ADP
Consulting : Engineering

Residential Development

Sustainability Management Plan

Golden Age Development – The Glen
235 Springvale Road
Glen Waverly, Victoria 3150

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1. Introduction

This report provides an overview of the sustainability strategy for the proposed development at 235 Springvale Road, Glen Waverly, within the municipal boundaries of Monash City Council. The development is a residential development consisting of three residential towers, with a common podium and basement car parking.

The objective of the report is to indicate how best practice environmentally sustainable design (ESD) is to be incorporated in the development. The report will highlight the ESD objectives for the development and the initiatives proposed to meet these objectives.

1.1 STATUTORY CONTEXT

Monash City Council adopts Sustainable Design Assessment in the Planning Process (SDAPP) Tools as the preferred means of assessing ESD. The purpose of the SDAPP program is to:

- Make sure that new buildings meet appropriate environmental performance standards.
- Give a clear outline of the environmental objectives and standards required by council
- Provide a consistent, fair approach to assessing planning applications on their environmental impact.
- Offer flexibility on how developments meet these standards with easy-to-use assessment tools.
- Promote awareness and knowledge of the benefits of incorporating sustainability within developments from the planning stage.

In meeting planning requirements, a SMP prepared by a suitably qualified professional must be submitted, addressing the 10 key sustainable building categories:

- Indoor environment quality
- Energy efficiency
- Water efficiency
- Building materials
- Transport
- Waste management
- Urban ecology
- Innovation
- Construction and building management

The BESS Tool has been utilised to benchmark the environmental performance of the project. The BESS Tool has been developed to replace the Sustainable Tools for Environmental Performance Strategy (STEPS) assessment tool, whilst still supporting the Council's SDAPP requirements.

1.2 SUMMARY OF KEY INITIATIVES

- Good natural ventilation and daylighting
- Access to external views
- High levels of insulation in the building fabric
- 6.5 star average house energy rating (NatHERS) for all apartments, with a minimum of 5.5 stars
- Efficient, centralised gas hot water system for each residential tower
- Efficient air-conditioning systems within one and a half star of best available energy rating
- Average lighting power density to be at least 20% less than BCA requirements
- High efficiency LED and compact fluorescent lighting with intelligent sensors
- Occupancy sensors on common area and car park lighting and daylight sensors on external lighting
- Car park ventilation controlled by CO sensors
- 28 kW photovoltaic system, spread out across the roofs of the 3 residential towers
- Extensive metering
- Water efficient WELS rated fixtures and fittings
- Sustainable material selection relating to PVC, steel, timber
- Use of low toxicity materials: paints, adhesives, sealants, carpets and engineered wood products
- Zero ODP refrigerants
- Excellent access to public transport
- Car parking compliant with Council requirements
- High level of neighbourhood amenity within walking distance

- Comprehensive building commissioning
- Building users' guide (BUG) to assist occupants in correct, optimum building operation
- Site selection does not contribute to urban sprawl
- Provision of communal, food production and green areas well in excess of BESS best practise.
- Construction waste management plan and 80% reduction in waste to landfill during construction
- 30% reuse of existing structure

The project uses the BESS assessment tools Refer to Appendix A for further details of the BESS assessment

2. ESD Objectives and Environmental Initiatives

The following section provides details of the ESD initiatives for the project, in line with the project brief.

2.1 INDOOR ENVIRONMENT QUALITY

2.1.1 Natural Ventilation

Buildings with effective natural ventilation provide passive means of cooling and air movement, which encourages occupants to open the windows in preference to using air conditioning. Natural ventilation also improves indoor environment quality by circulating fresh air.

This development supports the use of natural ventilation by providing large sliding doors to balconies and courtyards, as well as openable windows to other areas. Natural ventilation for air movement can be expected to occur under the following conditions[1]:

- Single sided, single opening: 1.5 x ceiling height
- Single sided, multiple openings: 2.5 x ceiling height
- Cross-ventilation: 5 x ceiling height

Following these guidelines, and based on a ceiling height of 2.7 metres, the following ventilation paths are possible:

- Single sided, single opening: 4.05 m
- Single sided, multiple openings: 6.75 m
- Cross-ventilation: 14 m

These natural ventilation paths for typical apartments are shown in Figure 1.

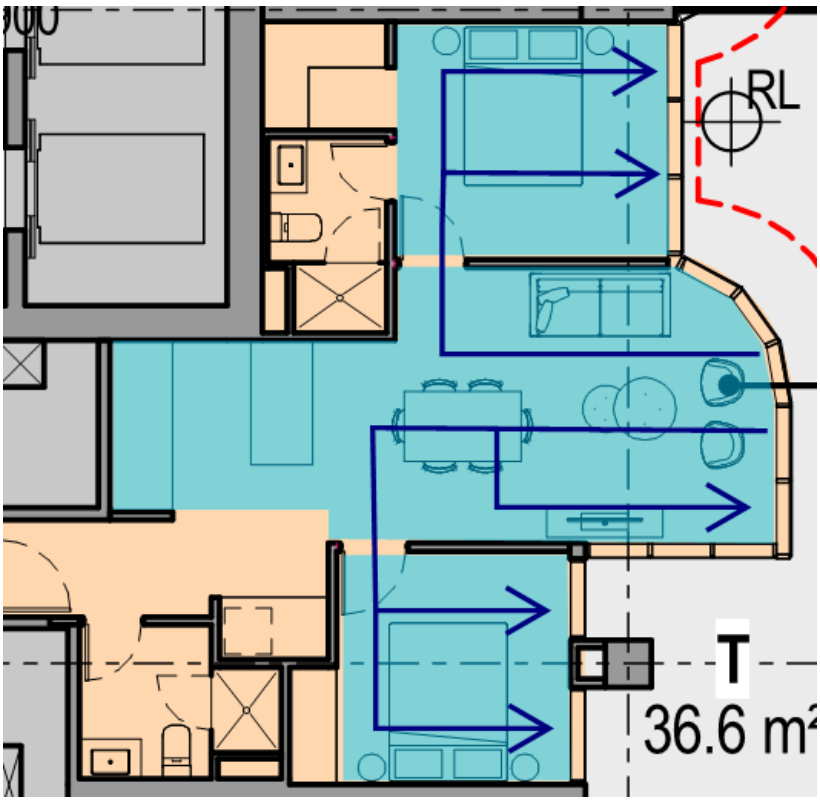


Figure 1: Natural Ventilation Illustrated (Blue Highlight)

The natural ventilation will be supplemented by the exhaust fans to kitchens and bathrooms/toilets. As well as removing indoor air pollutants and excess moisture, the exhaust fans will provide an additional air path for fresh air passing through the open façade, and will help avoid mould growth.

[1] Royal Institute of British Architects (n.d.) Sustainability Hub.

Window openable areas will be provided in compliance with *AS1668.4: natural ventilation of buildings*. Opening areas must be at least 5% of the area of the room they are serving in order to provide sufficient fresh air for health.

2.1.2 Natural Lighting

Daylighting is important to indoor environment quality and can reduce energy used by artificial lighting. Daylight penetration is generally governed by window to wall ratio (WWR), window head height (WHH) and the presence of any external obstructions. Room layout and artificial lighting design should also take daylight into account in order to realise the greatest energy savings.

In general, the following provide guidance on the depth and quality of daylight[2]:

- Daylit depth of WHH x 1.5 (diffuse only) to WHH x 2.5 (diffuse and direct)
- Daylight feasibility test: WWR > 22% for unobstructed facades or obstruction angle of > 20° when WWR = 100%

The development provides a WHH of approximately 2.7 m, resulting in a daylit depth of 4.05m to 6.75 m from the façade. With large windows to the living and bed rooms, and no windows significantly overshadowed by other buildings, the daylight feasibility test is achieved for 100%. All internal spaces have windows to the outside.

Figure 2 provides visual representations daylight depth.

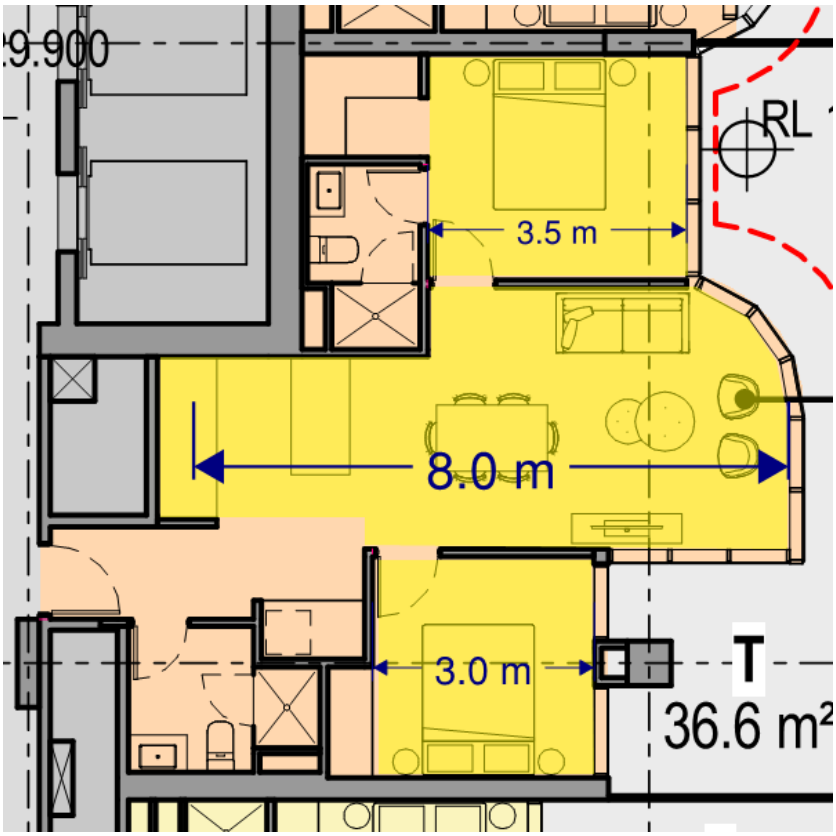


Figure 2: Daylit Depth Illustrated (Yellow Highlight)

BESS deem-to-satisfy (DTS) requirements for indoor environment quality consists of five key requirements, as shown in Table 1.

Under the BESS DTS method, there is no partial compliance. A project must meet all five requirements to be compliant.

Instead of using the DTS method, the project can choose to demonstrate performance via daylight modelling.

[2] Christoph Reinhart (2014). Daylighting Handbook I.

Table 1: BESS IEQ DTS Requirements

Requirement	Project Complies?
Are all living areas and bedrooms less than 8m deep (5m if south facing)?	Uncertain (adhering to this can be restrictive on design options)
Do all living areas and bedrooms have a floor-to-ceiling height of at least 2.7m?	Yes
Does all glazing to living areas achieve at least 60% Visible Light Transmittance (VLT)?	Uncertain (adhering to this can be restrictive on design options)
Do all living areas have an external facing window (not into a courtyard, light well or other major obstruction)?	Yes
Does the building(s) comply with the requirements of the building separation tables?	Uncertain

2.1.3 External Views

All apartments will have external views. In most cases, the line of site will be to beyond the site boundary.

2.1.4 Private External Space

Balconies are provided to all apartments in the development.

2.1.5 Artificial Lighting Levels

Appropriate levels of lighting (minimum 300 Lux) will be provided at all task-specific locations, as follows:

- Kitchen sink
- Stove/cooktop
- Vanity basins

2.1.6 Individual Control

Individual control allows occupants to adjust their thermal and lighting environment according to comfort preferences, which can vary substantially from person to person. A further advantage of individual control is that it encourages occupants to understand and take responsibility for their own environment and adjust it in response to external ambient conditions.

Individual control will be provided in this development through operable doors, operable windows, and individual control of heating, cooling and lighting within each apartment.

2.1.7 Mechanical Ventilation

Fresh air ventilation will be improved through the inclusion of exhaust fans to kitchens and bathrooms. As well as removing indoor air pollutants and excess moisture, the exhaust fans will provide an additional air path for air passing through the open façade.

A mechanical exhaust ventilation system will be provided for the basement car park. The car park exhaust fan is to be variable speed controlled based on carbon monoxide levels. The ventilation system will be designed in accordance with AS 1668.2-2012.

2.1.8 Internal Noise Levels

Incursion of environmental noise, particularly traffic noise, will be limited through the use of glazing which will be specified to meet acoustic performance criteria in line with Australian Standards.

The project will aim to achieve internal noise levels in the dwellings that are no more than 5 dB(A) above the satisfactory sound levels provided in AS2107, and the partition between the spaces to be constructed to achieve a weighted sound reduction index (Rw) of at least 45.

2.1.9 Volatile Organic Compounds

Materials containing Volatile Organic Compounds (VOCs) emit fumes at room temperatures and have been linked to a variety of health problems including respiratory disorders and eye, nose and throat irritation.

They are commonly found in products such as paints, sealants, adhesives, and wall and ceiling coverings. When selecting these items, Table 2 through Table 5 will be followed.

Table 2: Total VOC limits for Paints and Varnishes

Product Type	Max TVOC Content (g/l of ready-to-use product)
Walls and ceilings – interior gloss	75
Walls and ceilings – interior semi gloss	16
Walls and ceilings – interior low sheen	16
Walls and ceilings – interior flat washable	16
Ceilings – interior flat	14
Trim – gloss, semi gloss, satin, varnishes and woodstains	75
Timber and binding primers	30
Latex primer for galvanized iron and zincalume	60
Interior latex undercoat	65
Interior sealer	65
One and two pack performance coatings for floors	140
Any solvent-based coatings whose purpose is not covered in table	200

Table 3: Max TVOC Content Limits for Adhesives and Sealants

Product Type	Max TVOC Content (g/l of product)
Indoor carpet adhesive	50
Carpet pad adhesive	50
Wood flooring and Laminate adhesive	100
Rubber flooring adhesive	60
Sub-floor adhesive	50
Ceramic tile adhesive	65
Cove base adhesive	50
Dry Wall and Panel adhesive	50
Multipurpose construction adhesive	70
Structural glazing adhesive	100
Architectural sealants	250

Table 4: Flooring TVOC Emissions Limits

Coverings other than carpets	Max TVOC Emission Limit (mg/m^2 per hour)
Carpets and other flooring products (using ASTM D5116):	
Total VOC limit	0.5 mg/m^2 per hour
4-PC (4-Phenylcyclohexene)	0.05mg/m^2 per hour
Flooring products other than carpet (using ISO 16000 test protocol):	
TVOC at 3 days	5
TVOC at 28 days	0.5

Table 5: Wall and Ceiling Covering TVOC Emissions Limits

Coverings other than carpets	Max TVOC Emission Limit (mg/m^2 per hour)
TVOC at 3 days	5
TVOC at 28 days	0.5

2.1.10 Formaldehyde Minimisation

Low-formaldehyde composite wood products will be specified throughout, complying with E1, E0, Super E0 or lower emission limits. This requirement applies to any of the following when installed internally:

- Particleboard
- Plywood

- Veneer
- MDF
- Decorative overlaid wood panels

2.2 ENERGY EFFICIENCY

2.2.1 House Energy Rating - Residential

NCC2016-BCA Section J0.2a states that the sole-occupancy units of a Class 2 building or a Class 4 part of a building must:

> *(a) for reducing the heating or cooling loads -*
> *(i) collectively achieve an average energy rating of not less than 6 stars; and*
> *(ii) individually achieve an energy rating of not less than 5 stars, using house energy rating software*

Considering BESS requirements, the project is targeting a 6.5 star average house energy rating (NatHERS) for all apartments, with a minimum of 5.5 stars. It will be achieved due to high quality glass and building fabric, shading, and effective natural ventilation.

2.2.2 BCA Section J Compliance - Non Residential

The non-residential areas will comply with BCA Section J energy efficiency requirements. Compliance can be demonstrated via two possible methods:

- Meeting deemed-to-satisfy (DTS) provisions of BCA Section J on glazing and fabric, or
- Undertake JV3 modelling.

2.2.3 Insulation

The building has been designed to incorporate bulk insulation within the floor, roof and walls to minimise the heat loss in winter and heat gain in summer. The proposed preliminary insulation levels are as follows:

- Roof: R3.2
- External walls: R2.8
- Internal walls to unconditioned spaces (stairs, risers, shafts): R1.8
- Floor/slab above unconditioned space: R2.0

Insulation levels will be confirmed after final energy assessment is completed.

2.2.4 Glazing

High-performance glazing will be used to control solar gain from direct sunlight, reduce noise levels and minimise heat gain, heat loss, and radiant discomfort. Glazing shall be of low-e single or double glazed type, or equivalent, with specifications finalised during the detailed design phase when energy assessment is completed and acoustic performance established.

2.2.5 Thermal Mass

The thermal mass effect is the ability of materials to store and release energy over time. Thermal mass can lower indoor temperatures during the day and raise night time temperatures, utilising direct sunlight and diurnal temperature and ventilation patterns.

The thermally massive concrete structure of the development will help maintain comfortable conditions and reduce energy use by stabilising indoor temperatures. This complements the insulation and glazing, which protect internal spaces from external weather extremes.

2.2.6 Heating / Air-Conditioning Systems

The requirements for heating and air-conditioning have been minimised through passive design including glazing orientation and natural ventilation, however active systems will still be required to provide a suitable level of comfort.

The development will be generally heated and cooled via high efficiency air-conditioning systems. All systems will aim to have energy ratings within one and a half energy star of the best available on the market for the applicable system size.

The rated capacity of the air conditioning equipment will not exceed the design heating capacity by more than 20% and the design cooling capacity by more than 10%.

All air-conditioning systems will use zero ozone depletion potential (ODP) refrigerant.

2.2.7 Domestic Hot Water Systems

The building will incorporate a centralised gas hot water system for each residential tower. High efficiency five-star gas water heaters will be selected to minimise gas consumption.

Water distribution pipework will be designed to minimise hot water system piping length, piping diameter and maximise hot water piping insulation in accordance to the BCA to minimise heat loss.

A centralised gas hot water system has the following benefits:

- Low greenhouse gas emissions per unit of hot water generated
- High efficiency and lower storage heat losses due to centralised system
- Year-round performance

The domestic hot water energy usage will be offset via PV panels. Details are found in section 2.2.14.

2.2.8 Artificial Lighting

Poorly designed or controlled lighting systems can use a significant amount of energy. By selecting efficient light fittings, significant energy savings can be achieved.

The development will utilise efficient lighting fittings, with a combination of LED and compact fluorescent lighting to be used according to the requirements for each area. Additionally, lamps will be spaced economically to avoid over-lighting. No incandescent or dichroic (halogen downlight) lighting will be used in this development.

The maximum illumination power density (W/m2) will be at least 20% lower than required by Table J6.2a of the NCC BCA (201X) Volume 1 Section J.

2.2.9 Lighting Control Systems

Whilst efficient artificial lighting systems will be used throughout the project, the greatest energy and greenhouse gas savings can be made by implementing a control system that switches off the artificial lighting when not in use. The following control strategies are implemented:

- Light switches on entry to the apartments
- Car park lighting to be controlled via occupancy sensors
- Lobbies, corridors and common areas to be controlled via motion sensor controls and/or time clocks
- External lighting to be controlled by daylight sensors, and/or time clocks.
- 24-hour lighting to be provided by exit signs where possible, eliminating the need for additional 24-hour lights

2.2.10 Car Park Ventilation

Car park ventilation systems will be controlled to ensure fans are not running needlessly, using carbon monoxide sensors and variable speed drives. The car park ventilation system will be designed to reduce fan size, and hence energy consumption, as much as possible.

2.2.11 Gas Cooking Systems

The development will aim to use gas cooking appliances only, which help to reduce the overall greenhouse gas emissions and peak electrical load associated with the development.

2.2.12 Appliances

All appliances, if installed as part of the base building package, will have energy rating within one star of best rating available for that appliance type and capacity. Potential appliances that are subject to the energy star rating requirement include:

- Refrigerators/freezers
- Dishwashers
- Washing machines
- Clothes dryers

2.2.13 Peak Demand Reduction

Several energy efficiency measures have the additional effect of reducing peak electricity demand. This reduced pressure on electricity networks, particularly during times of peak cooling and heating use. The following initiatives will reduce electrical demand:

- Centralised gas hot water system
- High performance facade, which reduce the peak heating and cooling requirements
- High efficiency air conditioning system
- Energy efficient appliances, lighting, and central systems
- Use of non-electric cooking appliances

2.2.14 Renewable Energy

The development will include renewable energy in the form of a photovoltaic array producing electricity.

The photovoltaic system will be sized to achieve equal carbon abatement as a solar hot water preheat system providing 25% annual contribution. Total photovoltaic system capacity will be approximately 28 kWp across the whole project.

A photovoltaic system has been selected in preference to solar thermal preheat of hot water due to the much greater relative reduction of greenhouse gas emissions per capital cost. The carbon emissions produced by the hot water system and offset by the solar photovoltaic system are shown in Table 6.

The solar photovoltaic system will be situated on the roof, ensuring uninterrupted solar access. The electricity generated will offset the base building power usage, and the system will be managed by the embedded network provider.

Table 6: Carbon Abatement Options

System Type	Energy	Carbon Factor	Carbon Emissions
Gas hot water system	3,807,430 MJ/annum	0.05133 $kgCO_2$-e/MJ	195,435 $kgCO_2$-e/annum
Gas hot water system (25% of total)	-	-	48,859 $kgCO_2$-e/annum
Photovoltaic system 28 kWp	37,014 kWh/annum	1.32 $kgCO_2$-e/kWh	48,859 $kgCO_2$-e/annum

A 28 kWp PV installation is approximately around 113 x 250W panels, each panel measuring roughly 1.1m x 1.7m. The panels can be spread out across the roofs of the 3 residential towers. For optimum energy generation the panels will be mounted to face north with a 38° tilt angle from the horizon.

Final number of panels and spatial requirements can vary depending on panel type, configurations and clearance requirements.

2.3 WATER RESOURCES

2.3.1 Efficient Fixtures

To minimise the water consumed, water efficient fittings, fixtures and appliances will be selected for installation in the development. The following minimum WELS ratings will be used:

- Showers: 3 stars (7.5 L/min or lower)
- Toilets: 4 stars (3/4.5 L/flush or lower)
- Taps: 5 stars (6 L/min or lower)
- Urinals: 5 stars <1 L/stall (with smart demand operation and urine sensing device)
- Dishwashers: 5 stars (if provided as part of base building package)
- Washing machines: 4 stars (if provided as part of base building package)

2.3.2 Fire System Test Water

The fire system will include temporary storage for 80% of the routine fire protection system test water and maintenance drain-downs for reuse on-site. Sprinkler systems will be fitted with isolation valves or shut-off points on each floor for floor-by-floor testing.

2.3.3 Water Metering

Water meters will be provided for all major water uses in the building and individual water meters will be provided for each dwelling/tenancy.

2.3.4 Landscape Irrigation

The landscaping design will give preference to drought tolerant or indigenous species that require very little or no watering once established.

2.3.5 Minimise Dead Legs

Water wastage will be reduced through careful design by reducing heated water outlet piping length (dead leg) to reduce water consumption before full temperature water delivery.

2.4 BUILDING MATERIALS

2.4.1 Material Selection

A review process will be implemented to identify opportunities to use more sustainable products and materials, considering broad environmental impact. Where possible, materials used within the development will be selected to minimise environmental impact. The following criteria will be considered:

- Products that reduce raw and non-renewable material use, such as those with recycled content or those which use raw materials more efficiently
- Products with low impact disposal, such as products from manufacturers with end of lifecycle recycling systems
- Low embodied energy and embodied carbon
- Materials that are durable and fit for purpose, and hence can be expected to have a longer serviceable life
- Materials from sustainable sources such as timbers from recognised plantations (e.g. Australian Forestry Standard)
- Materials which are recognised as being manufactured under environmentally responsible systems and accredited by an independent body such as Good Environmental Choice Australia
- Materials that have a high probability of being recycled at end of life due to ease of recycling or high recoverable value
- Materials produced using ethical labour and fair trade
- Locally produced materials and products, due to the lower associated transportation emissions.

2.4.2 Steel

At least 60% of all steel (by mass) used on the project will either have a post-consumer recycled content greater than 50% or is re-used.

2.4.3 PVC Reduction

The target for the project is that at least 60% of the common use PVC in the building (by cost) will be replaced with PVC complying with the Best Practice guidelines published by the Green Building Council of Australia (http://www.gbca.org.au/files/literature-review-and-best-practice-guidelines-for-the-life-cycle-of-pvc-products), HDPE, or other alternative product. This requirement applies to the following:

- Pipes, conduits and associated fittings
- Wire and cable insulation
- Vinyl flooring and PVC-backed carpet
- Resilient wall coverings containing PVC

2.4.4 Timber

At least 95% (by cost) of the timber used in the construction of the building will be certified by a recognized forest certification scheme including the Australian Forestry Standard, Forest Stewardship Council, or Programmed for the Endorsement of Forest Certification, or will be re-used / post-consumer recycled timber.

2.4.5 Volatile Organic Compounds

Materials containing Volatile Organic Compounds (VOCs) emit fumes at room temperatures and have been linked to a variety of health problems including respiratory disorders and eye, nose and throat irritation.

They are commonly found in products such as paints, sealants, adhesives, and wall and ceiling coverings. When selecting these items, Table 2 through Table 5 will be followed.

Table 7: Total VOC limits for Paints and Varnishes

Product Type	Max TVOC Content (g/l of ready-to-use product)
Walls and ceilings – interior gloss	75
Walls and ceilings – interior semi gloss	16
Walls and ceilings – interior low sheen	16
Walls and ceilings – interior flat washable	16
Ceilings – interior flat	14
Trim – gloss, semi gloss, satin, varnishes and woodstains	75

Timber and binding primers	30
Latex primer for galvanized iron and zincalume	60
Interior latex undercoat	65
Interior sealer	65
One and two pack performance coatings for floors	140
Any solvent-based coatings whose purpose is not covered in table	200

Table 8: Max TVOC Content Limits for Adhesives and Sealants

Product Type	Max TVOC Content (g/l of product)
Indoor carpet adhesive	50
Carpet pad adhesive	50
Wood flooring and Laminate adhesive	100
Rubber flooring adhesive	60
Sub-floor adhesive	50
Ceramic tile adhesive	65
Cove base adhesive	50
Dry Wall and Panel adhesive	50
Multipurpose construction adhesive	70
Structural glazing adhesive	100
Architectural sealants	250

Table 9: Flooring TVOC Emissions Limits

Coverings other than carpets	Max TVOC Emission Limit (mg/m^2 per hour)
Carpets and other flooring products (using ASTM D5116):	
Total VOC limit	0.5 mg/m^2 per hour
4-PC (4-Phenylcyclohexene)	0.05mg/m^2 per hour
Flooring products other than carpet (using ISO 16000 test protocol):	
TVOC at 3 days	5
TVOC at 28 days	0.5

Table 10: Wall and Ceiling Covering TVOC Emissions Limits

Coverings other than carpets	Max TVOC Emission Limit (mg/m^2 per hour)
TVOC at 3 days	5
TVOC at 28 days	0.5

2.4.6 Formaldehyde Minimisation

Low-formaldehyde composite wood products will be specified throughout, complying with E1, E0, Super E0 or lower emission limits. This requirement applies to any of the following when installed internally:

- Particleboard
- Plywood
- Veneer
- MDF
- Decorative overlaid wood panels

2.5 TRANSPORT

2.5.1 Public Transport

The site has excellent access to public transport:

- Buses 623, 734, 736, 737, 742, 753, 754, 850, 885, 902 and 967
- Glen Waverly train station

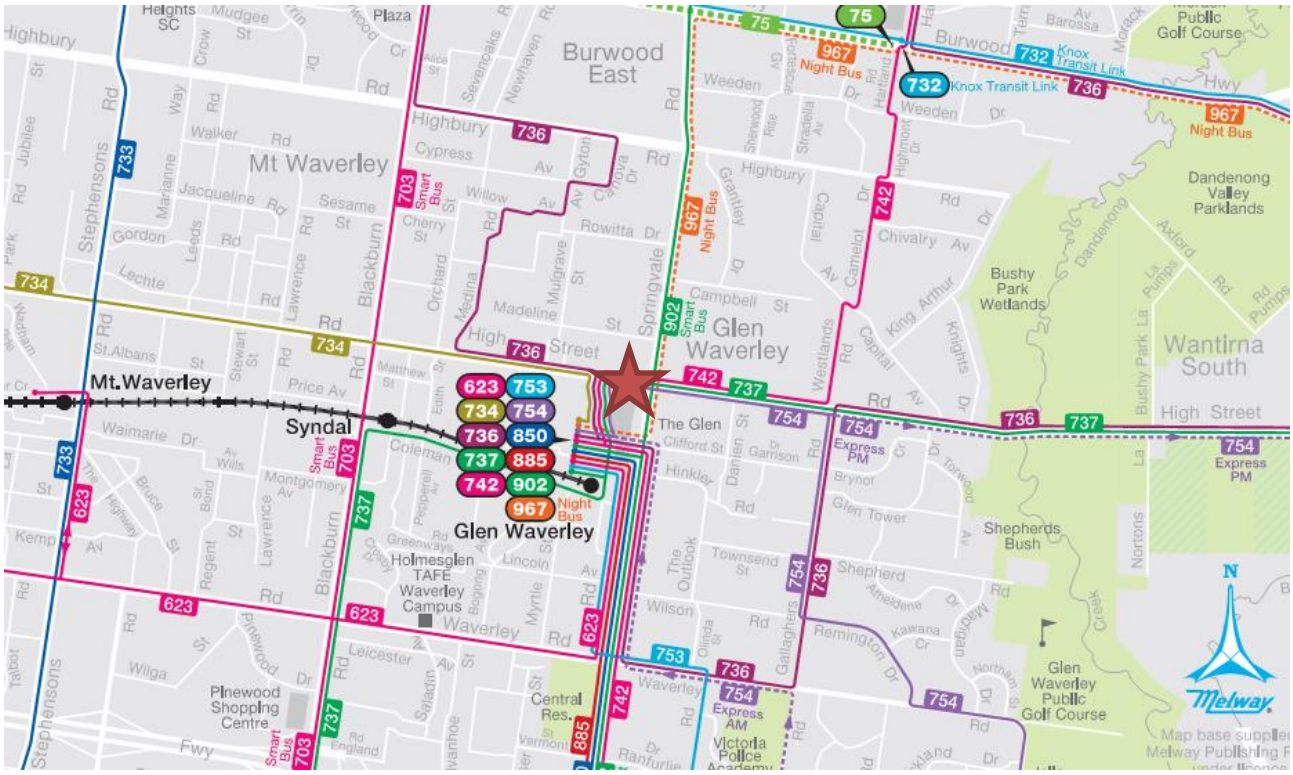


Figure 3: Local Public Transport (ptv.vic.gov.au)

The close proximity of public transport will benefit the development through a reduced reliance on cars as a means of transport. This, in turn, will reduce greenhouse gas emissions associated with occupants of the development.

2.5.2 Car Parking

The car parking has been allocated to meet the planning scheme for the permanent residents of the development and the visitor car parking will be allocated in the retail car parking area.

Table 11: Car parking provided

Car Park Provision	
Resident Car	612
Visitor	Allocated in retail carpark

2.5.3 Bicycle Use

The project will provide secure bicycle racks for residents and visitors. The number of bicycles required is shown in Table 12. This table provides guidance to the design team on the number of bicycle racks required. Currently the design provision does not meet Council or BESS requirements. This will need to be addressed.

Table 12: Resident Bicycle Rack Requirements

Summary	Council	BESS
Resident	111	566
Visitor	56	141
Current Design	119	

2.5.4 Walkability

Walkscore.com measures the walkability of any address worldwide by assessing proximity to nearby amenities such as schools, groceries, shopping, parks, errands and entertainment. Amenities within a 5 minute walk are given maximum points, decreasing to a maximum walk distance of 30 minutes. The score out of 100 corresponds with a rating (Table 13).

Table 13: Walk Score Rating System

Walk Score	Description
90–100	**Walker's Paradise** Daily errands do not require a car.
70–89	**Very Walkable** Most errands can be accomplished on foot.
50–69	**Somewhat Walkable** Some errands can be accomplished on foot.
25–49	**Car-Dependent** Most errands require a car.
0–24	**Car-Dependent** Almost all errands require a car.

The development achieves a Walkscore of 94, or 'Walker's Paradise', indicating that daily errands do not require a car, as shown in Figure 4.

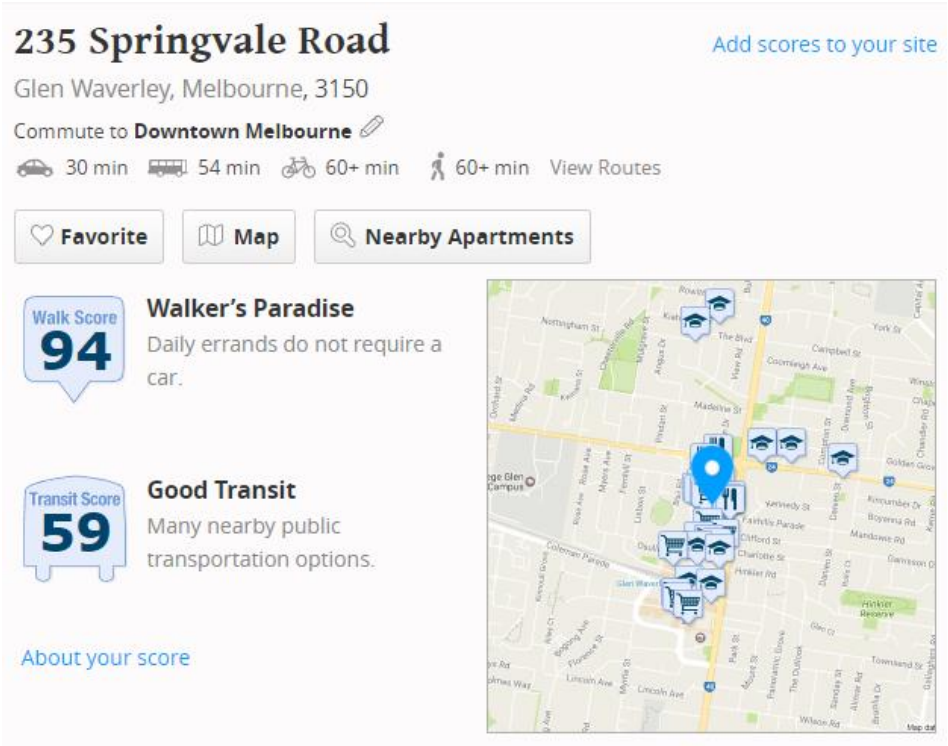


Figure 4: Walkability Score

2.6 WASTE MANAGEMENT

2.6.1 Operational Waste Management

Dedicated, sufficiently sized areas for the storage and collection of the applicable waste streams will be provided. The dedicated storage areas for the separation, collection and recycling of waste will be easily accessed by building occupants and will have suitable access for recycling contractors.

The storage area will be sized to accommodate all bins or containers, for all applicable waste streams, for at least one collection cycle. Access requirements for waste collection areas will adhere to best practices.

Guidance on correct waste management practices will be included in the building users' guide.

2.6.2 Construction Waste Management

The builder will implement a comprehensive Construction Waste Management Plan and an Environmental Management Plan. The project will aim to re-use or recycle at least 80% (by mass) of all construction and demolition waste.

As the development is being built on top of The Glen, as existing shopping centre, this development is using in excess of 30% of the existing structure.

2.6.3 Sewerage

Sewerage emissions will be significantly reduced through the requirement to utilise efficient fixtures and fittings, which will reduce the total volume of water draining to sewer.

2.6.4 Ozone Depleting Substances

All thermal insulation and refrigerants will be free from ozone-depleting substances, both in composition and manufacture.

2.6.5 Occupant Education

The Building Users Guide (BUG, refer section 2.8.3) will include guidance on minimizing pollution, including:

- What may and may not be disposed of down drains
- Environmentally preferable products (e.g. detergents) for minimising pollution
- Correct disposal of potentially harmful items such as batteries

2.7 URBAN ECOLOGY

2.7.1 Reuse of Developed Land

The project uses existing developed land with limited ecological value. As a result, the project has minimal negative impact on ecology, and increases overall housing density, which is needed to limit urban sprawl. The development will add significantly to the green/planted areas of this area.

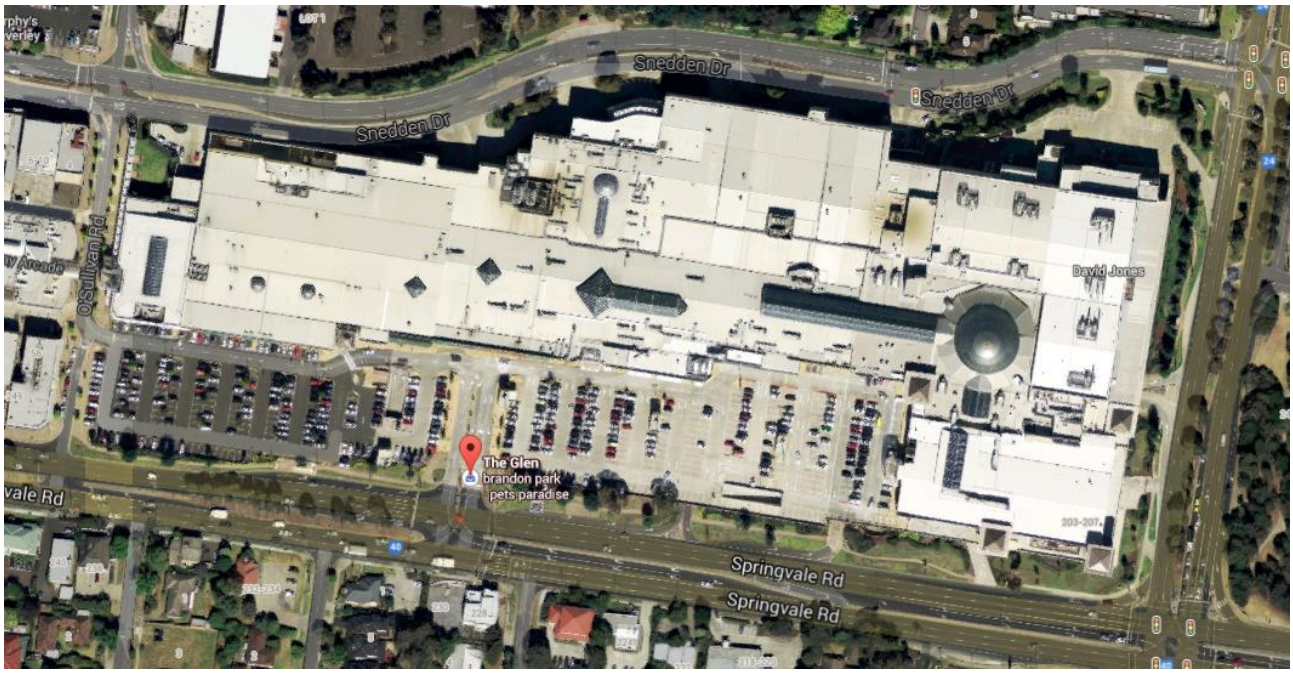


Figure 5: Existing Site

2.7.2 Communal Spaces

The Glen Residential development has made a significant design commitment to providing extensive communal areas. These areas are equipped with food production areas as well as large green and planted areas.

2.7.3 Endangered, Threatened or Vulnerable Species

As the site is already developed, there is no critically endangered, endangered, or vulnerable species, or ecological communities present on the site at time of purchase.

2.7.4 Heat Island Effect

Urban heat island effect is a phenomenon where temperatures in urban areas are warmer than the surrounding rural areas, most obviously during evening and night, due to differences in rate of cooling. This is caused by the layout of urban areas, urban canyons, and thermally massive building materials such as concrete, lack of vegetation, removal of water and generation of heat by vehicles and buildings. In Melbourne, the effect ranges from 2 to 4 °C up to a peak of 7°C.[3]

The development includes measures which will limit impact on urban heat island effect, as follows:

- Use of low albedo roof and paving.
- Extensive green and planted areas.

2.7.5 Light Pollution

The project will comply with AS 4282 “Control of the Obtrusive Effects of Outdoor Lighting”. Where possible, external lighting will avoid upward lighting to reduce light pollution to the sky.

[3] Coutts, Beringer, Jimi and Tapper (2009). The urban heat island in Melbourne: drivers, spatial and temporal variability, and the vital role of stormwater.

2.8 ONGOING BUILDING AND SITE MANAGEMENT

2.8.1 ESD Consultant

An ESD consultant has been engaged from the beginning of the project to set the ESD strategy, work closely with the project team to ensure the initiatives are incorporated, and provide assurance at the conclusion of design.

2.8.2 Commissioning of Building Systems

The importance of commissioning building service systems is crucial in achieving the intended environmental benefits. Commissioning has historically been carried out to low standards in the Australian commercial property sector. During design and construction the project team will ensure that:

- Comprehensive pre-commissioning, commissioning, and quality monitoring are performed for all building services (BMS, mechanical, electrical and hydraulic).
- The commissioning works are done in exact accordance with CIBSE Commissioning Codes or ASHRAE Commissioning Guideline 1-1996 (for mechanical services only) and CIBSE Commissioning Codes for the other Services.

The design team and contractor will transfer project knowledge to the building owner/manager through all of the following:

- Documented design intent
- As-built drawings
- Operations and Maintenance Manual
- Commissioning Report
- Training of building management staff

2.8.3 Building Users Guide

A simple building users guide (BUG) will be produced which will include information relevant to building owners, occupants and tenants' representatives.

The guide will include information on the following:

- Passive features for comfort and energy efficiency
- Operating appliances and building services for energy and water efficiency
- Local transport including trams, buses, trains, and pedestrian and bike routes
- Waste and recycling
- Building-wide features such as renewable energy
- Selection of sustainable and low toxicity materials
- Links to further and updated information

2.8.4 Environmental Management

The builder will be required to institute an environmental management plan (EMP) to manage and minimise environmental risks during construction. In addition, the builder will be ISO 14001 accredited for Environmental Management Systems, assuring quality in environmental management systems and processes.

2.8.5 Energy Management and Monitoring

A large proportion of energy can be wasted by a poorly tuned building, which can be difficult to determine without adequate sub metering. To enable the building energy to be monitored for fluctuations from normal operation (fault indication) and observe variations from the design, sub meters will be provided on all base building energy systems and substantial loads, including:

- Mechanical
  - Common area supply air system
  - Car park ventilation
- Electrical
  - Common area lighting and power
  - External lighting
- Vertical Transportation

- Passenger lifts

Individual electricity and hot water meters will be provided to each dwelling.

2.9 INNOVATION

The following innovation measures will be considered for the project.

- Sub-contractor education to be carried out, highlighting the project's sustainability attributes to 80% of staff on-site
- Validation of metering network via calibration, testing and commissioning
- DHW systems designed to manage the risk of microbial contamination
- Building air tightness testing to be undertaken in accordance with recognised industry standards
- Local procurement of services and skilled labour
- Over 50% of paint (by cost) to have a VOC content of <5g/L
- Pre and post occupancy survey for occupants

3. BESS Assessment

A BESS assessment has been completed for the development to provide a guide to the sustainability initiatives that will be implemented in the design.

In summary, the development achieves a total BESS score of 50 out of 100 (Table 14). This highlights the high commitment to sustainable development in the design.

Table 14: BESS summary

Category	Achieved
Management	100%
Water	25%
Energy	57%
IEQ	72%
Transport	22%
Waste	100%
Urban Ecology	44%
Innovation	70%
Project sustainability score	**50%**

Refer to the appendix for the full BESS results.

4. Implementation Schedule

The following implementation schedule is provided to provide guidance on the responsibilities for implementation of the ESD initiatives outlined in this report:

Table 15: Implementation Schedule

Item	Responsible Party
Natural Ventilation Natural Lighting	Architect
Individual Control of Indoor Environment	Architect Services Engineer
Mechanical Ventilation	Services Engineer
Thermal Insulation Shading	Architect
House Energy Rating	Architect ESD Consultant
Heating / Cooling / AC systems Domestic Hot Water Artificial Lighting Control Systems Energy Management and Metering	Services Engineer
Water Efficient Fixtures	Architect
Minimise Dead Legs	Services Engineer Builder
Public Area Water Consumption	Services Engineer Owner's Corporation
Materials Selection	Architect Builder
Reduction of VOC's	Architect Builder
Bicycle Use	Architect
Waste Management	Waste Management Consultant
Construction Waste Management	Builder
Topsoil Management	Builder
Building Operation and Maintenance	Services Engineer Builder Equipment Suppliers
Building Users Guide	Services Engineer Waste Management Engineer Architect
Commissioning of Building Systems	Builder

Appendix A - BESS Assessment

BESS Report

This BESS report outlines the sustainable design commitments of the proposed development at 235 Sprinvale Rd Glen Waverly VIC 3150. The BESS report and accompanying documents and evidence are submitted in response to the requirement for a Sustainable Design Assessment or Sustainability Management Plan at Monash City Council.

Note that where a Sustainability Management Plan is required, the BESS report must be accompanied by a report that further demonstrates the development's potential to achieve the relevant environmental performance outcomes and documents the means by which the performance outcomes can be achieved.

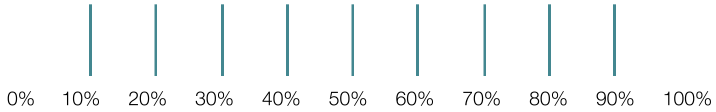
235 Sprinvale Rd, Glen Waverly 3150 Glen Waverly

Site area: 11000 m^2 · **Building Floor Area:** 37420 m^2 ·
Date of Assessment: 26 Sep 2017 ·
Version: V3, 1.5.0-B150 ·
Applicant: d.kim@adpconsulting.com.au

Project number
10106
Draft
http://bess.net.au/projects/10106

Your BESS score is

+ 50%

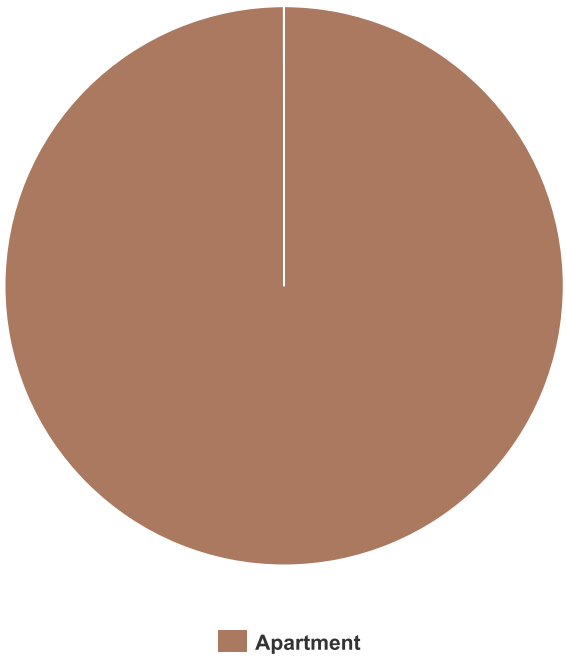


50% +
Best Practice

70% +
Excellence

% of Total	Category	Score	Pass
4 %	Management	100 %	
2 %	Water	25 %	✗
15 %	Energy	57 %	✓
0 %	Stormwater	0 %	✗
11 %	IEQ	72 %	✓
1 %	Transport	22 %	
5 %	Waste	100 %	
2 %	Urban Ecology	44 %	
6 %	Innovation	70 %	

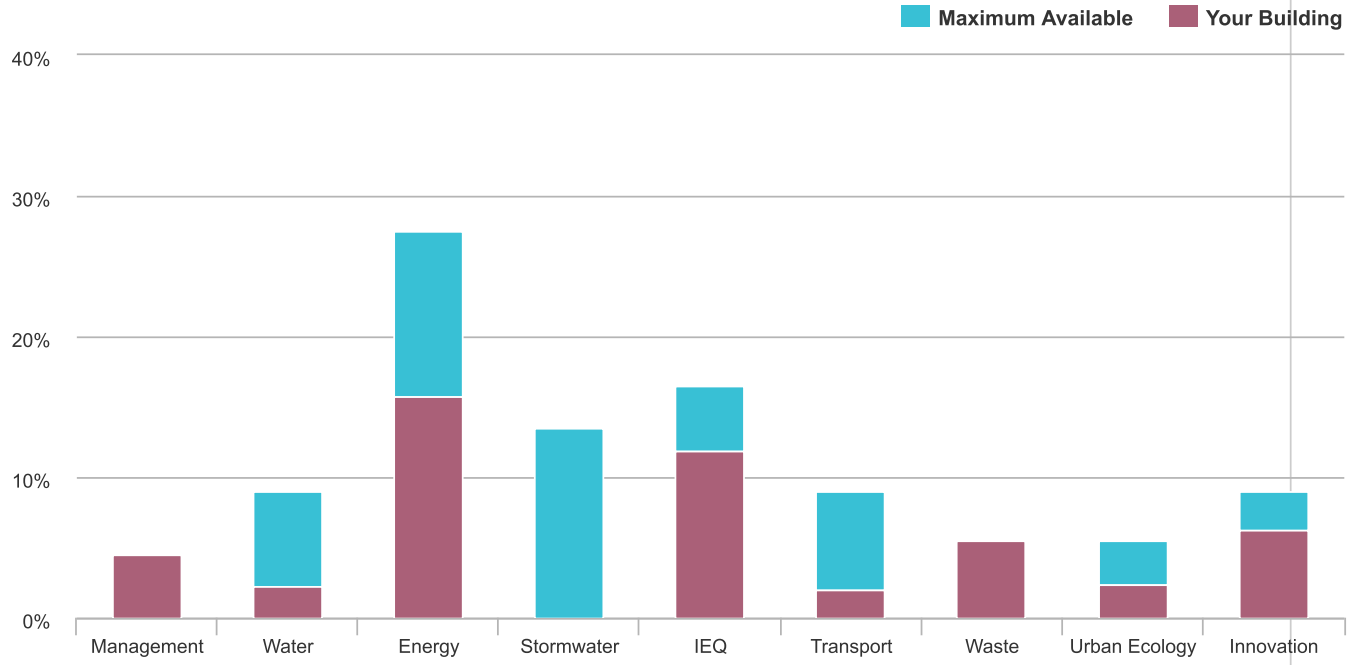
Building Composition



Dwellings

Type	Name	Quantity	Area
Apartment	1 Bed	180	50 m^2
Apartment	2 Bed	330	70 m^2
Apartment	3 Bed	56	95 m^2

How did this Development Perform in each Environmental Category?



Sustainable design commitments by category

The sustainable design commitments for this project are listed below. These are to be incorporated into the design documentation and subsequently implemented.

Management

100% - contributing 4% to overall score

Credit	Disabled	Scoped out	Score
Management 1.1 Pre-Application Meeting			100 %
Management 2.2 Thermal Performance Modelling - Multi-Dwelling Residential			100 %
Management 3.1 Metering			100 %
Management 3.3 Metering			100 %
Management 4.1 Building Users Guide			100 %

Management 1.1 Pre-Application Meeting

100%

Score Contribution	This credit contributes 37% towards this section's score.
Aim	To encourage the involvement of suitably qualified ESD professionals in the project team from the early design stage.

Questions

Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?

Yes

Management 2.2 Thermal Performance Modelling - Multi-Dwelling Residential

100%

Score Contribution	This credit contributes 25% towards this section's score.
Aim	To encourage and recognise developments that have used modelling to inform passive design at the early design stage

Questions

Have preliminary NatHERS ratings been undertaken for all thermally unique dwellings?

Yes

Management 3.1 Metering

100%

Score Contribution	This credit contributes 12% towards this section's score.
Aim	To provide building users with information that allows monitoring of energy and water consumption

Questions

Have utility meters been provided for all individual dwellings?

Yes

Management 3.3 Metering 100%

Score Contribution	This credit contributes 12% towards this section's score.
Aim	To provide building users with information that allows monitoring of energy and water consumption

Questions

Have all major common area services been separately submetered?

Yes

Management 4.1 Building Users Guide 100%

Score Contribution	This credit contributes 12% towards this section's score.
Aim	To encourage and recognise initiatives that will help building users to use the building efficiently

Questions

Will a building users guide be produced and issued to occupants?

Yes

Water 25% - contributing 2% to overall score

Credit	Disabled	Scoped out	Score
Water 3.1 Water Efficient Landscaping			100 %
Water 4.1 Building Systems Water Use Reduction			100 %

Water Approachs

What approach do you want to use Water?	Use the built in calculation tools

Project Water Profile Questions

Do you have a reticulated third pipe or an on-site water recycling system?	No

Are you installing a swimming pool?	Yes
Are you installing a rainwater tank?	No

Water fixtures, fittings and connections

	1 Bed	2 Bed	3 Bed
Showerhead	3 Star WELS (> 6.0 but <= 7.5)	3 Star WELS (> 6.0 but <= 7.5)	3 Star WELS (> 6.0 but <= 7.5)
Bath	Scope out	Scope out	Medium Sized Contemporary Bath
Kitchen Taps	> 5 Star WELS rating	> 5 Star WELS rating	> 5 Star WELS rating
Bathroom Taps	> 5 Star WELS rating	> 5 Star WELS rating	> 5 Star WELS rating
Dishwashers	> 4 Star WELS rating	> 4 Star WELS rating	> 4 Star WELS rating
WC	> 4 Star WELS rating	> 4 Star WELS rating	> 4 Star WELS rating
Urinals	Scope out	Scope out	Scope out
Washing Machine Water Efficiency	Scope out	Scope out	Scope out
Connected to which Tank	-1	-1	-1
Rainwater connected to: Toilets	Yes	Yes	Yes
Rainwater connected to: Laundry (washing machine)	No	No	No
Rainwater connected to: Hot Water System	No	No	No

Water 3.1 Water Efficient Landscaping 100%

Score Contribution	This credit contributes 12% towards this section's score.
Aim	Are water efficiency principles used for landscaped areas? This includes low water use plant selection (e.g. xeriscaping) and specifying water efficient irrigation (e.g. drip irrigation with timers and rain sensors). Note: food producing landscape areas and irrigation areas connected to rainwater or an alternative water source are excluded from this section.

Questions

Will water efficient landscaping be installed?

Yes

Water 4.1 Building Systems Water Use Reduction 100%

Score Contribution	This credit contributes 12% towards this section's score.

Aim	Will the project minimise water use for building systems such as evaporative cooling and fire testing systems?

Questions

Where applicable, have measures been taken to reduce potable water consumption by >80% in the buildings air-conditioning chillers and when testing fire safety systems?

Yes

Energy

57% - contributing 15% to overall score

Credit	Disabled	Scoped out	Score
Energy 1.2 Thermal Performance Rating - Residential			16 %
Energy 2.1 Greenhouse Gas Emissions			100 %
Energy 2.3 Electricity Consumption			100 %
Energy 2.4 Gas Consumption			100 %
Energy 3.1 Carpark Ventilation			100 %
Energy 3.2 Hot Water			100 %
Energy 3.6 Internal Lighting - Residential Multiple Dwellings			100 %

Dwellings Energy Approachs

What approach do you want to use for Energy?	Use the built in calculation tools

Project Energy Profile Questions

Are you installing a solar photovoltaic (PV) system?	Yes
Are you installing any other renewable energy system(s)?	No
Gas Supply	Natural Gas

Dwelling Energy Profiles

	1 Bed	2 Bed	3 Bed
Below the floor is	Another Occupancy	Another Occupancy	Another Occupancy
Above the ceiling is	Another Occupancy	Another Occupancy	Another Occupancy
Exposed sides	1	2	3
NatHERS Annual Energy Loads - Heat MJ/sqm	90.0	90.0	90.0
NatHERS Annual Energy Loads - Cool MJ/sqm	30.0	30.0	30.0
NatHERS star rating	6.5	6.5	6.5

	1 Bed	2 Bed	3 Bed
Type of Heating System	E Reverse cycle ducted	E Reverse cycle ducted	E Reverse cycle ducted
Heating System Efficiency	4 Star	4 Star	4 Star
Type of Cooling System	Refrigerative ducted	Refrigerative ducted	Refrigerative ducted
Cooling System Efficiency	4 Stars	4 Stars	4 Stars
Type of Hot Water System	I Gas Instantaneous 5 star	I Gas Instantaneous 5 star	I Gas Instantaneous 5 star
% Contribution from solar hot water system	%	%	%
Clothes Line	A No drying facilities	A No drying facilities	A No drying facilities
Clothes Dryer	A No clothes dryer	A No clothes dryer	A No clothes dryer

Solar Photovoltaic systems

	PV1
System Size (lesser of inverter and panel capacity) kW peak	28.0
Orientation (which way is the system facing)?	North
Inclination (angle from horizontal) Angle (degrees)	38.0

Energy 1.2 Thermal Performance Rating - Residential 16%

Score Contribution	This credit contributes 28% towards this section's score.
Aim	Reduce reliance on mechanical systems to achieve thermal comfort in summer and winter - improving comfort, reducing greenhouse gas emissions, energy consumption, and maintenance costs.
Criteria	What is the average NatHERS rating?

Questions

NATHERS Rating ? Stars

-

Calculations

Average NATHERS Rating (Weighted) Stars

6.5

Energy 2.1 Greenhouse Gas Emissions 100%

Score Contribution	This credit contributes 9% towards this section's score.
Aim	Reduce the building's greenhouse gas emissions
Criteria	Are greenhouse gas emissions >10% below the benchmark

Questions

Criteria Achieved ?

-

Calculations

Reference Building with Reference Services (BCA only) kg CO2

2432702.8

Proposed Building with Proposed Services (Actual Building) kg CO2

1148565.0

% Reduction in GHG Emissions Percentage %

52 %

Energy 2.3 Electricity Consumption 100%

Score Contribution	This credit contributes 9% towards this section's score.
Aim	Reduce consumption of electricity
Criteria	Is the annual electricity consumption >10% below the benchmark

Questions

Criteria Achieved ?

-

Calculations

Reference kWh

1772164.1

Proposed kWh

811632.3

Improvement Percentage %

54 %

Energy 2.4 Gas Consumption 100%

Score Contribution	This credit contributes 9% towards this section's score.
Aim	Reduce consumption of electricity
Criteria	Is the annual gas consumption >10% below the benchmark?

Questions

Criteria Achieved ?

-

Calculations

Reference MJ

6308736.8

Proposed MJ

3559761.1

Improvement Percentage %

43 %

Energy 3.1 Carpark Ventilation 100%

Score Contribution	This credit contributes 9% towards this section's score.

Questions

If you have a basement carpark, is it either: (a) fully naturally ventilated (no mechanical ventilation system), or (b) use Carbon Monoxide monitoring to control the operation and speed of the ventilation fans

Yes

Energy 3.2 Hot Water 100%

Score Contribution	This credit contributes 4% towards this section's score.
Criteria	Does the hot water system use >10% less energy (gas and electricity) than the reference case?

Questions

Criteria Achieved ?

-

Calculations

Reference MJ

1752426.9

Proposed MJ

991304.7

Improvement Percentage %

43 %

Energy 3.6 Internal Lighting - Residential Multiple Dwellings 100%

Score Contribution	This credit contributes 9% towards this section's score.
Aim	Reduce energy consumption associated with internal lighting

Questions

Is the maximum illumination power density (W/m2) in at least 90% of the relevant Building Class at least 20% lower than required by Table J6.2a of the NCC BCA (2013) Volume 1 Section J (Class 2 to 9) and clause 3.12.5.5 NCC BCA (2013) Volume 2 Section J (Class 1 and 10)

Yes

Stormwater 0% - contributing 0% to overall score

Which stormwater modelling are you using?	Melbourne Water STORM tool

IEQ 72% - contributing 11% to overall score

Credit	Disabled	Scoped out	Score
IEQ 1.1 Daylight Access - Living Areas			100 %
IEQ 1.2 Daylight Access - Bedrooms			100 %
IEQ 1.3 Winter Sunlight			100 %
IEQ 1.5 Daylight Access - Minimal Internal Bedrooms			100 %

IEQ DTSs

Use the BESS Deem to Satisfy (DtS) method for IEQ?	Yes
Are all living areas and bedrooms less than 8m deep (5m if south facing)?	Yes
Do all living areas and bedrooms have a floor-to-ceiling height of at least 2.7m?	Yes
Does all glazing to living areas achieve at least 60% Visible Light Transmittance (VLT)?	Yes
Do all living areas have an external facing window (not into a courtyard, light well or other major obstruction)?	Yes
Does the building(s) comply with the requirements of the building separation tables?	Yes

Dwellings IEQ Approachs

What approach do you want to use for IEQ?	Use the built in calculation tools

IEQ 1.1 Daylight Access - Living Areas 100%

Score Contribution	This credit contributes 27% towards this section's score.
Aim	To provide a high level of amenity and energy efficiency through design for natural light.
Criteria	What % of living areas achieve a daylight factor greater than 1%

Questions

Percentage Achieved ? Percentage %

0 %

IEQ 1.2 Daylight Access - Bedrooms 100%

Score Contribution	This credit contributes 27% towards this section's score.
Aim	To provide a high level of amenity and energy efficiency through design for natural light.
Criteria	What % of bedrooms achieve a daylight factor greater than 0.5%

Questions

Percentage Achieved ? Percentage %

0 %

IEQ 1.3 Winter Sunlight 100%

Score Contribution	This credit contributes 9% towards this section's score.
Aim	To provide a high level of amenity and reduce need for artificial heating in winter.
Criteria	Do 70% of dwellings receive at least 3 hours of direct sunlight in all Living areas between 9am and 3pm in mid-winter?

Questions

Criteria Achieved ?

Yes

IEQ 1.5 Daylight Access - Minimal Internal Bedrooms 100%

Score Contribution	This credit contributes 9% towards this section's score.
Aim	To provide a high level of amenity and energy efficiency through design for natural light and ventilation.

Questions

Do at least 90% of dwellings have an external window in all bedrooms?

Yes

Transport 22% - contributing 1% to overall score

Credit	Disabled	Scoped out	Score
Transport 2.1 Electric Vehicle Infrastructure			100 %

Transport 2.1 Electric Vehicle Infrastructure 100%

Score Contribution	This credit contributes 22% towards this section's score.
Aim	To facilitate the expansion of infrastructure to support electric vehicle charging

Questions

Are facilities are provided for the charging of electric vehicles?

Yes

Waste

100% - contributing 5% to overall score

Credit	Disabled	Scoped out	Score
Waste 1.1 - Construction Waste - Building Re-Use			100 %
Waste 2.1 - Operational Waste - Food & Garden Waste			100 %
Waste 2.2 - Operational Waste - Convenience of Recycling			100 %

Waste 1.1 - Construction Waste - Building Re-Use

100%

Score Contribution	This credit contributes 33% towards this section's score.
Aim	To recognise developments that re-use materials on-site

Questions

If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used?

Yes

Waste 2.1 - Operational Waste - Food & Garden Waste

100%

Score Contribution	This credit contributes 33% towards this section's score.
Aim	To minimise organic waste going to landfill

Questions

Are facilities provided for on-site management of food and garden waste?

Yes

Waste 2.2 - Operational Waste - Convenience of Recycling

100%

Score Contribution	This credit contributes 33% towards this section's score.
Aim	To minimise recyclable material going to landfill

Questions

Are the recycling facilities at least as convenient for occupants as facilities for general waste?

Yes

Urban Ecology

44% - contributing 2% to overall score

Credit	Disabled	Scoped out	Score
Urban Ecology 1.1 Communal Spaces			100 %
Urban Ecology 2.1 Vegetation			25 %
Urban Ecology 2.4 Private Open Space - Balcony / Courtyard Ecology			100 %
Urban Ecology 3.1 Food Production - Residential			100 %

Urban Ecology 1.1 Communal Spaces

100%

Score Contribution	This credit contributes 11% towards this section's score.
Aim	To encourage and recognise initiatives that facilitate interaction between building occupants
Criteria	Is there at least the following amount of common space measured in square meters : * 1m² for each of the first 50 occupants * Additional 0.5m² for each occupant between 51 and 250 * Additional 0.25m² for each occupant above 251

Questions

Common space provided Square Metres

1500.0

Calculations

Minimum Common Space Required Square Metres

386

Urban Ecology 2.1 Vegetation

25%

Score Contribution	This credit contributes 44% towards this section's score.
Aim	To encourage and recognise the use of vegetation and landscaping within and around developments
Criteria	How much of the site is covered with vegetation, expressed as a percentage of the total site area.

Questions

Percentage Achieved ? Percentage %

5 %

Urban Ecology 2.4 Private Open Space - Balcony / Courtyard Ecology 100%

Score Contribution	This credit contributes 11% towards this section's score.
Aim	Encourage plants to be grown on balconies and courtyards

Questions

Is there a tap and floor waste on every balcony / in every courtyard?

Yes

Urban Ecology 3.1 Food Production - Residential 100%

Score Contribution	This credit contributes 11% towards this section's score.
Aim	To encourage the production of fresh food on-site
Criteria	Is there at least 0.25m² of space per resident dedicated to food production?

Questions

Food Production Area Square Metres

500.0

Calculations

Min Food Production Area Square Metres

250

Innovation 70% - contributing 6% to overall score

Credit	Disabled	Scoped out	Score
Innovation 1.1 Innovation			70 %

Innovations

	Sub-Contractor Education	Metering Vaildation	DHW System Microbial Mitigation	Building Air Tightness

Description	Sub-contractor education to be carried out, highlighting the project's sustainability attributes to 80% of staff on-site	Validation of metering network via calibration, testing and commissioning	DHW system designed to manage the risk of microbial contamination	Building air tightness test is carried out in accordance with a recognised industry standard.
Points Targeted	1	1	1	1

	Local Procurement	Zero VOC Paints	Pre and Post Occupancy Survey
Description	Services and skilled labour employed by the project come from the local area surrounding the site.	Over 50% of paint (by cost) to have a TVOC content of <5g/L	Carry out a pre and post occupancy survey
Points Targeted	1	1	1

Innovation 1.1 Innovation 70%

Score Contribution	This credit contributes 100% towards this section's score.
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?

Questions

Criteria Achieved ?

-

Items to be marked on floorplans

0 / 15 floorplans & elevation notes complete.

Management 3.1: Individual utility meters annotated	Incomplete
Management 3.3: Common area submeters annotated	Incomplete
Energy 3.1: Carpark with natural ventilation or CO monitoring system	Incomplete
Water 3.1: Water efficient garden annotated	Incomplete

IEQ 1.1: If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.	Incomplete
IEQ 1.2: If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.	Incomplete
IEQ 1.3: If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.	Incomplete
IEQ 1.5: Floor plans with compliant bedrooms marked	Incomplete
Transport 2.1: Location of electric vehicle charging infrastructure	Incomplete
Waste 2.1: Location of food and garden waste facilities	Incomplete
Waste 2.2: Location of recycling facilities	Incomplete
Urban Ecology 1.1: Size and location of communal spaces	Incomplete
Urban Ecology 2.1: Vegetated areas	Incomplete
Urban Ecology 2.4: Taps and floor waste on balconies / courtyards	Incomplete
Urban Ecology 3.1: Food production areas	Incomplete

Documents and evidence

0 / 8 supporting evidence documentation complete.

Management 2.2: Preliminary NatHERS assessments	Incomplete
Energy 3.1: Provide a written explanation of either the fully natural carpark ventilation or carbon monxide monitoring, describing how these systems will work, what systems are required for them to be fully integrated and who will be responsible for their implementation throughout the design, procurement and operational phases of the building life.	Incomplete
Energy 3.6: Provide a written description of the average lighting power density to be installed in the development and specify the lighting type(s) to be used.	Incomplete
IEQ 1.1: If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.	Incomplete
IEQ 1.2: If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.	Incomplete
IEQ 1.3: If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.	Incomplete
IEQ 1.5: A list of compliant bedrooms	Incomplete
Waste 1.1: Report detailing how the existing building is being reused on-site	Incomplete

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

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