	Activity	Occupancy Density Clothing Air Velocity (m/s)
7A	Generic Building	10.0 0.7 0.1	1
5	Office	10.0 0.7 0.1	1

Lighting

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

Building Class	Space	W/m²
7A	Generic Building	8.0
5	Office	8.0

Equipment

Equipment density (W/m²) are stipulated in each thermal zone, subject to the function and

Blades - Humffray Street South

purpose of the space. Internal heat gains for the Reference and Proposed Reference Building equipment density are identical.

Building Class	Space	W/m²
7A	Generic Building	15.0
5	Office	15.0

Performance Based Design Brier

Air-Conditioning

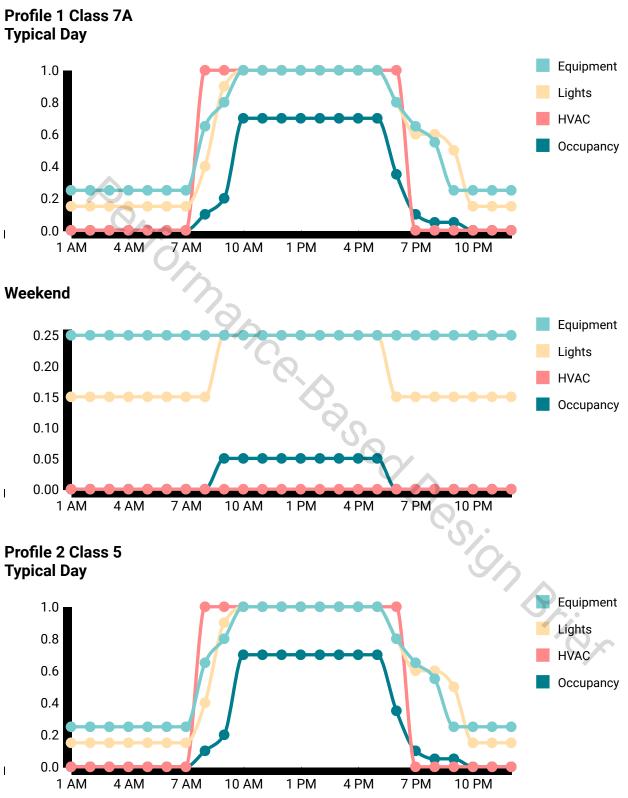
As a fabric only assessment, air-condition equipment and mechanical ventilation rates for the Reference and Proposed Building are identical. Minimum mechanical ventilation is required as per Part FP4.3 Outdoor air supply.

Thermostat Details

Building Class	Space	Cooling Set Point (°C)	Heating Set Point (°C)
7A	Generic Building	24.0	20.0
5	Office	24.0	20.0
HVAC Details			
НVAC Туре		Packaged Varia	able Air Volume System
Outdoor Air Flow Rate per Pers	on	0.0075	
Gross Rated Air Cooling Cop	2	3	
Heating Coil Type		Electric	
Supply Fan Efficiency	8	0.55	
Supply Fan Pressure		1000	
Supply Fan Motor Efficiency		0.55	
		esign	Ori. Cr

Blades - Humffray Street South

Profiles



Weekend

Blades - Humffray Street South

Commercial Section J



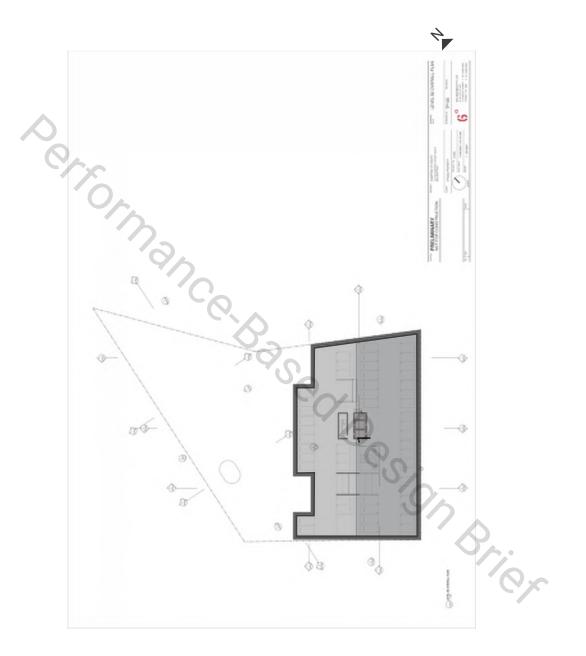


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Drawings

Level 1 - Basement 2

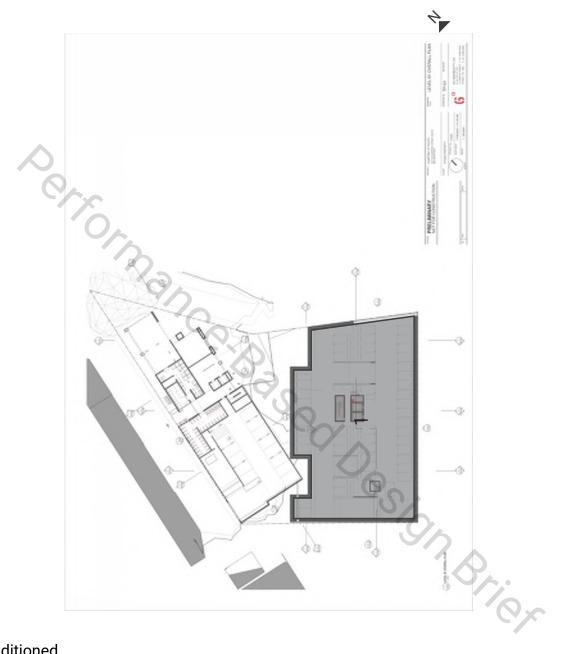


Unconditioned

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Level 2 - Basement 1

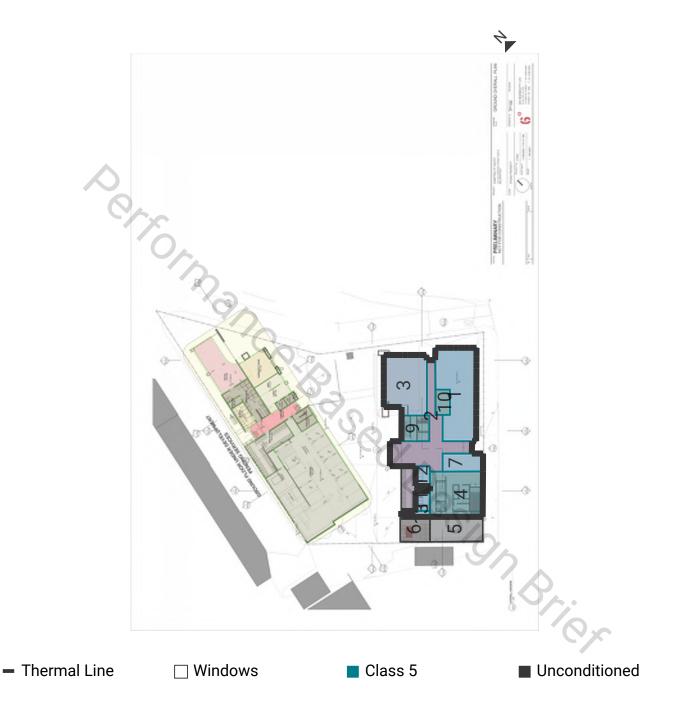


Unconditioned

Blades - Humffray Street South

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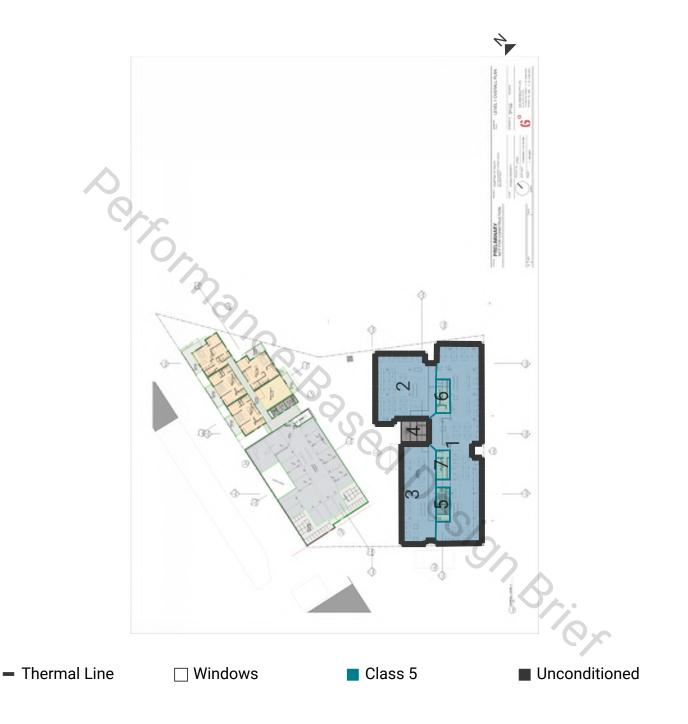
Level 3 - Ground



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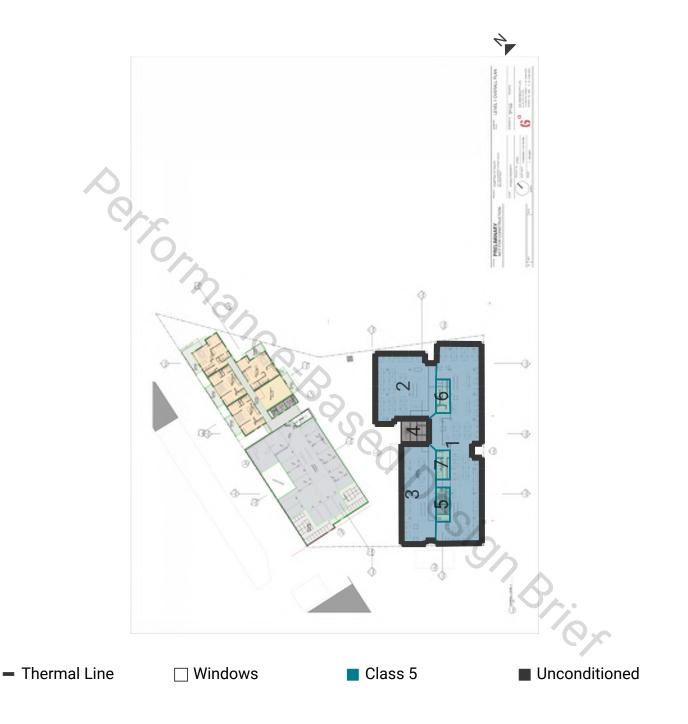
Level 4 - Levels 1 - 3



Blades - Humffray Street South

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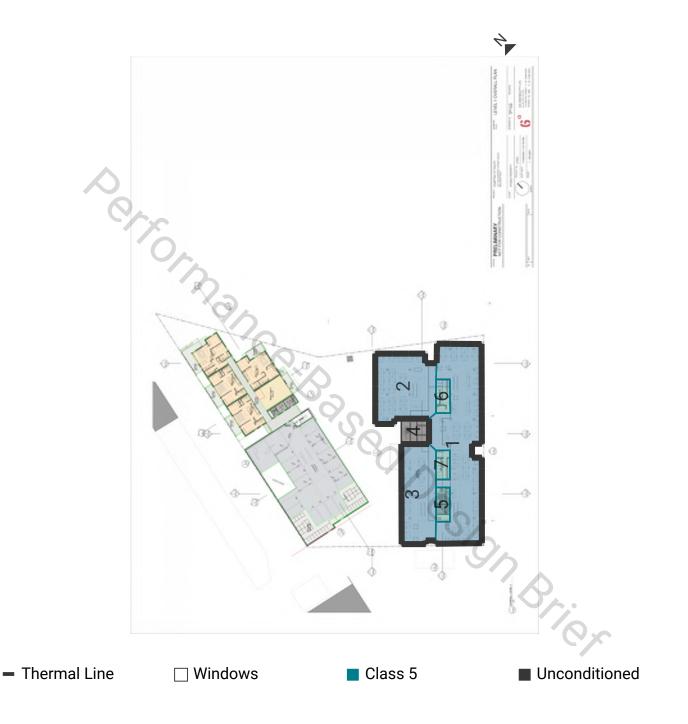
Level 5 - Levels 1 - 3



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Level 6 - Levels 1 - 3



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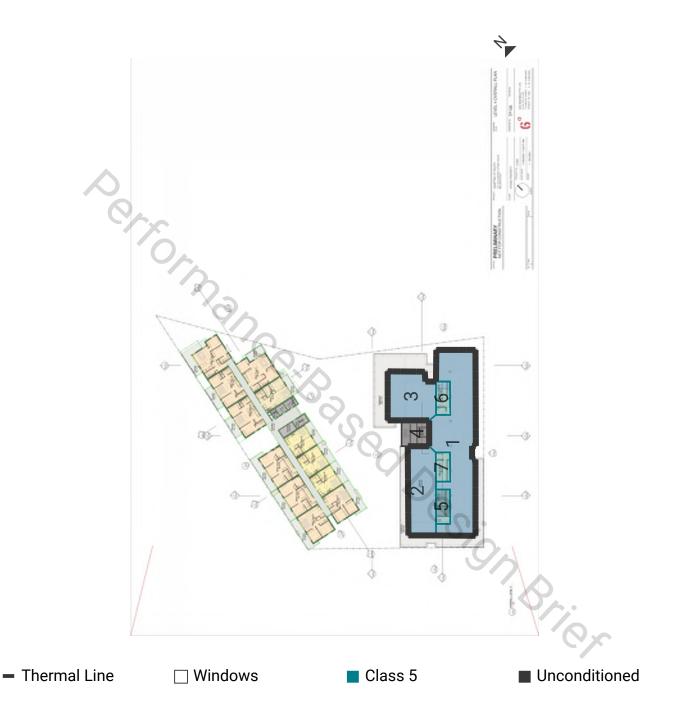
Level 7 - Levels 4 - 5



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Level 8 - Levels 4 - 5



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Level 9 - Level 6



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JV3 Building Assessment

National Construction Code 2019 - Volume 1

Project	Blades - Humffray Street South
Address	102 Humffray St S, Bakery Hill VIC 3350, Australia (37.56° S, 143.86° E)
Date	2022-09-24, 04:53 PM
Author	@sharedspacearchitecture.com.au
Scope	National Construction Code 2019
Building Class	5
Performance Requirements	JP1 Energy Use
Assessment Process	Comparison with the Deemed-to-Satisfy Provisions
Climate Zone	7 0
Storeys	7 8
Floor to Floor Height	4000 mm

Using Speckel

Speckel provides various calculations in line with the National Construction Code 2019 - Volume 1 - Section J Energy Efficiency. These calculations are tested in line with all applicable NCC equations or NCC referenced primary or secondary documents, for them to represent an accurate Performance Solution against the Performance Requirements - JP1 Energy Use. A Performance Solution must be shown to comply with the relevant Performance Requirements through one or a combination of Assessment Methods. Speckel is a valid Assessment Method by comparison with the Deemed-to-Satisfy Provisions of each relevant area.

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Results

The National Construction Code (NCC) specifies minimum performance standards for the energy efficiency of buildings through the Building Code of Australia (BCA) Volume 1, Section J.

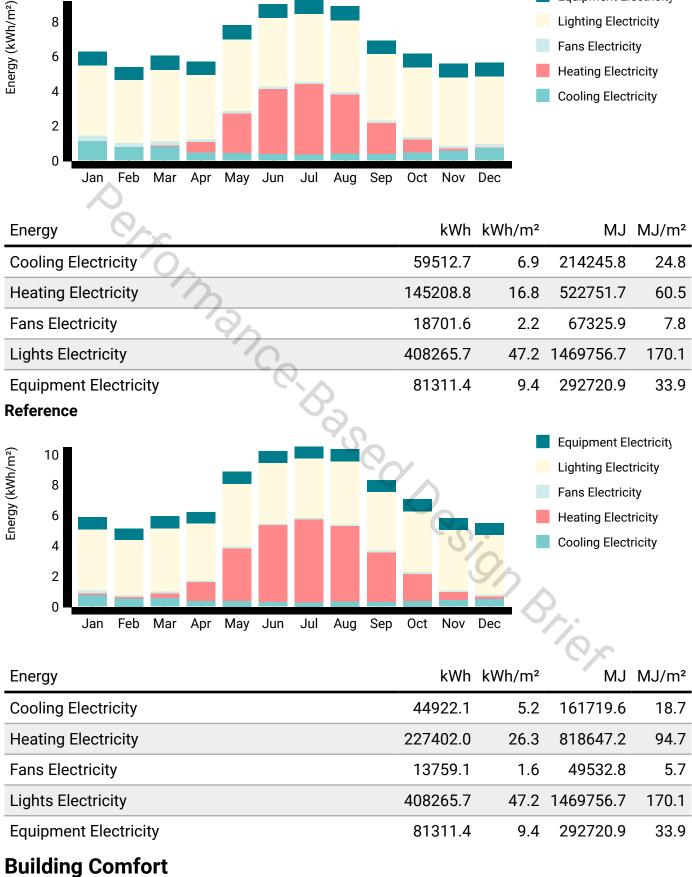
To enable flexibility of the architectural design of the building, a Performance Solution has been used to comply with the Performance Requirement - JP1.

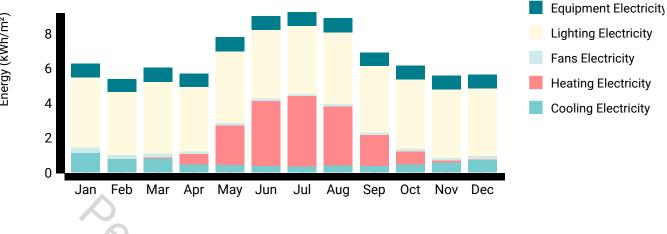
The Assessment Method, 'JV3 Verification using a reference building' has been used and is an Alternative Solution for the Building Fabric only. As such, a Proposed Building with the proposed fabric has been modelled as part of this approach, to compare against the Reference Building services.

To meet acceptance criteria, the Proposed Building with the proposed fabric GHG emissions must be no greater than the Reference Building services.

Proposed (kgCO2-e) Reference (kgCO2-e) Difference (%) 829076.73 Emissions 901937.85 -8.08 ased De **Building Energy** Equipment Electricity Lighting Electricity Reference **Fans Electricity** Heating Electricity **Cooling Electricity** Proposed 20 40 60 80 0 Energy (kWh/m²) Proposed

Building Emissions





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Proposed

# Zone	Int. Floor (m²)	Occupied (Hrs)	Comfortable (Hrs)	Ratio (%)	Pass
3 1. Commercial Space 1	279.60	2340	1899	81.15	×
3 3. Commercial Space 2	209.87	2340	1918	81.97	×
4 1. Office Zone 2	720.53	2340	1969	84.15	×
4 2. Office Zone 1	360.82	2340	1936	82.74	×
4 3. Office Zone 3	310.94	2340	1976	84.44	×
5 1. Office Zone 2	720.53	2340	2027	86.62	×
5 2. Office Zone 1	360.82	2340	2022	86.41	×
5 3. Office Zone 3	310.94	2340	2039	87.14	×
6 3. Office Zone 3	310.94	2340	2087	89.19	×
6 2. Office Zone 1	360.82	2340	2067	88.33	×
6 1. Office Zone 2	720.53	2340	2082	88.97	×
7 1. Office Area 2	530.14	2340	2050	87.61	×
7 2. Office Area 3	212.52	2340	2058	87.95	×
7 3. Office Area 1	193.02	2340	2037	87.05	×
8 1. Office Area 2	530.14	2340	2044	87.35	×
8 2. Office Area 3	212.52	2340	2057	87.91	×
8 3. Office Area 1	193.02	2340	2050	87.61	×
9 1. Office Area 1	523.49	2340	1958	83.68	×
9 2. Office Area 2	222.38	2340	1967	84.06	×
				Pass	×

Reference

# Zone	Int. Floor (m ²)	Occupied (Hrs)	Comfortable (Hrs)	Ratio (%)	Pass
3 1. Commercial Space 1	279.60	2340	1440	61.54	×
3 3. Commercial Space 2	209.87	2340	1472	62.91	×
4 1. Office Zone 2	720.53	2340	1534	65.56	×
4 2. Office Zone 1	360.82	2340	1522	65.04	×

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# Zone	Int. Floor (m²)	Occupied (Hrs)	Comfortable (Hrs)	Ratio (%)	Pass
4 3. Office Zone 3	310.94	2340	1559	66.62	×
5 1. Office Zone 2	720.53	2340	1577	67.39	×
5 2. Office Zone 1	360.82	2340	1591	67.99	×
5 3. Office Zone 3	310.94	2340	1606	68.63	×
6 3. Office Zone 3	310.94	2340	1661	70.98	×
6 2. Office Zone 1	360.82	2340	1629	69.62	×
6 1. Office Zone 2	720.53	2340	1613	68.93	×
7 1. Office Area 2	530.14	2340	1590	67.95	×
7 2. Office Area 3	212.52	2340	1655	70.73	×
7 3. Office Area 1	193.02	2340	1622	69.32	×
8 1. Office Area 2	530.14	2340	1589	67.91	×
8 2. Office Area 3	212.52	2340	1656	70.77	×
8 3. Office Area 1	193.02	2340	1635	69.87	×
9 1. Office Area 1	523.49	2340	1521	65.00	×
9 2. Office Area 2	222.38	2340	1581	67.56	×
			0.	Pass	×
			C'r	•	
			S'An Br	2	
				*	

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Method

Approach

- The National Construction Code (NCC) specifies minimum performance standards for the energy efficiency of buildings through the Building Code of Australia (BCA) Volume 1, Section J.
- To enable flexibility of the architectural design of the building, a Performance Solution has been used to comply with the Performance Requirement JP1.
- The Assessment Method, <u>JV3 Verification using a reference building</u> has been used and is an Alternative Solution for the Building Fabric only. As such, a Proposed Building with the proposed fabric has been modelled as part of this approach, to compare against the Reference Building services.
- To meet acceptance criteria, the Proposed Building with the proposed fabric <u>Greenhouse Gas</u> (<u>GHG</u>) emissions must be no greater than the Reference Building services.
- When the Simulated Shading Multipliers feature is enabled, each window is simulated in EnergyPlus twice, to compare a completely unshaded window, to a window affected by attached shading, building self-shading, and surrounding structures. The multiplier is based on the ratio of shaded versus unshaded annual average external incident solar radiation, limited between 0.0 and 1.0.

Assumptions / Limitations

- Parts J3 J8 are not part of this assessment.
- Specification JVa Additional Requirements Part 2. Additional Requirements General, is only met for provisions (a) General Thermal Construction, J1.2 and (b) for Floor Edge Insulation, J1.6(b) and J1.6(c). All other provisions (c - n) are not part of this assessment.
- Specification JVb Modelling Parameters Part 1. Scope, Part 2. Reference Building and Part 3
 Proposed Building and Reference Building have been used to form the basis of the Method of
 Assessment.
- Specification JVb Modelling Parameters Part 4. Services proposed and reference building, are not part of this assessment as the minimum performance requirements of the services are not part of this assessment.
- To ensure the reference building can be calculated, windows are limited to a maximum of 99% window-to-wall ratio (WWR).

Inputs

The NCC 2019 - Vol 1 contains technical design and construction requirements for all commercial buildings and their associated structures. The following Building Classes have been adopted in this <u>assessment.</u>

Building Class	Wall Ar (n	rea n²)	Window Area (m²)		of Area (m²)	Floo	r Area (m²)	Window-Wall Ratio
5	2668.	52	2450.54	1 1	545.47	16	86.74	0.48
Levels	A Pro-	#	Drawing	# Zones	Floor Ar	rea (m²)	Wall (m²)	Window (m²)
	0	1	Basement 2	1		1864.9	0.0	0.0
		2	Basement 1	1		1865.6	0.0	0.0
		3	Ground	13		1365.1	695.1	271.8
		4	Levels 1 - 3	7		1581.0	371.2	406.6
		5	Levels 1 - 3	7		1581.0	371.2	406.6
		6	Levels 1 - 3	7		1581.0	371.2	406.6
		7	Levels 4 - 5	007		1115.9	301.8	340.8
		8	Levels 4 - 5	7		1115.9	301.8	340.8
		9	Level 6	5		913.6	256.1	277.5
Zones						S		
	Level	Zon	e	A	rea (m²)	Volume	e (m²) Trea	ated Area (m²)
	1	1. B	asement Carpa	ark B2	1864.90	540	08.20	0.00
	2	1. B	asement Carpa	ark 1	1865.58	559	96.74	0.00
	3	1. C	ommercial Spa	ice 1	279.60	14	56.69	279.60
	3	2. L	obby		218.99	114	40.96	218.99
	3	3. C	ommercial Spa	ice 2	209.87	109	93.42	209.87
	3	4. B	ack of House 1		204.53	10	65.58	204.53
	3	5. C	arpark Entry Ra	amp	110.88	5	77.68	0.00
	3	6. R	efuse Room		63.08	32	28.62	0.00
	3	7. S [.]	tore 2		61.95	32	22.76	61.95

Level	Zone	Area (m²)	Volume (m²)	Treated Area (m ²)
3	8. Bike Storage	60.95	317.53	0.00
3	9. Lift and Stairs	60.89	317.26	60.89
3	10. Commercial Storage	31.08	161.93	31.08
3	11. Bathroom 1	24.65	128.45	24.65
3	12. Bathroom 2	24.32	126.72	24.32
3	13. Hallway	14.32	74.59	14.32
4	1. Office Zone 2	720.53	2557.86	720.53
4	2. Office Zone 1	360.82	1280.89	360.82
4	3. Office Zone 3	310.94	1103.85	310.94
4	4. Core 1	64.68	229.61	0.00
4	5. Core 2	43.68	155.06	43.68
4	6. Female Toilet	43.35	153.89	43.35
4	7. Male Toilet	36.96	131.21	36.96
5	1. Office Zone 2	720.53	2557.86	720.53
5	2. Office Zone 1	360.82	1280.89	360.82
5	3. Office Zone 3	310.94	1103.85	310.94
5	4. Core 1	64.68	229.61	0.00
5	5. Core 2	43.68	155.06	43.68
5	6. Female Toilet	43.35	153.89	43.35
5	7. Male Toilet	36.96	131.21	36.96
6	1. Office Zone 2	720.53	2557.86	720.53
6	2. Office Zone 1	360.82	1280.89	360.82
6	3. Office Zone 3	310.94	1103.85	310.94
6	4. Core 1	64.68	229.61	0.00
6	5. Core 2	43.68	155.06	43.68
6	6. Female Toilet	43.35	153.89	43.35
6	7. Male Toilet	36.96	131.21	36.96
7	1. Office Area 2	530.14	1882.00	530.14

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Level	Zone	Area (m²)	Volume (m²)	Treated Area (m ²)
7	2. Office Area 3	212.52	754.45	212.52
7	3. Office Area 1	193.02	685.21	193.02
7	4. Core 1	61.56	218.54	0.00
7	5. Core 2	41.92	148.80	41.92
7	6. Female Toilet	40.67	144.38	40.67
7	7. Male Toilet	36.12	128.23	36.12
8	1. Office Area 2	530.14	1882.00	530.14
8	2. Office Area 3	212.52	754.45	212.52
8	3. Office Area 1	193.02	685.21	193.02
8	4. Core 1	61.56	218.54	0.00
8	5. Core 2	41.92	148.80	41.92
8	6. Female Toilet	40.67	144.38	40.67
8	7. Male Toilet	36.12	128.23	36.12
9	1. Office Area 1	523.49	1858.46	523.49
9	2. Office Area 2	222.38	789.45	222.38
9	3. Toilets	65.97	234.21	65.97
9	4. Core 1	60.73	215.66	0.00
9	5. Core 2	41.00	145.55	41.00
		12983.90	5	8640.63
Walls			í O	

Walls

Total System R-values of all walls include the effects of thermal bridging, which are calculated in accordance with AS/NZS 4859.2 and NZ 4214:2006 (J1.2 Thermal construction - General (e)) or are stated values.

For the purpose of the Reference Building, the wall total system R-value of the wall-glazing construction has been calculated in accordance with J1.5 Walls and Glazing and Specification and J1.5a Calculation of U-Value and solar admittance.

Proposed	Title	Class	R-Value (m²K°/W)	Area (m²)
Exposed to Unconditioned	Concept	5	3.00	745.71
External	Concept	5	3.00	1922.81



Reference	Title	Class	R-Value (m²K°/W)	Area (m²)
Exposed to Unconditioned	Concept	5	3.00	745.71
External	Concept	5	3.00	1922.81

Roofs

Total system R-values of all roofs include the effects of thermal bridging are calculated in accordance with AS/NZS 4859.2 and NZ 4214:2006 (as per J1.2 Thermal Construction – General (e)) or are stated values.

For the purpose of the Reference Building, the roof total system R-value has been assumed in accordance with J1.3 Roof and ceiling construction.

· / O.	Title	Class	R-Value (m²K°/W)	Area (m²)
	Concept	5	3.50	692.60
2	Concept	5	4.50	852.87
	Title	Class	R-Value (m²K°/W)	Area (m²)
8	Concept	5	3.70	692.60
62	Concept	5	3.70	852.87
		Concept Concept Title Concept	Concept 5 Concept 5	Concept 5 3.50 Concept 5 4.50 Title Class R-Value (m²K°/W) Concept 5 3.70

Floors

Total system R-values of all floors include the effects of thermal bridging are calculated in accordance with AS/NZS 4859.2, NZ 4214:2006 and Section 3.5 of CIBSE Guide A (J1.2 Thermal construction — general (e)) or are stated values

For the purpose of the Reference Building, the floor total system R-value has been assumed in accordance with <u>J1.6 Floors</u>.

Proposed	Title	Class	R-Value (m²K°/W)	Area (m²)
Exposed to Unconditioned	Concept	5	2.50	1420.46
External	Concept	5	2.50	266.28
Reference	Title	Class	R-Value (m²K°/W)	Area (m²)
Exposed to Unconditioned	Concept	5	2.00	1420.46
External				

Windows

Total system U-values of all windows include the effects of thermal bridging at the frame, which are calculated in accordance with ISO 15099, as per J1.2 Thermal Construction – General (e).

For the purpose of the Reference Building, the glazing total system U-value and solar admittance of the wall-glazing construction has been calculated in accordance with J1.5 Walls and Glazing and Specification J1.5a Calculation of U-Value and solar admittance.

Proposed	Title	Class	U-value	SHGC	Area (m²)
External	Concept	5	2.00	0.35	2450.54
Reference	Title	Class	U-value	SHGC	Area (m²)
External	Concept	5	3.81	0.24	2450.54

Location and Climate

This development is located at Ballarat AP,VIC AUS. The climate file used in all simulations was AUS_VIC_Ballarat.AP.948520_TMYx.2004-2018, sourced from Climate.OneBuilding, an online repository collated from public sources. <u>http://www.climate.onebuilding.org/</u>.

Emission Factors

Greenhouse gas emission factors are used according to NCC2019 – Vol 1 Specification JVb Modelling Parameters - <u>Table 3a Greenhouse Gas Emissions Factors (kgC02-e/GJ</u>). In the case of this project, 323 kgC02-e/GJ has been used for electricity only, based on the site location.

Occupants

Occupant density (m²/person) are stipulated in each thermal zone, subject to the function and purpose of the space. Internal heat gains for the Reference and Proposed Reference Building occupant densities are identical.

Building Class	Activity	Occupancy Density Clothing Air Velocity (m/s)
7A	Generic Building	10.0 0.7 0.1
5	Office	10.0 0.7 0.1

Lighting

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

Building Class	Space	W/m²
7A	Generic Building	8.0
5	Office	8.0

Equipment

Equipment density (W/m²) are stipulated in each thermal zone, subject to the function and



purpose of the space. Internal heat gains for the Reference and Proposed Reference Building equipment density are identical.

Building Class	Space	W/m²
7A	Generic Building	15.0
5	Office	15.0

Performance Based Design Brier

Air-Conditioning

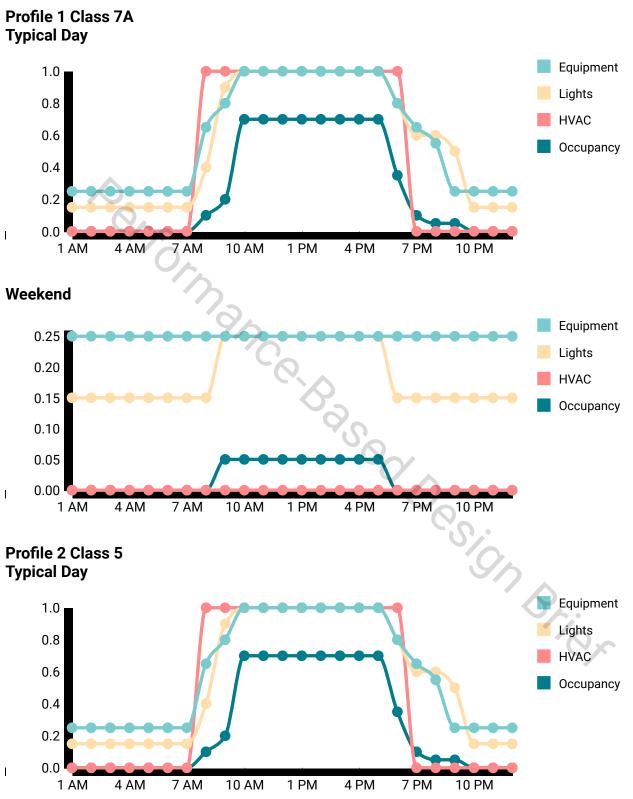
As a fabric only assessment, air-condition equipment and mechanical ventilation rates for the Reference and Proposed Building are identical. Minimum mechanical ventilation is required as per Part FP4.3 Outdoor air supply.

Thermostat Details

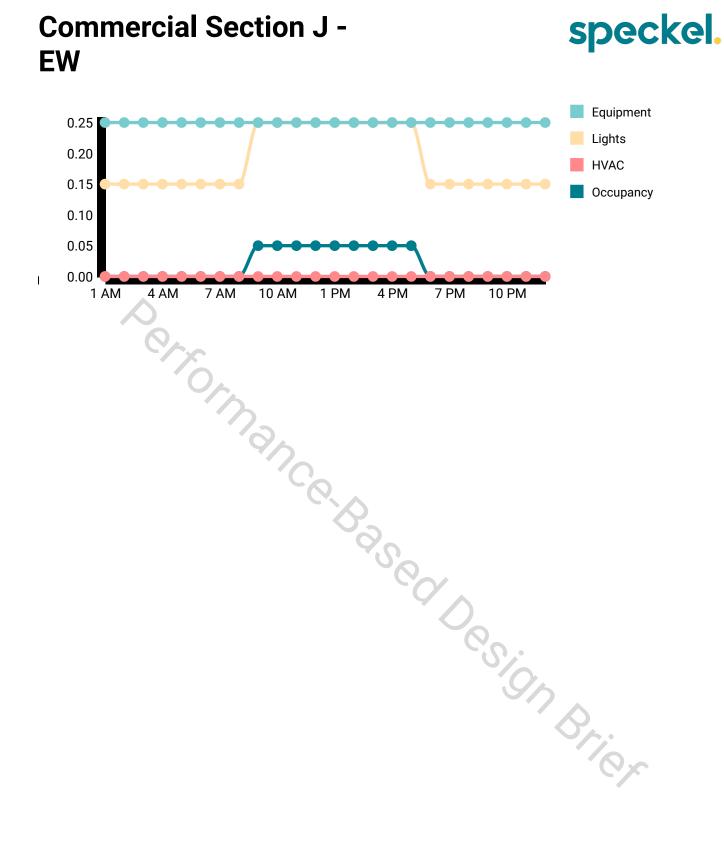
Building Class	Space	Cooling Set Point (°C)	Heating Set Point (°C)
7A	Generic Building	24.0	20.0
5	Office	24.0	20.0
HVAC Details			
НVAC Туре		Packaged Varia	ble Air Volume System
Outdoor Air Flow Rate per Perso	on	0.0075	
Gross Rated Air Cooling Cop	2	3	
Heating Coil Type		Electric	
Supply Fan Efficiency	Ś	0.55	
Supply Fan Pressure		1000	
Supply Fan Motor Efficiency		0.55	
		CS.On	Ori. Or

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Profiles



Weekend

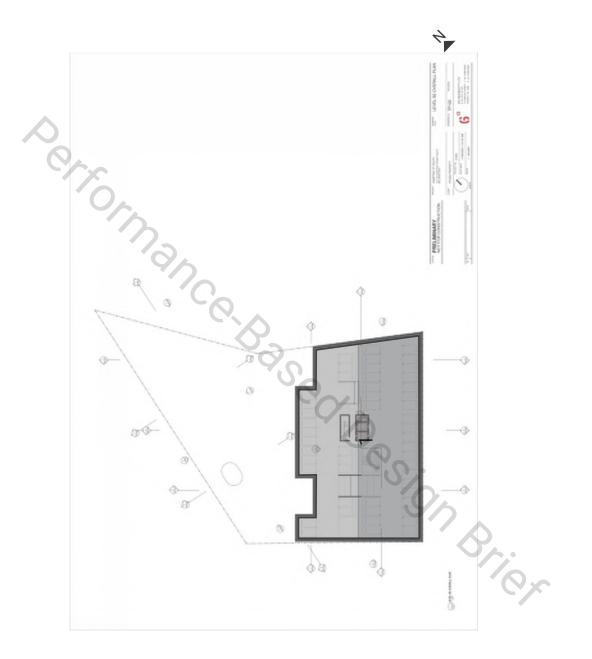


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Commercial Section J -EW

Drawings

Level 1 - Basement 2



Unconditioned



Unconditioned

Commercial Section J -EW

Level 2 - Basement 1

Deror Ra 0 20105 60

Derroma G 5

Class 5

Commercial Section J -EW

Level 3 - Ground

U Windows

- Thermal Line

Brie,

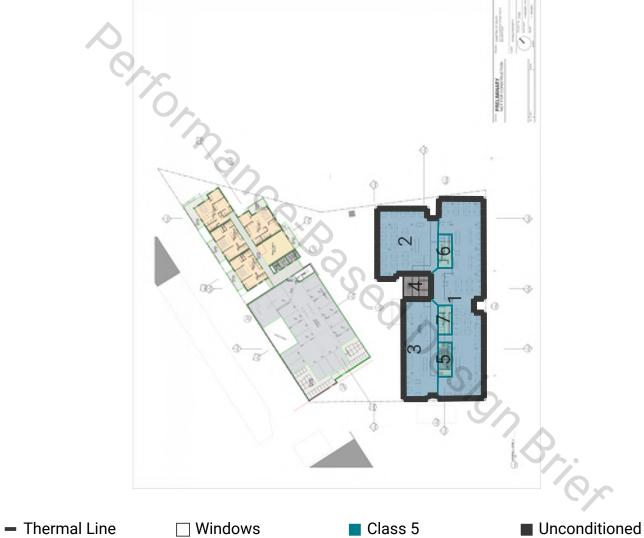
Unconditioned

Level 4 - Levels 1 - 3

EW

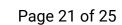
De Forma

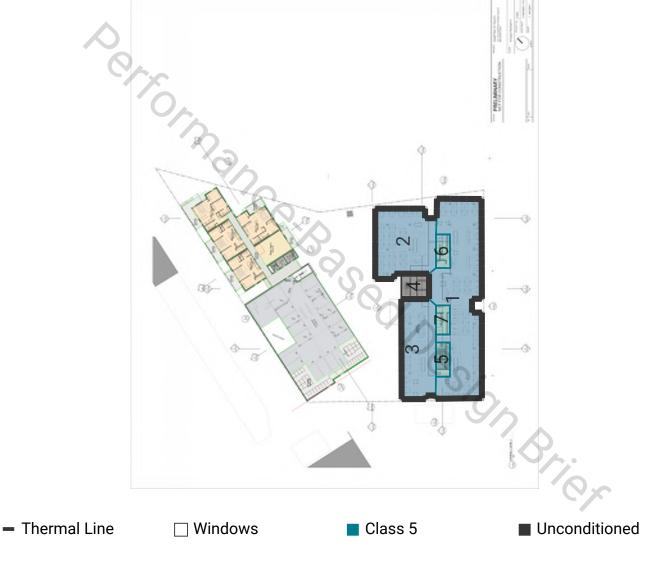
Brie, - Thermal Line U Windows Class 5 Unconditioned



Level 5 - Levels 1 - 3

EW Level 6 - Levels 1 - 3

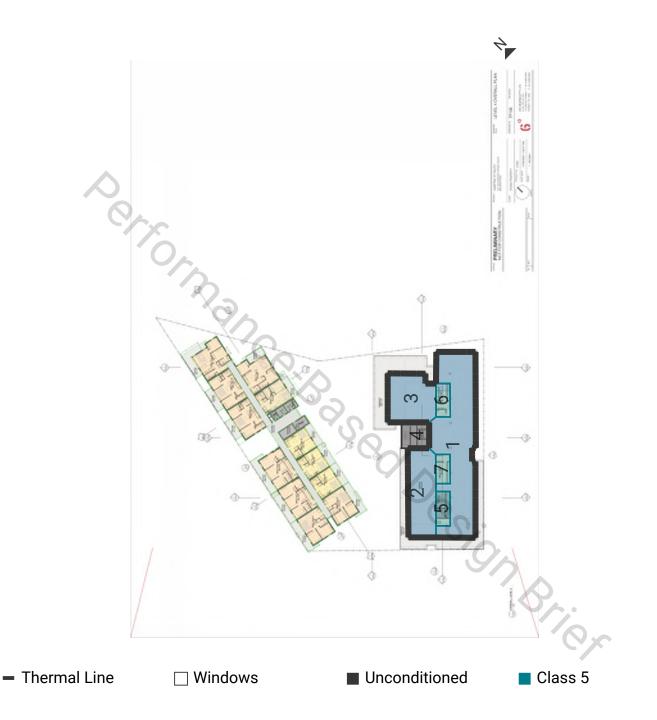






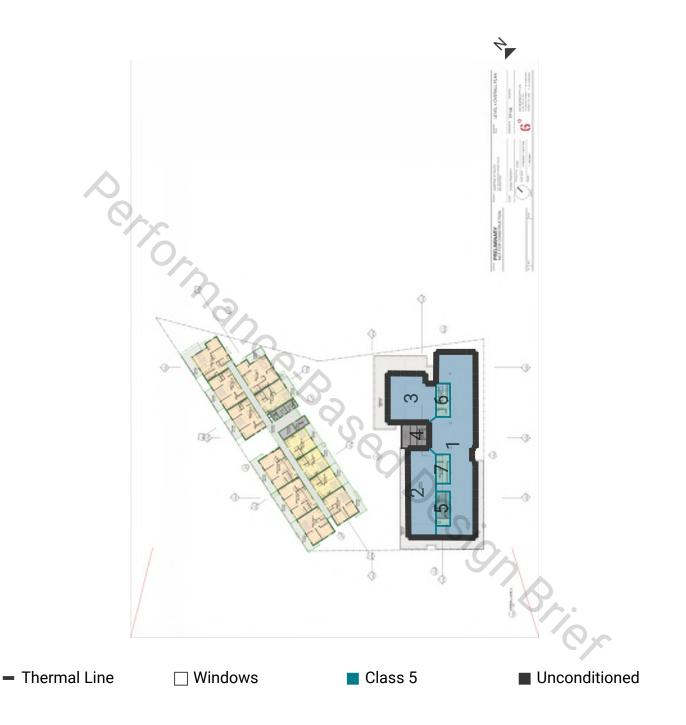
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Level 7 - Levels 4 - 5



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Level 8 - Levels 4 - 5



Level 9 - Level 6





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Indoor Environment Quality

dity To recognise occupants.

Green Star - Design & As Built Scorecard



ATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA		CORE & SHELL CREDIT TYPE	POINTS AVALABLE	POINTS TARGETED	NA/ SCALED POINTS AVAILABLE	POINTS
fanagement									
Freen Star Accredited	To recognise the appointment and active involvement of a Green Star Accredited Professional in order to amoun that the relaxion in avoid affactuate and	1.1	Accredited Professional		A	1	1	-	
		2.0	Environmental Performance Targets		A				
	To encourace and recognise commissioning.	2.1	Services and Maintainability Review		A				
Commissioning and to encourage and recognise commissioning. handowr and turing initiatives that ensure all building services operate to their full potential.	handowr and turing initiatives that ensure all	2.2	Building Commissioning		A				
	2.3	Building Systems Tuning		A	1				
		2.4	Independent Commissioning Agent		A				
Idaptation and Reallience	To encourage and recognise projects that are resilient to the impacts of a changing climate and natural disasters	3.1	Implementation of a Cilmais Adaptation Plan		A	2	2		
fullding Information	To recognise the development and provision of building information that facilitates understanding of a building's systems, operation and maintenance requirements, and environmential targets to enable the coltimate cenformance.	4.1	Building Information		A				
commitment to	To recognise practices that encourage building owners, building occupants and facilities	5.1	Environmental Building Performance		A		1		
reformance	management learns to set largets and monitor environmental performance in a collaborative way.	5.2	End of Life Waste Performance	A. Contractual Agreements	A				
Attering and	To recognize the implementation of effective energy	6.0	Metering		A				
Ionitoring	and water metering and monitoring systems.	6.1	Monitoring Systems		A				
	To reward projects that use best practice formal	7.0	Environmental Management Plan		в				
Responsible Construction Practices	environmental management procedures during	7.1	Environmental Management System		в				
	Come CLASS.	7.2	High Quality Staff Support		в				
Operational Waste	5. Prescriptive Pathway								
operational transit	a. Press quere Plasmay	85	Prescriptive Pathway: Facilities		A		1		
lotal						14	5	0	

SLOWISSION PLANNING			
Compliance Summary		Comments	
Fulfiled by Shared Space Architecture being contractual	By engaged to provide advice, support and information	related to Green Star principles, structure, liming and proc	mann, at al stages of the project, lead
]
Comprehensive pre-commissioning & commissioning activities performed for all nominated building			
Includes review of system warranties. Relident Tuning Plan required, with minimum quarterly			
ntingent on award of advice, monitoring and verification			1
roles, commercion from schemalic dealors show, at Risk assessment must span minimum of 2 limescales			-
relevant to anticipated building lifespan for		Added to SMP	
minute effects of temperature, coarciplation and asa-			-
Comprehensive G&M Manuals available to FM team + Building Lopbook to CIDSE TVD1.			
Accessible Building Liter Information. Guide must be			
tailored to users needs.			
commit to certified operation rating e.g. Green Star Perfo	ormance or NABERS		1
Contractual commitment to reduce demolition waste at and of first life through mithally arroad best			1
Accessible floor-by-floor and distinct use metering plus			1
all leasts a 9%, of arread anarra can or a \$256.03			
Requires Metering Schedule including type, location and consumition estimates			
Requires comprehensive beal-practice project-specific E	MP in place for construction		
Requires head-contractor to have current ISO 14001 EMS certified by members of IAF.			
Programs and policies in place going beyond legal OHS requirements recention physical well-being			
OUS requirements recording physical well-being			
Separale bin storage for general waste, paper &		Added to SMP	1
randward class classic AMD at least 1 observanie.			

	9.1	Ventilation System Attributes		A	1	1			Mnimum separation and intakes and exhausts (ASHRAE	
hat provide high air quality to	9.2	Provision of Outdoor Air	A. Comparison to Industry Standards B. Performance Based Approach C. Natural Ventilation	A	2	2			1 pt for 50% increase in outdoor air CR <800ppm CO2 co-sensing with temperature and <500m ² zoning 2 pts for 100% increase in outdoor air CR <700ppm	Γ
	9.3	Exhaust or Elimination of Polutants	A. Removing the Source of Pollutants B. Exhausting the Pollutants Directly to the Outsi	. A	1	- 1	-		Requires direct external exhaust (e.g. from printing or cooking equipment) OR compliant low-emission devices OR recirculating	Γ
	10.1	Internal Noise Levels		A	1	4			Requires internal noise in nominated areas no more than 5dBA above Satisfactory' invels from Table 2 of	
provide appropriate and " anditions for occupants.	10.2	Reverberation		c	0.89	0.89	0.11		Reverberation times in nominated areas must be below maximum stated in Table 1 of #5587 2107-2015	Г
	10.3	Acoustic Separation	A. Sound Reduction	c	0.89	0.89	0.11		Insultance stated in Table 1 of ASIAP 2107 2016 NA to abel & core areas. Requires internal partitions beau satisfied around radiation index of at least 45.	ľ
	11.0	Minimum Lighting Comfort		с		Complex			Flicker-free kerinairee/ballasts (>12 bit for LED drivers)	• •
-	11.1	11.1.1 General Iluminance	A. Non Residential Spaces B. Residential Spaces A. Prescriptive Method 1	c	0.89	0.89	0.11		ce light levels + glane elimination via baffles or Unified Gla	
of comfort to users.		11.1.2 Gare Reduction	B. Prescriptve Method 2 C. Performance Method A. Prescriptve Method						Requires average celling illuminance at least 32% of	L
	11.2	Surface Illuminance	B. Performance Method C. Residential Spaces (Prescriptive Method)	c	0.89	0.89	0.11		Hequires swinge county summaries at seast 30% of working plane + 50% of celling to have reflectance of at least 0.75. Also requires compliant Terant lease	
	11.3	Localised Lighting Control		с	0.89	0.89	0.11		Requires On/OH + brightness control within immediate environment. Also requires compliant Tenant	Γ
	12.0	Gare Reduction	A. Ford Shading Devices B. Blinds or Screens C. Daylight Gare Model	c		Complex	-	Complex	Requires food shading of direct surright for 80% of Requires food shading of direct surright for 80% of occupied hours or controllable blinds with VLT +10%. OR equivalent glare modeling.	Γ
ry of well-lit spaces that well comfort to building	12.1	Daylight	A. Prescriptive Methodology B. Compliance Using Daylight Factor C. Compliance Using Daylight Factoromy	A	2				Requires "Specified proportion" of primary spaces have Daylight Pactor > 2% OR Daylight Iluminance > 60 kex for 80% of occupied hours.	
	12.2	Views		A	1				Flaquires 60% of primary spaces have clear line of sight (within lim) to high quality esternal or internal	Γ
	13.1	13.1.1 Paints, Advantum and Sealarts	A. Product Certification B. Laboratory Testing C. No Paints, Adhesives or Sealarts		0.89		0.11		Requires 55% comply with Total VOC Imits prescribed. e.g. 16gil for paints, 65gil for primers, sealers & rep coats, 50gil for general purpose adhesives and	
hat safeguard occupant ction in internal air polutant		13.1.2 Carpets	A. Product Certification B. Laboratory Testing C: No Carpets						sealarita. Carpela «D.Smg/m* TVOC (§ 3 days OR GECA/Green Tag certified.	
	13.2	Engineered Wood Products	A. Product Certification B. Laboratory Testing	. c	0.89	0.89	0.11		95% comply with formaldehyde limits preacribed, typical	ł
onise projects that achieve	94.1	Thermal Comfort	A. Naturally Ventilated Spaces B. Mechanically Ventilated Spaces C. Residential Spaces	A	1	1	-		Mandatory for PCA /K Grade. Requires PMV between - 1 & +1; CR ASHRAE 55 - 80% acceptability. CR	ľ
onfat.	94.2	Advanced Thermal Comfort	A: Naturally Ventilated Spaces B: Machanically Ventilated Spaces C: Residential Spaces D: Industrial spaces	A	1		-			
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			Domestic Hot Water	A		1		
			Transition Plan	A		1		
			Fuel Switching	A		4		
			Co-Site Storage	A				
			Vertical Transportation	A		4		
			Of Site Personables	A		5		
				A		Complias		
			Thermal and Energy Performance	A		Compress		
				A				
			158.2.1 Lighting A. Machanically Conditioned Spaces					
			158 2.2 Ventilation and Air Conditioning B. Spaces With Mechanical Heating Only C: Naturally Ventilated Spaces	A				
			158.2.3 Dormatic Hot Water	A	-		-	
			158.2.4 Appliances & Equipment	A				
			158.2.5 Fuel Switching	A			-	
			158.2.6 Ce-Sile Storage	A				
			158.2.7 Vertical Transportation	A			-	
			152.2.8 Passive Laurdry Facilities	A				
			158.2.9 Unoccupied Areas	A				
			15E 2 10 OF-Sile Panevables	A				
			Conditional Requirement: BASIX Pathway	A				
			BASIX Greenhouse Gas Reductions	A				
			CIT-Site Renewables	A				
Greenhouse Gas Emissions	D. NABERS Energy Commitment Agreement Pathway		Conditional Requirement: NABERS Pathway NABERS Energy Greenhouse Gas Emissions	A				
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Park Econology	A Paucijaž Many	1923.3 Additional Presentative Memory 1922.4 1922.4 1922.4 1922.4 1922.4 1922.4 1922.4 1923.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5 1924.5	(93.1) when he (93.2) Are backey (94.2) Are backey (94.2) Are backey (94.2) Are backey (94.2) Are backey (95.2) Are backey <	A A A A A A A A A A A A A A A A A A A B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B B				

dese .	
Requires S5% comply with Total VOC limits prescribed. e.o. 16o1 for paints. 65o1 for primers, sealers &	
dow Requires 85% comply with Total VDC limits preacrited: a.g. (5g) for paints, 65g1 for primers, asslers & rep costs, 50g1 for general purpose adhesives and maskets. Carpets <0.5 mg1rf TVDC (§ 3 days CR GECAVCreen Tag certified.	
sealants. Carpets +0.5mpinf TVOC 62 3 days OR CECAICover-	
Tag certified.	
95% comply with formaldehyde limits prescribed, typical	
Mandatory for PCA' W Grada. Requires PMV between - 1 & +1; OR AGHRAE 55 - 80% acceptability. OR	
OR	
Plan developed showing how transition from freed-trails	
Plan developed showing how transition from feasi-fusis its all-shick(c) will be achieved by 2020. This No feasi fusis humed on with Up to 1% permissible for insuesidable' combustion e.e. commercial	
no tosse rues burned on site. Up to 1% permissible for 'unavoidable' combustion e.g. commercial	
The in Tasks has a second a combined in success as a second	
Up to 2pts for a supply contract to procure up to 100% Off-alle Denseable electricity for up to 10xx	
Renewable energy storage procurement and use strategy developed and demonstrates storages is strad	
and the second and removariant and an and	

Estimate of 5-10% of statistical data public transport access	ale of 5-10% of statistical data public transport access					
Peak building occupancy set at 519, 30 carparking spaces;	17.3 per car parking space	TBC				
5% of parking equipped with EV chargers i.e. 2 chargers						
7.5% of occupants catared for and one locker per bicycle p	arking spot	TBC				
Walkscore of at leat 70 achieved						

	All folures within 1° of maximum available WELS ratings	
	Tank undersized, however, STORM CALC achieves	

		10.1	Internal Noise Levels		A		- 1		
Accountic Coenfort To reward projects that provide appropriate and comfortable acountic conditions for occupants.	10.2	Reverberation		с	0.89	0.89	0.11		
	10.3	Acoustic Separation	A. Sound Reduction	с	0.89	0.89	0.11		
		11.0	Minimum Lighting Comfort		с		Complies		
		11.1		A. Non Residential Spaces B. Residential Spaces A. Prescriptive Method 1	с	0.89	0.89	0.11	
Lighting Comfort	To encourage and recognise well-it spaces that provide a high degree of comfort to users.		11.1.2 Gare Reduction	B. Prescriptve Method 2 C. Performance Method A. Prescriptve Method					
		11.2	Surface Illuminance	 B. Performance Method C. Residential Spaces (Prescriptive Method) 	c	0.89	0.89	0.11	
	11.3	Localised Lighting Control		c	0.89	0.89	0.11		
		12.0	Gare Reduction	A. Fixed Shading Devices B. Blinds or Screens C. Daylight Gare Model	с		Complies		Comple
	To recognise the delivery of well-lit spaces that provide high levels of visual confort to building occupants.	12.1	Daylight	A. Prescriptvs Methodology B. Compliance Using Daylight Factor C. Compliance Using Daylight Autonomy	A	2			
		12.2	Views		A	1			
			13.1.1 Paints, Adhesives and Sealarts	A. Product Certification B. Laboratory Testing C. No Paints, Adventues or Sealarts	c	0.89		0.11	
indoor Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.		13.1.2 Carpets	A. Product Certification B. Laboratory Testing C. No Carpets					
		13.2	Engineered Wood Products	A. Product Certification B. Laboratory Testing	с	0.89	0.89	0.11	
	To encourage and recognise projects that achieve	98.1	Thermal Comfort	A. Naturally Ventilated Spaces B. Mechanically Ventilated Spaces C. Residential Spaces	A	1	1		
Ihermal Comfort	to encourage and recognise projects that acreate high levels of thermal confort.	94.2	Advanced Thermal Confort	A. Naturally Verificated Spaces B. Machanically Verificated Spaces C. Residential Spaces D. Industrial spaces	A	1			
lotal						16.23			

	152.0							
	1527.4			-				
	155.2							
	152.3							
	15E.5 Additional							
	Prescriptiv	15E.5.2 Pail Saltching						
	a Measures	15E.5.3 On-Sile Storage						
	1591.0							
	1391.1							
	1511.2							
	1913							
		15H.3.2 Educral Lighting						
		Ventilation and Air Conditioning						
		Domestic Hot Water						
		Transition Plan						
		Transition Plan Puel Switching						
		Fuel Switching On-sile Storage						
		Provision of Structure for PV	-					
		Of all Revealed						
	1.0.0	Duthaser On-sile Renevable Energy						
		Prescriptive Pathway: On-Site Energy Generation		A	1	1		
			~		1			
A. Prescriptive Pathway								
A Prescriptive Pathway		Modelled Performance Pathway: Reference Building	2	A	2	14.52	0	0
A. Prescription Pathway		Nodeled Performance Pathway: Paterence Building		A		14.82	0	•
A. Prescription Pathway		Modeled Performance Pathway; Reference Building		A		14.89	Ö	¢
A. Prescriptus Patheay	155	Modeled Performance Pathway: Reference Building Performance Pathway		A		14.82	•	0
A. Prescripties Pathway	155 177A					14.29	- 0 -	•
A. Pysociplin Patney	155 17A 17 R .1	Performance Pathway		A	23			•
A. Precryble Pathery	105 17A 17B.1 17B.2	Pedarases Patheny Access by Pakle Transport	A Paking for FasicEfficient Webcks	A	23	1	-	•
A. Precryble Patroy	105 17A 17B.1 17B.2 17B.3	Performent Petiteny Access by Public Transport Reduced Car Parking Providen		A A	23 - - - - - - - - - - - - - - - - 	1	-	•
	177A 177A 177B.1 177B.2 177B.3 177B.4	Participation Professory Access by Public Transport Publics Car Parking Providen Lew Entestion Welch Infrastructure		A A A	23 3 1 1	1		4
	1724 1774 1778.1 1778.2 1778.3 1778.4 1778.5	Performents Pethany Access by Pakite Danapart Reduced Corp Perking Proteion Lack Freedow Pethal Corporation Lack Transport Facilities	A Paking for Fuel-Efficient Whitdee	A A A A A	23 	1 1 1 1 1	-	•
	175 177A 1778.1 1778.2 1778.2 1778.4 1778.5 1770.1	Performance Perhapy Access by Public Temport Access by Public Temport Los Greates Territory Perhaps Markela Neglocartocols Wahada Neglocartocols	A Paking for Fuel-Efficient Whitdee	A A A A A	23 	1 1 1 1 1		•
	1155 1774 1778 - 1 1778 - 2 1778 - 3 1776 - 1 1776 - 1	Forkinston Palacy Access by Palac Temport Related of Parking Protein Law Tempory Palace Action Tempory Palace Website Institution Compared National by Palac Temport	A Paking for Fuel-Efficient Whitdee	A A A A A	23 	1 1 1 1 1		
	102 103 103 103 103 103 103 103 103 103 103	Februaria Malanj Acasis y Addi Shugoti Nakadi Gendra Shugo Shugo Mala Shugo Shukatini Alaha Shugoti Shukatini Malaki Nagtanina Rakadi Sangti Shukati	A Paking for Fuel-Efficient Whitdee	A A A A A	23 	1 1 1 1 1		
	165 1774 1775 1 1775 2 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 1 1775 1	Factoreus Interne Annas (MA) Strepert Handloof Por Nate (MA) Las Bossen (MA) Malak Maja Shankatan Malak Majanahan Malak Majanahan Malak Majanahan Malak Janas (MA)	A Paking for Fuel-Efficient Whitdee	A A A A A	23 	1 1 1 1 1		
	165 1774 1775 1 1775 2 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 1 1775 1	Adams Valany Aninis (Vala Vangel Alakais (Vala Vala Vala Vala Kala Ingel Fala Mala Vala Vala Vala Vala Mala Vala Vala Vala	A Paking for Fuel-Efficient Whitdee	A A A A A	23 3 5 5 7 7 7 7 7 7 7 7 7 7	1 1 1 1		
	165 1774 1775 1 1775 2 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 1 1775 1	Adams Valany Aninis (Vala Vangel Adams Vala Vala Vala Vala Vala Mala Vala Vala Vala Vala Mala Vala Vala Vala Vala Mala Vala Vala Vala Vala Vala Mala Vala Vala Vala Vala Vala Vala Vala	A Paking for Fuel-Efficient Whitdee	A A A A A	23 	1 1 1 1 1		
	165 1774 1775 1 1775 2 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 1 1775 1	Adams Valany Aninis (Vala Vangel Adams Vala Vala Vala Vala Vala Mala Vala Vala Vala Vala Mala Vala Vala Vala Vala Mala Vala Vala Vala Vala Vala Mala Vala Vala Vala Vala Vala Vala Vala	A Paking for Fuel-Efficient Whitdee	A A A A A	23 3 5 5 7 7 7 7 7 7 7 7 7 7	1 1 1 1		
	165 1774 1775 1 1775 2 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 3 1775 4 1775 1 1775 1	Adams Valany Aninis (Vala Vangel Adams Vala Vala Vala Vala Vala Mala Vala Vala Vala Vala Mala Vala Vala Vala Vala Mala Vala Vala Vala Vala Vala Mala Vala Vala Vala Vala Vala Vala Vala	A Paking for Fuel-Efficient Whitdee	A A A A A	23 3 5 5 7 7 7 7 7 7 7 7 7 7	1 1 1 1		
S. Proception Professor	105 178.4 178.4 178.5 178.4 178.5 178.4 178.5 178.5	Restaurus Indusy Anara Ing Alik Stepert Matalaka Ger Yang Jang Boola Lan Bisawa Wala Shakacoza Akada Tangan Panlam Walaka Sugata Janaha Matala Sang Janaha	A Paking for Fuel-Efficient Whitdee	A A A A - - - -	23 3 5 5 7 7 7 7 7 7 7 7 7 7	1 1 1 1		
	17A 7734 7734 7734 7735 7735 7755 7755 7755	National Market Analis Markata Markata Charles Markata Markata Markata National Analis National Analis National Analisa Natio	A Paking for Fuel-Efficient Whitdee	A A A - - -	23 3 1 1 1 - - - - - - - - - - - - -	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
	100 17A 17B2 17B3 17B4 17B5 17C1 17C2 17C3 17C4 17C4 17C4 17C5 17C4 17C5 17C5 17C5 17C5 17C5 17C5 17C5 17C5	Restaurus Indusy Anarak y Alek Stepet Kanada Ger Yang Japan Lan Basen Vala Manakatan Mada Stepet Fallen Mada Stepet Fallen	A Palage FractReart Values A Palage FractReart Values A Palage A Palage A Palage ************************************	А А А А А А А А А А А А	23 3 5 5 7 7 7 7 7 7 7 7 7 7	1 1 1 1		

	100.3 Heat Rejection	A	2	2	
	100.4 Landscape Intigation	A		1	
	100.5 Fine Protection System Test Water	A	1	1	
Total					

A 6 A Additional Life Cycle Impact Reporting B. Material Selection Improvement C. Construction Process Improvement D. LCA Design Review

6

19A.1 Comparative Life Cycle A 19A.2 Additional Reporting

Requires whole-of-building, whole-of-life (crade-to-	
grave) life cycle assessment (LCA) modeling for	
1 pt for reporting on 5 additional impact calegories.	
1 pt for materials selection improvements totalling at	
1 pt for materials selection improvements totalling at least 3% cumulative impact improvement.	
1 pt for construction process improvement (transport to	
Likely to source Responsible Sitesl Fabricator	
FSC certified timber	
At least 3% compliant products	

No water heat negative proposed.
Newskish neiweaker and for sub-oil dip insplition with relative sensor.
Discogene Vet 3% of names the protection system heat
neiter 1, 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 - 500 -

		20.1	Structural and Reinforcing Steel	20.1.0 Responsible Steel Maker			Complies	
	To reward projects that include materials that are	40.1	Second and Personality State	A. Responsible Steel Fabricator		1	1	
Responsible Building Materials	responsibly sourced or have a sustainable supply	20.2	Timber	A. Certified Timber B. Reused Timber		1	1	
	chan.	20.3	Permanent Formwork, Pipes, Flooring, Blinds and	B. Reused Timber A. Products That Do Not Contain PVC	p			
		20.5	Cables	-	B			
Sustainable Products	To encourage sustainability and transparency in product specification.	21.1	Product Transparency and Sustainability	A. Reused Products B. Recycled Content Products C. Environmental Product Declarations (EPDs) D. Third Party Centification E. Sissendahip Programs	8	з	1	
Construction and Demolition Waste A. Fland Benchmark		22.0	Reporting Accuracy	A. Compliance Verification Summary	в			
	22A	Fixed Benchmark		в				
		225	Percentage Benchmark		в			
Total								
Land Use & Ecolog	v							
Ecological Value	To reward projects that improve the ecological value	23.0	Endangered, Threatened or Vulnerable Species	B. Hard Surface Land	A		Complies	
acceogical value	of their ste.	23.1	Ecological Value		A	3	1	
		24.0	Conditional Requirement		A		Complies	
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously	24.1	Reuse of Land	A. Previously Developed Land	A		4	
	developed land and remediate contaminate land.	24.2	Contemination and Hamerican Materials	A. Site Contamination				

purchase.	
ral land or welland of 'High National Importance'.	
sk) to incorporate vegetation, water, or light- coloured au	rfaces with compliant solar reflectance indices.
	parchase.

	Low risk of increased rainfal/flooding during design life of	af project	
	No edemal luminaire to exceed 5%, relative to its actual	monted orientation, 250mm deep eaves	

1 point for 50% of paints (by cost) to be ultra-low VOC (+5g/l) paints. 1 wint for Construction anale af Schler* GEA		
tpi for achieving good-practice air-lightness performanc	a (7m*s/m* (g 50Pa).	

cand use a boolog	av .							
Ecological Value	To reward projects that improve the ecological value	23.0	Endangered, Threatened or Valnerable Species	B. Hard Surface Land	A		Complies	
congen entre	of their site.	23.1	Ecological Value		A	3	- 1	
		24.0	Conditional Requirement		A		Complies	
Sustainable Sites have limited ecological value, re-use pre-	To reward projects that choose to develop sites that have limited ecological value, re-use previously	24.1	Reuse of Land	A. Previously Developed Land	A	1	- 1	
	developed land and remediate contaminate land.	26.2	Contamination and Hazardous Materials	A. Site Contamination	. A	4		
				B. Hazardous Materials			· ·	
Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island	25.1	Heat Island Effect Reduction		A	1		
Total								

Emissions								
Stormwater	To reward projects that minimise peak stormuster flows and reduce pollutants entering public sever	25.1	Stormvater Peak Discharge		A	1	1	
and meridian	infradruchre.	26.2	Stormwater Pollution Targets		A	1		
Light Pollution	To reward projects that minimise light pollution.	27.0	Light Pollution to Neighbouring Bodies		A		Complies	
Light Politicum 10	to rease a projecte site mension agre possion.	27.1	Light Pollution to Night Sky	A. Control of Upward Light Output Ratio (ULOR)	A	1	1	
Microbial Control:		28A	Natural Ventilation		A	1		
Legionella Impacts from Cooling Systems	A. Natural Vertilation							
Coosing systems								
Refrigerant Impacts	To encourage operational practices that minimise the anatroprovelation and retrievalion anatroprove	29.1	Rahigerants Impacts	A. Calculating TSDEI	A			
Total								

Innovation							
Innovative Technology or Process	The project meets the aims of an existing credit using a technology or process that is considered increative in Australia or the world.	3DA	Innovative Technology or Process	A			
Market Transformation	The project has undertaken a sustainability initiative that substantially contributes to the broader market insustrometion inservis sustainable descriptioner in	305	Market Transformation	A			
Improving on Green Star Benchmarks	The project has achieved full points in a Green Star credit and demonstrates a substantial improvement on the here hereic remined to achieve full noints.	30C	Improving on Green Star Benchmarks	A	10		
Innovation Challenge	Where the project addresses an sustainability issue not included within any of the Credits in the existing Green film ratios invite	300	Innovation Challenge	A			
Global Sustainability	Project learns may adopt an approved credit from a Global Green Building Rating tool that addresses a sustainability issue, that is currently outside the	305	Gobal Sustainability	A			
Transf							







4

NABERS T (02) 9995 5000 4 Parramatta Square Parramatta NSW 2150 E nabers@environment.nsw.gov.au nabers.gov.au

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NABERS Energy and Water for Offices Reverse Calculator

|--|

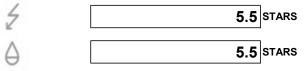
The NABERS Energy and Water for Offices reverse calculator helps you calculate the maximum amounts of energy and water a building can use to achieve a star rating that you specify. To ensure you achieve the rating, you should allow a factor of safety, and not design to the minimum figure for each star band. The outputs are the maximum amounts of energy and water allowed to be used to achieve the rating you nominate.

Note: the reverse calculator provides targets in 0.1 star increments, but NABERS only certifies 0.5 star increments from 1 to 6 stars.

1. ENTER THE TYPE OF OFFICE BUILDING YOU ARE RATING



2. ENTER THE STAR RATING YOU WISH TO ACHIEVE



3. ENTER THE BUILDING INFORMATION

Building Postcode	3550
Net Lettable Area of the building (m ²)	7,408.5
Hours each week with occupancy levels of 20% or more (hrs/week)	45.0
Number of computers that are normally switched on when the building is occupied	519
Percentage Breakdown of Energy Consumption: Electricity (MJ)	100%
Gas (MJ)	0%
Diesel (MJ)	0%
RESULTS	
	kaCOe/vear

NABERS	Benchmarking factor at selected rating	N/A	kgCO ₂ -e/year
	Maximum Emissions at 5.5 Star NABERS Energy	804,713	kgCO ₂ -e/year
	Actual Emissions for this Office - Scope 1, 2 and 3	782,564	kgCO ₂ -e/year
	Actual Emissions for this Office - Scope 1 and 2	708,737	kgCO ₂ -e/year
	Emissions Intensity at 5.5 Star NABERS Energy	108.6	kgCO2-e/m².year
	Energy Intensity at 5.5 Star NABERS Energy	358.7	MJ/m².year
	Maximum Allowable Fuel Consumption	700.000	
	Target Max Electric Target Max C		kWh per annum MJ per annum
	Target Max Die		L per annum
and the second se	Maximum Water Consumption at 5.5 Star NABERS Water	1,855	kL/year
NABERS	Water Intensity at 5.5 Star NABERS Water	0.251	kL/m².year