

Sustainability Management Plan

**98 Marshalltown Road,
Grovedale**

04th June 2026

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**Melbourne
Sustainability
Consultants.**

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Document History

Version	Date	Status	Author	Approved
0	3/06/2026	First Issue	YL	DM
1	04/06/2026	Updated report as per client's comments	YL	DM

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Introduction & Council’s Requirements

Melbourne Sustainability Consultants has been commissioned to provide guidance on achieving environmentally Sustainable Development outcomes for the proposed childcare development located at 98 Marshalltown Road, Grovedale.

The assessment is being carried out in compliance with Greater Geelong City Council's sustainability requirements specifically addressing Planning Policy Clause 15.01-2L *Environmentally Sustainable Development*.

Clause 15.01-2L of the policy outlines the key categories that the City of Greater Geelong has identified as crucial to be addressed in the assessment. These categories include Energy Performance, Water Resources, Stormwater Management, Indoor Environment Quality, Construction, Building & Waste Management, Building Materials, Transport, and Urban Ecology.

Stormwater quality management and its impact on the environment have been acknowledged by the City of Greater Geelong. As per the requirements of Clause 53.18 *Stormwater Management in Urban Development*, this report presents a solution to address the quality aspect of stormwater management.

Site & Proposed Development Description

The 2,628m² site is located at 98 Marshalltown Road, Grovedale within Greater Geelong local authority. The site currently contains residential housing as shown in the image below:



Figure 1: Site location and surroundings sourced from Google Maps.

The proposal development is a single storey childcare development with total 25 car spaces.

ESD Assessment Tools

BESS

BESS has been built and is maintained by local governments and is the only dedicated tool in Victoria for assessing sustainable design at the planning permit stage.

BESS evaluates the energy and water efficiency, thermal comfort, and overall environmental sustainability performance of new buildings or modifications. It was created to ensure that new development adheres to sustainability requirements as part of a planning permit application.

A BESS assessment has been conducted for the proposed development, providing a benchmark for the level of sustainability achieved by the project in line with the SDAPP 10 Key Sustainable Building Categories.

Each target area within the BESS tool typically receives a score ranging from 1% to 100%. To meet the energy, water, stormwater, and IEQ requirements, a minimum score of 50% is necessary. An overall project score of 50% represents 'Best Practice,' while a score above 70% represents 'Excellence.'

BLUE FACTOR

The BLUE FACTOR calculator is a tool developed by The Department of Energy, Environment and Climate Action (DEECA) and Microburst Software to assist with the design and assessment of stormwater management systems. The calculator enables users to determine the effectiveness of stormwater treatment measures in removing pollutants from stormwater runoff, thereby protecting waterways and aquatic ecosystems. Blue Factor is the successor to STORM and can already be used to replace it as an accepted tool.

The BLUE FACTOR assessment can be found in Appendix 1 of this report.

Summary of Initiatives

Initiatives listed below should be reflected on TP drawings either graphically on the plan (e.g. bike spaces, RWT etc.) or with a clear note. All WSUD initiatives listed in Appendix 1 should be clearly noted on drawings including all areas diverting to the proposed treatment (e.g. RWT, raingarden etc.) – Refer to Appendix 1.

Category	Requirement
Management	80% of all construction and demolition waste to be diverted from landfill
	Separate utility meter for the development
Water Efficiency	Minimum WELS rating of fittings and fixtures: 4 Star Toilets / 5 Star Taps / 4 Star (6.0-7.5 L/min) Showerhead / 5 Star Dishwasher
	Tanks with total effective capacity of 10,000L collecting water from the roof- Water to be used for toilet flushing
Energy Efficiency	NCC 2022 section J commitment to meet requirement with 10% increase on minimum floor and ceiling insulation
	Illumination power densities to meet NCC 2022 section J7D3 requirements
	Electric System chosen within one star of the best available product in the range at the time of purchase or 15% most efficient available products if no star rating is available
	HVAC system chosen within one star of the best available product in the range at the time of purchase or 15% most efficient available products if no star rating is available
	Min. 5kW Solar PV on development
Stormwater	5m ² of Raingarden to treat 250m ² of driveway
IEQ	All paint, adhesives, sealants and flooring to be low VOC – refer to Appendix 2 for limits
	Mechanical ventilation to provide fresh air rates 50% higher than minimum from AS1668 in children room or to maintain CO2 level below 800ppm
	All engineered wood will be low formaldehyde with E0 or better certification
	Glazing with VLT targeting 40% VLT or more
Transport	Total four bike spaces for staff and visitors
	EV charging infrastructure provision (capacity, conduit) for future EV charger (Level 2 – 32A 7Kw)
Waste	3-bin system (Rubbish, Recycling, FOGO) + Provision of space for future glass waste
Urban Ecology	Part of the site is covered with vegetation
Materials	Timber framing if used to be certified PEFC, AFS or FSC – No rainforest timber to be used
	Steel to be sourced from steel maker with ISO 14001 facility a member of the World Steel Association's (WSA) Climate Action Program (CAP).
	Carpet and underlay with third-party sustainable certification (GECA, Carpet institute ECS etc.)

1. Construction and Building Management

Effective construction and building management practices are crucial for sustainable development. By minimizing construction waste and effectively monitoring building performance, these practices can significantly reduce the environmental impact of the development and enhance its long-term sustainability.

Initiative	Description	Reference
Metering and Monitoring	Separate utility meters (water and electricity) will be provided for the development.	BESS Man 3.2
Construction Waste Management	On-site staff will receive a construction waste management plan during a site orientation session to minimise on-site waste generation and ensure proper disposal. A minimum of 80% of all construction and demolition waste created on-site will be reused or recycled.	N/A
Construction Environmental Management	The builder will identify environmental risks associated with construction and implement management strategies such as effective erosion and sediment control measures throughout construction and operation. They will also ensure that earthworks are staged appropriately to avoid bare earthworks in high-risk areas of the site during periods of dominant rainfall.	Clause 53.18

2. Water Resources

Maximising water efficiency in developments helps conserve water resources, reduces the strain on local water systems, and lower water bills for homeowners, making it an environmentally responsible and economically beneficial choice for developers. Additionally, implementing water-efficient practices and technologies can also contribute to a more sustainable and resilient community.

Initiative	Description	Reference
Fixtures and Fittings	The development will be provided with efficient fittings and fixtures. This will all be for a reduction of potable water use onsite. The following minimum Water Efficiency Labelling Scheme (WELS) star rating will be specified: • 4-Star Toilets • 5-Star Taps (Kitchen and bathrooms) • 4-Star (6.0-7.5 L/min) Showerheads All appliances provided as part of the based building will be chosen within one WELS star of the best available: • 5-Star Dishwasher	BESS Wat 1.1
Rainwater Collection and use	The roof of the development will have rainwater runoff collected and stored in tanks with total effective capacity of 10,000L. Additional charged pipe systems or multiple tanks may be installed to collect water if necessary. If a charged pipe system is used, it will not be placed underneath the building's slab. Rainwater collected will be utilised for toilet flushing, significantly reducing the development's stormwater impact and aiding in compliance with the BLUE FACTOR calculator (refer to Appendix 1).	BESS Wat 1.1 BESS Storm 1.1

3. Energy Efficiency

Maximizing energy efficiency in developments reduces greenhouse gas emissions and lowers utility costs for homeowners, making it an environmentally responsible and economically beneficial choice for developers. In addition, energy-efficient buildings are often more comfortable and healthier to live in, improving the quality of life for occupants.

Initiative	Description	Reference
NCC Section J Commitment	A section J (NCC 2022) DTS assessment will occur for the development (prior to construction) with the following commitments: • 10% improvement on NCC 2022 floor and ceiling insulation levels (Total R-Value); • Wall insulation and glazing system within NCC 2022 DTS requirements • Heating/cooling system to be chosen within one star of the best available product in the range at the time of purchase or COP/EER chosen within the best 15% of available products if no star rating is available; and • Water heating system to be chosen within one star of the best available product in the range at the time of purchase or the 15% most efficient available products if no star rating is available. Alternatively, an NCC JV3 modelling will be undertaken prior to construction. The JV3 modelling will demonstrate compliance with building fabric requirement when compared to an 'improved reference building' that will include the 10% improvement on NCC 2022 DTS floor and ceiling insulation levels. The JV3 approach described above would produce a lower score under BESS Energy 1.1 than the DTS approach however the BESS assessment submitted would maintain BESS compliance with the slightly decreased score.	BESS Ene 1.2 BESS Ene 2.1 BESS Ene 2.3
Hot water System	An electric instantaneous or storage system will be installed for the development. The system will be chosen within one star of the best available whichever is greater. System efficiency should be chosen within the 15% most efficient available products if no star rating is available.	BESS Ene 3.2

Initiative	Description	Reference
HVAC System	Heating and cooling will be provided with VRF, split or packaged unit. HVAC unit will be chosen within one star of the best available in a similar range at the time of purchase or will be chosen with COP/EER within 15% of the best available product if no star rating is available.	BESS Ene 2.3
All Electric Development	The development will be all-electric and will not have a gas connection. This will align the development with Councils and state targets for net zero and reduction of fossil fuel usage.	BESS Ene 2.6
Internal Lighting	LED lighting will be implemented throughout the development resulting in lower energy consumption for artificial lighting. The development will commit to meet the maximum illumination power densities from NCC 2022 part J7D3. Additionally, the utilisation of light internal colours will enhance daylight penetration, leading to a decreased reliance on artificial lighting.	BESS Ene 3.7
External Lighting	LED lighting will be implemented for all external lighting.	BESS Ene 3.7
Solar PV System	The development will have a 5kW solar photovoltaic system installed on its roof to generate renewable energy. This measure will reduce energy consumption for the development.	BESS Ene 4.5

4. Stormwater Quality Management

WSUD (Water Sensitive Urban Design) is crucial for developments because it helps manage stormwater runoff, reduces flooding risks, and improves water quality by using natural systems to filter and treat water. Additionally, WSUD can enhance the aesthetic value of a development by incorporating green infrastructure and providing green spaces for occupants to enjoy.

Initiative	Description	Reference
Rainwater Collection and use	The roof of the development will have rainwater runoff collected and stored in tanks with total effective capacity of 10,000L. Additional charged pipe systems or multiple tanks may be installed to collect water if necessary. If a charged pipe system is used, it will not be placed underneath the building's slab. Rainwater collected will be utilised for toilet flushing, significantly reducing the development's stormwater impact and aiding in compliance with the BLUE FACTOR calculator (refer to Appendix 1).	BESS Wat 1.1 BESS Storm 1.1
Raingarden	Part of the driveway/car park will have rainwater runoff channelled towards a 5m² raingarden. The raingarden location will be confirmed by the civil engineer once engaged however it should be away from footings or boundary to avoid flooding issues (minimum 300mm). Implementation of raingarden will actively treat stormwater pollution and help towards achieving compliance with WSUD requirements as described in Appendix 1.	BESS Storm 1.1

5. Indoor Environment Quality

IEQ (Indoor Environmental Quality) is essential for development because it affects the health, comfort, and well-being of occupants by addressing factors such as air quality, temperature, lighting, and noise levels. Providing a high-quality indoor environment can also increase the value and desirability of a development, leading to higher occupancy rates and property values.

Initiative	Description	Reference
Daylight Access Children's rooms	Light internal colours will be used for the development which will result in better internal reflection of natural light, enhancing the penetration of daylight through windows or other openings. Large windows will be installed in children's rooms which will increase natural light access. Windows will be provided on multiple façades wherever possible and room depth will be limited to improve daylight access even further. The development has achieved best practice requirement as demonstrated in the daylight hand calculation prepared in Appendix 4.	BESS IEQ 1.4
Shading	All west and east facing glazing in child rooms are provided horizontal projection above. This is typically not the most appropriate type of shading however it is not possible install external adjustable shading or vertical shading for child rooms as this would be a hazard for children moving in and out of the room. For this reason, these improved horizontal projections are deemed appropriate. Based on all shading types proposed on each façade in the development, we have input 100% under IEQ 3.4 in BESS.	BESS IEQ 3.4
Mechanical Ventilation	Mechanical ventilation will be provided to all child rooms to provide fresh air with a minimum 50% improvement of minimum rates from AS1668. Alternatively, mechanical ventilation will be provided to maintain CO2 levels below 800ppm.	BESS IEQ 2.3
Low VOC and Low Formaldehyde	All paints, adhesives and sealants and flooring should not exceed the limits outlined in Appendix 3. Alternatively, products will be selected with no VOCs.	BESS IEQ 4.1

Initiative	Description	Reference
	All engineered wood products will have 'low' formaldehyde emissions, certified as E0 or better or with no formaldehyde. Providers such as Polytec and Laminex Australia offer E0 or better products in their range.	

6. Sustainable Transport

Sustainable transport such as cycling and public transport is essential for residential developments as it reduces the environmental impact of commuting while improving air quality and decreasing traffic congestion. Additionally, it promotes healthy lifestyles by encouraging physical activity and reducing sedentary behaviours associated with car dependence.

Initiative	Description	Reference
Staff and visitors Bike Parking	Total four bike spaces for staffs and visitors.	BESS Tran 1.4
EV Charging Infrastructure	Electrical provision will be provided for a dedicated outlet for future EV chargers (capacity, conduit). The provision should be able to accommodate a Level 2, 32amp, 7kW charger in the future.	BESS Tran 2.1

7. Operational Waste Management

Effective operational waste management is vital for developments to minimise the amount of waste generated, reduce environmental impacts, and improve sustainability by promoting recycling and composting. Implementing efficient waste management practices can also lower operating costs, increase efficiency, and enhance the overall liveability of the development.

Initiative	Description	Reference
Operational Waste	The development will be provided with a three-bin system including general, recycling and food & organic (FOGO) waste. Additional space will be provided in the waste storage to accommodate the future fourth waste stream for glass waste as per the Victorian recycling policy for 2030. 	BESS Waste 2.1

8. Urban Ecology

Incorporating urban ecology principles into development promotes biodiversity, provides ecological services such as air and water purification, and enhances the overall health and well-being of residents by connecting them with nature. Additionally, creating sustainable and resilient urban ecosystems can also help mitigate the impacts of climate change and support the long-term viability of the development.

Initiative	Description	Reference
Vegetated Area	The proposed development will be proposed with landscaped areas. This will provide an enjoyable working environment.	BESS Eco 2.1

9. Materials

Choosing the right materials for a development is crucial as it impacts the durability, energy efficiency, and overall sustainability of the buildings. Thoughtful material selection can minimize environmental impacts, improve indoor air quality, and contribute to the long-term value and desirability of the development.

Initiative	Description	Reference
Sustainable Timber	No rainforest timber will be used on site. Timber framing (if used on site) will be procured from accredited sources such as Forest Stewardship Council (FSC), Program for the Endorsement of Forest Certification (PEFC) or Australian Forestry Scheme (AFS).	Clause 15.01-2L
Carpet	Wherever used, carpet and carpet underlay will be chosen with as third party certification such as Global GreenTag, GECA or Carpet Institute of Australia Limited, Environmental Certification Scheme (ECS).	Clause 15.01-2L
Steel	Steel for the development (structural and reinforcing) will be procured from a responsible steel maker. A responsible steel maker must have facilities with a currently valid and certified ISO 14001 Environmental Management System (EMS) in place, and be a member of the World Steel Association's (WSA) Climate Action Program (CAP).	Clause 15.01-2L

10. Result in Summary & Implementation

The development will comply with the BESS and WSUD requirements by implementing all measures, as stated in this report. All the measures included in this report have demonstrated their efficiency and are easy to upkeep, with any faults promptly noticeable to the development's occupants. This approach ensures the development's sustainability in the long run, as the installed systems will be maintained and functional throughout the building's life cycle.

All initiatives listed in the report will be implemented by the relevant design team member at the relevant stage of the development. An implementation schedule has been prepared as follows – Full detail for each initiative is available in the body of the report (hyperlink):

ESD Implementation Table

Initiative	Responsibility	Stage
Metering and Monitoring	Services Engineer Architect	Design Development
Construction Waste Management Plan – 80% of waste diverted from landfill	Head Contractor	Construction
Construction Environmental Management Plan	Head Contractor	Construction
Water Fixtures and Fitting – Minimum WELS rating	Architect Head Contractor	Design Development
Rainwater Collection and Reuse	Architect Civil Engineer	Design Development
NCC Section J commitment – 10% improvement on floor and ceiling minimum insulation	Section J Consultant	Design Development
Hot Water System chosen within one star or 15% most efficient	Services Engineer Architect	Design Development
HVAC System chosen within one star of 15% most efficient	Services Engineer Architect	Design Development
Internal Lighting Power in line with NCC 2022 section J7D3	Services Engineer Architect	Design Development
Solar PV System – Minimum 5kW	Solar Contractor Architect	Design Development
Raingarden treating part of the driveway	Architect Civil Engineer	Design Development
Low VOC and Low Formaldehyde Products	Architect Head Contractor	Design Development Construction

Initiative	Responsibility	Stage
Mechanical Ventilation – 50% Improvement on AS1668 or CO2 level maintained at 800ppm	Service Engineer	Design Development
Total 4 Bike spaces for staffs and visitors	Architect	Design Development
EV Charging Infrastructure – Level 2 provision	Architect Service Engineer	Design Development
Three-bin system	Architect Waste Consultant	Design Development
Carpet commitment to sustainable certification	Architect Head Contractor	Design Development
Steel commitment to responsible steel maker	Architect Head Contractor	Design Development
Timber commitment to certified plantations	Architect Head Contractor	Design Development



Appendix 1 – WSUD Report

To address Clause 15.01-2L-03 and 53.18, a Water Sensitive Urban Design (WSUD) assessment of the proposed development must occur.

Under Clause 53.18, WSUD assessment and associated proposed stormwater management system should be designed to:

- Meet the current best practice performance objectives for stormwater quality as contained in the Urban Stormwater - Best Practice Environmental Management Guidelines (Victorian Stormwater Committee, 1999). Currently, these water quality performance targets are:
 - Suspended Solids - 80% retention of typical urban annual load.
 - Total Nitrogen - 45% retention of typical urban annual load.
 - Total Phosphorus - 45% retention of typical urban annual load.
 - Litter - 70% reduction of typical urban annual load.
- Minimise the impact of chemical pollutants and other toxicants including by, but not limited to, bunding and covering or roofing of storage, loading and work areas.
- Contribute to cooling, improving local habitat and providing attractive and enjoyable spaces.

By identifying the impervious surfaces within the site and implementing treatments to mitigate the impacts of stormwater leaving the site, the proposed development has successfully fulfilled the objectives listed above.

The development was evaluated using the BLUE FACTOR tool, a widely accepted tool in the industry, to verify compliance with the aforementioned best practice targets. To meet the required standards, the development must attain a minimum compliance score of 100%.

1. Stormwater Quality Management Strategies & Site Demarcation

To achieve stormwater management objectives, it will be necessary to put in place stormwater treatment measures. The upcoming section outlines the surfaces that necessitate treatment and the specific treatment required. Effective management of stormwater flows in the building area will be crucial for the building's overall performance and its ability to meet stormwater management goals. The total site area for the WSUD assessment is 2645m². The following treatment will be implemented on-site:

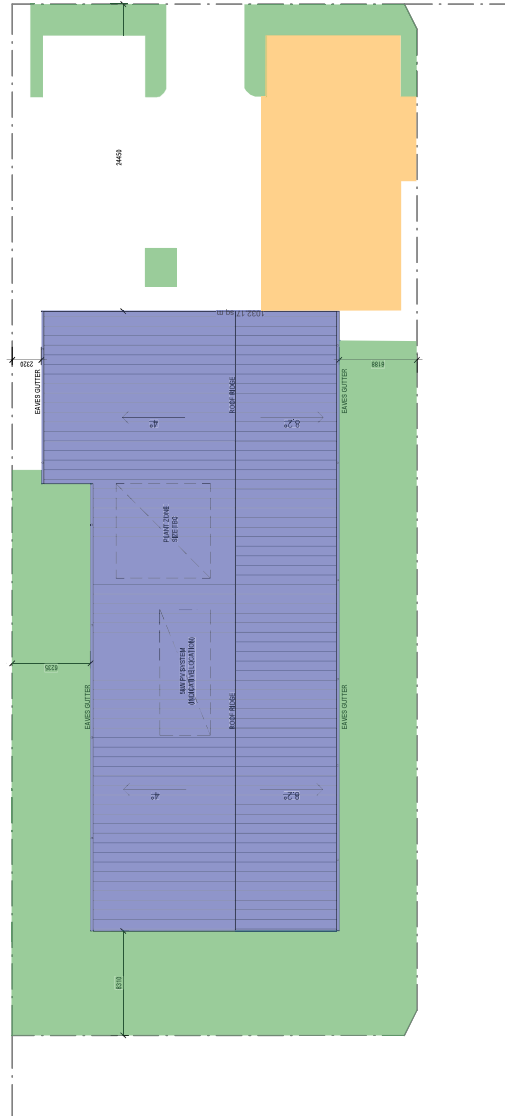
Surface	Treatment	Area	Description
Roof	Rainwater Tank	1032.2m²	The roof runoff will be diverted into rainwater tanks with total effective capacity of 10,000L. The rainwater will be used for toilet flushing. Rainwater collection might require the implementation of a charged pipe system that <u>cannot be running underneath the building footprint</u>.

Surface	Treatment	Area	Description
Driveway 1	Raingarden	250m ²	Part of the exposed driveway will be diverted to a minimum of 5m² of raingarden. Raingarden should be constructed as per Melbourne Water Guidelines for Inground Raingarden Raingarden must be installed away from the boundary or footings due to flooding potential (minimum 300mm).
Landscaped Areas	No treatment	892.2m ²	Part of the site will be designed as permeable. This will include landscaped areas.
Untreated Impervious Areas	No treatment	470.6m ²	Part of the site will be left untreated before being released at the legal point of discharge. This will include First Floor play area, roof of kiosk substation, untreated parts of driveways etc.

The development has prioritized maximizing permeable areas, resulting in decreased stormwater outflows from the site. Additionally, the proposed development includes vegetated areas, which not only reduces the heat island effect but also improves the local habitat.

2. WSUD Catchment Plan

Please refer to the next page for the full WSUD catchment plan including all treatment and areas included above.



|| ROOF PLAN
|| SCALE: 1:200

WSUD Legend

Roof Catchment

Permeable Areas

Driveway to Raingarden

ISSUED FOR
TOWN PLANNING

NO.	DATE	REVISION	BY	CHK
A	25.05.2024	TOWN PLANNING ISSUE	CZ	JB

All areas indicated are indicative for design and planning purposes only, and should not be used for any contractual reasons without verification by a licensed surveyor or further design development being completed.

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25143

TP04

REVIEW

A

DATE: MAY, 2025
DRAWN BY: CZ
SCALE: 1:200 @ A1
SCALE: 1:300 @ A3

CLIENT: SPROUT PROPERTY



TITLE
ROOF PLAN

PROJECT:
98 MARSHALLTOWN ROAD
GROVEDALE, VIC

**watson
young**

3. WSUD Assessment Results

All treatment measures and associated areas described above have been input into the BLUE FACTOR tool and the following results have been achieved:

BlueFactor does not include childcare as a building type therefore the class 5 office option has been used and occupancy set as 80 based on the maximum occupancy of the childcare including staff minus children not yet potty trained.

Please note that mean annual runoff volume infiltrated cannot be achieved in Blue Factor since permeable areas (where water could infiltrate) are not considered in the calculation. Permeable areas are only input in catchment to demonstrated that all areas on site have been accounted for. This was confirmed by blue Factor developer.

TSS has not achieved full compliance as it is difficult to achieve compliance with these requirements on these types of projects where TSS pollutants are already low. Reducing significantly the level of something that is already very low is complicated. This is in line with DEECA's position.

Project # CEA056A1
V2: 98 Marshalltown Road



04 June 2026 11:48 a.m.

98 Marshalltown Road

The proposed stormwater treatments provide 'deemed to comply' compliance with the minimum planning requirement for total nitrogen but does not comply with all the relevant objectives for management of stormwater flows on-site.



Project details

Name	V2: 98 Marshalltown Road
Project ID	CEA056A1
Street address	98 Marshalltown Rd, Grovedale VIC 3216, Australie
Municipality	Greater Geelong
Site area	2645 m ²
Planning Number	

Flow and pollutant load reductions

Item	Result	Target
Mean annual runoff volume harvested or evapotranspired (%)	41%	>32%
Mean annual runoff volume infiltrated or filtered (%)	0%	>3%
Total suspended solids (%)	55%	>80%
Total phosphorus (%)	49%	>45%
Total nitrogen (%)	50%	>45%
Total gross pollutants (%)	71%	>70%

Water treatment

Configuration 1	
	Roof to tank 1032.2m2
	Rainwater Tank 1 Rainwater tank retention volume in kilolitres: 10

Configuration 2	
	Driveway to RG Paved, 250m2
	Raingarden 1 Area: 5 m ² , Extended detention depth: 0.3 m, Submerged zone depth: 0.3 m, Site soil type: Lined

Catchments

	Roof to tank 1032.2m2
	Permeable Areas Pervious (garden and lawn), 892.2m2
	Driveway to RG Paved, 250m2
	Untreated Impervious Areas Paved, 470.6m2

Treatments



Rainwater Tank 1

Rainwater tank retention volume in kilolitres: 10

150%



Raingarden 1 Area: 5 m², Extended detention depth: 0.3 m,
Submerged zone depth: 0.3 m, Site soil type: Lined

172%

Buildings & dwellings



Childcare Non-Residential BCA Class 5 - Commercial/Office,
80 employee(s)

Water sources	I want to use the average efficiency for a typical new dwelling or building
Basin taps - Primary water source	Mains water
Showers - Primary water source	Mains water
Clothes Washer - Primary water source	Mains water
Urinal - Primary water source	
Urinal - Efficiency	
Toilets connected to mains water	0
Toilets connected to rainwater	12
Toilets connected to recycled water	0
Garden water use	Garden water demands are not in use

4. Proposed Treatment Typical Cross-Section

This section will include a typical cross-section of all WSUD treatments proposed in the development.

a. Rainwater Tanks

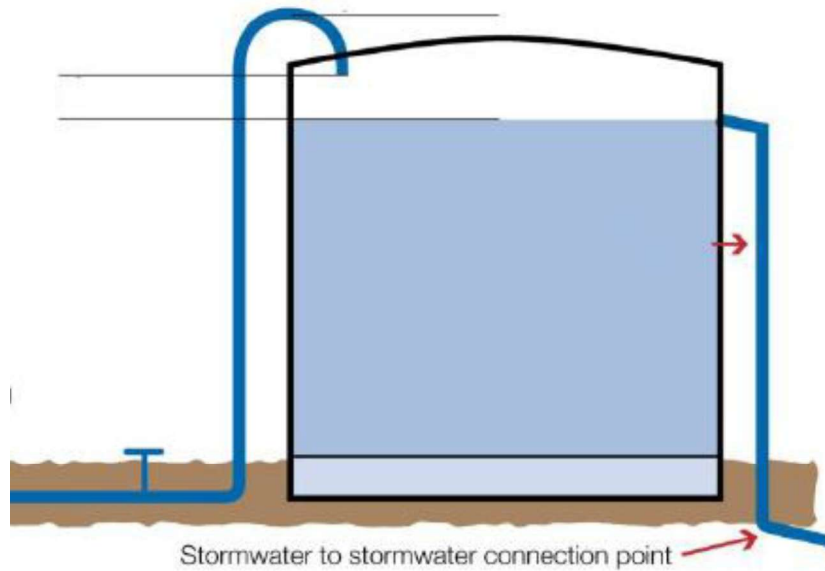


Figure 2: Typical Rainwater tank Cross-Section.

b. Raingarden

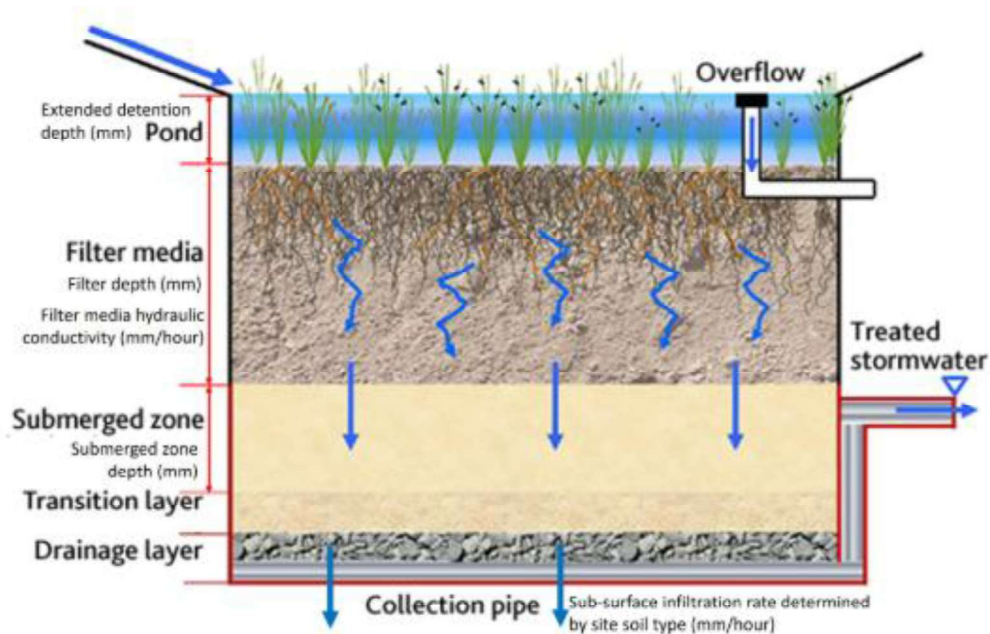


Figure 2: Raingarden Typical Cross-Section.

Acceptable raingarden design

- standard system with 300-500mm filter media depth
- including a submerged zone system and 300mm filter depth
- standard system with filter media depth of 500mm where surrounding soil has a high infiltration rate

Avoid

- standard raingardens with filter media depth less than 300mm
- raingardens downstream of a wetland or an oversized sedimentation basin

Note: All systems should be designed as per Adoption Guidelines for Stormwater Biofiltration Systems (FAWB, 2009).

Plant selection

This should be guided by expert opinion, based on the particular project conditions. The plant species that are commonly used in raingardens can be grouped into three general categories:

Category	Example plant species
Tolerant of both wet and dry conditions once established	<i>Carex appressa</i> (tall sedge)
Tolerant of dry conditions once established	<i>Ficinia nodosa</i> <i>Lomandra longifolia</i> <i>Juncus amibilis</i>
Prefer more constant conditions without wet/dry extremes	<i>Goodenia ovate</i> <i>Juncus flavidis</i>

Note: Other plant species may be appropriate for a particular system and these should be guided by expert opinion.

Scientific Name	Common name	Height (m)	Width (m)	Density (m ²)
<i>Acacia implexa</i> *	Lightwood	8	5	1
<i>Acacia melanoxylon</i> *	Blackwood	12	8	1
<i>Allocasuarina cunninghamiana</i> *	River Sheoak	15	8	1
<i>Carex appressa</i>	Tall Sedge	0.5-1.2	.05-1	4
<i>Callistemon sieberi</i>	River Bottlebrush	4	2	1
<i>Dianella admixta</i>	Black-anther Flax-lily	0.3-0.8	0.5-1.5	6
<i>Dianella longifolia</i>	Smooth Flax-lily	0.5	0.5	6
<i>Dianella tasmanica</i>	Tasman Flax-lily	0.75	1	4
<i>Ficinia nodosa</i>	Nobby Club-rush	0.5-1.5	0.6-2.0	5
<i>Gahnia radula</i>	Thatch Saw-sedge	1.5	1	4
<i>Juncus amabilis</i>	Hollow rush	0.2-1.2	0.2-0.5	6
<i>Juncus flavidus</i>	Yellow Rush	0.4-1.2	0.2-1	4
<i>Lepidosperma laterale</i> var. <i>laterale</i>	Variable Sword-sedge	1	0.4-1	4
<i>Lomandra filiformis</i> ssp. <i>Filiformis</i>	Wattle Mat-rush	0.3	0.3	6
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	1	1	4
<i>Lomandra nana</i>	Dwarf Mat-rush	1.5	10-20	5
<i>Myoporum parvifolium</i>	Creeping Boobialla	20-30	300	4
<i>Poa labillardieri</i>	Common Tussock-grass	0.3-0.8	1.3	4

*Canopy trees are only suitable in vegetation over 6m² with a minimum width of 2m.

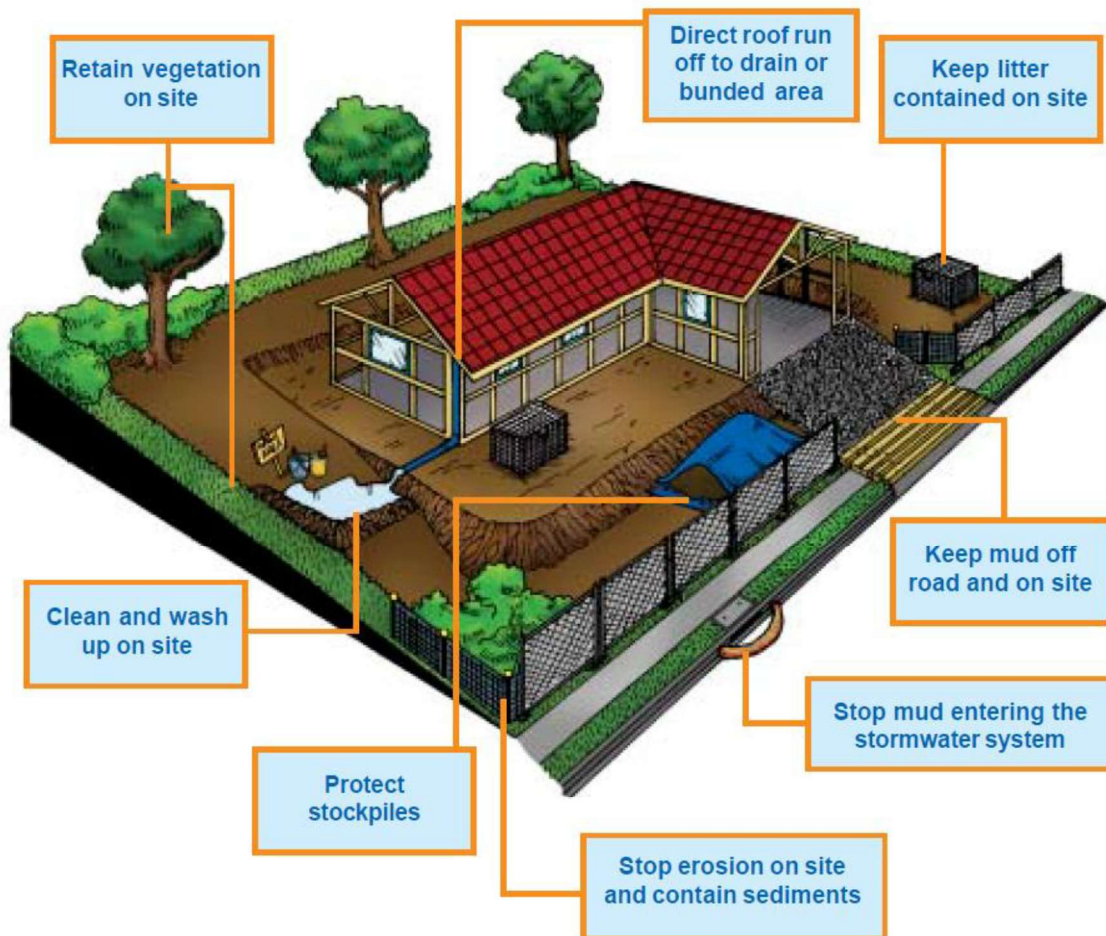
At least 50% of the plants chosen for a bioretention system should have the following characteristics for effective nutrient removal (FAWB, 2009):

- high root density
- extensive fibrous root systems (no bulbs)
- vigorous growth
- tolerant of freely draining soils
- drought and inundation tolerant

5. Stormwater Management During Construction

To prevent contamination of stormwater discharge and to decrease the speed of flows produced during construction, steps will be taken to manage stormwater. These measures will involve establishing buffer strips and maintaining a clean site by removing loose rubbish. "[Keeping Our Stormwater Clean - A Builder's Guide](#)" by Melbourne Water provides additional information. The objectives depicted in the diagram below illustrate ways to minimise the effects of stormwater runoff during the construction phase.

Check Council requirements and plan before you start work on site





Appendix 2 – WSUD Maintenance Manual

WSUD manuals are sourced from the City of Port Philip which has developed a detailed manual for the majority of treatment systems.

Tips for undertaking maintenance

Things to look for and how to fix them.

Leaf litter / debris in gutters Regularly clear your gutters. Make sure you cover the tank inlet if you're rinsing down the gutters to avoid debris entering the tank.	Pump not working 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 If you see water spilling from the edge of the gutters check that the downpipe is not blocked, removing any debris.	Mains backup or pump not working 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 mind operating it manually.
First flush diverter clogging 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.	Overflow 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 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.	Sediment / debris build-up in tank (more than 20mm thick) 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. 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.	Base area 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 mosquitoes Rainwater tanks can smell if there is debris in the gutters. Check the gutters and leaf strainers are clean. Mosquitoes 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 mosquitoes 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).	Monitoring the water level A range of devices are available to monitor water level. Some simple float systems can be used effectively.

Acknowledgement: Information from PJT 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 mosquitoes and other animals entering the tank.

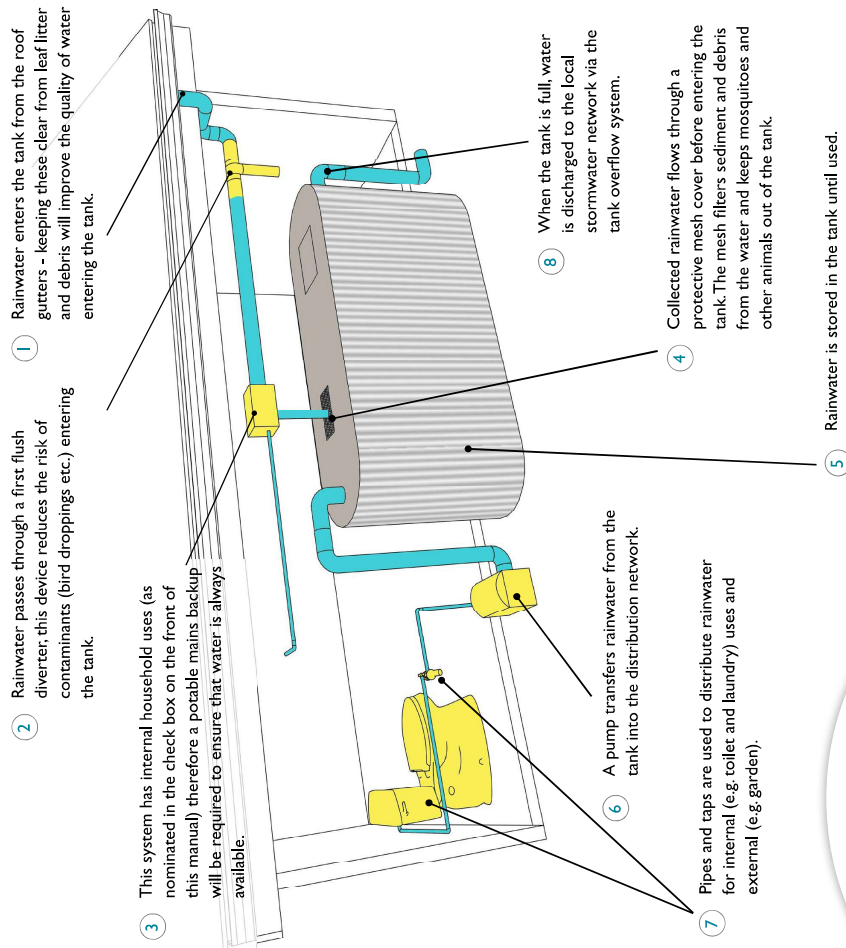
Tank connected to	toilet only ☐ toilet & irrigation ☐ toilet & laundry & hot water & irrigation ☐
Rainwater tank location	
Planning drawing number showing rainwater tank location	
Rainwater tank construction date	
Date of final building inspection	
Tank volume (litres)	
Area or percentage of the roof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



Maintenance Overview

Rainwater Tank Maintenance

The following diagram identifies the key items which are important for rainwater tanks and their maintenance.



Maintenance Checklist

The property owner is responsible for checking the maintenance items in this checklist at the recommended frequency at the bottom of the table. The maintenance log at the bottom of the page should be filled in once each maintenance check is complete. Upkeep of this maintenance log should continue throughout the life of the rainwater tank.

Item	Rainwater tank element	Inspection item	Y/N	Likely maintenance task									
1	Roof gutters and downpipes	Is there leaf litter or debris in the gutters?		Remove by hand and dispose responsibly.									
2	First flush diverter	Is there anything blocking the first flush diverter (leaves etc)?		Remove by hand and dispose responsibly.									
3	Potable mains back up device	Is the potable mains back up switch operating correctly?		Repair or replace device. Consider a manual switching device.									
4	Mesh cover	Has the mesh cover deteriorated or have any holes in it?		Replace mesh cover.									
5	Tank volume	Is there large amounts of sediment or debris sitting in the bottom of the tank, reducing the volume available in the tank to store water?		Remove sediment and dispose responsibly.									
6	Pump	Is the pump working effectively? Have you heard it on a regular basis?		Check the potable mains back up is not permanently on. Repair or replace pump.									
7	Pipes and taps	Are pipes and taps leaking?		Repair as needed.									
8	Overflow	Is the overflow clear and connected to the stormwater network?		Remove blockages and/or restore connections to stormwater network.									
9	Supporting base	Are there any cracks or movement of pavers?		Empty the tank to reduce weight then repair any damage to the base.									
Maintenance frequency													
All tasks		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Regular maintenance will improve the water quality and extend the life of your system. A well maintained tank isn't likely to need to be cleaned out for up to ten years (when there is more than 20mm of accumulated sediment).		x			x			x				x	

Maintenance Log

Maintenance date	Maintenance undertaken

Tips for undertaking maintenance

Things to look for and how to fix them.

Scour or erosion	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	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	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 surface	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	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.	Raingarden outlets not draining	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 in pits may require vacuuming or other appropriate machinery.
Elevated surface level / lots of excess sediment on surface	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.	Impermeable liner	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. sodic soils, shallow groundwater or close proximity to significant structures such as building foundations).
Unhealthy or dying plants / bare patches	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 created 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.	Raingarden holding water on the surface because of blocked planting media	Generally raingardens should be able to filter water at a rate of ~100mm 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:

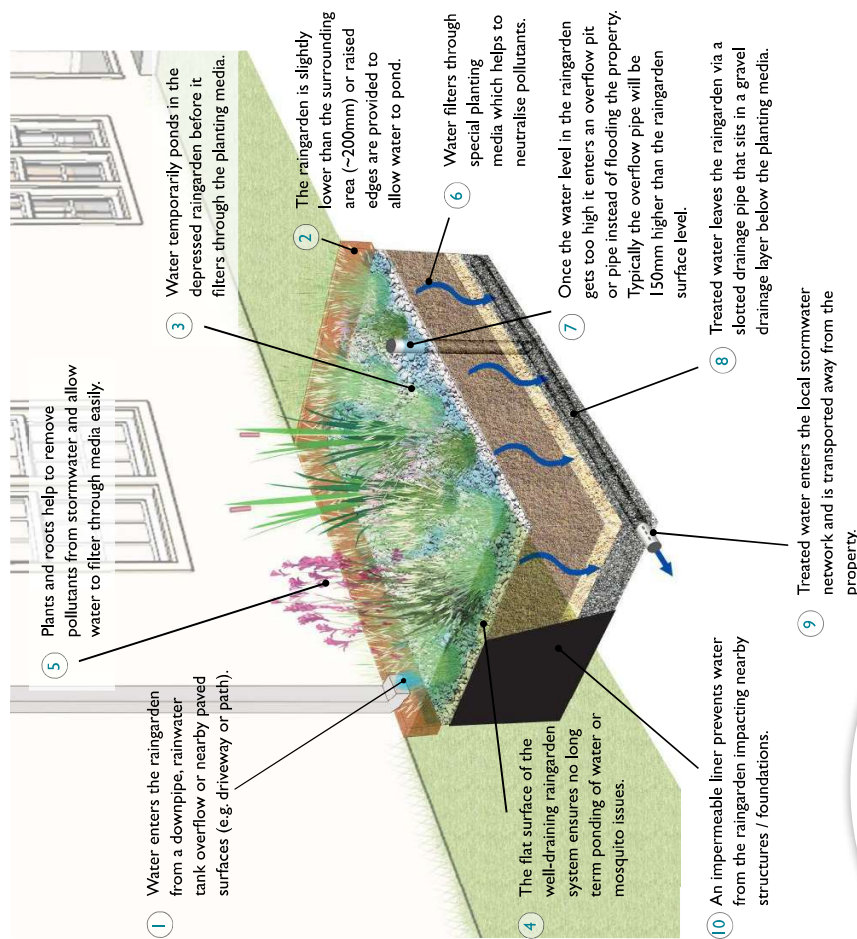
- effectively treat stormwater,
- continue to look good, and
- don't cause local flooding.

Raingarden location	
Planning drawing number showing raingarden location	
Raingarden construction date	
Date of final building inspection	
Area of raingarden (m ²)	
Area of catchment (m ²) (e.g. roof and/or paving) directed to the raingarden	

Maintenance Overview

Raingarden Maintenance

This diagram depicts an in-ground raingarden. Raised bed raingardens are also common (refer to photograph).



Note: It is important not to add fertiliser, compost or floatable mulch to a raingarden as the nutrients will pass through the raingarden and pollute the Bay. The plants best suited to raingardens will grow well in the planting media and take nutrients for their growth from the water entering the raingarden.



Maintenance Checklist

The property owner is responsible for checking the maintenance items in this checklist at the recommended frequency at the bottom of the table. The maintenance log at the bottom of the page should be filled in once each maintenance check is complete. Upkeep of this maintenance log should continue throughout the life of the raingarden.

Item	Raingarden element	Inspection item	Y/N	Likely maintenance task							
1	Raingarden inlet	Is there scour or erosion where water enters the raingarden? Is there rubbish, leaf litter or sediment blocking the inlet?		Re-profile with hand tools, place gravel or stones at the inlet. Remove by hand and dispose responsibly.							
2	Raingarden surface level	Is the level of the raingarden surface sitting less than 5 cm below the raingarden edges/borders?		Remove sediment from the surface so it is sitting about 10-20 cm below surrounding areas.							
3	Raingarden temporary detention	Is there moss or clay on the surface of the raingarden which seem to be slowing the filtration of flows?		Remove the crust from the top of the raingarden and check water will filter through exposed media.							
4	Raingarden surface	Are there areas which appear to be higher and are not getting wet during rain events? Are there areas which have been eroded away or scoured?		Smooth out surface so it is flat with hand tools.							
5	Plants	Are the plants looking unhealthy or dying? Are there bare patches forming between plants?		Prune diseased sections, irrigate and/ or replace dead plants. If plants keep dying, replace with a different type which is doing well. Do not use fertilizer to improve plant health as this will pollute the raingarden. Remove weeds by hand and dispose responsibly.							
6	Planting media	Is the raingarden holding water for more than a couple of hours after the rain has stopped?		Remove and replace the top 100 mm of planting material (loamy sand).							
7	Overflow pit / pipe	Is there anything blocking the top of the overflow pit / pipe preventing water from entering?		Remove blockages and dispose responsibly.							
8	Underdrainage	Is there rain draining to the bottom of the raingarden following heavy rain?		Flush the underdrain or uncover it to check for blockages.							
9	Stormwater network connection	Is there water ponding in the overflow pit or pipe and not entering the stormwater network?		Remove blockages and dispose responsibly.							
Maintenance frequency											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			x						x		
+ after heavy rainfall											

Maintenance Log

Maintenance date	Maintenance undertaken											



Appendix 3 – Green Star VOC Limits

VOC Limits for Paints, Adhesives and Sealants

Product Category	Maximum VOC content (g/L)
General-purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	16
Trim, varnishes and wood stains	75
Primers, sealers and prep coats	65
One and two-pack performance coatings for floors	140
Acoustic sealants, architectural sealants, waterproofing membranes and sealants, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100

VOC Limit for Carpets

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



Appendix 4 – Daylight Hand Calculation

Daylight access in the Child rooms was assess using the Green Star Daylight Hand Calculation.

The Green Star Daylight Hand Calculation is a simple method to assess how much of a space has achieved the minimum BESS best practice requirement (2% Daylight Factor (DF)). The calculation is based on one simple formula as follows:
 Zone of compliance = 2 x Height of window above working plane x Width of the window. Windows must have a minimum of 40% VLT to us this hand calculation method.

Working plane is 400mm for child rooms, 700mm for office. See below for a mark-up of nominated areas (blue) and compliant areas (orange):



Figure 3: Daylight Hand Calculation mark-up.

Note the below table represents daylight performance outcomes.

Space Type	Nominated Area (m²)	Floor Area Compliant (m²)	Compliant Areas (%)
Children's Room 1	42	19.6	
Children's Room 2	42	19.6	
Children's Room 3	42	19.6	
Children's Room 4	55	30.9	
Children's Room 5	55	20.9	
Children's Room 6	38	12.6	
Children's Room 7	75	26.6	
Children's Room 8	75	26.6	
Total	424	176.4	42%



Appendix 5 – BESS Report

BESS, 98 Marshalltown Road, Grovedale 98 Marshalltown Rd, Grovedale 3216

BESS Buildings Report

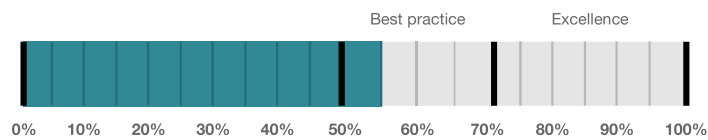
Built Environment Sustainability Scorecard



This BESS report outlines the sustainable design commitments of the proposed development at 98 Marshalltown Rd Grovedale Victoria 3216. 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 Greater Geelong City Council.

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

Your BESS Score



57%

Project details

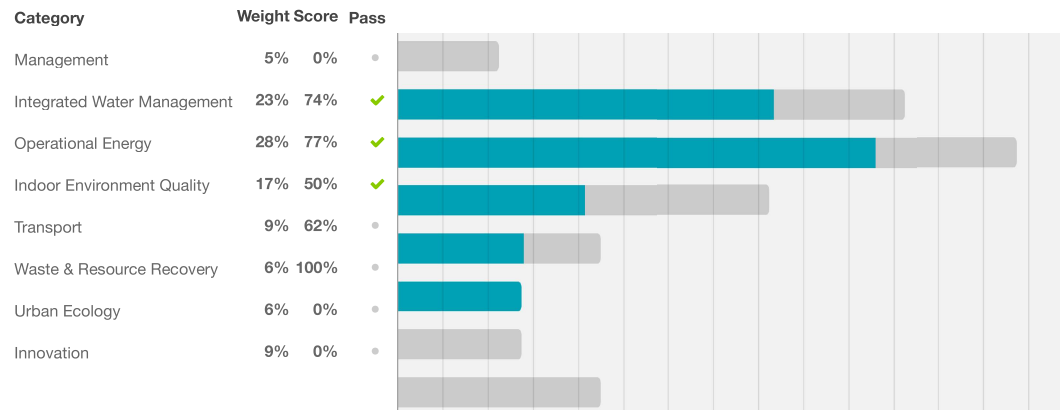
Name 98 Marshalltown Road, Grovedale
Address 98 Marshalltown Rd Grovedale Victoria 3216
Project ID 38EC9659-R2
BESS Version BESS-10
Date 04 June 2026
Software version 2.3.0-B.654

Site type Non-residential development
Account admin@msconsultants.com.au
Application no.
Site area 2,645 m²
Building floor area 835 m²



Performance by category

● This project ● Maximum available



BESS, 98 Marshalltown Road, Grovedale 98 Marshalltown Rd, Grovedale 3216

Buildings

Name	Height	Footprint	% of total footprint
Childcare	1	835 m ²	100%

Dwellings & Non Res Spaces

Non-Res Spaces

Name	Quantity	Area	Building	% of total area
Public building				
Childcare	1	835 m ²	Childcare	100%
Total	1	835 m²	100%	

Supporting Evidence

Shown on Floor Plans

Credit	Requirement	Response	Status
Integrated Water Management 2.1	Location of any stormwater management systems (rainwater tanks, raingardens, buffer strips)		-
Operational Energy 4.2	Location and size of solar photovoltaic system		-
Transport 1.4	Location of non-residential bicycle parking spaces		-
Transport 1.5	Location of non-residential visitor bicycle parking spaces		-
Transport 2.1	Location of electric vehicle charging infrastructure		-
Waste & Resource Recovery 2.1	Location of food and garden waste facilities		-
Waste & Resource Recovery 2.2	Location of recycling facilities		-

Supporting Documentation

Credit	Requirement	Response	Status
Integrated Water Management 2.1	STORM report or MUSIC model		-
Operational Energy 1.1	Energy Report showing calculations of reference case and proposed buildings		-
Operational Energy 3.7	Average lighting power density and lighting type(s) to be used		-
Operational Energy 4.2	Specifications of the solar photovoltaic system(s)		-
Indoor Environment Quality 1.4	A short report detailing assumptions used and results achieved.		-

BESS, 98 Marshalltown Road, Grovedale 98 Marshalltown Rd, Grovedale 3216

Credit summary**Management Overall contribution 4.5%**

		0%
1.1 Pre-Application Meeting		0%
2.3 Thermal Performance Modelling - Non-Residential		0%
3.2 Metering - Non-Residential		N/A ✦ Scoped Out
		n/a
3.3 Metering - Common Areas		N/A ✦ Scoped Out
		n/a
4.1 Building Users Guide		0%

IWM Overall contribution 22.5%

		74% ✓ Pass
1.1 Potable Water Use		58% ✓ Achieved
2.1 Stormwater Treatment		100% ✓ Achieved
3.1 Water Efficient Landscaping		0%
4.1 Building Systems Water Use		0%

Operational Energy Overall contribution 27.5%

		Minimum required 50%	77% ✓ Pass
1.1 Thermal Performance Rating - Non-Residential		37%	
2.1 Greenhouse Gas Emissions		100%	
2.2 Peak Demand		100%	
2.6 Electrification		100%	
2.7 Energy consumption		100%	
3.1 Carpark Ventilation		N/A ✦ Scoped Out	
		n/a	
3.2 Hot Water - Non-Residential		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		N/A ✦ Scoped Out	
		No other (non-solar PV) renewable energy is in use.	

BESS, 98 Marshalltown Road, Grovedale 98 Marshalltown Rd, Grovedale 3216

IEQ Overall contribution 16.5%

		Minimum required 50%	50%	✓ Pass
1.4 Daylight Access - Non-Residential		42%	✓ Achieved	
2.3 Ventilation - Non-Residential		33%	✓ Achieved	
3.4 Thermal comfort - Shading - Non-Residential		100%		
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%		
4.1 Air Quality - Non-Residential		100%		

Transport Overall contribution 9.0%

		62%
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		N/A  Scoped Out
		n/a
2.3 Motorbikes / Mopeds		0%

Waste & Resource Recovery Overall contribution 5.5%

		100%
1.1 Construction Waste - Building Re-Use		N/A ✦ Scoped Out
		Undeveloped site
2.1 Operational Waste - Food & Garden Waste		100%
2.2 Operational Waste - Convenience of Recycling		100%

Urban Ecology Overall contribution 5.5%

		0%
	1.1 Communal Spaces	N/A ✦ Scoped Out
		n/a
	2.1 Vegetation	0%
	2.2 Green Roofs	0%
	2.3 Green Walls and Facades	0%
	3.2 Food Production - Non-Residential	0%

Innovation Overall contribution 9.0%

		0%
1.1 Innovation		0%

BESS, 98 Marshalltown Road, Grovedale 98 Marshalltown Rd, Grovedale 3216

Credit breakdown**Management Overall contribution 4.5%**

		0%
1.1 Pre-Application Meeting		0%
Score Contribution	This credit contributes 50% 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	
2.3 Thermal Performance Modelling - Non-Residential		0%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2022 Section J4D6?	
Question	Criteria Achieved ?	
Public building	No	
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2022 Section J (Energy Efficiency), NABERS or Green Star?	
Question	Criteria Achieved ?	
Public building	No	
3.2 Metering - Non-Residential		N/A ✦ Scoped Out
n/a		
This credit was scoped out	n/a	
3.3 Metering - Common Areas		N/A ✦ Scoped Out
n/a		
This credit was scoped out	n/a	
4.1 Building Users Guide		0%
Score Contribution	This credit contributes 16.7% towards the category score.	
Criteria	Will a building users guide be produced and issued to occupants?	
Question	Criteria Achieved ?	
Project	No	

BESS, 98 Marshalltown Road, Grovedale 98 Marshalltown Rd, Grovedale 3216

IWM Overall contribution 22.5%

		74% ✔ Pass
--	--	---

Do you have a reticulated third pipe or an on-site water recycling system?:	No
Are you installing a swimming pool?:	No
Stormwater profile	
Which stormwater modelling software are you using?:	Blue Factor
Blue Factor score achieved?:	100
Flow:	-
Total Suspended Solids:	-
Total Phosphorus:	-
Total Nitrogen:	-
Rainwater tank profile	
What is the total roof area connected to the rainwater tank?:	
Rainwater Tank 1	1,032 m²
	-
Tank Size:	
Rainwater Tank 1	10,000 Litres
	-
Irrigation area connected to tank:	
Rainwater Tank 1	-
	-
Is connected irrigation area a water efficient garden?:	
Rainwater Tank 1	No
	-
Other external water demand connected to tank?:	
Rainwater Tank 1	-
	-
Fixtures, fittings & connections profile	
Building:	Childcare
Showerhead:	4 Star WELS (>= 6.0 but <= 7.5)
Bath:	Scope out
Kitchen Taps:	>= 5 Star WELS rating
Bathroom Taps:	>= 5 Star WELS rating
Dishwashers:	>= 5 Star WELS rating
WC:	>= 4 Star WELS rating
Urinals:	Scope out
Washing Machine Water Efficiency:	Scope out
Which non-potable water source is the dwelling/space connected to?:	Rainwater Tank 1
Non-potable water source connected to Toilets:	Yes

BESS, 98 Marshalltown Road, Grovedale 98 Marshalltown Rd, Grovedale 3216

Non-potable water source connected to Laundry (washing machine):		No
Non-potable water source connected to Hot Water System:		No
1.1 Potable Water Use		58%   Achieved
Score Contribution	This credit contributes 31.2% 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	2839 kL	
Output	Proposed (excluding rainwater and recycled water use)	
Project	2209 kL	
Output	Proposed (including rainwater and recycled water use)	
Project	1734 kL	
Output	% Reduction in Potable Water Consumption	
Project	38 %	
Output	% of connected demand met by rainwater	
Project	94 %	
Output	How often does the tank overflow?	
Project	Never / Rarely	
Output	Opportunity for additional rainwater connection	
Project	493 kL	
2.1 Stormwater Treatment		100%   Achieved
Score Contribution	This credit contributes 56.2% towards the category score.	
Criteria	Has best practice stormwater management been demonstrated?	
Output	Min Blue Factor Score	
Project	100	
Output	Blue Factor Score	
Project	100	
3.1 Water Efficient Landscaping		0% 
Score Contribution	This credit contributes 6.2% towards the category score.	
Criteria	Will water efficient landscaping be installed?	
Question	Criteria Achieved ?	
Project	No	
4.1 Building Systems Water Use		0% 
Score Contribution	This credit contributes 6.2% towards the category score.	
Criteria	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?	
Question	Criteria Achieved ?	
Project	No	

BESS, 98 Marshalltown Road, Grovedale 98 Marshalltown Rd, Grovedale 3216

Operational Energy Overall contribution 27.5%

		Minimum required 50%	77%	✓ Pass
--	--	----------------------	-----	--------

Project profile	
Use the BESS Deem to Satisfy (DtS) method for Non-residential spaces?:	Yes
Are you installing any renewable energy system(s) (other than solar photovoltaic)?:	No
Energy Supply:	All-electric
Solar Photovoltaic system profile	
System Size (lesser of inverter and panel capacity): Solar Photovoltaic system 1	5.0 kW peak
Orientation (which way is the system facing)?: Solar Photovoltaic system 1	North
Inclination (angle from horizontal): Solar Photovoltaic system 1	20.0 Angle (degrees)
Non-residential Deemed-to-Satisfy profile	
Do all exposed floors and ceilings (forming part of the envelope) demonstrate a minimum 10% improvement in required NCC2022 insulation levels (total R-value upwards and downwards)?:	Yes
Does all wall and glazing demonstrate meeting the required NCC2022 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
1.1 Thermal Performance Rating - Non-Residential	37%
Score Contribution	This credit contributes 36.4% towards the category score.
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC2022 Section J)?
2.1 Greenhouse Gas Emissions	100%
Score Contribution	This credit contributes 9.1% towards the category score.
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?
2.2 Peak Demand	100%
Score Contribution	This credit contributes 4.5% towards the category score.
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?
2.6 Electrification	100%

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Score Contribution	This credit contributes 13.6% towards the category score.	
Criteria	Is the development all-electric?	
Question	Criteria Achieved?	
Project	Yes	
2.7 Energy consumption		100%
Score Contribution	This credit contributes 18.2% towards the category score.	
Criteria	What is the % reduction in annual energy consumption against the benchmark?	
3.1 Carpark Ventilation		N/A ✦ Scoped Out
n/a		
This credit was scoped out	n/a	
3.2 Hot Water - Non-Residential		100%
Score Contribution	This credit contributes 4.5% towards the category score.	
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?	
3.7 Internal Lighting - Non-Residential		100%
Score Contribution	This credit contributes 9.1% 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 J7D3a of the NCC 2022 Vol 1?	
Question	Criteria Achieved ?	
Public building	Yes	
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A ✦ Scoped Out
No cogeneration or trigeneration system in use.		
This credit was scoped out	No cogeneration or trigeneration system in use.	
4.2 Renewable Energy Systems - Solar		100%
Score Contribution	This credit contributes 4.5% towards the category score.	
Criteria	What % of the estimated energy consumption of the building class it supplies does the solar power system provide?	
Output	Solar Power - Energy Generation per year	
Public building	6,385 kWh	
Output	% of Building's Energy	
Public building	20 %	
4.4 Renewable Energy Systems - Other		N/A ✦ Scoped Out
No other (non-solar PV) renewable energy is in use.		
This credit was scoped out	No other (non-solar PV) renewable energy is in use.	

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IEQ Overall contribution 16.5%

		Minimum required 50%	50%	✓ Pass
1.4 Daylight Access - Non-Residential			42%	✓ Achieved
Score Contribution	This credit contributes 35.3% towards the category score.			
Criteria	What % of the nominated floor area has at least 2% daylight factor?			
Question	Percentage Achieved?			
Public building	42 %			
2.3 Ventilation - Non-Residential			33%	✓ Achieved
Score Contribution	This credit contributes 35.3% towards the category score.			
Criteria	What % of the regular use areas are effectively naturally ventilated?			
Question	Percentage Achieved?			
Public building	-			
Criteria	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2:2012?			
Question	Percentage Achieved?			
Public building	50 %			
Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?			
Question	Value			
Public building	-			
3.4 Thermal comfort - Shading - Non-Residential			100%	
Score Contribution	This credit contributes 17.6% 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	100 %			
3.5 Thermal Comfort - Ceiling Fans - Non-Residential			0%	
Score Contribution	This credit contributes 5.9% towards the category score.			
Criteria	What percentage of regular use areas in tenancies have ceiling fans?			
Question	Percentage Achieved?			
Public building	-			
4.1 Air Quality - Non-Residential			100%	
Score Contribution	This credit contributes 5.9% towards the category score.			

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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	Yes

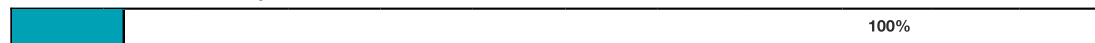
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Transport Overall contribution 9.0%

		62%
1.4 Bicycle Parking - Non-Residential		100%
Score Contribution	This credit contributes 25% 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 12.5% 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	2	
1.6 End of Trip Facilities - Non-Residential		0%
Score Contribution	This credit contributes 12.5% 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 25% towards the category score.	
Criteria	Are facilities provided for the charging of electric vehicles?	
Question	Criteria Achieved ?	
Project	Yes	
2.2 Car Share Scheme		N/A ✦ Scoped Out
		n/a

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This credit was scoped out	n/a
2.3 Motorbikes / Mopeds	0%
Score Contribution	This credit contributes 25% 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 & Resource Recovery Overall contribution 5.5%

1.1 Construction Waste - Building Re-Use	N/A	✚ Scoped Out
Undeveloped site		
This credit was scoped out	Undeveloped site	
2.1 Operational Waste - Food & Garden Waste		100%
Score Contribution	This credit contributes 50% 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% 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	

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Urban Ecology Overall contribution 5.5%

	0%
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1.1 Communal Spaces		N/A	✦ Scoped Out
			n/a
This credit was scoped out	n/a		
2.1 Vegetation		0%	
Score Contribution	This credit contributes 57.1% 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	0 %		
2.2 Green Roofs		0%	
Score Contribution	This credit contributes 14.3% 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 14.3% towards the category score.		
Criteria	Does the development incorporate a green wall or green façade?		
Question	Criteria Achieved ?		
Project	No		
3.2 Food Production - Non-Residential		0%	
Score Contribution	This credit contributes 14.3% towards the category score.		
Criteria	What area of space per occupant is dedicated to food production?		
Question	Food Production Area		
Public building	-		
Output	Min Food Production Area		
Public building	21 m²		

Innovation Overall contribution 9.0%

	0%
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1.1 Innovation		0%
Score Contribution	This credit contributes 100% towards the category score.	
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?	

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