ADP
Consulting : Engineering

Lilydale

Sustainability Management Plan

Prepared for: Hamilton Corporation

Project No: MEL3531
Date: 12 April 2023
Revision: 01

ADP Consulting : Engineering

Creating great environments with great people

Project:	Lilydale
Location:	357 Swansea Road Lilydale, 3140
Prepared by:	ADP Consulting Pty Ltd Level 13/55 Collins Street, Melbourne VIC 3000
Project No:	MEL3531
Revision:	01
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Rev	Date	Comment	Author	Signature	Technical Review	Signature	Authorisa-tion & QA	Signature
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1. Introduction

This report provides an overview of the environmentally sustainable development (ESD) strategy for the proposed multi use development at 357 Swansea Road, Lilydale within the municipal boundaries of the City of Yarra Ranges. The project consists of 50 detached dwellings, which are unregistrable movable dwellings. As well as a communal clubhouse with a community pool and bowling green. Within the clubhouse there is a large dining space, kitchen, lounge, theatre/multi-purpose room, gym and activities room.

The objective of this report is to describe how best practice ESD will be incorporated in the development, including targets and proposed design approaches, and to demonstrate that the development meets or exceeds the standards required by the City of Yarra Ranges Planning Scheme, specifically the requirement to achieve the design potential to a minimum +50% BESS score.

1.1 Site Overview

The site is located at 375 Swansea Road, Lilydale. The proposed development is comprised of four different design types of single story detached dwellings. There is also a clubhouse with communal spaces for residents including a pool, bowling green, gym and other facilities.

Table 1: Site Plan of 375 Swansea Road

1.2 Statutory Context

1.2.1 City of Yarra Ranges

The site is situated within Lilydale in the municipal boundaries of the City of Yarra Ranges. The City of Yarra Ranges has objectives and strategies relating to ESD which are contained in the planning scheme. These policies and objectives have been taken into consideration throughout this assessment and in our advice given to the applicant. These clauses have been considered into the design of the Swansea Road development:

1.2.2 Sustainable Design Assessment in the Planning Process (SDAPP)

The City of Port Phillip adopts the Sustainable Design Assessment in the Planning Process (SDAPP) framework which ensures the consistent inclusion of environmental performance considerations into planning permit approvals. The framework identifies 9 key sustainable design criteria that need to be addressed, as follows:

- Ongoing building and site management
- Water resources
- Energy efficiency
- Stormwater management
- Indoor environment quality (IEQ)
- Transport
- Waste Management
- Urban Ecology
- Innovation

The Built Environment Sustainability Scorecard (BESS) has been utilised to benchmark the environmental performance of the project. The proposal has the preliminary design potential to achieve the following BESS Score:

- 56% - Best Practice

1.3 Summary of ESD Initiatives

Table 2 demonstrates summary of ESD initiatives in the different SDAPP categories including Management, Water, Energy, Stormwater, IEQ, Transport, Waste Management, Urban Ecology and Innovation.

Table 2 : Summary of ESD initiatives

	ESD Initiatives	
Management	> Preliminary thermal modelling of all non-residential areas	> Metering common areas strategy > Building users guide
Water	> Water efficient fittings, fixtures and appliances: > Showers: 4 Stars (>6 but ≤7.5L/min) > Toilets: 4 Stars > Kitchen taps: 4 Stars	> Bathroom taps: 5 Stars > Dishwashers: 4 Stars > Rainwater tanks connected to toilets. > Water efficient landscaping
Energy	> High Performance Fabric and Glazing > Electrification > External lighting is controlled by a motion detector. > High efficiency domestic hot water systems	> High performance LED lighting. > 5kWp PV system supplied to the clubhouse. > Development achieves a maximum illumination power density of 4W/sqm or less.
Stormwater	> Best practice stormwater pollutant reduction	
IEQ	> 60% of regular use areas are effectively naturally ventilated. > Daylight access – Non-Residential	> Low toxicity interior finishes > Thermal comfort by double glazing.
Transport	> Each dwelling will be provided with 1 bicycle space in the garage. > The clubhouse will be provided with 5 bicycle spaces, a 50% increase of planning scheme requirements	> EV charging infrastructure provided to all residential dwellings. > An EV charging point will be provided to the clubhouse
Waste	> Organic compositing facilities are provided on-site	> Recycling facilities are provided on site for occupants.
Urban Ecology	> 376m^2 of communal space within the clubhouse > 57m^2 of vegetation on site	> A minimum of 38 m^2 is allocated to food production for use by the residents > A minimum of 15m^2 of clubhouse area is allocated to food production.

2. ESD Strategy

The following section provides details of the ESD initiatives which have been deemed potentially suitable for the project. These form the overall benchmarking assessment of the building. These initiatives are currently adopted or under consideration; best endeavours will be made to include these in the fully developed design.

2.1 Management

The SDAPP 'Management' category encourages and rewards the adoption of practices and processes that enable and support best practice sustainability outcomes throughout the different phases of a project's design, construction, and its ongoing operation.

Throughout the 'Management' category, SDAPP intends to improve the sustainability performance of a project by influencing areas where decision-making is critical. This category rewards the implementation of processes and strategies that support positive sustainability outcomes during construction. The category also promotes practices that ensure a project will be used to its optimum operational potential.

The 'Management' category rewards projects that achieve the following outcomes:

> Coordinated approaches.
> Commitment to implementation
> Sustainable cultures and behaviours

Table 3: Actions for Building Management

Action	Response-Strategies and Innovation
Thermal Performance Modelling – Non-residential	> Preliminary façade performance calculations in accordance with NCC 2019 Section J Façade Calculator has been done. > Refer to Appendix D for the DTS Section J advice for the Clubhouse.
Metering strategy	> Utility meters provided to all individual dwellings and the clubhouse to be separately sub-metered.
Building Users Guide	> A building user's guide will be developed for use by the occupants and building maintenance.
Total Score	**0.8%**
Maximum Score Available	**4.5%**

2.2 Water

The SDAPP 'Water' category aims to encourage and reward initiatives that reduce the consumption of potable water through measures such as the incorporation of water efficient fixtures and building systems and water re-use.

Reductions in operational water consumption may be achieved through maximisation of water-efficiency within a project, as well as through the utilisation of reclaimed water sources.

The 'Water' category rewards projects that achieve the following outcomes:

> The selection of equipment that is more water efficient than comparable standard practice equivalents.

> The use of water-efficient supplementary equipment;

> The selection of water-efficient toilets taps and showers.

Table 4: Actions to maximise Water Efficiency

Action	Response-Strategies and Innovation
Water Efficient Fixtures and Fittings	> Water efficient fittings, fixtures, and appliances: – Showers: 4 Stars (≥6.0 but ≤7.5 L/min) – Toilets: 4 Stars – Kitchen Taps: 4 Stars – Bathroom Taps: 5 Stars – Dishwashers: 4 Stars
Water Efficient Landscaping	> Drought tolerant planting will be installed in landscaping to reduce potable water usage by irrigation.
Rainwater Collection & Reuse	> Collection from the roofs of a minimum of 8 dwelling to be stored in individual 3,000L water tanks. Each tank will be connected to the dwelling's toilets and irrigation system. > All dwellings will be provided with a third pipe connection installed with the option for future building occupants to install rainwater tank. > Collection from all the roof area from the clubhouse to be gathered in a 7,500L rainwater tank and connected to the clubhouse toilets and irrigation system.
Total Score	**4.5%**
Maximum Score Available	**9.0%**

2.3 Energy

The SDAPP 'Energy' category aims to reward projects that are designed and constructed to reduce their overall operational energy consumption below that of a comparable standard practice building. Such reductions are directly related to reduced greenhouse gas emissions, lower overall energy demand as well as reductions in operating costs for building owners and occupants.

Through the 'Energy' category, SDAPP aims to ensure reductions in greenhouse gas emissions by facilitating efficient energy usage and encouraging the utilisation of energy generated by low-emission sources.

The 'Energy' category rewards projects that achieve the following outcomes:

- The implementation of well-designed systems, aimed at lower operating emissions;
- The selection of high efficiency equipment over less energy efficient alternatives;
- The implementation of well-designed and zoned lighting that is energy efficient and appropriate for a space's use;
- The use of efficient supplementary equipment; and
- The procurement of zero carbon and low carbon energy sources.

Table 5: Actions to Maximise Energy Efficiency

Action	Response-Strategies and Innovation
Building Envelope Non-residential	> 10% improvement from required NCC2019 insulation levels for exposed floor and ceiling R-value ratings. > Wall and glazing performance requirement in line with NCC2019 façade calculator. > Please refer to Appendix D for the DTS Section J advice for the Clubhouse.
Building Envelope – Residential	> All dwellings will be provided with building fabric exceeding the minimum requirement by the Victorian Consolidation Regulations for Residential Tenancies (Caravan and Movable Dwellings Registration and Standards) Regulations 2020 – Schedule 3, Part 2, Section 3. > Wall Insulation will have a minimum total system value of R1.5. > Roof Insulation will have a minimum total system value of R5.0. > Underfloor insulation will have a minimum total system value of R2.0. > Double Glazed Clear windows in standard frames. > For metal framed dwellings, a thermal break such as timber, polystyrene strips, plywood or compressed bulk insulation must be provided. > All sides of doors and windows must be sealed to restrict air infiltration. A range hood and exhaust fan must be provided with a flap that closes when not in use. > To enable cross ventilation, an external window must be of a design other than a top hung awning window. > Please refer to Appendix E for the DTS Section J advice for the Movable Dwellings.
Electrification	> The development is all-electric. Induction cooktops will be installed in development.

Action	Response-Strategies and Innovation
Hot Water	> Individual high-efficiency Electric Heat Pumps will be installed in each dwelling and the clubhouse.
Clothes Drying	> External clotheslines will be installed for laundry use in each dwelling.
External Lighting	> All external lighting will be controlled by motion detectors.
Internal Lighting – Residential Single Dwelling	> Maximum illumination power density of 4 W/m^2 across all individual residential detached dwellings.
Internal Lighting – Non-residential	> Maximum illumination power density (W/m^2) in at least 90% of areas meet the requirements in Table J 6.2a of the NCC 2019 Vol 1.
Renewable Energy Systems	> Installation of a 5kWp Solar PV system for the Clubhouse.
Total Score	**14.9%**
Maximum Score Available	**27.5%**

2.4 Stormwater

The SDAPP 'Stormwater' category aims to ensure projects are responsibly treating stormwater to reduce the amount of polluted stormwater run-off entering local waterways such as; rivers, streams, wetlands and bays. This can be achieved by the following water sensitive urban design strategies (WSUD); rainwater tanks, raingardens, porous paving and landscaping.

To demonstrate compliance, a score of 100% must be achieved using the Stormwater Treatment Objective – Relative Measure (STORM) tool, demonstrating that the following has been achieved:

- Suspended solids – 80% retention of typical urban load
- Total Nitrogen – 45% retention of typical urban load
- Total Phosphorous – 45% retention of typical urban load
- Litter – 70% reduction of typical urban load

Table 6: Actions to achieve WSUD

Action	Response-Strategies and Innovation
Stormwater Treatment	> Stormwater collection from all the non-trafficable roof area of the clubhouse and store in a 7,500L rainwater tank connected to toilets for flushing and landscape irrigation. > Requires the Minimum collection of rainwater from the rooftop of eight dwellings to individual 8 x 3,000L tanks connected to toilets for flushing and landscape irrigation. > All remaining dwellings will be installed with a third pipe connection for the option for future building occupants to install rainwater tank(s). > Further details of the treatment system and how it achieves best practice pollutant reduction targets are detailed in Appendix A.
Total Score	**13.5%**
Maximum Score Available	**13.5%**

2.5 Indoor Environment Quality

The SDAPP 'Indoor Environment Quality' category aims to encourage and reward initiatives that enhance the comfort and well-being of occupants. The credits within this category address issues such as natural daylight, air quality and thermal comfort.

The 'Indoor Environment Quality' category rewards projects that achieve the following outcomes:

> Increased comfort and wellbeing

> Reduced exposure to pollutants

Table 7: Actions to maximise Indoor Environment Quality

Action	Response-Strategies and Innovation
Daylight Access – Non-Residential	> Daylight hand calculations conclude that there is 38% compliance of the nominated floor area which has a daylight factor of at least 2%.
Cross Flow Ventilation	> All habitable rooms are designed to achieve natural cross flow ventilation through the installation of openable windows.
Ventilation – Non-Residential	> 60% of the regular use areas are effectively naturally ventilated.
Thermal Comfort – Double Glazing	> Double glazing is used throughout all habitable areas.
Low Toxicity Interiors	> The following items will be specified with either low VOC content or low formaldehyde content. – Paints, sealants and adhesives – Carpets – Engineered wood products > Limits have been specified in Appendix F
Total Score	**8.8%**
Maximum Score Available	**16.5%**

2.6 Transport

The SDAPP 'Transport' category aims to reward projects that facilitate a reduction of the dependency of occupants on private car use as an important means of reducing overall greenhouse gas emissions. The use of motor vehicles directly contributes to climate change in two ways – through the high amounts of energy required to produce cars and build and maintain supporting road transport infrastructure and services; and the direct emissions that result from car operations.

If reliance on individual motor vehicle transportation is to be reduced, it is necessary to maximise alternative transportation options. Rather than limiting access to private fossil fuel vehicles, the 'Transport' category aims to encourage and reward initiatives that reduce the need for their use. This may include initiatives that encourage the use of public transport options, cycling or walking, and the selection of sites that are close to local amenities.

The 'Transport' category rewards projects that achieve the following outcomes:

> The selection of sites that have readily accessible public transport options;

> The selection of sites within close proximity of a diversity of amenities;

> The facilitation and encouragement of the use of alternative transport options, such as bicycles or electric vehicles.

Table 8: Actions to maximise Sustainable Transport

Action	Response-Strategies and Innovation
Electric Vehicle Charging	> EV infrastructure will be provided to all dwellings. > The clubhouse will have EV charging facilities.
Bicycle Parking	> 50 residential bicycle spaces are provided. 1 bicycle space per residential dwelling, located in the garage. > 5 bicycle spaces are provided to the clubhouse, for visitors and employees, exceeding a 50% increase in planning scheme requirements.
Total Score	**4.5%**
Maximum Score Available	**9%**

2.7 Waste and Materials

The SDAPP 'Materials' category aims to address the consumption of resources within a building construction context, by encouraging the selection of lower-impact materials. The category also encourages absolute reductions in the amount of waste generated or the recycling of as much of the waste generated as possible.

The 'Materials' category rewards projects that achieve the following outcomes:

> Use of products and materials with lower impact.

> Reduction in waste to landfill

Table 9: Actions for Sustainable Material Selection

Action	Response-Strategies and Innovation
Operational Waste - Food & Garden Waste	A compost facility will be provided for on-site management of food and garden waste.
Operational Waste Convenience of Recycling	Recycling facilities will be as accessible as the general waste bins to minimise the recyclable materials entering the general waste stream.
Total Score	**5.5%**
Maximum Score Available	**5.5%**

2.8 Urban Ecology

The SDAPP 'Land Use & Ecology' category aims to reduce the negative impacts on sites' ecological value as a result of urban development and reward projects that minimise harm and enhance the quality of local ecology.

The 'Land Use & Ecology' category rewards projects that achieve the following outcomes:

> Site sustainability.

> Reducing ecological impacts from occupied sites.

Table 10: Actions for Land Use and Ecology

Action	Response-Strategies and Innovation
Communal Spaces	> 376m^2 of communal space across the whole development. These communal spaces are within the clubhouse. Including a theatre and multipurpose room, activity room, communal kitchen and lounge.
Vegetation	> 57 % of the site is covered with vegetation, expressed as a percentage of the total site area.
Food Production – Residential and Non Residential	> A minimum of 55m^2 of area will be dedicated to food production for use by the development.
Total Score	**3.9%**
Maximum Score Available	**5.5%**

Figure 1: Communal spaces within the Clubhouse

2.9 Floorplan and Elevation Notes

Please ensure that the items below are marked on the plans or included in its notes/specification.

- All Common areas are to be separately sub metered.
- All landscaping will be designed to be water efficient.
- All external lighting will be controlled via motion detectors.
- Glazing Specification.
- Electric vehicle infrastructure for dwellings.
- Floor plans to include the following:
  a. Location of external clothesline.
  b. Solar PV System on the clubhouse roof (15 x 350W panels).
  c. Location and size of RWT tanks and raingardens.
  d. Glazing specification
  e. Bicycle parking spaces in the dwellings and clubhouse
  f. Location of EV charging point.
  g. Location of food and garden waste facilities.
  h. Location of recycling facilities.
  i. Food Production Areas.

3. BESS Assessment Summary

BESS provides a framework for benchmarking the ESD achievement of a building design. The tool includes credits under a range of categories which may be used to guide ESD and tally a score which corresponds to the following benchmarks:

> +50% – Best Practice

> +70% – Excellence

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 56 out of 100 (Table 11). This highlights the high commitment to sustainable development in the design of the building.

Table 11: BESS Summary

SDAPP Criteria	Score Achieved
Management	18%
Water	50%
Energy	54%
Stormwater	100%
IEQ	53%
Transport	50%
Waste	100%
Urban Ecology	71%
BESS SCORE	**56%**

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Appendix A – Stormwater Management Plan

Sydney
Level 6, 33 Erskine Street
Sydney NSW 2000
T. 02 8203 5447

Melbourne
Level 13, 55 Collins Street
Melbourne VIC 3000
T. 03 9521 1195

Brisbane
Level 16, 15 Adelaide Street
Brisbane QLD 4000
T. 07 3088 4022

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Background

Melbourne Water's Stormwater Treatment Objective – Relative Measure (STORM) Calculator is a simple analysis method for stormwater treatment and water sensitive urban design (WSUD). It rates the performance of treatment measures such as rainwater tanks, wetlands, and infiltration systems relative to best practice targets, and calculates a weighted average score. A STORM score of 100 or greater indicates that treatment measures are of sufficiently high standard.

In order to demonstrate compliance, a score of 100% must be achieved using the Stormwater Treatment Objective – Relative Measure (STORM) tool, demonstrating that the following has been achieved:

- Suspended solids – 80% retention of typical urban load
- Total Nitrogen – 45% retention of typical urban load
- Total Phosphorous – 45% retention of typical urban load
- Litter – 70% reduction of typical urban load

As design progresses, the site stormwater management strategy will consider flows from the development as well as the streets, driveways and other impervious surfaces. The overall stormwater strategy will be detailed in the civil engineer's WSUD report and will be designed to ensure that council's best practice targets are met.

A provisional STORM rating has been carried out, based on the following WSUD measures:

- Stormwater collection from all the non-trafficable roof area of the clubhouse and store in a 7,500L rainwater tank connected to toilets for flushing and landscape irrigation.
- The minimum collection of rainwater from the rooftop of eight dwellings to individual 8 x 3,000L tanks connected to toilets for flushing and landscape irrigation.
- The minimum collection of rainwater from the rooftops of Type A and C dwellings (4,087m^2) to be treated via a minimum raingarden(s) area of 95m^2 (300mm deep).
- All roads and hardscaping (4,665m^2) onsite will be treated via minimum raingarden(s) area of 100m^2 (300mm deep).
- Collection of rainwater from the remainder of the site will be directed towards the nearest legal point of discharge (LPG) and does not require any additional treatment.

The development achieves a STORM rating of 104% as shown below.

Melbourne Water STORM Rating Report

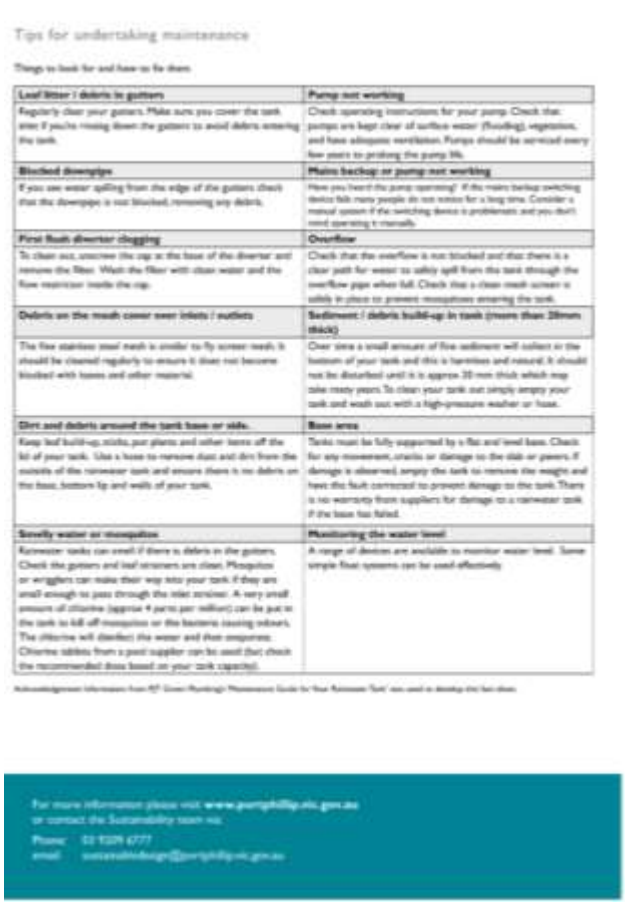
TransactionID:	1558482
Municipality:	YARRA RANGES
Rainfall Station:	YARRA RANGES
Address:	375 Swansea Road,
	Lilydale
	VIC 3140
Assessor:	Zain Siddiqui
Development Type:	Residential - Mixed Use
Allotment Site (m2):	23,850.00
STORM Rating %:	104

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Clubhouse Roof	589.93	Rainwater Tank	7,500.00	10	75.60	94.30
Driveway and Road	4,664.60	Raingarden 300mm	120.00	0	133.00	0.00
Type A Roofs	1,168.00	Raingarden 300mm	25.00	0	131.50	0.00
Type C Roofs	2,919.00	Raingarden 300mm	70.00	0	132.90	0.00
Type D Roofs	2,082.00	None	0.00	0	0.00	0.00
Type A- Roof Tank	292.00	Rainwater Tank	6,000.00	4	80.40	100.00
Type B- Roof Tank	310.00	Rainwater Tank	6,000.00	4	78.30	100.00
Type C- Roof Tank	278.00	Rainwater Tank	6,000.00	4	86.00	99.70
Type D- Roof Tank	320.00	Rainwater Tank	6,000.00	6	90.10	97.00

Stormwater Collection Areas

This section provides the rainwater collection area mark-ups used for STORM calculations. Different colour highlights are used to denote different types of areas:

Maintenance Manual Rainwater Tank



Tips for undertaking maintenance

Things to look for and how to fix them

Leaf litter / debris in gutters	**Pump not working**
Regularly clear your gutters. Make sure you cover the tank inlet if you're rinsing down the gutters to avoid debris entering the tank.	Check operating instructions for your pump. Check that pumps are kept clear of surface water (flooding), vegetation, and have adequate ventilation. Pumps should be serviced every few years to prolong the pump life.
Blocked downpipe	**Mains backup or pump not working**
If you see water spilling from the edge of the gutters check that the downpipe is not blocked, removing any debris.	Have you heard the pump operating? If the mains backup switching device fails many people do not notice for a long time. Consider a manual system if the switching device is problematic and you don't need operating it manually.
First flush diverter clogging	**Overflow**
To clean out, unscrew the cap at the base of the diverter and remove the filter. Wash the filter with clean water and the flow restrictor inside the cap.	Check that the overflow is not blocked and that there is a clear path for water to safely spill from the tank through the overflow pipe when full. Check that a clean mesh screen is safely in place to prevent mosquitoes entering the tank.
Debris on the mesh cover over inlets / outlets	**Sediment / debris build-up in tank (more than 20mm thick)**
The fine stainless steel mesh is similar to fly screen mesh. It should be cleaned regularly to ensure it does not become blocked with leaves and other material.	Over time a small amount of fine sediment will collect in the bottom of your tank and this is harmless and natural. It should not be disturbed until it is approx 20 mm thick which may take many years. To clean your tank out simply empty your tank and wash out with a high-pressure washer or hose.
Dirt and debris around the tank base or side.	**Base area**
Keep leaf build-up, sticks, pot plants and other items off the lid of your tank. Use a hose to remove dust and dirt from the outside of the rainwater tank and ensure there is no debris on the base, bottom lip and walls of your tank.	Tanks must be fully supported by a flat and level base. Check for any movement, cracks or damage to the slab or pavers. If damage is observed, empty the tank to remove the weight and have the fault corrected to prevent damage to the tank. There is no warranty from suppliers for damage to a rainwater tank if the base has failed.
Smelly water or mosquitos	**Monitoring the water level**
Rainwater tanks can smell if there is debris in the gutters. Check the gutters and leaf strainers are clean. Mosquitos or wrigglers can make their way into your tank if they are small enough to pass through the inlet strainer. A very small amount of chlorine (approx 4 parts per million) can be put in the tank to kill off mosquitos or the bacteria causing odours. The chlorine will disinfect the water and then evaporate. Chlorine tablets from a pool supplier can be used (but check the recommended dose based on your tank capacity).	A range of devices are available to monitor water level. Some simple float systems can be used effectively.

Acknowledgement: Information from NT Green Plumbing's 'Maintenance Guide for Your Rainwater Tank' was used to develop this fact sheet.

For more information please visit **www.portphillip.vic.gov.au**
or contact the Sustainability team via:
Phone: 03 9209 6777
email: sustainabledesign@portphillip.vic.gov.au

Maintenance manual

Rainwater tanks

Site address: _____

Planning permit number: _____

Rainwater tank maintenance

This manual lists the key tasks required to maintain a domestic rainwater tank and the recommended frequency of each task. This manual can be submitted with planning permit applications for developments that include the installation of a domestic rainwater tank. Once endorsed, the property owner is responsible for continuous implementation of rainwater tank maintenance, in accordance with the guidance in this manual.

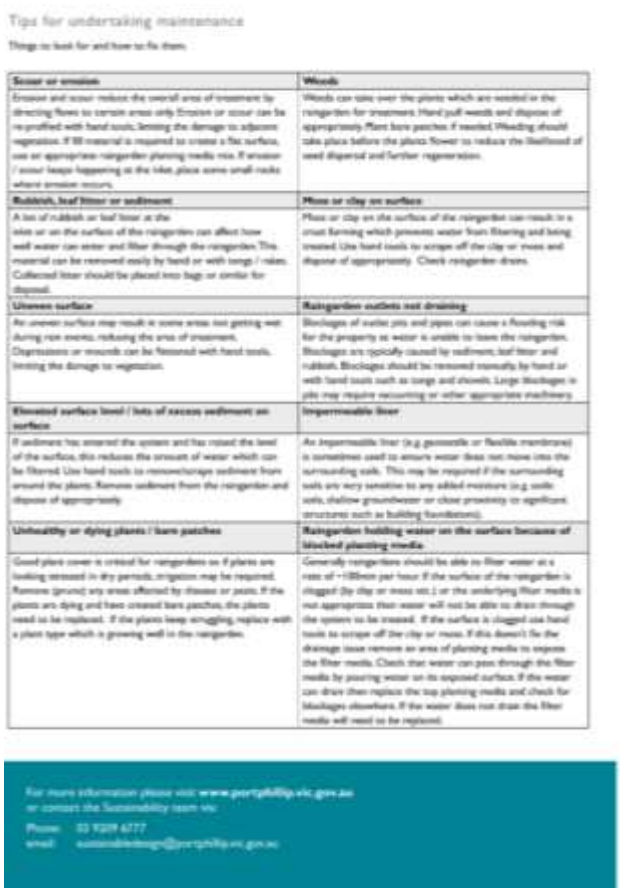
Rainwater tanks are an exceptional tool for environmental protection. They collect and store roofwater for use inside and outside the home. This simultaneously reduces the demand on our precious potable mains water and limits the amount of stormwater pollutants that enter our sensitive Bay.

Maintenance of rainwater tanks is relatively easy however it is important to do the following key tasks to ensure the quality of water is high:

- stop leaf litter and debris entering the tank.
- prevent bird droppings and dust building up in the gutters.
- prevent mosquitos and other animals entering the tank.

Tank connected to	toilet only ☐ toilet & irrigation ☐ toilet & laundry & irrigation ☐ toilet & laundry & hot water & irrigation ☐
Rainwater tank location	
Planning drawing number showing rainwater tank location	
Rainwater tank construction date	
Date of final building inspection	
Tank volume (litres)	
Area or percentage of the roof that is connected to the tank via gutters and downpipes	

Maintenance Manual Rainwater Tank



Tips for undertaking maintenance

Things to look for and how to fix them

Scour or erosion	**Weeds**
Erosion and scour reduce the overall area of treatment by directing flows to certain areas only. Erosion or scour can be re-profiled with hand tools, limiting the damage to adjacent vegetation. If fill material is required to create a flat surface, use an appropriate raingarden planting media mix. If erosion / scour keeps happening at the inlet, place some small rocks where erosion occurs.	Weeds can take over the plants which are needed in the raingarden for treatment. Hand pull weeds and dispose of appropriately. Plant bare patches if needed. Weeding should take place before the plants flower to reduce the likelihood of seed dispersal and further regeneration.
Rubbish, leaf litter or sediment	**Moss or clay on surface**
A lot of rubbish or leaf litter at the inlet or on the surface of the raingarden can affect how well water can enter and filter through the raingarden. This material can be removed easily by hand or with tongs / rakes. Collected litter should be placed into bags or similar for disposal.	Moss or clay on the surface of the raingarden can result in a crust forming which prevents water from filtering and being treated. Use hand tools to scrape off the clay or moss and dispose of appropriately. Check raingarden drains.
Uneven surface	**Raingarden outlets not draining**
An uneven surface may result in some areas not getting wet during rain events, reducing the area of treatment. Depressions or mounds can be flattened with hand tools, limiting the damage to vegetation.	Blockages of outlet pits and pipes can cause a flooding risk for the property as water is unable to leave the raingarden. Blockages are typically caused by sediment, leaf litter and rubbish. Blockages should be removed manually by hand or with hand tools such as tongs and shovels. Large blockages or pits may require vacuuming or other appropriate machinery.
Elevated surface level / lots of excess sediment on surface	**Impermeable liner**
If sediment has entered the system and has raised the level of the surface, this reduces the amount of water which can be filtered. Use hand tools to remove/scrape sediment from around the plants. Remove sediment from the raingarden and dispose of appropriately.	An impermeable liner (e.g. geotextile or flexible membrane) is sometimes used to ensure water does not move into the surrounding soils. This may be required if the surrounding soils are very sensitive to any added moisture (e.g. soils soils, shallow groundwater or close proximity to significant structures such as building foundations).
Unhealthy or dying plants / bare patches	**Raingarden holding water on the surface because of blocked planting media**
Good plant cover is critical for raingardens so if plants are looking stressed in dry periods, irrigation may be required. Remove (prune) any areas affected by disease or pests. If the plants are dying and have entered bare patches, the plants need to be replaced. If the plants keep struggling, replace with a plant type which is growing well in the raingarden.	Generally raingardens should be able to filter water at a rate of ~180mm per hour. If the surface of the raingarden is clogged (by clay or moss etc.) or the underlying filter media is not appropriate then water will not be able to drain through the system to be treated. If the surface is clogged use hand tools to scrape off the clay or moss. If this doesn't fix the drainage issue remove an area of planting media to expose the filter media. Check that water can pass through the filter media by pouring water on its exposed surface. If the water can drain then replace the top planting media and check for blockages elsewhere. If the water does not drain the filter media will need to be replaced.

For more information please visit **www.portphillip.vic.gov.au**
or contact the Sustainability team via:
Phone: 03 9209 6777
email: sustainabledesign@portphillip.vic.gov.au

Maintenance manual

Raingardens

Site address: _____

Planning permit number: _____

Raingarden maintenance

This manual lists the key tasks required to maintain a domestic raingarden and the recommended frequency of each task. This manual can be submitted with planning permit applications for developments that include the installation of a domestic raingarden. Once endorsed, the property owner is responsible for continuous implementation of raingarden maintenance, in accordance with the guidance in this manual.

A raingarden is a specially designed garden that uses plants and soil to remove the pollutants from stormwater runoff that is generated from roofs, driveways and paths following rainfall events. These natural treatment systems help protect the environment by reducing the amount of stormwater runoff and pollutants that enter the Bay.

Maintenance of raingardens is essential in order to ensure that they:

- effectively treat stormwater,
- continue to look good, and
- don't cause local flooding.

Raingarden location	
Planning drawing number showing raingarden location	
Raingarden construction date	
Date of final building inspection	
Area of raingarden (m²)	
Area of catchment (m²) (e.g. roof and/or paving) directed to the raingarden	

Appendix B – Daylight Hand Calculation

Introduction

Daylight assessments were undertaken utilizing the GBCA Green Star Daylight Hand Calculation Guide.

This review has been based on the architectural drawings by Mondo Architects dated 16.12.22 revision 8.

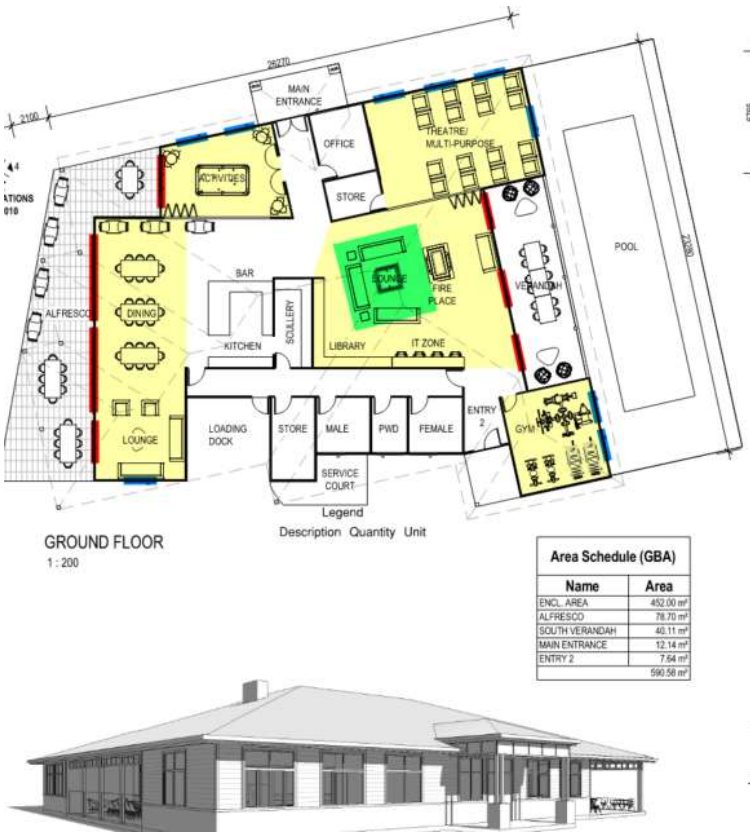
General Information

Table 12 summarises the daylight assessment that provide the compliant area.

Table 12 Daylight Assessment

Nominated (Primary Area) highlighted in yellow	278.7m^2

Window Description	Height	Above Desktop level	Total Width	Zone of Compliance
Tall Windows	2.7	2	21.1	42.2
Short Windows	1.8	1.8	16.2	29.1
Skylight (1.5m x 1.5m)	na	na	na	20.25
Percentage of Complaint Area	33%	**Total Area of Compliance**		91.6m^2



Appendix C – BESS Report

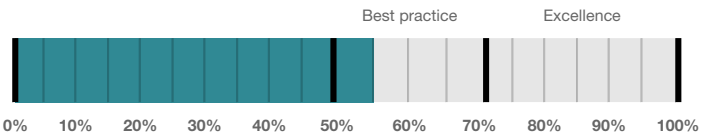
BESS Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at 375 Swansea Rd Lilydale Victoria 3140. 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 Yarra Ranges Shire Council.

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

Your BESS Score

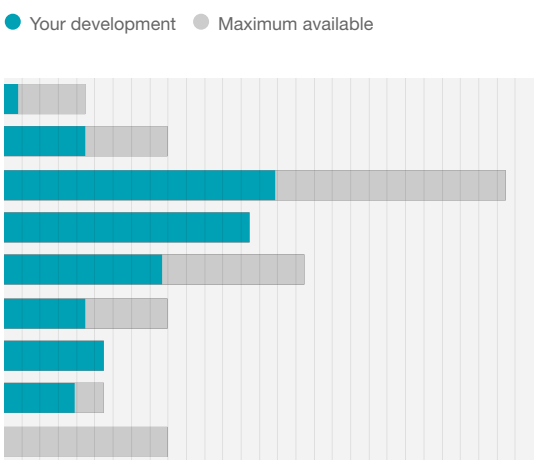


56%

Project details

Address	375 Swansea Rd Lilydale Victoria 3140
Project no	0FA17B52-R1
BESS Version	BESS-7
Site type	Mixed use development
Account	sustainabilityteam@adpconsulting.com.au
Application no.	
Site area	8,184.00 m²
Building floor area	7,958.00 m²
Date	05 April 2023
Software version	1.7.1-B.396

Performance by category



Category	Weight	Score	Pass
Management	5%	18%	
Water	9%	50%	✓
Energy	28%	54%	✓
Stormwater	14%	100%	✓
IEQ	17%	53%	✓
Transport	9%	50%	
Waste	6%	100%	
Urban Ecology	6%	71%	
Innovation	9%	0%	

Buildings

Name	Height	Footprint	% of total footprint
Club House	1	591 m²	7%
Type A - Solaris 146	1	1,460 m²	18%
Type B - Solaris 155	1	310 m²	3%
Type C - Iron Bark	1	1,668 m²	20%
Type C - Charlise	1	1,529 m²	19%
Type D - Shamrock	1	2,400 m²	30%

Dwellings & Non Res Spaces

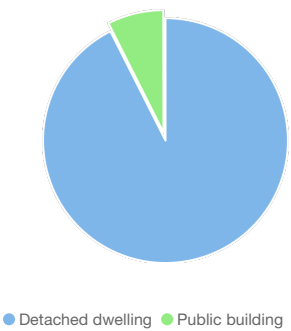
Dwellings

Name	Quantity	Area	Building	% of total area
Detached dwelling				
Shamrock	15	160 m²	Type D - Shamrock	30%
Iron Bark	12	139 m²	Type C - Iron Bark	20%
Charlise	11	139 m²	Type C - Charlise	19%
Solaris 146	10	146 m²	Type A - Solaris 146	18%
Solaris 155	2	155 m²	Type B - Solaris 155	3%
Total	**50**	**7,367 m²**	**92%**	

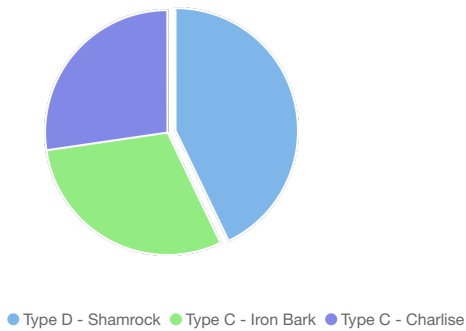
Non-Res Spaces

Name	Quantity	Area	Building	% of total area
Public building				
Club House	1	591 m²	Club House	7%
Total	**1**	**591 m²**	**7%**	

Building Type composition



Building composition



Supporting information

Floorplans & elevation notes

Credit	Requirement	Response	Status
Management 3.3	Common area submeters annotated		-
Water 3.1	Water efficient garden annotated		-
Energy 3.3	External lighting sensors annotated		-
Energy 3.4	Clothes line annotated (if proposed)		-
Energy 4.2	Floor plans showing location of photovoltaic panels as described.		-
Stormwater 1.1	Location of any stormwater management systems used in STORM or MUSIC modelling (e.g. Rainwater tanks, raingarden, buffer strips)		-
IEQ 2.2	Dwellings meeting the requirements for having 'natural cross flow ventilation'		-
IEQ 3.1	Glazing specification to be annotated		-
Transport 1.1	All nominated residential bicycle parking spaces		-
Transport 1.4	All nominated non-residential bicycle parking spaces		-
Transport 1.5	All nominated non-residential visitor bicycle parking spaces		-
Transport 2.1	Location of electric vehicle charging infrastructure		-
Waste 2.1	Location of food and garden waste facilities		-
Waste 2.2	Location of recycling facilities		-
Urban Ecology 1.1	Size and location of communal spaces		-
Urban Ecology 2.1	Vegetated areas		-
Urban Ecology 3.1	Food production areas		-
Urban Ecology 3.2	Food production areas		-

Supporting evidence

Credit	Requirement	Response	Status
Management 2.3a	Section J glazing assessment		-
Energy 1.1	Energy Report showing calculations of reference case and proposed buildings		-
Energy 3.5	Provide a written description of the average lighting power density to be installed in the development and specify the lighting type(s) to be used.		-
Energy 3.7	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.		-
Energy 4.2	Specifications of the solar photovoltaic system(s).		-
Stormwater 1.1	STORM report or MUSIC model		-
IEQ 1.4	A short report detailing assumptions used and results achieved.		-
IEQ 2.2	A list of dwellings with natural cross flow ventilation		-
IEQ 3.1	Reference to floor plans or energy modelling showing the glazing specification (U-value and Solar Heat Gain Coefficient, SHGC)		-

Credit summary

Management Overall contribution 4.5%

	18%
1.1 Pre-Application Meeting	0%
2.1 Thermal Performance Modelling - Single Dwelling	0%
2.3 Thermal Performance Modelling - Non-Residential	50%
3.2 Metering - Non-Residential	N/A Scoped Out
	the non-commercial section shall be under 1 tenant.
3.3 Metering - Common Areas	100%
4.1 Building Users Guide	100%

Water Overall contribution 9.0%

	Minimum required 50%	50% ✔ Pass
1.1 Potable water use reduction		40%
3.1 Water Efficient Landscaping		100%
4.1 Building Systems Water Use Reduction		N/A Scoped Out
		Areas assessed are too small to require fire safety testing systems.

Energy Overall contribution 27.5%

	Minimum required 50%	54%	Pass

1.1 Thermal Performance Rating - Non-Residential	12%	
1.2 Thermal Performance Rating - Residential	50%	
2.1 Greenhouse Gas Emissions	0%	
2.2 Peak Demand	0%	
2.3 Electricity Consumption	100%	
2.4 Gas Consumption	N/A	Scoped Out
	No gas connection in use	
2.5 Wood Consumption	N/A	Scoped Out
	No wood heating system present	
2.6 Electrification	100%	
3.1 Carpark Ventilation	N/A	Scoped Out
	No enclosed carpark on site.	
3.2 Hot Water	100%	
3.3 External Lighting	100%	
3.4 Clothes Drying	100%	
3.5 Internal Lighting - Residential Single Dwelling	100%	
3.7 Internal Lighting - Non-Residential	100%	
4.1 Combined Heat and Power (cogeneration / trigeneration)	N/A	Scoped Out
	No cogeneration or trigeneration system in use.	
4.2 Renewable Energy Systems - Solar	100%	
4.4 Renewable Energy Systems - Other	0%	Disabled
	No other (non-solar PV) renewable energy is in use.	
4.5 Solar PV - Houses and Townhouses	0%	

Stormwater Overall contribution 13.5%

	Minimum required 100%	100%	Pass

1.1 Stormwater Treatment	100%	

IEQ Overall contribution 16.5%

	Minimum required 50%	53%	Pass
1.4 Daylight Access - Non-Residential		33%	✔ Achieved
2.2 Cross Flow Ventilation		100%	
2.3 Ventilation - Non-Residential		33%	✔ Achieved
3.1 Thermal comfort - Double Glazing		100%	
3.2 Thermal Comfort - External Shading		0%	
3.3 Thermal Comfort - Orientation		0%	
3.4 Thermal comfort - Shading - Non-residential		0%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%	
4.1 Air Quality - Non-Residential		100%	

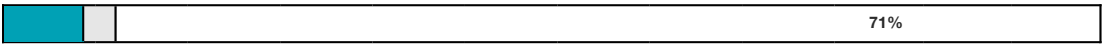
Transport Overall contribution 9.0%

	50%
1.1 Bicycle Parking - Residential	100%
1.4 Bicycle Parking - Non-Residential	100%
1.5 Bicycle Parking - Non-Residential Visitor	100%
1.6 End of Trip Facilities - Non-Residential	0%
2.1 Electric Vehicle Infrastructure	100%
2.2 Car Share Scheme	0%
2.3 Motorbikes / Mopeds	0%

Waste Overall contribution 5.5%

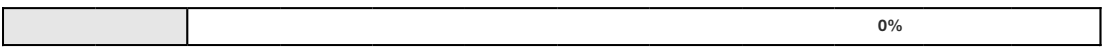
	100%	
1.1 - Construction Waste - Building Re-Use	N/A	✧ Scoped Out
	The site has no previous development.	
2.1 - Operational Waste - Food & Garden Waste	100%	
2.2 - Operational Waste - Convenience of Recycling	100%	

Urban Ecology **Overall contribution 5.5%**



1.1 Communal Spaces	100%
2.1 Vegetation	100%
2.2 Green Roofs	0%
2.3 Green Walls and Facades	0%
3.1 Food Production - Residential	100%
3.2 Food Production - Non-Residential	100%

Innovation **Overall contribution 9.0%**



1.1 Innovation	0%

Credit breakdown

Management Overall contribution 1%

1.1 Pre-Application Meeting		0%
Score Contribution	This credit contributes 49.4% towards the category score.	
Criteria	Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?	
Question	Criteria Achieved ?	
Project	No	
2.1 Thermal Performance Modelling - Single Dwelling		0%
Score Contribution	This credit contributes 30.5% towards the category score.	
Criteria	Has a preliminary NatHERS rating been undertaken?	
Annotation	We will be specifying the roof and wall insulations better than those stated in the Victorian Consolidated Regulations - Schedule 3 - Design, Construction and installation of unregistrable movable dwellings and annexes - Part 2.3.	
Question	Criteria Achieved ?	
Detached dwelling	No	
2.3 Thermal Performance Modelling - Non-Residential		50%
Score Contribution	This credit contributes 2.4% towards the category score.	
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2019 Section J1.5?	
Question	Criteria Achieved ?	
Public building	Yes	
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2019 Section J (Energy Efficiency), NABERS or Green Star?	
Question	Criteria Achieved ?	
Public building	No	
3.2 Metering - Non-Residential		N/A ◈ Scoped Out
This credit was scoped out	the non-commercial section shall be under 1 tenant.	
3.3 Metering - Common Areas		100%
Score Contribution	This credit contributes 1.2% towards the category score.	
Criteria	Have all major common area services been separately submetered?	
Question	Criteria Achieved ?	
Public building	Yes	

4.1 Building Users Guide	100%
Score Contribution	This credit contributes 16.5% towards the category score.
Criteria	Will a building users guide be produced and issued to occupants?
Question	Criteria Achieved ?
Project	Yes

Water Overall contribution 4% Minimum required 50%

Water Approach	
What approach do you want to use for Water?:	Use the built in calculation tools
Project Water Profile Question	
Do you have a reticulated third pipe or an on-site water recycling system?:	Yes
Are you installing a swimming pool?:	Yes
Are you installing a rainwater tank?:	Yes
Reticulated third pipe or an on-site water recycling system	
Recycled Profile Name:	Third pipe
Irrigation area connected to reticulated third pipe or an on-site water recycling system only (i.e. not also connected to rainwater system):	-
Water Efficient Garden?:	-
Other external water demand connected to reticulated third pipe or an on-site water recycling system only (i.e. not also connected to rainwater system):	-
Water fixtures, fittings and connections	
Building:	
Solaris 146	Type A - Solaris 146
Solaris 155	Type B - Solaris 155
Iron Bark	Type C - Iron Bark
Charlise	Type C - Charlise
Club House	Club House
Shamrock	Type D - Shamrock
Showerhead:	
Solaris 146 Solaris 155 Iron Bark Charlise Shamrock	4 Star WELS (>= 6.0 but <= 7.5)
Club House	Scope out
Bath: All	Scope out
Kitchen Taps:	
Solaris 146 Solaris 155 Iron Bark Charlise Shamrock	>= 4 Star WELS rating
Club House	>= 5 Star WELS rating
Bathroom Taps: All	>= 5 Star WELS rating
Dishwashers: All	>= 4 Star WELS rating
WC: All	>= 4 Star WELS rating
Urinals: All	Scope out

Washing Machine Water Efficiency:	
Solaris 146 Solaris 155 Iron Bark Charlise Shamrock	Occupant to Install
Club House	Scope out

Which non-potable water source is the dwelling/space connected to?:	
Solaris 146 Club House	RWT-clubhouse
Solaris 155	RWT Tank - Solaris 155
Iron Bark	RWT Tank - Iron Bark
Charlise	RWT Tank - Charlise
Shamrock	RWT Tank - Shamrock

Non-potable water source connected to Toilets: All	Yes
Non-potable water source connected to Laundry (washing machine): All	No
Non-potable water source connected to Hot Water System: All	No

Rainwater Tanks

What is the total roof area connected to the rainwater tank?:	
RWT-clubhouse	580 m^2
RWT Tank - Solaris 146	292 m^2
RWT Tank - Solaris 155	310 m^2
RWT Tank - Iron Bark	278 m^2
RWT Tank - Charlise	278 m^2
RWT Tank - Shamrock	320 m^2

Tank Size:	
RWT-clubhouse	7,500 Litres
RWT Tank - Solaris 146	6,000 Litres
RWT Tank - Solaris 155	6,000 Litres
RWT Tank - Iron Bark	6,000 Litres
RWT Tank - Charlise	6,000 Litres
RWT Tank - Shamrock	6,000 Litres

Will this tank be connected to the reticulated third pipe or onsite water recycling system?:	
RWT-clubhouse	-
RWT Tank - Solaris 146	-
RWT Tank - Solaris 155	-
RWT Tank - Iron Bark	-
RWT Tank - Charlise	-
RWT Tank - Shamrock	-

Irrigation area connected to tank:	
RWT-clubhouse	300 m²
RWT Tank - Solaris 146	208 m²
RWT Tank - Solaris 155	310 m²
RWT Tank - Iron Bark	278 m²
RWT Tank - Charlise	278 m²
RWT Tank - Shamrock	320 m²
Is connected irrigation area a water efficient garden?:	
RWT-clubhouse	Yes
RWT Tank - Solaris 146	Yes
RWT Tank - Solaris 155	Yes
RWT Tank - Iron Bark	Yes
RWT Tank - Charlise	Yes
RWT Tank - Shamrock	Yes
Other external water demand connected to tank?:	
RWT-clubhouse	-
RWT Tank - Solaris 146	-
RWT Tank - Solaris 155	-
RWT Tank - Iron Bark	-
RWT Tank - Charlise	-
RWT Tank - Shamrock	-

1.1 Potable water use reduction	40%
Score Contribution	This credit contributes 83.3% towards the category score.
Criteria	What is the reduction in total potable water use due to efficient fixtures, appliances, rainwater use and recycled water use? To achieve points in this credit there must be >25% potable water reduction.
Output	Reference
Project	10750 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	8950 kL
Output	Proposed (including rainwater and recycled water use)
Project	7652 kL
Output	% Reduction in Potable Water Consumption
Project	28 %
Output	% of connected demand met by rainwater
Project	64 %
Output	How often does the tank overflow?
Project	Very Often
Output	Opportunity for additional rainwater connection
Project	3563 kL

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

4.1 Building Systems Water Use Reduction		N/A	Scoped Out
This credit was scoped out	Areas assessed are too small to require fire safety testing systems.		

Energy Overall contribution 15% Minimum required 50%

Use the BESS Deem to Satisfy (DtS) method for Energy?:	Yes
Do all exposed floors and ceilings (forming part of the envelope) demonstrate a minimum 10% improvement in required NCC2019 insulation levels (total R-value upwards and downwards)?:	Yes
Does all wall and glazing demonstrate meeting the required NCC2019 facade calculator (or better than the total allowance)?:	Yes
Are heating and cooling systems within one Star of the most efficient equivalent capacity unit available, or Coefficient of Performance (CoP) & Energy Efficiency Ratios (EER) not less than 85% of the CoP & EER of the most efficient equivalent capacity unit available?:	Yes
Are water heating systems within one star of the best available, or 85% or better than the most efficient equivalent capacity unit?:	Yes
Dwellings Energy Approach	
What approach do you want to use for Energy?:	Provide our own calculations
Non-Residential Building Energy Profile	
Heating, Cooling & Comfort Ventilation - Electricity Reference fabric & services:	-
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and reference services:	-
Heating, Cooling & Comfort Ventilation - Electricity Proposed fabric & services:	-
Heating - Wood - reference fabric and services:	-
Heating - Wood - proposed fabric and reference services:	-
Heating - Wood - proposed fabric and services:	-
Hot Water - Electricity - Reference:	-
Hot Water - Electricity - Proposed:	-
Lighting - Reference:	-
Lighting - Proposed:	-
Peak Thermal Cooling Load - Reference:	-
Peak Thermal Cooling Load - Proposed:	-
Solar Photovoltaic system	
System Size (lesser of inverter and panel capacity): Solar System (5kW)	5.0 kW peak
Orientation (which way is the system facing)?: Solar System (5kW)	West
Inclination (angle from horizontal): Solar System (5kW)	3.0 Angle (degrees)
Which Building Class does this apply to?: Solar System (5kW)	Public building

1.1 Thermal Performance Rating - Non-Residential	12%
Score Contribution	This credit contributes 3.0% towards the category score.
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC 2019 Section J)?
Question	Criteria Achieved ?
Public building	Yes

1.2 Thermal Performance Rating - Residential	50%
Score Contribution	This credit contributes 27.8% towards the category score.
Criteria	What is the average NatHERS rating?
Annotation	Provided minimum rating for compliance in the energy section. > All dwellings will be provided with building fabric exceeding the minimum requirement by the Victorian Consolidation Regulations for Residential Tenancies (Caravan and Movable Dwellings Registration and Standards) Regulations 2020 – Schedule 3, Part 2, Section 3.
Question	NATHERS Rating ?
Detached dwelling	7.0 Stars

2.1 Greenhouse Gas Emissions	0%
Score Contribution	This credit contributes 10.0% towards the category score.
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?
Question	Criteria Achieved ?
Detached dwelling	No
Public building	No

2.2 Peak Demand	0%
Score Contribution	This credit contributes 5.0% towards the category score.
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?
Question	Criteria Achieved ?
Detached dwelling	No
Public building	No

2.3 Electricity Consumption	100%
Score Contribution	This credit contributes 10.0% towards the category score.
Criteria	What is the % reduction in annual electricity consumption against the benchmark?
Annotation	Provided minimum rating for compliance in the energy section. > All dwellings will be provided with building fabric exceeding the minimum requirement by the Victorian Consolidation Regulations for Residential Tenancies (Caravan and Movable Dwellings Registration and Standards) Regulations 2020 – Schedule 3, Part 2, Section 3.
Question	Criteria Achieved ?
Detached dwelling	Yes
Public building	Yes

2.4 Gas Consumption	N/A ✣ Scoped Out
This credit was scoped out	No gas connection in use

2.5 Wood Consumption		N/A	Scoped Out
This credit was scoped out	No wood heating system present		
2.6 Electrification		100%	
Score Contribution	This credit contributes 10.0% towards the category score.		
Criteria	Is the development all-electric?		
Annotation	Electric Heat Pump Hot Water Systems and Induction Cooktops will be installed in the development.		
Question	Criteria Achieved?		
Project	Yes		
3.1 Carpark Ventilation		N/A	Scoped Out
This credit was scoped out	No enclosed carpark on site.		
3.2 Hot Water		100%	
Score Contribution	This credit contributes 5.0% towards the category score.		
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?		
Annotation	Electric Heat Pump Hot Water Systems will be installed in the development.		
Question	Criteria Achieved ?		
Detached dwelling	Yes		
Public building	Yes		
3.3 External Lighting		100%	
Score Contribution	This credit contributes 4.6% towards the category score.		
Criteria	Is the external lighting controlled by a motion detector?		
Question	Criteria Achieved ?		
Detached dwelling	Yes		
3.4 Clothes Drying		100%	
Score Contribution	This credit contributes 4.6% towards the category score.		
Criteria	What is the % reduction in annual energy consumption (gas and electricity) from a combination of clothes lines and efficient driers against the benchmark?		
Annotation	External clothes lines will be provided to each dwelling.		
Question	Criteria Achieved ?		
Detached dwelling	Yes		
3.5 Internal Lighting - Residential Single Dwelling		100%	
Score Contribution	This credit contributes 4.6% towards the category score.		
Criteria	Does the development achieve a maximum illumination power density of 4W/sqm or less?		
Question	Criteria Achieved?		
Detached dwelling	Yes		

3.7 Internal Lighting - Non-Residential		100%	
Score Contribution	This credit contributes 0.7% towards the category score.		
Criteria	Does the maximum illumination power density (W/m2) in at least 90% of the area of the relevant building class meet the requirements in Table J6.2a of the NCC 2019 Vol 1?		
Question	Criteria Achieved ?		
Public building	Yes		
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A	Scoped Out
This credit was scoped out	No cogeneration or trigeneration system in use.		
4.2 Renewable Energy Systems - Solar		100%	
Score Contribution	This credit contributes 0.4% towards the category score.		
Criteria	What % of the estimated energy consumption of the building class it supplies does the solar power system provide?		
4.4 Renewable Energy Systems - Other		0%	Disabled
This credit is disabled	No other (non-solar PV) renewable energy is in use.		
4.5 Solar PV - Houses and Townhouses		0%	
Score Contribution	This credit contributes 9.3% towards the category score.		
Criteria	What % of the estimated energy consumption of the building class it supplies does the solar power system provide?		
Question	Criteria Achieved ?		
Public building	Yes		

Stormwater

Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using?:	Melbourne Water STORM tool	
1.1 Stormwater Treatment		100%
Score Contribution	This credit contributes 100.0% towards the category score.	
Criteria	Has best practice stormwater management been demonstrated?	
Question	STORM score achieved	
Project	104	
Output	Min STORM Score	
Project	100	

IEQ Overall contribution 9% Minimum required 50%

1.4 Daylight Access - Non-Residential	33%	✔ Achieved
Score Contribution	This credit contributes 7.6% towards the category score.	
Criteria	What % of the nominated floor area has at least 2% daylight factor?	
Question	Percentage Achieved?	
Public building	33 %	
2.2 Cross Flow Ventilation	100%	
Score Contribution	This credit contributes 15.7% towards the category score.	
Criteria	Are all habitable rooms designed to achieve natural cross flow ventilation?	
Question	Criteria Achieved ?	
Detached dwelling	Yes	
2.3 Ventilation - Non-Residential	33%	✔ Achieved
Score Contribution	This credit contributes 7.6% towards the category score.	
Criteria	What % of the regular use areas are effectively naturally ventilated?	
Question	Percentage Achieved?	
Public building	60 %	
Criteria	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2:2012?	
Question	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668:2012?	
Public building	0 %	
Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?	
Question	Value	
Public building	-	
3.1 Thermal comfort - Double Glazing	100%	
Score Contribution	This credit contributes 31.4% towards the category score.	
Criteria	Is double glazing (or better) used to all habitable areas?	
Question	Criteria Achieved ?	
Detached dwelling	Yes	
3.2 Thermal Comfort - External Shading	0%	
Score Contribution	This credit contributes 15.7% towards the category score.	
Criteria	Is appropriate external shading provided to east, west and north facing glazing?	
Question	Criteria Achieved ?	
Detached dwelling	No	

3.3 Thermal Comfort - Orientation	0%
Score Contribution	This credit contributes 15.7% towards the category score.
Criteria	Are at least 50% of living areas orientated to the north?
Question	Criteria Achieved ?
Detached dwelling	No

3.4 Thermal comfort - Shading - Non-residential	0%
Score Contribution	This credit contributes 3.8% towards the category score.
Criteria	What percentage of east, north and west glazing to regular use areas is effectively shaded?
Question	Percentage Achieved?
Public building	30 %

3.5 Thermal Comfort - Ceiling Fans - Non-Residential	0%
Score Contribution	This credit contributes 1.3% towards the category score.
Criteria	What percentage of regular use areas in tenancies have ceiling fans?
Question	Percentage Achieved?
Public building	0 %

4.1 Air Quality - Non-Residential	100%
Score Contribution	This credit contributes 1.3% towards the category score.
Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Public building	Yes

Criteria	Does all carpet meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Public building	Yes

Criteria	Does all engineered wood meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Public building	No engineered wood

Transport Overall contribution 5%

1.1 Bicycle Parking - Residential	100%
Score Contribution	This credit contributes 14.9% towards the category score.
Criteria	How many secure and undercover bicycle spaces are there per dwelling for residents?
Question	Bicycle Spaces Provided ?
Detached dwelling	50
Output	Min Bicycle Spaces Required
Detached dwelling	50

1.4 Bicycle Parking - Non-Residential	100%
Score Contribution	This credit contributes 2.4% towards the category score.
Criteria	Have the planning scheme requirements for employee bicycle parking been exceeded by at least 50% (or a minimum of 2 where there is no planning scheme requirement)?
Question	Criteria Achieved ?
Public building	Yes
Question	Bicycle Spaces Provided ?
Public building	2

1.5 Bicycle Parking - Non-Residential Visitor	100%
Score Contribution	This credit contributes 1.2% towards the category score.
Criteria	Have the planning scheme requirements for visitor bicycle parking been exceeded by at least 50% (or a minimum of 1 where there is no planning scheme requirement)?
Question	Criteria Achieved ?
Public building	Yes
Question	Bicycle Spaces Provided ?
Public building	3

1.6 End of Trip Facilities - Non-Residential	0%
Score Contribution	This credit contributes 1.2% towards the category score.
Criteria	Where adequate bicycle parking has been provided. Is there also: * 1 shower for the first 5 employee bicycle spaces plus 1 to each 10 employee bicycles spaces thereafter, * changing facilities adjacent to showers, and * one secure locker per employee bicycle space in the vicinity of the changing / shower facilities?
Question	Number of showers provided ?
Public building	-
Question	Number of lockers provided ?
Public building	-
Output	Min Showers Required
Public building	1
Output	Min Lockers Required
Public building	2

2.1 Electric Vehicle Infrastructure	100%
Score Contribution	This credit contributes 32.1% towards the category score.
Criteria	Are facilities provided for the charging of electric vehicles?
Question	Criteria Achieved ?
Project	Yes

2.2 Car Share Scheme	0%
Score Contribution	This credit contributes 16.1% towards the category score.
Criteria	Has a formal car sharing scheme been integrated into the development?
Question	Criteria Achieved ?
Project	No

2.3 Motorbikes / Mopeds	0%
Score Contribution	This credit contributes 32.1% towards the category score.
Criteria	Are a minimum of 5% of vehicle parking spaces designed and labelled for motorbikes (must be at least 5 motorbike spaces)?
Question	Criteria Achieved ?
Project	No

Waste Overall contribution 6%

1.1 - Construction Waste - Building Re-Use	N/A Scoped Out
This credit was scoped out	The site has no previous development.

2.1 - Operational Waste - Food & Garden Waste	100%
Score Contribution	This credit contributes 50.0% towards the category score.
Criteria	Are facilities provided for on-site management of food and garden waste?
Question	Criteria Achieved ?
Project	Yes

2.2 - Operational Waste - Convenience of Recycling	100%
Score Contribution	This credit contributes 50.0% towards the category score.
Criteria	Are the recycling facilities at least as convenient for occupants as facilities for general waste?
Question	Criteria Achieved ?
Project	Yes

Urban Ecology Overall contribution 4%

1.1 Communal Spaces	100%
Score Contribution	This credit contributes 1.0% towards the category score.
Criteria	Is there at least the following amount of common space measured in square meters : * 1m² for each of the first 50 occupants * Additional 0.5m² for each occupant between 51 and 250 * Additional 0.25m² for each occupant above 251?
Question	Common space provided
Public building	376 m²
Output	Minimum Common Space Required
Public building	54 m²

2.1 Vegetation	100%
Score Contribution	This credit contributes 56.5% towards the category score.
Criteria	How much of the site is covered with vegetation, expressed as a percentage of the total site area?
Question	Percentage Achieved ?
Project	57 %

2.2 Green Roofs	0%
Score Contribution	This credit contributes 14.1% towards the category score.
Criteria	Does the development incorporate a green roof?
Question	Criteria Achieved ?
Project	No

2.3 Green Walls and Facades	0%
Score Contribution	This credit contributes 14.1% towards the category score.
Criteria	Does the development incorporate a green wall or green façade?
Question	Criteria Achieved ?
Project	No

3.1 Food Production - Residential	100%
Score Contribution	This credit contributes 13.1% towards the category score.
Criteria	What area of space per resident is dedicated to food production?
Question	Food Production Area
Detached dwelling	38.0 m²
Output	Min Food Production Area
Detached dwelling	38 m²

3.2 Food Production - Non-Residential	100%
Score Contribution	This credit contributes 1.0% towards the category score.
Criteria	What area of space per occupant is dedicated to food production?
Question	Food Production Area
Public building	15.0 m²
Output	Min Food Production Area
Public building	15 m²

Innovation

Overall contribution 0%

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

Disclaimer

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Appendix D – Preliminary Section J1 advice Non- Residential

Introduction

The following advice note has been prepared to outline the NCC 2019 Section J Part J1 compliance requirements for the subject project at 375 Swansea Road, VIC 3140.

This preliminary review has been based on the architectural drawings by Mondo Architects dated 16.12.22 revision 8.

Section J Part J1 Requirements

General Information

Table 12 summarises general project's information that form the basis of this advice.

Table 13 General project information

Building Class	Class 9b
Climate Zone	6
Applicable NCC version	NCC 2019
Assessment pathway	Deemed-to-Satisfy

Opaque Components

Table 13 lists the thermal performance parameters that must be achieved for the opaque components forming part of the building thermal envelope.

Table 14 Opaque components' performance requirements

Component	R_T (m^2.K/W)	Solar Absorptance	Comments
Roofs / ceilings	3.2	≤ 0.45	Refer to Apendix A for the roof insulation markup. Detailed roof schedule and built up is required to calculate the added insulation.
Walls	1.4	≤ 0.6	Refer to Apendix A for the wall insulation markup. Detailed wall schedule and built up is required to calculate the added insulation.
Floor on ground	2	N/A	No added insulation is required to slab on ground. Contact from soil provides sufficient R-value. Assuming a 200mm slab and a wall thickness of 150mm.

Total R-values stated in table 13 must also take into consideration thermal bridging (generally in accordance with AS/NZ4859.2).

Translucent Components

Table 14 lists the thermal performance parameters that must be achieve for the translucent components forming part of the building thermal envelope.

Table 15 Translucent components' performance requirements

Component	U_w (W/m^2.K)	$SHGC_w$
Glazing – Fixed	≤ 3.6	≤ 0.42
Glazing – Sliding	≤ 3.8	≤ 0.34
Glazing – Hinged Door	≤ 4.1	≤ 0.36
Skylight	≤ 3.9	≤ 0.45

U- Value and SHGC are stated for the total system (glass + frame). These values are typical of a double-glazed Grey glazing in standard aluminium frames.

Section J Part J1 & J3 Report

This advice note is not a statement of compliance and cannot be used to obtain a Building Permit. Rather, it provides relevant stakeholders information relating to the performance targets that must be achieved by the building thermal envelope to ensure compliance with Section J Part J1 & J3 can be met.

A Section J Part J1 & J3 Report will be developed based on 'For Building Permit' or 'For Construction' documentation which as a minimum must include:

- Site Plan
- Floor Plans
- Elevations
- Sections
- Wall Type Schedule and Wall Set-out Plan
- Windows and Doors Schedule

Appendix A

Figure 2 : Thermal envelop markup

Appendix B

NCC 2019 Wall-Glazing Calculator v3.0 (Open-source)

Wall and glazing energy efficiency in Class 2-9 buildings - Method 2 of Specification J1.5a, NCC 2019

Building name and description	Classification	Climate Zone
375 Swansea Road - Clubhouse	Other	6

Calculated Area-Weighted U-Value	1.91	Calculated Representative Air-Conditioning Energy Value	61.7
Allowable Area-Weighted U-Value	2.00	Allowable Representative Air-Conditioning Energy Value	72.4
Building total U-Value allowance met	96%	Building total SHGC allowance met	86%
Check Values: Visible	Wall Element Requirements: Met	Display Glazing Element Requirements	-

Use of this calculator does not guarantee compliance with the NCC. The disclaimer and a version update check are available at the bottom of the page.

	Element Description				U-Value		SHGC and Shading				
ID	Description (optional)	Element Type	Facing Sector	Area (m^2)	U-Value	U-Value Element share of allowance used	SHGC	Glazing Height (m)	Shading Height (m)	Shading Projection (m)	SHGC Element share of allowance used
1	North	Wall	North	38.57	1.00	6% of building total					Not counted
2	East	Wall	East	58.99	1.00	9% of building total					Not counted
3	South	Wall	South	61.57	1.00	9% of building total					Not counted
4	West	Wall	West	75.06	1.00	11% of building total					Not counted
5	FIXED North	Glazing	North	8.94	3.60	5% of building total	0.42	0.6	3	2	12% of building total
6	FIXED East	Glazing	East	6.31	3.60	3% of building total	0.42	0.6	3	0.59	7% of building total
7	FIXED South	Glazing	South	7.02	3.60	4% of building total	0.42	0.6	3	2.4	4% of building total
8	FIXED West	Glazing	West	15.40	3.60	8% of building total	0.42	0.6	3	1.3	17% of building total
9	SLIDING North	Glazing	North	31.28	3.80	18% of building total	0.34	2.1	3	2	29% of building total
10	SLIDING East	Glazing	East	12.62	3.80	7% of building total	0.34	1.2	3	0.59	11% of building total
11	SLIDING South (tall)	Glazing	South	13.23	3.80	8% of building total	0.34	2.1	3	4	5% of building total
12	SLIDING South (small	Glazing	South	6.48	3.80	4% of building total	0.34	1.2	3	0.58	4% of building total
13	SLIDING West	Glazing	West	7.54	3.80	4% of building total	0.34	1.2	3	1.3	7% of building total
14	HINGED East	Glazing	East	3.63	4.10	2% of building total	0.36	2.1	3	2.36	2% of building total
15	HINGED West	Glazing	West	3.38	4.10	2% of building total	0.36	2.1	3	3.58	2% of building total

Figure 2: NCC 2019 Glazing Calculator for Swansea Road

Appendix E – Movable Buildings energy advice - Residential

Introduction

The following advice note has been prepared to outline the energy compliance requirements for the subject project at 375 Swansea Road, VIC 3140 as per the Victorian Consolidation Regulations for Residential Tenancies (Caravan and Movable Dwellings Registration and Standards) Regulations 2020 – Schedule 3, Part 2, Section 3.

This preliminary review has been based on the architectural drawings by Mondo Architects dated 16.12.22 revision 8.

Section J Part J1 Requirements

General Information

Table 15 summarises general project's information that form the basis of this advice.

Table 16 General project information

Building Class	Movable Dwellings
Climate Zone	6

Components

The following thermal performance parameters that must be achieved for building components forming part of the building thermal envelope.

- Wall Insulation will have a minimum total system value of R1.5.
- Roof Insulation will have a minimum total system value of R5.0.
- Underfloor insulation will have a minimum total system value of R2.0.
- Double Glazed Clear windows in standard frames.
- For metal framed dwellings, a thermal break such as timber, polystyrene strips, plywood or compressed bulk insulation must be provided.
- All sides of doors and windows must be sealed to restrict air infiltration. A range hood and exhaust fan must be provided with a flap that closes when not in use.
- To enable cross ventilation, an external window must be of a design other than a top hung awning window.

Total R-values stated must also take into consideration thermal bridging (generally in accordance with AS/NZ4859.2).

Appendix F – VOC & Formaldehyde Limits

Paints, Sealants and Adhesives

Product Certification

The product is certified under a recognised Product Certification Scheme. The current list of recognised schemes is shown on the GBCA website: http://new.gbca.org.au/product-certification-schemes/.

The certificate must be current at the time of project registration or submission and list the relevant product name and model.

Laboratory Testing

TVOC limits for paints, adhesives or sealants are detailed in the table below. Most adhesives and sealants are addressed in the 'General purpose adhesives and sealants' category of the table, unless they clearly belong in the other specialised product categories.

Table 17: Maximum TVOC Limits for Paints, Adhesives and Sealants

Product Category	**Max TVOC content of ready to use product (g/L)**
General purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	15
Trim, varnishes and wood stains	75
Primers, sealers and prep coats	65
One and two pack performance coatings for floors	140
Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100

Carpets

There are two methods for demonstrating that a carpet complies with this criterion. A combination of methods can be used to demonstrate compliance:

> Product certification, or;

> Laboratory testing

Product Certification

The product is certified under a recognised Product Certification Scheme (listed on the GBCA website http://new.gbca.org.au/product-certification-schemes/) or other recognised standards.

The certificate must be current at the time of project registration or submission and list the relevant product name and model.

Laboratory Testing

The product must comply with the Total VOC (TVOC) limits for a selected compliance option, specified in the table below.

Table 18: TVOC Limits – Laboratory Testing

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

*Both limits should be met when testing against ASTM D5116

Engineered Wood Products

There are two methods for demonstrating than an engineered wood product complies:

> Product certification

> Laboratory testing

A combination of methods can be used to demonstrate compliance. Engineered wood products include particleboard, plywood, Medium Density Fibreboard (MDF), Laminated Veneer Lumber (LVL), High-Pressure Laminate (HPL), Compact Laminate and decorative overlaid wood panels. Timber veneers are excluded. Where only part of a product is composed of an engineered wood product, the limits apply only to that portion of the product, not the entire item.

The following applications of engineered wood products are excluded from this credit:

> Formwork;

> Car park applications; and

> Non-engineered wood products such as milled timber.

Product Certification

The product is certified under a recognised Product Certification Scheme. The current list of recognised schemes is shown on the GBCA website http://new.gbca.org.au/product-certification-schemes/.

The certificate must be current at the time of project registration or submission and list the relevant product name and model.

Laboratory Testing

All engineered wood products used in the building must meet the relevant limits specified in Table 19 as per the specified test protocol, or have product specific evidence that it contains no formaldehyde.

Table 19: Limits by Test Protocol

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

*mg/m^{2}hr may also be represented as mg/m^2/hr.

**The test report must confirm that the conditions of Table 15 comply for the particular wood product type, the final results must be presented in EN 717-1 equivalent (as presented in the table) using the correlation ratio of 0.98.

***The final results must be presented in EN 717-1 equivalent (as presented in the table), using the correlation ratio of 0.98.

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