



# SHARED SPACE ARCHITECTURE



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## 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

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### Town Planning

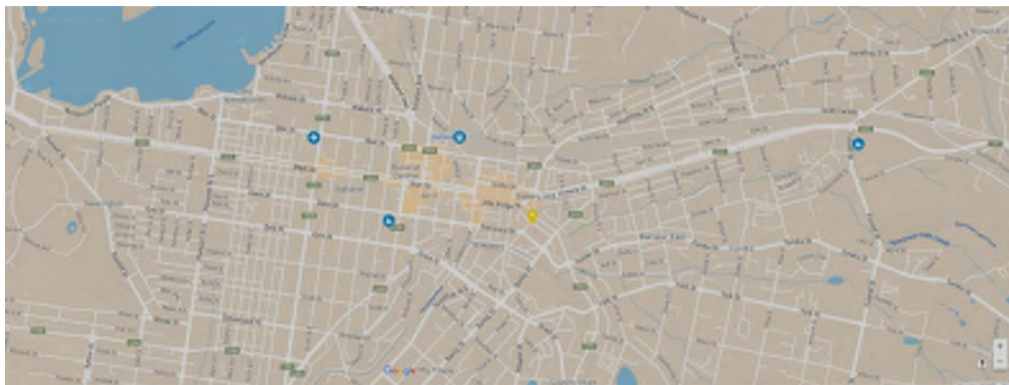
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## CONTEXT

### 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 7,500m<sup>2</sup> 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 4,000m<sup>2</sup> 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, 3<sup>rd</sup> Edition', effective 1<sup>st</sup> 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 Meteorology – Ballarat Aerodome.

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years
<b>Temperature</b>														
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
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
<b>Rainfall</b>														
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
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
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
<b>Other daily elements</b>														
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
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

[http://www.bom.gov.au/climate/averages/tables/cw\\_089002.shtml](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

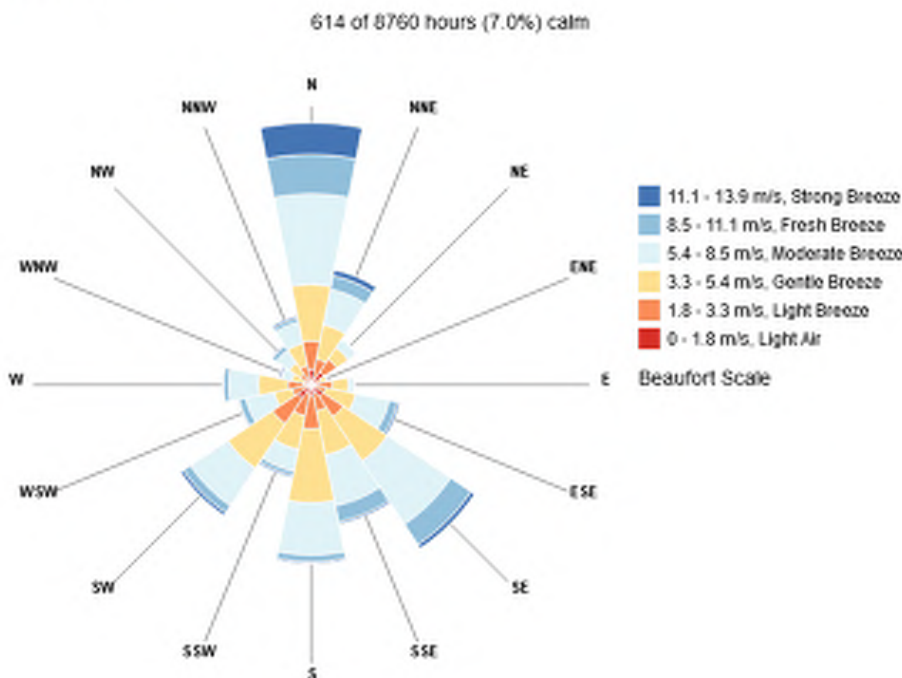


Figure 3: Windrose of Ballarat Climate File

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.

Cloud Cover Floodplot

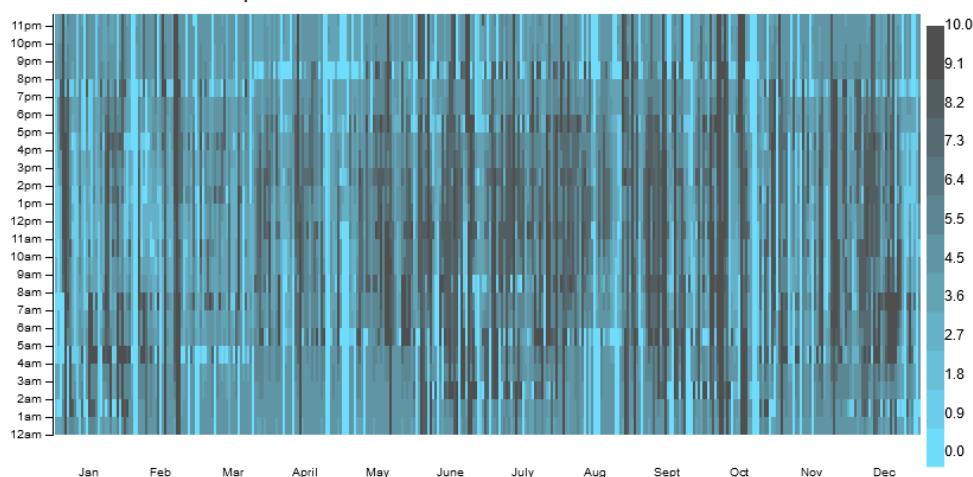


Figure 4: Cloud Cover shown throughout the year at Ballarat

### 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 2,100m<sup>2</sup> (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.

N.1.03	N.1.04	N.2.05	N.5.01	N.7.01
8.2	8.8	8.3	7.9	8.3
S.2.10	S.5.06	S.5.10	S.5.12	S.7.24
7.1	7.6	7.8	8.1	7.7

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
  - 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:
  - General Waste
  - Paper and Cardboard
  - Glass
  - 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 CO<sub>2</sub> co-sensing. 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 mixed-mode 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.
- 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/m<sup>2</sup> TVOC @ 3 days OR GECA/Green Tag certified.
  - Engineered Wood Products: Requires 95% comply with formaldehyde limits prescribed, typically <1mg/l.
- Thermal Comfort
  - Mandatory for PCA 'A' Grade. Requires PMV between -1 & +1; OR ASHRAE 55 - 80% acceptability. OR
  - 20<sup>3</sup>-24<sup>3</sup>C + RH 40%-60% + air velocity < 0.2m/s + perimeter zones < 4m deep & <75m<sup>3</sup>. 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

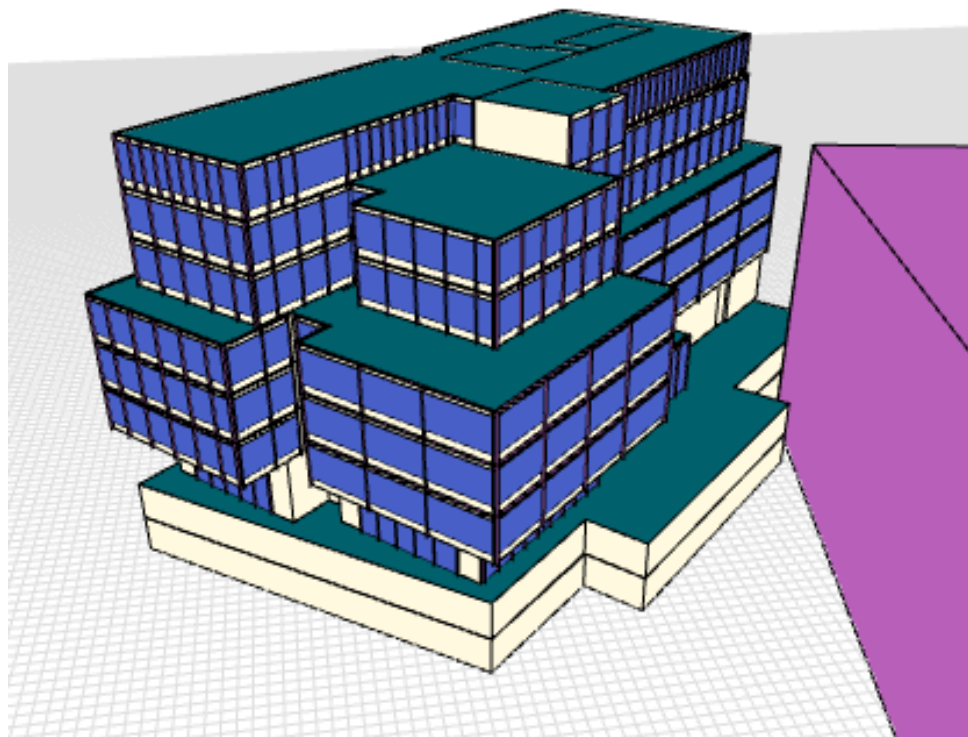
JV3 modelling has been conducted using Speckel for the two commercial zones on the ground floor [include commercial building here too]. A report has been attached to this SMP as an appendix. There is an overall reduction in building emissions of -6.45% from the model of a reference building, which deems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

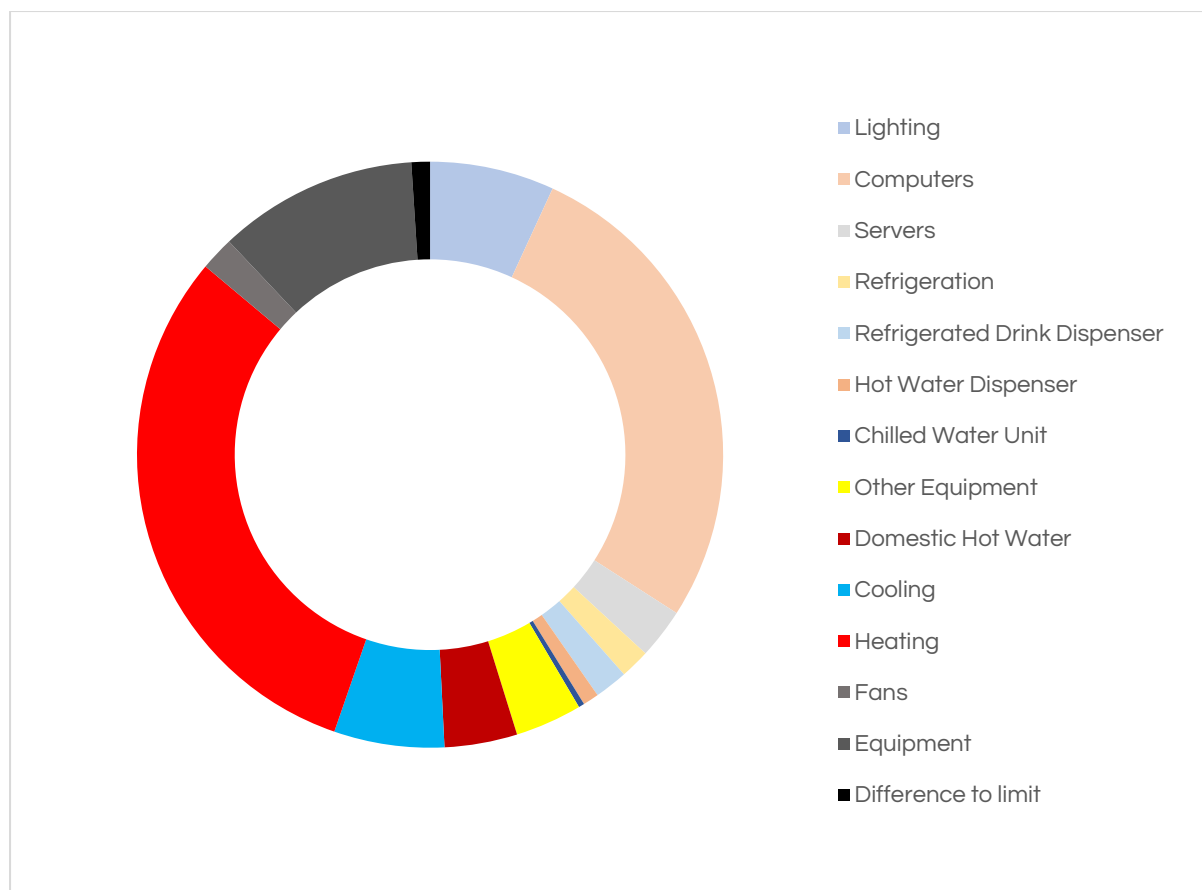
### NABERS Office Energy

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 5,000m<sup>2</sup>. This demonstrated that there are enough stormwater strategies to minimise retention and collection on site.

30m<sup>2</sup> 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 5,000m<sup>2</sup> 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 m<sup>2</sup>, the following ratios exist in the current design:

- Footprint of Residential Building: 1,000m<sup>2</sup> (20.0%)
- Footprint of the Office Building: 1,100m<sup>2</sup> (22.0%)
- Ground Floor Landscaping (including hard surfaces): 2,900m<sup>2</sup> (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.

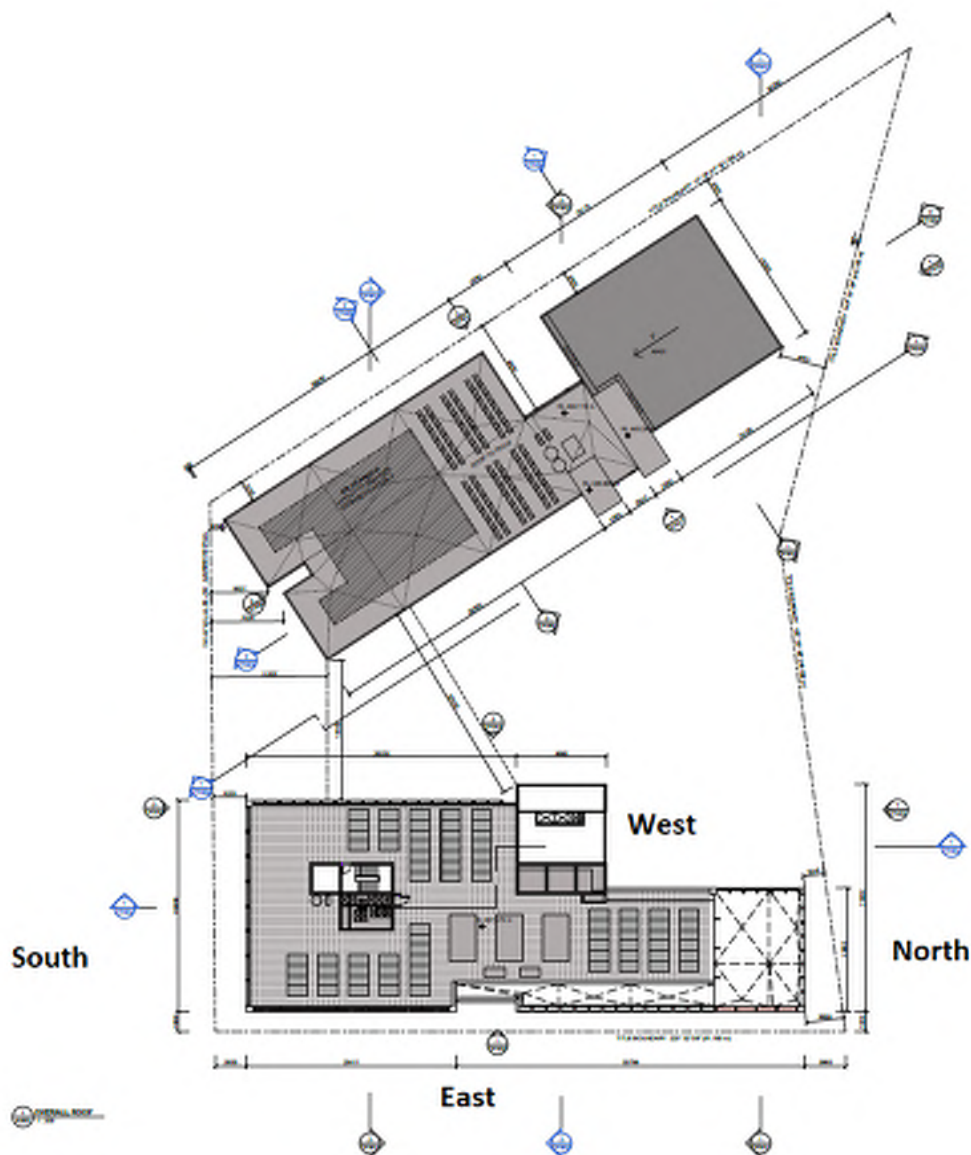
Access to natural light is important and this development demonstrates that every dwelling has an external wall with a window to living spaces and bedrooms. Paths, forming part of the hard landscape have been interweaved amongst green spaces on site.

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

187m<sup>2</sup> 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.

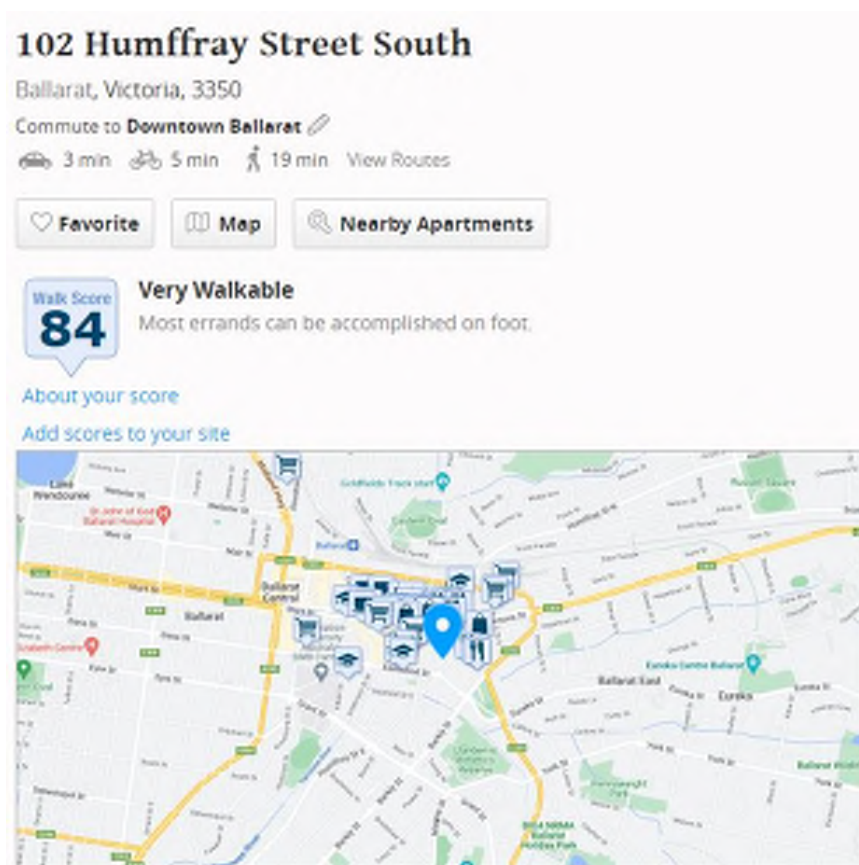


Figure 9: Walkscore demonstrating a high level of access



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.

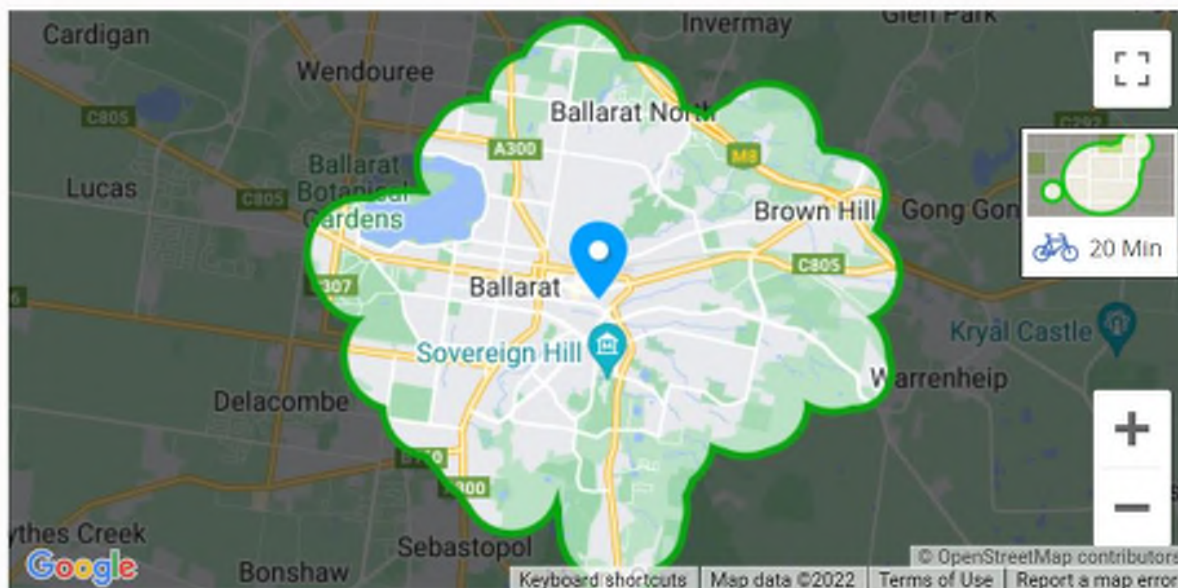


Figure 10: Walkscore demonstrating an accessible area by bicycle from the site

### 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 and 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'<sup>1</sup> 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.

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<sup>1</sup> [https://eprints.qut.edu.au/1908/1/fothsanders\\_dc4\\_v8nc.pdf](https://eprints.qut.edu.au/1908/1/fothsanders_dc4_v8nc.pdf)

## 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:

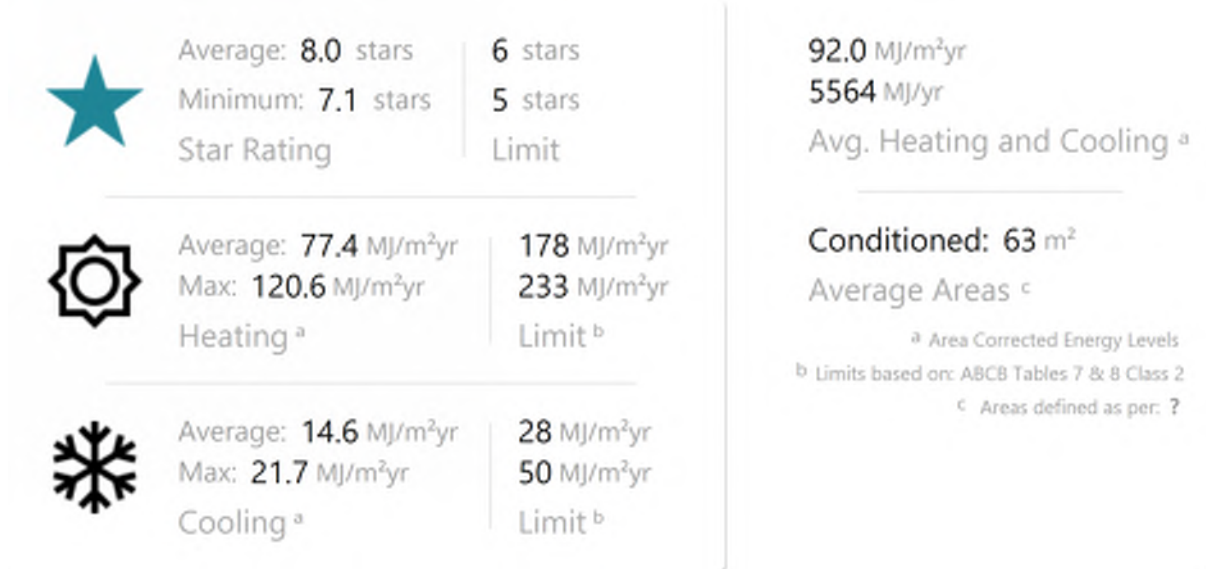


Figure 11: Graph from HERO Software showing a summary of results and an average 8.0 star rating

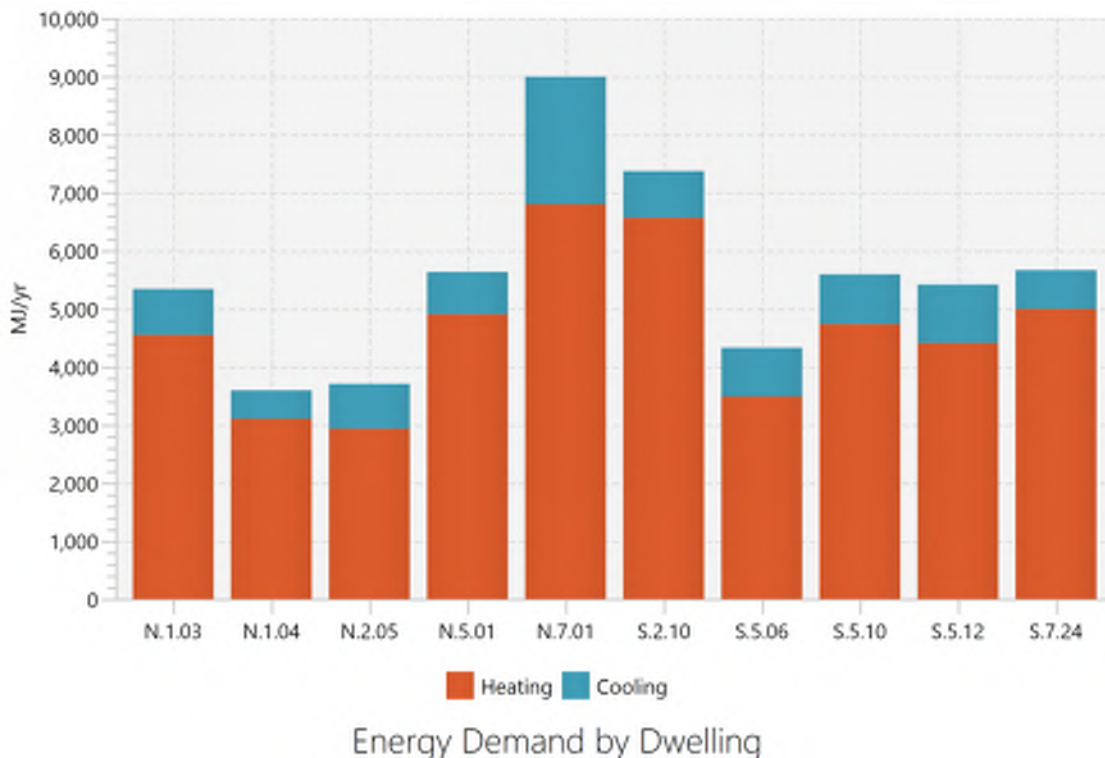


Figure 12: Graph from HERO Software showing the distribution of energy within the selection of apartments

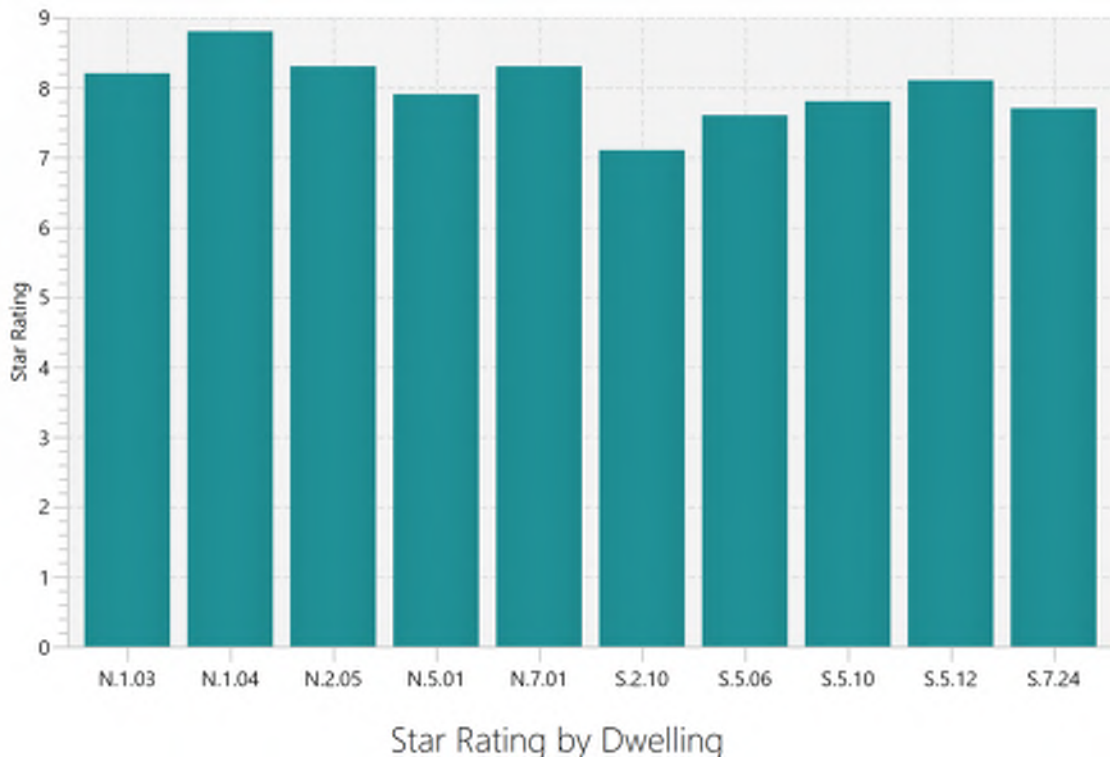


Figure 13: Square metre energy consumption per apartment selected

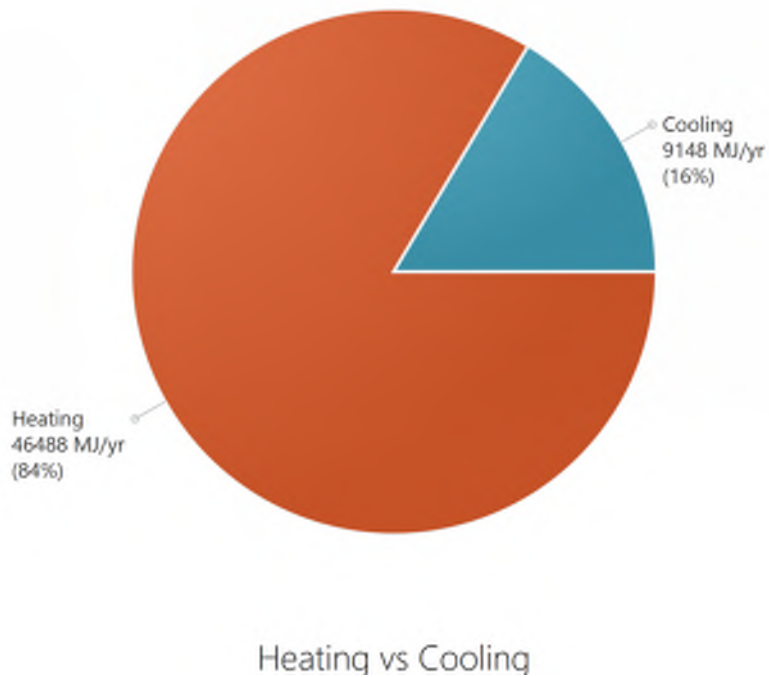


Figure 14: Ratio between heating and cooling energy

The individual apartment results are:

Dwelling	Rating	Rating Limit	Total (MJ/yr)	Total (MJ/m <sup>2</sup> yr)	Heating (MJ/yr)	Heating (MJ/m <sup>2</sup> yr)	Heating Limit (MJ/m <sup>2</sup> yr)	Cooling (MJ/yr)	Cooling (MJ/m <sup>2</sup> yr)	Cooling Limit (MJ/m <sup>2</sup> yr)
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

## 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



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
<b>TOTAL NLA</b>	<b>7408.5</b>	
<b>Default Occupancy</b>	<b>519</b>	

Detailed calculation of electricity consumption:

<b>Lighting</b>	
Requirement (lux)	160
In Watts/m <sup>2</sup>	1.78
Total Area (m <sup>2</sup> )	9338
% of year lit	0.34
Carpark Lighting (lux)	10
In Watts/m <sup>2</sup> (carpark)	0.11
<b>Carpark Area (m<sup>2</sup>)</b>	<b>3600</b>
Total kW	50720.055

<b>Computers</b>	<b>Qty</b>	<b>Peak Load (W)</b>	<b>Off Peak Load (V)</b>	<b>Peak Hrs</b>	<b>Off Peak Hours</b>	<b>Total kW</b>
Desktop	207	120	8	2160	6600	64584
Monitor	414	90	5	2160	6600	94143.6
Laptop	103	35	3	2160	6600	9826.2
Laptop Ext Screen	103	50	5	2160	6600	14523
Laptop + Ext Screen	103	65	5	2160	6600	17860.2
					<b>Total</b>	<b>200937</b>

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

<b>Refrigeration</b>	<b>Power</b>
Refrigerators per level	2
Levels	7
Fridge Capacity	140 46
Freezer Capacity	70 52
<b>TOTAL kW</b>	<b>12026.952</b>

<b>Refrigerated Drink Dispenser</b>	
Dispensers per level	2
Levels	7
<b>TOTAL kW</b>	<b>13499.64</b>

<b>Hot Water Dispenser</b>	
Dispensers per level	2
Levels	7
People	519
<b>TOTAL kW</b>	<b>6483.8375</b>

<b>Chilled Water Unit</b>	
Dispensers per level	2
Levels	7
<b>TOTAL kW</b>	<b>2352</b>

<b>Other Equipment</b>	<b>Qty</b>	<b>Operation</b>	<b>Standby</b>	<b>Peak Hrs</b>	<b>Off-Peak Hours</b>	<b>Total kW</b>
A4 Laser Printer	7	110	22	2160	6600	2679.6
Fax/Inkjet Printer	0	20	5	2160	6600	0
Copier	7	150	5	2160	6600	2499
TV	14	65	5	2160	6600	2427.6
Shredder	7	10	2	2160	6600	243.6
Electronic Whiteboard	14	10	2	2160	6600	487.2
Scanner	7	8	8	2160	6600	490.56
Laminator	7	65	37.2	2160	6600	2701.44
Binder	7	8	2	2160	6600	213.36
Dishwasher	7	46	0	2160	6600	695.52
Oven	7	60	0	2160	6600	907.2
Microwave	14	62	2	2160	6600	2059.68
Small Kitchen Appliances	28	100	0	2160	6600	6048
Coffee Machine	7	150	0	2160	6600	2268
Hot Water Service	2	200	200	2160	6600	3504
						<b>27224.76</b>

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

@sharedspacearchitecture.com.au

+61 406376341

**Accreditation No.** DMN/21/2003

**Assessor Accrediting Organisation** DMN

### Verification

DRAFT PREVIEW ISSUE - NOT TO BE USED FOR CERTIFICATION

### Summary of all dwellings

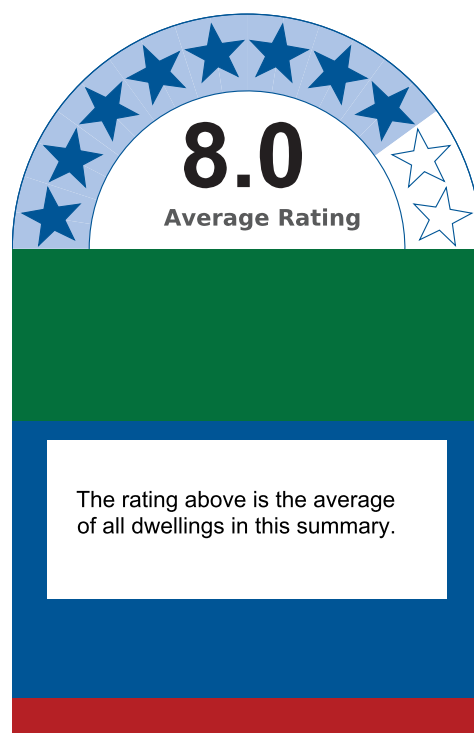
Certificate number and link	Unit Number	Heating load (MJ/m <sup>2</sup> )	Cooling load (MJ/m <sup>2</sup> )	Total load (MJ/m <sup>2</sup> )	Star rating
	Unit 01	45.0	7.1	52.2	8.8
	Unit 02	68.9	12.0	80.9	8.2
	Unit 03	58.3	15.3	73.6	8.3
	Unit 04	120.6	14.7	135.3	7.1

### 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](http://www.abcb.gov.au).

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





## Summary of all dwellings

Certificate number and link	Unit Number	Heating load (MJ/m <sup>2</sup> )	Cooling load (MJ/m <sup>2</sup> )	Total load (MJ/m <sup>2</sup> )	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 licensed assessor. NatHERS accredited assessors are members of a professional body called an Assessor Accrediting Organisation (AAO). 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 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

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 responsibility of the assessor who prepared this certificate to use NatHERS accredited software correctly and follow the NatHERS Technical Notes 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

**Type** New

## Plans

**Main Plan** 27 July 2022

**Prepared by** Six Degrees Architecture

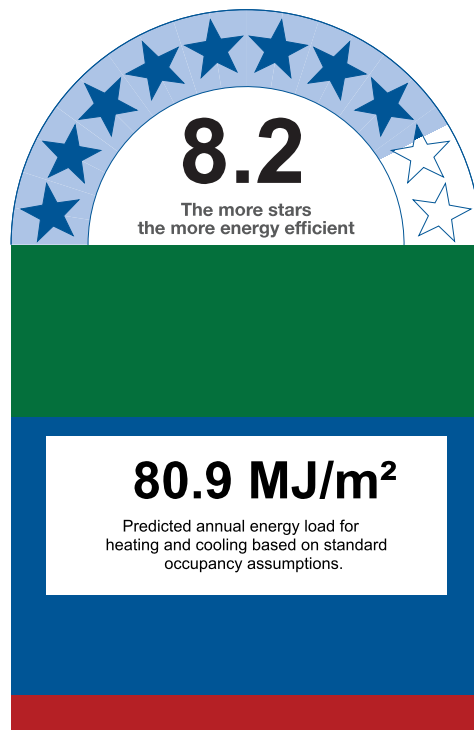
## Construction and environment

Assessed floor area (m <sup>2</sup> )*		Exposure Type
Conditioned*	66.0	Suburban
Unconditioned*	5.4	<b>NatHERS climate zone</b>
Total	71.4	66 - Ballarat Aerodrome
Garage	0.0	



## Accredited assessor

**Name** [REDACTED]  
**Business name** Shared Space Architecture  
**Email** [REDACTED]@sharedspacearchitecture.com.au  
**Phone** +61 4 6376341  
**Accreditation No.** DMN/21/003  
**Assessor Accrediting Organisation** DMN  
**Declaration of interest** No Conflict of Interest



## Thermal Performance

Heating	Cooling
<b>68.9</b>	<b>12.0</b>
MJ/m <sup>2</sup>	MJ/m <sup>2</sup>

### 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.

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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 and glazed door type and performance

### Default\* windows

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

### Custom\* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-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	E	None
BED 02	A&L-004-06 A	W05	2100	1200	Awning	60	N	None
KIT/LIV/DIN	A&L-004-06 A	W01	2100	796	Awning	60	W	None

\* Refer to glossary.

## Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orientation	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	N	None
KIT/LIV/DIN	A&L-004-06 A	W04	2100	1200	Awning	60	N	None

## Roof window *type and performance value*

### Default\* roof windows

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

### Custom\* roof windows

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

## Roof window *schedule*

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

## Skylight *type and performance*

Skylight ID	Skylight description
None	

## Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Diffuser	Shaft Reflectance
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)	Orientation	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	N	675	Yes
BED 02	CONC-150-PB	2800	3001	E		Yes
BED 02	CONC-150-PB	2800	1151	W	7668	Yes
ENSUITE	CONC-150-PB	2800	1655	E		Yes
KIT/LIV/DIN	CONC-150-PB	2800	6249	W	2316	Yes
KIT/LIV/DIN	CONC-150-PB	2800	250	N	1826	Yes

## Internal wall type

Wall ID	Wall Type	Area (m <sup>2</sup> )	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	57.5	2.00
INT-PB	Internal Plasterboard Stud Wall	23.5	0.00

## Floor type

Location	Construction	Area (m <sup>2</sup> )	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

## 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	Type	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

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

\* Refer to glossary.

## 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.

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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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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

<b>Annual energy load</b>	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
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<b>Ceiling penetrations</b>	features that require a penetration to the ceiling, including downlights, vents, exhaust fans, rangehoods, chimneys and flues. Excludes fixtures attached to the ceiling with small holes through the ceiling for wiring, e.g. ceiling fans; pendant lights, and heating and cooling ducts.
<b>Conditioned</b>	a zone within a dwelling that is expected to require heating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
<b>Custom windows</b>	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
<b>Default windows</b>	windows that are representative of a specific type of window product and whose properties have been derived by statistical methods.
<b>Entrance door</b>	these signify ventilation benefits in the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 building.
<b>Exposure category - exposed</b>	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
<b>Exposure category - open</b>	terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors).
<b>Exposure category - suburban</b>	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
<b>Exposure category - protected</b>	terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas.
<b>Horizontal shading feature</b>	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.
<b>National Construction Code (NCC) Class</b>	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at <a href="http://www.abcb.gov.au">www.abcb.gov.au</a> .
<b>Opening percentage</b>	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
<b>Provisional value</b>	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 <a href="http://www.nathers.gov.au">www.nathers.gov.au</a>
<b>Reflective wrap (also known as foil)</b>	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
<b>Roof window</b>	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.
<b>Shading device</b>	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
<b>Shading features</b>	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
<b>Solar heat gain coefficient (SHGC)</b>	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.
<b>Skylight (also known as roof lights)</b>	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
<b>U-value</b>	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
<b>Unconditioned</b>	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions
<b>Vertical shading features</b>	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).

\* Refer to glossary.

# 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

**Type** New

## Plans

**Main Plan** 27 July 2022

**Prepared by** Six Degrees Architecture

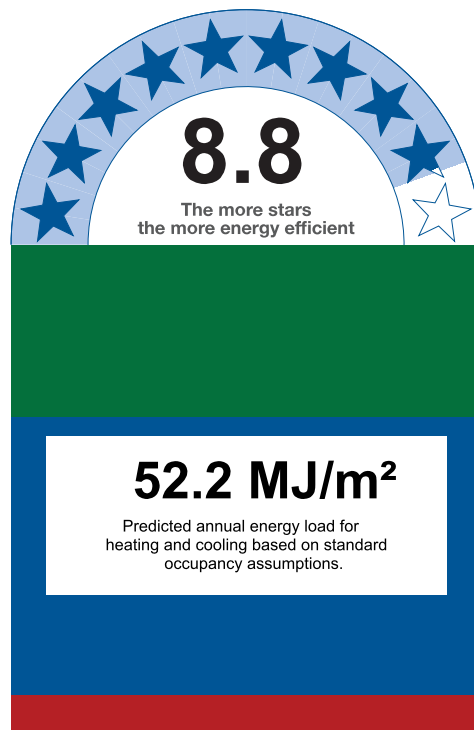
## Construction and environment

Assessed floor area (m <sup>2</sup> )*		Exposure Type
Conditioned*	68.9	Suburban
Unconditioned*	4.1	<b>NatHERS climate zone</b>
Total	73.0	66 - Ballarat Aerodrome
Garage	0.0	



## Accredited assessor

**Name** [REDACTED]  
**Business name** Shared Space Architecture  
**Email** [REDACTED]@sharedspacearchitecture.com.au  
**Phone** +61 4 6376341  
**Accreditation No.** DMN/21/003  
**Assessor Accrediting Organisation** DMN  
**Declaration of interest** No Conflict of Interest



## Thermal Performance

Heating	Cooling
<b>45.0</b>	<b>7.1</b>
MJ/m <sup>2</sup>	MJ/m <sup>2</sup>

### 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](http://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 and glazed door type and performance

### Default\* windows

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

### Custom\* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-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	E	None
BED 02	A&L-004-06 A	W01	2100	1200	Awning	60	N	None
DIN/KIT/LIV	A&L-004-06 A	W03	2100	743	Awning	60	E	None

\* Refer to glossary.

### Window and glazed door *schedule*

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

### Roof window *type and performance value*

#### Default\* roof windows

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

#### Custom\* roof windows

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

### Roof window *schedule*

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

### Skylight *type and performance*

Skylight ID	Skylight description
None	

### Skylight *schedule*

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

\* Refer to glossary.

## External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* projection (mm)	Vertical shading feature
BED 01	CONC-150-PB	2800	3658	E		Yes
BED 02	CONC-150-PB	2800	3650	N	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	N	2563	Yes

## Internal wall type

Wall ID	Wall Type	Area (m <sup>2</sup> )	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 (m <sup>2</sup> )	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: Suspended Concrete Slab Floor (100mm)	11.8	N/A	2.00	Timber
BED 02	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	10.3	N/A	2.00	Timber
DIN/KIT/LIV	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	42.3	N/A	2.00	Timber
ENSUITE	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	4.5	N/A	2.00	Timber

## Ceiling type

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

## Ceiling penetrations\*

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

\* Refer to glossary.

### Ceiling penetrations\*

Location	Quantity	Type	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 type

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

DRAFT

\* Refer to glossary.

## Explanatory Notes

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<b>Exposure category - open</b>	terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors).
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<b>Provisional value</b>	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 <a href="http://www.nathers.gov.au">www.nathers.gov.au</a>
<b>Reflective wrap (also known as foil)</b>	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
<b>Roof window</b>	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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<b>Solar heat gain coefficient (SHGC)</b>	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.
<b>Skylight (also known as roof lights)</b>	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
<b>U-value</b>	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
<b>Unconditioned</b>	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions
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\* Refer to glossary.

# 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

**Type** New

## Plans

**Main Plan** 27 July 2022

**Prepared by** Six Degrees Architecture

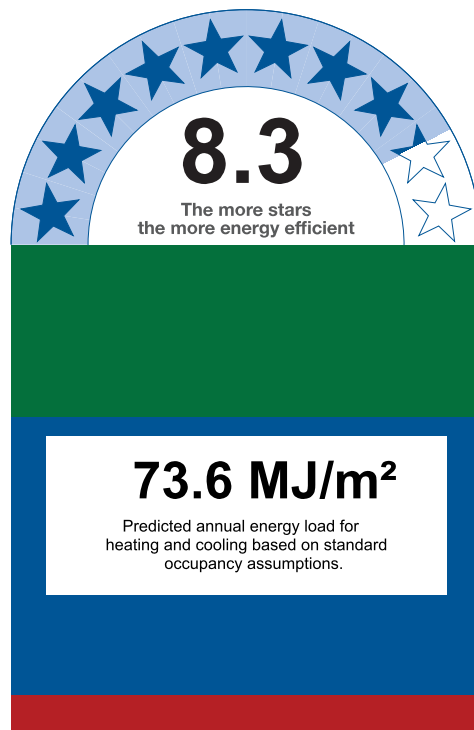
## Construction and environment

Assessed floor area (m <sup>2</sup> )*		Exposure Type
Conditioned*	50.4	Suburban
Unconditioned*	5.4	<b>NatHERS climate zone</b>
Total	55.7	66 - Ballarat Aerodrome
Garage	0.0	



## Accredited assessor

**Name** [REDACTED]  
**Business name** Shared Space Architecture  
**Email** [REDACTED]@sharedspacearchitecture.com.au  
**Phone** +61 4 6376341  
**Accreditation No.** DMN/21/03  
**Assessor Accrediting Organisation** DMN  
**Declaration of interest** No Conflict of Interest



## Thermal Performance

Heating	Cooling
<b>58.3</b>	<b>15.3</b>
MJ/m <sup>2</sup>	MJ/m <sup>2</sup>

### 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](http://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 and glazed door type and performance

### Default\* windows

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

### Custom\* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-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	E	None
KIT/DIN/LIV	A&L-004-06 A	W01	2100	3300	Sliding	45	E	None

\* Refer to glossary.

## Roof window type and performance value

### Default\* roof windows

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

### Custom\* roof windows

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

## Roof window schedule

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

## Skylight type and performance

Skylight ID	Skylight description
None	

## Skylight schedule

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Diffuser	Shaft Reflectance
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
INT-PB	Internal Plasterboard Stud Wall	0.50	Medium	2.50	No

## External wall schedule

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

\* Refer to glossary.



## External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orientation	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	N		Yes

## Internal wall type

Wall ID	Wall Type	Area (m <sup>2</sup> )	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 (m <sup>2</sup> )	Sub-floor ventilation	Added insulation (R-value)	Covering
BATH	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	5.4	N/A	2.00	Timber
BED 01	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	11.6	N/A	2.00	Timber
KIT/DIN/LIV	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	32.9	N/A	2.00	Timber
STUDY	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	6.0	N/A	2.00	Timber

## Ceiling type

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

## Ceiling penetrations\*

Location	Quantity	Type	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

\* Refer to glossary.

### Ceiling fans

Location	Quantity	Diameter (mm)
None		

### Roof type

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

DRAFT

## Explanatory Notes

### About this report

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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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## Glossary

<b>Annual energy load</b>	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
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<b>Ceiling penetrations</b>	features that require a penetration to the ceiling, including downlights, vents, exhaust fans, rangehoods, chimneys and flues. Excludes fixtures attached to the ceiling with small holes through the ceiling for wiring, e.g. ceiling fans; pendant lights, and heating and cooling ducts.
<b>Conditioned</b>	a zone within a dwelling that is expected to require heating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
<b>Custom windows</b>	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
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<b>Horizontal shading feature</b>	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.
<b>National Construction Code (NCC) Class</b>	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at <a href="http://www.abcb.gov.au">www.abcb.gov.au</a> .
<b>Opening percentage</b>	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
<b>Provisional value</b>	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 <a href="http://www.nathers.gov.au">www.nathers.gov.au</a>
<b>Reflective wrap (also known as foil)</b>	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
<b>Roof window</b>	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.
<b>Shading device</b>	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
<b>Shading features</b>	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
<b>Solar heat gain coefficient (SHGC)</b>	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.
<b>Skylight (also known as roof lights)</b>	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
<b>U-value</b>	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
<b>Unconditioned</b>	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions
<b>Vertical shading features</b>	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).

\* Refer to glossary.

# 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

**Type** New

## Plans

**Main Plan** 27 July 2022

**Prepared by** Six Degrees Architecture

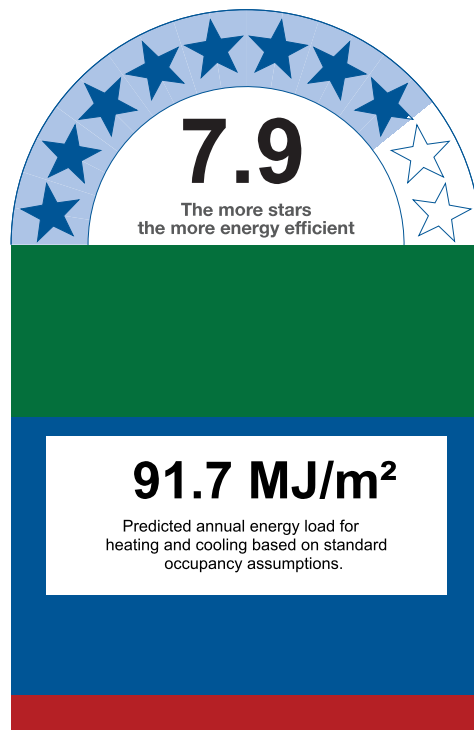
## Construction and environment

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



## Accredited assessor

**Name** [REDACTED]  
**Business name** Shared Space Architecture  
**Email** [REDACTED]@sharedspacearchitecture.com.au  
**Phone** +61 4 6376341  
**Accreditation No.** DMN/21/003  
**Assessor Accrediting Organisation** DMN  
**Declaration of interest** No Conflict of Interest



## Thermal Performance

Heating	Cooling
<b>79.9</b>	<b>11.8</b>
MJ/m <sup>2</sup>	MJ/m <sup>2</sup>

### 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.

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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.

### 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 type and performance

### Default\* windows

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

### Custom\* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-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.

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

#### Custom\* roof windows

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

### Roof window *schedule*

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

### Skylight *type and performance*

Skylight ID	Skylight description
None	

### Skylight *schedule*

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

\* Refer to glossary.

## External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orientation	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 (m <sup>2</sup> )	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	94.6	2.00

## Floor type

Location	Construction	Area (m <sup>2</sup> )	Sub-floor ventilation	Added insulation (R-value)	Covering
BATH	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	5.8	N/A	2.00	Timber
BED 01	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	12.7	N/A	2.00	Timber
BED 02	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	10.1	N/A	2.00	Timber
ENSUITE	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	4.8	N/A	2.00	Timber
KIT/DIN/LIV	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	32.8	N/A	2.00	Timber

## Ceiling type

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

## Ceiling penetrations\*

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
BATH	1	Downlight	100	Sealed
BATH	1	Exhaust Fan	250	Sealed
BED 01	2	Downlight	100	Sealed
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\* Refer to glossary.

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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			

DRAFT

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<b>Unconditioned</b>	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions
<b>Vertical shading features</b>	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).

\* Refer to glossary.

# 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

**Type** New

## Plans

**Main Plan** 27 July 2022

**Prepared by** Six Degrees Architecture

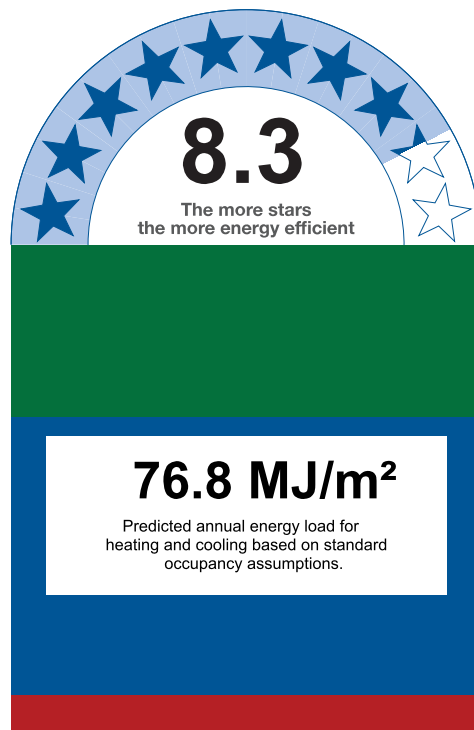
## Construction and environment

Assessed floor area (m <sup>2</sup> )*		Exposure Type
Conditioned*	117.1	Open
Unconditioned*	2.4	<b>NatHERS climate zone</b>
Total	119.5	66 - Ballarat Aerodrome
Garage	0.0	



## Accredited assessor

**Name** [REDACTED]  
**Business name** Shared Space Architecture  
**Email** [REDACTED]@sharedspacearchitecture.com.au  
**Phone** +61 4 6376341  
**Accreditation No.** DMN/21/003  
**Assessor Accrediting Organisation** DMN  
**Declaration of interest** No Conflict of Interest



## Thermal Performance

Heating	Cooling
<b>58.1</b>	<b>18.7</b>
MJ/m <sup>2</sup>	MJ/m <sup>2</sup>

### 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](http://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 and glazed door type and performance

### Default\* windows

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

### Custom\* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-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	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.

## Window and glazed door *schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orientation	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	N	None
DIN/LIV/KIT	A&L-004-06 A	W07	2100	1200	Awning	60	N	None

## Roof window *type and performance value*

### Default\* roof windows

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

### Custom\* roof windows

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

## Roof window *schedule*

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

## Skylight *type and performance*

Skylight ID	Skylight description
None	

## Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Diffuser	Shaft Reflectance
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)	Orientation	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	N		No
ENSUITE	CONC-150-PB	2800	1956	S		Yes

## Internal wall type

Wall ID	Wall Type	Area (m <sup>2</sup> )	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	71.9	2.00
INT-PB	Internal Plasterboard Stud Wall	73.5	0.00

## Floor type

Location	Construction	Area (m <sup>2</sup> )	Sub-floor ventilation	Added insulation (R-value)	Covering
BATH	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	7.0	N/A	2.00	Timber
BED 01	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	16.6	N/A	2.00	Timber
BED 02	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	10.6	N/A	2.00	Timber
BED 03	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	10.5	N/A	2.00	Timber
DIN/LIV/KIT	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	62.6	N/A	2.00	Timber
ENSUITE	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	5.3	N/A	2.00	Timber
PANTRY	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	4.6	N/A	2.00	Timber
POWDER	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	2.4	N/A	2.00	Timber

\* Refer to glossary.

## 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	Type	Diameter (mm)	Sealed /unsealed
BATH	1	Downlight	100	Sealed
BED 01	2	Downlight	100	Sealed
BED 02	2	Downlight	100	Sealed
BED 03	1	Downlight	100	Sealed
DIN/LIV/KIT	2	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

\* Refer to glossary.



## Explanatory Notes

### About this report

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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

<b>Annual energy load</b>	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
<b>Assessed floor area</b>	the floor area modelled in the software for the purpose of the NatHERS assessment. Note, this may not be consistent with the floor area in the design documents.
<b>Ceiling penetrations</b>	features that require a penetration to the ceiling, including downlights, vents, exhaust fans, rangehoods, chimneys and flues. Excludes fixtures attached to the ceiling with small holes through the ceiling for wiring, e.g. ceiling fans; pendant lights, and heating and cooling ducts.
<b>Conditioned</b>	a zone within a dwelling that is expected to require heating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
<b>Custom windows</b>	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
<b>Default windows</b>	windows that are representative of a specific type of window product and whose properties have been derived by statistical methods.
<b>Entrance door</b>	these signify ventilation benefits in the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 building.
<b>Exposure category - exposed</b>	terrain with no obstructions, e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
<b>Exposure category - open</b>	terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors).
<b>Exposure category - suburban</b>	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
<b>Exposure category - protected</b>	terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas.
<b>Horizontal shading feature</b>	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.
<b>National Construction Code (NCC) Class</b>	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at <a href="http://www.abcb.gov.au">www.abcb.gov.au</a> .
<b>Opening percentage</b>	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
<b>Provisional value</b>	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 <a href="http://www.nathers.gov.au">www.nathers.gov.au</a>
<b>Reflective wrap (also known as foil)</b>	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
<b>Roof window</b>	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.
<b>Shading device</b>	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
<b>Shading features</b>	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
<b>Solar heat gain coefficient (SHGC)</b>	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.
<b>Skylight (also known as roof lights)</b>	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
<b>U-value</b>	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
<b>Unconditioned</b>	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions
<b>Vertical shading features</b>	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).

\* Refer to glossary.

# 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

**Type** New

## Plans

**Main Plan** 27 July 2022

**Prepared by** Six Degrees Architecture

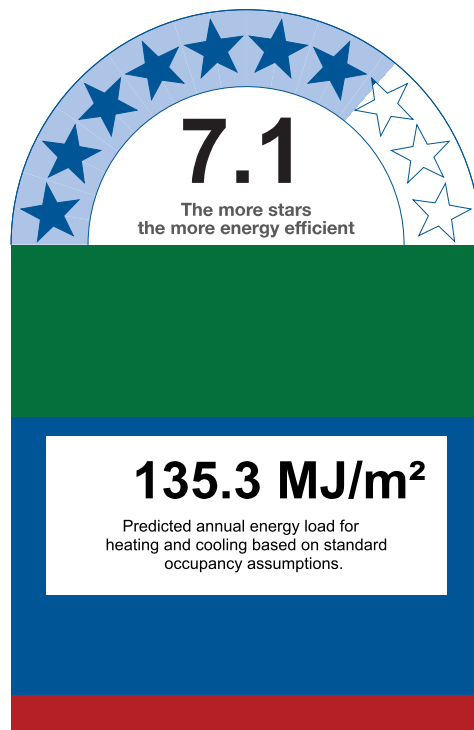
## Construction and environment

Assessed floor area (m <sup>2</sup> )*		Exposure Type
Conditioned*	54.5	Suburban
Unconditioned*	5.4	<b>NatHERS climate zone</b>
Total	59.9	66 - Ballarat Aerodrome
Garage	0.0	



## Accredited assessor

**Name** [REDACTED]  
**Business name** Shared Space Architecture  
**Email** [REDACTED]@sharedspacearchitecture.com.au  
**Phone** +61 4 6376341  
**Accreditation No.** DMN/21/2003  
**Assessor Accrediting Organisation** DMN  
**Declaration of interest** No Conflict of Interest



## Thermal Performance

Heating	Cooling
<b>120.6</b>	<b>14.7</b>
MJ/m <sup>2</sup>	MJ/m <sup>2</sup>

### 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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## Certificate Check

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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?

### 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 type and performance

### Default\* windows

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

### Custom\* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-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	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.

## Roof window type and performance value

### Default\* roof windows

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

### Custom\* roof windows

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

## Roof window schedule

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

## Skylight type and performance

Skylight ID	Skylight description
None	

## Skylight schedule

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Diffuser	Shaft Reflectance
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)	Orientation	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.

## External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orientation	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 (m <sup>2</sup> )	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 (m <sup>2</sup> )	Sub-floor ventilation	Added insulation (R-value)	Covering
BATH	SUSP-CONC-100: Suspended Concrete Slab 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: Suspended Concrete Slab Floor (100mm)	10.8	N/A	2.00	Timber
KIT/LIV/DIN	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	30.6	N/A	2.00	Timber

## Ceiling type

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

## Ceiling penetrations\*

Location	Quantity	Type	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

\* Refer to glossary.

### Ceiling fans

Location	Quantity	Diameter (mm)
None		

### Roof type

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

DRAFT

## Explanatory Notes

### About this report

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## Glossary

<b>Annual energy load</b>	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
<b>Assessed floor area</b>	the floor area modelled in the software for the purpose of the NatHERS assessment. Note, this may not be consistent with the floor area in the design documents.
<b>Ceiling penetrations</b>	features that require a penetration to the ceiling, including downlights, vents, exhaust fans, rangehoods, chimneys and flues. Excludes fixtures attached to the ceiling with small holes through the ceiling for wiring, e.g. ceiling fans; pendant lights, and heating and cooling ducts.
<b>Conditioned</b>	a zone within a dwelling that is expected to require heating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
<b>Custom windows</b>	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
<b>Default windows</b>	windows that are representative of a specific type of window product and whose properties have been derived by statistical methods.
<b>Entrance door</b>	these signify ventilation benefits in the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 building.
<b>Exposure category - exposed</b>	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
<b>Exposure category - open</b>	terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors).
<b>Exposure category - suburban</b>	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
<b>Exposure category - protected</b>	terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas.
<b>Horizontal shading feature</b>	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.
<b>National Construction Code (NCC) Class</b>	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at <a href="http://www.abcb.gov.au">www.abcb.gov.au</a> .
<b>Opening percentage</b>	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
<b>Provisional value</b>	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 <a href="http://www.nathers.gov.au">www.nathers.gov.au</a>
<b>Reflective wrap (also known as foil)</b>	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
<b>Roof window</b>	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.
<b>Shading device</b>	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
<b>Shading features</b>	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
<b>Solar heat gain coefficient (SHGC)</b>	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.
<b>Skylight (also known as roof lights)</b>	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
<b>U-value</b>	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
<b>Unconditioned</b>	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions
<b>Vertical shading features</b>	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).

\* Refer to glossary.

# 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

**Type** New

### Plans

**Main Plan** 27 July 2022

**Prepared by** Six Degrees Architecture

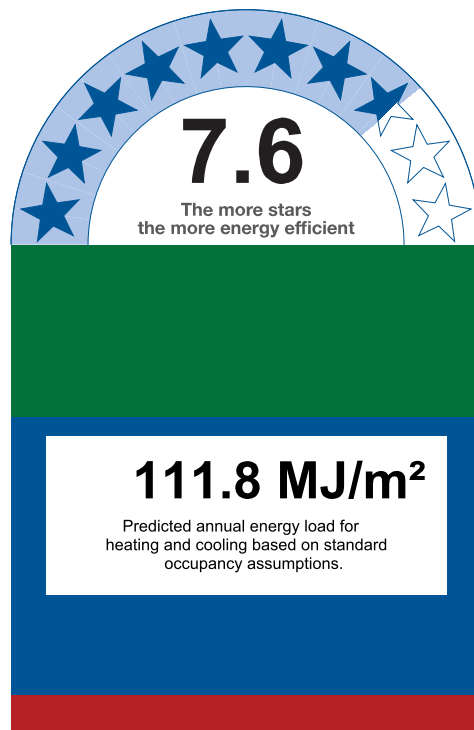
### Construction and environment

Assessed floor area (m <sup>2</sup> )*		Exposure Type
Conditioned*	38.7	Open
Unconditioned*	5.2	<b>NatHERS climate zone</b>
<b>Total</b>	<b>43.9</b>	<b>66 - Ballarat Aerodrome</b>
<b>Garage</b>	<b>0.0</b>	



### Accredited assessor

**Name** [REDACTED]  
**Business name** Shared Space Architecture  
**Email** [REDACTED]@sharedspacearchitecture.com.au  
**Phone** +61 4 6376341  
**Accreditation No.** DMN/21/003  
**Assessor Accrediting Organisation** DMN  
**Declaration of interest** No Conflict of Interest



### Thermal Performance

Heating	Cooling
<b>90.1</b>	<b>21.7</b>
MJ/m <sup>2</sup>	MJ/m <sup>2</sup>

#### 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](http://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 and glazed door type and performance

### Default\* windows

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

### Custom\* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-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	E	None
KIT/DIN/LIV	A&L-004-06 A	W02	2100	3287	Sliding	30	E	None

\* Refer to glossary.

## Roof window type and performance value

### Default\* roof windows

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

### Custom\* roof windows

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

## Roof window schedule

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

## Skylight type and performance

Skylight ID	Skylight description
None	

## Skylight schedule

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Diffuser	Shaft Reflectance
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
INT-PB	Internal Plasterboard Stud Wall	0.50	Medium	2.50	No

## External wall schedule

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

\* Refer to glossary.



## External wall schedule

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

## Internal wall type

Wall ID	Wall Type	Area (m <sup>2</sup> )	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	53.4	2.00

## Floor type

Location	Construction	Area (m <sup>2</sup> )	Sub-floor ventilation	Added insulation (R-value)	Covering
BATH	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	5.2	N/A	2.00	Timber
BED 01	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	13.3	N/A	2.00	Timber
KIT/DIN/LIV	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	25.4	N/A	2.00	Timber

## Ceiling type

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

## Ceiling penetrations

Location	Quantity	Type	Diameter (mm)	Sealed /unsealed
BATH	1	Downlight	100	Sealed
BATH	1	Exhaust Fan	250	Sealed
BED 01	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
None			

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## 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) licenced 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

The format of the NatHERS Certificate was developed by the NatHERS Administrator. However the content of each individual certificate is entered and created by the assessor to create a NatHERS Certificate. It is the responsibility of the assessor who prepared this certificate to use NatHERS accredited software correctly and follow the NatHERS Technical Notes to produce a NatHERS Certificate.

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

<b>Annual energy load</b>	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
<b>Assessed floor area</b>	the floor area modelled in the software for the purpose of the NatHERS assessment. Note, this may not be consistent with the floor area in the design documents.
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<b>Entrance door</b>	these signify ventilation benefits in the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 building.
<b>Exposure category - exposed</b>	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
<b>Exposure category - open</b>	terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors).
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<b>Horizontal shading feature</b>	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.
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<b>Opening percentage</b>	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
<b>Provisional value</b>	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 <a href="http://www.nathers.gov.au">www.nathers.gov.au</a>
<b>Reflective wrap (also known as foil)</b>	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
<b>Roof window</b>	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.
<b>Shading device</b>	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
<b>Shading features</b>	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
<b>Solar heat gain coefficient (SHGC)</b>	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.
<b>Skylight (also known as roof lights)</b>	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
<b>U-value</b>	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
<b>Unconditioned</b>	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions
<b>Vertical shading features</b>	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).

\* Refer to glossary.

# 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

**Type** New

## Plans

**Main Plan** 27 July 2022

**Prepared by** Six Degrees Architecture

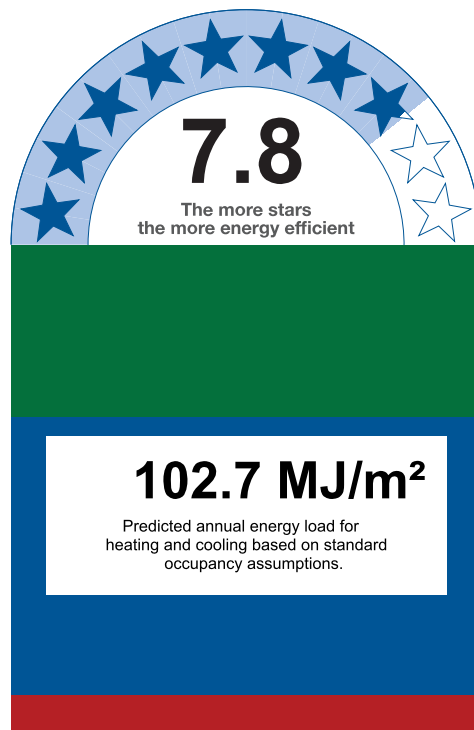
## Construction and environment

Assessed floor area (m <sup>2</sup> )*	Exposure Type
<b>Conditioned*</b> 54.5	Open
<b>Unconditioned*</b> 5.4	<b>NatHERS climate zone</b>
<b>Total</b> 59.9	66 - Ballarat Aerodrome
<b>Garage</b> 0.0	



## Accredited assessor

**Name** [REDACTED]  
**Business name** Shared Space Architecture  
**Email** [REDACTED]@sharedspacearchitecture.com.au  
**Phone** +61 4 6376341  
**Accreditation No.** DMN/21/2003  
**Assessor Accrediting Organisation** DMN  
**Declaration of interest** No Conflict of Interest



## Thermal Performance

Heating	Cooling
<b>86.9</b>	<b>15.7</b>
MJ/m <sup>2</sup>	MJ/m <sup>2</sup>

### About the rating

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## Verification

DRAFT PREVIEW ISSUE - NOT TO BE USED FOR CERTIFICATION

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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 and glazed door type and performance

### Default\* windows

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

### Custom\* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-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.

## Roof window type and performance value

### Default\* roof windows

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

### Custom\* roof windows

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

## Roof window schedule

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

## Skylight type and performance

Skylight ID	Skylight description
None	

## Skylight schedule

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Diffuser	Shaft Reflectance
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)	Orientation	Horizontal shading feature* projection (mm)	Vertical shading feature
BATH	CONC-150-PB	2800	1253	E		Yes
BED 01	CONC-150-PB	2800	3599	W	2072	Yes

\* Refer to glossary.

## External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orientation	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	E		Yes
KIT/LIV/DIN	CONC-150-PB	2800	4852	W	2072	Yes

## Internal wall type

Wall ID	Wall Type	Area (m <sup>2</sup> )	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	71.9	2.00

## Floor type

Location	Construction	Area (m <sup>2</sup> )	Sub-floor ventilation	Added insulation (R-value)	Covering
BATH	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	5.4	N/A	2.00	Timber
BED 01	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	10.8	N/A	2.00	Timber
BED 02	SUSP-CONC-100: Suspended Concrete Slab 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 type

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

## Ceiling penetrations\*

Location	Quantity	Type	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.

### Ceiling fans

Location	Quantity	Diameter (mm)
None		

### Roof type

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

DRAFT



## 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.

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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.

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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

<b>Annual energy load</b>	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
<b>Assessed floor area</b>	the floor area modelled in the software for the purpose of the NatHERS assessment. Note, this may not be consistent with the floor area in the design documents.
<b>Ceiling penetrations</b>	features that require a penetration to the ceiling, including downlights, vents, exhaust fans, rangehoods, chimneys and flues. Excludes fixtures attached to the ceiling with small holes through the ceiling for wiring, e.g. ceiling fans; pendant lights, and heating and cooling ducts.
<b>Conditioned</b>	a zone within a dwelling that is expected to require heating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
<b>Custom windows</b>	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
<b>Default windows</b>	windows that are representative of a specific type of window product and whose properties have been derived by statistical methods.
<b>Entrance door</b>	these signify ventilation benefits in the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 building.
<b>Exposure category - exposed</b>	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
<b>Exposure category - open</b>	terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors).
<b>Exposure category - suburban</b>	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
<b>Exposure category - protected</b>	terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas.
<b>Horizontal shading feature</b>	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.
<b>National Construction Code (NCC) Class</b>	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at <a href="http://www.abcb.gov.au">www.abcb.gov.au</a> .
<b>Opening percentage</b>	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
<b>Provisional value</b>	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 <a href="http://www.nathers.gov.au">www.nathers.gov.au</a>
<b>Reflective wrap (also known as foil)</b>	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
<b>Roof window</b>	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.
<b>Shading device</b>	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
<b>Shading features</b>	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
<b>Solar heat gain coefficient (SHGC)</b>	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.
<b>Skylight (also known as roof lights)</b>	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
<b>U-value</b>	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
<b>Unconditioned</b>	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions
<b>Vertical shading features</b>	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).

\* Refer to glossary.

# 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

**Type** New

## Plans

**Main Plan** 27 July 2022

**Prepared by** Six Degrees Architecture

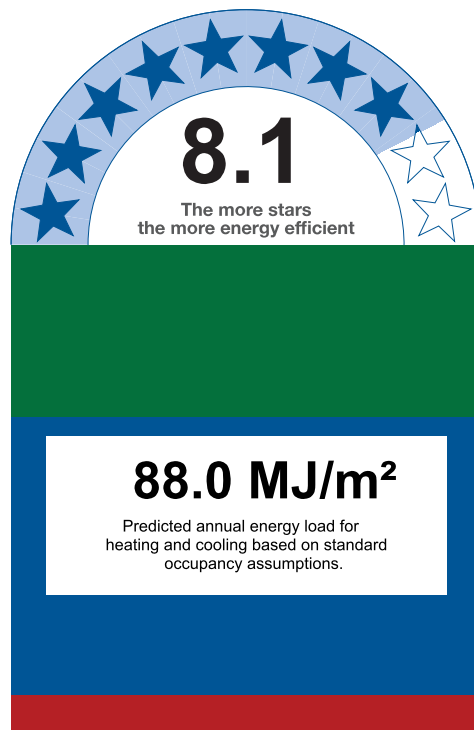
## Construction and environment

Assessed floor area (m <sup>2</sup> )*	Exposure Type
<b>Conditioned*</b> 61.5	Open
<b>Unconditioned*</b> 6.9	<b>NatHERS climate zone</b>
<b>Total</b> 68.4	66 - Ballarat Aerodrome
<b>Garage</b> 0.0	



## Accredited assessor

**Name** [REDACTED]  
**Business name** Shared Space Architecture  
**Email** [REDACTED]@sharedspacearchitecture.com.au  
**Phone** +61 4 6376341  
**Accreditation No.** DMN/21/2003  
**Assessor Accrediting Organisation** DMN  
**Declaration of interest** No Conflict of Interest



## Thermal Performance

Heating	Cooling
<b>71.7</b>	<b>16.4</b>
MJ/m <sup>2</sup>	MJ/m <sup>2</sup>

### 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](http://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 and glazed door type and performance

### Default\* windows

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

### Custom\* windows

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

\* Refer to glossary.

## 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	N	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 U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
None					

### Custom\* roof windows

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

## Roof window *schedule*

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

## Skylight *type and performance*

Skylight ID	Skylight description
None	

## Skylight *schedule*

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

\* Refer to glossary.

## External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* projection (mm)	Vertical shading feature
BED 01	CONC-150-PB	2800	3001	W	2072	Yes
BED 02	CONC-150-PB	2800	3103	W	2072	Yes
BED 02	CONC-150-PB	2800	4699	N		Yes
BED 02	CONC-150-PB	2800	101	E		Yes
ENSUITE 02	CONC-150-PB	2800	2299	N		Yes
KIT/DIN/LIV	CONC-150-PB	2800	3577	W	2072	Yes

## Internal wall type

Wall ID	Wall Type	Area (m <sup>2</sup> )	Bulk insulation
INT-PB	Internal Plasterboard Stud Wall	97.5	2.00

## Floor type

Location	Construction	Area (m <sup>2</sup> )	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: Suspended Concrete Slab Floor (100mm)	14.6	N/A	2.00	Timber
ENSUITE	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	4.6	N/A	2.00	Timber
ENSUITE 02	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	6.9	N/A	2.00	Timber
KIT/DIN/LIV	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	31.5	N/A	2.00	Timber

## Ceiling type

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

## Ceiling penetrations\*

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

\* Refer to glossary.

## Ceiling penetrations\*

Location	Quantity	Type	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			

DRAFT

## 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).

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<b>Exposure category - open</b>	terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors).
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<b>Opening percentage</b>	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
<b>Provisional value</b>	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 <a href="http://www.nathers.gov.au">www.nathers.gov.au</a>
<b>Reflective wrap (also known as foil)</b>	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
<b>Roof window</b>	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.
<b>Shading device</b>	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
<b>Shading features</b>	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
<b>Solar heat gain coefficient (SHGC)</b>	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.
<b>Skylight (also known as roof lights)</b>	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
<b>U-value</b>	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
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\* Refer to glossary.



# 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

**Type** New

### Plans

**Main Plan** 27 July 2022

**Prepared by** Six Degrees Architecture

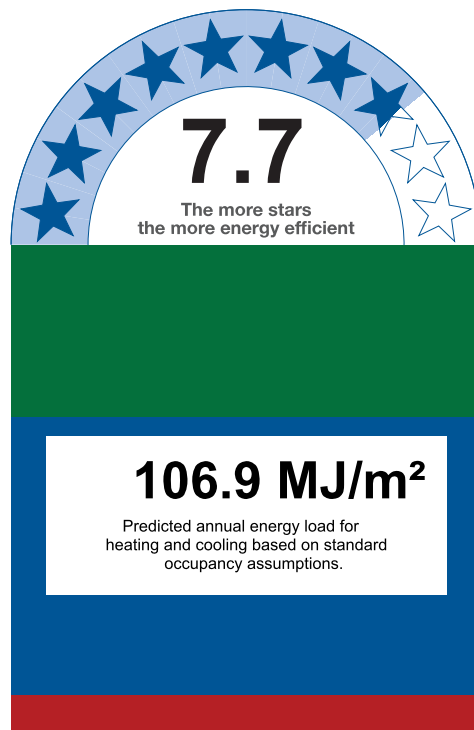
### Construction and environment

Assessed floor area (m <sup>2</sup> )*	Exposure Type
<b>Conditioned*</b> 53.0	Open
<b>Unconditioned*</b> 5.4	<b>NatHERS climate zone</b>
<b>Total</b> 58.4	66 - Ballarat Aerodrome
<b>Garage</b> 0.0	



### Accredited assessor

**Name** [REDACTED]  
**Business name** Shared Space Architecture  
**Email** [REDACTED]@sharedspacearchitecture.com.au  
**Phone** +61 4 6376341  
**Accreditation No.** DMN/21/003  
**Assessor Accrediting Organisation** DMN  
**Declaration of interest** No Conflict of Interest



### Thermal Performance

Heating	Cooling
<b>94.3</b>	<b>12.6</b>
MJ/m <sup>2</sup>	MJ/m <sup>2</sup>

#### 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.

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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 and glazed door type and performance

### Default\* windows

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

### Custom\* windows

Window ID	Window Description	Maximum U-value*	SHGC*	SHGC substitution tolerance ranges	
				lower limit	upper limit
A&L-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	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.

## Roof window type and performance value

### Default\* roof windows

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

### Custom\* roof windows

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

## Roof window schedule

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

## Skylight type and performance

Skylight ID	Skylight description
None	

## Skylight schedule

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Diffuser	Shaft Reflectance
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)	Orientation	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.

## External wall schedule

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

## Internal wall type

Wall ID	Wall Type	Area (m <sup>2</sup> )	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 (m <sup>2</sup> )	Sub-floor ventilation	Added insulation (R-value)	Covering
BATH	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	5.4	N/A	2.00	Timber
BED 01	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	12.7	N/A	2.00	Timber
BED 02	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	10.8	N/A	2.00	Timber
KIT/DIN/LIV	SUSP-CONC-100: Suspended Concrete Slab Floor (100mm)	29.5	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
KIT/DIN/LIV	FLAT-01: Flat Framed / Skillion Metal Roof & Flat PB Ceiling	5.00	Yes

## Ceiling penetrations\*

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

\* Refer to glossary.

### Ceiling penetrations\*

Location	Quantity	Type	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

DRAFT

\* Refer to glossary.

## 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) licenced 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

The format of the NatHERS Certificate was developed by the NatHERS Administrator. However the content of each individual certificate is entered and created by the assessor to create a NatHERS Certificate. It is the responsibility of the assessor who prepared this certificate to use NatHERS accredited software correctly and follow the NatHERS Technical Notes to produce a NatHERS Certificate.

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

<b>Annual energy load</b>	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
<b>Assessed floor area</b>	the floor area modelled in the software for the purpose of the NatHERS assessment. Note, this may not be consistent with the floor area in the design documents.
<b>Ceiling penetrations</b>	features that require a penetration to the ceiling, including downlights, vents, exhaust fans, rangehoods, chimneys and flues. Excludes fixtures attached to the ceiling with small holes through the ceiling for wiring, e.g. ceiling fans; pendant lights, and heating and cooling ducts.
<b>Conditioned</b>	a zone within a dwelling that is expected to require heating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
<b>Custom windows</b>	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
<b>Default windows</b>	windows that are representative of a specific type of window product and whose properties have been derived by statistical methods.
<b>Entrance door</b>	these signify ventilation benefits in the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 building.
<b>Exposure category - exposed</b>	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
<b>Exposure category - open</b>	terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors).
<b>Exposure category - suburban</b>	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
<b>Exposure category - protected</b>	terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas.
<b>Horizontal shading feature</b>	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.
<b>National Construction Code (NCC) Class</b>	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at <a href="http://www.abcb.gov.au">www.abcb.gov.au</a> .
<b>Opening percentage</b>	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
<b>Provisional value</b>	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 <a href="http://www.nathers.gov.au">www.nathers.gov.au</a>
<b>Reflective wrap (also known as foil)</b>	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
<b>Roof window</b>	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.
<b>Shading device</b>	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
<b>Shading features</b>	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
<b>Solar heat gain coefficient (SHGC)</b>	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.
<b>Skylight (also known as roof lights)</b>	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
<b>U-value</b>	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
<b>Unconditioned</b>	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions
<b>Vertical shading features</b>	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).

\* Refer to glossary.

## 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
Storeys	7
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.

## 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.

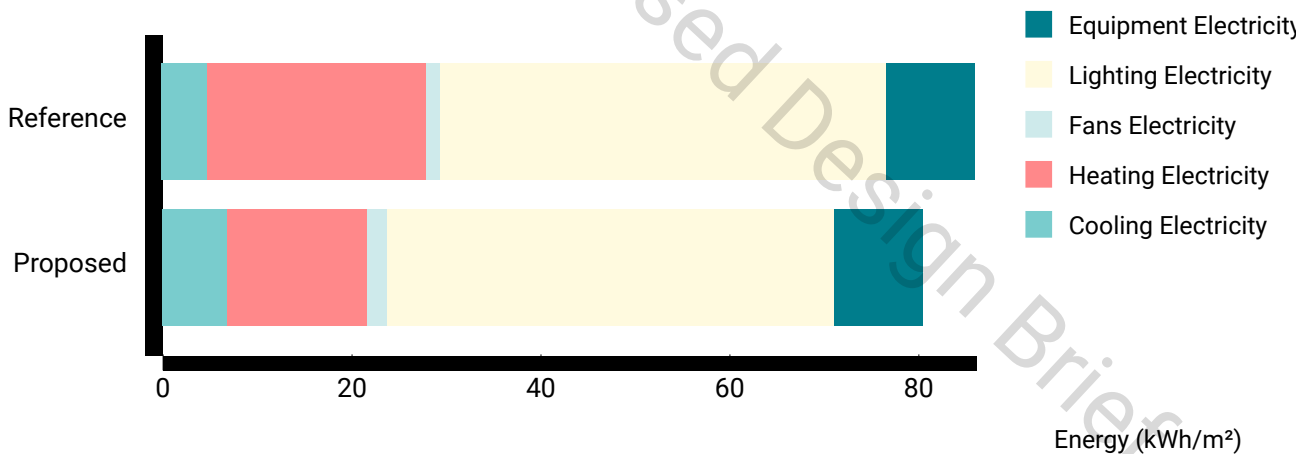
The Assessment Method, 'JV3 Verification using a reference building' has been used and is an Alternative Solution for the Building Fabric only. As such, a Proposed Building with the proposed fabric has been modelled as part of this approach, to compare against the Reference Building services.

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

## Building Emissions

	Proposed (kgCO2-e)	Reference (kgCO2-e)	Difference (%)
Emissions	809520.84	865297.03	-6.45

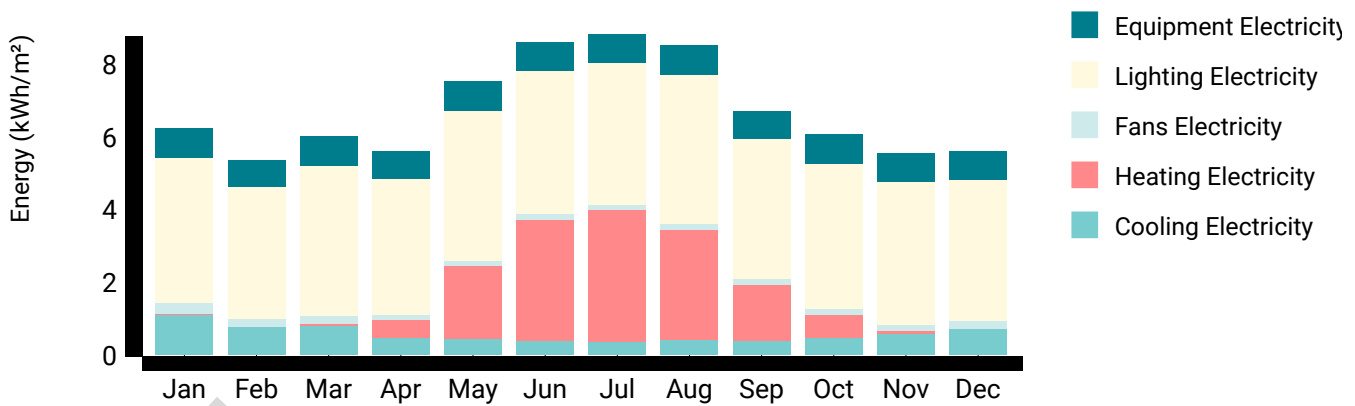
## Building Energy



## Proposed

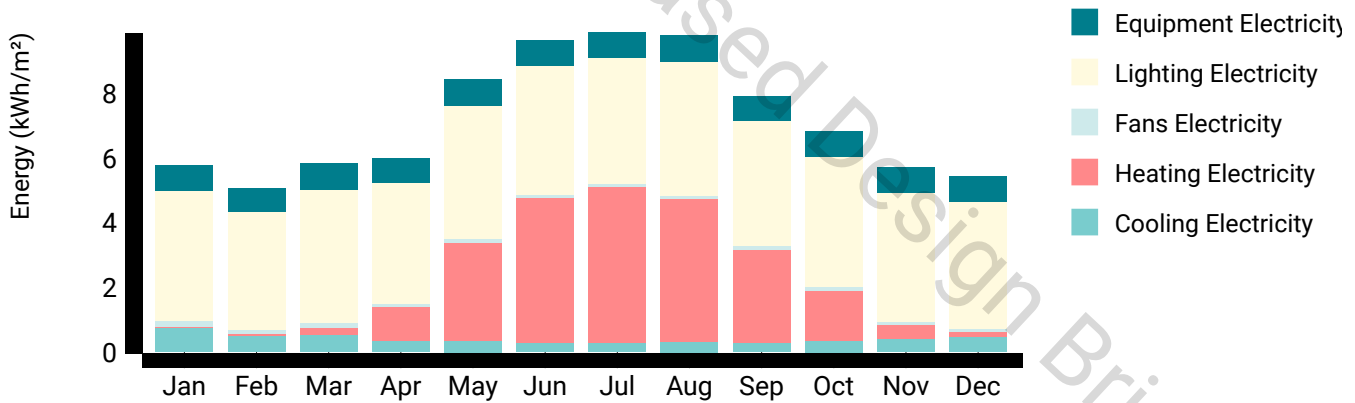
# Commercial Section J

Blades - Humffray Street South



Energy	kWh	kWh/m <sup>2</sup>	MJ	MJ/m <sup>2</sup>
Cooling Electricity	59436.0	6.9	213969.7	24.8
Heating Electricity	128659.4	14.9	463173.9	53.6
Fans Electricity	18528.2	2.1	66701.4	7.7
Lights Electricity	408247.4	47.3	1469690.5	170.1
Equipment Electricity	81311.4	9.4	292720.9	33.9

## Reference



Energy	kWh	kWh/m <sup>2</sup>	MJ	MJ/m <sup>2</sup>
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



# Commercial Section J

Blades - Humffray Street South



## Proposed

#	Zone	Int. Floor (m <sup>2</sup> )	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 (m <sup>2</sup> )	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	✘

# Commercial Section J

Blades - Humffray Street South



#	Zone	Int. Floor (m <sup>2</sup> )	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	✘
					Pass	✘

## 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, [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 [Greenhouse Gas \(GHG\) 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 [assessment](#).

Building Class	Wall Area (m <sup>2</sup> )	Window Area (m <sup>2</sup> )	Roof Area (m <sup>2</sup> )	Floor Area (m <sup>2</sup> )	Window-Wall Ratio
5	2182.77	2291.84	1545.47	1686.74	0.51

## Levels

#	Drawing	# Zones	Floor Area (m <sup>2</sup> )	Wall (m <sup>2</sup> )	Window (m <sup>2</sup> )
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	7	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

Level	Zone	Area (m <sup>2</sup> )	Volume (m <sup>3</sup> )	Treated Area (m <sup>2</sup> )
1	1. Basement Carpark B2	1864.90	5408.20	0.00
2	1. Basement Carpark 1	1865.58	5596.74	0.00
3	1. Commercial Space 1	279.60	1456.69	279.60
3	2. Lobby	218.99	1140.96	218.99
3	3. Commercial Space 2	209.87	1093.42	209.87
3	4. Back of House 1	204.53	1065.58	204.53
3	5. Carpark Entry Ramp	110.88	577.68	0.00
3	6. Refuse Room	63.08	328.62	0.00
3	7. Store 2	61.95	322.76	61.95

# Commercial Section J

Blades - Humffray Street South



Level	Zone	Area (m <sup>2</sup> )	Volume (m <sup>2</sup> )	Treated Area (m <sup>2</sup> )
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
6	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

# Commercial Section J

Blades - Humffray Street South



Level	Zone	Area (m <sup>2</sup> )	Volume (m <sup>3</sup> )	Treated Area (m <sup>2</sup> )
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		8640.05

## 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 (m <sup>2</sup> K <sup>o</sup> /W)	Area (m <sup>2</sup> )
Exposed to Unconditioned	Concept	5	3.00	673.55
External	Concept	5	3.00	1509.22

# Commercial Section J

Blades - Humffray Street South



Reference	Title	Class	R-Value (m <sup>2</sup> K°/W)	Area (m <sup>2</sup> )
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	Title	Class	R-Value (m <sup>2</sup> K°/W)	Area (m <sup>2</sup> )
External	Concept	5	3.50	692.60
Top	Concept	5	4.50	852.87
Reference	Title	Class	R-Value (m <sup>2</sup> K°/W)	Area (m <sup>2</sup> )
External	Concept	5	3.70	692.60
Top	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 [J1.6 Floors](#).

Proposed	Title	Class	R-Value (m <sup>2</sup> K°/W)	Area (m <sup>2</sup> )
Exposed to Unconditioned	Concept	5	2.50	1420.46
External	Concept	5	2.50	266.28
Reference	Title	Class	R-Value (m <sup>2</sup> K°/W)	Area (m <sup>2</sup> )
Exposed to Unconditioned	Concept	5	2.00	1420.46
External	Concept	5	2.00	266.28

## 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 (m <sup>2</sup> )
External	Concept	5	2.00	0.35	2291.84
Reference	Title	Class	U-value	SHGC	Area (m <sup>2</sup> )
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. <http://www.climate.onebuilding.org/>.

## Emission Factors

Greenhouse gas emission factors are used according to NCC2019 – Vol 1 Specification JVb Modelling Parameters - [Table 3a Greenhouse Gas Emissions Factors \(kgCO<sub>2</sub>-e/GJ\)](#). In the case of this project, 323 kgCO<sub>2</sub>-e/GJ has been used for electricity only, based on the site location.

## Occupants

Occupant density (m<sup>2</sup>/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/m<sup>2</sup>) 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/m <sup>2</sup>
7A	Generic Building	8.0
5	Office	8.0

## Equipment

Equipment density (W/m<sup>2</sup>) are stipulated in each thermal zone, subject to the function and



# Commercial Section J

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/m <sup>2</sup>
7A	Generic Building	15.0
5	Office	15.0

Performance-Based Design Brief

## 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

HVAC Type	Packaged Variable Air Volume System
Outdoor Air Flow Rate per Person	0.0075
Gross Rated Air Cooling Cop	3
Heating Coil Type	Electric
Supply Fan Efficiency	0.55
Supply Fan Pressure	1000
Supply Fan Motor Efficiency	0.55

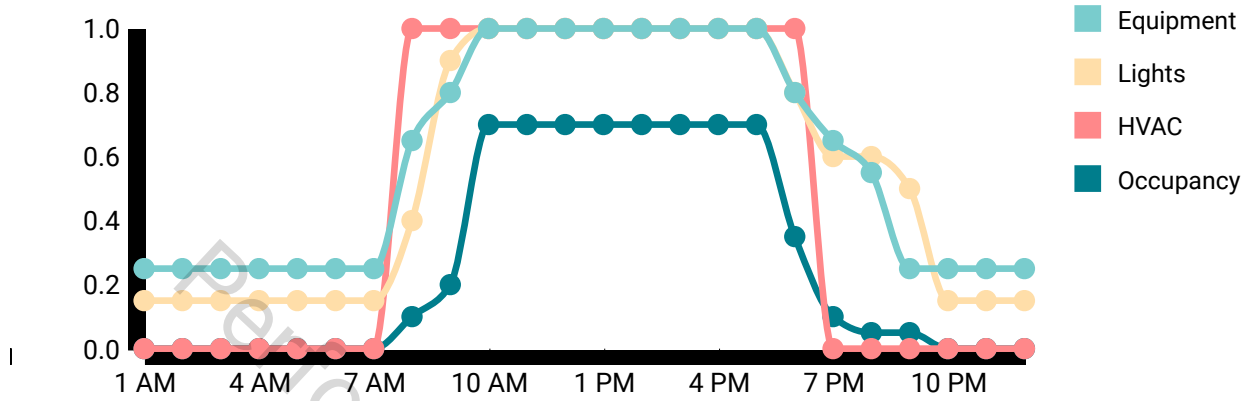
# Commercial Section J

Blades - Humffray Street South

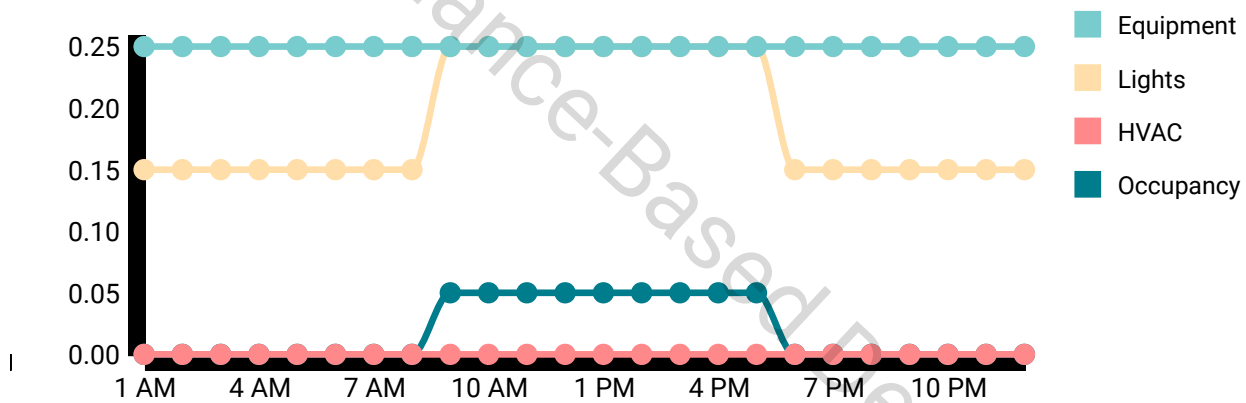
## Profiles

### Profile 1 Class 7A

#### Typical Day

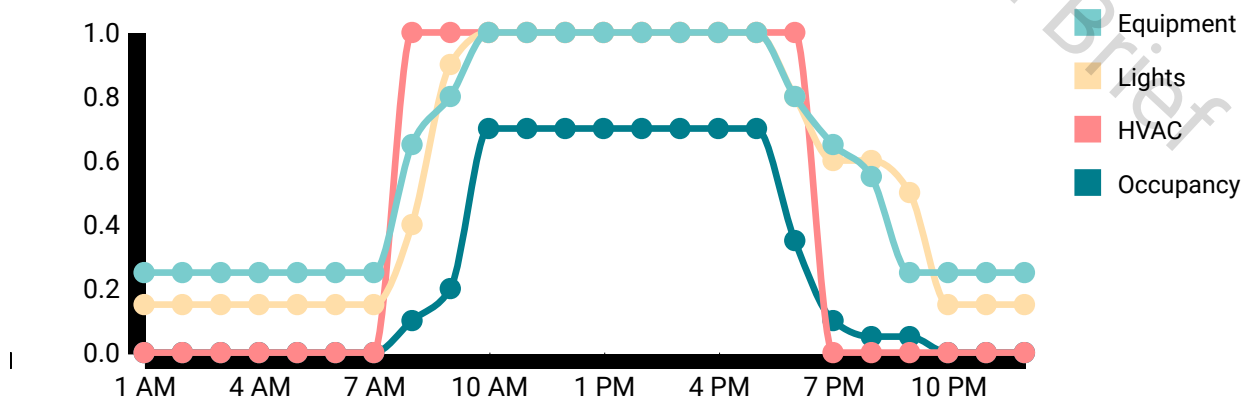


#### Weekend



### Profile 2 Class 5

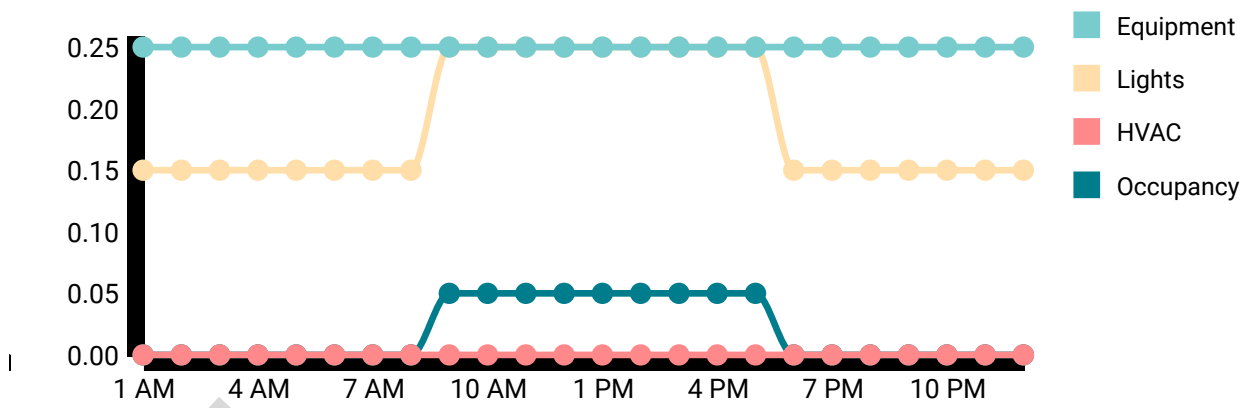
#### Typical Day



#### Weekend

# Commercial Section J

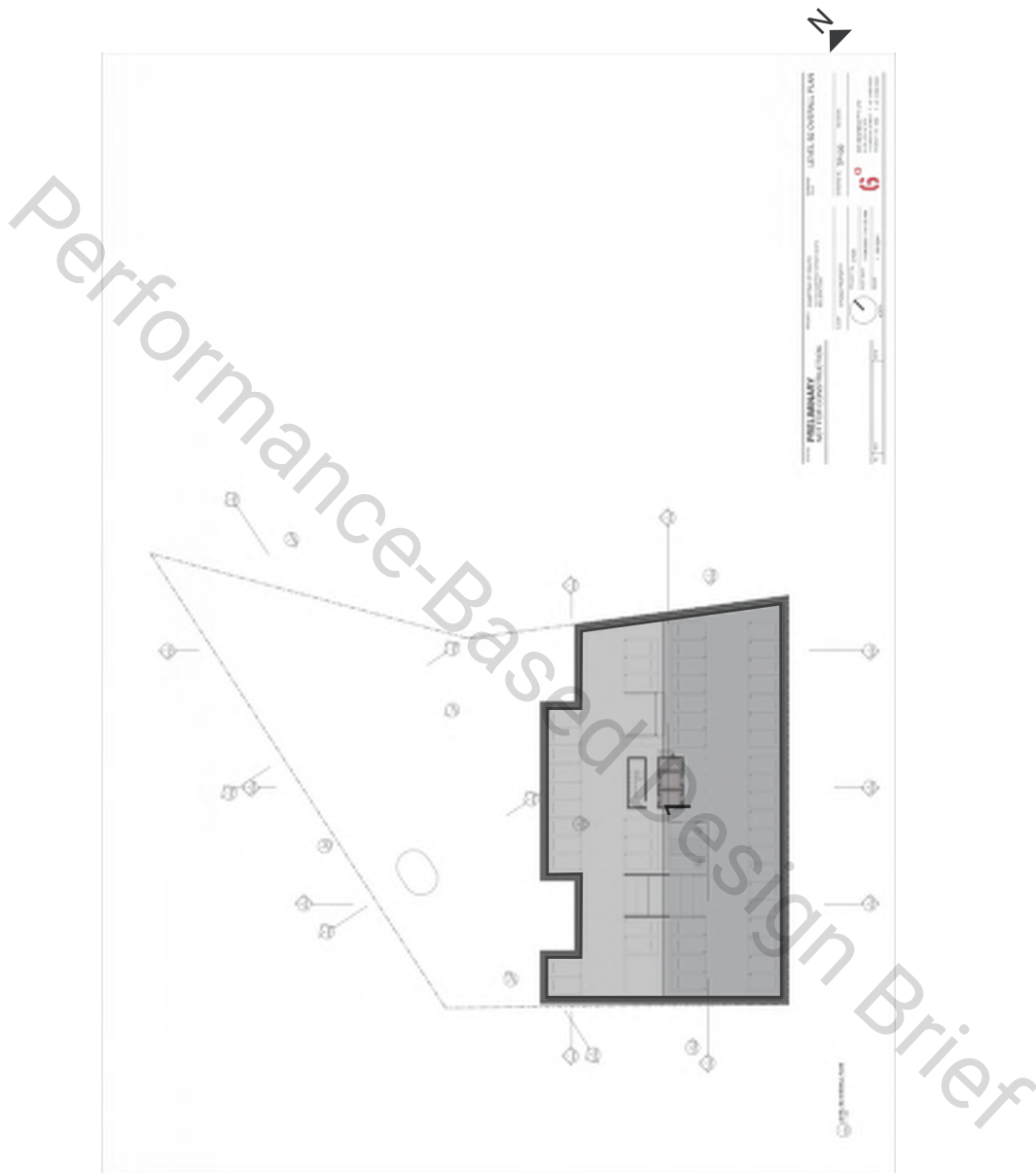
Blades - Humffray Street South



Performance-Based Design Brief

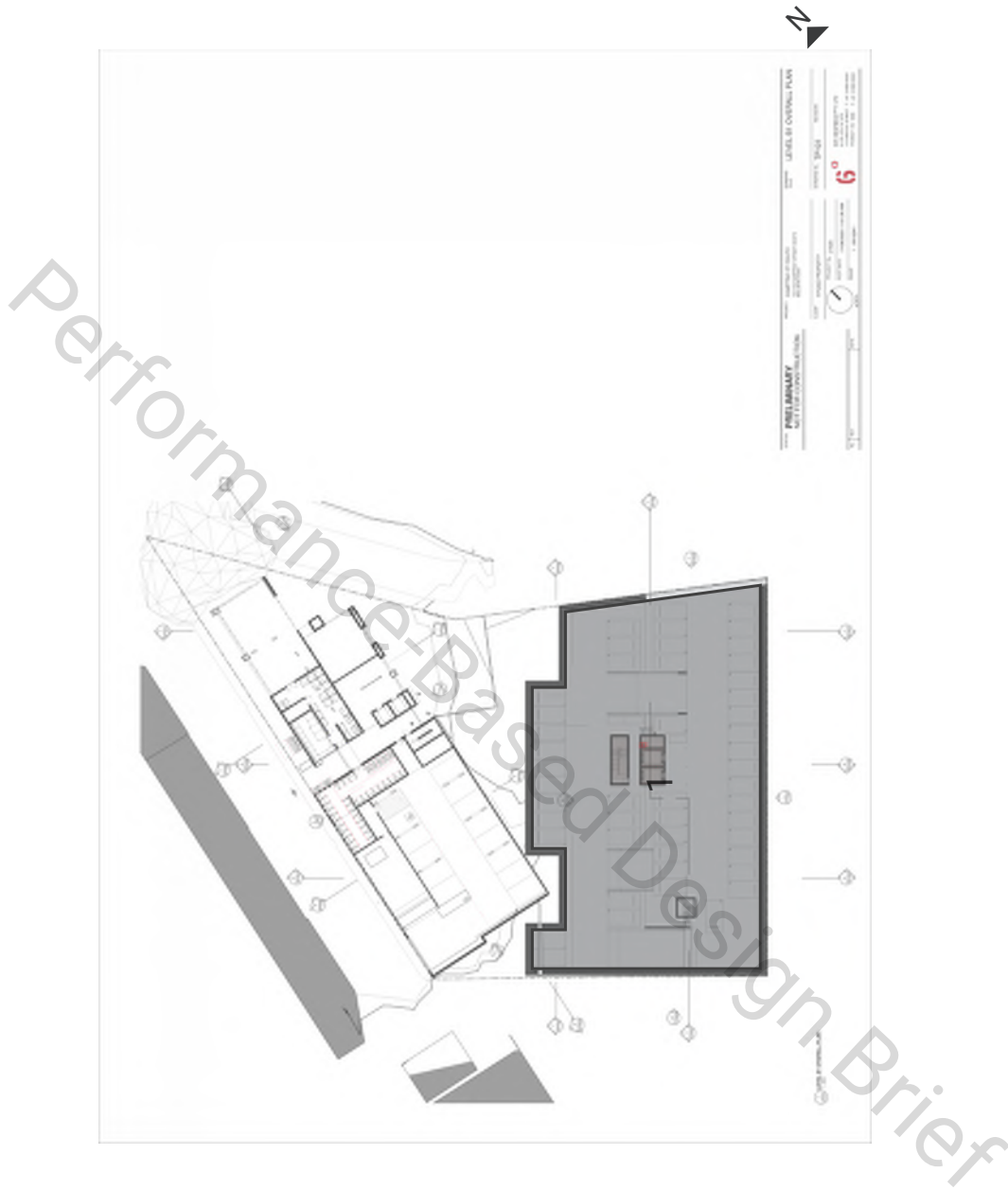
## Drawings

### Level 1 - Basement 2



■ Unconditioned

## Level 2 - Basement 1

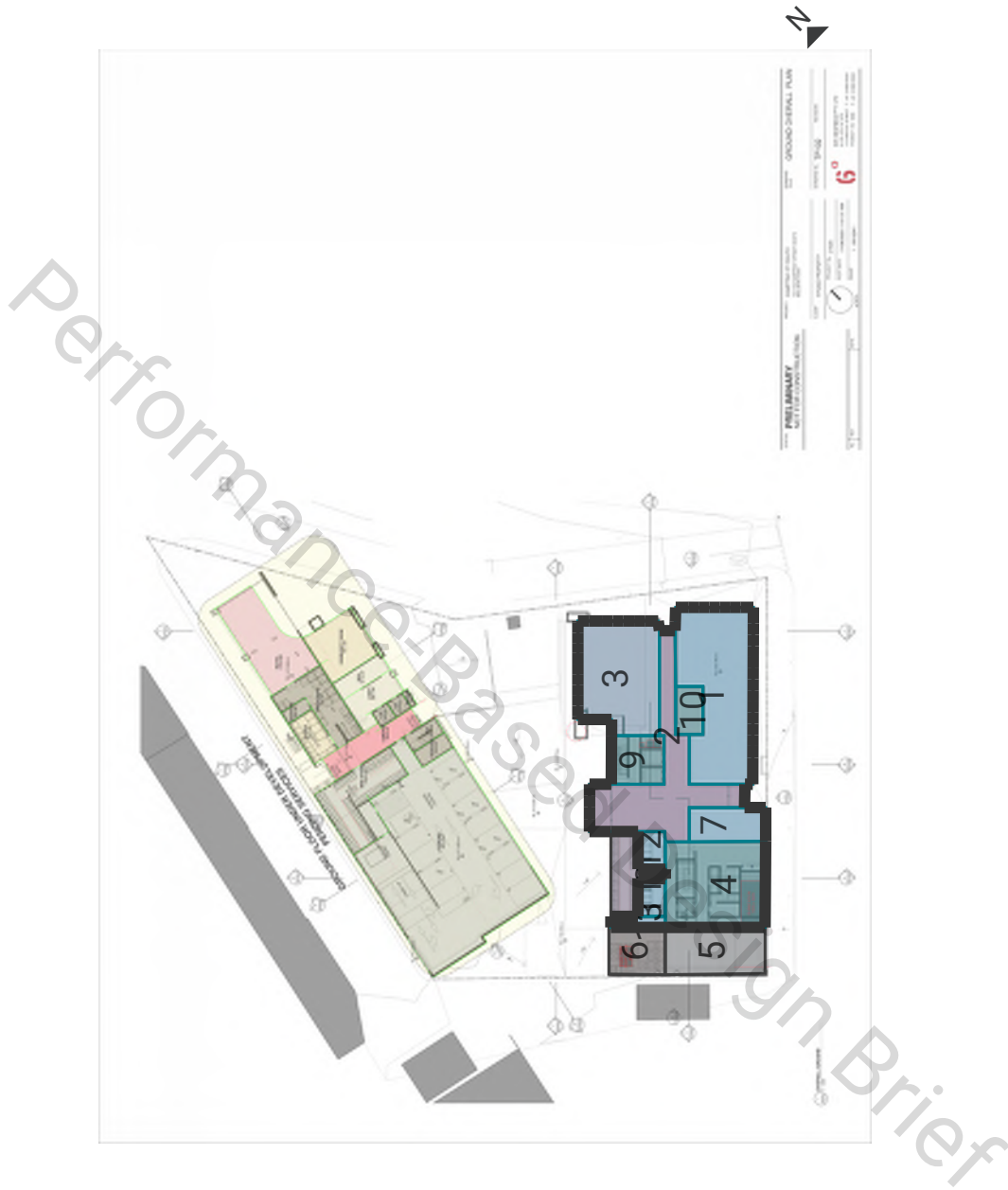


■ Unconditioned

# Commercial Section J

Blades - Humffray Street South

## Level 3 - Ground



— Thermal Line

□ Windows

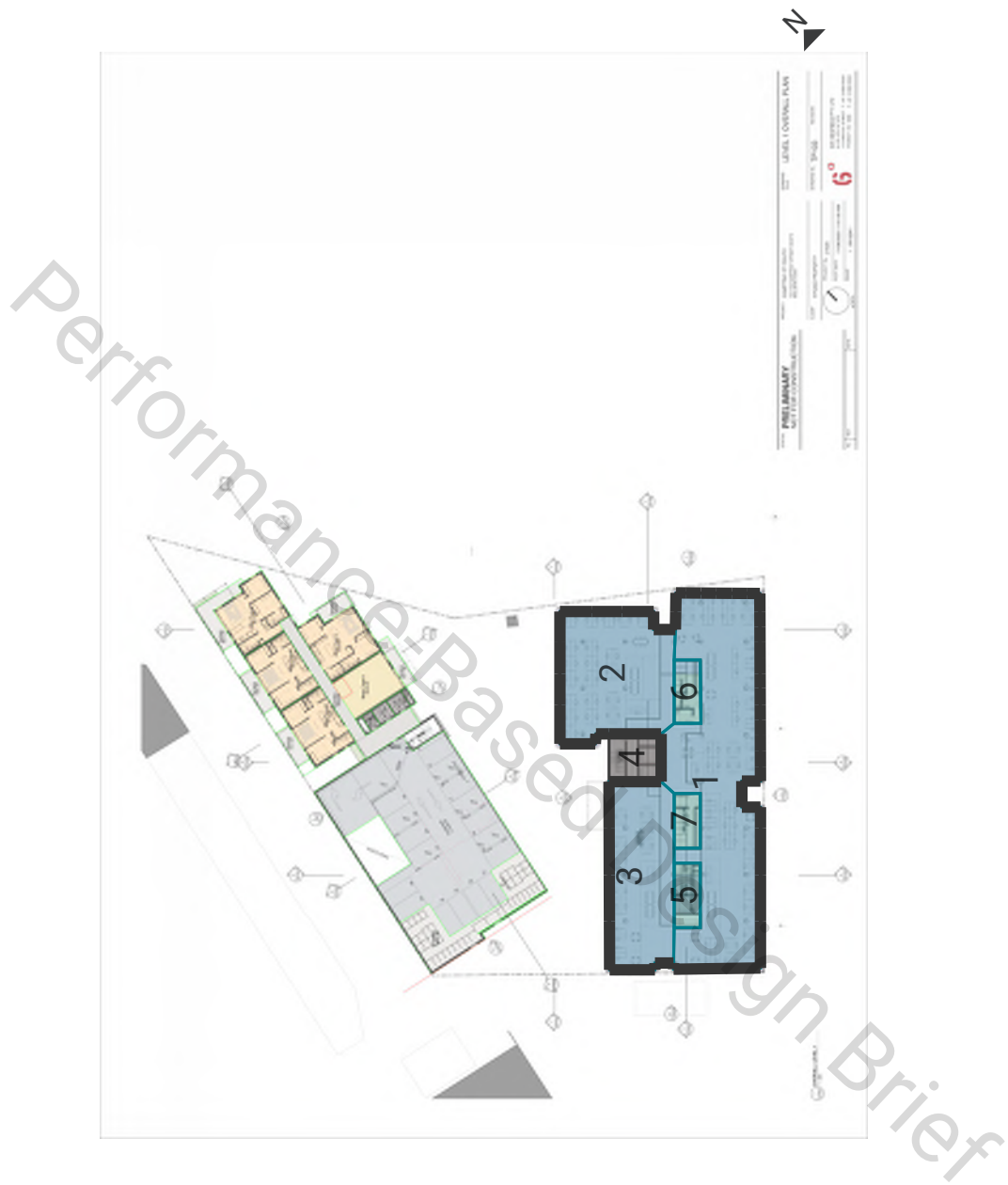
■ Class 5

■ Unconditioned

# Commercial Section J

Blades - Humffray Street South

## Level 4 - Levels 1 - 3



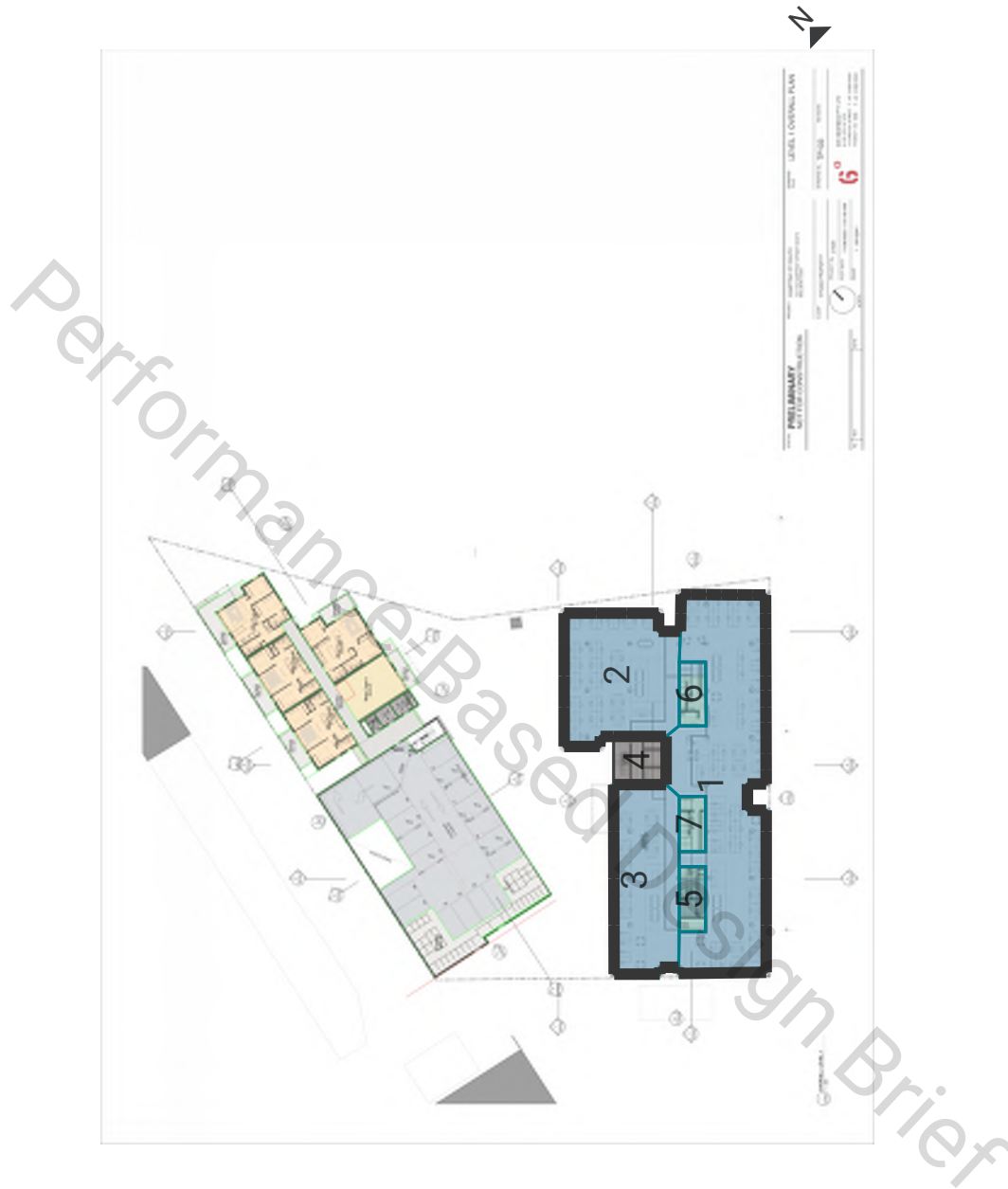
- Thermal Line
- Windows
- Class 5
- Unconditioned



# Commercial Section J

Blades - Humffray Street South

## Level 5 - Levels 1 - 3



— Thermal Line

□ Windows

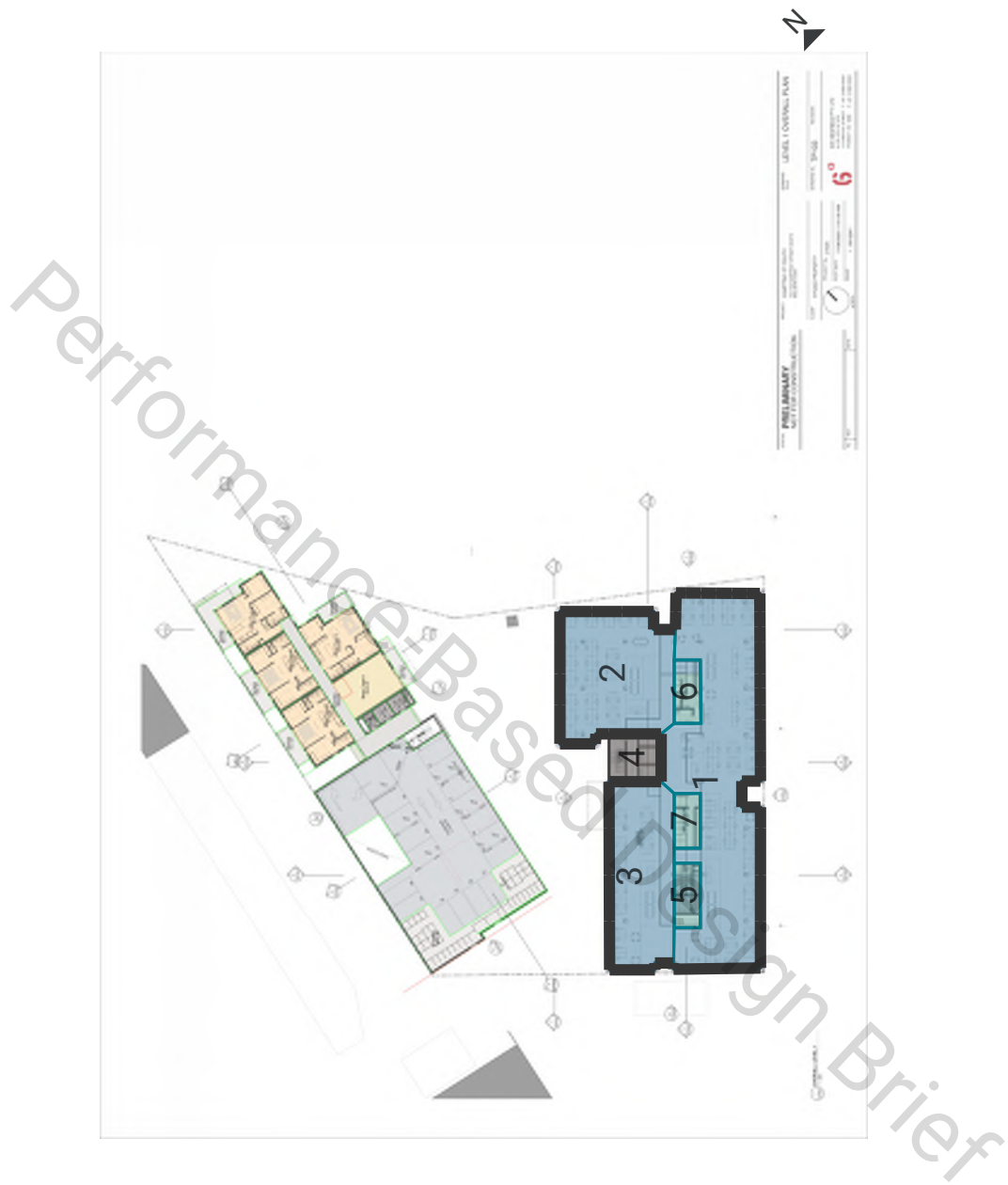
■ Class 5

■ Unconditioned

# Commercial Section J

Blades - Humffray Street South

## Level 6 - Levels 1 - 3

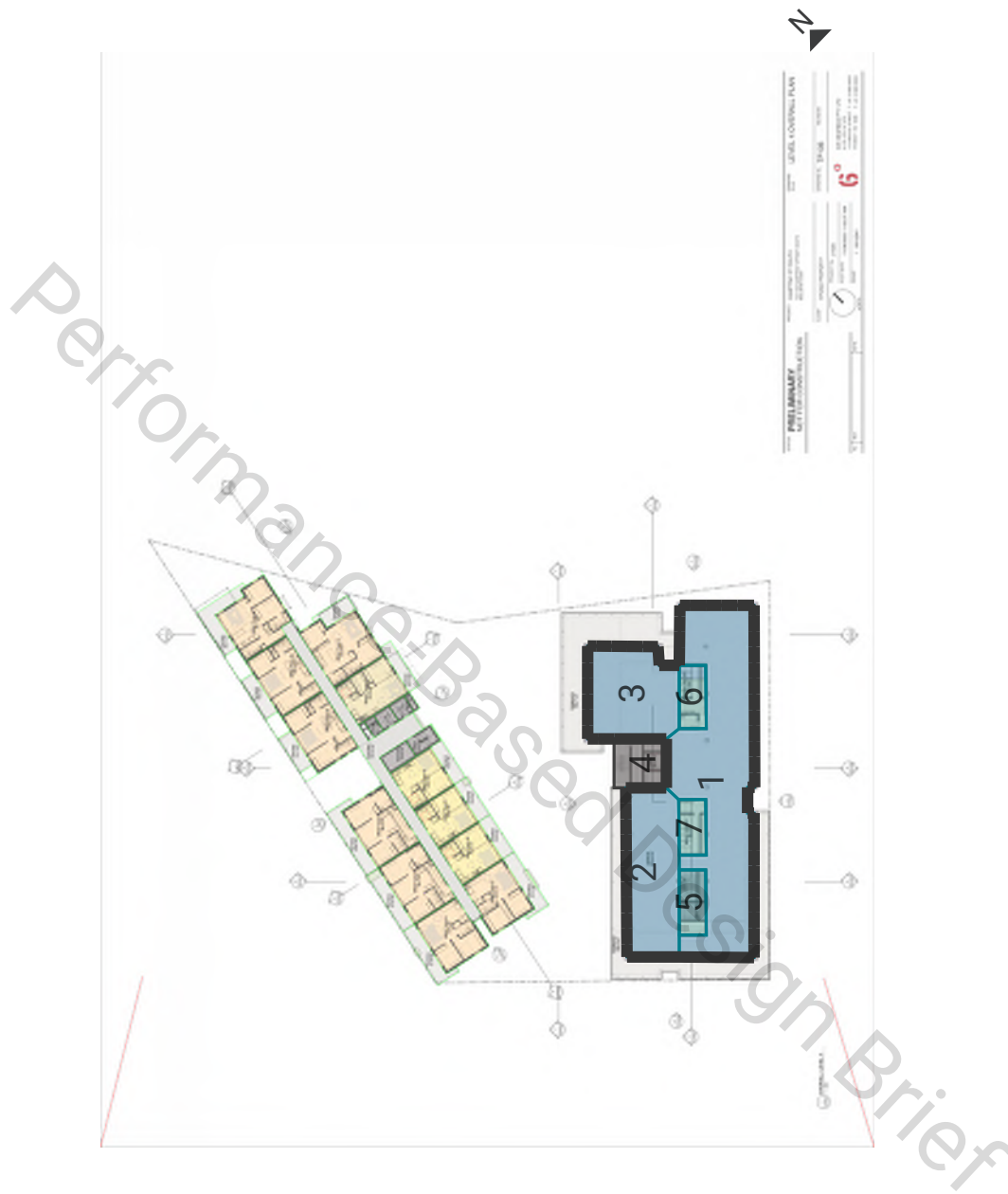


- Thermal Line
- Windows
- Class 5
- Unconditioned

# Commercial Section J

Blades - Humffray Street South

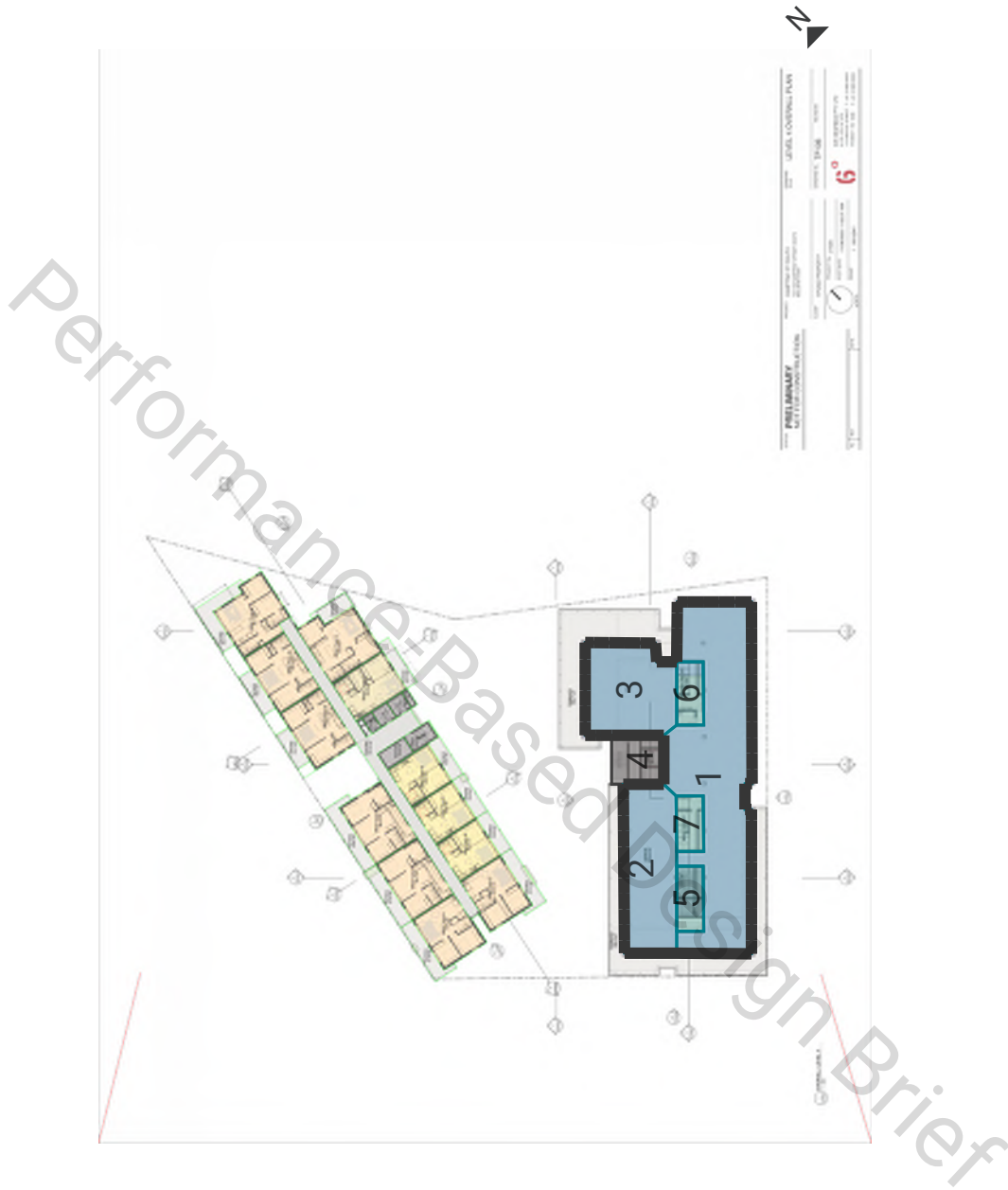
## Level 7 - Levels 4 - 5



# Commercial Section J

Blades - Humffray Street South

## Level 8 - Levels 4 - 5



— Thermal Line

□ Windows

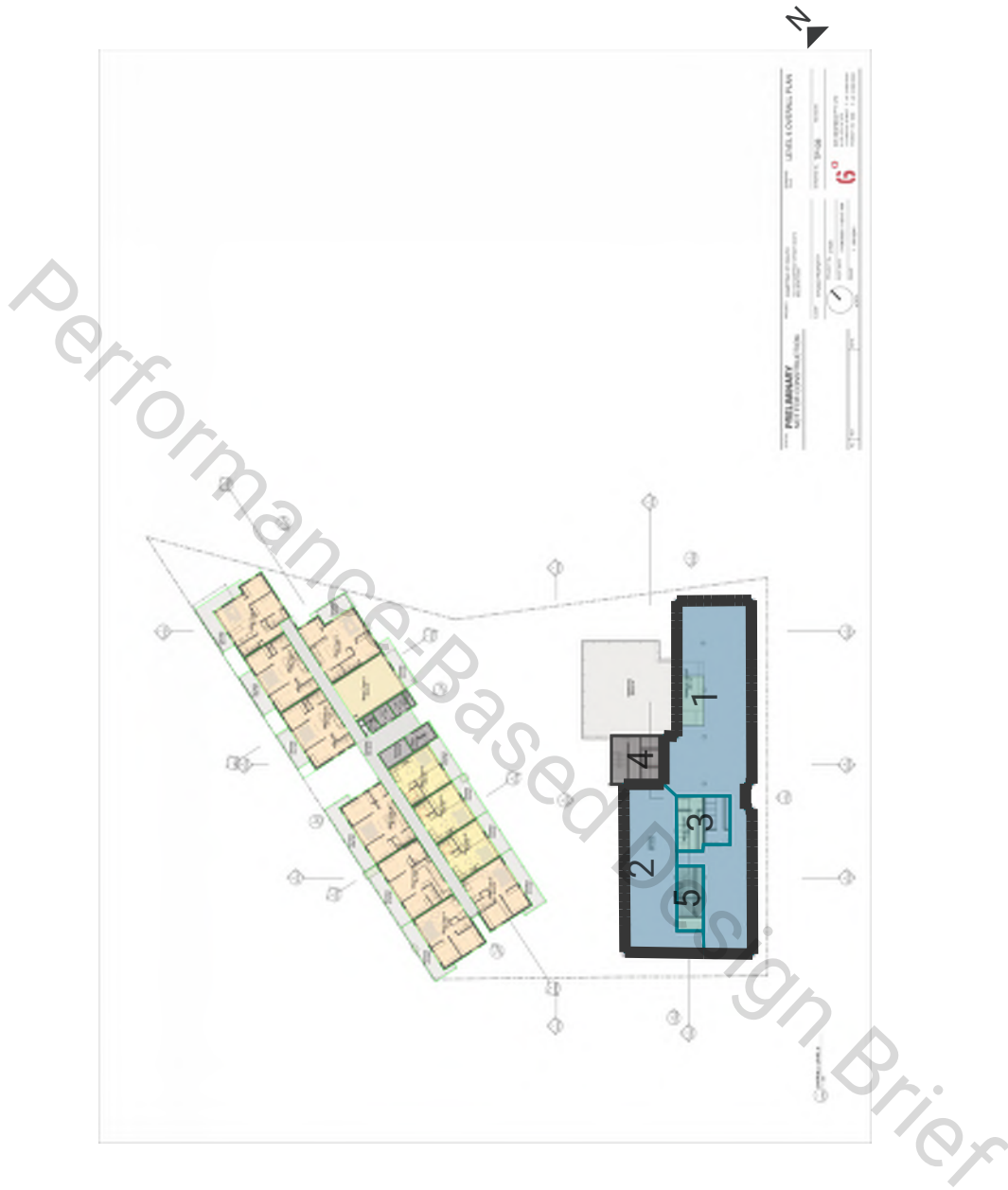
■ Class 5

■ Unconditioned

# Commercial Section J

Blades - Humffray Street South

## Level 9 - Level 6



- Thermal Line
- Windows
- Unconditioned
- Class 5

## Disclaimer

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Performance-Based Design Brief

## 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
Storeys	7
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.

## 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.

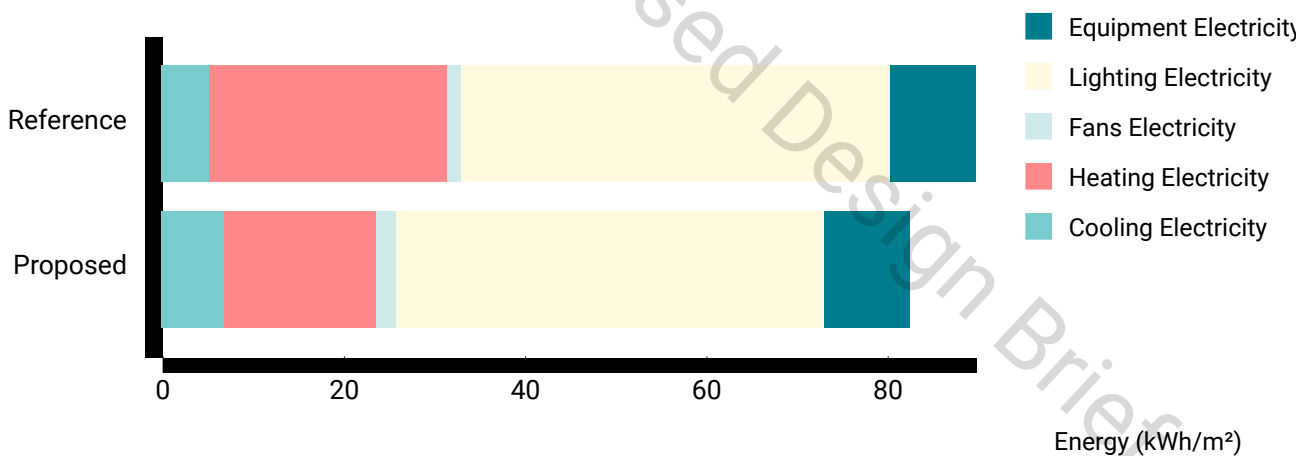
The Assessment Method, 'JV3 Verification using a reference building' has been used and is an Alternative Solution for the Building Fabric only. As such, a Proposed Building with the proposed fabric has been modelled as part of this approach, to compare against the Reference Building services.

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

## Building Emissions

	Proposed (kgCO2-e)	Reference (kgCO2-e)	Difference (%)
Emissions	829076.73	901937.85	-8.08

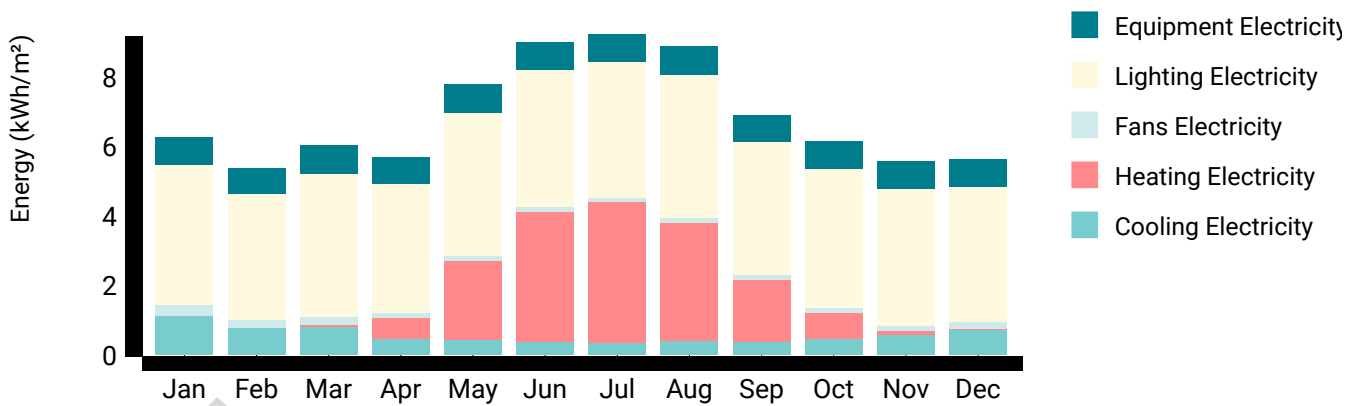
## Building Energy



## Proposed

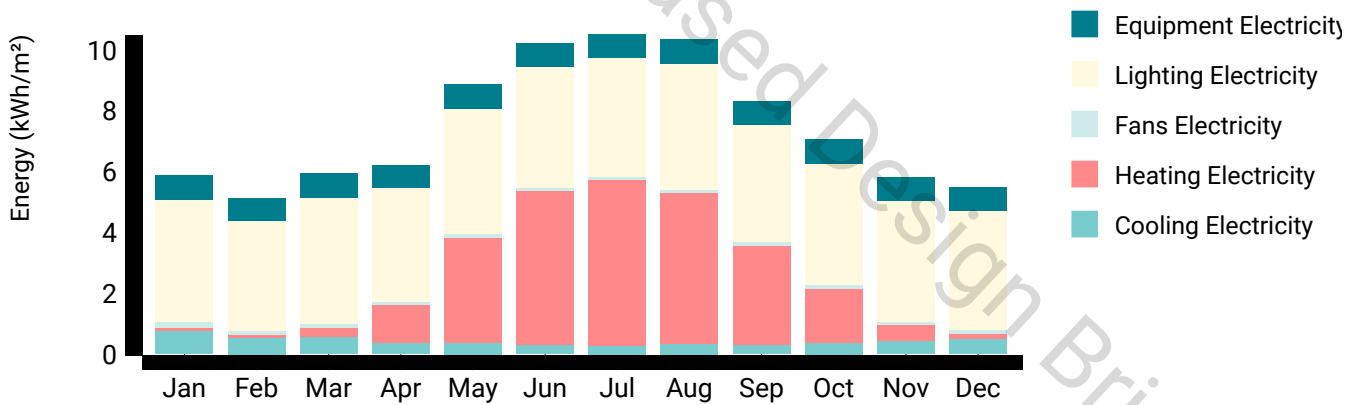


# Commercial Section J - EW



Energy	kWh	kWh/m <sup>2</sup>	MJ	MJ/m <sup>2</sup>
Cooling Electricity	59512.7	6.9	214245.8	24.8
Heating Electricity	145208.8	16.8	522751.7	60.5
Fans Electricity	18701.6	2.2	67325.9	7.8
Lights Electricity	408265.7	47.2	1469756.7	170.1
Equipment Electricity	81311.4	9.4	292720.9	33.9

## Reference



Energy	kWh	kWh/m <sup>2</sup>	MJ	MJ/m <sup>2</sup>
Cooling Electricity	44922.1	5.2	161719.6	18.7
Heating Electricity	227402.0	26.3	818647.2	94.7
Fans Electricity	13759.1	1.6	49532.8	5.7
Lights Electricity	408265.7	47.2	1469756.7	170.1
Equipment Electricity	81311.4	9.4	292720.9	33.9

## Building Comfort

# Commercial Section J - EW

## Proposed

#	Zone	Int. Floor (m <sup>2</sup> )	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 <sup>2</sup> )	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	✘

# Commercial Section J - EW

#	Zone	Int. Floor (m <sup>2</sup> )	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	✘
						Pass ✘

## 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, [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 [Greenhouse Gas \(GHG\) 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).

# Commercial Section J - EW

## 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 [assessment](#).

Building Class	Wall Area (m <sup>2</sup> )	Window Area (m <sup>2</sup> )	Roof Area (m <sup>2</sup> )	Floor Area (m <sup>2</sup> )	Window-Wall Ratio
5	2668.52	2450.54	1545.47	1686.74	0.48

## Levels

#	Drawing	# Zones	Floor Area (m <sup>2</sup> )	Wall (m <sup>2</sup> )	Window (m <sup>2</sup> )
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	7	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

Level	Zone	Area (m <sup>2</sup> )	Volume (m <sup>3</sup> )	Treated Area (m <sup>2</sup> )
1	1. Basement Carpark B2	1864.90	5408.20	0.00
2	1. Basement Carpark 1	1865.58	5596.74	0.00
3	1. Commercial Space 1	279.60	1456.69	279.60
3	2. Lobby	218.99	1140.96	218.99
3	3. Commercial Space 2	209.87	1093.42	209.87
3	4. Back of House 1	204.53	1065.58	204.53
3	5. Carpark Entry Ramp	110.88	577.68	0.00
3	6. Refuse Room	63.08	328.62	0.00
3	7. Store 2	61.95	322.76	61.95

# Commercial Section J - EW

Level	Zone	Area (m <sup>2</sup> )	Volume (m <sup>2</sup> )	Treated Area (m <sup>2</sup> )
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

# Commercial Section J - EW

Level	Zone	Area (m <sup>2</sup> )	Volume (m <sup>3</sup> )	Treated Area (m <sup>2</sup> )
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		8640.63

## 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 (m <sup>2</sup> K <sup>0</sup> /W)	Area (m <sup>2</sup> )
Exposed to Unconditioned	Concept	5	3.00	745.71
External	Concept	5	3.00	1922.81

# Commercial Section J - EW

Reference	Title	Class	R-Value (m <sup>2</sup> K°/W)	Area (m <sup>2</sup> )
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.

Proposed	Title	Class	R-Value (m <sup>2</sup> K°/W)	Area (m <sup>2</sup> )
External	Concept	5	3.50	692.60
Top	Concept	5	4.50	852.87
Reference	Title	Class	R-Value (m <sup>2</sup> K°/W)	Area (m <sup>2</sup> )
External	Concept	5	3.70	692.60
Top	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 [J1.6 Floors](#).

Proposed	Title	Class	R-Value (m <sup>2</sup> K°/W)	Area (m <sup>2</sup> )
Exposed to Unconditioned	Concept	5	2.50	1420.46
External	Concept	5	2.50	266.28
Reference	Title	Class	R-Value (m <sup>2</sup> K°/W)	Area (m <sup>2</sup> )
Exposed to Unconditioned	Concept	5	2.00	1420.46
External	Concept	5	2.00	266.28

## 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 (m <sup>2</sup> )
External	Concept	5	2.00	0.35	2450.54
Reference	Title	Class	U-value	SHGC	Area (m <sup>2</sup> )
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. <http://www.climate.onebuilding.org/>.

## Emission Factors

Greenhouse gas emission factors are used according to NCC2019 – Vol 1 Specification JVb Modelling Parameters - [Table 3a Greenhouse Gas Emissions Factors \(kgCO<sub>2</sub>-e/GJ\)](#). In the case of this project, 323 kgCO<sub>2</sub>-e/GJ has been used for electricity only, based on the site location.

## Occupants

Occupant density (m<sup>2</sup>/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/m<sup>2</sup>) 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/m <sup>2</sup>
7A	Generic Building	8.0
5	Office	8.0

## Equipment

Equipment density (W/m<sup>2</sup>) are stipulated in each thermal zone, subject to the function and

# Commercial Section J - EW

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

Building Class	Space	W/m <sup>2</sup>
7A	Generic Building	15.0
5	Office	15.0

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## 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

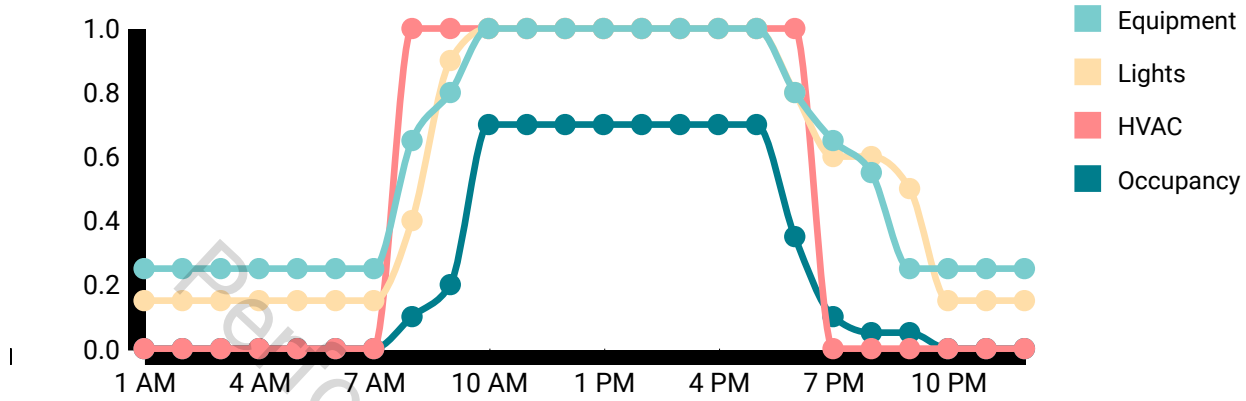
## HVAC Details

HVAC Type	Packaged Variable Air Volume System
Outdoor Air Flow Rate per Person	0.0075
Gross Rated Air Cooling Cop	3
Heating Coil Type	Electric
Supply Fan Efficiency	0.55
Supply Fan Pressure	1000
Supply Fan Motor Efficiency	0.55

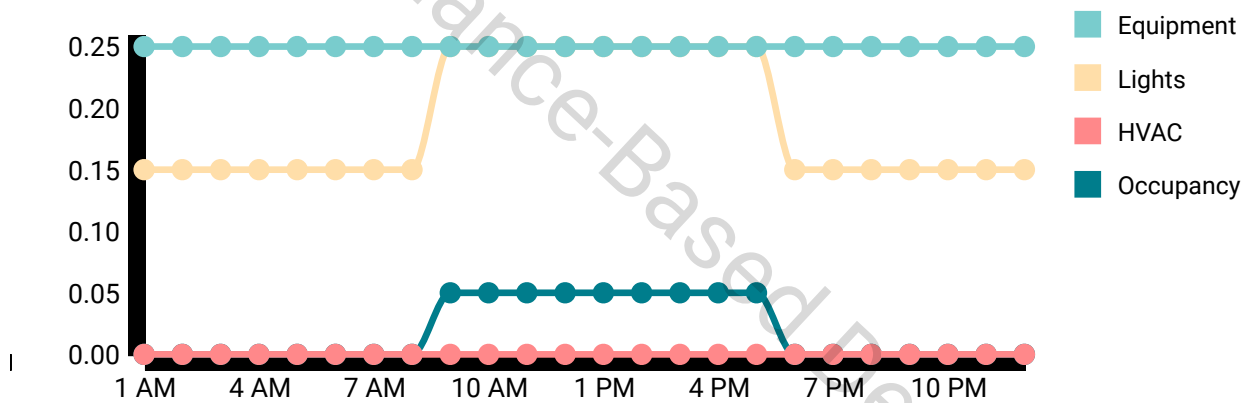
# Commercial Section J - EW

## Profiles

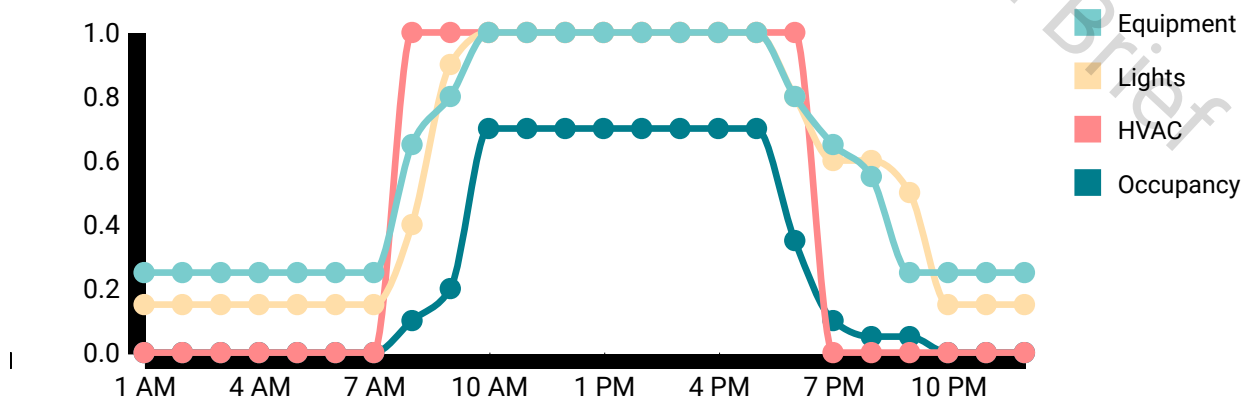
Profile 1 Class 7A  
Typical Day



## Weekend

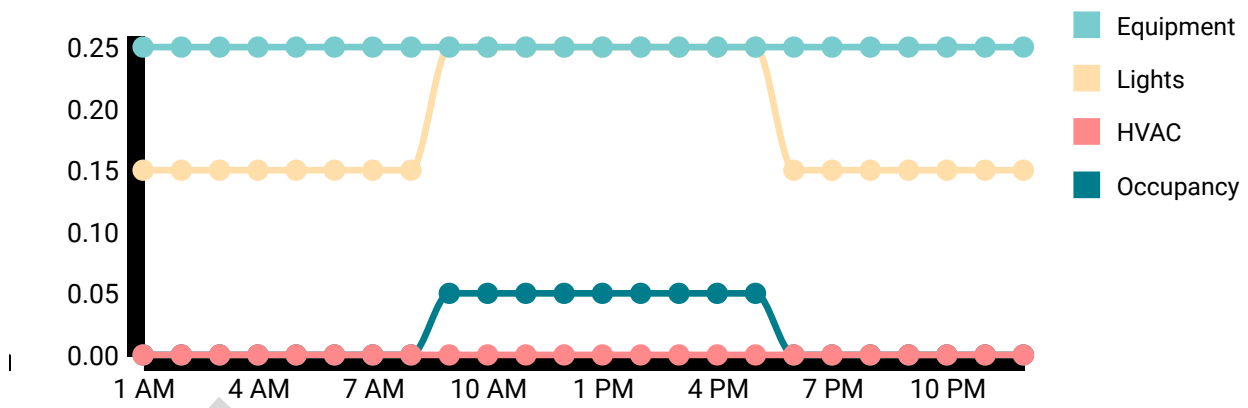


Profile 2 Class 5  
Typical Day



## Weekend

# Commercial Section J - EW

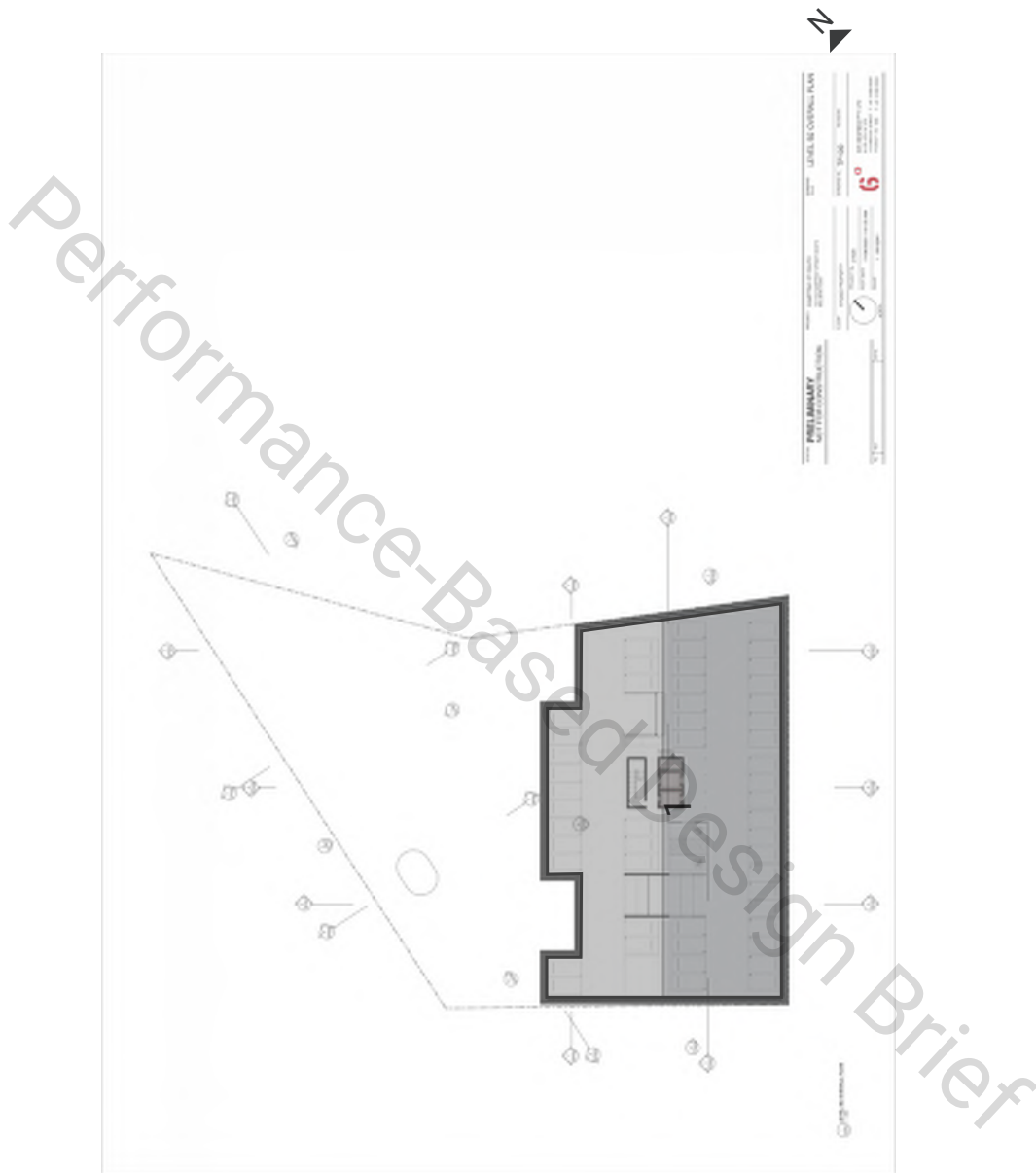


Performance-Based Design Brief

# Commercial Section J - EW

## Drawings

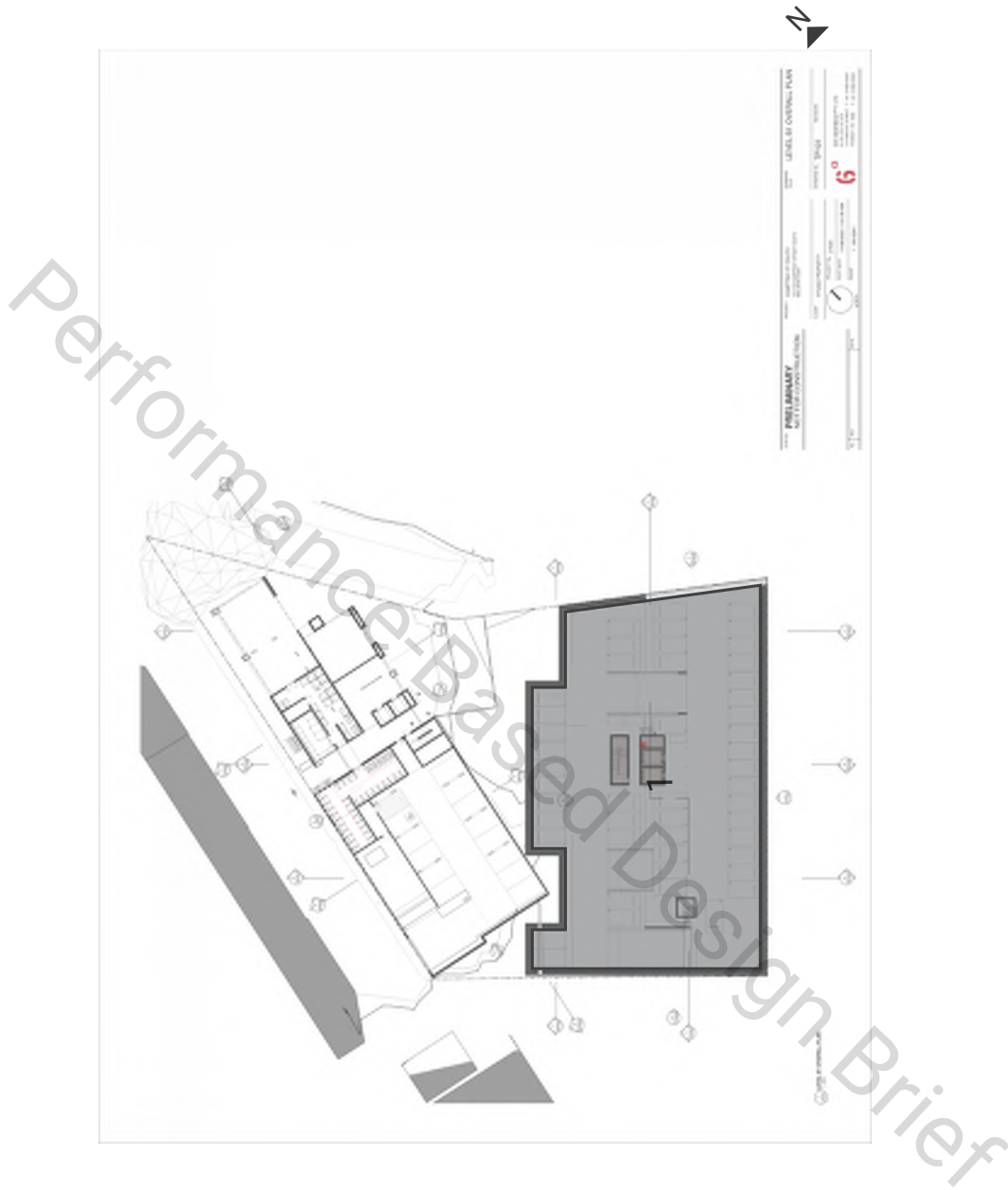
### Level 1 - Basement 2



■ Unconditioned

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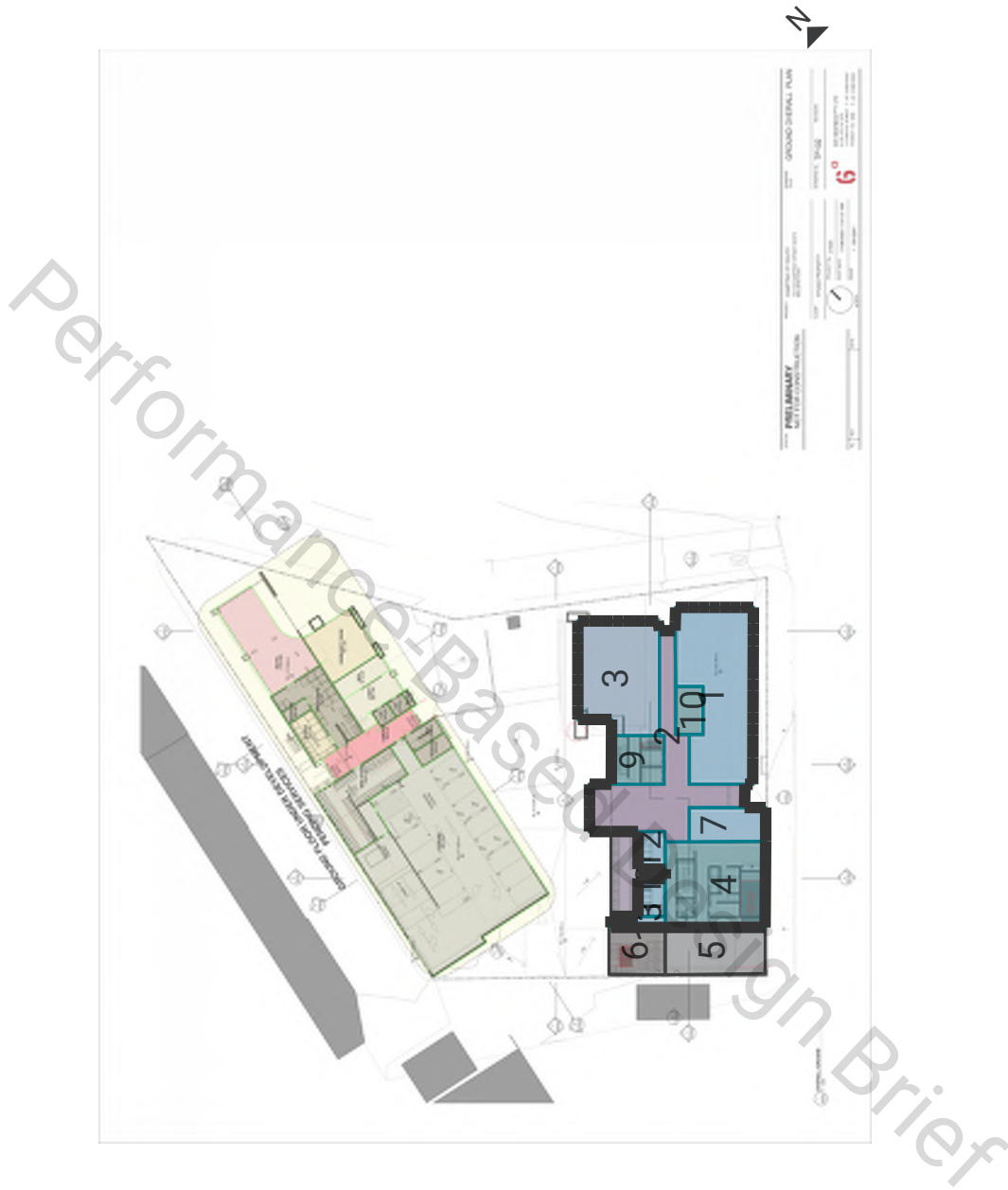
## Level 2 - Basement 1



■ Unconditioned

# Commercial Section J - EW

## Level 3 - Ground



— Thermal Line

□ Windows

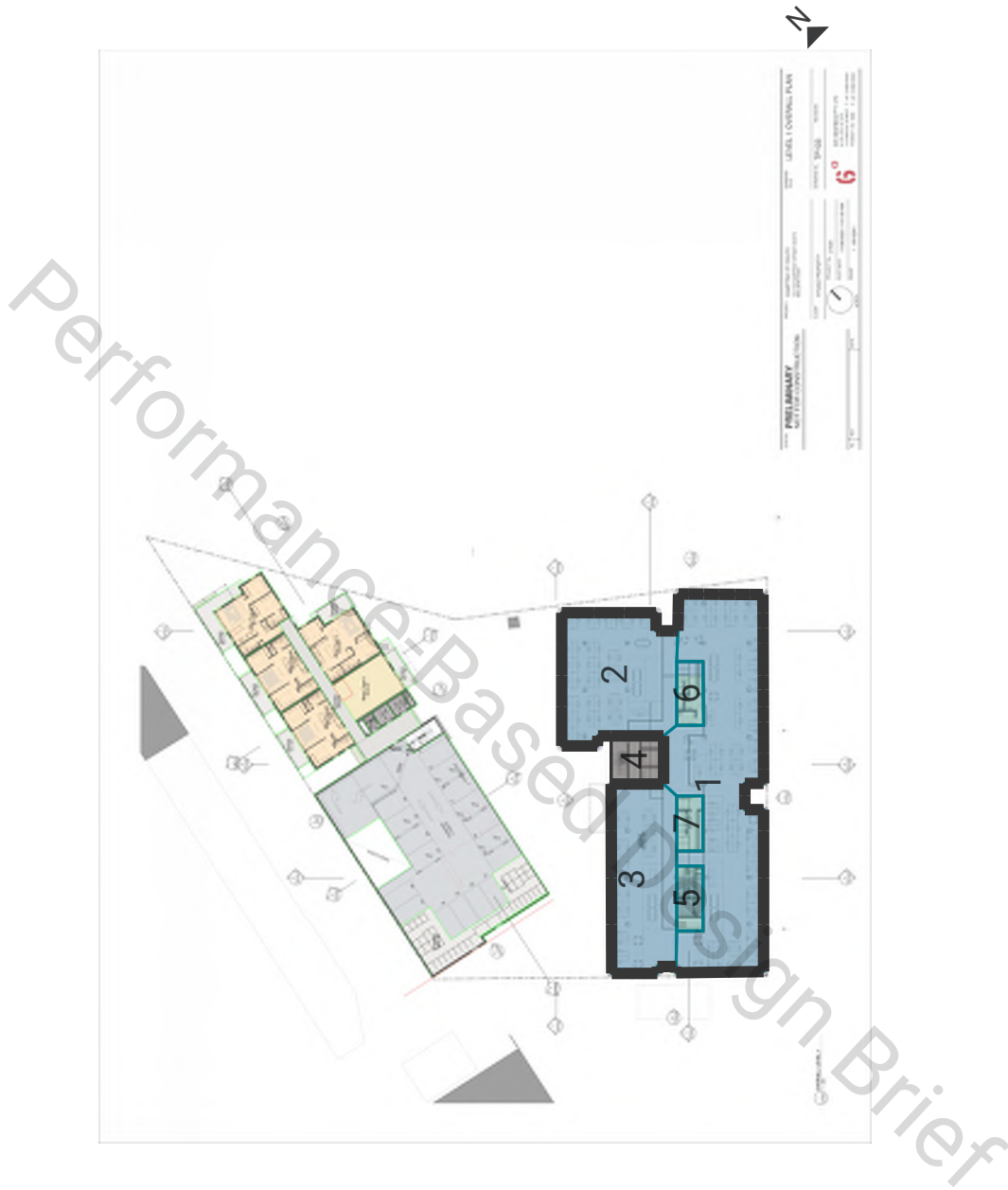
■ Class 5

■ Unconditioned



# Commercial Section J - EW

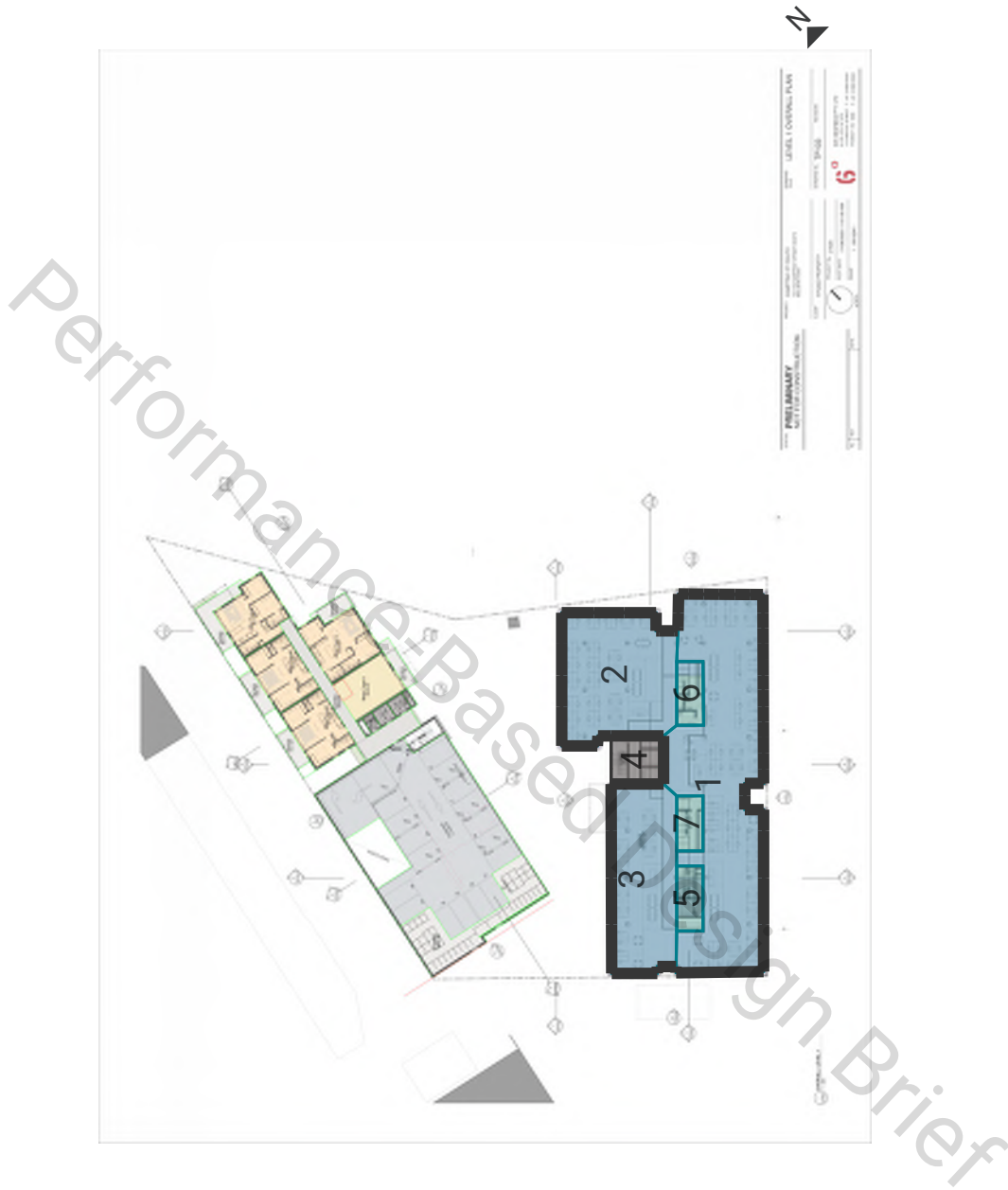
## Level 4 - Levels 1 - 3



- Thermal Line
- Windows
- Class 5
- Unconditioned

# Commercial Section J - EW

Level 5 - Levels 1 - 3



— Thermal Line

□ Windows

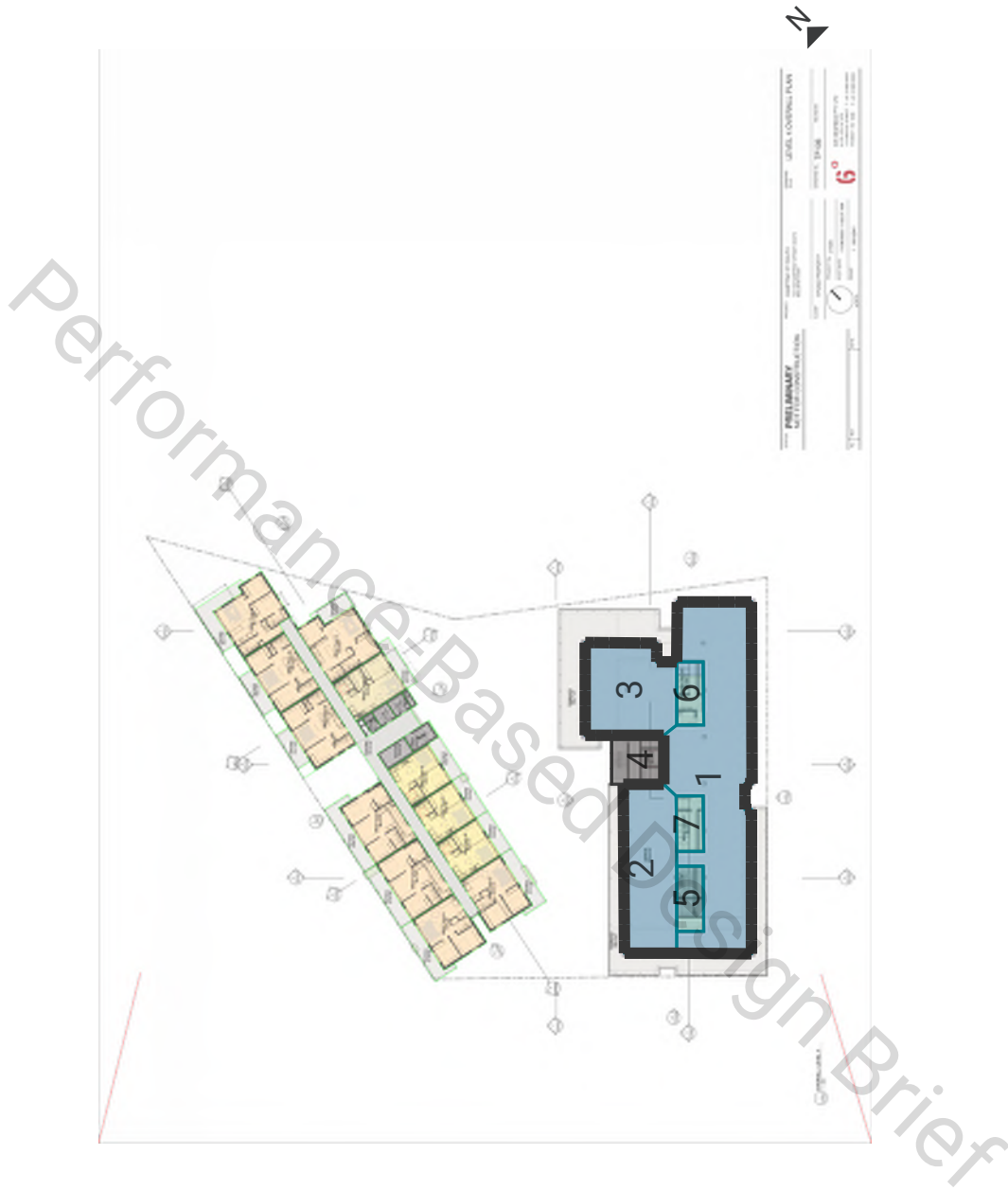
■ Class 5

■ Unconditioned



# Commercial Section J - EW

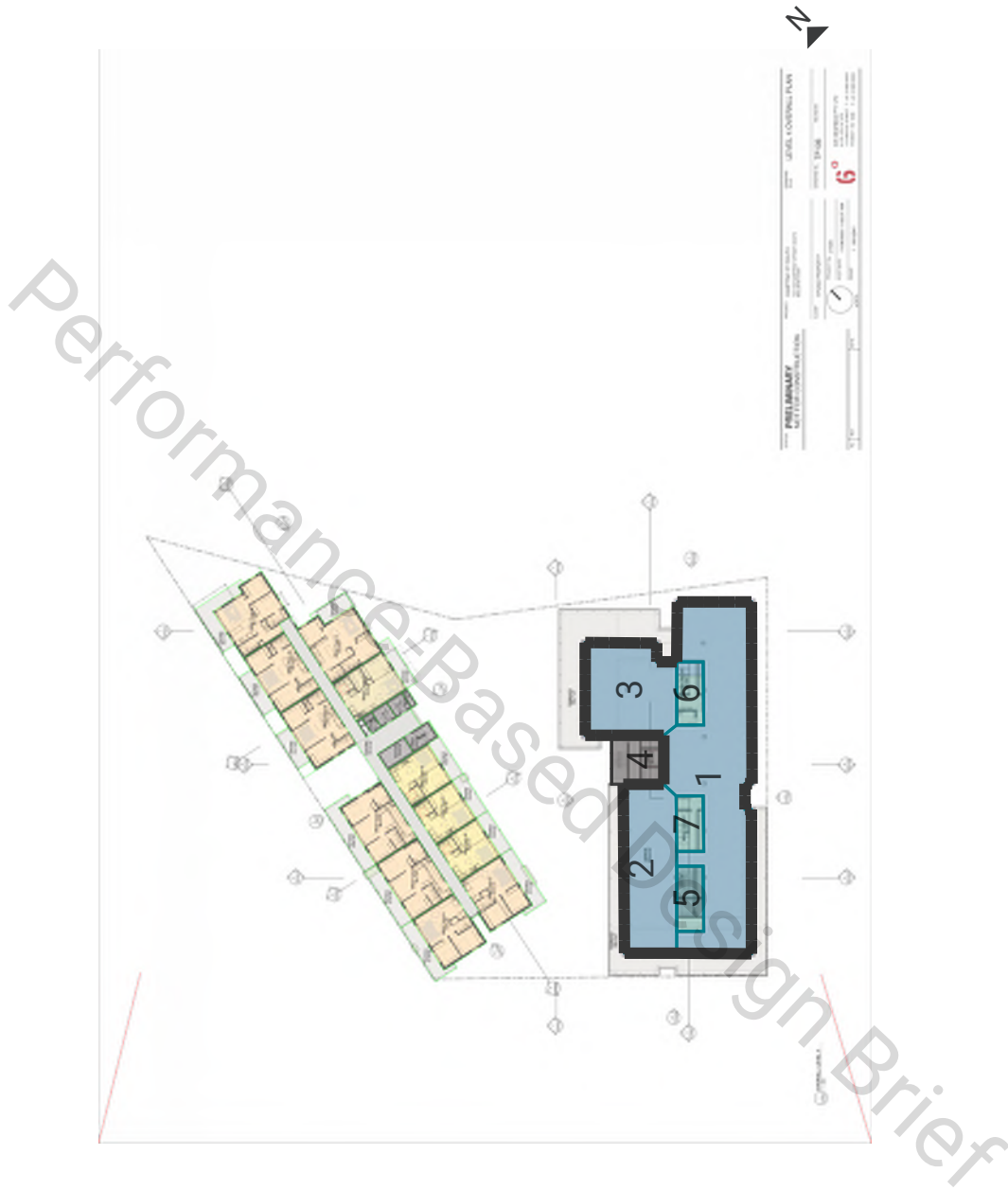
Level 7 - Levels 4 - 5



- Thermal Line
- Windows
- Unconditioned
- Class 5

# Commercial Section J - EW

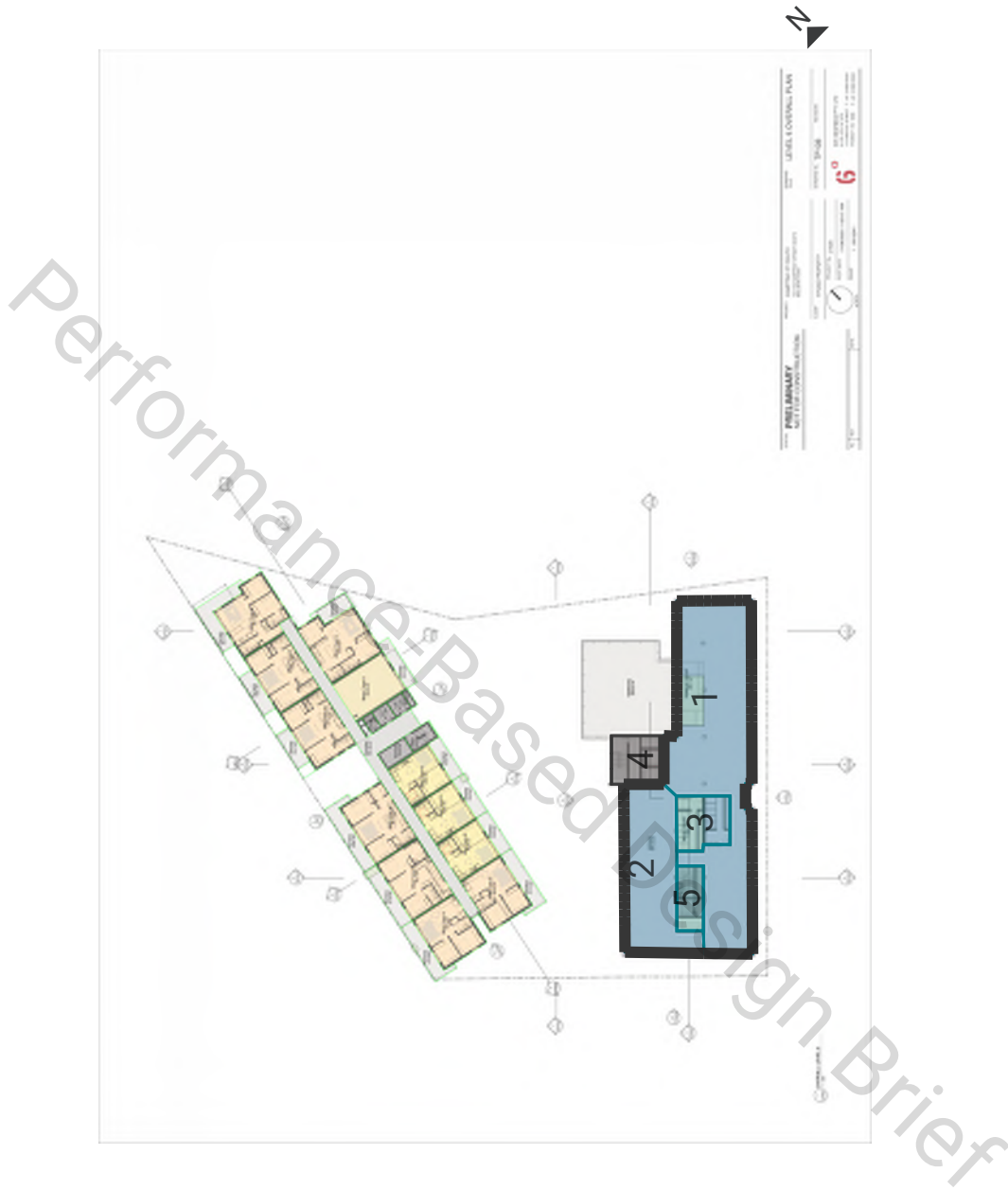
Level 8 - Levels 4 - 5



- Thermal Line
- Windows
- Class 5
- Unconditioned

# Commercial Section J - EW

Level 9 - Level 6



- Thermal Line
- Windows
- Unconditioned
- Class 5

## Disclaimer

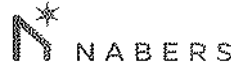
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 Parramatta NSW 2150

## NABERS Energy and Water for Offices Reverse Calculator



Version: 20.1 Date: Jun-22

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

**Whole Building**

### 2. ENTER THE STAR RATING YOU WISH TO ACHIEVE



**5.5** STARS





**5.5** STARS

### 3. ENTER THE BUILDING INFORMATION

Building Postcode		3550
Net Lettable Area of the building (m <sup>2</sup> )		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

	Benchmarking factor at selected rating	N/A	kgCO <sub>2</sub> -e/year
	Maximum Emissions at 5.5 Star NABERS Energy	804,713	kgCO <sub>2</sub> -e/year
	Actual Emissions for this Office - Scope 1, 2 and 3	782,564	kgCO <sub>2</sub> -e/year
	Actual Emissions for this Office - Scope 1 and 2	708,737	kgCO <sub>2</sub> -e/year
	Emissions Intensity at 5.5 Star NABERS Energy	108.6	kgCO <sub>2</sub> -e/m <sup>2</sup> .year
	Energy Intensity at 5.5 Star NABERS Energy	358.7	MJ/m <sup>2</sup> .year
	Maximum Allowable Fuel Consumption		
	Target Max Electricity	738,268	kWh per annum
	Target Max Gas	-	MJ per annum
	Target Max Diesel	-	L per annum
	Maximum Water Consumption at 5.5 Star NABERS Water	1,855	kL/year
	Water Intensity at 5.5 Star NABERS Water	0.251	kL/m <sup>2</sup> .year