



ecoresults

Clause 55.05 Sustainability Report

Report No: 2024-3739-55.05

Date: 8 December 2025

Address: 88-90 Brook St, Sunbury VIC 3419

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Clause 55.05

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	Date	Issue	Description	Consultant
Tracking	21 August 2025	1	Original report issue	MS
	8 December 2025	2	Update to WSUD	MS

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Project details

Project details	Property address	88-90 Brook St, Sunbury VIC 3429
	Project description	8 x 3 Storey Townhouses
	Council	Hume City Council
	Site area	1,210m ²
	Drawings assessed	Plans prepared by Draft Comp Services dated 19 May 2025

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Purpose and scope of report

- EcoResults has been engaged as Environmentally Sustainable Design (ESD) consultants for the proposed development to ensure that the development adequately responds to the Hume City Council Planning Scheme Clause 55.05 (Sustainability).
- The purpose of this report is to detail how the proposed design and operation of the building, as detailed in the planning drawings and our comments and recommendations listed in this herein, satisfies the clause. As noted in each sub-clause section below, some standards are addressed in detail by EcoResults while others will require the project team to address.
- EcoResults has consulted extensively with the designer, planning consultant and other relevant sub-consultants on how best to incorporate sustainability principles in the proposed design, and to comply with the current benchmarks required.
- Sustainability outcomes have been assessed using the following benchmarking tools:
 - **Stormwater Quality:** Blue Factor
- Our assessment shows that the proposed development meets current best practice for ESD.
- This report should be attached to and read in conjunction with the town planning drawings. This report should be attached to and read in conjunction with the town planning drawings. Compliance statements and recommendations are based on the assessed drawings. See project details box above for details of the drawings assessed
- Images depicting the standards are copyright the State of Victoria, Department of Transport and Planning.

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Clause 55.05-1 | Permeability and stormwater management

Objective

- To reduce the impact of increased stormwater run-off on the drainage system and downstream waterways.
- To facilitate on-site stormwater infiltration.
- To encourage stormwater management that maximises the retention and reuse of stormwater.
- To contribute to urban cooling.

Standard B5-1

- The site area covered by the pervious surfaces is at least 20 percent of the site.
 - **This report includes a pervious surface assessment to show compliance with Standard B5-1.**
- The development includes a stormwater management system designed to:
 - Meet the best practice quantitative performance objectives for stormwater quality specified in the Urban Stormwater Management Guidance (EPA Publication 1739.1, 2021) of:
 - Suspended solids 80% reduction in mean annual load.
 - Total phosphorus and Total Nitrogen 45% reduction in mean annual load.
 - Litter 70% reduction of mean annual load.
 - Note: A certificate generated from a stormwater assessment tool including Stormwater Treatment Objective - Relative Measurement (STORM), Model for Urban Stormwater Improvement Conceptualisation (MUSIC) or an equivalent product accepted by the responsible authority may be used to demonstrate the performance objectives for stormwater quality are met.
 - **This report includes a Blue Factor rating which shows compliance with Standard B5-1.**
- Direct flows of stormwater into treatment areas, garden areas, tree pits and permeable surfaces, with drainage of residual flows to the legal point of discharge.
 - **The majority of runoff from impermeable areas is directed to treatment measures with residual flows to the LPD.**

Decision guidelines

- Before deciding on an application, the responsible authority must consider:
 - The design response.
 - The capacity of the site to incorporate stormwater retention and reuse.
 - The existing site coverage and any constraints imposed by existing development.
 - The capacity of the drainage network to accommodate additional stormwater.

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Pervious surface assessment

- Standard B5-1 requires that at least 20 percent of the site area must consist of pervious surfaces to support site permeability and reduce stormwater runoff
- Permeability is calculated as the total pervious area multiplied by 100 divided by total site area.
- Water cannot penetrate an impervious surface. An impervious surface includes a dwelling, a small second dwelling, a garage or carport, a verandah, a garden shed, a path, a swimming pool, outdoor paved areas, a driveway or any other sealed surface.
- At least 20 per cent of the site should have surfaces that can allow penetration of water to deep soil such as garden beds, lawn and other unsealed surfaces. This can include driveways, pathways and outdoor entertaining areas, provided the materials used for their construction are pervious.
 - Total site area = 1,210 m²
 - Total pervious surface area = 280 m²
 - Percentage of site as pervious surface = 23%
 - Compliance status: Complies



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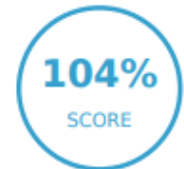
Stormwater quality | Blue Factor rating

To comply with the permeability and stormwater management objectives outlined in Standard B5-1 within Clause 55.05-1 a Blue Factor assessment has been conducted. This includes proposed stormwater quality/treatment measures in order to achieve a compliant score.

A compliant STORM assessment meets the current best practice performance objectives for stormwater quality as contained in the Urban Management Guidance. See below for the results and required treatment measures.

Copy of 2024-3739 | 88-90 Brook St Sunbury

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	Copy of 2024-3739 88-90 Brook St Sunbury
Street address	88-90 Brook St, Sunbury VIC 3429, Australia
Municipality	Hume
Site area	1210 m ²
Planning Number	P25582

Flow and pollutant load reductions

Item	Result	Target
Mean annual runoff volume harvested or evapotranspired (%)	37%	>28%
Mean annual runoff volume infiltrated or filtered (%)	0%	>9%
Total suspended solids (%)	50%	>80%
Total phosphorus (%)	47%	>45%
Total nitrogen (%)	47%	>45%
Total gross pollutants (%)	52%	>70%

Compliance statement







- The project score of 104% means that the proposed development meets the standard that is considered best environmental practice for Blue Factor. See schedule below for stormwater management measures required to achieve this score.
- Plans and design details to be shown on plans by designer. See below for more information and contact EcoResults with any queries on compliance.
- For the development to achieve the Blue Factor score listed, it must be constructed according to the town planning drawings as well as the specifications outlined in the WSUD measures below.

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Markup of impermeable surface areas



WSUD Legend

-  Water tank 2500 litre
-  Treated roof area to water tanks
Connected to toilet flushing to each unit
-  Roof untreated
Method of discharge to LPD through selected method of detention design
-  Paving untreated
Method of discharge to LPD through selected method of detention design
-  Paving treated
100mm freeboard raingarden with minimum area of 2.5m²
-  Raingarden 2.5m² collecting water from gravity fed pit
Overflow to discharge via pump to pit/LPD detention system
-  Terraces

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Stormwater quality requirements to achieve Blue Factor score

Stormwater quality requirements

- Runoff from each of the dwelling roofs to be diverted to a 2,500L rainwater tank per dwelling dedicated to reuse
 - The tanks are to be connected to the toilet flushing of all toilets in the dwellings and garden irrigation as needed
 - Tank(s) and any associated filtration to be specified by civil/services engineer so as to be appropriate for the intended usage of harvested water
 - Ensure that selected fittings and appliances are suitable for the Rainwater/filtration system specified
 - The tank may be connected to other uses, e.g. outdoor taps, laundry etc, but this is not required to achieve the Blue Factor score
 - The tank capacity may be achieved by installing several independent tanks as long as they are connected to operate in series as if they were one tank
- Partial driveway runoff [131m²] to be diverted to a 100mm freeboard raingarden with a minimum plan area of 2.5m²
- The detailed, site specific design of stormwater quality measures should be undertaken by a suitably qualified person

Note:

- Refer to maintenance program for stormwater quality measures below
- All areas measured in Blue Factor are in a horizontal plan and open to sky
- Refer to architectural set for WSUD layout plan

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Rainwater tanks

- The project’s hydraulic/services engineers will be responsible for the design of the tanks and rainwater reticulation, shall inform the building facility manager and/or owners corporation in writing, of the required maintenance tasks to keep the system operational including:
 - Regular inspections of the tank(s), pump(s), reticulation system and toilets to ensure that the system is operating for toilet flushing as designed
 - Periodic cleaning and major maintenance of the tank(s), pump(s) and reticulation system to ensure the long term viability of the system
- The building facility manager and/or owners corporation shall include on their building maintenance schedule the required maintenance tasks specified by the hydraulic/services engineers at the required intervals.
- For further information on maintenance of stormwater quality measures refer to the Appendix below.

Raingardens

- The project’s hydraulic/civil engineers will be responsible for the design of the raingardens and the connection inlets and outlets to and from the raingarden, and shall inform the building facility manager and/or owners corporation in writing, of the required maintenance tasks to keep the system operational including:
 - Watering the raingarden if a does not rain for a long period of time until plants have established compliance with local water restrictions
 - Regular inspections of the raingarden, level of gravel mulch covering the raingarden, blockages in the overflow pipe, sediments in the downpipes, weeds and plant erosion in the raingarden itself
 - Other required activities as specified by the suitably qualified designer of the raingarden – refer to pages 2 and 3 of the attached Melbourne Water Maintenance Guidelines
 - Distribution of the water flow into the raingarden to limit erosion from heavy rainfall
 - Ongoing protection from pedestrian and vehicular access
 - Owner’s Corporation (OC) bylaws to prohibit removal of all soil and plants within raingarden, and an obligation on residents to report any maintenance concerns to the OC
- The building facility manager and/or owners corporation shall include on their building maintenance schedule the required maintenance tasks specified by the hydraulic/services engineers at the required intervals.
- For further information on maintenance of stormwater quality measures refer to the Reference Information section below.

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Construction site management plan for stormwater

During the construction phase, the key pollutants at risk of entering the stormwater system include:

- Sediments (soil, sand, gravel and concrete washings); and
- Litter, debris etc

These pollutants arise from factors such as dirt from construction vehicles, stockpiles located close to surface runoff flow paths, and surface runoff from disturbed areas during earthmoving and construction works. It is therefore important to have measures in place that either prevent or minimise the pollutant loads entering the stormwater system during construction.

To mitigate the impacts of the above pollutants on the stormwater system, the following stormwater management strategies will be implemented during the construction phase, as appropriate:

- A focus on erosion management and reduction, through measures such as minimising the amount of earth destabilised at one time, retaining existing vegetation and utilising stabilisation matting etc.
- Uncontaminated stormwater will be directed away from the site using flow diversion devices to reduce the volume of stormwater that reaches the destabilised areas of the site.
- Installation of on-site sediment control measures. All installed control measures shall be regularly inspected & maintained to ensure their effectiveness.
- Litter bins with a lid will be used to prevent litter from getting blown away and entering stormwater drains

Additionally, the following work practices shall be adopted to reduce stormwater pollution:

- Site induction by the head contractor/builder to make personnel aware of stormwater management measures in place.
- Employ suitable measures to reduce mud being carried off-site into the roadways such as limiting site access to vehicles, installing a rumble grid/gravel/crushed-rock driveway (or equivalent measure) to provide clean access for delivery vehicles, manual wheel and tyre washing etc.
- Safe handling and storage of chemicals, paints, oils and other elements that could wash off-site to prevent them from entering stormwater drains.
- Where practicable, stockpiles will be covered, located within the site's fence, away from any drainage paths and up-slope of any sediment barriers.

Refer to <https://www.melbournewater.com.au/building-and-works/stormwater-management/options-treating-stormwater/stormwater-quality-objectives> for details of the minimum design requirements which are binding on all developments during the construction phase.

The measures presented above will reduce the pollutants entering the stormwater system from the site during construction works. The information above may be included in any broader Construction Management Plan (CMP) which is prepared for this project and can be updated to account for additional site-specific stormwater quality management requirements as needed. Furthermore, the initiatives are consistent with Standard W3 within Clause 53.18-6 of the Hume City Council Planning Scheme.

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Clause 55.05-2 | Overshadowing domestic solar energy systems

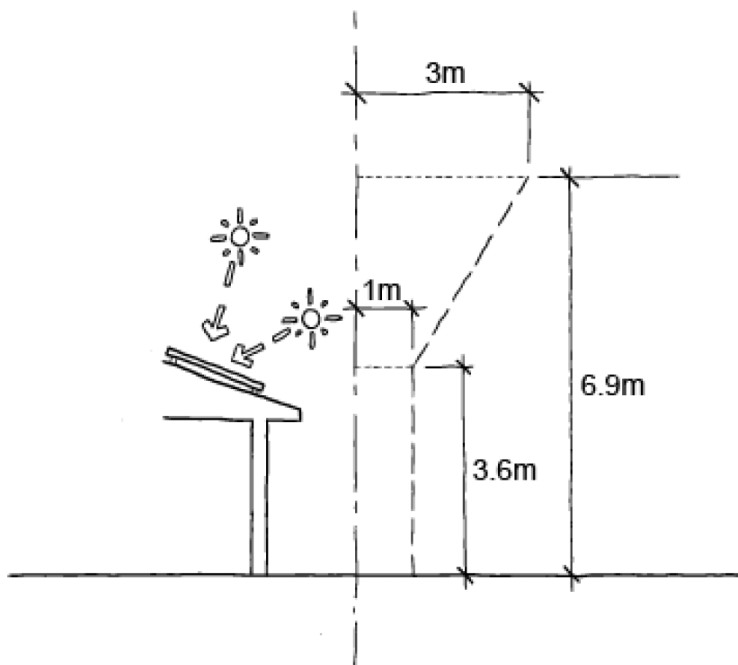
Objective

- To ensure that the height and setback of a building from a boundary allows reasonable solar access to existing domestic solar energy systems on the roofs of buildings.

Standard B5-2

- Any part of a new building that will reduce the sunlight at any time between 9am and 4 pm on 22 September to an existing domestic solar energy system on the roof of a building on an adjoining lot be set back from the boundary to that lot by at least 1 metre at 3.6 metres above ground level, plus 0.3 metres for every metre of building height over 3.6 metres up to 6.9 metres, plus 1 metre for every metre of height over 6.9 metres.

New building setback from the boundary of an existing domestic solar energy system on the roof of a building on an adjoining lot



- This standard applies to an existing building in a Township Zone, General Residential Zone or Neighbourhood Residential Zone.
- In Clause 55.05-2 domestic solar energy system means a domestic solar energy system that existed at the date the application was lodged.
 - Based on satellite imagery dated Sep 2024 for the proposed site, solar energy systems are not currently present on the neighboring dwellings. Based on the available information, the proposed townhouse setbacks on assessed drawings are in compliance with this standard.

Decision guidelines

- Before deciding on an application, the responsible authority must consider whether the domestic solar energy system has been sited to optimise efficiency and protection from overshadowing.

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Clause 55.05-3 | Rooftop solar energy generation area

Objective

- To support the future installation of appropriately sited rooftop solar energy systems for a dwelling.

Standard B5-3

- In Clause 55.05-3 rooftop solar energy area means an area provided on the roof of a dwelling to enable the future installation of a solar energy system.
- An area on the roof is capable of siting a rooftop solar energy area for each dwelling which:
 - Has a minimum dimension of 1.7 metres.
 - Has a minimum area in accordance with Table B5-3.
 - Is oriented to the north, west or east.
 - Is positioned on the top two thirds of a pitched roof.
 - Can be a contiguous area or multiple smaller areas.
 - Is free of obstructions on the roof of the dwelling within twice the height of each obstruction (H), measured horizontally (D) from the centre point of the base of the obstruction to the nearest point of the rooftop solar energy area.

Diagram B5-3 Allowable distance between obstructions and the rooftop solar energy area

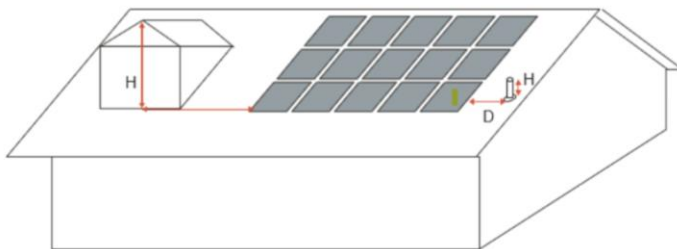


Table B5-3 Minimum rooftop solar energy generation area

Number of bedrooms	Minimum roof area
1 bedroom dwelling	15 square metres
2 or 3 bedroom dwelling	26 square metres
4 or more bedroom dwelling	34 square metres

- Obstructions located south of all points of the rooftop solar energy area are not subject to the horizontal distance requirements.
- This standard does not apply to apartments and multi-residential buildings.
 - Future rooftop solar energy generation areas have been identified in compliance with this standard as shown on the assessed plans dated 19.05.2025.

Decision guidelines

- Before deciding on an application, the responsible authority must consider:
 - The design response.
 - The size and orientation of the building.
 - The availability of solar access to the rooftop.
 - The extent to which the rooftop solar energy generation area is overshadowed by existing buildings, other permanent structures or equipment.

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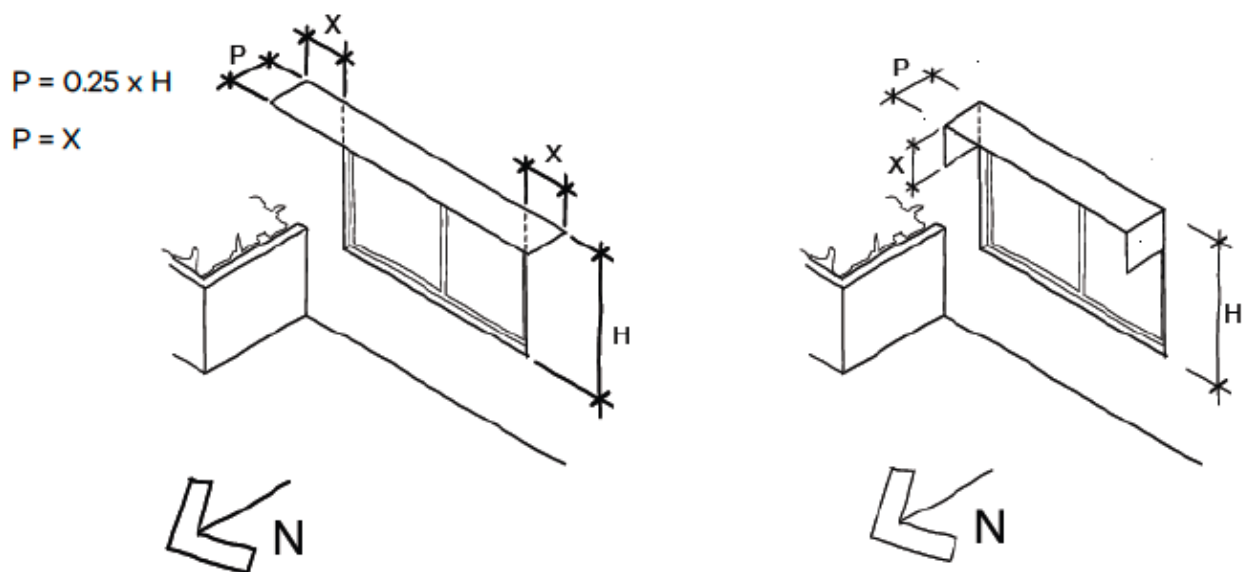
Clause 55.05-4 | Solar protection to new north-facing windows

Objective

- To encourage external shading of north facing windows to minimise summer heat gain.

Standard B5-4

- North facing windows are shaded by eaves, fixed horizontal shading devices or fixed awnings with a minimum horizontal depth of 0.25 times the window height.



- Shading devices to all north facing windows, in compliance with this standard, to be shown on the plans.

Decision guidelines

- Before deciding on an application, the responsible authority considers:
 - The design response.
 - The size and orientation of the lot.
 - The type and useability of external solar shading devices, including alternative design responses.

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Clause 55.05-5 | Waste and recycling objectives

Objective

- To ensure dwellings are designed to facilitate waste recycling.
- To ensure that waste and recycling facilities are accessible and are of sufficient size to manage organic and general waste, and mixed and glass recycling.
- To ensure that waste and recycling facilities are designed and managed to minimise impacts on residential amenity.

Standard B5-5

- The development includes an individual bin storage area for each dwelling, or a shared bin storage area for use by each dwelling, of at least the applicable area, depth and height specified in Table B5-5.1.

Type of bin storage area	Minimum area	Minimum depth	Minimum height
Individual bin storage area for a dwelling.	1.8 square metres	0.8 metre	1.8 metres
Shared bin storage area for 3 dwellings or less.	5.4 square metres	0.8 metre	1.8 metres
Shared bin storage area for 4 or more dwellings.	1 square metre per dwelling plus 4 square metres	0.8 metre	1.8 metres

- Bin storage areas, in compliance with this standard, are shown on the plans within the garage of each dwelling.

Decision guidelines

- Before deciding on an application, the responsible authority must consider:
 - The design response, including a Waste Management Plan.
 - The guidelines for the Low Rise and Medium Density code, by the Department of Transport and Planning, note that demonstrating compliance with the standard can be supported with a waste management plan (WMP) if required.
 - A WMP provides a clear method for storage, collection, and disposal of household waste and recyclables. In addition, a WMP can also incorporate management of eWaste and hard waste.
- Any relevant waste and recycling objective, policy or statement set out in this planning scheme.
- The functionality and accessibility of waste and recycling facilities, including for people with limited mobility.
- Whether facilities are provided for on-site reuse or management of food and garden organics through composting or other waste recovery.

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- Whether waste and recycling facilities are designed to meet the better practice design options specified in Waste management and recycling in multi-unit developments (Sustainability Victoria, 2019).

Clause 55.05-6 | Noise impacts

Objectives

- To minimise the impact of mechanical plant noise located in the development.

Standard B5-6

- Mechanical plant, including mechanical car storage and lift facilities are not located immediately adjacent to bedrooms of new or existing dwellings or small second dwellings, unless a solid barrier is in place to provide a line-of-sight barrier to transmission of noise and the location of all relevant bedrooms.
 - **No mechanical plant currently proposed on the plans. If any mechanical systems are proposed, EcoResults can assess this for compliance.**

Decision guidelines

- Before deciding on an application, the responsible authority must consider:
 - The design response.
 - Whether the impact of potential noise sources within a development have been mitigated through design, location and siting.
 - Whether an alternative design meets the relevant objectives having regard to the amenity of the dwelling or small second dwelling and the site context.

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Clause 55.05-7 | Energy efficiency for apartment developments

Objectives

- To achieve energy efficient dwellings and buildings.
- To ensure dwellings achieve adequate thermal efficiency.

Standard B5-7

- Dwellings in or forming part of an apartment development located in a climate zone identified in Table B5-7 do not exceed the maximum NatHERS annual cooling load.
 - **N/A to townhouse developments.**

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Conclusion

Our sustainable building consultants have found that:

- The proposal has met the benchmarks set out by the Blue Factor assessment tools.
- The development will meet the objectives and application requirements of the Hume City Council Clauses 55.05 Sustainability if it is constructed in accordance with the application drawings and the measures detailed in this Memo.

Appendix

- Melbourne Water Rainwater Tank Fact Sheet (2 pages)
- Raingarden Fact Sheet (8 pages)
- Blue Factor Report (5 pages)

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INSTRUCTION SHEET

Building an inground raingarden

What is an inground raingarden?

Building a raingarden is a simple way to help the environment and the health of our local waterways while providing a self-watering garden for your backyard.

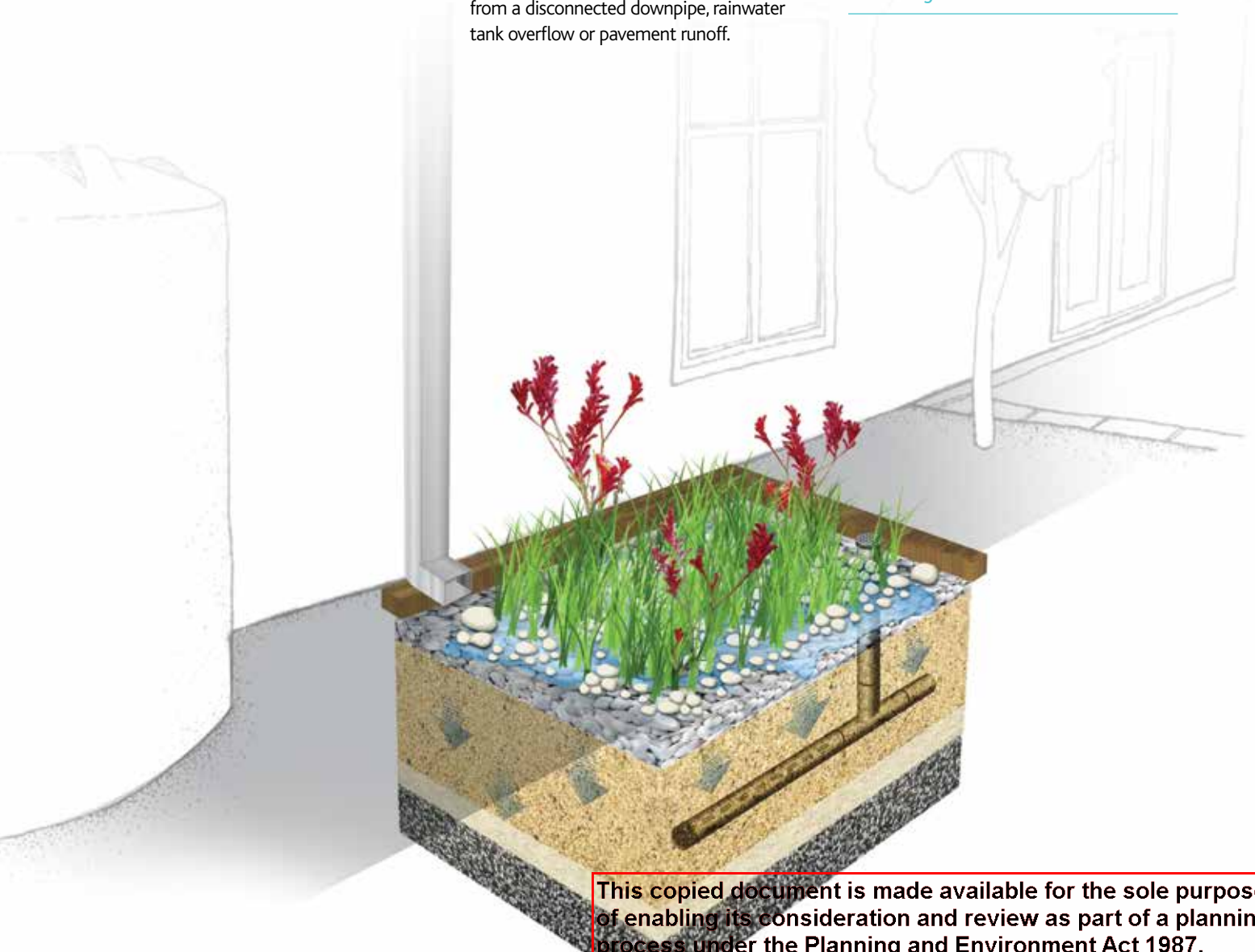
A raingarden is a specially prepared garden designed to receive and filter rain run-off from roofs or hard surfaces such as driveways or paving.

Featuring layers of soil for filtration, gravel for drainage, and plants that can tolerate periods without rain, a raingarden helps to protect our streams and rivers from stormwater pollutants.

With a slotted pipe beneath the soil to take away the filtered rainwater and an overflow pipe on the surface to prevent flooding, raingardens are designed to collect water from a disconnected downpipe, rainwater tank overflow or pavement runoff.

Please note: A certified plumber must be used for stormwater connections and modifications.

Did you know that a raingarden is only wet during and immediately after rain, leaving it dry most of the time? This is due to the drainage and filtration properties of the soil combination used in the raingarden.



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Building your raingarden

Step 1 – getting started

Location

Build your raingarden as close as possible to the water source – whether it is a downpipe, rainwater tank overflow, paved area or driveway. This will help minimise the additional plumbing needed to bring water to the raingarden.

Table 1 sets out how far away your raingarden needs to be from your house depending on how deep your existing foundations are. A minimum distance of 300mm from your house is recommended.

Ensure when digging near your foundations not to disturb areas directly underneath the foundations and area as shown below – ‘no dig zone’.

Handy Hint - Avoid building your raingarden underneath large trees as the root system will interfere with your excavations. As a general rule, the root zone will extend out to the edge of the tree canopy.

Having decided on a location, it is important to determine the depth of the existing underground stormwater pipe to make sure your raingarden is connected properly. Your local plumber can help with this and also how and when to disconnect your downpipe so that the area doesn't flood during construction.

Stormwater reconnection

All connections or modifications to existing stormwater pipes need to be done by a licensed plumber. The plumber should ensure that pipes are reconnected into the property's stormwater and not another services such as the sewer.

Underground services

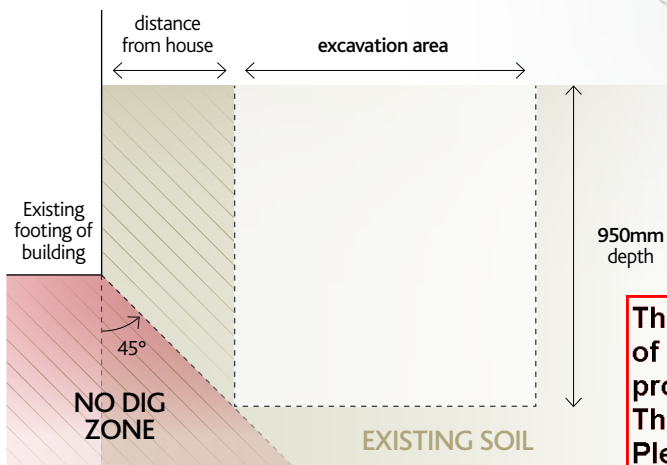
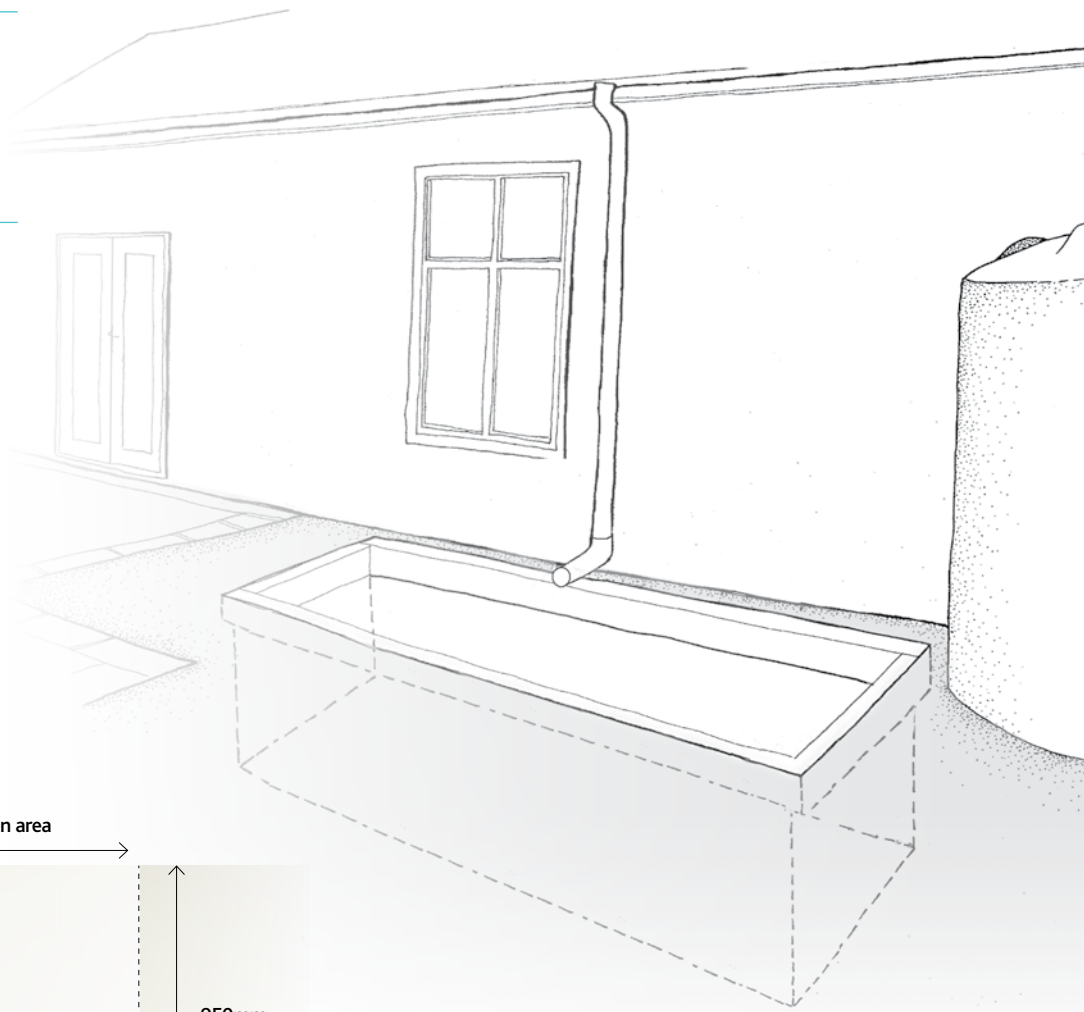
Be aware of any underground services (gas, electricity, water) that run near your house or under your garden as this will influence where you can excavate your raingarden. Raingardens should not be built over or in close proximity to a septic system.

Materials

See *Materials List* for information about what you need to build a raingarden.

Table 1 – Footing depth chart

EXISTING HOUSE FOUNDATION DEPTH	RAINGARDEN MINIMUM DISTANCE FROM FOOTING
150 mm	800 mm
250 mm	700 mm
350 mm	600 mm
450 mm	500 mm
550 mm	400 mm
650 mm	300 mm



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Size

You need to make sure that your raingarden is large enough to manage the amount of stormwater it will receive. If your raingarden is going to capture run-off from the roof via a downpipe, measure the area of roof that drains to that downpipe. Generally, the size of the raingarden should be approximately 2% of the run-off area. Table 2 will help you work out the correct size.

Table 2 – Raingarden sizing chart

AREA OF RUN-OFF (m ²)	RAINGARDEN SIZE (m ²)
50	1
100	2
150	3
200	4
250	5
300	6
350	7
400	8
450	9

Step 2 - excavation and pipe infrastructure

Excavation

Excavate your raingarden with a gentle slope towards the stormwater outlet (where the water will exit your raingarden).

Line your raingarden (base and sides) with a PVC liner. Overlap the sheets by 200mm and seal the joints with PVC tape.

Place the 7mm screenings (gravel) to a depth of 50mm. This will form a base for the slotted drainage pipe. Make sure the screenings are washed and clean of excess dirt as this can create blockages in the raingardens drainage.

Pipe Infrastructure

Lay a 90mm diameter slotted drainage pipe horizontally along the centre of the raingarden base and cap one end of the slotted drainage pipe. Call your plumber to connect the drainage pipe back into the property's existing stormwater.

Handy Hint – If your raingarden is greater than 4m wide, you will need to install two slotted drainage pipes and two overflow pipes. These need to be evenly spaced across the raingarden base to provide adequate drainage.

Connect the vertical 90mm diameter overflow pipe into the slotted drainage pipe using a 90 degree elbow pipe and seal. When the raingarden is finished, the top of the overflow pipe should sit 100mm above the gravel mulch and 100mm below the surrounding ground level.

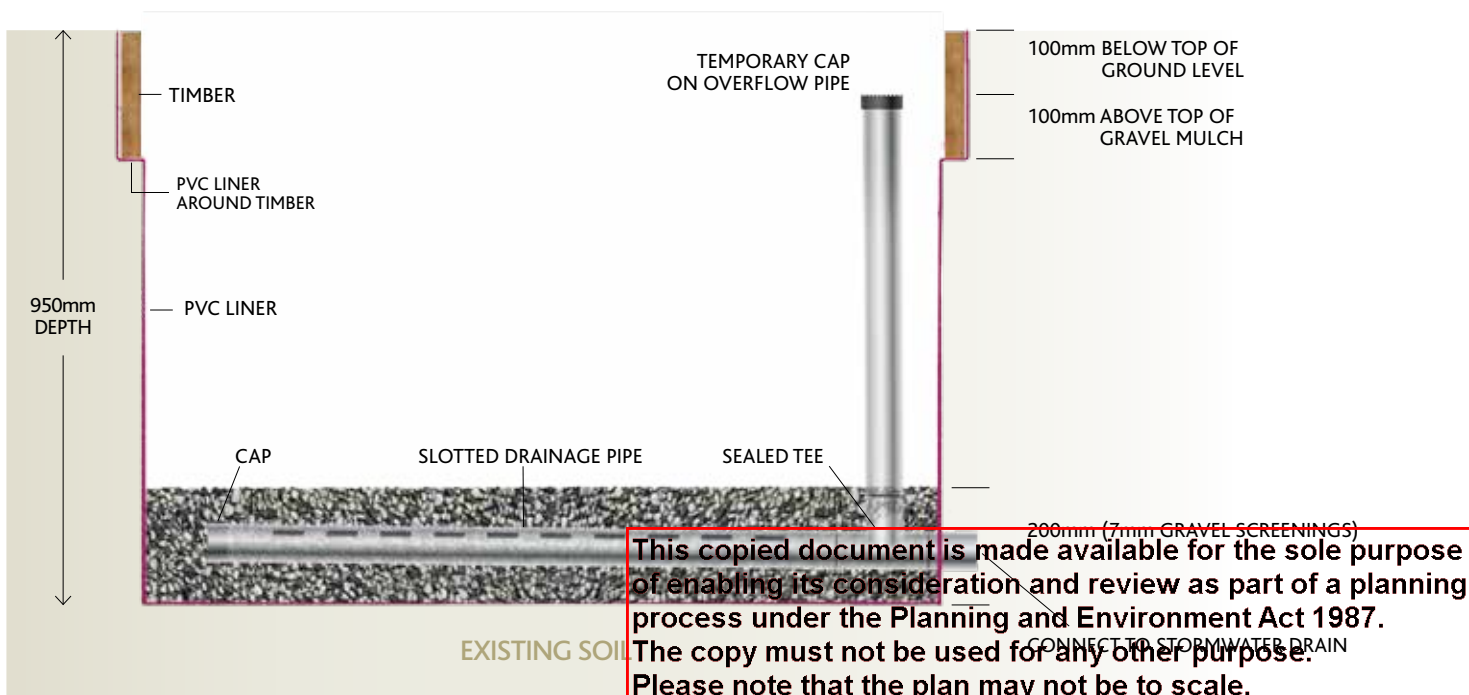
Install a temporary cap on top of the overflow pipe to prevent materials dropping into it during construction. Some plastic taped across the top of the pipe will work fine.

Frame

Install a frame to separate your raingarden from the surrounding soil. If using timber, ensure that it is no less than 50mm thick. While Class 1 or similar hardwood (200mm x 50mm) is ideal for this type of frame, you can use any material available that is a similar thickness and won't warp or bend over time.

Excavate a ledge around the top of the raingarden for the frame to rest on. The top edge of the frame needs to sit level with the surrounding ground.

Ensure that the PVC liner sits between the frame and surrounding ground. Secure the PVC liner to the frame to prevent surrounding soil entering the raingarden.



Building your raingarden

Step 3 – soil layers

Screenings layer

Add 7mm screenings (gravel) to a depth of 150mm over the slotted drainage pipe in the base of your raingarden. This brings to total depth of screenings (gravel) to 200mm. Be careful when not to dislodge or damage the slotted drainage pipe when adding the additional screenings.

Sand layer

Place white washed sand to a depth of 100mm over the screenings (gravel) layer.

Sand/soil mix layer

Mix 4 parts white washed sand with 1 part topsoil. Add this mix to the raingarden to a depth of 400mm.

Handy Hint – Ensure you firmly put down each layer of soil when building your raingarden to help reduce the layers from sinking.

Step 4 – pipe adjustments, plants and mulch

Pipe adjustments

Redirect your downpipe into the raingarden using pipe bends where required. If possible, use two 45 degree bends connected together as this will provide a much gentler and more even flow of water, reducing the risk of erosion and prevent blockages within the downpipe. A 90 degree elbow pipe will do as an alternative.

Handy Hint – To help prevent your raingarden from overflowing, it is important that the raingarden frame sits higher than the top of the overflow pipe.

Plants

In general, plants that grow well in a raingarden:

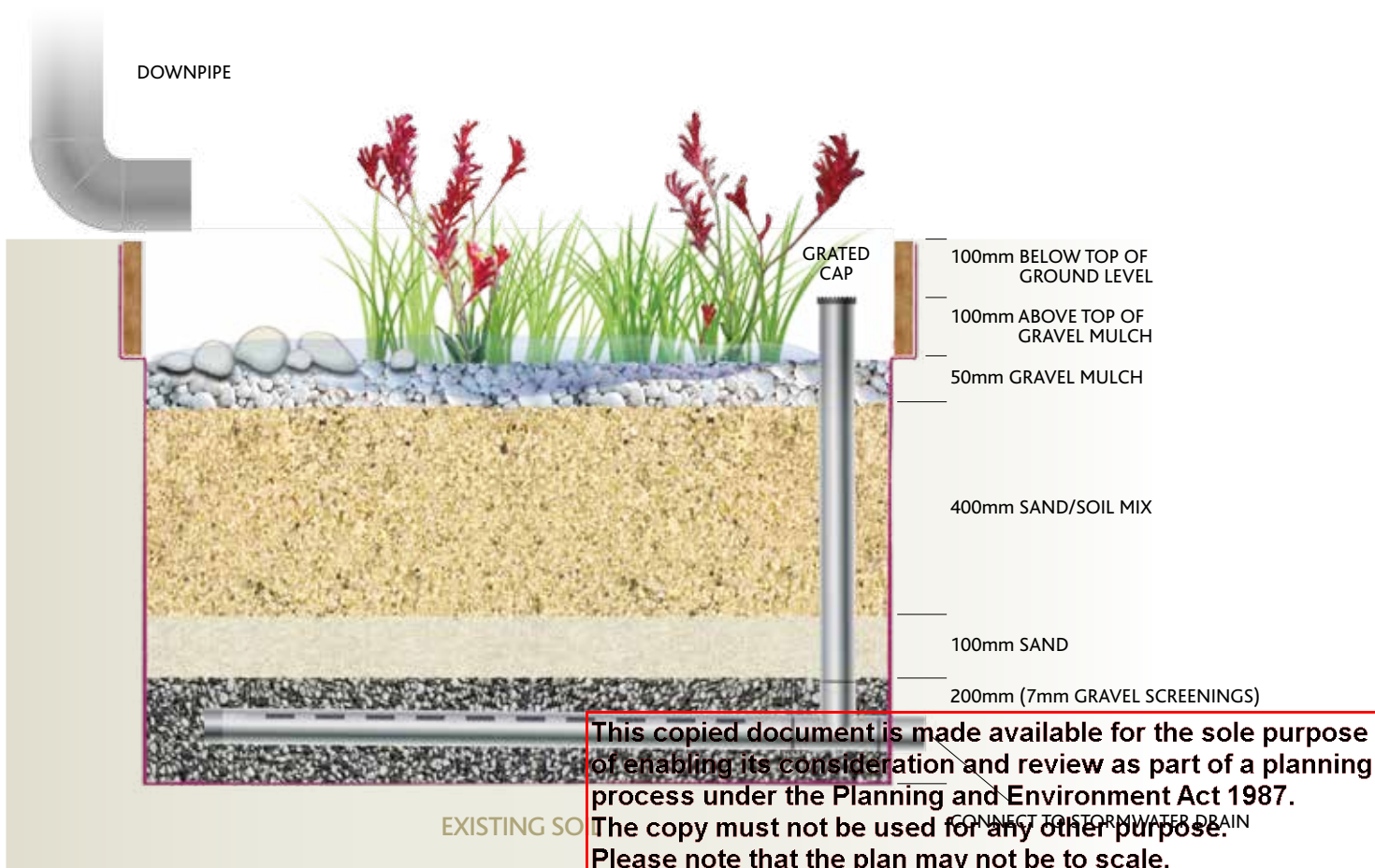
- › like dry conditions but can tolerate temporary wet periods
- › are perennial rather than annual
- › have an extensive fibrous root system.

A wide range of plants are suitable for raingardens and your local nursery will be able to guide you on what is right for your area. There are also particular plants that are really good at removing pollutants from stormwater. These include:

- › *Carex appressa*
- › *Lomandra longifolia*
- › *Juncus flavidus*
- › *Melaleuca ericifolia*
- › *Goodenia ovate*.

50% of your raingarden should be planted with these species, the other 50% can be made up of plants that like a dry environment with intermittent wet periods. It is important that the plants you select are suitable for the amount of sun and shade on your raingarden. See the *Plant List* for a suggested list of suitable raingarden plants.

Regardless of the type of plants you select, it is important to plant densely to cover the raingarden, set your plants out at roughly 6 plants per m². So for a 2m² raingarden, you will need to buy 12 plants. Now start planting.



Looking after your raingarden

Mulch

Spread gravel mulch to a depth of 50mm around the plants.

To allow the spread of water gently over the raingarden, place some large flat rocks where water flows from the downpipe. Place smaller rocks in between the large rocks to fill the gaps and help prevent erosion. Alternatively a flow spreading device can be fitted to the downpipe.

Remove the temporary end cap from overflow pipe and replace with a 90mm PVC finishing collar and domed pipe grate.

Water the plants in – complying with your local water restrictions.

Need help?

If you have questions about building a raingarden, your landscape gardener or local plumber may be able to help. For more information visit melbournewater.com.au/raingardens

Once established, raingardens are low maintenance especially when planted with native plant species. They don't need to be watered, mowed or fertilised. However, a few simple tips can help your raingarden mature and function well.

- › Gravel mulch will help retain moisture in your raingarden and prevent weeds from growing.
- › Ensure that the overflow is never blocked.
- › Remove any sediment or build up from the downpipe.
- › Some weeding may need to take place until plants have matured.
- › Evenly distribute water flow into your garden to limit erosion from heavy rainfall. Strategically placed rocks may help with this.

- › Inspect your garden regularly – replace plants and repair erosion when necessary.
- › Driving over or squashing your raingarden will affect its ability to work efficiently.
- › Avoid using organic (timber) mulch as this will float in the raingarden and may cause blockages.

Note – If necessary, water your raingarden until your plants have established in compliance with your local water restrictions.



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Materials List – what you need to build your raingarden

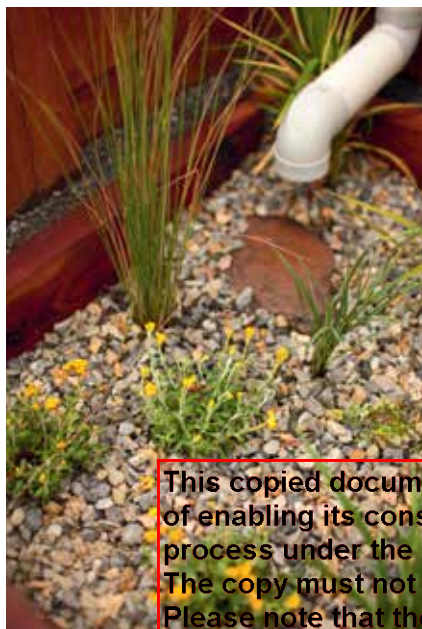
Table 3 details the materials required to create a 2m² raingarden. While item prices may vary depending on the materials you select, building a 2m² raingarden is likely to cost between \$400 and \$500 (plus the cost of a plumber).

Table 3 – Raingarden materials list

QUANTITY	MATERIAL
6 l/m	200mmx50mm Class 1 hardwood sleepers
2 l/m	90mm diametre slotted drainage pipe (Ag Pipe)
2 l/m	90mm diametre uPVC pipe*
0.4m ³	7mm screenings
0.85m ³	Sand (white washed)
0.15m ³	Topsoil
12	Plants (150mm pots)
0.1m ³	Gravel mulch
1	90mm diametre uPVC 90 degree bend or 2x 45 degree bends
1	PVC grate 90mm finishing collar
1	PVC 90mm diametre domed pipe grate
1	PVC 90mm tee
1	PVC 90mm cap
10m ²	PVC liner
	PVC tape

*Costs per square meter will depend on the length of connections back to the existing stormwater drain.

l/m = lineal metres m² = square metres m³ = cubic metres mm = millimetres



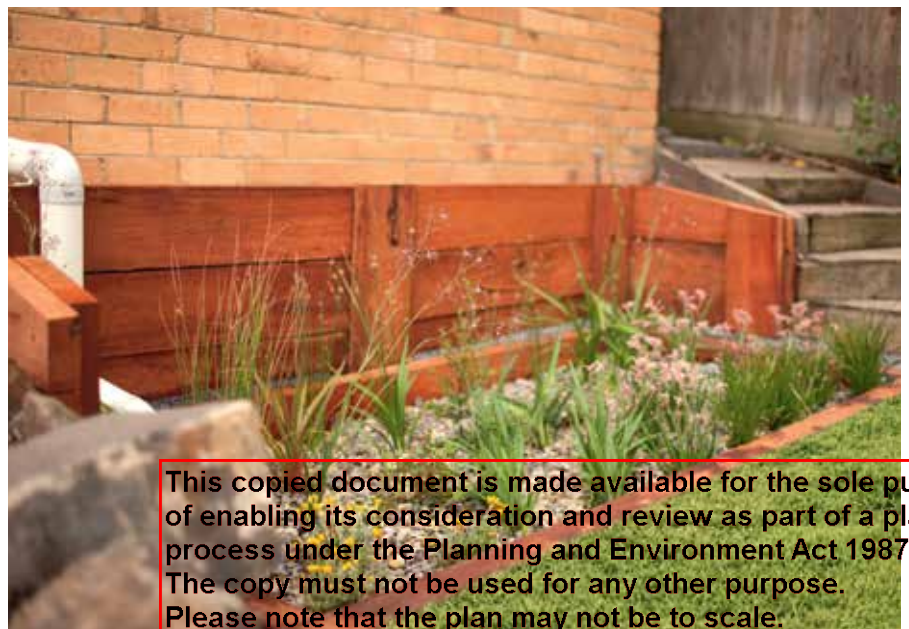
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Plant List – the best plants for your raingarden

The following plants grow well in raingardens.

Table 4 – Raingarden plant list

BOTANICAL NAME	COMMON NAME	CONDITIONS	SIZE (H x W) (cm)
<i>Anigozanthos sp.</i>	Kangaroo paw	Full sun	30-90 x 100-120
<i>Blechnum nudum</i>	Fishbone Water-fern	Full sun to partial shade	50-100 x 40-80
<i>Calocephalus lacteus</i>	Milky Beauty-heads	Full sun to partial shade	15-30 x 10-30
<i>Carex Appressa</i>	Tall Sedge	Full sun to partial shade	80-100 x 120
<i>Carpobrotus modestus</i>	Pigface	Full sun	20cm high and spreading
<i>Chrysocephalum apiculatum</i>	Common Everlasting	Full sun	30-90 x 10-30
<i>Derwentia perfoliata</i>	Digger's Speedwell	Full sun to partial shade	20-40 x 30-60
<i>Dianella species</i>		Full sun to partial shade	60-120 x 40-150
<i>Ficinia nodosa</i>	Knobby Club-rush	Full sun	50-150 x 60-200
<i>Juncas amabilis</i>	Hollow Rush	Full sun to partial shade	20-120 x 20-50
<i>Juncas flavidus</i>	Yellow Rush	Full sun to partial shade	40-120 x 20-100
<i>Leucaphyta brownii</i>	Cushion Bush	Full sun, salt tolerant	100 x 200
<i>Lomandra species</i>		Full sun to partial shade	60-120 x 50-100
<i>Melaleuca ericifolia</i>	Swamp paperback	Full sun to partial shade	4m high x 3m wide
<i>Myoporum parvifolium</i>	Creeping Boobiolla	Full sun	20-30 x 300
<i>Patersonia occidentalis</i>	Native iris	Sun to partial shade	20-40 x 30-60
<i>Pratia perdunculata</i>	Matter Pratia	Partial shade	50-150 x 1.8-5
<i>Wahlenbergia communis</i>	Tufted Bluebell	Full sun	15-50 x 15



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Rainwater Tanks



Stormwater Sensitive Homes

How does a rainwater tank help protect our local streams?

Most people install a rainwater tank primarily to harvest stormwater from their roof and conserve their mains water use. In addition to conserving water, a rainwater tank also helps treat stormwater and protect local streams from high storm flows by reducing the volume of stormwater and quantity of pollutants coming from a house block that would otherwise be delivered to the local stream.

What do I use my tank water for?

Garden irrigation, laundry and toilet flushing consume much of our home water use. In most cases these uses do not require the water to be of drinking quality standard that is provided by mains water. By plumbing your rainwater tank to your toilet or laundry and substituting these mains water needs with the rainwater harvested from your roof, you can conserve mains water whilst reducing the amount of stormwater that enters our streams.



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Why can't I use my rainwater tank for my garden alone?

So that your tank is not too full to collect rainwater when it rains, you need to be consistently using your tank water all year round.

If tank water is used for your garden alone, your tank will remain full and unused during the winter months when your garden does not require watering. With a full tank, your capacity to capture and store the regular winter rainfall and thus benefit the local waterway is significantly reduced.

By plumbing your rainwater tank to your toilet or laundry, your tank water is used consistently all year round allowing rainfall to refill the tank more often especially in winter. This ultimately reduces the volume of stormwater that is delivered to the stream and the quantity of pollutants that are washed with it.

The Victorian Government has recognised the importance of plumbing your tank to your toilet and offers a cash rebate for the installation of connected rainwater tanks (www.dse.vic.gov.au). In addition, a 5 star energy standard has been introduced that requires a connected 2000Lt rainwater tank or solar hot water service to be installed in all new houses and apartments (class 1 and 2 buildings). (www.buildingcommission.com.au).

How do I choose a rainwater tank?

The most important thing to consider when choosing a rainwater tank is to first identify what you want from your rainwater tank. The size and type of rainwater tank you choose will vary depending on your homes water needs and the reliability you seek from your rainwater tank supply. There are a number of factors that may influence this and the following questions should be considered when planning your tank installation:

- what is the water demand of your home?
- how many people are living in your home?
- what is your intended use of rainwater?
- what reliability do you want from your tank?
- what is the total area of roof draining into your tank?
- what is average rainfall of your area?
- do you need extras like a pressure pump, the ability to top up your tank with drinking water, a backflow prevention device or a first flush device?
- are the materials used on your roof suitable to collect rainwater?
- are there physical constraints of your property that may influence the type of rainwater tank you need?

Once you know how much water you can collect and how much water you are going to use then a tank size can be selected to provide the reliability of water supply that you need.

Types of rainwater tanks

Rainwater tanks come in a variety of materials, shapes and sizes and can be incorporated into building design so they don't impact on the aesthetics of the development. They can be located above ground, underground, under the house or can even be incorporated into fences or walls.

There are three main tank systems to consider and a variety of materials to choose from. Features of these are outlined below and in the pictures above:

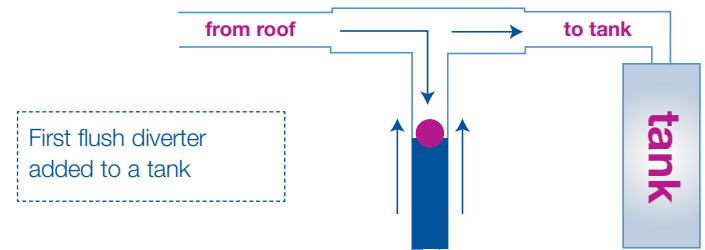
Tank systems:

Gravity Systems - rely on gravity to supply rainwater to the household and the garden by placing the tank on a stand at height.

Dual Supply Systems - top your rainwater tank with mains water when tank level is low ensuring reliable water supply.

Pressure Systems - use a pump to deliver rainwater to household and garden fixtures.

To reduce the amount of sediment and debris entering a tank, mesh screens and 'first flush diverters' can be fitted. A screen will filter large debris such as leaves and sticks while 'first flush diverters' store the 'first flush' of the rainfall that carries the sediment and other pollutants initially washed from your roof (see figure below).



Costs & rebates

Costs of installing a tank vary however a standard 2000Lt tank or bladder will cost around \$1000.

Additional plumbing and/ or.....

- Above ground tanks cost approximately \$250 for a 500 litre tank.
- Below ground tanks cost between \$300-\$600 per 1000 litres of storage
- The costs of pumps start from \$200.

Additional plumbing and/or excavation costs vary on intended use, pipe layout, materials and site accessibility.

The Victorian Government offers a total rebate of \$300 for the installation of a rainwater tank that is plumbed to toilet and connected by a licensed plumber. For further details refer to the Department of Sustainability and Environment website www.dse.vic.gov.au.

For more information:

Melbourne Water's Water Sensitive Urban Design Website:
www.wsud.melbournewater.com.au

Municipal Association of Victoria Clearwater Program:
www.clearwater.asn.au

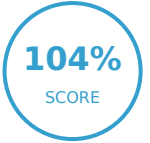
Water Sensitive Urban Design in the Sydney Region: www.wsud.org

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Urban Stormwater Best Practice Environmental Management Guidelines, Victorian Government, 2005.
Delivering Water Sensitive Urban Design: Final Report of Clean Stormwater - a planning framework, ABM, 2004.

Copy of 2024-3739 | 88-90 Brook St Sunbury

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	Copy of 2024-3739 88-90 Brook St Sunbury
Street address	88-90 Brook St, Sunbury VIC 3429, Australia
Municipality	Hume
Site area	1210 m ²
Planning Number	P25582

Flow and pollutant load reductions

Item	Result	Target
Mean annual runoff volume harvested or evapotranspired (%)	37%	>28%
Mean annual runoff volume infiltrated or filtered (%)	0%	>9%
Total suspended solids (%)	50%	>80%
Total phosphorus (%)	47%	>45%
Total nitrogen (%)	47%	>45%
Total gross pollutants (%)	52%	>70%

Water treatment

Catchments

Paving Untreated Paved, 167m²

Terraces Paved, 167m²

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Unit 1 Roof, 37.2m²

Unit 2 Roof, 43.4m²

Unit 3 Roof, 39.9m²

Unit 4 Roof, 45.1m²

Unit 5 Roof, 46.2m²

Unit 6 Roof, 39.2m²

Unit 7 Roof, 41.3m²

Unit 8 Roof, 37.1m²

Paving Treated Paved, 131m²

Roofs Untreated 107.6m²

Pervious Area Pervious (garden and lawn), 305m²

Warning: Total catchment area of 1166.9m² is 43m² below total area of 1210m²

Treatments

Rainwater Tank

Rainwater tank capacity: 1000 litres

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Rainwater Tank 2

Rainwater tank retention volume in kilolitres: 2.5

Rainwater Tank 3

Rainwater tank retention volume in kilolitres: 2.5

Rainwater Tank 4

Rainwater tank retention volume in kilolitres: 2.5

Rainwater Tank 5

Rainwater tank retention volume in kilolitres: 2.5

Rainwater Tank 6

Rainwater tank retention volume in kilolitres: 2.5

Rainwater Tank 7

Rainwater tank retention volume in kilolitres: 2.5

Rainwater Tank 8

Rainwater tank retention volume in kilolitres: 2.5

Raingarden 1 Area: 2.5 m², Extended detention depth: 0.1 m,
Submerged zone depth: 0 m, Site soil type: Clay

Buildings & dwellings

Unit 1 Residential Townhouse, 3 bedroom(s)

Unit 2 Residential Townhouse, 3 bedroom(s)

Unit 3 Residential Townhouse, 3 bedroom(s)

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Unit 4 Residential Townhouse, 3 bedroom(s)

Unit 5 Residential Townhouse, 3 bedroom(s)

Unit 6 Residential Townhouse, 3 bedroom(s)

Unit 7 Residential Townhouse, 3 bedroom(s)

Unit 8 Residential Townhouse, 3 bedroom(s)

Configuration 1

Unit 1 Roof, 37.2m²

Rainwater Tank 1

Rainwater tank retention volume in kilolitres: 2.5,

Unit 1 Residential Townhouse, 3 bedroom(s)

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Configuration 2

Unit 2 Roof, 43.4m²

Rainwater Tank 2

Rainwater tank retention volume in kilolitres: 2.5,

Unit 2 Residential Townhouse, 3 bedroom(s)

Configuration 3

Unit 3 Roof, 39.9m²

Rainwater Tank 3

Rainwater tank retention volume in kilolitres: 2.5,

Unit 3 Residential Townhouse, 3 bedroom(s)

Configuration 4

Unit 4 Roof, 45.1m²

Rainwater Tank 4

Rainwater tank retention volume in kilolitres: 2.5,

Unit 4 Residential Townhouse, 3 bedroom(s)

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Configuration 5

Unit 5 Roof, 46.2m²

Rainwater Tank 5

Rainwater tank retention volume in kilolitres: 2.5,

Unit 5 Residential Townhouse, 3 bedroom(s)

Configuration 6

Unit 6 Roof, 39.2m²

Rainwater Tank 6

Rainwater tank retention volume in kilolitres: 2.5,

Unit 6 Residential Townhouse, 3 bedroom(s)

Configuration 7

Unit 7 Roof, 41.3m²

Rainwater Tank 7

Rainwater tank retention volume in kilolitres: 2.5,

Unit 7 Residential Townhouse, 3 bedroom(s)

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Configuration 8

Unit 8 Roof, 37.1m²

Rainwater Tank 8

Rainwater tank retention volume in kilolitres: 2.5,

Unit 8 Residential Townhouse, 3 bedroom(s)

Configuration 9

Paving Treated Paved, 131m²

Raingarden 1 Area: 2.5 m²,
Extended detention depth: 0.1 m,
Submerged zone depth: 0 m, Site soil type: Clay,

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Legal statement

This Sustainable Design Assessment has been prepared in conjunction with Sustainable Design Assessment in the Planning Process (SDAPP) protocols and any required tools including ESD, Stormwater quality, Energy and/or Daylight assessment as required.

The development is assessed to achieve the stated ratings only if it is built in accordance with the specifications listed in the attached assessment tool printouts, and according to the plans provided by the designer to EcoResults. This report must be read in conjunction with all assessment tool printouts. Any variation to the design or construction of the development will deem this SDA void unless the variations are assessed by EcoResults. Please contact EcoResults if there are any questions or variations that are required.

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