HUME CITY COUNCIL

Office Use Only

Application No.: Date Lodged: / /

# Application for Planning Permit

Planning Enquiries
Phone: 03 9205 2200
Web: http://www.hume.vic.gov.au

If you need help to complete this form, read How to complete the Application for Planning Permit form.

⚠ Any material submitted with this application, including plans and personal information, will be made available for public viewing, including electronically, and copies may be made for interested parties for the purpose of enabling consideration and review as part of a planning process under the *Planning and Environment Act 1987*. If you have any concerns, please contact Council's planning department.

⚠ **Questions marked with an asterisk (*) are mandatory and must be completed.**

⚠ **If the space provided on the form is insufficient, attach a separate sheet.**

Clear Form

## The Land

(1) Address of the land. Complete the Street Address and one of the Formal Land Descriptions.

**Street Address ***

Unit No.: | St. No.: 647, 649, 649a | St. Name: Donnybrook Road

Suburb/Locality: Kalkallo | Postcode: 3064

**Formal Land Description ***
Complete either A or B.

⚠ This information can be found on the certificate of title.

A Lot No.: 10 ◯ Lodged Plan ◯ Title Plan ◯ Plan of Subdivision No.: 00698

OR

B Crown Allotment No.: | Section No.:

Parish/Township Name:

Remove Address

**Formal Land Description ***
Complete either A or B.

⚠ This information can be found on the certificate of title.

A Lot No.: ◯ Lodged Plan ◉ Title Plan ◯ Plan of Subdivision No.: 647 , 649 , 649a

OR

B Crown Allotment No.: 2027 and 9 and 10 | Section No.:

Parish/Township Name:

Remove Address

If this application relates to more than one address, please click this button and enter relevant details. Add Address

## The Proposal

⚠ You must give full details of your proposal and attach the information required to assess the application. Insufficient or unclear information will delay your application.

(2) **For what use, development or other matter do you require a permit? ***

If you need help about the proposal, read: How to Complete the Application for Planning Permit Form

Development of Land for second dwelling across 647, 649 and 649A Donnybrook Road, Kalkallo

Provide additional information on the proposal, including: plans and elevations; any information required by the planning scheme, requested by Council or outlined in a Council planning permit checklist; and if required, a description of the likely effect of the proposal.

(3) **Estimated cost of development for which the permit is required** *

Cost $400000

⚠ You may be required to verify this estimate. Insert '0' if no development is proposed.

If the application is for land within **metropolitan Melbourne** (as defined in section 3 of the *Planning and Environment Act 1987*) and the estimated cost of the development exceeds $1 million (adjusted annually by CPI) the Metropolitan Planning Levy **must** be paid to the State Revenue Office and a current levy certificate **must** be submitted with the application. Visit www.sro.vic.gov.au for information.

## Existing Conditions

(4) **Describe how the land is used and developed now** *

eg. vacant, three dwellings, medical centre with two practitioners, licensed restaurant with 80 seats, grazing.

Residential

Provide a plan of the existing conditions. Photos are also helpful.

## Title Information

(5) **Encumbrances on title** *

If you need help about the title, read: How to complete the Application for Planning Permit form

Does the proposal breach, in any way, an encumbrance on title such as a restrictrive covenant, section 173 agreement or other obligation such as an easement or building envelope?

- ○ Yes. (If 'yes' contact Council for advice on how to proceed before continuing with this application.)
- ◉ No
- ○ Not applicable (no such encumbrance applies).

Provide a full, current copy of the title for each individual parcel of land forming the subject site. (The title includes: the covering 'register search statement', the title diagram and the associated title documents, known as 'instruments', eg. restrictive covenants.)

## Applicant and Owner Details

(6) Provide details of the applicant and the owner of the land.

**Applicant** *

The person who wants the permit.

[redacted]

*Where the preferred contact person for the application is different from the applicant, provide the details of that person.*

Contact person's details

Same as applicant (if so, go to 'contact information') ☐

Name:

Title: Mr | First Name: Michael | Surname: Unalan

Organisation (if applicable):

Postal Address: | If it is a P.O. Box, enter the details here:

Unit No.: | St. No.: 647 | St. Name: Donnbrook Road

Suburb/Locality: Kalkallo | State: VIC | Postcode: 3064

*Please provide at least one contact phone number* *

**Contact information**

Business Phone: | Email: michael@fintik.com.au

Mobile Phone: 0447 370 700 | Fax:

Owner *

The person or organisation who owns the land

*Where the owner is different from the applicant, provide the details of that person or organisation.*

[redacted]

## Declaration

7 **This form must be signed by the applicant ***

⚠ Remember it is against the law to provide false or misleading information, which could result in a heavy fine and cancellation of the permit.

I declare that I am the applicant; and that all the information in this application is true and correct; and the owner (if not myself) has been notified of the permit application.

Signature:

Date: 10-02-25

day / month / year

## Need help with the Application?

If you need help to complete this form, read How to complete the Application for Planning Permit form
General information about the planning process is available at www.delwp.vic.gov.au/planning

Contact Council's planning department to discuss the specific requirements for this application and obtain a planning permit checklist. Insufficient or unclear information may delay your application.

(8) **Has there been a pre-application meeting with a Council planning officer?**

○ No ◉ Yes

If 'yes', with whom?: Ben Micallef

Date: 31-01-25 day / month / year

## Checklist

(9) **Have you:**

- ☑ Filled in the form completely?
- ☑ Paid or included the application fee?

⚠ Most applications require a fee to be paid. Contact Council to determine the appropriate fee.

- 📎 Provided all necessary supporting information and documents?
  - ☑ A full, current copy of title information for each individual parcel of land forming the subject site
  - ☑ A plan of existing conditions.
  - ☑ Plans showing the layout and details of the proposal
  - ☑ Any information required by the planning scheme, requested by council or outlined in a council plan... ...rmit checklist.
  - ☑ If required, a description of the likely effect of the proposal (eg traffic, noise, environmental impacts).
  - ☐ If applicable, a current Metropolitan Planning Levy certificate (a levy certificate expires 90 days after the day on which it is issued by the State Revenue Office and then cannot be used). Failure to comply means the application is void.

- ☑ Completed the relevant Council planning permit checklist?
- ☑ Signed the declaration (section 7)?

## Lodgement

Lodge the completed and signed form, the fee payment and all documents with:

Hume City Council
PO Box 119 Dallas VIC 3047
Pascoe Vale Road Broadmeadows VIC 3047

**Contact information:**

Telephone: 61 03 9205 2200
Email: email@hume.vic.gov.au
DX: 94718
Translation: 03 9205 2200 for connection to Hume Link's multilingual telephone informa... ...rvice

**Deliver application in person, by fax, or by post:**

Print Form

Make sure you deliver any required supporting information and necessary payment when you deliver this form to the above mentioned address. This is usually your local council but can sometimes be the Minister for Planning or another body.

**Save Form:**

Save Form To Your Computer

You can save this application form to your computer to complete or review later or email it to others to complete relevant sections.

The Victorian Government acknowledges the Traditional Owners of Victoria and pays respects to their ongoing connection to their Country, History and Culture. The Victorian Government extends this respect to their Elders, past, present and emerging.

REGISTER SEARCH STATEMENT (Title Search) Transfer of Land Act 1958

---

VOLUME 10244 FOLIO 869 Security no : 124121879904W
Produced 10/02/2025 12:19 PM

LAND DESCRIPTION

---

Crown Allotment 9 Section 2 Township of Kalkallo Parish of Kalkallo.
PARENT TITLE Volume 00698 Folio 456
Created by Application No. 074428R 08/08/1995

REGISTERED PROPRIETOR

---

[redacted]

ENCUMBRANCES, CAVEATS AND NOTICES

---

MORTGAGE AY310085F 15/08/2024
MA MONEY FINANCIAL SERVICES PTY LTD

For details of any other encumbrances see the plan or imaged folio set out under DIAGRAM LOCATION below.

NOTICE Section 45 Melbourne Strategic Assessment (Environment Mitigation Levy) 2020
AT390531A 01/07/2020

DIAGRAM LOCATION

---

SEE TP003152X FOR FURTHER DETAILS AND BOUNDARIES

ACTIVITY IN THE LAST 125 DAYS

---

NIL

----------END OF REGISTER SEARCH STATEMENT----------

Additional information: (not part of the Register Search Statement)

Street Address: 647 DONNYBROOK ROAD KALKALLO VIC 3064

ADMINISTRATIVE NOTICES

---

NIL

eCT Control 19531K DENTONS AUSTRALIA
Effective from 15/08/2024

DOCUMENT END

| | TITLE PLAN | | EDITION 1 | TP3152X |
|---|---|---|---|---|

**Location of Land**
**Parish:** KALKALLO
**Township:** KALKALLO
**Section:** 2
**Crown Allotments:** 9 & 10
**Crown Portion:** ----------

**LTO base record :** 5402 (T ' ship)
**Last Plan Reference:** ---------
**Title References:** C/G VOL. 698 FOL. 456
VOL. 698 FOL. 457
**Depth Limitation:** NIL.

**Notations:**

**Easement Information**

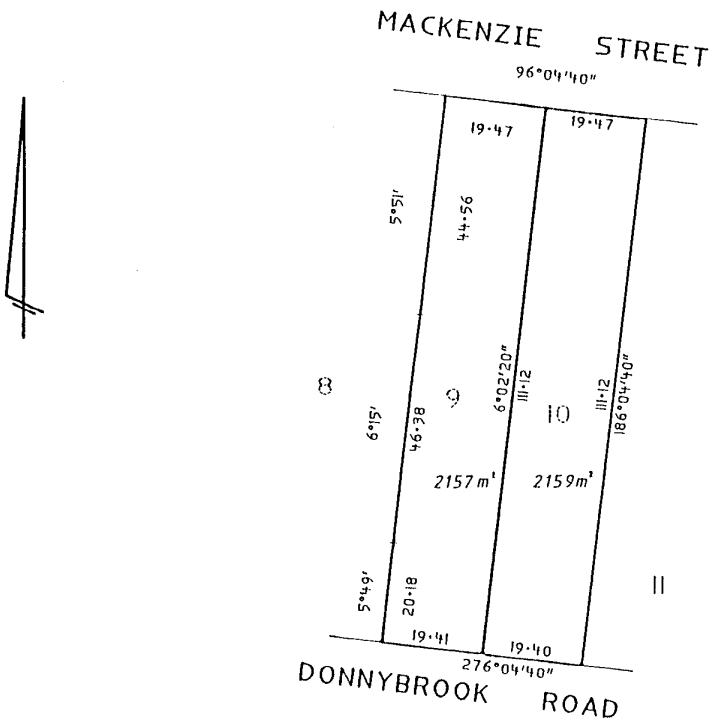
| Easement Reference | Purpose/Authority | Width (Metres) | Origin | Land benefitted/In favour of |
|---|---|---|---|---|
| NIL. | | | | |

THIS PLAN HAS BEEN PREPARED BY THE VICTORIAN LAND TITLES OFFICE FOR TITLE DIAGRAM PURPOSES

Checked by ZKA

Date 24 / 5 / 95

Assistant Registrar of Titles




Sheet 1 of 1 Sheet

| LENGTHS ARE IN METRES | SCALE | SHEET SIZE A3 | FILE No: AP 74428R |
|---|---|---|---|

The Victorian Government acknowledges the Traditional Owners of Victoria and pays respects to their ongoing connection to their Country, History and Culture. The Victorian Government extends this respect to their Elders, past, present and emerging.

REGISTER SEARCH STATEMENT (Title Search) Transfer of Land Act 1958

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VOLUME 10244 FOLIO 870 Security no : 124121737232A
Produced 04/02/2025 06:27 PM

LAND DESCRIPTION

---

Crown Allotment 10 Section 2 Township of Kalkallo Parish of Kalkallo.
PARENT TITLE Volume 00698 Folio 457
Created by Application No. 074428R 08/08/1995

REGISTERED PROPRIETOR

---

[redacted]

ENCUMBRANCES, CAVEATS AND NOTICES

---

MORTGAGE AY310085F 15/08/2024
MA MONEY FINANCIAL SERVICES PTY LTD

For details of any other encumbrances see the plan or imaged folio set out under DIAGRAM LOCATION below.

NOTICE Section 45 Melbourne Strategic Assessment (Environment Mitigation Levy) 2020
AT390570P 01/07/2020

DIAGRAM LOCATION

---

SEE TP003152X FOR FURTHER DETAILS AND BOUNDARIES

ACTIVITY IN THE LAST 125 DAYS

---

NIL

----------END OF REGISTER SEARCH STATEMENT----------

Additional information: (not part of the Register Search Statement)

Street Address: 649 DONNYBROOK ROAD KALKALLO VIC 3064

ADMINISTRATIVE NOTICES

---

NIL

eCT Control 19531K DENTONS AUSTRALIA
Effective from 15/08/2024

DOCUMENT END

The Victorian Government acknowledges the Traditional Owners of Victoria and pays respects to their ongoing connection to their Country, History and Culture. The Victorian Government extends this respect to their Elders, past, present and emerging.

REGISTER SEARCH STATEMENT (Title Search) Transfer of Land Act 1958

---

VOLUME 11081 FOLIO 389 Security no : 124121880255Q
Produced 10/02/2025 12:26 PM

CROWN GRANT

LAND DESCRIPTION

---

Crown Allotment 2027 Township of Kalkallo Parish of Kalkallo.

REGISTERED PROPRIETOR

---

[redacted]

ENCUMBRANCES, CAVEATS AND NOTICES

---

MORTGAGE AY310085F 15/08/2024
MA MONEY FINANCIAL SERVICES PTY LTD

Any crown grant reservations exceptions conditions limitations and powers noted on the plan or imaged folio set out under DIAGRAM LOCATION below. For details of any other encumbrances see the plan or imaged folio set out under DIAGRAM LOCATION below.

NOTICE Section 45 Melbourne Strategic Assessment (Environment Mitigation Levy) 2020
AT390537M 01/07/2020

DIAGRAM LOCATION

---

SEE TP870516U FOR FURTHER DETAILS AND BOUNDARIES

ACTIVITY IN THE LAST 125 DAYS

---

NIL

----------END OF REGISTER SEARCH STATEMENT----------

Additional information: (not part of the Register Search Statement)

Street Address: 649A DONNYBROOK ROAD KALKALLO VIC 3064

ADMINISTRATIVE NOTICES

---

NIL

eCT Control 19531K DENTONS AUSTRALIA
Effective from 15/08/2024

DOCUMENT END

# TITLE PLAN

EDITION 1

TP 870516U

## LOCATION OF LAND

PARISH : KALKALLO
TOWNSHIP: KALKALLO

SECTION :
CROWN ALLOTMENT : 2025, 2026 AND 2027

MGA94 Co-ordinates
(of approx. centre of land in plan) E 318880 N 5843330 ZONE: 55 GDA 94

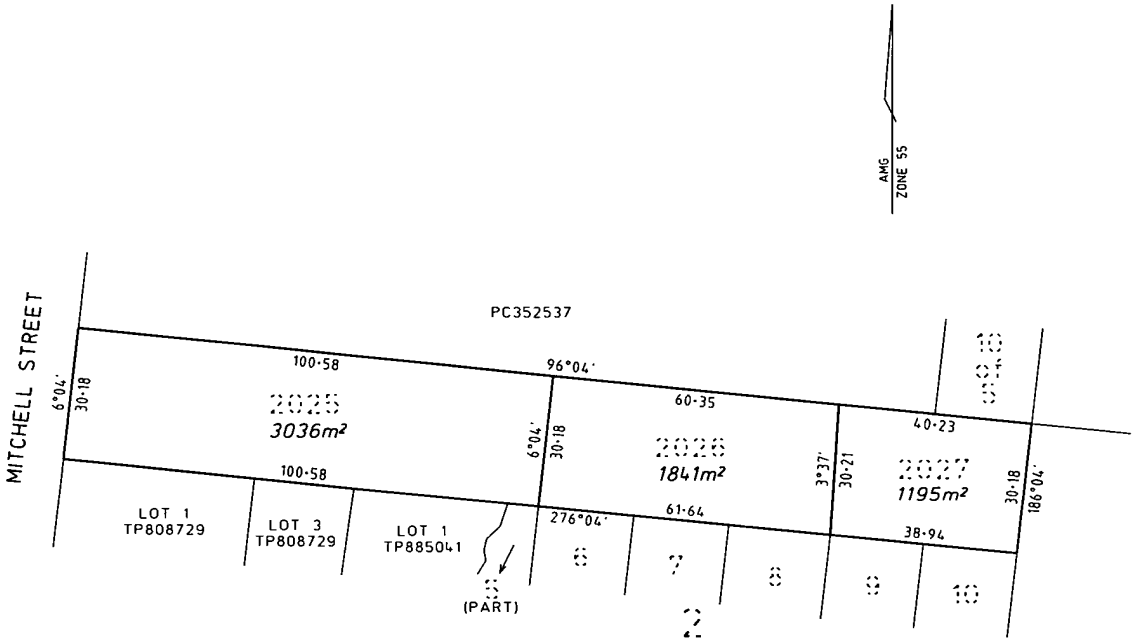
DEPTH LIMITATION : 15 Metres

## NOTATIONS:

SUBJECT TO ANY RESERVATIONS, EXCEPTIONS, CONDITIONS AND POWERS NOTED ON SHEET 2 OF THIS PLAN.

THIS PLAN HAS BEEN PREPARED BY LAND REGISTRY, LAND VICTORIA FOR TITLE DIAGRAM PURPOSES.

Checked by: R.W. Grimwood
Date: 26/3/2007
Assistant Registrar of Titles






PREPARED FROM: VDP, D(973), OP117052, APPN 74428, APPN 76898

PLAN OF CROWN ALLOTMENT

DRAWN: AJ 15-2-2007
CAD FILE: TP870516U.DGN

CHECKED: A.JASKIEWICZ 15-2-2007

OFFICE OF SURVEYOR GENERAL
DEPARTMENT OF SUSTAINABILITY AND ENVIRONMENT

SCALE
10 0 10 20 30 40
LENGTHS ARE IN METRES

SCALE 1:1000

SHEET SIZE A3

John E. Tulloch
SURVEYOR-GENERAL

23. 3. 2007
DATE

Corr. No. 12L12-1233

Sheet 1 of 2 Sheets

| TITLE PLAN | TP 870516U |
|---|---|

**RESERVATIONS EXCEPTIONS CONDITIONS AND POWERS**

The reservation to the Crown of:

- any minerals as defined in the *Mineral Resources Development Act* 1990 and petroleum as defined in the *Petroleum Act* 1958 (the "reserved minerals");
- rights of access to any part of the land to search and obtain the reserved minerals; and
- rights of access to any part of the land for pipe-lines, works and other purposes necessary to obtain and convey the reserved minerals on and from the land;

The right to resume the said land for mining purposes under Section 205 of the *Land Act* 1958; and

The right of a licensee under the *Mineral Resources Development Act* 1990 or any corresponding previous enactment, to enter land and do work, within the meaning of that Act, and to erect and occupy mining plant or machinery on the land, in the same manner and under the same conditions and provisions as such licensee currently has on Crown land, provided compensation is paid under Part 8 of that Act for surface damage to the lands.

The condition that the grantee and his heirs executors administrators and successors in title shall take the said land notwithstanding the impediment that no legal road access thereto has been provided or implied by these presents to the above mentioned allotments 2026, 2027 and the grantee and his heirs and successors in title agree to indemnify Us Our heirs and successors against the expenses of acquiring or providing an easement of way to the land hereby granted or any part thereof.

# WRITTEN RESPONSE TO MINISTER'S GUIDELINE MG-12
# SITING AND DESIGN OF SINGLE DWELLINGS

## SUBJECT SITE:
## NO.649 DONNYBROOK RD, KALKALLO (LOT 10)

**Date:** 30/07/2023
**Prepared by:** PD STUDIO (Building designer / owner's agent)

| | |
|---|---|
| **MAXIMUM STREET SETBACK**<br><br>Objective:<br><br>To facilitate consistent streetscapes by discouraging the siting of single dwellings at the rear of lots. | ✓ **Complies** |
| **MINIMUM STREET SETBACK**<br><br>Objective:<br><br>To ensure that the setbacks of buildings from a street respect the existing or preferred character of the neighbourhood and make efficient use of the site. | ✓ **Complies** |
| **BUILDING HEIGHT**<br><br>Objective:<br><br>To ensure that the height of buildings respects the existing or preferred character of the neighbourhood. | ✓ **Complies** |

| | |
|---|---|
| **SITE COVERAGE**<br><br>Objective<br><br>To ensure that the site coverage respects the existing or preferred neighbourhood character and responds to the features of the site. | ✓ **Complies** |
| **PERMEABILITY**<br><br>Objective:<br><br>To reduce the impact of increased stormwater run-off on the drainage system and to facilitate on-site stormwater infiltration. | ✓ **Complies** |
| **CAR PARKING**<br><br>Objective To ensure that car parking is adequate for the needs of the residents | ✓ **Complies** |
| **SIDE AND REAR SETBACKS**<br><br>Objective:<br><br>To ensure that the height and setback of a building from a boundary respects the existing or preferred character and limits the impact on the amenity of existing dwellings. | ✓ **Complies** |
| **WALLS ON BOUNDARIES**<br><br>Objective To ensure that the location, length and height of a wall on a boundary respects the existing or preferred neighbourhood character and limits the impact on the amenity of existing dwellings. | ✓ **Complies** |
| **DAYLIGHT TO EXISTING HABITABLE ROOM WINDOWS**<br><br>Objective To allow adequate daylight into habitable room windows. | ✓ **Complies** |

| | |
|---|---|
| **SOLAR ACCESS TO EXISTING NORTH-FACING WINDOWS**<br><br>Objective:<br><br>To allow adequate solar access into existing north-facing habitable room windows.<br><br>Decision Guidelines:<br><br>The reporting authority may give its consent to an application for a building permit for a single dwelling, which does not comply with regulation 417 of the Building Regulations 2006, if –<br><br>(a) The building will not impact on the amenity of existing dwellings on nearby allotments; and<br><br>(b) The building is consistent with a building envelope that has been approved under a planning scheme or planning permit and or included in an agreement under section 173 of the Planning and Environment Act 1987. | ✓ **Complies** |
| **OVERSHADOWING OF SECLUDED PRIVATE OPEN SPACE**<br><br>Objective:<br><br>To ensure buildings do not unreasonably overshadow existing secluded private open spaces. | ✓ **Complies** |
| **OVERLOOKING**<br><br>Objective:<br><br>To limit views into existing secluded private open space and existing habitable room windows. | ✓ **Complies** |
| **DAYLIGHT TO NEW HABITABLE ROOM WINDOWS**<br><br>Objective To allow adequate daylight into new habitable room windows of the dwelling. | ✓ **Complies** |

| | |
|---|---|
| **PRIVATE OPENSPACE**<br><br>Objective:<br><br>To provide adequate private open space for the reasonable recreation and service needs of residents. | ✓ **Complies** |
| **FRONT FENCE HEIGHT**<br><br>Objective:<br><br>To ensure front fence design respects the existing or preferred character of the neighbourhood. | ✓ **Not Applicable** |

# PLAN OF FEATURE SURVEY OF
# C.A.10 ON TP 3152X
# No.649 DONNYBROOK ROAD
# KALKALLO

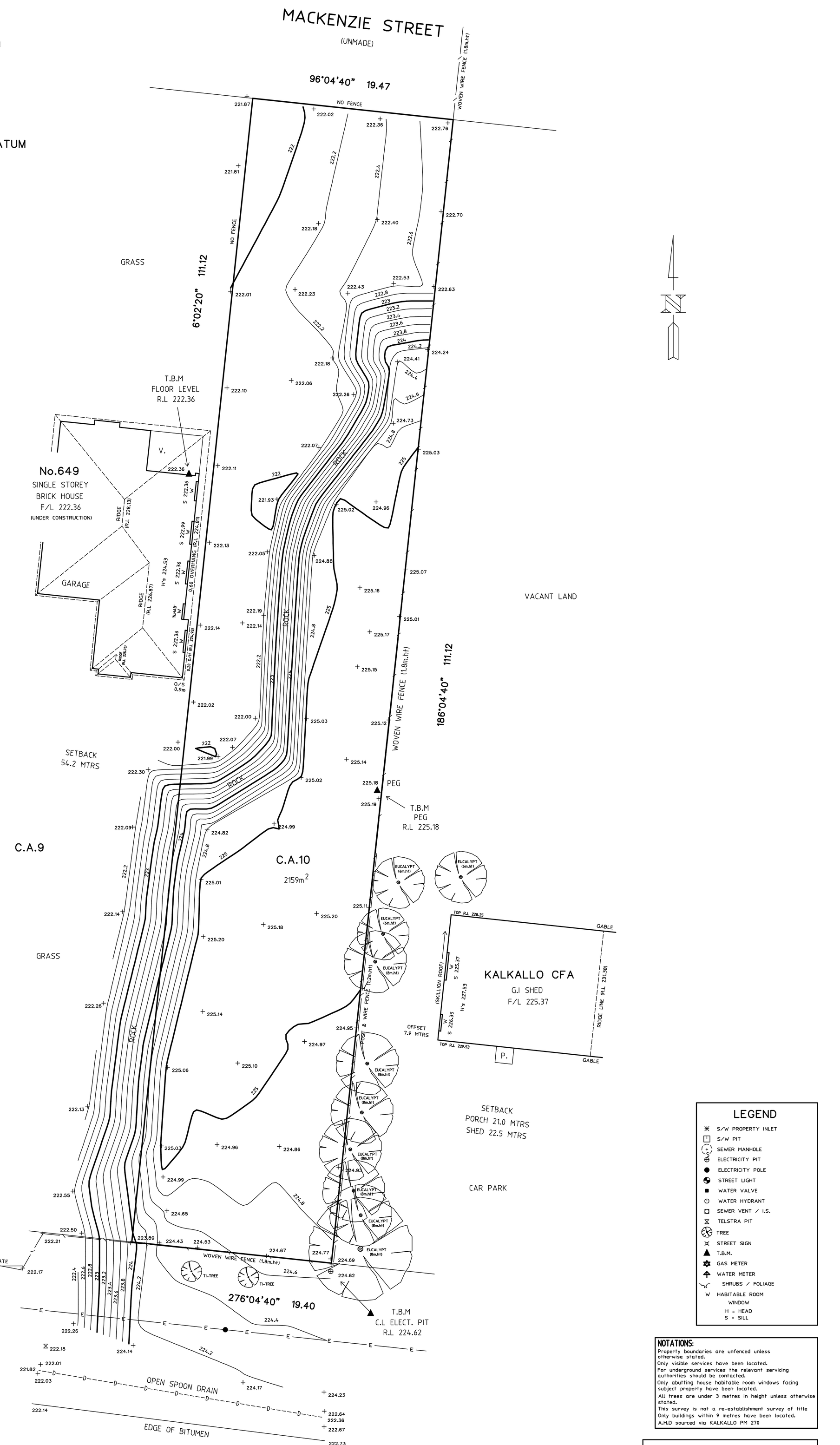
(ORIGINAL SHEET SIZE A–1)

SCALE 1:200 METRIC

LEVELS ARE TO AUSTRALIAN HEIGHT DATUM

CONTOUR INTERVAL 0.20 METRES

COMPUTER REF: 242902




## LEGEND

- S/W PROPERTY INLET
- S/W PIT
- SEWER MANHOLE
- ELECTRICITY PIT
- ELECTRICITY POLE
- STREET LIGHT
- WATER VALVE
- WATER HYDRANT
- SEWER VENT / I.S.
- TELSTRA PIT
- TREE
- STREET SIGN
- T.B.M.
- GAS METER
- WATER METER
- SHRUBS / FOLIAGE
- W HABITABLE ROOM WINDOW
  H = HEAD
  S = SILL

## NOTATIONS:

Property boundaries are unfenced unless otherwise stated.
Only visible services have been located.
For underground services the relevant servicing authorities should be contacted.
Only abutting house habitable room windows facing subject property have been located.
All trees are under 3 metres in height unless otherwise stated.
This survey is not a re-establishment survey of title
Only buildings within 9 metres have been located.
A.H.D sourced via KALKALLO PM 270



## PLAN OF FEATURE SURVEY

C.A.10 ON TP 3152X
No.649 DONNYBROOK ROAD
KALKALLO

FEATURESURVEY .COM.AU
MELBOURNE, VICTORIA
www.featuresurvey.com.au
PH: 0407 006 715
E: BryceA@featuresurvey.com.au
ABN: 88 671 470 683

REF: 242902
DATE: 22/5/2023
DRAWN: BRYCE AUJARD
FIELD: BRYCE AUJARD

# Sustainable Design Assessment

Proposed Single Storey Dwelling
Address: No.649 (Lot 10) Donnybrook Road, Kalkallo
Client: PD Studio

# Table of Contents

# Introduction

EcoHaus Assessors has been engaged to undertake a Sustainable Design Assessment for the proposed single storey dwelling located at 649 Donnybrook Road, Kalkallo. This has been prepared to address the Hume City Council's sustainability requirements Planning Policy Clause 15.01-2L-03 *Environmentally Sustainable Development*.

The key categories to be addressed within the Clause include:

- Energy Performance
- Water Efficiency
- Stormwater Management
- Indoor Environment Quality
- Transport
- Urban Ecology
- Waste Management
- Building Materials
- Construction and Building Management
- Innovation and ESD Excellence

# Site Description

**Project Address**
No.649 (Lot10) Donnybrook Road, Kalkallo
**Municipality**
Hume City Council
**Project Name**
Single Storey Dwelling

**Site Area**
2159.00m2
**Site Coverage**
23.22%
**Proposed Building Area**
501.30m2


# Proposed Development

The proposal consists of development of a single storey dwelling which includes 4 bedrooms. The area of the site is 2159.00m2. The dwelling will be provided with an undercover garage and an individual driveway opening to a street.

# Built Environment Sustainable Scorecard (BESS)

The development has been assessed using the BESS tool. This tool assesses the energy and water efficiency, thermal comfort and overall environmental sustainability performance of new buildings or alterations. It was created to demonstrate how new development can meet sustainability requirements as part of a planning permit application for the participating council.

Overall BESS score: **53%**

| **Category** | **Score** |
|---|---|
| Management | 40% |
| Water | 57% |
| Energy | 50% |
| Stormwater | 100% |
| IEQ | 80% |
| Transport | 0% |
| Waste | 50% |
| Urban Ecology | 57% |
| Innovation | 0% |

# Energy Performance

Objectives:

- Maximising passive design through improvements to the building shell
- Ensuring efficient use of energy through highly efficient mechanical and electrical system components.
- Reducing operating greenhouse gas emissions and energy costs.
- Encouraging uptake of local renewable energy generation.

| | | |
|---|---|---|
| Renewable Energy | **No** | Solar PV system |
| NatHERS Summary | | Minimum NatHERS Star Rating for **Dwelling** is **7.0 stars**<br>Annual Heating Load: **92.6 MJ/sqm**<br>Annual Cooling Load: **6.0 MJ/sqm** |
| Energy Supply | | Electricity & LPG |
| Heating System | | System Type – Reverse cycle ducted<br>ERS – 6 Star Rating |
| Cooling System | | System Type – Refrigerative ducted<br>ERS – 6 Star Rating |
| Hot Water System | | System Type – Electric Heat Pump Band 1 |
| Clothes Drying | **Yes** | Clothes lines provided to dwelling.<br>Clothes line to be installed in secluded private open space of dwelling refer to architectural drawings. |
| Lighting Strategy | | LED downlight will be installed in all habitable areas to reduce energy consumption. Illumination power density calculation can be found on the architectural working drawings. |

# Water Efficiency

Objectives:

- Ensuring the efficient use of water and minimising costs from water use
- Supporting the collection and reuse of alternative water sources, e.g. grey water, rainwater and stormwater

| | | |
|---|---|---|
| Recycled Water Use | **No**<br>**Yes**<br>**No** | Purple pipe – Class A Recycled Water reticulation on site<br>Rainwater tanks proposed<br>Swimming pools proposed |
| Rainwater tanks | **Yes** | Proposed dwelling to have a **22500L septic rainwater tank** provided with reticulation to<br>- sanitary flushing systems<br>- laundry washing machines. |
| Water fixtures, fittings and device connections | | Showerheads – Min. 4 Stars WELS rating<br>Baths – Medium sized contemporary Bath<br>Kitchen taps – Min.4 Stars WELS rating<br>Bathroom taps – Min. 4 Stars WELS rating<br>Dishwashers – Min. 4 Stars WELS rating<br>Toilets - Min. 4 Stars WELS rating<br>Urinals – Scoped Out<br>Washing machines – Scoped Out |
| Non-potable water sources | | Non-potable water is connected to rainwater tank as demonstrated above. |
| Water Efficient Appliances | | All appliances if provided in the development as part of the base building work (e.g. dishwasher) will be chosen within one WELS star of the best available. |
| Water Efficient Landscaping | | Native or drought-tolerant plants will be implemented for the landscaped areas on site. Use of water or irrigation will not be required after initial period when plants are getting established. If irrigation is required, it will be connected to rainwater tank. |

# Stormwater Management

Objectives:

- Reducing runoff from hard and impervious surfaces to improve the quality of waterways
- Maximising the re-use of stormwater onsite
- Demonstrate compliance with Urban Stormwater Management Best Practice Standards for Water Quality
-

| | |
|---|---|
| STORM or MUSIC Report % | Melbourne Water STORM Calculator, achieving a rating of **108%.** |
| Rainwater tanks | Each proposed dwelling is to have a **22500L septic rainwater tank** provided with reticulation to:<br>• sanitary flushing systems<br>• laundry washing machines |
| Raingardens | Two above-ground raingardens of 3m2 catchment area will receive stormwater runoff from two roof spaces, one on each dwelling.<br>**Catchment area of Dwelling Roof to Raingarden:** 223.25m2<br>**Catchment area of Driveway to Raingarden:** 200.00m2 |

Melbourne Water **STORM Rating Report**

| | |
|---|---|
| TransactionID: | 0 |
| Municipality: | HUME |
| Rainfall Station: | HUME |
| Address: | 649 Donnybrook Rd<br><br>Kalkallo<br>VIC 3064 |
| Assessor: | 649 Donnybrook Rd, Kalkallo VIC 3064, Australia |
| Development Type: | Residential - Dwelling |
| Allotment Site (m2): | 2,159.00 |
| STORM Rating %: | 108 |

| Description | Impervious Area (m2) | Treatment Type | Treatment Area/Volume (m2 or L) | Occupants / Number Of Bedrooms | Treatment % | Tank Water Supply Reliability (%) |
|---|---|---|---|---|---|---|
| Dwelling Roof to RWT | 266.05 | Rainwater Tank | 22,500.00 | 4 | 107.00 | 99.70 |
| Rain Garden | 223.25 | Raingarden 100mm | 3.00 | 0 | 120.30 | 0.00 |
| Untreated Driveway | 51.85 | None | 0.00 | 0 | 0.00 | 0.00 |
| Driveway to Rain Garden | 200.00 | Raingarden 100mm | 3.00 | 0 | 122.40 | 0.00 |

# Indoor Environment Quality

Objectives:

- To achieve a healthy indoor environment quality for the wellbeing of building occupants, including the provision of fresh air intake, cross ventilation, and natural daylight.
- To achieve thermal comfort levels with minimised need for mechanical heating, ventilation and cooling.
- To reduce indoor air pollutants by encouraging use of materials with low toxic chemicals.
- To reduce reliance on mechanical heating, ventilation, cooling and lighting systems.
- To minimise noise levels and noise transfer within and between buildings and associated external areas.

| | |
|---|---|
| Cross Flow Ventilation | Cross-flow ventilation has been designed into the dwelling through window placement and internal layout as well as window type and orientation tailing wind-rose patterns.<br>All cross-flow ventilation is shown on the dedicated ESD Drawing.<br>The kitchen will have a separate dedicated exhaust fan (range-hood) which will be directly exhausted out of the building. |
| Double Glazing | Glazing will be chosen in accordance with the energy rating requirements at the building approval stage. However, as a minimum double glazing will be provided to all living areas and bedrooms. This will provide better thermal performance and reduce condensation which helps prevent the formation of mould within the dwellings. |
| Thermal Comfort | R6.0 insulation is nominated for ceilings and R2.5 for the external walls.<br>The roof will be a dark colour including antiglare foil to help reduce solar heat gain. |
| Indoor air quality | Low VOC, water based and non-toxic paints to be specified.<br>Timber used at the site will be either reused, post-consumer recycled or certified under the forest certification scheme where applicable. |
| Daylight Levels | Daylight penetration will be enhanced with the use of light internal colours to improve daylight reflection. All bedrooms and living rooms will be provided with windows to allow for natural sunlight and ventilation. There are no bedrooms that rely on borrowed daylight. |

# Transport

Objectives:

- To ensure that the built environment is designed to promote the use of walking, cycling and public transport, in that order.
- To promote the use of low emissions vehicle technologies and supporting infrastructure.
- To minimise car dependency

# Urban Ecology

Objectives:

- To protect and enhance biodiversity within the municipality.
- To provide environmentally sustainable landscapes and natural habitats and minimise the urban heat island effect.
- To encourage the retention of significant trees.
- To encourage the planting of indigenous vegetation.
- To encourage the provision of space for productive gardens, particularly in larger residential developments.

| | |
|---|---|
| Taps to S.P.O.S or balcony | The dwelling to have a secluded private open space that is equipped with a tap and floor waste system. |
| Vegetation | Proportion of site covered by vegetation, does not include fake grass or non-contributing permeable pavement: 30%, trees, shrubs, tussocks, grasses. |

# Waste

Objectives:

- To promote waste avoidance, reuse and recycling during the design, construction and operation stages of development.
- To ensure durability and long term reusability of building materials.
- To ensure sufficient space is allocated for future change in waste management needs, including (where possible) composting and green waste facilities.

| | |
|---|---|
| Food and Garden Waste | Compost bins and internal cabinetry for the fitment of min. four waste streams. (Recycle, Red-cycle, Compost/FOGO, Waste). |


Figure 1: bins for each stream including future glass bin

Figure 2: Examples of kitchen receptacles for general waste and recycling.

# Building Materials

Objectives:

- To minimize the environmental impacts of materials used by encouraging the use of materials with a favourable lifecycle assessment.
- Reduce embodied energy of materials.
- Use materials with recycled content.

| | |
|---|---|
| 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 | The use of timber flooring will be preferred for all living areas. Wherever possible, flooring will be selected from products/materials certified under any of the following:<br>• Carpet Institute of Australia Limited, Environmental Certification Scheme (ECS);<br>• Global Green Tag; and/or<br>• Good Environmental Choice (GECA) |
| Joinery | Wherever possible, joinery will be manufactured from materials/products certified under any of the following:<br>• Global Green Tag; and/or<br>• Good Environmental Choice (GECA) |
| Steel | Wherever possible, steel for the development will be sourced from a Responsible Steel Maker. Reinforcing steel for the project will be manufactured using energy-reducing processes commonly used by large manufacturers such as Bluescope or OneSteel. |



# Construction and Building Management

Objectives:

- Best practice for building management means that sustainability is integrated from concept design through the construction process. Good decisions made early will always deliver the maximum benefit for the lowest cost.
- Best practice building management also means giving future occupants the information they need to be able to run their buildings in the most efficient way.

# Innovation and ESD Excellence

Objectives:

- To encourage innovative technology, design and processes in all development, so as to positively influence the sustainability of buildings.

| | |
|---|---|
| EV Charging infrastructure | A power point located in the garage for the dwelling to accommodate infrastructure in future to charge electric vehicles. |

# Appendix

**WSUD/STORM Assessment**

**BESS Assessment**

**NatHERS Assessment**

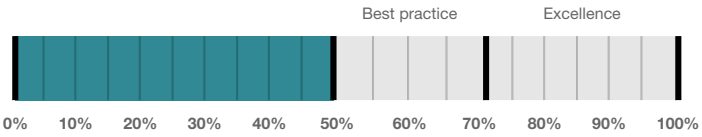
# BESS Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at 649 Donnybrook Rd Kalkallo Victoria 3064. 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 Hume City Council.

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

## Your BESS Score

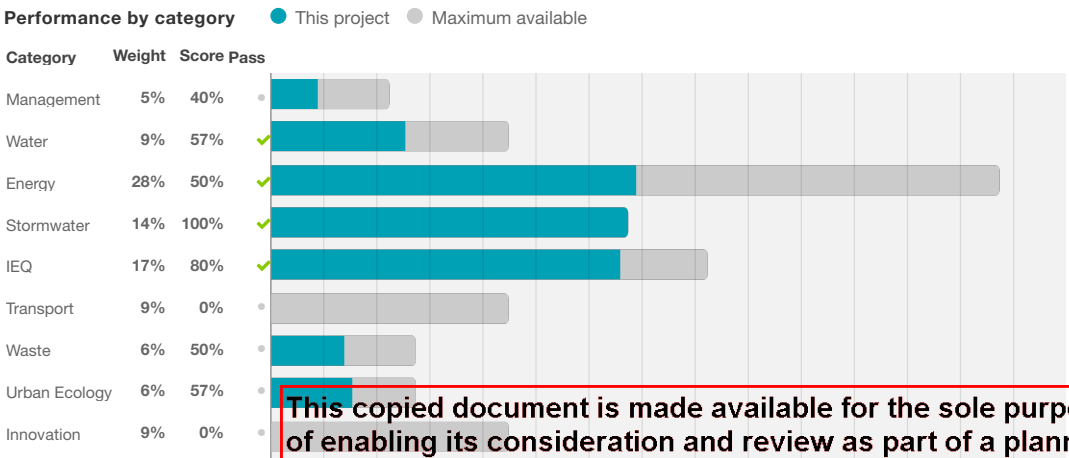



**53%**

## Project details

| | |
|---|---|
| **Name** | Lot 10/ No.649 Donnybrook Rd, Kalkallo VIC 3064, Australia |
| **Address** | 649 Donnybrook Rd Kalkallo Victoria 3064 |
| **Project ID** | CB363D57-R1 |
| **BESS Version** | BESS-8 |
| **Site type** | Single dwelling |
| **Account** | ecohaus.assessors@outlook.com |
| **Application no.** | |
| **Site area** | 2,159 m² |
| **Building floor area** | 501 m² |
| **Date** | 10 February 2025 |
| **Software version** | 2.0.1-B.576 |

## Performance by category



## Dwellings & Non Res Spaces

### Dwellings

| Name | Quantity | Area | % of total area |
|---|---|---|---|
| **Detached dwelling** | | | |
| Dwelling | 1 | 501 m² | 100% |
| **Total** | **1** | **501 m²** | **100%** |



## Supporting Evidence

### Shown on Floor Plans

| Credit | Requirement | Response | Status |
|---|---|---|---|
| Water 3.1 | Annotation: Water efficient garden details | To be printed<br>Floorplans & elevations - To be noted on floor plans | ✔ |
| Energy 3.3 | Annotation: External lighting controlled by motion sensors | To be printed<br>Floorplans & elevations - To be noted on floor plans | ✔ |
| Energy 3.4 | Location of clothes line (if proposed) | To be printed<br>Floorplans & elevations - to be shown on floor plans | ✔ |
| Stormwater 1.1 | Location of any stormwater management systems (rainwater tanks, raingardens, buffer strips) | To be printed<br>Floorplans & elevations - Shown on floor plans | ✔ |
| IEQ 2.2 | Annotation: Dwellings designed for 'natural cross flow ventilation' (If not all dwellings, include a list of compliant dwellings) | To be printed<br>Floorplans & elevations - Shown on both floor plans & elevations | ✔ |
| IEQ 3.1 | Annotation: Glazing specification (U-value, SHGC) | To be printed<br>Prelim NatHERs Report - Shown on prelim energy rating report | ✔ |
| IEQ 3.3 | North-facing living areas | To be printed<br>Floorplans & elevations - Shown on both floorplans & elevations | ✔ |
| Waste 2.1 | Location of food and garden waste facilities | To be printed<br>Floorplans & elevations - To be shown on floorplans | ✔ |
| Urban Ecology 2.1 | Location and size of vegetated areas | To be printed<br>Floorplans & elevations - To be shown on floorplans | ✔ |

### Supporting Documentation

| Credit | Requirement | Response | Status |
|---|---|---|---|
| Management 2.1 | Preliminary NatHERS assessment | To be printed<br>Preliminary NatHERS assessment<br>Shown on Preliminary NatHERS assessment | ✔ |
| Energy 3.5 | Average lighting power density and lighting type(s) to be used | To be printed<br>Preliminary NatHERS assessment<br>Shown on Preliminary NatHERS assessment | ✔ |
| Stormwater 1.1 | STORM report or MUSIC model | To be printed<br>STORM report<br>Shown on STORM report | ✔ |

| Credit | Requirement | Response | Status |
|---|---|---|---|
| IEQ 2.2 | A list of dwellings with natural cross flow ventilation | To be printed<br>Architectural drawings<br>Shown on Architectural drawings | ✔ |
| IEQ 3.1 | Reference to floor plans or energy modelling showing the glazing specification (U-value and Solar Heat Gain Coefficient, SHGC) | To be printed<br>Preliminary NatHERS assessment<br>Shown on Preliminary NatHERS assessment | ✔ |
| IEQ 3.3 | Reference to the floor plans showing living areas orientated to the north | To be printed<br>Architectural drawings<br>Shown on Architectural drawings | ✔ |

## Credit summary

### Management Overall contribution 4.5%

**40%**

| | |
|---|---|
| 1.1 Pre-Application Meeting | 0% |
| 2.1 Thermal Performance Modelling - Single Dwelling | 100% |

### Water Overall contribution 9.0%

**Minimum required 50%** **57%** ✔ **Pass**

| | |
|---|---|
| 1.1 Potable Water Use Reduction | 49% |
| 3.1 Water Efficient Landscaping | 100% |

### Energy Overall contribution 27.5%

**Minimum required 50%** **50%** ✔ **Pass**

| | | |
|---|---|---|
| 1.2 Thermal Performance Rating - Residential | 0% | ✔ Achieved |
| 2.1 Greenhouse Gas Emissions | 84% | |
| 2.6 Electrification | 0% | ⊘ Disabled |
| Credit is available when the energy supply is set to all-electric (no gas or wood). | | |
| 2.7 Energy consumption | 100% | |
| 3.3 External Lighting | 100% | |
| 3.4 Clothes Drying | 100% | |
| 3.5 Internal Lighting - Houses and Townhouses | 100% | |
| 4.4 Renewable Energy Systems - Other | N/A | ✣ Scoped Out |
| No other (non-solar PV) renewable energy is in use. | | |
| 4.5 Solar PV - Houses and Townhouses | 0% | ⊘ Disabled |
| No solar PV renewable energy is in use. | | |

**Stormwater** Overall contribution 13.5%

| | Minimum required 100% | 100% | ✔ Pass |
|---|---|---|---|
| 1.1 Stormwater Treatment | | 100% | |

**IEQ** Overall contribution 16.5%

| | Minimum required 50% | 80% | ✔ Pass |
|---|---|---|---|
| 2.2 Cross Flow Ventilation | | 100% | |
| 3.1 Thermal comfort - Double Glazing | | 100% | |
| 3.2 Thermal Comfort - External Shading | | 0% | |
| 3.3 Thermal Comfort - Orientation | | 100% | |

**Transport** Overall contribution 9.0%

| | | 0% | |
|---|---|---|---|
| 1.1 Bicycle Parking - Residential | | 0% | |
| 2.1 Electric Vehicle Infrastructure | | 0% | |

**Waste** Overall contribution 5.5%

| | | 50% | |
|---|---|---|---|
| 1.1 - Construction Waste - Building Re-Use | | 0% | |
| 2.1 - Operational Waste - Food & Garden Waste | | 100% | |

**Urban Ecology** Overall contribution 5.5%

| | | 57% | |
|---|---|---|---|
| 2.1 Vegetation | | 100% | |
| 2.2 Green Roofs | | 0% | |
| 2.3 Green Walls and Facades | | 0% | |
| 3.1 Food Production - Residential | | 0% | |

**Innovation** Overall contribution 9.0%

| | | 0% | |
|---|---|---|---|
| 1.1 Innovation | | 0% | |

## Credit breakdown

**Management** Overall contribution 4.5%

40%

| 1.1 Pre-Application Meeting | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 60% towards the category score. | |
| Criteria | Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council? | |
| Question | Criteria Achieved ? | |
| Project | No | |

| 2.1 Thermal Performance Modelling - Single Dwelling | | 100% |
|---|---|---|
| Score Contribution | This credit contributes 40% towards the category score. | |
| Criteria | Has a preliminary NatHERS rating been undertaken? | |
| Question | Criteria Achieved ? | |
| Detached dwelling | Yes | |

**Water** Overall contribution 9.0%

| | | | | |
|---|---|---|---|---|
| | | Minimum required 50% | 57% | ✔ Pass |

| | |
|---|---|
| **Water Approach** | |
| What approach do you want to use for Water?: | Use the built in calculation tools |
| Do you have a reticulated third pipe or an on-site water recycling system?: | No |
| Are you installing a swimming pool?: | No |
| Are you installing a rainwater tank?: | Yes |
| **Fixtures, fittings & connections profile** | |
| Showerhead: | 4 Star WELS (>= 4.5 but <= 6.0) |
| Bath: | Medium Sized Contemporary Bath |
| Kitchen Taps: | >= 4 Star WELS rating |
| Bathroom Taps: | >= 4 Star WELS rating |
| Dishwashers: | >= 4 Star WELS rating |
| WC: | >= 4 Star WELS rating |
| Urinals: | Scope out |
| Washing Machine Water Efficiency: | Scope out |
| Which non-potable water source is the dwelling/space connected to?: | Single Storey Dwelling |
| Non-potable water source connected to Toilets: | Yes |
| Non-potable water source connected to Laundry (washing machine): | Yes |
| Non-potable water source connected to Hot Water System: | No |
| **Rainwater tank profile** | |
| What is the total roof area connected to the rainwater tank?: Single Storey Dwelling | 54.0 m² |
| Tank Size: Single Storey Dwelling | 22,500 Litres |
| Irrigation area connected to tank: Single Storey Dwelling | 12.0 m² |
| Is connected irrigation area a water efficient garden?: Single Storey Dwelling | Yes |
| Other external water demand connected to tank?: Single Storey Dwelling | - |
| **1.1 Potable Water Use Reduction** | 49% |

| | |
|---|---|
| Score Contribution | This credit contributes 83.3% towards the category score. |
| Criteria | What is the reduction in total potable water use due to efficient fixtures, appliances, rainwater use and recycled water use? To achieve points in this credit there must be >25% potable water reduction. |
| Output | Reference |
| Project | 278 kL |
| Output | Proposed (excluding rainwater and recycled water use) |
| Project | 223 kL |
| Output | Proposed (including rainwater and recycled water use) |
| Project | 188 kL |
| Output | % Reduction in Potable Water Consumption |
| Project | 32 % |
| Output | % of connected demand met by rainwater |
| Project | 100 % |
| Output | How often does the tank overflow? |
| Project | Never / Rarely |
| Output | Opportunity for additional rainwater connection |
| Project | 53 kL |

| **3.1 Water Efficient Landscaping** | 100% |
|---|---|

| | |
|---|---|
| Score Contribution | This credit contributes 16.7% towards the category score. |
| Criteria | Will water efficient landscaping be installed? |
| Question | Criteria Achieved ? |
| Project | Yes |

**Energy** Overall contribution 27.5%

| | | | |
|---|---|---|---|
| | Minimum required 50% | 50% | ✔ Pass |

| Dwellings Energy Approach | |
|---|---|
| What approach do you want to use for Dwellings?: | Use the built in calculation tools |
| Are you installing any solar photovoltaic (PV) system(s)?: | No |
| Are you installing any other renewable energy system(s)?: | - |
| Energy Supply: | Electricity & LPG |

| Dwelling Energy Profile | |
|---|---|
| Below the floor is: | Ground or Carpark |
| Above the ceiling is: | Outside |
| Exposed sides: | 4 |
| NatHERS Annual Energy Loads - Heat: | 92.6 MJ/sqm |
| NatHERS Annual Energy Loads - Cool: | 6.0 MJ/sqm |
| NatHERS star rating: | 7.0 |
| Type of Heating System: | Reverse cycle ducted |
| Heating System Efficiency: | 6 Stars (2011 MEPS) |
| Type of Cooling System: | Refrigerative ducted |
| Cooling System Efficiency: | 6 Stars (2011 MEPS) |
| Type of Hot Water System: | Electric Heat Pump Band 1 |
| % Contribution from solar hot water system: | - |
| Clothes Line: | Private outdoor clothesline |
| Clothes Dryer: | Occupant to install |

| 1.2 Thermal Performance Rating - Residential | | 0% | ✔ Achieved |
|---|---|---|---|
| Score Contribution | This credit contributes 17.6% towards the category score. | | |
| Criteria | What is the average NatHERS rating? | | |
| Output | Average NATHERS Rating (Weighted) | | |
| Detached dwelling | 7.0 Stars | | |

| 2.1 Greenhouse Gas Emissions | | 84% |
|---|---|---|
| Score Contribution | This credit contributes 17.6% towards the category score. | |
| Criteria | What is the % reduction in annual greenhouse gas emissions against the benchmark? | |
| Output | Reference Building with Reference Services (BCA only) | |
| Detached dwelling | 5,227 kg CO2 | |
| Output | Proposed Building with Proposed Services (Actual Building) | |
| Detached dwelling | 4,343 kg CO2 | |
| Output | % Reduction in GHG Emissions | |
| Detached dwelling | 16 % | |

| 2.6 Electrification | | 0% | ⊘ Disabled |
|---|---|---|---|
| | | Credit is available when the energy supply is set to all-electric (no gas or wood). | |
| This credit is disabled | Credit is available when the energy supply is set to all-electric (no gas or wood). | | |

| 2.7 Energy consumption | | 10% |
|---|---|---|

| | |
|---|---|
| Score Contribution | This credit contributes 23.5% towards the category score. |
| Criteria | What is the % reduction in annual energy consumption against the benchmark? |
| Output | Reference Building with Reference Services (BCA only) |
| Detached dwelling | 40,188 MJ |
| Output | Proposed Building with Proposed Services (Actual Building) |
| Detached dwelling | 18,395 MJ |
| Output | % Reduction in total energy |
| Detached dwelling | 54 % |

**3.3 External Lighting** 100%

| | |
|---|---|
| Score Contribution | This credit contributes 2.9% towards the category score. |
| Criteria | Is the external lighting controlled by a motion detector? |
| Question | Criteria Achieved ? |
| Detached dwelling | Yes |

**3.4 Clothes Drying** 100%

| | |
|---|---|
| Score Contribution | This credit contributes 5.9% towards the category score. |
| Criteria | What is the % reduction in annual energy consumption (gas and electricity) from a combination of clothes lines and efficient driers against the benchmark? |
| Output | Reference |
| Detached dwelling | 869 kWh |
| Output | Proposed |
| Detached dwelling | 174 kWh |
| Output | Improvement |
| Detached dwelling | 80 % |

**3.5 Internal Lighting - Houses and Townhouses** 100%

| | |
|---|---|
| Score Contribution | This credit contributes 2.9% towards the category score. |
| Criteria | Does the development achieve a maximum illumination power density of 4W/sqm or less? |
| Question | Criteria Achieved? |
| Detached dwelling | Yes |

**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. |

**4.5 Solar PV - Houses and Townhouses** 0% Disabled

No solar PV renewable energy is in use.

| | |
|---|---|
| This credit is disabled | No solar PV renewable energy is in use. |

**Stormwater** Overall contribution 13.5%

| | Minimum required 100% | 100% | ✔ Pass |
|---|---|---|---|

| Which stormwater modelling software are you using?: | Melbourne Water STORM tool |
|---|---|
| **1.1 Stormwater Treatment** | 100% |
| Score Contribution | This credit contributes 100% towards the category score. |
| Criteria | Has best practice stormwater management been demonstrated? |
| Question | STORM score achieved |
| Project | 108 |
| Output | Min STORM Score |
| Project | 100 |

**IEQ** Overall contribution 16.5%

| | Minimum required 50% | 80% | ✔ Pass |
|---|---|---|---|

| **2.2 Cross Flow Ventilation** | 100% |
|---|---|
| Score Contribution | This credit contributes 20% towards the category score. |
| Criteria | Are all habitable rooms designed to achieve natural cross flow ventilation? |
| Question | Criteria Achieved ? |
| Detached dwelling | Yes |
| **3.1 Thermal comfort - Double Glazing** | 100% |
| Score Contribution | This credit contributes 40% towards the category score. |
| Criteria | Is double glazing (or better) used to all habitable areas? |
| Question | Criteria Achieved ? |
| Detached dwelling | Yes |
| **3.2 Thermal Comfort - External Shading** | 0% |
| Score Contribution | This credit contributes 20% towards the category score. |
| Criteria | Is appropriate external shading provided to east, west and north facing glazing? |
| Question | Criteria Achieved ? |
| Detached dwelling | No |
| **3.3 Thermal Comfort - Orientation** | 100% |
| Score Contribution | This credit contributes 20% towards the category score. |
| Criteria | Are at least 50% of main living areas orientated to the north? |
| Question | Criteria Achieved ? |
| Detached dwelling | Yes |

**Transport** Overall contribution 9.0%

| | |
|---|---|
| | 0% |

| 1.1 Bicycle Parking - Residential | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 50% towards the category score. | |
| Criteria | How many secure and undercover bicycle spaces are there for residents? | |
| Question | Bicycle Spaces Provided ? | |
| Detached dwelling | 0 | |

| 2.1 Electric Vehicle Infrastructure | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 50% towards the category score. | |
| Criteria | Are facilities provided for the charging of electric vehicles? | |
| Question | Criteria Achieved ? | |
| Project | No | |

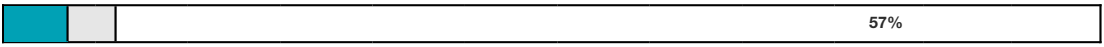
**Waste** Overall contribution 5.5%

| | | |
|---|---|---|
| | | 50% |

| 1.1 - Construction Waste - Building Re-Use | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 50% 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 | | 100% |
|---|---|---|
| Score Contribution | This credit contributes 50% towards the category score. | |
| Criteria | Are facilities provided for on-site management of food and garden waste? | |
| Question | Criteria Achieved ? | |
| Project | Yes | |

**Urban Ecology** Overall contribution 5.5%



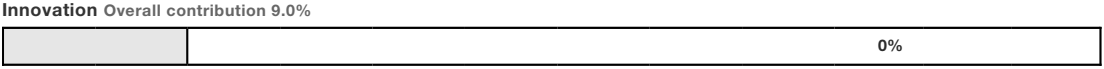

| 2.1 Vegetation | | 100% |
|---|---|---|
| Score Contribution | This credit contributes 57.1% towards the category score. | |
| Criteria | How much of the site is covered with vegetation, expressed as a percentage of the total site area? | |
| Question | Percentage Achieved ? | |
| Project | 30 % | |

| 2.2 Green Roofs | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 14.3% towards the category score. | |
| Criteria | Does the development incorporate a green roof? | |
| Question | Criteria Achieved ? | |
| Project | No | |

| 2.3 Green Walls and Facades | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 14.3% towards the category score. | |
| Criteria | Does the development incorporate a green wall or green façade? | |
| Question | Criteria Achieved ? | |
| Project | No | |

| 3.1 Food Production - Residential | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 14.3% towards the category score. | |
| Criteria | What area of space per resident is dedicated to food production? | |
| Question | Food Production Area | |
| Detached dwelling | - | |
| Output | Min Food Production Area | |
| Detached dwelling | 2 $m^2$ | |

**Innovation** Overall contribution 9.0%




| 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**

# Nationwide House Energy Rating Scheme®
# NatHERS® Certificate No. 89TAFMYFLK

**Generated on 9 Feb 2025 using FirstRate5: 5.5.5a (3.22)**

## Property

| | |
|---|---|
| **Address** | Donnybrook Road, Kalkallo, VIC, 3064 |
| **Lot/DP** | Lot 10/ No. 649 |
| **NCC Class*** | Class 1a |
| **Floor/all Floors** | |
| **Type** | New Home |

## Plans

| | |
|---|---|
| **Main plan** | 31/01/2025 |
| **Prepared by** | PD Studio |

## Construction and environment

| **Assessed floor area [m²]*** | | **Exposure type** |
|---|---|---|
| Conditioned* | 354.9 | suburban |
| Unconditioned* | 58.8 | **NatHERS climate zone** |
| Total | 413.7 | 60 Tullamarine |
| Garage | 35.7 | |

## Accredited assessor

| | |
|---|---|
| **Name** | Nurcan Aksoy |
| **Business name** | EcoHaus Assessors |
| **Email** | ecohaus.assessors@outlook.com |
| **Phone** | 0423737737 |
| **Accreditation No.** | HERA10297 |
| **Assessor Accrediting Organisation** | HERA |
| **Declaration of interest** | No |

## NCC Requirements

| | |
|---|---|
| **NCC provisions** | Volume 2 |
| **State/Territory variation** | Yes |

### National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J3D3 and J3D15 of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements apply in some states and territories.

## Thermal performance star rating


## Thermal performance [MJ/m²]

Limits taken from ABCB Standard 2022

| | Heating | Cooling |
|---|---|---|
| **Modelled** | 92.6 | 6 |
| **Load limits** | N/A | N/A |

**Features determining load limits**

| | |
|---|---|
| Floor type (lowest conditioned area) | N/A |
| NCC climate zone 1 or 2 | N/A |
| Outdoor living area | N/A |
| Outdoor living area ceiling fan | N/A |

## Whole of Home performance rating

No Whole of Home performance rating generated for this certificate

## Verification

To verify this certificate, scan the QR code or visit When using either link, ensure you are visiting www.fr5.com.au



*Refer to glossary.

## About the ratings

### Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

### Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

## Heating & Cooling Load Limits

### Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the ABCB NatHERS heating and cooling load limits Standard 2022 for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

### Setting options:

Floor type:

- CSOG – Concrete Slab on Ground
- SF – Suspended Floor (or a mixture of CSOG and SF)
- NA – Not Applicable

NCC climate Zone 1 or 2:

- Yes
- No
- NA – not applicable

Outdoor living area:

- Yes
- No
- NA – not applicable

Outdoor living area ceiling fan:

- Yes
- No
- NA – not applicable

## Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

## Predicted Whole of Home annual impact by appliance

Shows the contribution each appliance has on the home's annual energy use, greenhouse gas emissions and cost without solar

### Energy use:

No Whole of Home performance assessment conducted for this certificate.

### Greenhouse gas emissions:

No Whole of Home performance assessment conducted for this certificate.

### Cost:

No Whole of Home performance assessment conducted for this certificate.

### Graph key:



*Refer to glossary.

## Certificate check

The checklist covers important items impacting the dwelling's ratings.
It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and who should check each item.
It is not mandatory to complete this checklist.

| | Approval stage | | Construction stage | | |
|---|---|---|---|---|---|
| | Assessor checked | Consent authority/ surveyor checked | Builder checked | Consent authority/ surveyor checked | Occupancy/other |
| **Genuine certificate check** | | | | | |
| Does this Certificate match the one available at the web address or QR code verification link on the front page? | | ☐ | ☐ | ☐ | ☐ |
| Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate? | | ☐ | ☐ | ☐ | ☐ |
| **Thermal performance check** | | | | | |
| **Windows and glazed doors** | | | | | |
| Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in *'Window and glazed door schedule'* and *'Roof window schedule'* tables on this Certificate? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the *'Window and glazed door type and performance'* and *'Roof window type and performance'* tables on this Certificate? | | | ☐ | ☐ | ☐ |
| **External walls** | | | | | |
| Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the External wall type table on this Certificate? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Does the external wall shade (colour) match what is shown in the *'External wall type'* table on this Certificate? | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Floor** | | | | | |
| Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Floor type'* table on this certificate? | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Ceiling penetrations*** | | | | | |
| Does the *'quantity'* and *'type'* of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling penetrations'* table on this Certificate? | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Ceiling** | | | | | |
| Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the *'Ceiling type'* table on this Certificate? | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Roof** | | | | | |
| Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the *'Roof type'* table on this Certificate? | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Apartment entrance doors (NCC Class 2 assessments only)** | | | | | |
| Does the 'External Door Schedule' show apartment entrance doors? Please note that an "external door" between the modelled dwelling and a shared space, such as an enclosed corridor or foyer, should not be included in the assessment (because it overstates the possible ventilation) and would invalidate the Certificate. | ☐ | ☐ | | ☐ | ☐ |
| **Exposure*** | | | | | |
| Has the appropriate exposure type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected". | ☐ | ☐ | | ☐ | ☐ |
| **Heating and cooling load limits*** | | | | | |
| Do the load limits settings (shown on page 1) match the values in the ABCB Standard 2022: NAtHERS heating and cooling load limits for the appropriate climate zone? | ☐ | ☐ | ☐ | ☐ | ☐ |



*Refer to glossary.

## Certificate check

Continued

| | Approval stage | | Construction stage | | |
|---|---|---|---|---|---|
| | Assessor checked | Consent authority/ surveyor checked | Builder checked | Consent authority/ surveyor checked | Occupancy/other |
| ***Additional NCC requirements for thermal performance (not included in the NatHERS assessment)*** | | | | | |
| **Thermal bridging** | | | | | |
| Does the dwelling meet the NCC requirement for thermal bridging? | | ☐ | ☐ | ☐ | ☐ |
| **Insulation installation method** | | | | | |
| Has the insulation been installed according to the NCC requirements? | | | ☐ | ☐ | ☐ |
| **Building sealing** | | | | | |
| Does the dwelling meet the NCC requirements for Building Sealing? | | ☐ | ☐ | ☐ | ☐ |
| **Whole of Home performance check** (not applicable if a Whole of Home performance assessment is not conducted) | | | | | |
| **Appliances** | | | | | |
| Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the Appliance schedule on this Certificate? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the *'Appliance schedule'* on this Certificate? | ☐ | ☐ | ☐ | ☐ | ☐ |
| Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the *'Onsite Renewable Energy schedule'* on this Certificate? | ☐ | ☐ | ☐ | ☐ | ☐ |
| ***Additional NCC Requirements for Services (not included in the NatHERS assessment)*** | | | | | |
| Does the lighting meet the artificial lighting requirements specified in the NCC? | | ☐ | ☐ | ☐ | ☐ |
| Does the hot water system meet the additional requirements specified in the NCC? | | ☐ | ☐ | ☐ | ☐ |
| **Provisional values* check** | | | | | |
| Have provisional values* been used in the assessment and, if so, are they noted in *'Additional notes'* table below? | ☐ | ☐ | | | |
| ***Other NCC requirements*** | | | | | |

Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.

**Additional notes**



*Refer to glossary.

## Room *schedule*

| Room | Zone Type | Area [m²] |
|---|---|---|
| Bed 1 | bedroom | 22.4 |
| Bed 1 WC | nightTime | 1.8 |
| Bed 1 ENS | nightTime | 8.9 |
| Bed 1 WIR | nightTime | 15.9 |
| L'dry | unconditioned | 8.1 |
| Bath | unconditioned | 9.5 |
| P'dr | dayTime | 2.5 |
| Theatre | living | 24.3 |
| Bed 2 | bedroom | 13.3 |
| Bed 2 WIR | nightTime | 3.9 |
| Bed 3 | bedroom | 15.7 |
| Bed 2 ENS | nightTime | 3.9 |
| Bed 3 ENS | nightTime | 4.1 |
| Bed 4 | bedroom | 18.3 |
| Bed 4 WIR | nightTime | 7.8 |
| Bed 4 ENS | nightTime | 6.3 |
| Gym | dayTime | 19.3 |
| Gym Bath | unconditioned | 5.5 |
| Gym Storage | dayTime | 3.8 |
| B'try | dayTime | 12 |
| Rear Hallway | dayTime | 23.4 |
| Kitchen/Living/Dining | kitchen | 93 |
| Family | living | 24.5 |
| Entry/Hallway | dayTime | 29.8 |
| Garage | garage | 35.7 |

## Window and glazed door *type and performance*

Default* windows

| Window ID | Window description | Maximum U-value* | SHGC* | Substitution tolerance ranges | |
|---|---|---|---|---|---|
| | | | | SHGC lower limit | SHGC upper limit |
| ALM-003-03 A | Aluminium A DG Air Fill High Solar Gain low-E -Clear | 4.3 | 0.47 | 0.45 | 0.49 |
| ALM-004-03 A | Aluminium B DG Air Fill High Solar Gain low-E -Clear | 4.3 | 0.53 | 0.5 | 0.56 |
| ALM-006-03 A | Aluminium B DG Argon Fill High Solar Gain low-E -Clear | 4.1 | 0.52 | 0.49 | 0.55 |



*Refer to glossary.

| | | | | | |
|---|---|---|---|---|---|
| ALM-005-03 A | Aluminium A DG Argon Fill High Solar Gain low-E -Clear | 4.1 | 0.47 | 0.45 | 0.49 |
| TIM-001-04 W | Timber A SG Low Solar Gain Low-E | 3.7 | 0.35 | 0.33 | 0.37 |

Custom* windows

| | | | | Substitution tolerance ranges | |
|---|---|---|---|---|---|
| **Window ID** | **Window description** | **Maximum U-value*** | **SHGC*** | SHGC lower limit | SHGC upper limit |
| No Data Available | | | | | |

## Window and glazed door *schedule*

| Location | Window ID | Window no. | Height [mm] | Width [mm] | Window type | Opening % | Orientation | Window shading device* |
|---|---|---|---|---|---|---|---|---|
| Bed 1 | ALM-003-03 A | W1 | 2100 | 3000 | awning | 60.0 | S | No |
| Bed 1 WC | ALM-003-03 A | W2 | 1200 | 600 | awning | 90.0 | W | No |
| Bath | ALM-003-03 A | W14 | 1200 | 1450 | awning | 45.0 | E | No |
| Theatre | ALM-003-03 A | W13 | 1200 | 1450 | awning | 45.0 | E | No |
| Bed 2 | ALM-003-03 A | W12 | 1450 | 1450 | awning | 45.0 | E | No |
| Bed 3 | ALM-003-03 A | W9 | 1800 | 600 | awning | 60.0 | E | No |
| Bed 3 | ALM-003-03 A | W10 | 1800 | 600 | awning | 60.0 | E | No |
| Bed 2 ENS | ALM-003-03 A | W11 | 1200 | 600 | awning | 90.0 | E | No |
| Bed 4 | ALM-003-03 A | W6 | 1800 | 600 | awning | 60.0 | E | No |
| Bed 4 | ALM-003-03 A | W7 | 1800 | 600 | awning | 60.0 | E | No |
| Bed 4 ENS | ALM-003-03 A | W8 | 1200 | 600 | awning | 90.0 | E | No |
| Gym | ALM-004-03 A | SD2 | 2100 | 3021 | sliding | 60.0 | N | No |
| Gym Bath | ALM-003-03 A | W5 | 1200 | 600 | awning | 90.0 | E | No |
| Kitchen/Living/-Dining | ALM-006-03 A | SD1 | 2400 | 4815 | sliding | 60.0 | N | No |
| Kitchen/Living/-Dining | ALM-005-03 A | W4 | 600 | 4000 | awning | 90.0 | W | No |
| Kitchen/Living/-Dining | ALM-005-03 A | W3 | 600 | 3000 | awning | 90.0 | W | No |
| Family | ALM-003-03 A | W15 | 2100 | 3000 | awning | 20.0 | E | No |
| Entry/Hallway | TIM-001-04 W | D2 | 2400 | 1520 | casement | 100.0 | S | No |

## Roof window* *type and performance value*

Default* roof windows

| | | | | Substitution tolerance ranges | |
|---|---|---|---|---|---|
| **Window ID** | **Window description** | **Maximum U-value*** | **SHGC*** | SHGC lower limit | SHGC upper limit |
| No Data Available | | | | | |

Custom* roof windows



*Refer to glossary.

| Window ID | Window description | Maximum U-value* | SHGC* | Substitution tolerance ranges | |
|---|---|---|---|---|---|
| | | | | SHGC lower limit | SHGC upper limit |
| No Data Available | | | | | |

## Roof window* *schedule*

| Location | Window ID | Window no. | Opening % | Area [m²] | Width [mm] | Orientation | Outdoor shade | Indoor shade |
|---|---|---|---|---|---|---|---|---|
| No Data Available | | | | | | | | |

## Skylight* *type and performance*

| Skylight ID | Skylight description | Skylight shaft reflectance |
|---|---|---|
| No Data Available | | |

## Skylight* *schedule*

| Location | Skylight ID | Skylight No. | Skylight shaft length [mm] | Area [m²] | Orient-ation | Outdoor shade | Diffuser |
|---|---|---|---|---|---|---|---|
| No Data Available | | | | | | | |

## External door *schedule*

| Location | Height [mm] | Width [mm] | Opening % | Orientation |
|---|---|---|---|---|
| L'dry | 2100 | 820 | 100.0 | W |
| Garage | 2400 | 4800 | 100.0 | S |

## External wall *type*

| Wall ID | Wall type | Solar absorptance | Wall shade [colour] | Bulk insulation [R-value] | Reflective wall wrap* |
|---|---|---|---|---|---|
| 1 | 1000 - Brick Veneer Antiglare + R2.5 | 0.5 | Medium | Glass fibre batt: R2.5 (R2.5) | Yes |
| 2 | 1000 - Rendered Hebel Panel Antiglare + R2.5 | 0.5 | Medium | Glass fibre batt: R2.5 (R2.5) | Yes |
| 3 | 1000 - Rendered Hebel Panel Antiglare + R2.5 | 0.9 | Dark | Glass fibre batt: R2.5 (R2.5) | Yes |
| 4 | 1000 - Timber Cladding + R2.5 | 0.9 | Dark | Glass fibre batt: R2.5 (R2.5) | No |

## External wall *schedule*

| Location | Wall ID | Height [mm] | Width [mm] | Orientation | Horizontal shading feature* maximum projection [mm] | Vertical shading feature* (yes/no) |
|---|---|---|---|---|---|---|
| Bed 1 | 1 | 3000 | 1400 | E | 0 | Yes |
| Bed 1 | 2 | 3000 | 6299 | W | 103 | Yes |
| Bed 1 | 1 | 3000 | 4056 | S | 640 | Yes |
| Bed 1 WC | 2 | 3000 | 1960 | W | 108 | Yes |



*Refer to glossary.

| | | | | | | |
|---|---|---|---|---|---|---|
| Bed 1 WIR | 2 | 3000 | 3501 | W | 108 | Yes |
| L'dry | 2 | 3000 | 2490 | W | 108 | Yes |
| Bath | 2 | 3000 | 2590 | E | 99 | No |
| Theatre | 2 | 3000 | 4501 | E | 99 | No |
| Bed 2 | 2 | 3000 | 3500 | E | 104 | No |
| Bed 3 | 2 | 3000 | 3510 | E | 92 | No |
| Bed 2 ENS | 2 | 3000 | 2000 | E | 87 | No |
| Bed 4 | 2 | 3000 | 4501 | E | 99 | No |
| Bed 4 ENS | 2 | 3000 | 3911 | E | 99 | No |
| Gym | 2 | 3000 | 3861 | N | 100 | No |
| Gym | 2 | 3000 | 5001 | W | 5739 | Yes |
| Gym Bath | 2 | 3000 | 1886 | N | 100 | No |
| Gym Bath | 2 | 3000 | 2911 | E | 101 | No |
| Gym Storage | 2 | 3000 | 2000 | E | 99 | No |
| B'try | 2 | 3000 | 2630 | W | 108 | Yes |
| Rear Hallway | 2 | 3000 | 2575 | W | 5738 | Yes |
| Kitchen/Living/Dining | 2 | 3000 | 4204 | W | 108 | Yes |
| Kitchen/Living/Dining | 2 | 3000 | 5550 | N | 7768 | Yes |
| Kitchen/Living/Dining | 2 | 3000 | 7598 | W | 100 | Yes |
| Kitchen/Living/Dining | 2 | 3000 | 555 | S | 0 | Yes |
| Kitchen/Living/Dining | 2 | 3000 | 4653 | W | 655 | Yes |
| Kitchen/Living/Dining | 2 | 3000 | 547 | N | 0 | Yes |
| Family | 2 | 3000 | 4544 | E | 100 | No |
| Entry/Hallway | 3 | 3000 | 1848 | S | 0 | Yes |
| Garage | 3 | 3000 | 1400 | W | 0 | Yes |
| Garage | 4 | 3000 | 5401 | S | 403 | No |
| Garage | 2 | 3000 | 6601 | E | 99 | No |

## Internal wall *type*

| Wall ID | Wall type | Area [m²] | Bulk insulation |
|---|---|---|---|
| 1 | FR5 - Internal Plasterboard Stud Wall | 357.1 | |
| 2 | 1000 - Internal Wall + R2.5 | 102.8 | Glass fibre batt: R2.5 (R2.5) |

## Floor *type*

| Location | Construction | Area [m²] | Sub-floor ventilation | Added insulation [R-value] | Covering |
|---|---|---|---|---|---|
| Bed 1 | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 22.4 | Enclosed | R0.0 | Tiles |
| Bed 1 WC | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 1.8 | Enclosed | R0.0 | Tiles |



*Refer to glossary.

| | | | | | |
|---|---|---|---|---|---|
| Bed 1 ENS | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 8.9 | Enclosed | R0.0 | Tiles |
| Bed 1 WIR | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 15.9 | Enclosed | R0.0 | Tiles |
| L'dry | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 8.1 | Enclosed | R0.0 | Tiles |
| Bath | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 9.5 | Enclosed | R0.0 | Tiles |
| P'dr | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 2.5 | Enclosed | R0.0 | Tiles |
| Theatre | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 24.3 | Enclosed | R0.0 | Tiles |
| Bed 2 | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 13.3 | Enclosed | R0.0 | Carpet |
| Bed 2 WIR | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 3.9 | Enclosed | R0.0 | none |
| Bed 3 | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 15.7 | Enclosed | R0.0 | Carpet |
| Bed 2 ENS | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 3.9 | Enclosed | R0.0 | Tiles |
| Bed 3 ENS | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 4.1 | Enclosed | R0.0 | Tiles |
| Bed 4 | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 18.3 | Enclosed | R0.0 | Carpet |
| Bed 4 WIR | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 7.8 | Enclosed | R0.0 | Carpet |
| Bed 4 ENS | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 6.3 | Enclosed | R0.0 | Tiles |
| Gym | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 19.3 | Enclosed | R0.0 | Tiles |
| Gym Bath | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 5.5 | Enclosed | R0.0 | Tiles |
| Gym Storage | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 3.8 | Enclosed | R0.0 | Tiles |
| B'try | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 12 | Enclosed | R0.0 | Timber |
| Rear Hallway | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 23.4 | Enclosed | R0.0 | Tiles |
| Kitchen/Living/D- ining | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 93 | Enclosed | R0.0 | Tiles |
| Family | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 24.5 | Enclosed | R0.0 | Tiles |
| Entry/Hallway | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 29.8 | Enclosed | R0.0 | Tiles |
| Garage | FR5 - 300mm waffle pod, 85mm concrete (R0.63) | 35.7 | Enclosed | R0.0 | Concrete |



*Refer to glossary.

## Ceiling *type*

| Location | Construction material/type | Bulk insulation R-value [may include edge batt values] | Reflective wrap* |
|---|---|---|---|
| Bed 1 | Plasterboard | R6.0 | Yes |
| Bed 1 WC | Plasterboard | R6.0 | Yes |
| Bed 1 ENS | Plasterboard | R6.0 | Yes |
| Bed 1 WIR | Plasterboard | R6.0 | Yes |
| L'dry | Plasterboard | R6.0 | Yes |
| Bath | Plasterboard | R6.0 | Yes |
| P'dr | Plasterboard | R6.0 | Yes |
| Theatre | Plasterboard | R6.0 | Yes |
| Bed 2 | Plasterboard | R6.0 | Yes |
| Bed 2 WIR | Plasterboard | R6.0 | Yes |
| Bed 3 | Plasterboard | R6.0 | Yes |
| Bed 2 ENS | Plasterboard | R6.0 | Yes |
| Bed 3 ENS | Plasterboard | R6.0 | Yes |
| Bed 4 | Plasterboard | R6.0 | Yes |
| Bed 4 WIR | Plasterboard | R6.0 | Yes |
| Bed 4 ENS | Plasterboard | R6.0 | Yes |
| Gym | Plasterboard | R6.0 | Yes |
| Gym Bath | Plasterboard | R6.0 | Yes |
| Gym Storage | Plasterboard | R6.0 | Yes |
| B'try | Plasterboard | R6.0 | Yes |
| Rear Hallway | Plasterboard | R6.0 | Yes |
| Kitchen/Living/D- ining | Plasterboard | R6.0 | Yes |
| Family | Plasterboard | R6.0 | Yes |
| Entry/Hallway | Plasterboard | R6.0 | Yes |
| Garage | Plasterboard | R6.0 | Yes |

## Ceiling *penetrations**

| Location | Quantity | Type | Height [mm] | Width [mm] | Sealed/unsealed |
|---|---|---|---|---|---|
| Bed 1 | 2 | Downlights | 50 | 50 | Sealed |
| Bed 1 WC | 1 | Downlights | 50 | 50 | Sealed |
| Bed 1 WC | 1 | Exhaust Fans | 250 | 250 | Sealed |
| Bed 1 ENS | 1 | Downlights | 50 | 50 | Sealed |
| Bed 1 ENS | 1 | Exhaust Fans | 250 | 250 | Sealed |
| Bed 1 WIR | 2 | Downlights | 50 | 50 | Sealed |
| L'dry | 1 | Downlights | 50 | 50 | Sealed |



*Refer to glossary.

| | | | | | |
|---|---|---|---|---|---|
| L'dry | 1 | Exhaust Fans | 250 | 250 | Sealed |
| Bath | 1 | Downlights | 50 | 50 | Sealed |
| Bath | 1 | Exhaust Fans | 250 | 250 | Sealed |
| P'dr | 1 | Downlights | 50 | 50 | Sealed |
| Theatre | 4 | Downlights | 50 | 50 | Sealed |
| Bed 2 | 2 | Downlights | 50 | 50 | Sealed |
| Bed 2 WIR | 1 | Downlights | 50 | 50 | Sealed |
| Bed 3 | 2 | Downlights | 50 | 50 | Sealed |
| Bed 2 ENS | 1 | Downlights | 50 | 50 | Sealed |
| Bed 2 ENS | 1 | Exhaust Fans | 250 | 250 | Sealed |
| Bed 3 ENS | 1 | Downlights | 50 | 50 | Sealed |
| Bed 3 ENS | 1 | Exhaust Fans | 250 | 250 | Sealed |
| Bed 4 | 2 | Downlights | 50 | 50 | Sealed |
| Bed 4 WIR | 1 | Downlights | 50 | 50 | Sealed |
| Bed 4 ENS | 1 | Downlights | 50 | 50 | Sealed |
| Bed 4 ENS | 1 | Exhaust Fans | 250 | 250 | Sealed |
| Gym | 4 | Downlights | 50 | 50 | Sealed |
| Gym Bath | 1 | Downlights | 50 | 50 | Sealed |
| Gym Storage | 1 | Downlights | 50 | 50 | Sealed |
| B'try | 2 | Downlights | 50 | 50 | Sealed |
| Rear Hallway | 4 | Downlights | 50 | 50 | Sealed |
| Kitchen/Living/Dining | 12 | Downlights | 50 | 50 | Sealed |
| Kitchen/Living/Dining | 1 | Exhaust Fans | 250 | 250 | Sealed |
| Family | 4 | Downlights | 50 | 50 | Sealed |
| Entry/Hallway | 4 | Downlights | 50 | 50 | Sealed |

## Ceiling *fans*

| Location | Quantity | Diameter [mm] |
|---|---|---|
| No Data Available | | |

## Roof *type*

| Construction | Added insulation [R-value] | Solar absorptance | Roof shade [colour] |
|---|---|---|---|
| Cont:Attic-Continuous | 1.3 | 0.9 | Dark |

## Thermal bridging *schedule for steel frame elements*

| Building element | Steel section dimensions [height x width, mm] | Frame spacing [mm] | Steel thickness [BMT,mm] | Thermal break [R-value] |
|---|---|---|---|---|
| No Data Available | | | | |



*Refer to glossary.

## Appliance *schedule*

**(not applicable if a Whole of Home performance assessment is not conducted for this certificate)**

Note: A flat assumption of 5W/m2 is used for lighting, therefore lighting is not included in the appliance schedule.

### Cooling system

| Appliance/ system type | Location | Fuel type | Minimum efficiency/ performance | Recommended capacity |
|---|---|---|---|---|
| No Whole of Home performance assessment conducted for this certificate. | | | | |

### Heating system

| Appliance/ system type | Location | Fuel type | Minimum efficiency/ performance | Recommended capacity |
|---|---|---|---|---|
| No Whole of Home performance assessment conducted for this certificate. | | | | |

### Hot water system

| Appliance/ system type | Fuel type | Minimum efficiency/ performance | Hot Water CER Zone | Zone 3 STC | Assessed daily load |
|---|---|---|---|---|---|
| No Whole of Home performance assessment conducted for this certificate. | | | | | |

### Pool/spa equipment

| Appliance/ system type | Fuel type | Minimum efficiency/ performance | Recommended capacity |
|---|---|---|---|
| No Whole of Home performance assessment conducted for this certificate. | | | |

## Onsite renewable energy *schedule*

**(not applicable if a Whole of Home performance assessment is not conducted for this certificate)**

| System type | Orientation | System size or generation capacity |
|---|---|---|
| No Whole of Home performance assessment conducted for this certificate. | | |

## Battery *schedule*

**(not applicable if a Whole of Home performance assessment is not conducted for this certificate)**

| System type | Size [battery storage capacity] |
|---|---|
| No Whole of Home performance assessment conducted for this certificate. | |



*Refer to glossary.

# Explanatory Notes

## About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary. Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

## Accredited assessors

For quality assured NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

## Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in the certificate is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

The predicted annual energy load, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the assessor using the NatHERS accredited software tool are presented in this report and further details or data files may be obtained from the assessor.

# Glossary

| | |
|---|---|
| **Annual energy load** | the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions. |
| **AFRC** | Australian Fenestration Rating Council |
| **Assessed floor area** | the floor area modelled in the software for the purpose of the NatHERS assessment. Note, this may not be consistent with the floor area in the design documents. |
| **Ceiling penetrations** | features that require a penetration to the ceiling, including downlights, vents, exhaust fans, range hoods, chimneys and flues. Excludes fixtures attached to the ceiling with small holes through the ceiling for wiring, e.g. ceiling fans; pendant lights, and heating and cooling ducts. |
| **Conditioned** | a zone within a dwelling that is expected to require heating and cooling based on standard occupancy assumptions. In some circumstances it will include garages. |
| **COP** | Coefficient of performance |
| **Custom windows** | windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating. |
| **Default windows** | windows that are representative of a specific type of window product and whose properties have been derived by statistical methods. |
| **EER** | Energy Efficiency Ratio, measure of how much cooling can be achieved by an air conditioner for a single kWh of electricity input |
| **Energy use** | This is your homes rating without solar or batteries. |
| **Energy value** | The net cost to society including, but not limited to, costs to the building user, the environment and energy networks (as defined in the ABCB Housing Provisions Standard). |
| **Entrance door** | these signify ventilation benefits in the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 building. |
| **Exposure category – exposed** | terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors). |
| **Exposure category – open** | terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors). |
| **Exposure category – suburban** | terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas. |
| **Exposure category – protected** | terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas. |
| **Horizontal shading feature** | provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels. |
| **National Construction Code (NCC) Class** | the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au. |
| **Net zero home** | a home that achieves a net zero energy value*. |
| **Opening percentage** | the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations. |
| **Provisional value** | an assumed value that does not represent an actual value. For example, if the wall colour is unspecified in the documentation, a provisional value of 'medium' must be modelled. Acceptable provisional values are outlined in the NatHERS Technical Note and can be found at www.nathers.gov.au |
| **Recommended capacity** | this is the capacity or size of equipment that is recommended by NatHERS to achieve the desired comfort conditions in the zone or zones serviced. This is a recommendation and the final selection sizing should be confirmed by a suitably qualified person. |
| **Reflective wrap (also known as foil)** | can be applied to walls, roofs and ceilings. When combined with an appropriate air gap and emissivity value, it provides insulative properties. |
| **Roof window** | for NatHERS this is typically an operable window (i.e. can be opened), will have a plaster or similar light well if there is an attic space, and generally does not have a diffuser. |
| **Shading features** | includes neighbouring buildings, fences, and overhangs that obstruct sunlight. |
| **Solar heat gain coefficient (SHGC)** | the fraction of incident solar radiation admitted through a window, both directly transmitted as well as absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits. |
| **Skylight (also known as roof lights)** | for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level. |



*Refer to glossary.

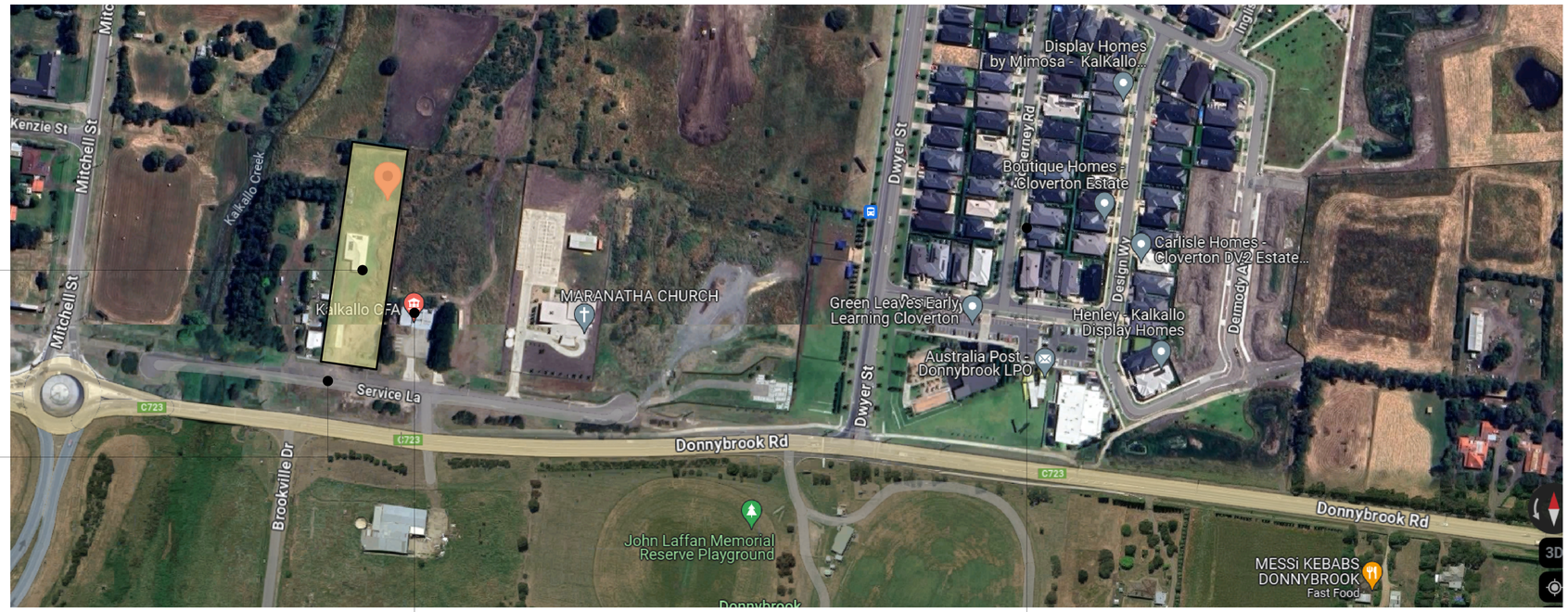
| | |
|---|---|
| **STCs** | Small-scale Technology Certificates, certificates created by the REC registry for renewable energy technologies that may be bought and sold as part of the Small-scale Renewable Energy Scheme operated by the Clean Energy Regulatory |
| **Thermal breaks** | are materials with an R-value greater than or equal to 0.2 that must separate the metal frame from the cladding. This includes, but is not limited to, materials such as timber battens greater than or equal to 20mm thick, continuous thermal breaks such as polystyrene insulation sheeting, plastic strips or furring channels. |
| **U-value** | the rate of heat transfer through a window. The lower the U-value, the better the insulating ability. |
| **Unconditioned** | a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions. |
| **Vertical shading features** | provides shading to the building in the vertical plane and can be parallel or perpendicular to the subject wall/window. Includes privacy screens, other walls in the building (wing walls), fences, other buildings, vegetation (protected or listed heritage trees). |
| **Window shading device** | a device fixed to windows that provides shading e.g. window awnings or screens but excludes horizontal* or vertical shading features* (eg eaves and balconies) |



*Refer to glossary.

# NO.649 (LOT 10) DONNYBROOK RD, KALKALLO

DEVELOPMENT OF THE LAND FOR A SECOND DWELLING





**OVERALL 3D VISUAL**
1:71.36



PDSTUDIO.
2/667 HIGH STREET, PRESTON | (03) 9972 7667 | PD.NET.AU

**SITE ADDRESS**
NO.649 (LOT 10)
DONNYBROOK RD, KALKALLO

**PROPOSAL**
DEVELOPMENT OF THE LAND FOR A SECOND DWELLING FOR MICHAEL

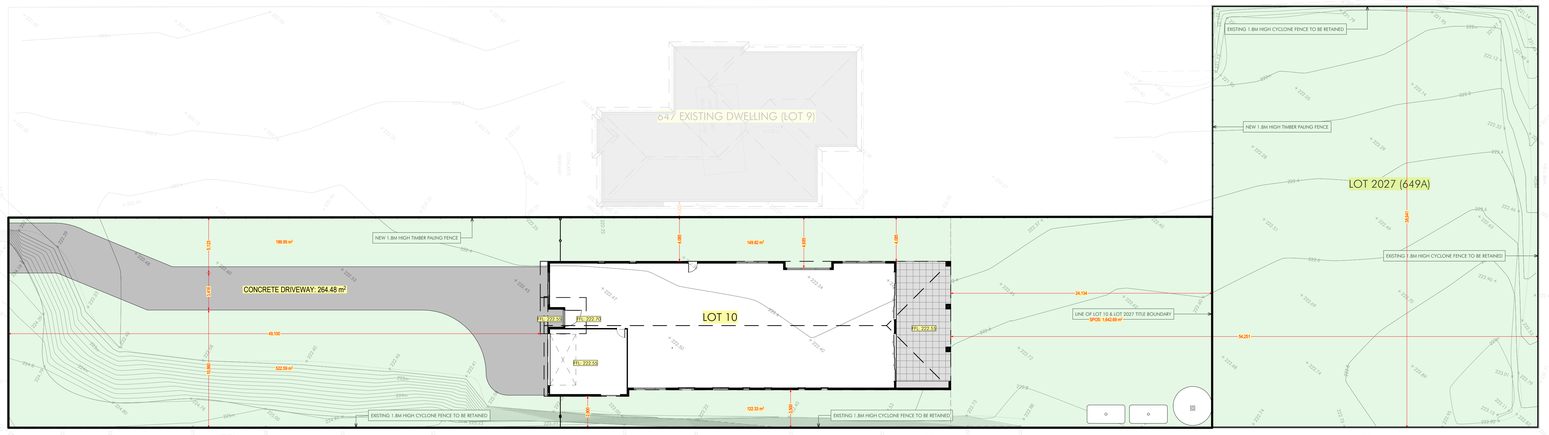
**DESIGN RESPONSE**

**DRAWING DETAILS**
19/03/2025 | @ A0 | A.T

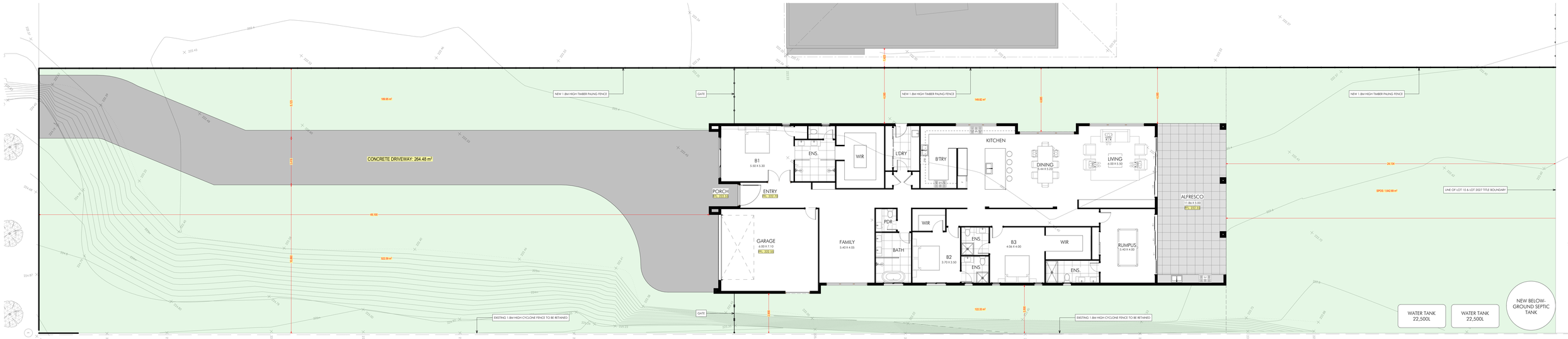
**DRAWING NO.**
TP-01
232083

# NO.649 (LOT 10) DONNYBROOK RD, KALKALLO

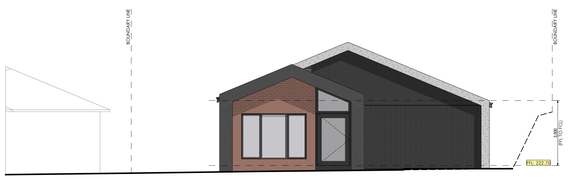
## DEVELOPMENT OF THE LAND FOR A SECOND DWELLING



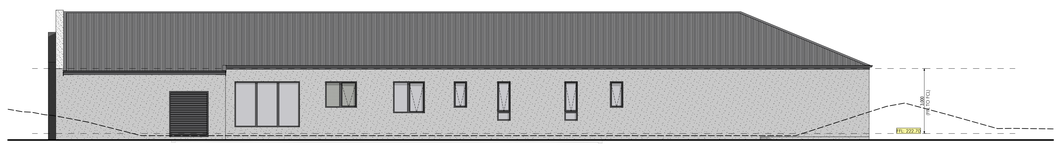

SITE PLAN
1:200


GROUND FLOOR PLAN
1:100




A SOUTH ELEVATION
1:100




B EAST ELEVATION
1:100


C NORTH ELEVATION
1:100


D WEST ELEVATION
1:100

| AREA SUMMARY | |
|---|---|
| TOTAL SITE AREA | 2,159m² |
| | |
| EXISTING DWELLING | 274.29m² |
| GRAND TOTAL | 274.29m2 |
| GROUND FLOOR LIVING | 331.06m² |
| GARAGE | 45.51m² |
| ALFRESCO | 59.66m² |
| PORCH | 6.98m² |
| GRAND TOTAL | 443.21m² |
| SQ | 4892 |
| | |
| % SITE COVERAGE | 33% |
| % IMPERMEABLE AREA | 45.48% |
| % PERMEABLE AREA | 54.52% |

FACADE VIEW

MATERIALS SCHEDULE

| DESCRIPTION | COLOUR SAMPLE |
|---|---|
| BRICK WORK - RECYCLED BRICK AS PER OWNER'S SELECTION | |
| RENDER FINISH #1 - VIVID WHITE FINISH OVER HEBEL | |
| RENDER FINISH #2 - MONUMENT FINISH OVER HEBEL | |
| PERMATIMBER CLADDING - EBONY FINISH | |
| GARAGE PANEL LIFT DOOR - PERMATIMBER CLADDING OVER, EBONY FINISH | |
| ALUMINIUM FRAMED WINDOW & DOORS - MONUMENT FINISH BY COLORBOND OR SIMILAR | |
| COLORBOND ROOF SHEETING - MONUMENT FINISH | |
| FASCIA & GUTTER - MONUMENT FINISH | |
| CONCRETE AGGREGATE - 'CHARCOAL' FINISH OR SIMILAR | |



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SITE ADDRESS
NO.649 (LOT 10)
DONNYBROOK RD, KALKALLO

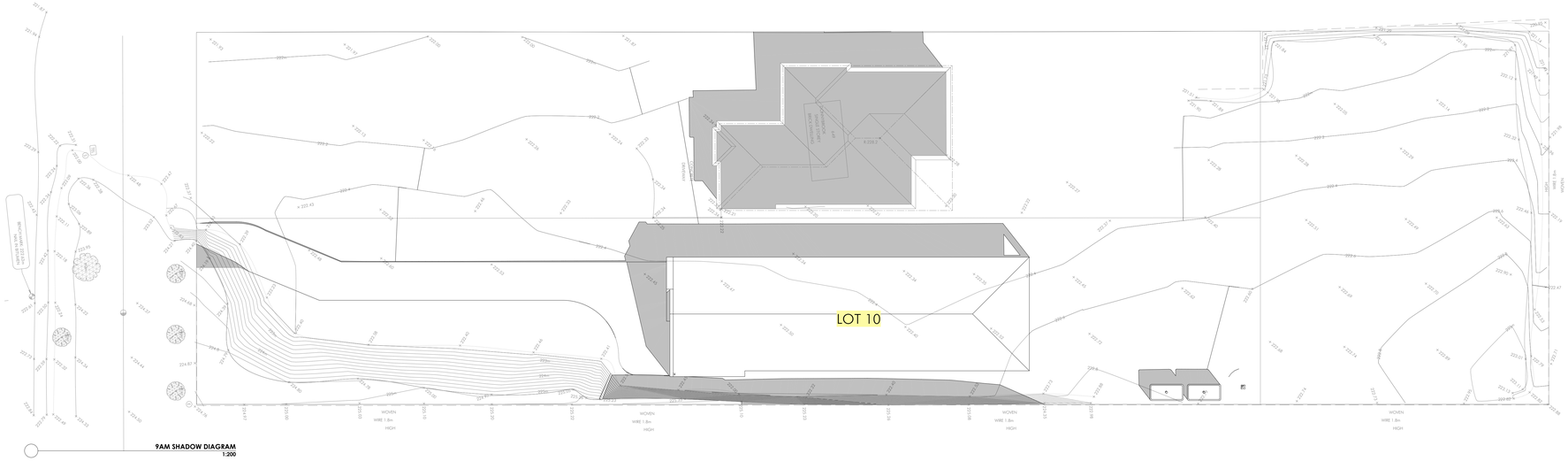
PROPOSAL
DEVELOPMENT OF THE LAND FOR A SECOND DWELLING FOR MICHAEL

PROPOSED LOT 10

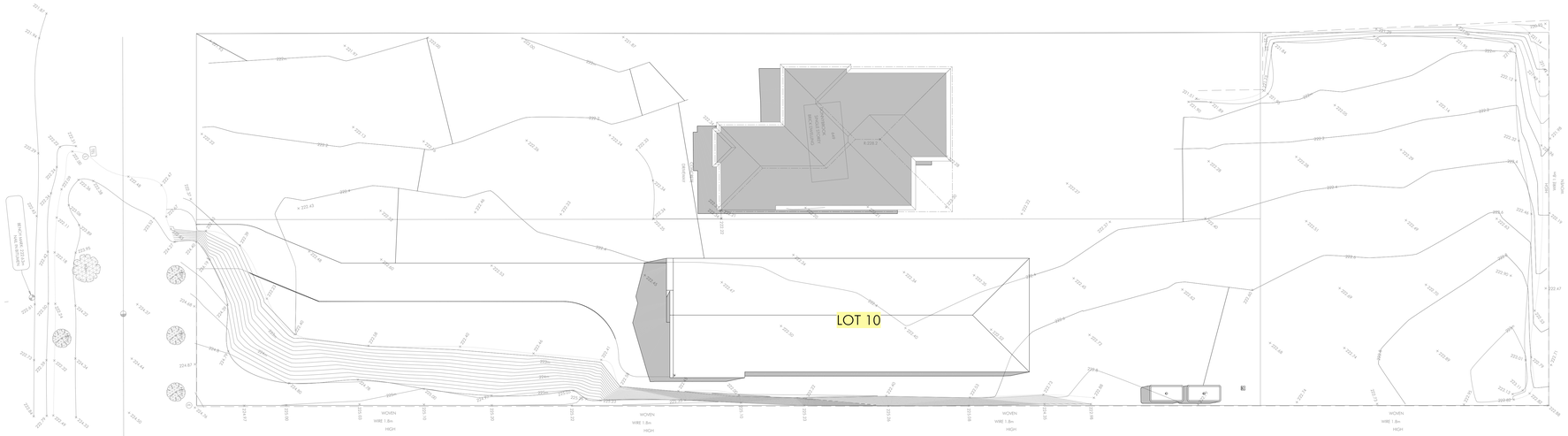
DRAWING DETAILS
19/03/20@900, 1:750, 1:100 @ A0 A.T

DRAWING NO.
TP-01

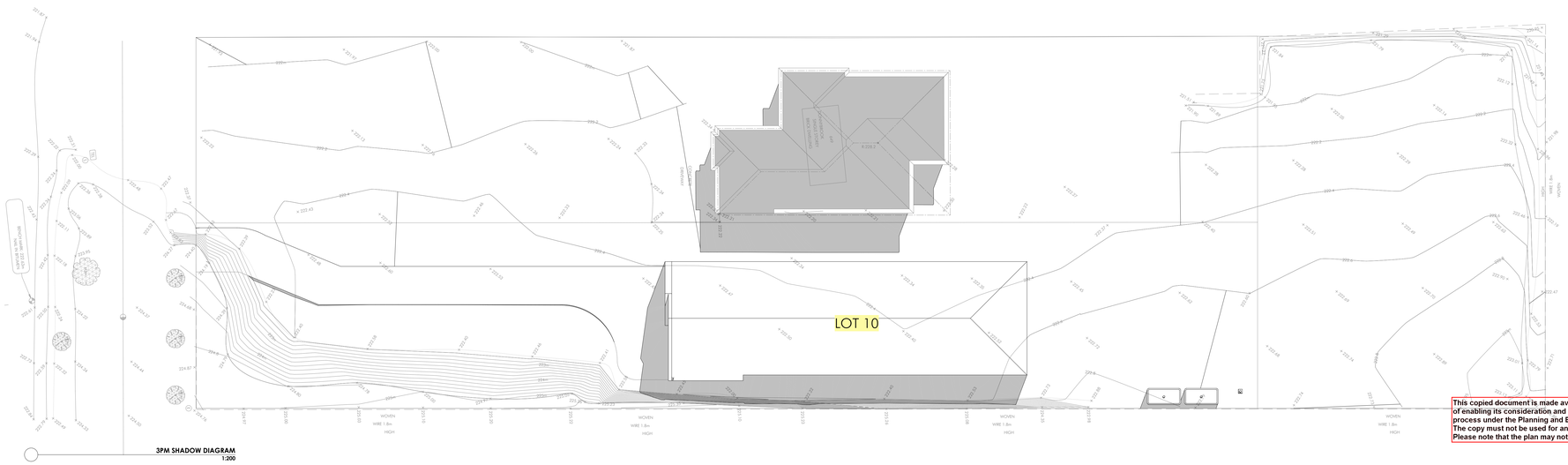
232083




9AM SHADOW DIAGRAM
1:200




12PM SHADOW DIAGRAM
1:200




3PM SHADOW DIAGRAM
1:200



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**SITE ADDRESS**
NO.649 (LOT 10)
DONNYBROOK RD, KALKALLO

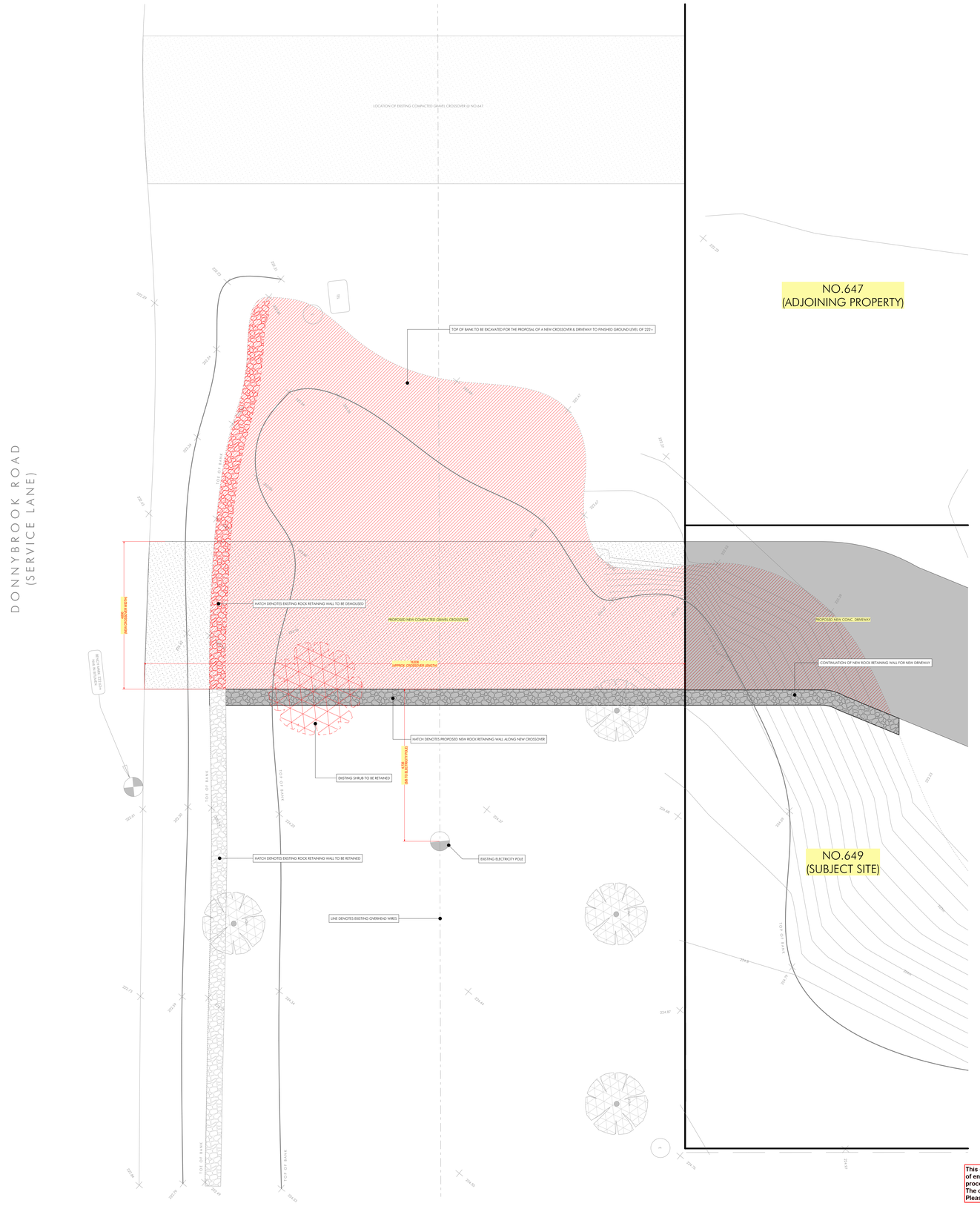
**PROPOSAL**
DEVELOPMENT OF THE LAND FOR A SECOND DWELLING FOR MICHAEL

**SHADOW DIAGRAMS**

**DRAWING DETAILS**
19/03/2025 | 1:200 @ A0 | A1

**DRAWING NO.**
TP-03

232083






PDSTUDIO.
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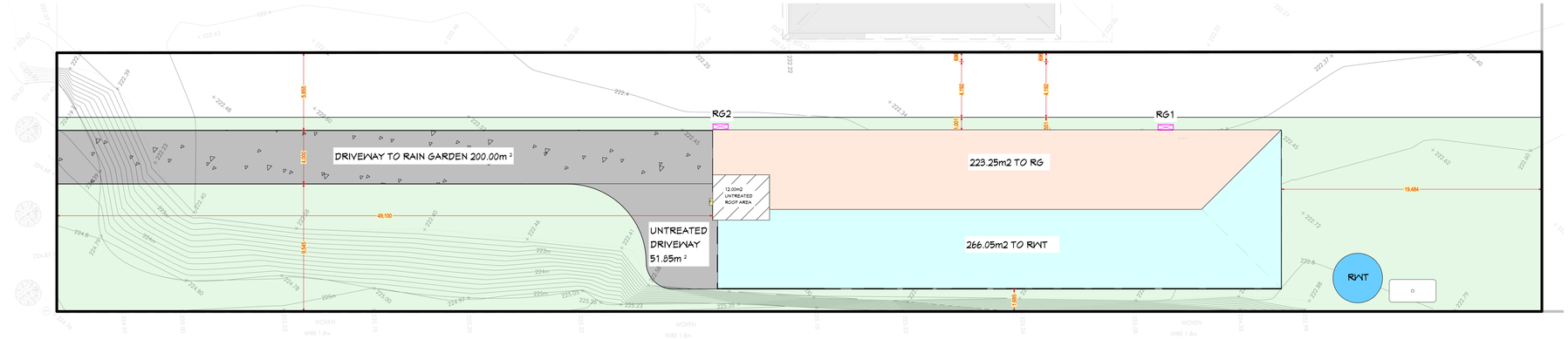
**SITE ADDRESS**
NO.649 (LOT 10)
DONNYBROOK RD, KALKALLO

**PROPOSAL**
DEVELOPMENT OF THE LAND FOR A SECOND DWELLING FOR MICHAEL

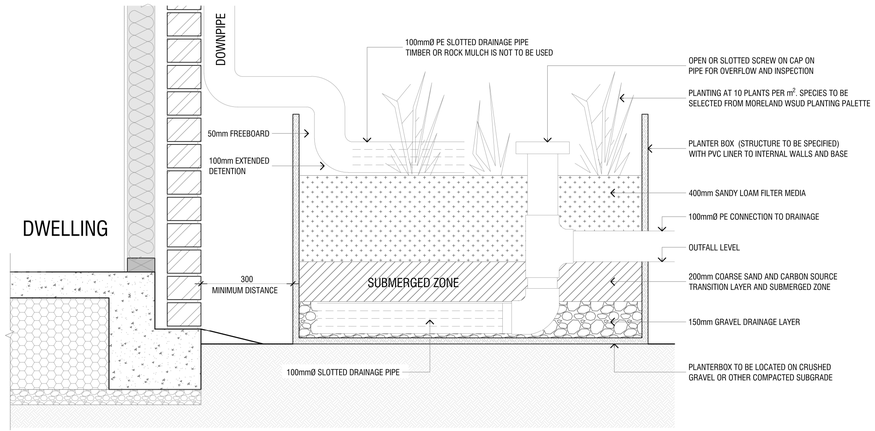
**NEW CROSSOVER PROPOSAL**

**DRAWING DETAILS**
19/03/2025 | 1:50 @ A0 | A.T

**DRAWING NO.**
TP-04
232083




TYPICAL ABOVE GROUND RAIN GARDEN




ABOVE GROUND RAINGARDEN

MINIMUM DIMENSIONS
WIDTH: 500mm
HEIGHT: 900mm

## WSUD LEGEND/TREATMENT METHOD

RWT — RAIN WATER TANKS
2000 LITRES SLIMLINE 1700mm x 700mm x 1860mm (LxWxH)

RAIN WATER TANKS ARE TO BE USED ONLY FOR REUSE WITHIN DWELLINGS AND ARE COMPLETELY INDEPENDENT OF ANY DETENTION REQUIREMENTS, THROUGH THE L.P.O.D. PROCESS.

TREATED ROOF AREA TO RAIN WATER TANKS

TOTAL DWELLING ROOF CATCHMENT OF 266.05m² TO RWT

METHOD OF DISCHARGE: CHARGED SYSTEM

CONNECTED TO: TOILETS
LAUNDRY WASHING MACHINE

ADDITIONAL NOTES: OVERFLOW TO BE CONNECTED TO L.P.O.D

100mm ABOVE GROUND PLANTER BOX RAINGARDEN

- TREATED ROOF AREA TO RAINGARDEN TOTAL CATCHMENT AREA IS 223.25m² TO DISCHARGE THROUGH RG 1
- DRIVEWAY TO RAIN GARDEN TOTAL AREA 200.00m² TO DISCHARGE THROUGH RG 2

METHOD OF DISCHARGE: GRAVITY FED

TREATMENT AREA: PLANTER BOX RAINGARDEN
3.0m² ABOVE GROUND 100mmD RAINGARDEN
(2000mm x 500mm x 900mm DEEP

ADDITIONAL NOTES: OVERFLOW TO BE CONNECTED TO L.P.O.D

TOTAL UNTREATED ROOF AREA TO DWELLING 12.00m²

METHOD OF DISCHARGE: GRAVITY FED TO L.P.O.D. THROUGH RETENTION SYSTEM

UNTREATED DRIVEWAY/PAVING

TOTAL CATCHMENT AREA IS 51.85m²

PERMEABLE AREA OF 1405.85m² COMPROMISED OF LANDSCAPE AREA, PERMEABLE PAVING, AND OTHER PERVIOUS SURFACES IN THE BACKYARD

Melbourne Water

# STORM Rating Report

TransactionID: 0
Municipality: HUME
Rainfall Station: HUME
Address: 649 Donnybrook Rd
Kalkallo
VIC 3064
Assessor: 649 Donnybrook Rd, Kalkallo VIC 3064, Australia
Development Type: Residential - Dwelling
Allotment Site (m2): 2,159.00
STORM Rating %: 108

| Description | Impervious Area (m2) | Treatment Type | Treatment Area/Volume (m2 or L) | Occupants / Number Of Bedrooms | Treatment % | Tank Water Supply Reliability (%) |
|---|---|---|---|---|---|---|
| Dwelling Roof to RWT | 266.05 | Rainwater Tank | 22,500.00 | 4 | 107.00 | 99.70 |
| Rain Garden | 223.25 | Raingarden 100mm | 3.00 | 0 | 120.30 | 0.00 |
| Untreated Driveway | 51.85 | None | 0.00 | 0 | 0.00 | 0.00 |
| Driveway to Rain Garden | 200.00 | Raingarden 100mm | 3.00 | 0 | 122.40 | 0.00 |

ecohaus ASSESSORS

Project
Project
SINGLE STOREY DWELLING
Lot 10, No.649 Donnybrook Road, Kalkallo



Drawing Title
WATER SENSITIVE URBAN DESIGN PLAN

Scale 1:100 @A1
Date 10/02/2025

INSTRUCTION SHEET

# Building a planter box raingarden (lined)

healthy waterways
Raingardens

## What is a planter box 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.

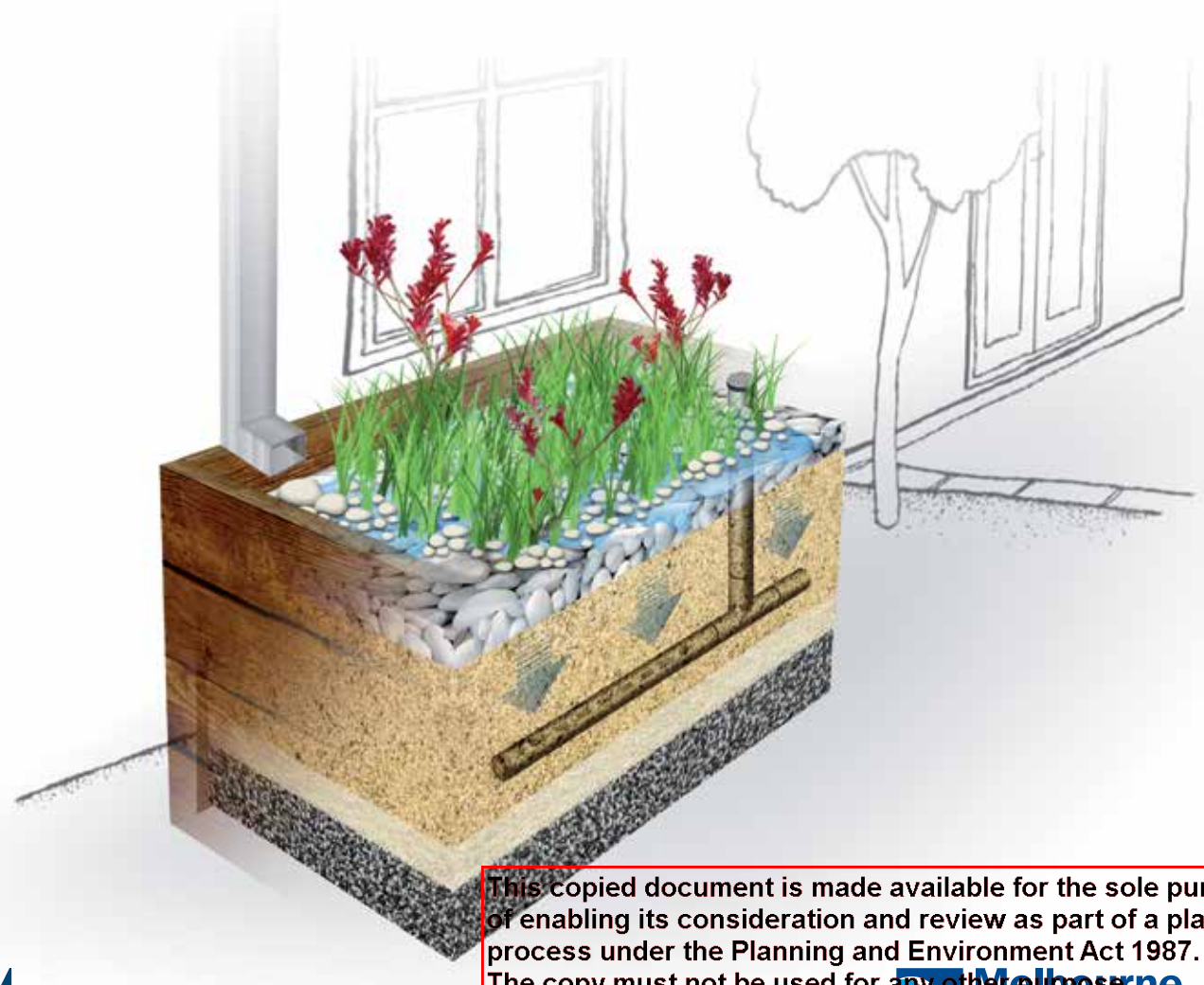
A raingarden is a specially prepared garden designed to receive and filter rain run-off from roofs or hard surfaces such as driveways or paving. You can even create a raingarden in a planter box, positioning it to collect water from a diverted downpipe or rainwater tank overflow.

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 diverted 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.*





State Government Victoria

Melbourne Water

# Building your raingarden

## Step 1 – getting started

### Location

Build your planter box as close as possible to the water source whether it be a downpipe or rainwater tank overflow. This will help minimise the additional plumbing needed to bring water to the raingarden. Your raingarden needs to sit at least 300mm away from your house.

Having decided on a location, it is important to determine the proximity of the existing stormwater pipe to make sure your raingarden is connected properly. Your local plumber can help with this and also how and when to divert 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 as this may determine where you can build your raingarden. Raingardens should not be built over or in close proximity to a septic system.

### Materials

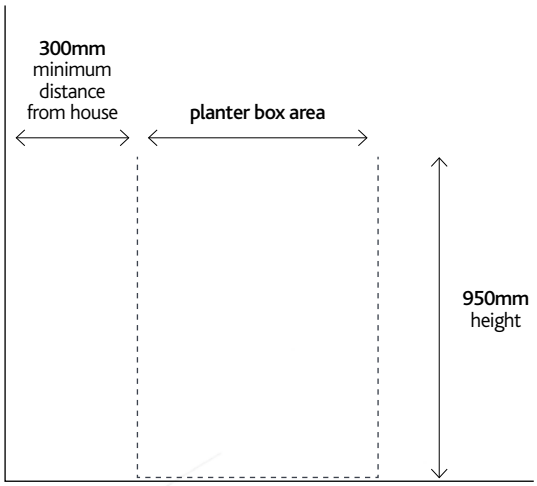
See *Materials List* for information about what you need to build a raingarden.

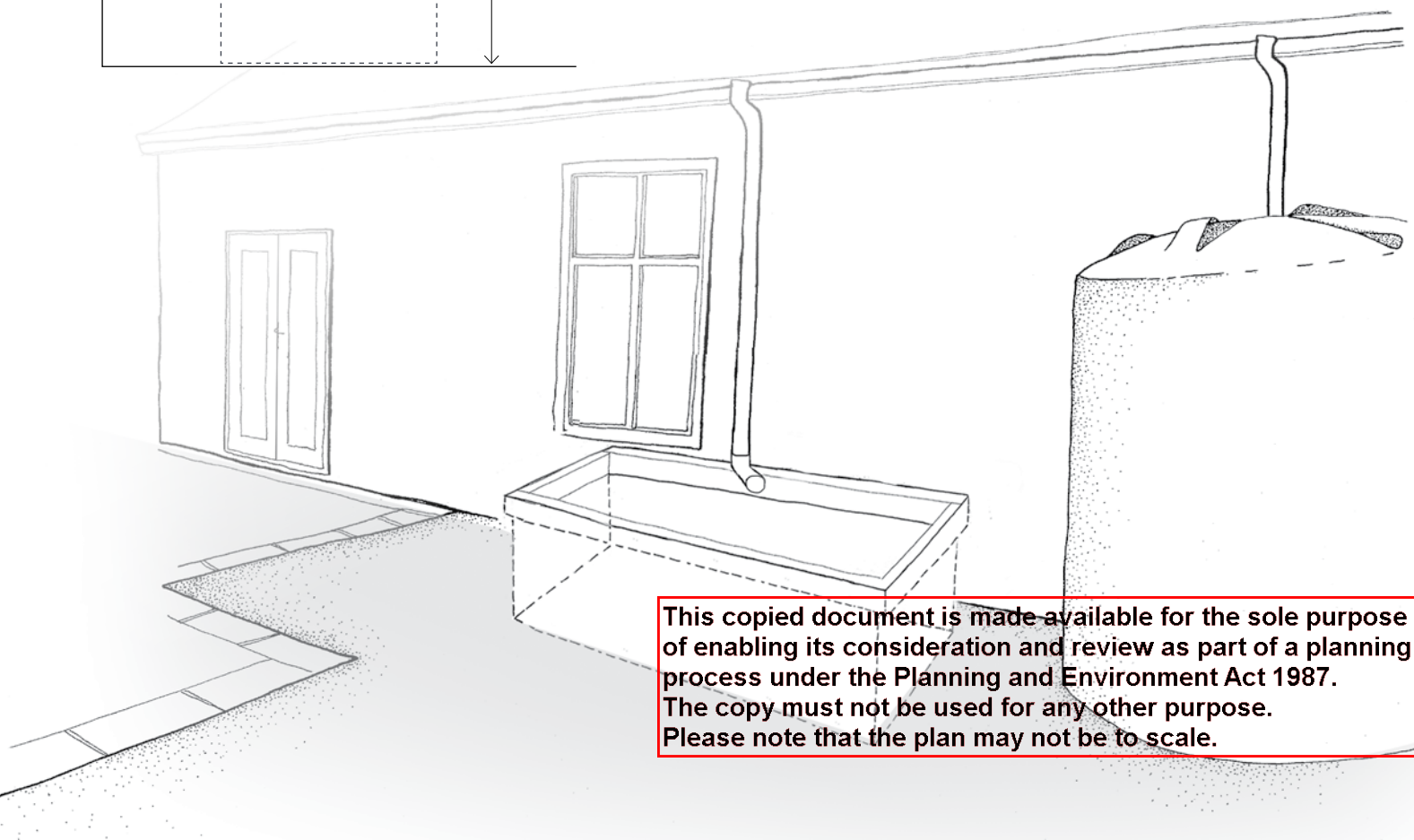
### Size

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 1 will help you work out the correct size.

**Table 1 – Raingarden sizing chart**

| AREA OF RUN-OFF (m²) | RAINGARDEN SIZE (m²) |
|---|---|
| 50 | 1 |
| 100 | 2 |
| 150 | 3 |
| 200 | 4 |
| 250 | 5 |
| 300 | 6 |
| 350 | 7 |
| 400 | 8 |
| 450 | 9 |



## Step 2 - planter box and pipe infrastructure

### Preparing your planter box

You can create a planter box out of any material as long as it is strong enough to hold soil. This could be a corrugated iron 'tank', an old wine barrel, or you could build your own planter box using plantation hardwood or similar.

Line your planter box (sides and base) with a PVC liner. Overlap the sheets by 200mm and seal the joins 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 cleaned of excess dirt as this can create blockages in the raingardens drainage.

Use the screenings to create a gentle slope towards the stormwater outlet (where the water will exit your planter box).

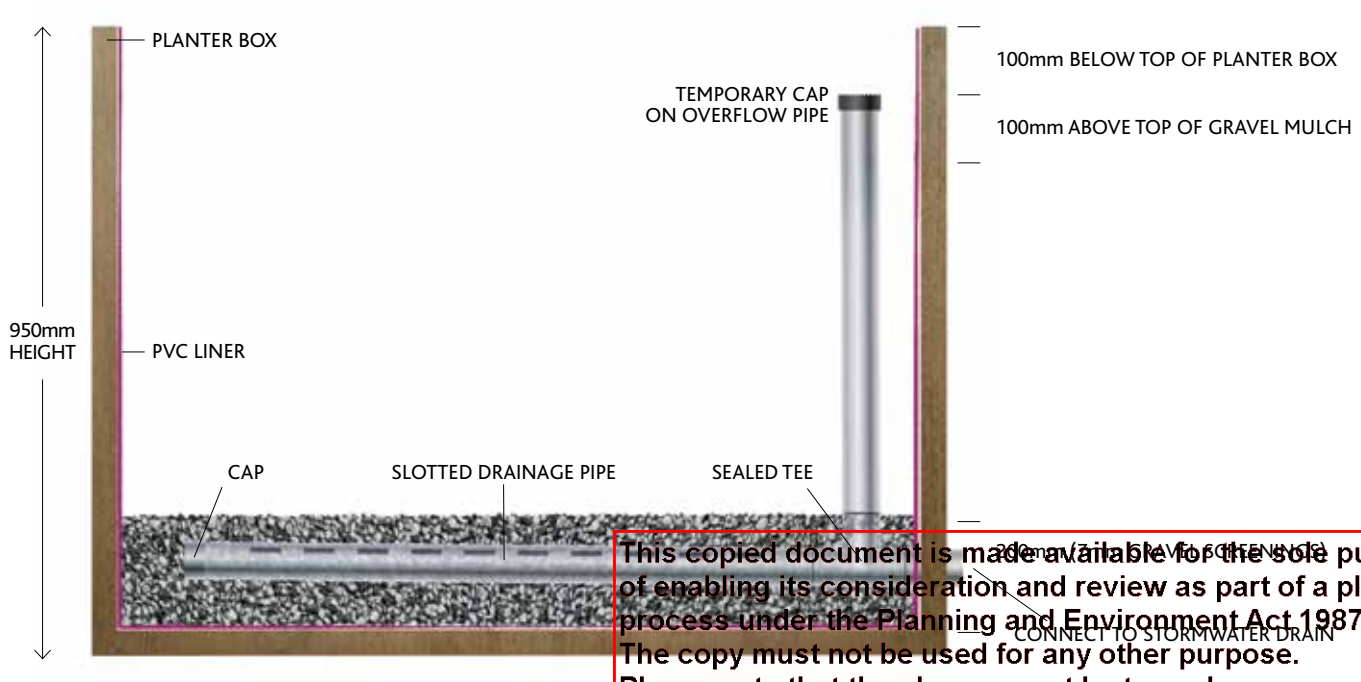
### Pipe infrastructure

Lay a 90mm diametre slotted drainage pipe horizontally along the centre of the planter box 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 planter box base to provide adequate drainage.*

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

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.



# 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 pat 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.

### 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.

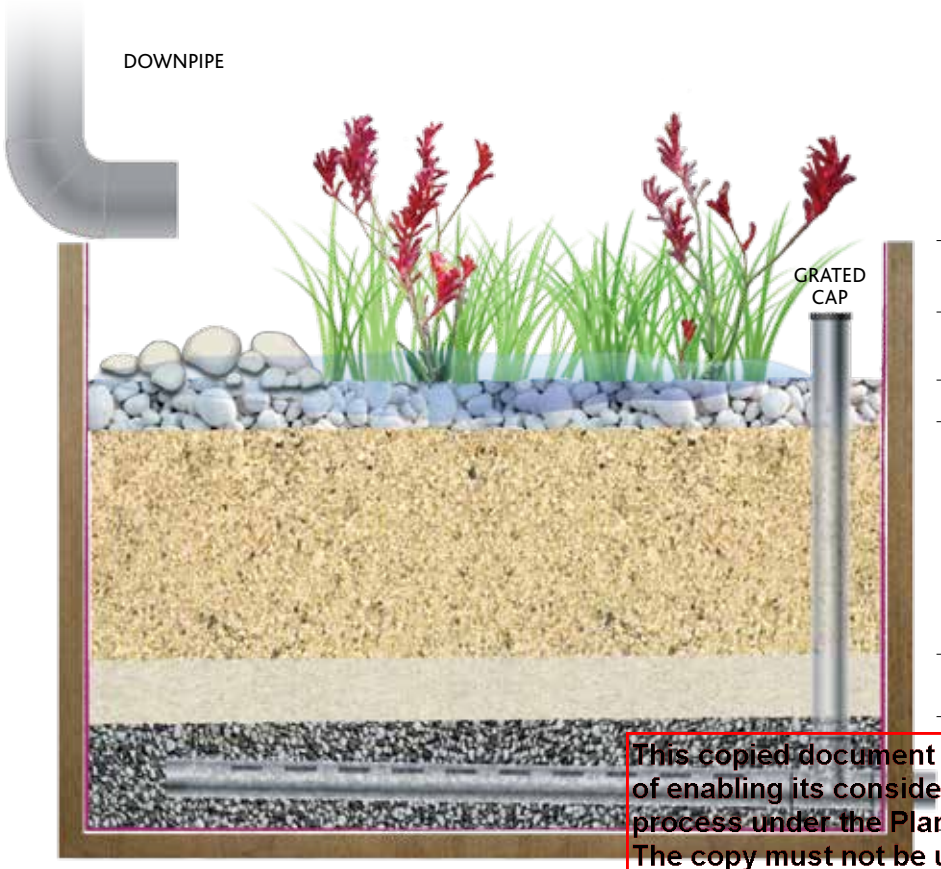
There are also particular plants that are really good at removing pollutants from stormwater. These include:

- *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.

*(continued on next page)*



# Looking after your raingarden

**Mulch**

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.

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

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

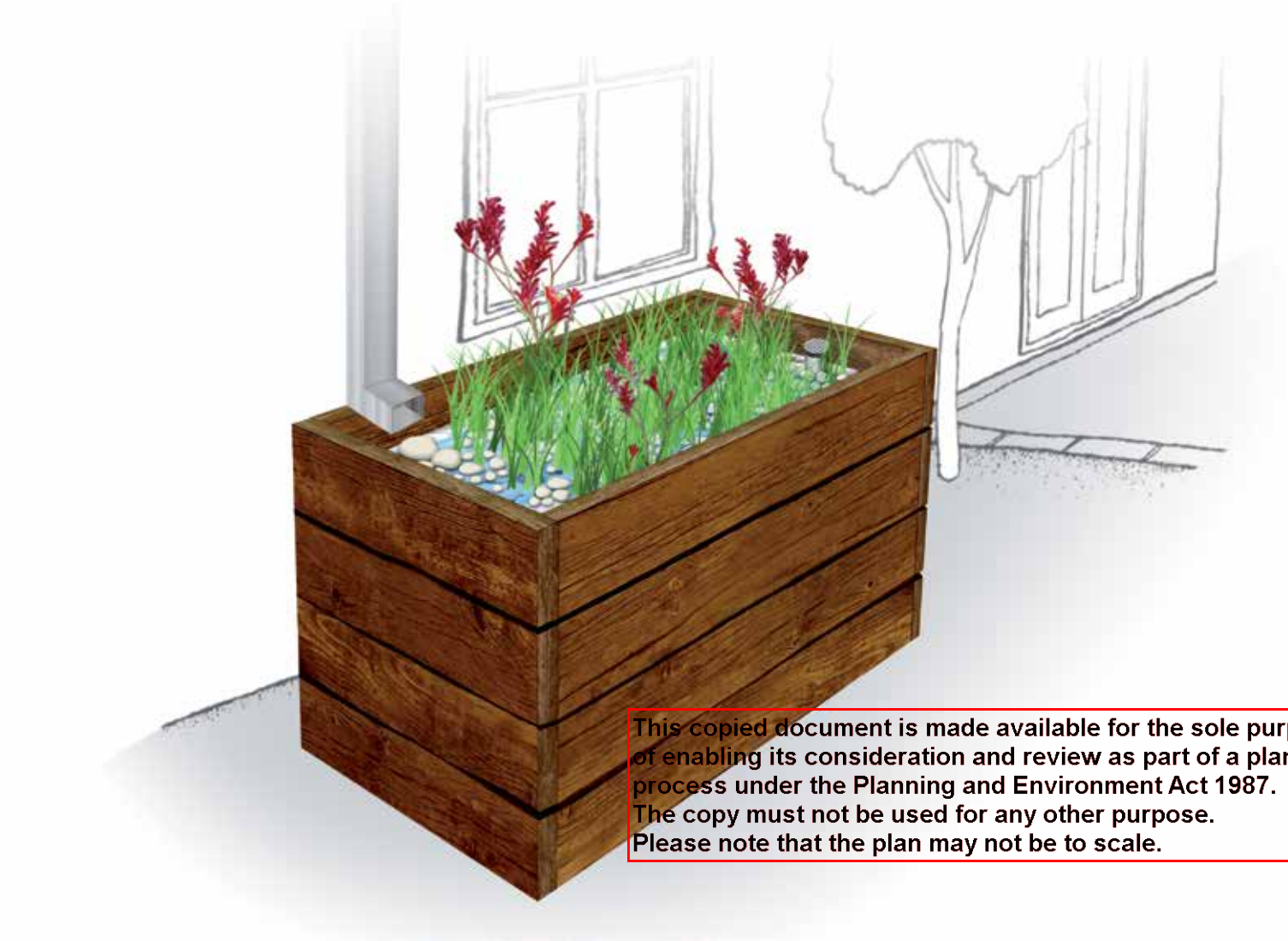
Water the plants in – complying with your local water restrictions.

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.

*Note – If necessary, water your raingarden until your plants have established in compliance 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*



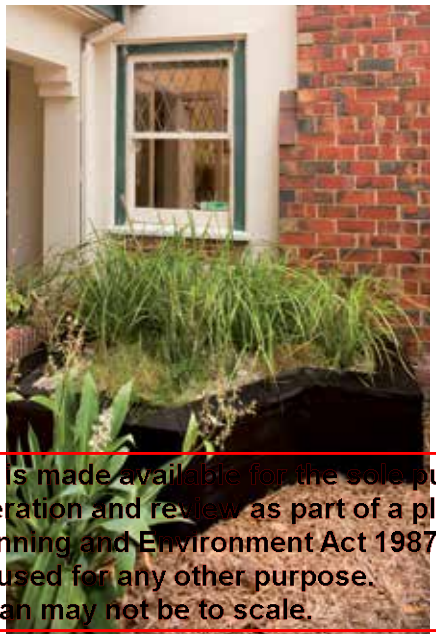
# Materials List – what you need to build your raingarden

Table 2 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 planter box and plumber).

| QUANTITY | MATERIAL |
|---|---|
| 2 l/m | 90mm diameter slotted drainage pipe (Ag Pipe) |
| 2 l/m | 90mm diameter uPVC pipe* |
| 0.4m³ | 7mm screenings |
| 0.85m³ | Sand (white washed) |
| 0.15m³ | Topsoil |
| 12 | Plants (150mm pots) |
| 0.1m³ | Gravel mulch |
| 1 | 90mm diameter uPVC 90 degree bend or 2x 45 degree bends |
| 1 | PVC grate 90mm finishing collar |
| 1 | PVC 90mm diameter domed pipe grate |
| 1 | PVC 90mm tee |
| 1 | PVC 90mm cap |
| 10m² | 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



# Plant List – the best plants for your raingarden

The following plants grow well in raingardens.

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

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# 6. Monitoring and maintenance

**In a similar fashion to all drinking water supplies, rainwater systems need to be monitored. Monitoring of domestic rainwater tanks consists of a range of visual inspections rather than laboratory testing of rainwater quality.**

The recommended regime of inspections and associated maintenance is not particularly onerous, but it is necessary for quality assurance. A proactive approach will prevent the development of problems that can lead to the deterioration of water quality. Tables 2 and 3 provide an overview of monitoring requirements and corrective actions.

Once a rainwater tank is installed, it is recommended that the following components of the roof catchment and tank be inspected at least every six months:

- Gutters – they generally will need cleaning as well as inspection. If inspection finds large amounts of leaf material or other debris, then the inspection and cleaning frequency may need to be increased.
- Roof – check for the presence of accumulated debris including leaf and other plant material. Accumulated material should be cleared. If tree growth has led to overhanging branches these should be pruned.
- Tank inlets, insect-proofing and leaf filters – if necessary these should be cleaned and repaired.
- Tank and tank roof – check structural integrity of the tank including the roof and access cover. Any holes or gaps should be repaired.
- Internal inspection – check for evidence of access by animals, birds or insects including the presence of mosquito larvae. If present, identify and close access points. If there is any evidence of algal growth (green growth or scum on or in the water), find and close points of light entry.
- Pipework – check for structural integrity. Sections of pipework that are not self-draining should be drained. Buried pipework, such as with 'wet systems', can be difficult to drain or flush. Where possible drainage points should be fitted.

In addition to six-monthly inspections, tanks should be inspected every 2-3 years for the presence of accumulated sediments. If the bottom of the tank is covered with sediment the tank should be cleaned.

Rainwater tanks can become a significant mosquito breeding site when they are no longer required or when they fall into disrepair. Tanks that are no longer required should be drained, cut up and removed to an appropriate waste disposal site.

In addition to six-monthly inspections, tanks should be inspected every 2-3 years for the presence of accumulated sediments. If the bottom of the tank is covered with sediment the tank should be cleaned.

## Initial inspection on moving into a house with a rainwater tank

On moving into a house with a rainwater tank all the above steps should be undertaken. In addition, a wider inspection should be conducted to gain an understanding of the physical characteristics of the roof catchment area, storage tank and any associated pipework including whether:

- the tank and tank roof are in reasonable condition with no obvious holes or gaps that would allow ingress of small animals, insects or light
- water in the tank is clear and has no obvious odours
- the tank inlet is protected by a leaf litter guard and that all permanent openings (inlet, overflows etc.) are covered by mosquito-proof screens
- pipework is either self-draining or has drainage points installed
- there are no cross connections with the public mains water. If there are, it should be confirmed that this has been done in accordance with local requirements (check with the water supply authority – see Section 7)
- there is no exposed preservative-treated timber, large amounts of uncoated lead flashing or lead washers used with roofing screws on the roof area supplying the tank
- there is a flue from a slow combustion heater and, if there is, that it is installed in accordance with Australian Standards.

Any remedial action should be instituted as soon as possible.

Local, regional and state/territory health authorities can be a valuable source of advice and/or information on rainwater tanks including local and state/territory requirements.

## Water quality testing

Regular chemical or microbiological testing of domestic rainwater tanks is not needed, but rainwater used for any commercial purpose or for community-based supplies will require testing to verify suitability for drinking (see Section 11).

Microbial testing of rainwater from domestic tanks is rarely necessary and in most cases is not recommended. Water quality in rainwater tanks can change rapidly during wet weather and, during dry periods, the concentrations of indicator bacteria *(E. coli)* and faecal pathogen numbers decrease due to die-off (Edberg et al. 2000). Testing for specific pathogens is often expensive and is generally only warranted as part of an outbreak investigation. If there are strong concerns about water quality, chlorination of tank water is a suitable alternative to testing. If microbial testing is undertaken, the parameter of choice is *E. coli* as an indicator of faecal contamination. Tests for total coliforms or heterotrophic plate counts are of little value as indicators of the safety of rainwater for drinking.

Chemical testing should only be required in exceptional circumstances, such as in specific areas where there are concerns about impacts from major industrial or agricultural emissions. In these circumstances the chemicals of concern need to be identified before testing or large costs can be incurred with limited likelihood of successful detection.

Advice on the need for testing and analytical laboratories should be sought from local water or environmental health authorities; alternatively, information on testing and analytical laboratories in the local area can be found in the business telephone directory by looking under 'analyst'. When testing is performed, results should be compared to the values contained in the ADWG.