BUILDING MATERIALS

Materials selection should be integrated into the design of the proposed development. The criteria for appropriate materials used are based on economic and environmental costs.

Timber

All timber used in the development will be Forest Stewardship Council (FSC) or Program for the Endorsement of Forest Certification (PEFC) certified, or recycled / reused.

Flooring

Wherever possible, flooring will be selected from products/materials certified under any of the following:

- Carpet Institute of Australia Limited, Environmental Certification Scheme (ECS) v1.2;
- Global GreenTag - https://www.globalgreentag.com/; and/or
- Good Environmental Choice (GECA).

Joinery

Where possible, joinery will be manufactured from materials/products certified under any of the following:

- Global GreenTag - https://www.globalgreentag.com/; and/or
- Good Environmental Choice (GECA); and/or
- The Institute for Market Transformation to Sustainability (MTS) Sustainable Materials Rating Technology standard Version 4.0 – SmaRT 4.0.

The use of Ecological Panel (or equivalent), which is created from 100% post-consumer recycled products, will be investigated.

Steel

Wherever possible, steel for the development will be sourced from a Responsible Steel Maker[2]. Reinforcing steel for the project will be manufactured using energy-reducing processes commonly used by large manufacturers such as Bluescope or OneSteel.

[2] 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).

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URBAN ECOLOGY

In highly urbanised environments, such as metropolitan Melbourne, it is important to recognise the importance of maintaining and increasing the health of our urban ecosystems to improve living conditions not only for the fauna but also for ourselves. We can improve our urban ecosystem by incorporating vegetation through landscaping in both new and existing developments.

Landscaping

The landscaping on-site will provide the occupants with a pleasant surrounding environment. The design will incorporate a mix of native species to help maintain local biodiversity.

Insulant ODP

All thermal insulation used in the development will not contain any ozone-depleting substances and will not use any in its manufacturing.

IMPLEMENTATION & MONITORING

The proposed development will meet the best practice requirements of the City of Cardinia through the different initiatives described in this report, such as a thermally efficient building envelope, efficient air conditioning and hot water system and sustainable materials. Appropriate implementation and monitoring of the initiatives outlined within this report will be required.

Implementation of the ESD initiatives outlined in this report requires the following processes:

- Full integration with architectural plans and specifications
- Full integration with building services, design drawings, and specifications
- Endorsement of the ESD Report with town planning drawings
- ESD initiatives to be included in plans and specifications for building approval

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APPENDIX A – WSUD REPORT / STORM ASSESSMENT

New development must comply with the best practice performance targets for suspended solids, total phosphorus and total nitrogen, as set out in the Urban Stormwater Best Practice Environmental Management Guidelines, Victoria Stormwater Committee 1999. Currently, these water quality performance targets require:

- 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.

The Stormwater Treatment Objective – Relative Measure BlueFactor, which addresses stormwater quality considerations, has been used in the development to ensure that stormwater management best-practice requirements have been met.

Site Delineation

For the purpose of the assessment, the development has been delineated into the following surface types:

- Site area of 4,009m^2;
- Part of the roof area runoff of 891m^2 which will be diverted into rainwater tank(s);
- Part of the exposed car park of at least 280m^2, which will be designed to divert towards raingardens;
- Permeable area of 2,230m^2 comprised of landscaped area and the entire exposed ground floor play area;
- Remainder of impervious areas of 608m^2 comprised of part of driveway/carpark (544m^2) and untreated roof area (64m^2).

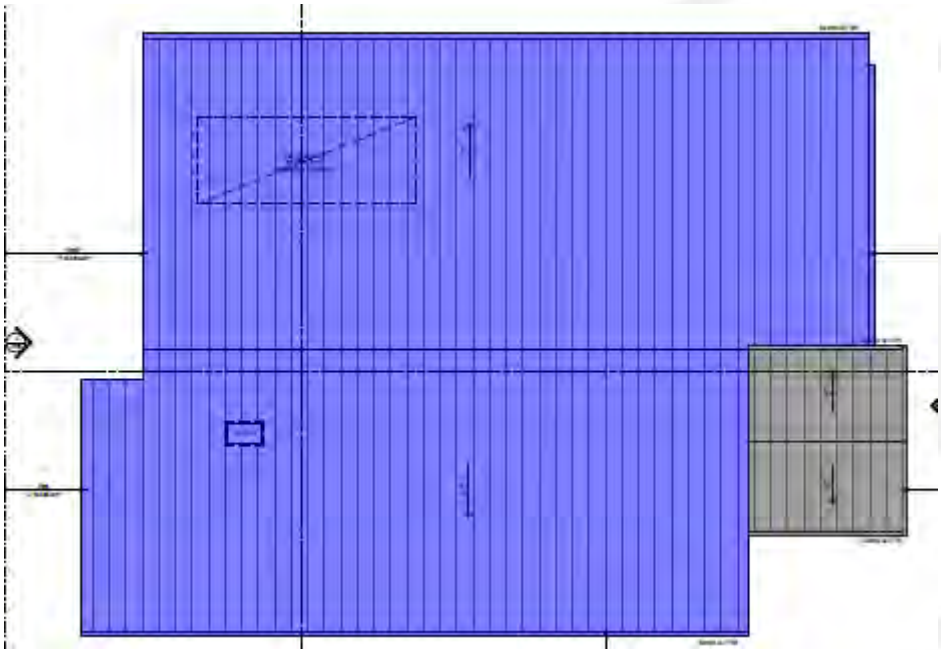

Figure 2: Roof catchment (blue) to RWTs and Untreated Rood (Grey)

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Figure 3: Roof catchment (blue) to RWTs, Part of the driveway/carpark to Raingardens (Orange) and permeable area (green)

Figure 4: Total permeable area (green)

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Stormwater initiatives

Rainwater Tank
(Rainwater tank for toilet flushing)

The roof catchment area of 891m^2 (as described above) will be diverted to rainwater tank(s) with a total effective capacity of 10,000L for the development. The rainwater collected will be used for toilet flushing in the development.

If required, a charged pipe system or multiple tanks will be installed to collect water from part of the roof of the development.

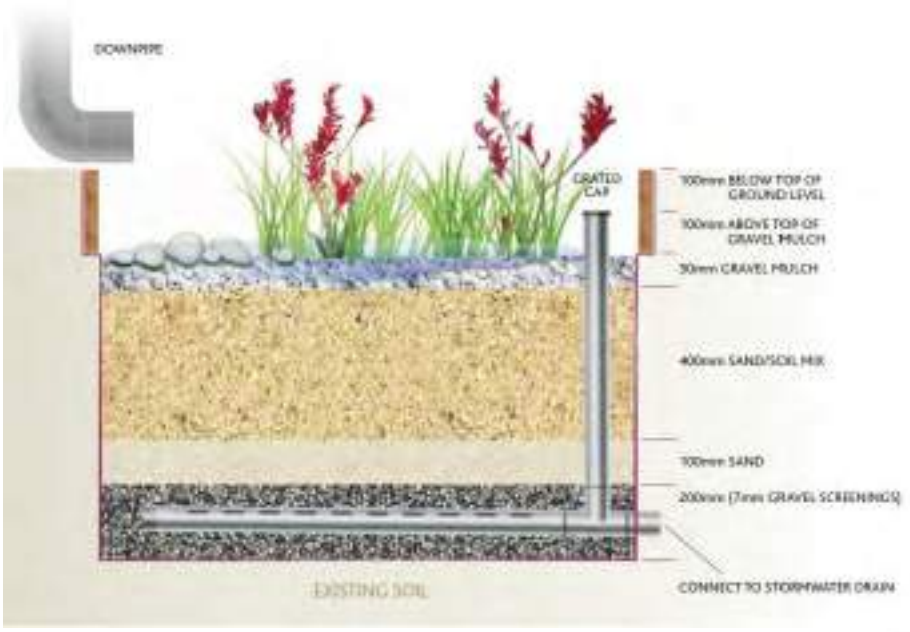
In the case of a charged pipe system, the charged pipes will not run underneath the slab. Stakeholders (builder/developer/architect) will be required to explicitly acknowledge this solution and have the capacity to install it.

Raingarden

Part of the driveway/carpark area runoff will be diverted towards a minimum of 6m^2 of raingarden before being released at the legal point of discharge.

The raingardens will be implemented within the landscaped areas adjacent to the driveway and will be installed at least 300mm away from the boundary or structural footings. The raingardens treating the driveway/carpark areas will be installed in-ground.

Outflows from the raingardens will be released at the legal point of discharge on site. The raingarden will help reduce the coarse and fine sediment levels in the outflows. For more information on how to build raingarden, please visit https://www.melbournewater.com.au/sites/default/files/INGROUND.pdf.



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The remainder of the impervious areas will be directly released at the legal point of discharge on-site.

It should be noted that permeable areas have been maximised in the development, which will reduce the overall stormwater outflows from the site. Vegetated areas are provided in the proposed development, reducing the heat island effect and improving the local habitat.

Stormwater Results

The initiatives and areas described above have been applied to the Blue Factor calculator, and the proposed development has achieved a score of 107%.

Key Assumptions

- Employee numbers based on expected child occupancy. To account for infants who are not yet toilet-trained, a factor of 0.8 is applied to children, while a factor of 0.2 is applied to staff. Consequently, the occupancy number is set at 114 children for the Blue Factor calculations.

Limitations

- Building class 9b is not available in Blue Factor. Therefore, class 5 has been selected for the blue factor as the closest available building class. Occupancy has been adjusted accordingly.

The blue factor results can be found on the following page

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Project # 45724889 - FCS 65352 - 23 Ryan Road, PAKENHAM, VIC Published V1
23 Ryan Rd, Pakenham VIC 3810, Australia
06 November 2025 10:11 a.m.

BLUE FACTOR.

FCS 65352 - 23 Ryan Road, PAKENHAM, VIC Published V1

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.

107%
SCORE

Project details

Name	FCS 65352 - 23 Ryan Road, PAKENHAM, VIC Published V1
Street address	23 Ryan Rd, Pakenham VIC 3810, Australia
Municipality	Cardinia
Site area	4009 m^2
Planning Number	

Flow and pollutant load reductions

Item	Result	Target
Mean annual runoff volume harvested or evapotranspired (%)	36%	>28%
Mean annual runoff volume infiltrated or filtered (%)	1%	>9%
Total suspended solids (%)	53%	>80%
Total phosphorus (%)	46%	>45%
Total nitrogen (%)	48%	>45%
Total gross pollutants (%)	65%	>70%

Water treatment

Catchments

Roof to RWT 891m2

Permeable area Pervious (garden and lawn), 2230m2

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Driveway to RG Paved, 280m2

Other Impervious Areas Paved, 544m2

Untreated Roof Paved, 64m2

Treatments

Rainwater Tank
Rainwater tank retention volume in kilolitres: 10

Raingarden for Driveway Area: 6 m^2,
Extended detention depth: 0.3 m, Submerged zone depth: 0.3 m,
Site soil type: Clay

Buildings & dwellings

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

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Configuration 1

Roof to RWT 891m2

Rainwater Tank
Rainwater tank retention volume in kilolitres: 10,

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

Configuration 2

Driveway to RG Paved, 280m2

Raingarden for Driveway Area: 6 m^2,
Extended detention depth: 0.3 m,
Submerged zone depth: 0.3 m, Site soil type: Clay,

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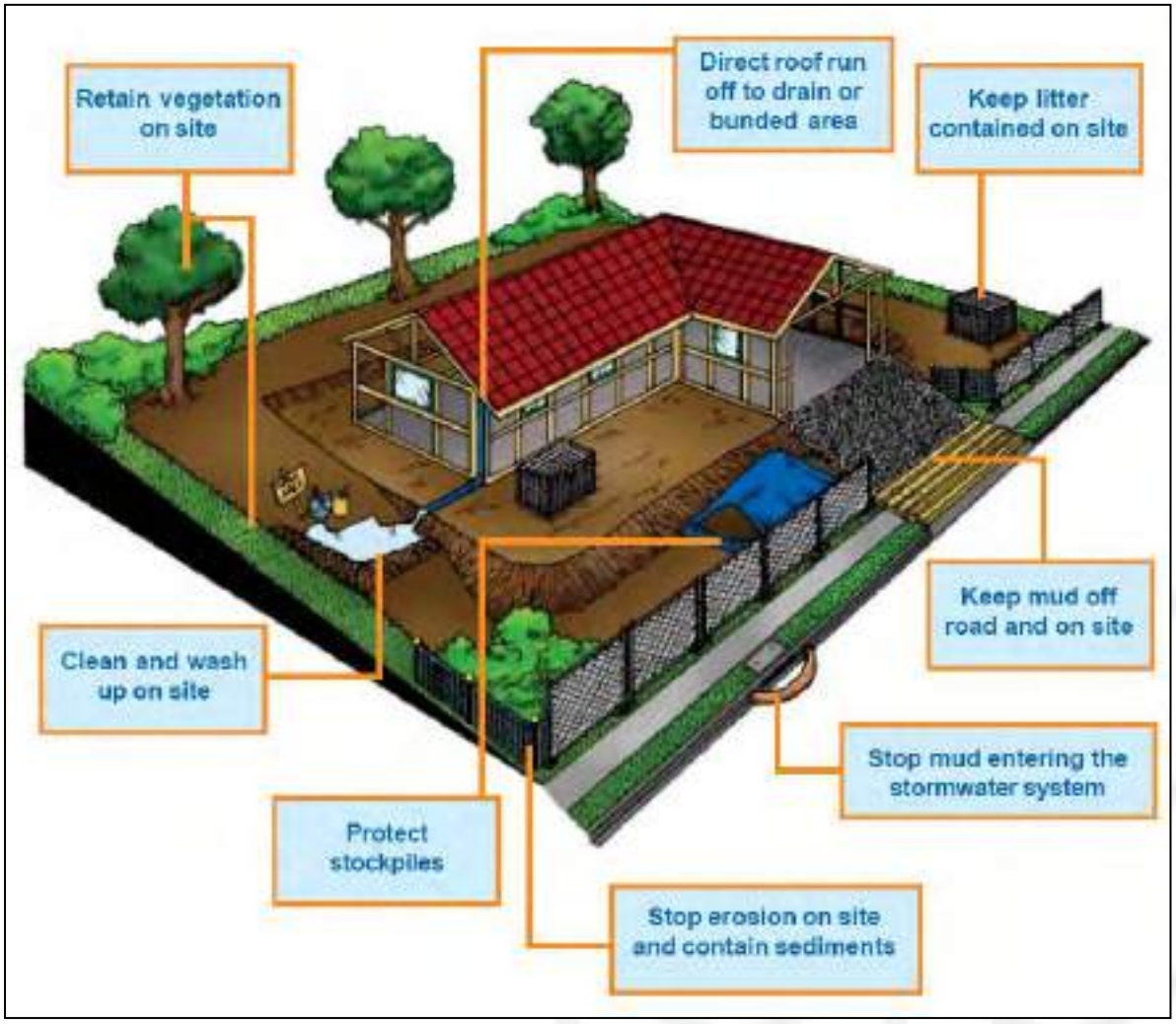
Stormwater Management at Construction Site

To manage stormwater management in the construction stage, measures will be put in place to minimise the likelihood of contaminating stormwater. This will mean ensuring buffer strips are in place, sediment traps are installed, and the site will be kept clean from any loose rubbish. The builder will follow the process outlined in "Keeping Our Stormwater Clean – A Builder's Guide" by Melbourne Water.



Copies of "Keeping Our Stormwater Clean – A Builder's Guide" booklet can be downloaded from the following website.

https://www.clearwatervic.com.au/resource-library/guidelines-and-strategy/keeping-our-stormwater-clean-a-builders-guide.php

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APPENDIX B – WSUD MAINTENANCE & INSTALLATION

Installation

Rainwater Tank(s)

The rainwater tank(s) will be installed above ground. Its manufacturer or material has not been nominated. It will be installed with a mesh insect cover over the inlet pipe to ensure the tank does not become a breeding ground for pests. Mesh needs to be installed over overflow pipes, and if a manhole is present, it needs to be properly sealed.

Please refer to the architectural drawings for the location of the rainwater tank.

Pumps

The pumps are required either to divert the stormwater runoff to the rainwater tank or to distribute the collected water to the end uses (toilets). They will be installed according to the chosen manufacturer's specifications.

Raingarden

The building of a raingarden should be designed by the landscape architect and in accordance with the Melbourne Water "Building an inground raingarden", "Building an infiltration raingarden", or "Building a planter box raingarden" document/s
https://www.melbournewater.com.au/sites/default/files/INGROUND.pdf
All layers should be installed as specified, and commissioning (drainage tests, running water through the raingarden) should occur prior to building sign off.

Inspection Requirements

Rainwater Tanks

Inspections of roof areas and gutters leading to the tank should take place every 6 months. Rainwater in the tanks should be checked every 6 months for mosquito infestation.

The rainwater tank should be examined every 2 years for sludge buildup.

Ensure the monitoring system (be it digital or a simple float system) is functioning properly by checking the water level in the rainwater tanks.

Pumps

The pumps required will need to be routinely inspected by listening to the day-to-day operation of the pumps. Unusual noise or no noise should be investigated. Inspection should occur as per the chosen manufacturer specifications.

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Raingarden

Raingardens should be inspected for damage after large storm events (48.2mm in one hour is considered a large storm event in Melbourne – 1 in 100-year storm) and should be inspected when garden maintenance occurs onsite (e.g. 3-monthly).

A full inspection of the raingarden should occur annually for a flow test, to identify any plant replacement requirements and whether silt build-up has occurred.

Inspections of driveway/carpark areas leading to the raingarden should take place every 6 months.

Clean Out / Maintenance Procedure

Rainwater Tank, Roof and Gutters

Rainwater tanks will require the roof and gutters onsite to be maintained; gutters should be checked, maintained and cleaned every six months to avoid blockages from occurring. If a leaf blocking system is installed, this can be completed annually.

Any trees onsite should be maintained every 6 months with branches overhanging the roof removed.

Water ponding in gutters should be avoided as this provides a breeding ground for mosquitos; tanks should also not become breeding grounds for mosquitoes. If mosquitoes are detected in the tank, remedial steps need to be taken to prevent breeding. If mosquitoes or other insects are found in rainwater tanks, the point of entry should be located and repaired. As well as preventing further access, this will prevent the escape of emerging adults. Gutters should be inspected to ensure they do not contain ponded water, and be cleaned if necessary.

Please refer to https://www.health.vic.gov.au/sites/default/files/2022-11/Keeping-your-rainwater-tank-safe-from-mosquitos.pdf for more information on mosquito control.

Rainwater tanks should be checked by a regular maintenance person every 3-6 months to ensure that the connection to the building is maintained and there are no blockages.

A simple way to ensure the tank is operating as intended would be through the installation of a smart monitoring device (e.g. OneBox®). These systems allow users to operate tanks remotely from internet or smartphone, monitor and control the tanks in real time, allow automatic release of stored water prior to storm events, alert users if there is any blockage and view tank history and usage patterns.

Alternatively, onsite tank gauges can help those familiar with the tank know if the tank is not working correctly.

Pumps

Maintenance should occur as per the chosen manufacturer specifications. All strainers and filters should be cleaned every 6 months. Good quality pump should provide trouble free service for up to 10 years.

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Raingarden

The following maintenance schedule for raingarden has been sourced from *WSUD Maintenance Guidelines* by Melbourne Water.

Item	What to check for	Action	Frequency
Civil components – Raingarden			
Inlet	No evidence of erosion, blockage, damage or standing water.	Clear inlet of accumulated sediment or debris. Eroded areas should be locally re-profiled or reinforced, and re-planted if necessary. Refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets* if the erosion is either recurring or severe.	Storm events 3 months
Outlet	No evidence of erosion, blockage, damage or standing water Outlet freely draining.	Clear outlet of accumulated sediment or debris. Refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets* if standing (backwatering into the raingarden) is present.	Storm events 3 months
Other structures	No evidence of erosion and damage to other structures, e.g. pits, pipes, access ramps, walls and rock protection.	Repair minor damage to structures. Eroded areas should be repaired (reinforced). This may involve minor re-profiling or re-planting works. For severe damage, i.e. where flows have scoured down the side of a structure refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets*.	3 months
Batters and bunds	No evidence of erosion.	Eroded areas should be locally re-profiled or reinforced, and re-planted if necessary.	Annually
Hydraulic conductivity	Filter media is draining freely. No water ponded on the surface of the raingarden for more than 12 hours after rainfall.	If water is ponded on the surface of the raingarden for more than 12 hours after rainfall, refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets*. Note: the disposal of raingarden filter material must comply with EPA Victoria guidelines for the disposal of contaminated soil (Appendix C).	Storm events
Sediment accumulation	Sediment forebay less than 75% full. No major sediment accumulation on surface of the raingarden.	Clean out accumulated sediment from the sediment forebay. Accumulated sediment to be removed from the surface of the raingarden and the system replanted as required.	Annually
Filter media surface	No surface scour, depressions.	Filter surface to be repaired. This may involve evening out the surface, importing additional filter media and replanting.	3 months
Fine sediment surface crust	No impermeable or clayey surface on the filter media. No major surface crusting (<3mm depth across less than 10% of the filter area is permissible).	Repair surface layer by scarify filter media surface, re-profiling and re-establishing vegetation, if required. If the problem persists refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets*.	3 months
Mulch layer	Even depth and distribution of the mulch layer. Surface of the mulch layer is at least 100 mm below the top of the outflow pit. Mulch is not touching the plant stems	Re-distribute or replace mulch that has been washed out or displaced. This may involve retaining mulch using jute mats or nets. Remove mulch that is touching plant stems.	3 months
Algal or moss growth	No major algal growth (less than 10% of raingarden area is permissible). No moss growth.	If significant patches of algal growth or moss persist across the surface of the raingarden (i.e. greater than 10% of the surface) then refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets*.	3 months
Inspection opening	Water level is below filter media layer. No sediment accumulation in underdrain system.	Refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets* if standing water is present in the filter media layer. Flush the underdrain system using low pressure water jet to remove accumulated sediment.	Annually

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Vegetation cover – filter media	Greater than 90% vegetation cover. Plants healthy, free from disease and vigorously growing.	Remove any dead or diseased vegetation. Replant individual bare patches (greater than 5% of the area) using either new plants or by dividing and translocating existing plants. If bare areas represent greater than 30% of the raingarden area, refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets*.	3 months
Vegetation cover – batters	Continuous vegetation cover along the lower batter. Greater than 90% vegetation cover. Plants healthy, free from disease and vigorously growing.		Annually
Weeds – filter media – batters	Less than 10% of the filter media surface area and batters covered in weeds.	Physically remove weeds from filter media surface and batters. Do not use herbicides as these may harm the desirable raingarden vegetation and contaminate the filter media. Refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets* if weed ingress is a persistent problem (i.e. weed coverage is persistently greater than 30%).	3 months
Litter	Filter media surface and batters free of litter (i.e. less than 1 piece litter per 4m²).	Remove all litter and excessive debris	3 months
Pests	No damage by pest animals and insects.	Seek specialist advice if persistent insect damage is observed. Refer to Water by Design (2012) *Rectifying Vegetated Stormwater Treatment Assets* if there is evidence of pest animal damage.	3 months

Please note that the Water by Design documents "*Maintaining Vegetated Stormwater Assets" and "Rectifying Vegetated Stormwater Assets"* can be accessed online at http://waterbydesign.com.au/.

Commissioning

Rainwater Tank

All rainwater tanks should be washed or flushed out prior to use. All inlets and outlets should be correctly sealed to prevent insects from entering. Connection to all toilets in the development should be tested (dye test or equivalent).

Please note that if a new roof coating or paint is to be installed, then the first few run-offs after installation need to be discarded.

Pumps

Commissioning should occur as per the chosen manufacturer specifications.

Raingarden

A flow test which equates to running water through the raingarden needs to occur to ensure underdrainage works correctly and the raingarden drains within 24 hours. A maintenance manual for the raingarden must be provided by the designer of the rain garden if any requirements differ from those outlined above. A full inspection, including a flow test, must be undertaken annually.

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Summary

The following needs to occur onsite to ensure compliance with WSUD requirements and maintain the operation of the rainwater tank and connections onsite.

Task	When?	Requirement
Inspect Rainwater tanks	Every 6 months	• Check for any damage/compression • Mosquitoes infestation
	Every 2 years	• Sludge Build up – if sludge build up occurs a vacuum tank needs to be called out to site.
Inspect roofs & gutters	Every 6 months	• Clean out of leaves / debris. • Remove any overhanging branches onsite.
Inspection of Raingardens	3-Monthly Following large storm event	• Check slit levels • Check pollutants • Check for blockages • Check plant health • Overflow? Flooding?
	Annually	• Flow test needs to be undertaken to ensure underdrainage works properly • Silt and sediment build up • Plant replacement requirement

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APPENDIX C – DAYLIGHT ACCESS – GREEN STAR CALCULATION

The Green Building Council of Australia (GBCA) has created a daylight access calculation method within the Green Star benchmarking tool. This tool is widely recognised by Councils and Industry.

The Green Star Daylight Hand Calculation method is used to determine if there are risks associated with the current design, particularly with respect to meeting the desired daylight factors referenced in the Sustainable Management Plan in the Planning Process (SDAPP) Indoor Environment Quality guidelines.

According to the SDAPP guidelines, best practice is achieved when 2% daylight factor is achieved across 30% of the floor area of the nominated area.

The calculation method is based on a simple formula to calculate a zone of compliance within a nominated room. The compliant zone is the area of the room achieving 2% daylight factor and can be calculated as follows:

$$\boldsymbol{Zone\ of\ Compliance = 2 \times h \times w}$$

$\boldsymbol{w}$ is the width of the glazing serving the room

$\boldsymbol{h}$ is the height of the window head above the desktop/table level

Windows serving the nominated area are required to have a minimum 40% VLT to use the formula.

The percentage of compliant area within the nominated area can then be easily calculated with the following formula:

$$\boldsymbol{Percentage\ of\ compliant\ area = \frac{Zone\ of\ Compliance}{Nominated\ Area} \times 100}$$

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Site Description

The proposed new development is a childcare facility; therefore, the nominated areas for the Hand Calculation include all child rooms.

The desktop/table level has been estimated to be 700mm (office and staff room)

The desktop/table level has been estimated to be 400mm (childrooms)

See below for the mark-up of the compliant zone (orange) within each nominated area (light blue).

The inclusion of the skylights for ventilation proposes also enhances the daylighting results

Daylight provision from skylight is not addressed by the Green Star Hand Calculation tool. However, a simple calculation to assess its daylight compliance was used. Please see link for more information: https://lightingcontrolsassociation.org/2011/11/21/daylight-zones-toplighted-spaces/.

The daylight zone does not specifically state the 2% daylight factor. However, it represents the area substantially illuminated by daylight, which is in line with the BESS requirement.

A daylight zone, also called the daylight area (expressed in square feet) is defined by the ASHRAE/IES 90.1-2010 energy standard as "the floor area substantially illuminated by daylight." In other words, it should consistently receive significant quantities of daylight.

By identifying daylight zones, the lighting control system designer identifies areas where daylight harvesting control is appropriate. The designer can then make further decisions about how many control zones are appropriate for the given daylight zone, and their configuration.

In this article, we will examine methods for establishing daylight zones in toplighted building spaces, such as spaces with skylights, roof monitors and clerestories.

Rule of Thumb for Toplighted Daylight Zones

For toplighted spaces, a rule of thumb is that a daylight zone can be established as the skylight length or width plus 1/2 the ceiling height on each side, and a second zone as the skylight length or width plus the ceiling height on each side.

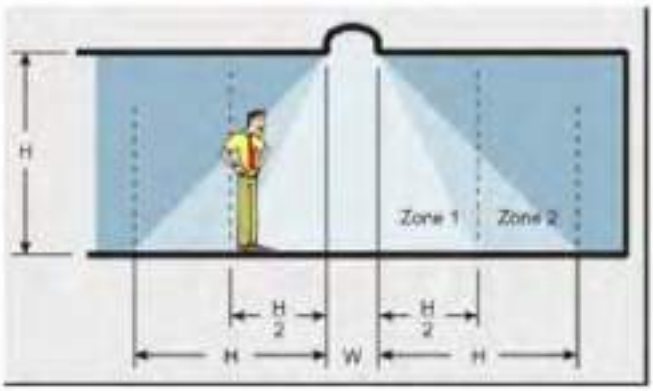

Image courtesy of the Lighting Research Center

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See below for the mark-up of the compliant zone (orange) within each nominated area (light blue).

Figure 5: Compliance zone for regularly occupied spaces on ground floor

	Nominated Areas (m²)	Compliant Areas (m²)	Compliant Areas (%)
Childroom 1	42	15.36	
Childroom 2	30	12.01	
Childroom 3	41	20.84	
Childroom 4	55	20.8	
Childroom 5	73	19.55	
Childroom 6	73	19.36	
Childroom 7	73	32.12	
Office	10	3.46	
Staff room	19	2.8	
Planning	14	0	
TOTAL	**430**	**146.3**	**34%**

The green star hand calculation for the proposed childcare indicates that the development will meet and exceed the SDAPP best practice requirement, with over 30% of the floor area having a 2% daylight factor.

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APPENDIX D – VOC & FORMALDEHYDE EMISSION LIMITS

The following table is an extract of the Green Star Design and as-built submission guidelines:

Table 13.1.1: Maximum TVOC Limits for Paints, Adhesives and Sealants

Product Category	Max TVOC content in grams per litre (g/L) of ready to use product.
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 sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100

The product complies with the Total VOC (TVOC) limits specified in the Table below.

Carpet Test Standards and TVOC Emissions Limits

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

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Table 13.2: Formaldehyde Emission Limit Values for Engineered Wood Products

Test Protocol	Emission Limit/ Unit of Measurement
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	≤1mg/ L
AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.5 mg/L
AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1mg/ L
AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/ L
Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL	≤1mg/ L
JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	≤0.1 mg/m²hr*
ASTM D5116 (applicable to high pressure laminates and compact laminates)	≤0.1 mg/m²hr
ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	≤0.1 mg/m²hr (at 3 days)
ASTM D6007	≤0.12mg/m³**
ASTM E1333	≤0.12mg/m³***
EN 717-1 (also known as DIN EN 717-1)	≤0.12mg/m³
EN 717-2 (also known as DIN EN 717-2)	≤3.5mg/m²hr

*mg/m²hr may also be represented as mg/m²/hr

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APPENDIX E – BESS ASSESSMENT

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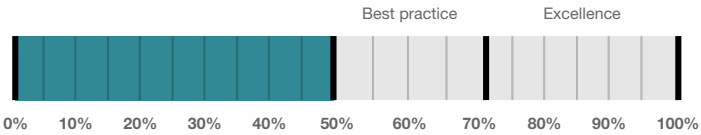
BESS Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at 23 Ryan Rd Pakenham Victoria 3810. 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 Cardinia Shire Council.

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

Your BESS Score



54%

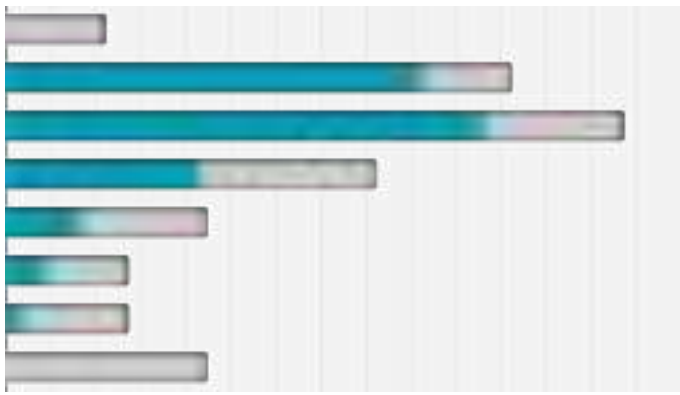
Project details

Name	23 Ryan Road, Pakenham VIC, Australia
Address	23 Ryan Rd Pakenham Victoria 3810
Project ID	CE93BADE-R3
BESS Version	BESS-9
Site type	Non-residential development
Account	jair@fraterconsultingservices.com.au
Application no.	
Site area	4,009 m²
Building floor area	835 m²
Date	19 January 2026
Software version	2.3.0-B.641

Performance by category

This project Maximum available

Category	Weight	Score	Pass
Management	5%	0%	
Integrated Water Management	23%	82%	✓
Operational Energy	28%	77%	✓
Indoor Environment Quality	17%	52%	✓
Transport	9%	37%	
Waste & Resource Recovery	6%	33%	
Urban Ecology	6%	12%	
Innovation	9%	0%	



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 m^2**	**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)		-
Integrated Water Management 3.1	Annotation: Water efficient garden details		-
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		-
Waste & Resource Recovery 2.2	Location of recycling facilities		-
Urban Ecology 2.1	Location and size of vegetated areas		-

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.		-

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
		One tenant
3.3 Metering - Common Areas	0%	
4.1 Building Users Guide	0%	

IWM Overall contribution 22.5%

	82%	**Pass**
1.1 Potable Water Use	46%	Achieved
2.1 Stormwater Treatment	100%	Achieved
3.1 Water Efficient Landscaping	100%	
4.1 Building Systems Water Use	N/A	Scoped Out
		No Sprinklers

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.

IEQ Overall contribution 16.5%

Minimum required 50%	52%	✔ Pass
1.4 Daylight Access - Non-Residential	34%	✔ Achieved
2.3 Ventilation - Non-Residential	50%	✔ Achieved
3.4 Thermal comfort - Shading - Non-Residential	66%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential	80%	
4.1 Air Quality - Non-Residential	100%	

Transport Overall contribution 9.0%

	37%	
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	0%	
2.2 Car Share Scheme	N/A	◇ Scoped Out
		N/A
2.3 Motorbikes / Mopeds	0%	

Waste & Resource Recovery Overall contribution 5.5%

	33%	
1.1 Construction Waste - Building Re-Use	0%	
2.1 Operational Waste - Food & Garden Waste	0%	
2.2 Operational Waste - Convenience of Recycling	100%	

Urban Ecology Overall contribution 5.5%

	12%	
1.1 Communal Spaces	0%	
2.1 Vegetation	25%	
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%	

Credit breakdown

Management Overall contribution 4.5%

		0%

1.1 Pre-Application Meeting		0%
Score Contribution	This credit contributes 42.9% 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 28.6% 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
		One tenant
This credit was scoped out	One tenant	
3.3 Metering - Common Areas		0%
Score Contribution	This credit contributes 14.3% towards the category score.	
Criteria	Have all major common area services been separately submetered?	
Question	Criteria Achieved ?	
Public building	No	
4.1 Building Users Guide		0%
Score Contribution	This credit contributes 14.3% towards the category score.	
Criteria	Will a building users guide be produced and issued to occupants?	
Question	Criteria Achieved ?	
Project	No	

IWM Overall contribution 22.5%

82% ✔ 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?:	Melbourne Water STORM tool
STORM score achieved:	107
Flow:	-
Total Suspended Solids:	-
Total Phosphorus:	-
Total Nitrogen:	-

Rainwater tank profile	
What is the total roof area connected to the rainwater tank?:	
Rainwater Tank	891 m²
	-
Tank Size:	
Rainwater Tank	10,000 Litres
	-
Irrigation area connected to tank:	
Rainwater Tank	0.0 m²
	-
Is connected irrigation area a water efficient garden?:	
Rainwater Tank	No
	-
Other external water demand connected to tank?:	
Rainwater Tank	0.0 Litres/Day
	-

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:	Occupant to Install
Which non-potable water source is the dwelling/space connected to?:	Rainwater Tank
Non-potable water source connected to Toilets:	Yes

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 — 46% ✔ Achieved

Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	What is the reduction in total potable water use due to efficient fixtures, appliances, rainwater use and recycled water use? To achieve points in this credit there must be >25% potable water reduction.
Output	Reference
Project	3735 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	3105 kL
Output	Proposed (including rainwater and recycled water use)
Project	2626 kL
Output	% Reduction in Potable Water Consumption
Project	29 %
Output	% of connected demand met by rainwater
Project	95 %
Output	How often does the tank overflow?
Project	Very Often
Output	Opportunity for additional rainwater connection
Project	1658 kL

2.1 Stormwater Treatment — 100% ✔ Achieved

Score Contribution	This credit contributes 60% towards the category score.
Criteria	Has best practice stormwater management been demonstrated?
Output	Min STORM Score
Project	100
Output	STORM Score
Project	107

3.1 Water Efficient Landscaping — 100%

Score Contribution	This credit contributes 6.7% towards the category score.
Criteria	Will water efficient landscaping be installed?
Question	Criteria Achieved ?
Project	Yes

4.1 Building Systems Water Use — N/A ✣ Scoped Out

No Sprinklers

This credit was scoped out	No Sprinklers

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): SPV	5.0 kW peak
Orientation (which way is the system facing)?: SPV	North
Inclination (angle from horizontal): SPV	10.0 Angle (degrees)
Non-residential Deemed-to-Satisfy profile	
Do all exposed floors and ceilings (forming part of the envelope) demonstrate meeting the 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%

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	6,059 kWh
Output	% of Building's Energy
Public building	19 %

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.

IEQ Overall contribution 16.5%

	Minimum required 50%	52%	✔ Pass

1.4 Daylight Access - Non-Residential		34%	✔ 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	34 %		
2.3 Ventilation - Non-Residential		50%	✔ 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	37 %		
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	800 ppm		
3.4 Thermal comfort - Shading - Non-Residential		66%	
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	50 %		
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		80%	
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	80 %		
4.1 Air Quality - Non-Residential		100%	
Score Contribution	This credit contributes 5.9% towards the category score.		

Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Public building	Yes

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

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

Transport Overall contribution 9.0%

			37%

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)?	
Annotation	There is no statutory requirement for an Early Learning Centre (childcare centre) to provide bicycle parking facilities. Therefore, 2 spots are assigned to comply.	
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		0%
Score Contribution	This credit contributes 25% towards the category score.	
Criteria	Are facilities provided for the charging of electric vehicles?	
Question	Criteria Achieved ?	
Project	No	

2.2 Car Share Scheme		N/A	Scoped Out
			N/A
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%**

33%

1.1 Construction Waste - Building Re-Use		0%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used?	
Question	Criteria Achieved ?	
Project	No	

2.1 Operational Waste - Food & Garden Waste		0%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	Are facilities provided for on-site management of food and garden waste?	
Question	Criteria Achieved ?	
Project	No	

2.2 Operational Waste - Convenience of Recycling		100%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	Are the recycling facilities at least as convenient for occupants as facilities for general waste?	
Question	Criteria Achieved ?	
Project	Yes	

Urban Ecology Overall contribution 5.5%

	12%

1.1 Communal Spaces	0%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Is there at least the following amount of common space measured in square meters : * 1m² for each of the first 50 occupants * Additional 0.5m² for each occupant between 51 and 250 * Additional 0.25m² for each occupant above 251?
Question	Common space provided
Public building	-
Output	Minimum Common Space Required
Public building	66 m²

2.1 Vegetation	25%
Score Contribution	This credit contributes 50% 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	5 %

2.2 Green Roofs	0%
Score Contribution	This credit contributes 12.5% 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 12.5% 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 12.5% 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%

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)?	

Disclaimer

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

The Municipal Association of Victoria (MAV) and CASBE (Council Alliance for a Sustainable Built Environment) member councils do not guarantee, and accept no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of BESS, any material contained on this website or any linked sites

FEATURE & LEVEL PLAN

23 - 25 Ryan Road & 2C Pinehill Drive

PAKENHAM

SCALE 1:750 (A3)

LEGEND

- SIDE ENTRY PIT
- WATER METER
- TELSTRA PIT
- POWER POLE
- PHOTO POSITION & DIRECTION
- SEWER PIT

DAM

DEEP CREEK

DRAINAGE & RECREATION RESERVE

DRAINAGE & RECREATION RESERVE

GARAGE

No.21 SINGLE STOREY BRICK HOUSE

PORCH

PORCH

31.6m

30.3m

99°47'

138

81.90

41°29'

12m HIGH POST & WIRE

12m HIGH POST & RAIL

GRAVEL DRIVEWAY

GRASS

3m WIDE EASEMENT

TBM NAIL IN TREE STUMP RL:34.00m

POND

CHICKEN COOP

CHICKEN COOP

GRASS

25.3m

No.2C Pinehill Drive SINGLE STOREY COLORBOND HOUSE

GARAGE

No.2 Pinehill Drive

TIN SHED

SHED

1.2m HIGH POST & WIRE

1.2m HIGH PALINGS

1.2m HIGH HORIZONTAL BOARDS

No.23 SINGLE STOREY BRICK HOUSE

ENCLOSED PORCH

15.1m

4.6m

26.3m

INVERT OF CONCRETE KERB

RYAN ROAD

TBM RIVET IN KERB RL:38.24m

PORCH

No.25 SINGLE STOREY BRICK HOUSE

PORCH

31.4m

GRASS

SHED

SHED

SHED

APPROXIMATE TRUE NORTH

N

NOTE:

- LEVELS SHOWN ON THIS PLAN ARE TO A.H.D BASED ON NAR-NAR-GOON PM 41 (R.L. 60.598)
- TITLE & BUILDING POSITIONS OFF SUBJECT SITE ARE DISPLAYED FOR INDICATION PURPOSES, USE QUOTED SETBACKS ONLY
- P.O.S DENOTES PRIVATE OPEN SPACE

NOBELIUS LAND SURVEYORS

P.O. BOX 461
PAKENHAM 3810
Ph 03 5941 4112
mail@nobelius.com.au

NOTE:

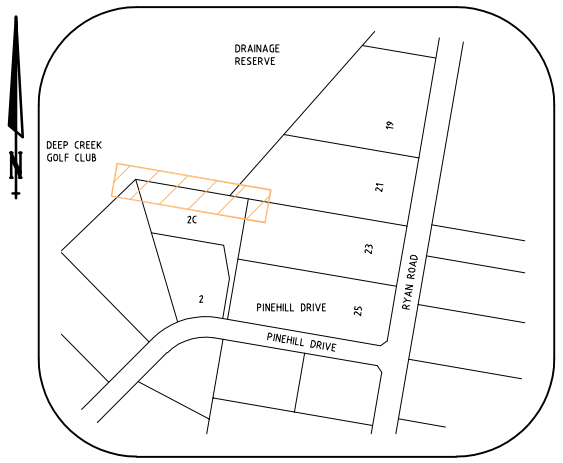
THIS IS A CADASTRAL PLAN PREPARED UNDER THE SUPERVISION OF A LICENSED SURVEYOR.

DRAWN BY : L.NOBELIUS

DATE OF SURVEY : 22/04/2025

SURV. REF. NO. 21188

A3



LOCALITY PLAN

SCALE: NOT TO SCALE
MELWAYS REF : 318 B8

Schedule 7: Drawing Schedule

Drawing No.	Sheet No.	Title
11PD2613/ 01	1	NOTES, SCHEDULE & LOCALITY PLAN
11PD2613/ 02	2	DETAIL PLAN
11PD2613/ 03	3	LONGITUDINAL SECTION & MAINTENANCE HOLE DETAIL

General Notes:

1. Only contractors accredited by South East Water to SC1 and SC7 shall be eligible to construct these works.
2. Only products approved and catalogued by the Water Agency shall be used.
3. Works must be to constructed according to the MRWA Sewerage Standards and MRWA edition of the WSAA Sewerage code of Australia WSA 02-2014-3.1.
4. The design consultant is responsible for the design and coordination of the works. Any problem arising during construction shall be directed to the consultant.

Survey, Set Out and Asset Recording

5. All contours and levels are in metres to the Australian Height Datum (A.H.D.) GDA 2020 Zone 55
6. All co-ordinates shown are to Map Grid of Australia (MGA).
7. Chainages shown on detail plans are discontinuous at maintenance structures.
   Chainages shown on long section sheets are continuous.
8. Coordinates are to sewer line intersection point unless otherwise shown.
9. Before commencement of work, the Contractor must complete a level check between all TBM's to verify level values.
10. TBM's and control points are to be maintained and protected at all times during construction.
    Should any marks be disturbed, the contractor will immediately notify the consultant to arrange re-instatement at the contractors expense.

Property Connections

11. Number of lots to be sewered: 2 lots
12. All property connections to be DN100 unless otherwise indicated.
13. Branch tie distance shown on detail plans are from approved subdivision survey pegs. Branch ties for future lots are shown as a chainage. (Ch) Distance is from the downstream sewer structure.
14. Invert level of the property connection point is shown opposite the branch position.
15. Property Connections requiring Boundary Traps will be designated with "BT" at the end of the Property Connection Type description.

Bends:

16. Detectable markers shall be installed above all bends which are not directly connected to Maintenance Structures. Refer Figure 104B-B.

Earthworks and Retaining Walls:

17. In areas subject to earthworks, construction of sewers shall not commence until earthworks has been completed unless written approval has been given by the Water Agency.

Embedment

18. Embedment shall be Type A (refer MRWA-S-202) unless otherwise specified on the Longitudinal section.

Backfill

19. Selection and compaction of trench backfill material shall be in accordance with the Water Agency adopted version of MRWA specification no 04-03.1 and Council requirements.

20. Refer to Longitudinal Section drawings for backfill requirements.

Compaction Testing

21. Test results shall be provided to the Superintendent prior to practical completion / acceptance of works.
22. The Contractor is required to undertake all testing of fill compaction in accordance with the Water Agency adopted version of the MRWA Backfill Specification 04-03.1

Safety:

23. Prior to commencement of works on site, the Contractor must ensure that all matters relating to the Occupational Health and Safety Act 2004 and Occupational Health and Safety regulations 2017, have been and will be complied with.

Work on Live Sewers:

24. All works on live sewers must be carried out by a Water Agency accredited contractor.
25. All existing sewers must be plugged in accordance with Water Agency requirements to stop gas emissions prior to any connections being made.
26. To enable connections to live assets or any work on live assets, the contractor shall submit the appropriate forms to the Superintendent at least 3 working days prior to any works on live sewers.
27. The Contractor is not permitted to break into an existing live pipeline, enter a live sewer or remove the cover to a live maintenance structure unless authorised by the Water Agency.

Testing:

28. The Contractor is to give a minimum of two (2) days notice to the superintendent and Water Agency prior to the testing being undertaken. Testing is to be undertaken in the presence of superintendent.

Cultural Heritage Requirements

29. Not applicable

Environmental Management Plan:

30. On commencement of construction works the contractor must comply with the recommendations of the EPA publication "Construction Techniques for Sediment Pollution Control" (publication no 275 1991).
31. Prior to the commencement of work, the contractor is to submit a site environmental management plan to Melbourne Water.
32. All trees and vegetation are to be protected unless otherwise indicated for removal.
    The extent of any vegetation removal shall be confirmed on site with the Superintendent and local council prior to commencement, and in accordance with any planning permits. Any removal shall be documented.
33. All areas containing creek vegetation, trees and revegetated areas near the construction zone are to be fenced off during the works with secure and highly visible material such as para-webbing fencing.
34. Ensure all machinery, equipment and/or footwear entering the site is weed and pathogen free.

Other:

35. The Contractor is to provide DPM Consulting Group with CCTV data for the sewer line and confirmation of the constructed grade as a part of the acceptance testing. The use of directional drilling is at the contractor's risk.

Schedule 1: New Pipe

Pipe Size	Pipe Type	Length (m)	Pipe Class	Standard
DN100	UPVC-DWV	-	SN10	WSA PS 230
DN180	PE-100 POLYETHYLENE, BUTT WELDED JOINTS	117	SN>8	WSA PS 230

Schedule 2: Property Connections

Connection Type	Type 1a	Type 1b	Type 2	Type 4a	Type 4b	Type S	Type 4S	Type B	Type 4B	Jump Up Flexible Couplings, ie: "F"
Quantities	1	-	-	-	-	1	-	1	-	-

Schedule 3: Service Offsets and Locations:

Street	NDW		Water		Comms		Elec.		Lighting	
-	-	-	-	-	-	-	-	-	-	-

Schedule 4: **Maintenance Structures** (other than Maintenance Holes)
Inspection Shafts (IS), Maintenance Shafts (MS) and Maintenance Chambers (MC):

Maintenance Structure ID	Type - (IS/MS/MC)	Cover Class	Depth to Invert (mm)	Shaft Connections
-	-	-	-	-

NOTE: All MS and MC are to have four way bases. Cap unused legs.

Schedule 5: Water Agency Granted Dispensations

ID	Location	Asset / Feature	Description of Dispensation Accepted
1	E4	STRUCTURE SPACING	INCREASED STRUCTURE SPACING AT LINE EMB17A-10 TO DPM-1
2	LOT 23	LOT CONTROL	PARTIAL LOT CONTROL OF LOT 23
3	D3-E6	SEWER	DIRECTIONAL DRILLING

Schedule 6: Maintenance Holes

Maintenance Hole ID	MH Type (Any /Plastic / Made to Order)	MH Top Type (Conical/Flat)	Cover Class	Internal Diameter (mm)	Min. Wall Thickness (if Concrete)	Depth Lowest Invert	Drops	Ladder (L) Step Irons (S) Landing (Ld)	Corrosion Protection	Shaft Re-inforcement	Comments (Offsets / Details)
EMB17A-10	Ex	Conical	-	1050	-	2200	-	-	-	-	Refer to base detail
DPM-1	Any	Conical	B	1050	150	2580	1 x DN100	S	-	-	-

Schedule 7: Water Seals, Boundary Traps and Syphons

Structure Type	Boundary Trap	Water Seals	Syphons
Quantity	3	-	-

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WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

FOR CONSTRUCTION

REV	DESCRIPTION	DATE	APPROVED
C2	CONSTRUCTION METHODOLOGY AMENDED	26/08/2025	T.P.
C1	PLANS CHECKED	23/06/2025	T.P.
P1	PRELIMINARY ISSUE	19/05/2025	T.P.

DESIGNED J. Beveridge DATE: 19/05/2025
DRAWN J. Beveridge DATE: 19/05/2025
CHECKED T. Parsons DATE: 23/06/2025

PROJECT NUMBER 47991421
AUTHORISED V. Soklevski DATE: 24/06/2025
REGISTERED ENGINEER NAME: J. Beveridge PE REG. NO: PE0006668 DATE: 24/06/2025

DPM Ref: 3246

22 Business Park Drive Notting Hill
3168 A.C.N. 006 550 803 E: consulting@dpmvic.com.au W: www.dpmvic.com.au
T: (03) 9538 5000
DPM Consulting Group

SOUTH EAST WATER
CARDINIA SHIRE COUNCIL
23 & 25 RYAN ROAD, PAKENHAM
SEWER DESIGN PLANS
NOTES, SCHEDULE & LOCALITY PLAN

SCALE: N.T.S.
SHEET: 1 OF 3
DRAWING No.: 11PD2613 01
REV C2

SYMBOLS LEGEND

- MAINTENANCE HOLE (MH)
- MAINTENANCE CHAMBER (MC)
- MAINTENANCE SHAFT (MS)
- INSPECTION SHAFT (IS)
- BURIED JUMP UP
- INSPECTION OPENING (IO)
- WATER SEAL
- PIPE STUB
- VERTICAL BEND
- RETAINING WALL
- ROCK RETAINING WALL
- MAINTENANCE HOLE (MH), Cover centered over black segment
- NO REASONABLE ACCESS LOTS
- W — WATER MAINS
- G — GAS MAINS
- E — ELECTRICAL CABLES
- T — COMMS CABLES
- D — DRAINAGE

WARNING

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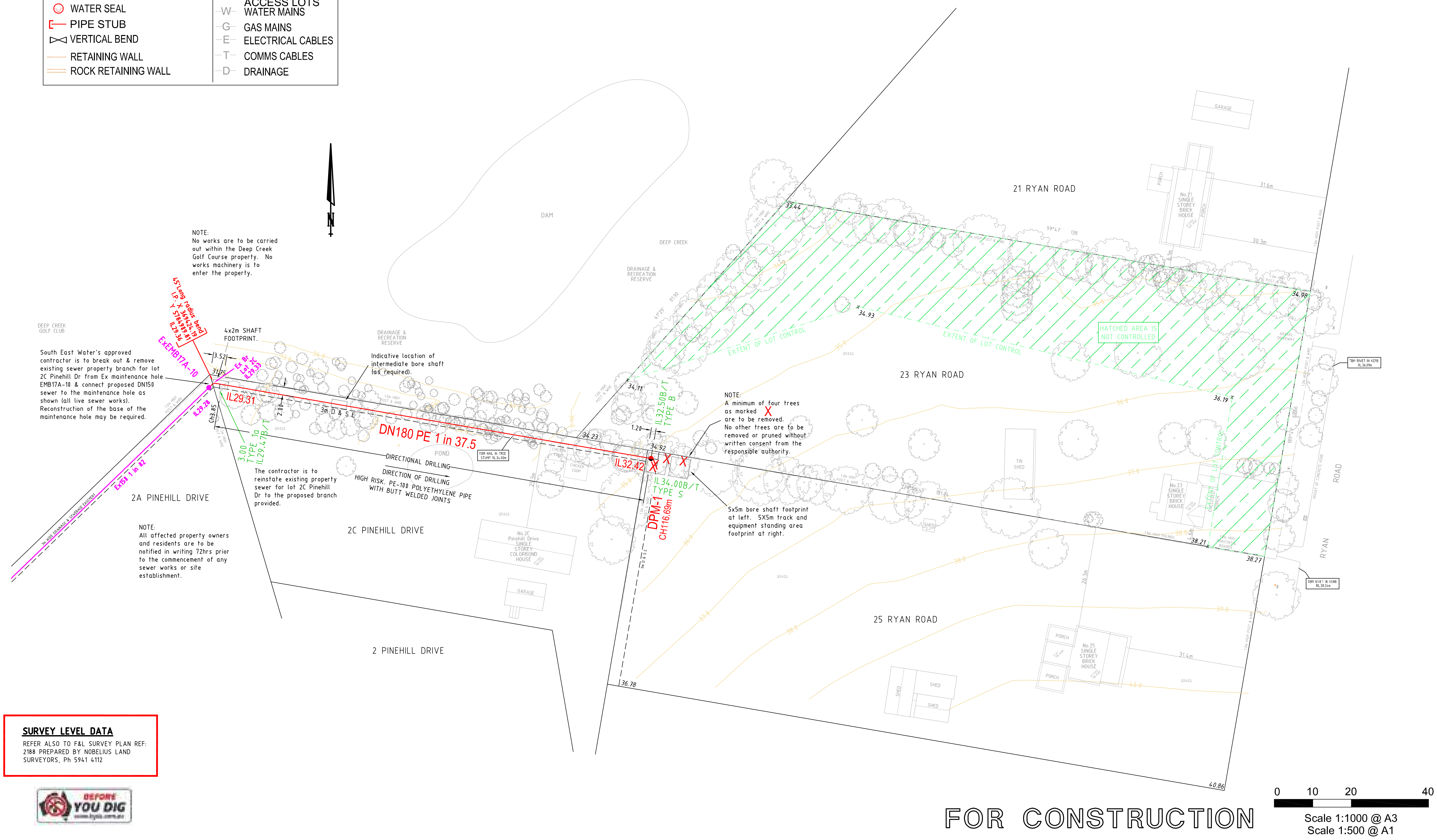

N
NOTE:
No works are to be carried out within the Deep Creek Golf Course property. No works machinery is to enter the property.
DAM
DEEP CREEK GOLF CLUB
45°Long radius bend
I.P. X 369424.19 Y 5784989.81
IL29.36
ExEMB17A-10
Ex 8L Lot 2C IL29.33
IL29.28
4x2m SHAFT FOOTPRINT.
3.52
3.75
Ch3.85
South East Water's approved contractor is to break out & remove existing sewer property branch for lot 2C Pinehill Dr from Ex maintenance hole EMB17A-10 & connect proposed DN150 sewer to the maintenance hole as shown (all live sewer works). Reconstruction of the base of the maintenance hole may be required.
DRAINAGE & RECREATION RESERVE
Indicative location of intermediate bore shaft (as required).
IL29.31
2.00
3m D & S E
DN180 PE 1 in 37.5
3.00 TYPE 1a IL29.47B/T
DIRECTIONAL DRILLING
DIRECTION OF DRILLING
HIGH RISK, PE-100 POLYETHYLENE PIPE WITH BUTT WELDED JOINTS
POND
The contractor is to reinstate existing property sewer for lot 2C Pinehill Dr to the proposed branch provided.
ExS4 1 in 82
2A PINEHILL DRIVE
NOTE:
All affected property owners and residents are to be notified in writing 72hrs prior to the commencement of any sewer works or site establishment.
2C PINEHILL DRIVE
No.2C Pinehill Drive SINGLE STOREY COLORBOND HOUSE
GARAGE
2 PINEHILL DRIVE
DEEP CREEK
DRAINAGE & RECREATION RESERVE
34.11
34.23
1.20
IL32.50B/T TYPE B
34.92
IL32.42
DPM-1 CH116.69m
IL34.00B/T TYPE S
NOTE:
A minimum of four trees as marked X are to be removed. No other trees are to be removed or pruned without written consent from the responsible authority.
5x5m bore shaft footprint at left. 5X5m track and equipment standing area footprint at right.
36.78
33.44
34.93
EXTENT OF LOT CONTROL
21 RYAN ROAD
No.21 SINGLE STOREY BRICK HOUSE
GARAGE
PORCH
31.6m
30.3m
34.98
HATCHED AREA IS NOT CONTROLLED
23 RYAN ROAD
No.23 SINGLE STOREY BRICK HOUSE
36.19
TIN SHED
38.21
38.27
25 RYAN ROAD
No.25 SINGLE STOREY BRICK HOUSE
SHED
26.3m
31.6m
40.86
RYAN ROAD
0 10 20 40
Scale 1:1000 @ A3
Scale 1:500 @ A1

SURVEY LEVEL DATA

REFER ALSO TO F&L SURVEY PLAN REF: 2188 PREPARED BY NOBELIUS LAND SURVEYORS, Ph 5941 4112

BEFORE YOU DIG www.byda.com.au

FOR CONSTRUCTION

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CHECKED	T. Parsons DATE: 23/06/2025	REGISTERED ENGINEER	NAME: J. Beveridge PE REG. NO: PE0006668 DATE: 24/06/2025

DPM Ref: 3246
22 Business Park Drive Notting Hill 3168 A.C.N. 006 550 803 E: consulting@dpmvic.com.au W: www.dpmvic.com.au
T: (03) 9538 5000
dpm Consulting Group

South East Water

SOUTH EAST WATER

CARDINIA SHIRE COUNCIL

23 & 25 RYAN ROAD, PAKENHAM

SEWER DESIGN PLANS

DETAIL PLAN

SCALE: 1 : 500 (A1) 1 : 1000 (A3)

SHEET: 2 OF 3

DRAWING No.: 11PD2613 02

REV C2

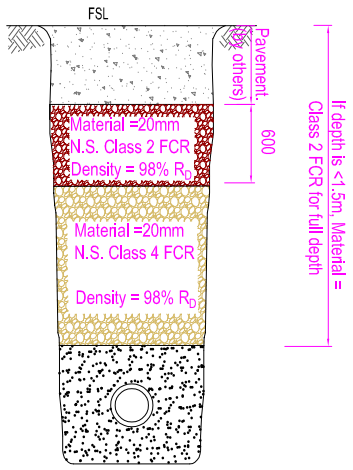


Figure 2: Type R Backfill

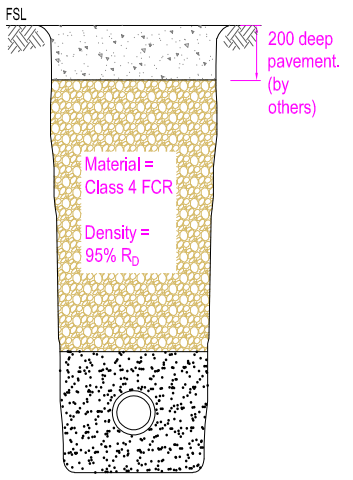


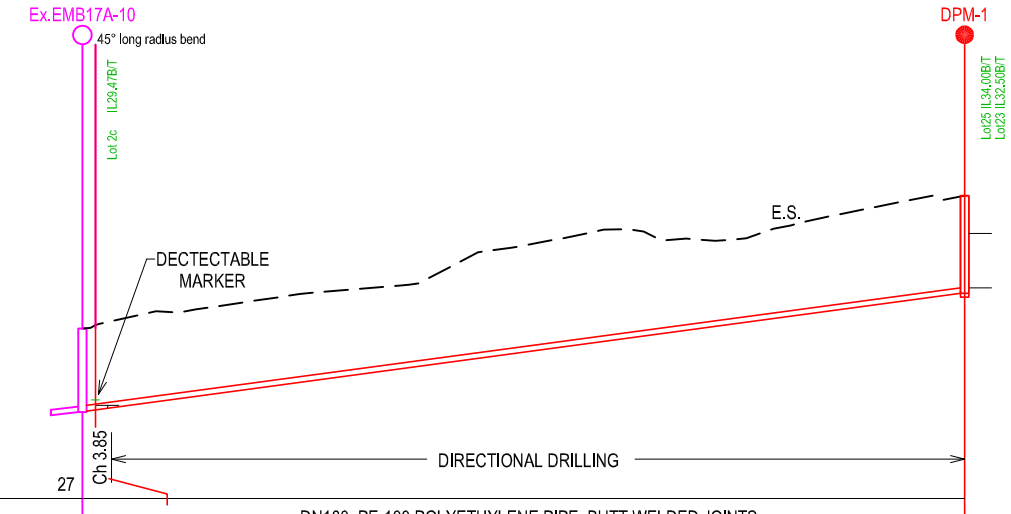
Figure 1: Type F Backfill

EMBEDMENT & BACKFILL DETAILS:

- Embedment shall be Type A unless stated otherwise.
- Backfill Type O is ordinary fill, to be selected and installed as per MRWA Backfill Specification 04-03.2.
- Type F is to be installed as per Figure 1
- Type R is to be installed as per Figure 2. Type R backfill is to be used under all road pavement and Laneway Access.

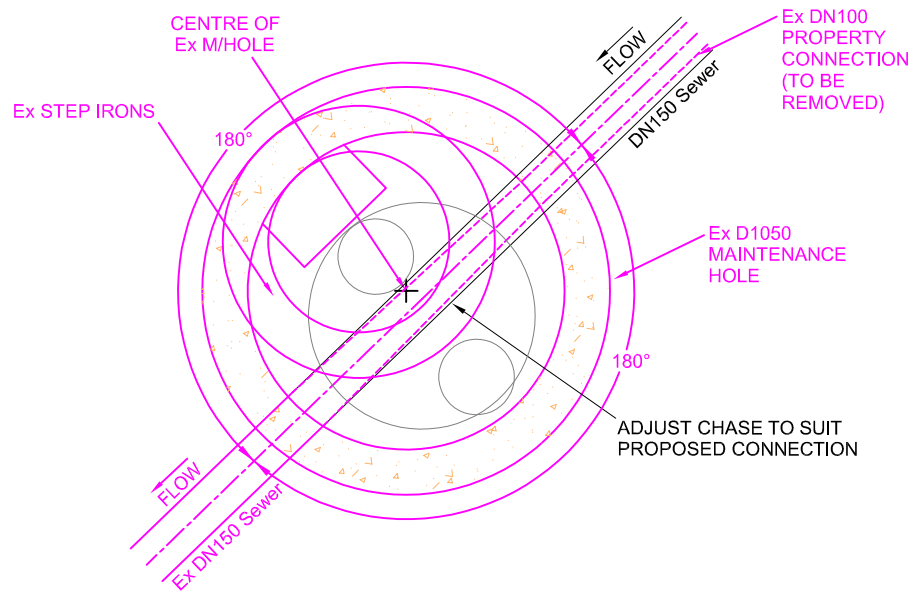
COLOUR LEGEND

RED 10	SEWERAGE (NEW) INCLUDING NOTES
GREEN 94	PROPERTY CONNECTION TEXT
BLACK 0.35	FINISHED SURFACE, PROPERTY CONNECTION PIPES
MAGENTA 210	EXISTING SEWERAGE
GREY 252	DRAINAGE
ORANGE 32	RETAINING WALLS
GREY 252	CUT & FILL (EARTHWORKS)



DATUM (m)	27			
PIPE DETAILS		DN180, PE-100 POLYETHYLENE PIPE, BUTT WELDED JOINTS		
GRADE		1:37.5	1:37.5	
EMBEDMENT		A N/A	N/A	
BACKFILL TYPE		O N/A	N/A	
DEPTH TO INVERT	2.22	2.19	2.22	2.58
INVERT LEVEL	29.28	29.31	29.36	32.42
FINISHED SURFACE LEVEL	31.50		31.58	35.00
CHAINAGE	0.00		1.72	116.69
LENGTH		(1.72)	(114.97)	

0 10 20 40
0 2 4 8
Scale H 1:1000, V 1:200 @ A3



Ex MAINTENANCE HOLE No. EMB17A-10

SCALE 1:25 @ A3

FOR CONSTRUCTION

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Consulting Group

SOUTH EAST WATER
CARDINIA SHIRE COUNCIL
23 & 25 RYAN ROAD, PAKENHAM
SEWER DESIGN PLANS
LONGITUDINAL SECTION & MAINTENANCE HOLE DETAIL

SCALE: 1 : 500 (A1) 1 : 1000 (A3)
SHEET: 3 OF 3
DRAWING No.: 11PD2613 03
REV C2

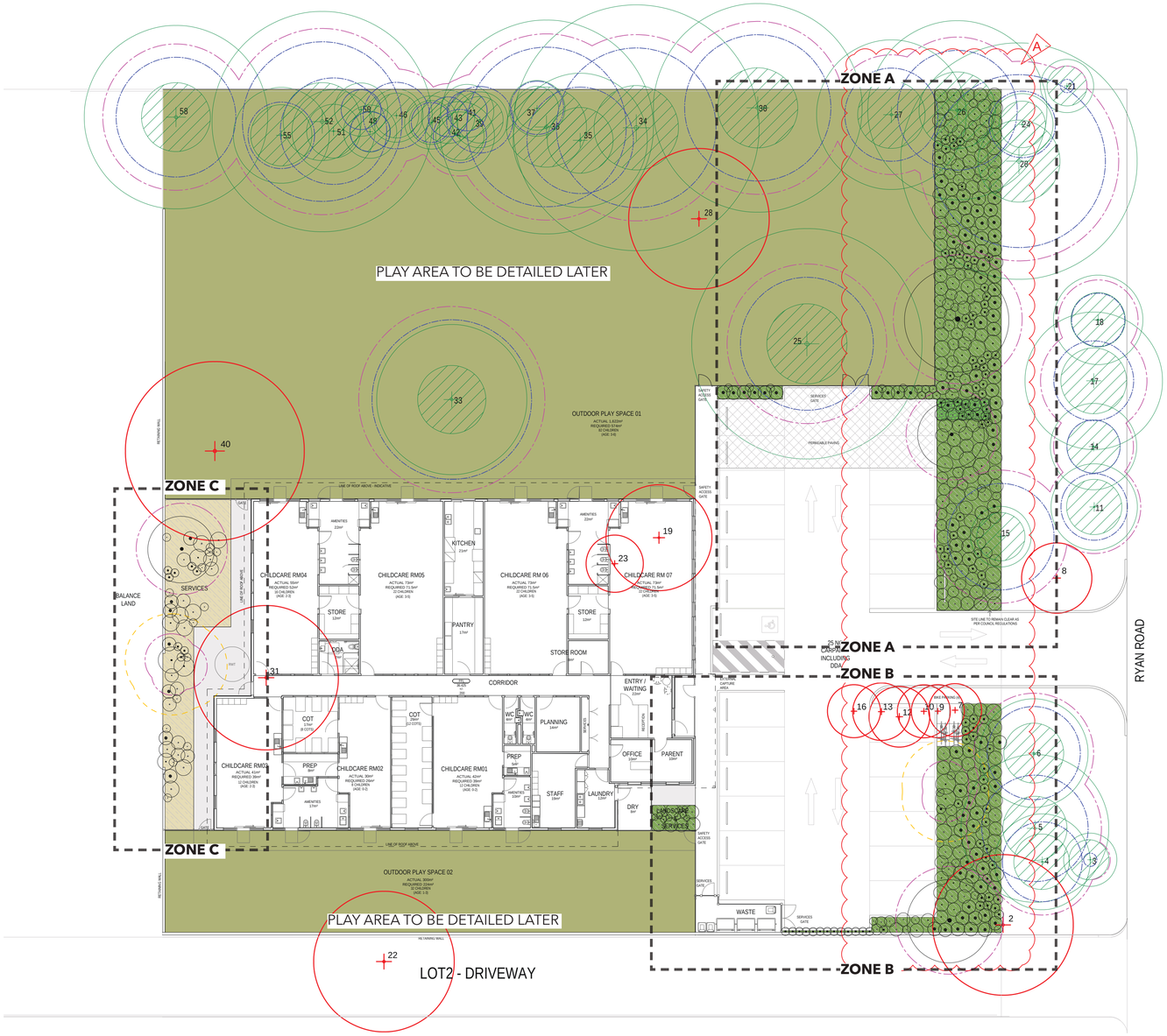
Proposed Pakenham Early Learning Centre

23 Ryan Road, Pakenham, VIC 3810

Landscape Town Planning Submission

Revision A

Drawing Register:
LS01 - Full Site Plan & Existing Tree Schedule
LS02 - Planting Plans & Schedule
LS03 - Planting Specification & Details



01 FULL SITE PLAN
PLAN
SCALE 1:200 @ A1

LEGEND

Play Area
To be detailed later

Concrete Paving
To be detailed later

Garden Bed
With woody mulch

Garden Bed/Open Space
With gravel mulch

Rain Garden
6m² rain garden for carpark catchment
See VG03/04
(Note: 6m² Rain Garden has been adjusted and moved slightly to allow room for new trees)

Existing Vegetation - Retain
TPZ = TREE PROTECTION ZONE
SRZ = STRUCTURAL ROOT ZONE
See Arborist report by arbkey dated 13/05/2025 for details

Existing Vegetation - Remove
See Arborist report by arbkey dated 13/05/2025 for details

Proposed Tree
See VG02

Proposed Understorey
As indicated see VG01

Proposed Grass
As indicated see VG01

Additional notation for BAL Requirements

Canopy Line
Crown spread (see arborist report by arbkey dated 13/05/2025 for existing trees spread details)

Tree Canopy Offset
See Tree Canopy Separation for canopy offsets details

Large Shrub Offset
See Large Shrub & Shrub Group Separation for canopy offsets details

CANOPY OFFSETS

Canopy offset lines to ensure planting layout complies with BAL requirement

Existing Trees Canopy Line
For existing trees only. (see arborist report by arbkey dated 13/05/2025 for existing trees canopy spread details)

1m Buffer Line (purple) Around All Trees
For both existing & proposed, see Tree Canopy Separation below

2.5m Buffer Line (yellow) & 1m Buffer Line (purple) & Around All Shrubs / Shrub Clumps
See Large Shrub Separation below for offset requirements

Existing Trees Canopy Line Crown Spread
TPZ = TREE PROTECTION ZONE
SRZ = STRUCTURAL ROOT ZONE
Blue line indicates Existing Tree Canopy Spread as per arborist report by arbkey dated 13/05/2025.

Tree Canopy Separation
BAL requirements include a 2m separation between all tree canopies at maturity.
To ensure all new trees comply, a 1 metre buffer (purple) is indicated around all canopy trees, both existing and the approximate mature size of any proposed trees.
These purple lines cannot overlap for any proposed trees. This does not apply to the separation between existing tree canopies.

Large Shrub & Shrub Group Separation
BAL requirements include a 5 metre separation between all large shrubs or groups of shrubs (clumps). To ensure this complies a 2.5m buffer (yellow) is indicated around the approximate mature size of all proposed large shrubs or shrub clumps. As per BAL requirements, each shrub clump is under 5m² at approximate maturity.
These yellow lines cannot overlap. The Tree Canopy 1m buffer line (purple) is also included around shrubs/shrub clumps to ensure a 2m separation from tree canopies.

EXISTING TREE SCHEDULE

See Arborist report by arbkey dated 13/05/2025 for details

Code	Botanical Name	Common Name	TPZ (m)	SRZ (m)	To remove/ retain
2	*Photinia x fraseri*	Chinese Hawthorn	5.31	2.37	Remove
3	*Corymbia ficifolia*	Flowering Gum	2.00	1.50	Retain
4	*Pittosporum undulatum*	Sweet Pittosporum	3.60	2.08	Retain
5	*Melaleuca armillaris*	Giant Honey Myrtle	5.55	2.41	Retain
6	*Melaleuca armillaris*	Giant Honey Myrtle	4.08	2.25	Retain
7	*Photinia x fraseri*	Chinese Hawthorn	2.00	1.50	Remove
8	*Corymbia ficifolia*	Flowering Gum	2.64	1.85	Remove
9	*Photinia x fraseri*	Chinese Hawthorn	2.00	1.53	Remove
10	*Photinia x fraseri*	Chinese Hawthorn	2.00	1.65	Remove
11	*Corymbia ficifolia*	Flowering Gum	3.22	2.05	Retain
12	*Photinia x fraseri*	Chinese Hawthorn	2.31	1.79	Remove
13	*Photinia x fraseri*	Chinese Hawthorn	2.17	1.79	Remove
14	*Corymbia ficifolia*	Flowering Gum	3.24	2.02	Retain
15	*Quercus palustris*	Pin Oak	2.28	1.79	Retain
16	*Photinia x fraseri*	Chinese Hawthorn	2.11	1.82	Remove
17	*Corymbia ficifolia*	Flowering Gum	5.16	2.47	Retain
18	*Corymbia ficifolia*	Flowering Gum	3.36	2.05	Retain
19	*Acer negundo*	Box Elder	6.57	2.61	Remove
20	*Corymbia maculata*	Spotted Gum	8.88	3.08	Retain
21	*Syzygium paniculatum*	Magenta Cherry	2.00	1.50	Retain
22	*Salix chilensis*	Chilean Willow	5.31	2.37	Remove
23	*Liquidambar styraciflua*	Liquidamber	3.48	2.08	Remove
24	*Corymbia maculata*	Spotted Gum	2.31	1.75	Retain
25	*Eucalyptus mannifera*	Brittle Gum	8.66	3.01	Retain
26	*Melaleuca armillaris*	Giant Honey Myrtle	6.73	2.88	Retain
27	*Melaleuca armillaris*	Giant Honey Myrtle	5.62	2.53	Retain
28	*Eucalyptus kitsoniana*	Gippsland Mallee	5.28	2.47	Remove
30	*Melaleuca armillaris*	Giant Honey Myrtle	7.84	2.93	Retain
31	*Corymbia maculata*	Spotted Gum	6.84	2.81	Remove
33	*Eucalyptus leucoxylon*	Yellow Gum	5.64	2.57	Retain
34	*Eucalyptus botryoides*	Southern Mahogany	9.24	3.17	Retain
35	*Grevillea robusta*	Silky Oak	5.04	2.47	Retain
36	*Eucalyptus tereticornis*	Forest Red Gum	8.04	3.01	Retain
37	*Pittosporum undulatum*	Sweet Pittosporum	2.10	1.65	Retain
39	*Ligustrum lucidum*	Privet	2.10	1.75	Retain
40	*Melia azedarach*	White Cedar	6.74	2.74	Remove
41	*Pittosporum undulatum*	Sweet Pittosporum	2.00	1.50	Retain
42	*Ligustrum lucidum*	Privet	2.60	1.82	Retain
43	*Pittosporum undulatum*	Sweet Pittosporum	2.00	1.50	Retain
45	*Pittosporum undulatum*	Sweet Pittosporum	2.00	1.65	Retain
46	*Eucalyptus botryoides*	Southern Mahogany	2.00	1.68	Retain
48	*Ligustrum lucidum*	Privet	2.00	1.53	Retain
50	*Pittosporum undulatum*	Sweet Pittosporum	2.00	1.50	Retain
51	*Acacia mearnsii*	Black Wattle	3.12	2.02	Retain
52	*Corymbia maculata*	Spotted Gum	8.28	2.93	Retain
58	*Corymbia maculata*	Spotted Gum	6.89	2.63	Retain

A

NOTE:
To incorporate additional canopy trees within the landscape setback to Ryan Road while maintaining compliance with the BAL 12.5 rating, the following actions and outcomes apply:
1. Two additional canopy trees are proposed within the Ryan Road landscape setback, resulting in a total of three canopy trees currently proposed within the Ryan Road landscape setback.
2. Three shrubs have been removed from the landscape setback to accommodate the additional canopy trees in accordance with BAL 12.5 requirements.

STRATIS LANDSCAPE ARCHITECTS
www.stratisla.com // ABN 54 605 387 166 // T 03 9482 7868
PO Box 662 Eltham 3095

Client: Ryan Road Pakenham Land Pty Ltd
Project Address: 23 Ryan Road Pakenham, VIC 3810

N

scale: 1:200 @ A1
1:200 2 4 6 8 10 20 metres

Principal Designer: Elliot Summers
Assisted by: Joy Qiao
Contact Number: 03 9482 7868
Email: elliot@stratisla.com

Date of Issue : 23/01/2026

Drawing Number: LS01

Revision:
A 23/01/2026
Adjusted planting to allow for more canopy trees within the landscape setback; relocation of the raingarden

INDICATIVE PLANTING


Acacia melanoxylon

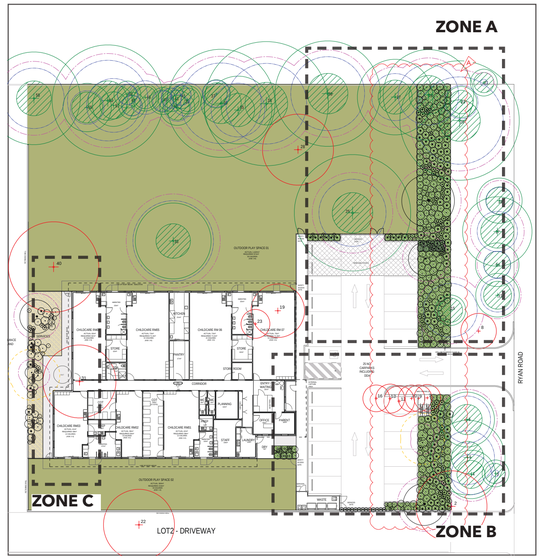

Cassinia aculeata

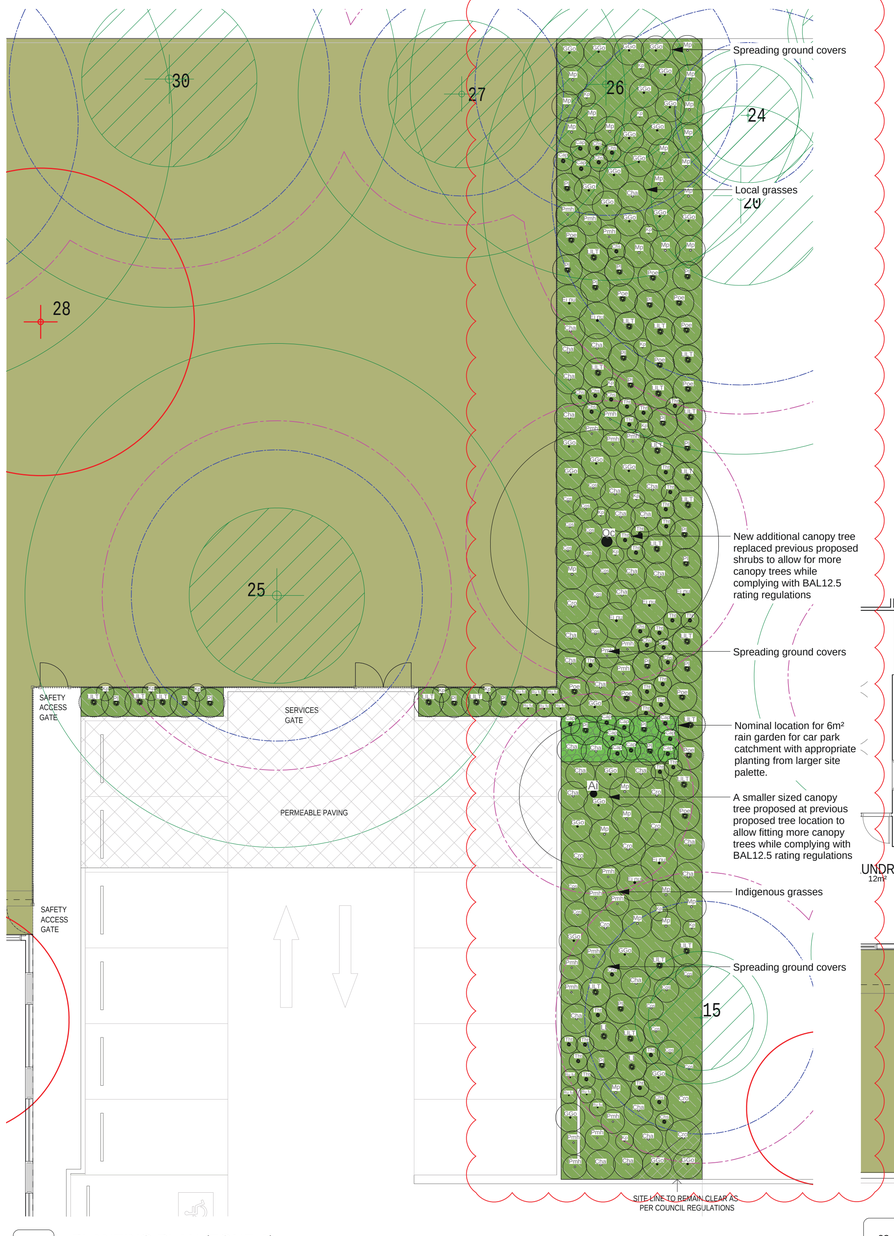

Chrysocephalum apiculatum


Themeda triandra


Myoporum parvifolium


Carpobrotus rossii





LEGEND

Play Area
To be detailed later

Concrete Paving
To be detailed later

Garden Bed
With woody mulch

Garden Bed/Open Space
With gravel mulch

Rain Garden
6m² rain garden for carpark catchment
See VG03/04
(Note: 6m² Rain Garden has been adjusted and moved slightly to allow room for new trees)

Existing Vegetation - Retain
TPZ = TREE PROTECTION ZONE
SRZ = STRUCTURAL ROOT ZONE
See Arborist report by arbkey dated 13/05/2025 for details

Existing Vegetation - Remove
See Arborist report by arbkey dated 13/05/2025 for details

Proposed Tree
See VG02

Proposed Understorey
As indicated see VG01

Proposed Grass
As indicated see VG01

Additional notation for BAL Requirements

Canopy Line
Crown spread (see arborist report by arbkey dated 13/05/2025 for existing trees spread details)

Tree Canopy Offset
See Tree Canopy Separation for canopy offsets details

Large Shrub Offset
See Large Shrub & Shrub Group Separation for canopy offsets details

PLANTING SCHEDULE - EXTERNAL

Code	Botanical Name	Common Name	Size (HxW)	Pot Size	Qty
TREES, LARGE SHRUBS					
Ai	Acacia implexa	Lightwood	10 x 5	40L	2
Am	Acacia melanoxylon	Blackwood	10-15 x 5-8	40L	1
Qc	Quercus coccinea	Scarlet Oak	12 x 8	40L	1
SHRUBS / FERNS / PERENNIALS					
Chs	Chrysocephalum semipapposum	Clustered Everlasting	0.4 x 0.6	14cm	27
Cr	Correa reflexa	Native Fuschia	1 x 1	14cm	1
Cssa	Cassinia aculeata	Dogwood	3 x 1.5	20cm	3
Pasp	Pomaderris aspera	Hazel Pomaderris	5 x 2	20cm	1
Ru fu	Rudbeckia fulgida	Black-Eyed Susan	1 x 0.5	20cm	10
GRASSES & STRAPPY					
Cap	Carex appressa	Tall Sedge	1 x 1	14cm	27
Ll	Lomandra longifolia	Mat-rush	1 x 1	14cm	14
LILT	Lomandra longifolia 'Lime Tuff'	Lime Tuff	1 x 1	14cm	31
PK	Poa poiformis 'Kingsdale'	Kingsdale Blue Tussock-Grass	0.5 x 0.5	14cm	14
Pl	Poa labillardieri	Native Tussock Grass	1 x 1	14cm	41
Poe	Poa ensiformis	Purple-sheath Tussock Grass	0.6 x 1	14cm	14
Tht	Themeda triandra	Kangaroo Grass	1 x 0.6	14cm	36
GROUNDCOVERS & CLIMBERS					
Cro	Carpobrotus rossii	Karkalla	p x 2	14cm	18
Cha	Chrysocephalum apiculatum	Billy Buttons	0.3 x 1.0	14cm	47
Cos	Convolvulus 'Two Moons'	Morroccan Glory Vine	0.2 x 1	14cm	18
Dr	Dichondra repens	Kidney Weed	.05 x spreading	14cm	10
Ei nu	Einadia nutans	Climbing Saltbush	0.1 x 1	14cm	10
GGo	Goodenia ovata 'Gold Cover'	Groundcover Goodenia	0.2 x 1	20cm	39
Kp	Kennedia prostrata	Running Postman	0.1 x 0.6	14cm	42
Mp	Myoporum parvifolium	Creeping Boobialla	0.1 x 1	14cm	51
Pmh	Pimelea humilis	Common Rice-Flower	0.3 x 0.8	14cm	26

CONTAINER SIZE & HEIGHT OF PLANT:
200L - Min height at time of planting: 3m
100L - Min height at time of planting: 2.5m
40/45L/40cm - Min height at time of planting: 1.8m

NOTE:
To incorporate additional canopy trees within the landscape setback to Ryan Road while maintaining compliance with the BAL 12.5 rating, the following actions and outcomes apply:
1. Two additional canopy trees are proposed within the Ryan Road landscape setback, resulting in a total of three canopy trees currently proposed within the Ryan Road landscape setback.
2. Three shrubs have been removed from the landscape setback to accommodate the additional canopy trees in accordance with BAL 12.5 requirements.

01 PLANTING PLAN (ZONE A)
PLAN
SCALE 1:100 @ A1

02 PLANTING PLAN (ZONE B)
PLAN
SCALE 1:100 @ A1

03 PLANTING PLAN (ZONE C)
PLAN
SCALE 1:100 @ A1

STRATIS LANDSCAPE ARCHITECTS
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PO Box 662 Eltham 3095

Client: Ryan Road Pakenham Land Pty Ltd
Project Address: 23 Ryan Road Pakenham, VIC 3810

N

scale: 1:100 @ A1
1:100 0 1 2 3 4 5 10
metres

Principal Designer: Elliot Summers
Assisted by: Joy Qiao
Contact Number: 03 9482 7868
Email: elliot@stratisla.com
Date of Issue : 23/01/2026

Drawing Number: LS02

Revision:
A 23/01/2026
Adjusted planting to allow for more canopy trees within the landscape setback; relocation of the raingarden

PLANTING SPECIFICATION

1. PLANTING

1.1 Plant care and ongoing maintenance is dependant on the type and timing of planting. Contractor is to prepare a suitable procedure depending on the season and weather to ensure the care of all plants and ongoing establishment of planted areas. It is recommended no planting take place November - February however it is understood that scheduling and timing of projects often does not allow this so additional care and time must be taken during these months to ensure success.

1.2 Immediately following collection from the nursery the contractor must ensure that at all times prior to planting all plants are stored upright in a protected location free of extremes of wind, temperature and sunlight and thoroughly watered at least early morning and late afternoon, ensuring that the entire root ball is completely saturated on each occasion

1.3 All plants are to be true to species, healthy, free from pests disease and stress

1.4 Location of services (overhead and underground) to be checked prior to excavation for tree planting. Plant no species with an expected mature height of more than three metres under power lines. Where plants are have been specified under powerlines seek advice and direction from the landscape architect prior to proceeding

1.5 Care must be taken *at all times* to protect root system when planting.

1.6 It is recommended that mulch be installed *after* planting has taken place to ensure all plants are suitably installed directly into ground and not excess mulch.

1.7 Planting should be undertaken in the following order:
1.7.1 - Plants are laid out in the correct location in line with the drawings provided
1.7.2 - Plants, *whilst still in their pots,* are 'planted' in ground as if being properly installed with dirt packed against the top of the pot
1.7.3 - All plants are to be thoroughly watered both inside and around the pots to saturate root ball & consolidate backfill.
1.7.4 - Plants are given a minimum of half an hour for soil to settle and water to be absorbed
1.7.5 - Planting Process: Removing the pot from the soil leaving an even pot-sized hole, carefully remove plant from the pot and place directly & gently into hole.
1.7.6 - *Roots should be undisturbed* by this procedure. Only in exceptional circumstances, when completely root bound, should they be loosened.
1.7.7 - Once placed in holes, soil to be gently but firmly pressed against top of rootball and thoroughly watered again regardless of weather conditions to consolidate backfill around roots. Following 1.7.3, plants root ball should be sufficiently saturated.
1.7.8 - Mulch as specified. Organic mulch to leave a space between base of plant and mulch. Gravel mulch can fill up to base of plant. Water mulch into place

1.8 All labels, wires, twine and other binding materials are to be removed from plants and root ball prior to backfilling

1.9 No changes are to be made to the planting plan or schedule without the direct consent of the designer. Any plants that may seem close together have been done so deliberately and no substitutions, variations or changes are to take place without approval.

1.10 Site to be left clean and tidy on completion of planting. Remove weeds and building spoil from all planting beds

1.11 Ground levels within all landscape areas should drain away from buildings in accordance with all regulations. Ensure all drainage areas have contingency overflow clear of buildings

1.12 All dimensions are to be verified on site prior to construction commencing. Any discrepancies are to be immediately reported to the Project Manager for further instruction

2. WATERING & ESTABLISHMENT

2.1 The contractor shall ensure all plants are watered as required for a minimum of 14 week establishment period. This will vary on weather conditions however it shall be an a *minimum* of twice per week regardless of weather.

2.2 All plants will be thoroughly soaked as part of this process. Contractor to ensure water reaches the deep soil and that each and every plant is waterered in with care with no disruption to the roots or mulch.

2.3 The contractor shall provide the client with a document detailing the most suitable watering process for the garden areas over the following 12 months of establishment.

2.4 Planting has been designed to survive prolonged periods of dry and rely solely on rainwater, howevere it must be noted that should they not be suitably established either through maintenance, installation or poor timing of planting, they will not survive. Furthermore, this scheme is designed to survive these periods of dry, however it will not thrive or look its best without regular watering during these times.

3. GARDEN PREPARATION

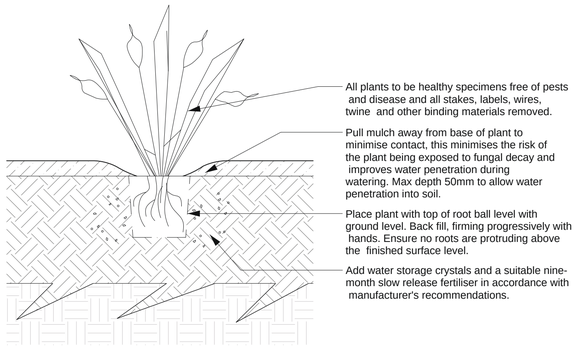
3.1 Prior to preparing garden beds the entire soil profile is to be thoroughly cleared of weeds, building rubble and other debris.

3.2 Where not reasonably practical to rework existing site soil garden must be established with imported sandy loam to a minimum depth of 200mm. The pH value of imported sandy loam should be between 5.5 and 6.5. Organic additives to the sandy loam should be based on well rotten vegetative material free from harmful chemicals, grass and weeds. Imported soils must comply with AS4419 Soils for landscaping and garden use

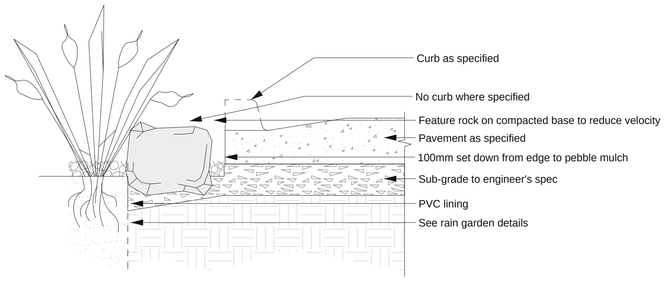
3.3 Rip Subgrade & cultivate site soil to a broken up friable texture. In clay soils incorporate gypsum at the rate of 2.0 kg/square metre. Mix through well decomposed low nutrient organic material (eg fine pine sawdust, not manure) at a ratio of 25% organic material to 75% site soil. Organic material must be completely free from harmful chemicals, grass and weed seed or cuttings

3.4 Soil additives are essential for plant establishment, the following products should be applied at manufacturers rate of application recommendation: Biochar (eg Green Man Char), Rock dust (see Diggers Rock Dust), Mychorrizal fungi (eg Mycogold Beneficial Fungi). A soil wetting agent should be applied yearly in Summer such as Saturaid.

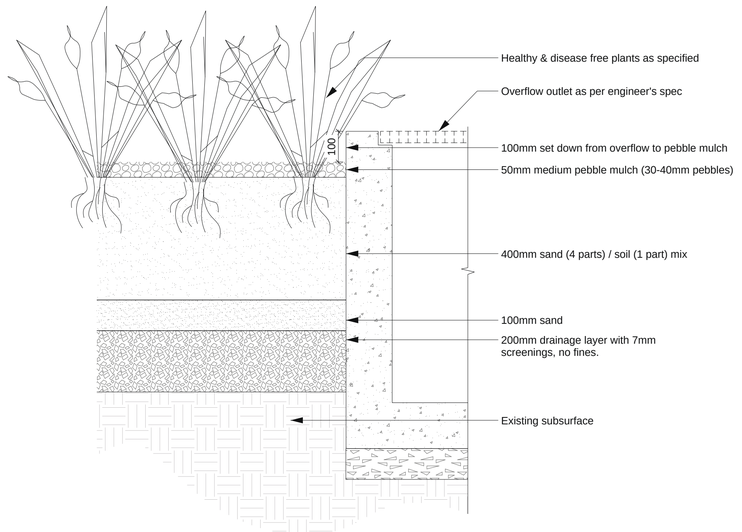
3.5 When planting water saving crystals https://www.yates.com.au/yates-waterwise-water-storage-crystals/ should be placed at the bottom of the planting hole. Every plant should be watered immediatley after planting NOT at the end of the day.



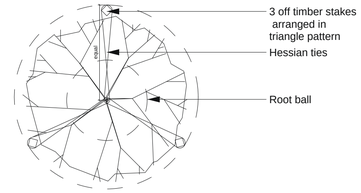
VG01 / 01 — PLANTING DETAIL
SECTION
SCALE 1:10 @ A1



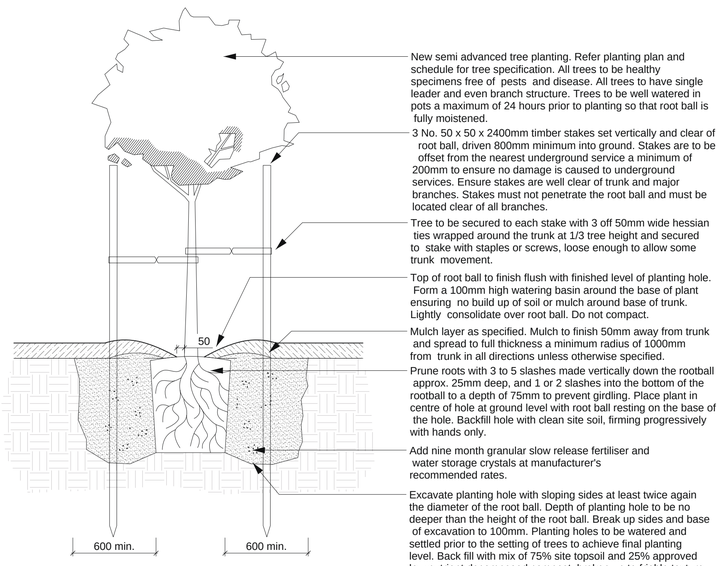
VG03 / 01 — RAIN GARDEN / CURB INTERFACE
SECTION
SCALE 1:10 @ A1



VG04 / 01 — RAIN GARDEN - TYPICAL
SECTION
SCALE 1:10 @ A1



VG02 / 01 — ADVANCED TREE PLANTING
PLAN
SCALE 1:20 @ A1



VG02 / 02 — ADVANCED TREE PLANTING
SECTION
SCALE 1:20 @ A1

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Client: Ryan Road Pakenham Land Pty Ltd
Project Address: 23 Ryan Road Pakenham, VIC 3810

N

scale: 1:10 @ A1
1:20 @ A1
1:10 0 .1 .2 .3 .4 .5 1
1:20 .2 .4 .6 .8 1 2
metres

Principal Designer: Elliot Summers
Assisted by: Joy Qiao
Contact Number: 03 9482 7868
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Date of Issue : 23/01/2026

Drawing Number: LS03

Revision:
A 23/01/2026
Adjusted planting to allow for more canopy trees within the landscape setback; relocation of the raingarden

SHEET LIST:

ARTISTS IMPRESSION ONLY
SCALE : NTS

CHILDCARE RYAN RD
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watson young