

NOTICE OF AN APPLICATION FOR PLANNING PERMIT



Benalla Rural City Council
PO Box 227, Benalla, VIC 3671
DX 32230

1 Bridge Street East, Benalla 3672
Telephone: (03) 5760 2600
Facsimile: (03) 5762 5537
Email: council@benalla.vic.gov.au
www.benalla.vic.gov.au

ABN 42 379 380 529

**The land affected by the application is located at:
1170 Lake Mokoan Road, Chesney Vale,
Lot 1, TP78122, Parish of Mokoan**

**The application is for a permit to:
Use and development of the land for a dwelling**

**The applicant for the permit is:
Mrs Sue Patterson**

**The application reference number is:
P0116/24
DA6215**

**You may look at the application and any documents that support the
application online at the following link:**

<https://www.benalla.vic.gov.au/Your-Property/Building-Planning/Planning/Advertised-Planning-Permit-Applications>

If you cannot access the link, please contact Benalla Rural City Council on 5760 2600 for an alternative arrangement.

Any person who may be affected by the granting of the permit may object or make other submissions to the Responsible Authority.

An objection must:

- * **be made to the Responsible Authority in writing;**
- * **include the reasons for the objection; and**
- * **state how the objector would be affected.**

The Responsible Authority must make a copy of every objection available at its office for any person to inspect during office hours free of charge until the end of the period during which an application may be made for review of a decision on the application.

**The Responsible Authority will not decide on the application before:
28 November 2024**

If you object, the Responsible Authority will tell you its decision.

Planning and Environment Regulations 2015 - Form 2 – Section 52(1)

Planning Enquiries
Phone: (03) 5760 2600
Web: www.benalla.vic.gov.au

Application for a Planning Permit

If you need help to complete this form, read MORE INFORMATION at the end of this 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 questions, please contact Council's planning department.

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

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

i Click for further information.

BENALLA RURAL CITY COUNCIL
25 OCT 2024
FILE NO. DA6215 2 10 P

Clear Form

The Land **i**

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

Street Address *

Unit No.:	St. No.: 1170	St. Name: Lake Mokoan Road
Suburb/Locality: Chesney Vale		Postcode: 3725
A Lot No.: 1	<input type="radio"/> Lodged Plan	<input checked="" type="radio"/> Title Plan
		<input type="radio"/> Plan of Subdivision
No.: 078122K		
OR		
B Crown Allotment No.:	Section No.:	
Parish/Township Name:		

Formal Land Description *
Complete either A or B.

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

If this application relates to more than one address, attach a separate sheet setting out any additional property details.

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.

i For what use, development or other matter do you require a permit? *

Development of land for a dwelling and associated works including shed.

Benalla Rural City Council
Receipt No. 296424
Date paid 25/10/2024
Amount \$1535 -
Cashier Initial BA

⚠ Provide additional information about 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.

i Estimated cost of any development for which the permit is required *

Cost \$600,000 **⚠** You may be required to verify this estimate. Insert '0' if no development is proposed.

Existing Conditions i

Describe how the land is used and developed now *

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

Farming Zone - livestock grazing
Previous Planning Permit - expired Permit P0007/11
Development Approval DA5454
Previous Building Approval for Shed - Permit 7626321357731/0

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

Title Information i

Encumbrances on title *

Does the proposal breach, in any way, an encumbrance on title such as a restrictive 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', for example, restrictive covenants.

Applicant and Owner Details i

Provide details of the applicant and the owner of the land.

Applicant *

The person who wants the permit.

Name:		
Title: Mrs	First Name: Sue	Surname: Paterson
Organisation (if applicable):		
Postal Address:		If it is a P.O. Box, enter the details here:
Unit No.:	St. No.: 1821	St. Name: Romsey Road
Suburb/Locality: Romsey	State: Vic	Postcode: 3434

Please provide at least one contact phone number *

Contact information for applicant OR contact person below

Business phone: 0412820120	Email: sue@blaglab.com
Mobile phone: 0412820120	Fax:

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

Name:		
Title:	First Name:	Surname:
Organisation (if applicable):		
Postal Address:		If it is a P.O. Box, enter the details here:
Unit No.:	St. No.:	St. Name:
Suburb/Locality:	State:	Postcode:

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.

Name:		
Title: Mrs	First Name: Belinda	Surname: Fuller
Organisation (if applicable):		
Postal Address:		If it is a P.O. Box, enter the details here:
Unit No.:	St. No.: 276	St. Name: Orchard Drive
Suburb/Locality: Glenrowan	State: Vic	Postcode: 3675
Owner's Signature (Optional):	Date:	
	day / month / year	


Declaration

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: 25/10/24

day / month / year

Privacy consent

I give consent to my personal information disclosed in the application to be made available for public inspection, including on Council's public website, whilst the application is being determined, in accordance with Section 51 of the Planning and Environment Act 1987.

Yes No

Signature:



Date: 25/10/24

day / month / year

Need help with the Application?

General information about the planning process is available at planning.vic.gov.au

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.

Has there been a pre-application meeting with a council planning officer?

No Yes

If 'Yes', with whom?: Elke

Date: 04/10/2024


day / month / year

Checklist

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 planning permit checklist.

If required, a description of the likely effect of the proposal (for example, traffic, noise, environmental impacts).

Completed the relevant council planning permit checklist?

Signed the declaration above?

Lodgement

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

Benalla Rural City Council
PO Box 227
Benalla VIC 3671

Customer Service Centre
1 Bridge Street East
Benalla VIC 3671

Contact information:

Phone (03) 5760 2600
Email: council@benalla.vic.gov.au
DX: 32230

Deliver application in person, by post or by electronic lodgement.

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TITLE PLAN

EDITION 1

TP 78122K

Location of Land

Parish: MOKOAN
Township:
Section:
Crown Allotment: 63B(PT)
Crown Portion:

Notations

Last Plan Reference:
Derived From: VOL 9451 FOL 781
Depth Limitation: NIL

ANY REFERENCE TO MAP IN THE TEXT MEANS THE DIAGRAM SHOWN ON THIS TITLE PLAN

Description of Land / Easement Information

THIS PLAN HAS BEEN PREPARED FOR THE LAND REGISTRY, LAND VICTORIA, FOR TITLE DIAGRAM PURPOSES AS PART OF THE LAND TITLES AUTOMATION PROJECT.
COMPILED: 26/07/1989
VERIFIED: C.lam

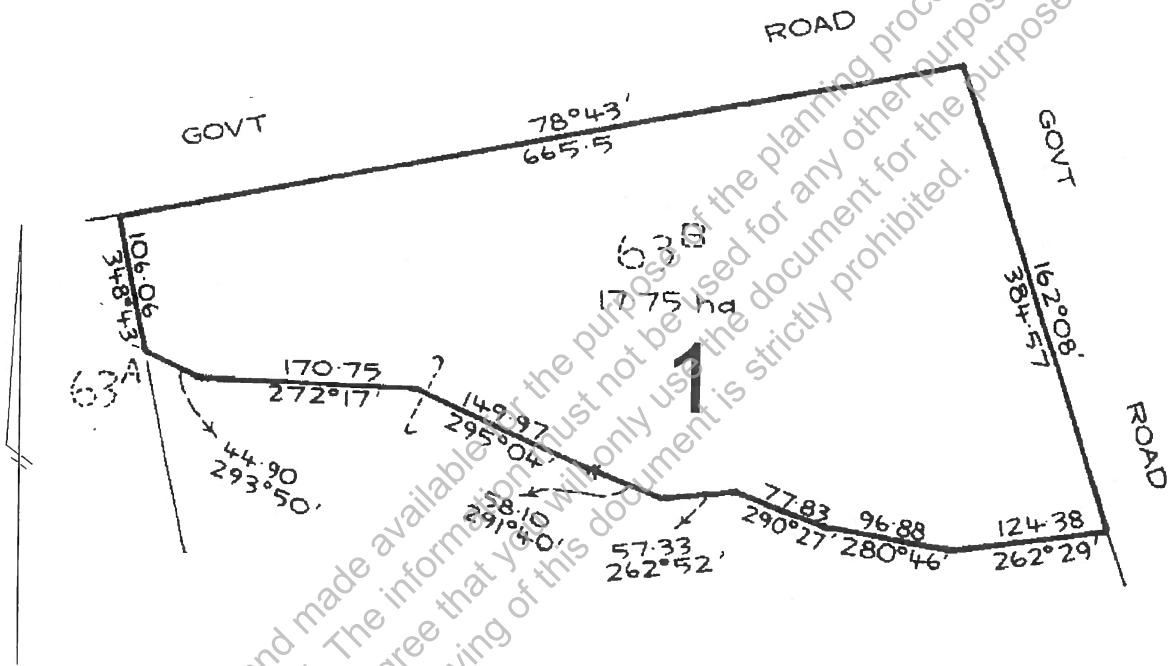


TABLE OF PARCEL IDENTIFIERS

WARNING: Where multiple parcels are referred to or shown on this Title Plan this does not imply separately disposable parcels under Section 8A of the Sale of Land Act 1962
PARCEL 1 = CA 63B (PT)

LENGTHS ARE IN METRES

Metres = 0.3048 x Feet
Metres = 0.201168 x Links



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

VOLUME 09451 FOLIO 781

Security no : 124118643914B
Produced 30/09/2024 02:58 PM

LAND DESCRIPTION

Lot 1 on Title Plan 078122K.
PARENT TITLE Volume 08079 Folio 870
Created by instrument J678779 16/10/1981

REGISTERED PROPRIETOR

Estate Fee Simple
TENANTS IN COMMON
As to 1 of a total of 2 equal undivided shares
Sole Proprietor

STEPHEN NATHANIEL FULLER of 276 ORCHARD DRIVE GLENROWAN VIC 3675
As to 1 of a total of 2 equal undivided shares

Sole Proprietor

BELINDA KATE FULLER of 276 ORCHARD DRIVE GLENROWAN VIC 3675
AN548009Q 11/02/2017

ENCUMBRANCES, CAVEATS AND NOTICES

MORTGAGE AN548010G 11/02/2017
COMMONWEALTH BANK OF AUSTRALIA

CAVEAT AY109487G 18/06/2024

Caveator

CLARE MAREE CORRIGAN

Grounds of Claim

TRUSTEE OF THE BANKRUPT ESTATE OF THE FOLLOWING PARTIES UNDER THE BANKRUPTCY ACT 1966.

Parties

STEPHEN NATHANIEL FULLER

Estate or Interest

FREEHOLD ESTATE

Prohibition

ABSOLUTELY

Lodged by

KERRS LAW PTY LTD

Notices to

CLARE MAREE CORRIGAN of 1 TUDOR STREET NEWCASTLE WEST NSW 2302

Any encumbrances created by Section 98 Transfer of Land Act 1958 or Section 24 Subdivision Act 1988 and any other encumbrances shown or entered on the plan set out under DIAGRAM LOCATION below.

DIAGRAM LOCATION

SEE TP078122K FOR FURTHER DETAILS AND BOUNDARIES

ACTIVITY IN THE LAST 125 DAYS

NUMBER	STATUS	DATE
AY400249A (E)	BANKRUPTCY LAND	13/09/2024
AY109487G (E)	CAVEAT	18/06/2024
AY266987E (E)	NOMINATION OF ECT TO LC	01/08/2024

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

AY420396X RECTIFY PROPRIETORSHIP Registered 24/09/2024

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

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

Street Address: 1170 LAKE MOKOAN ROAD CHESNEY VALE VIC 3725

ADMINISTRATIVE NOTICES

AY266987E NOMINATION OF ECT TO LC 01/08/2024
ECT Nominated to Lodgement Case 1148729491

ECT Control 15771K COMMONWEALTH BANK OF AUSTRALIA - CONSUMER
Effective from 11/02/2017

DOCUMENT END

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1170 Lake Mokoan Road

Chesney Vale 3725

Stephen & Sue Paterson
c/o 1821 Romsey Road
Romsey Vic 3434
sue@blaglab.com

In support of Application for Planning Permit for development of a dwelling and associated works including a shed at 1170 Lake Mokoan Road, Chesney Vale. 3725

The Buildings:

The proposal is to construct a single level 200m² solar passive, off-grid residential dwelling with north facing decking, and a shed not more than 50m from the house to provide security for necessary farming equipment and support sufficient photo voltaic panels to provide approximately 15kw of power. The shed will house the battery bank for power storage away from the house and provide additional water capture for storage in tanks.

No tree removal will be required for construction of any buildings and associated ground works.



Figure 1 Schematic of Proposed Building Locations

The house will be based on the Australian Government “Design for Place” energy efficient house designs. [Banksia House - Melbourne](#) is designed to provide best practice energy efficiency in house

design taking into consideration climate zone 6 of the Benalla region. The Australian Government has provided [detailed plans](#) which will form the base of our house design.



Figure 2 Banksia House Design - Northern Facade



Figure 3 Our Conceptual Floor Plan

The house will be lime rendered in a soft warm sandstone colour to be visually gentle on the surrounding landscape, with a colourbond roof in a non-reflective finish.

The Land Capability Assessment conducted by Simon Hollis at GeoPlan confirms the suitability of a Land Application Area on the property for the dispersal of wastewater. [See Appendix](#)

We plan to treat wastewater treatment using an A&A Worm Farm Waste System of similar type to the [commercial system](#) installed at the nearby Winton Wetlands Visitor Centre and Café, sized appropriately

for domestic use. This is consistent with Option 3 (Aerobic Biological Filter (wet composting, vermiculture) in LCA report.



Figure 4 Winton Wetlands Wastewater Treatment System

Bushfire Preparedness:

The property has no Bushfire Management Overlay, however, it is located in a designated Bushfire Prone Area. The proposed building envelope is greater than 100m from any large established native flora. The driveway and entry gate will be 3.5m wide or wider and not more than 200m long, including a turning circle with a radius of 10m or more, providing access for CFA vehicles. The dwelling will be constructed and rendered to a high level of fire resistance in accordance with assessed BAL rating. Water tanks will include approved CFA fittings, have firefighting reserves and have vehicle access.

Land Usage:

The property is zoned as Farming Zone and is currently used for grazing by the owner's 3 horses, 2 ponies and 2 sheep. The land shows signs of having no improvement done for some time and is heavily weedy. Paterson's Curse covers approximately 20% of the property, as well as stinkwort, thistles and some serrated tussock.

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Figure 5 Paterson's Curse in flower 3rd October 2024



Figure 6 Spear Thistle beginning to flower 3rd October 2024



Figure 7 Stinkwort with seed heads 1st June 2024

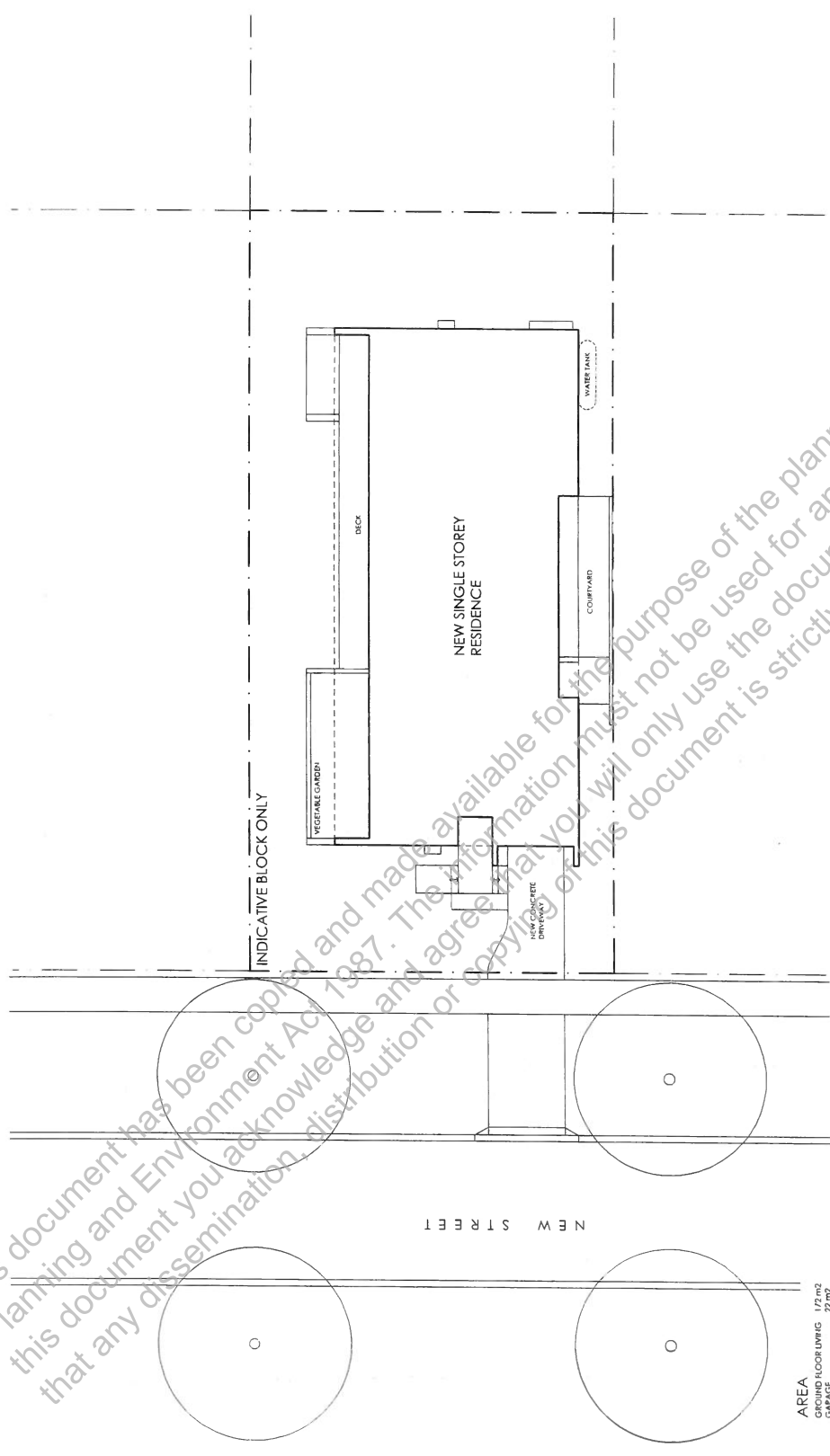


Figure 8 Serrated Tussock 1st June 2024

Our approach will be to continuously reduce the weed load on the property by methods approved and recommended in the Goulburn Broken Catchment Management Authority in its [Goulburn Broken Invasive Plants, Animals and Biosecurity Strategy 2019-2025](#). We will continue to improve the pasture quality and quantity to increase the stock holding capability.

The size of the land at 17.75ha is too small to provide a primary production income on a commercial level and we have no requirement for it to do so. It is however our intent to have grazing livestock to reduce the fuel load of the pasture and reduce fire risk. Stocking levels will be assessed to achieve the reduction in fuel load without overgrazing and stressing the land.




An appropriate fencing plan will be designed to support sufficient rotational grazing to allow the pasture to recuperate and avoid overgrazing. Fencing will also secure the house area from livestock and protect the Land Application Area of the wastewater system.



AREA
 GROUND FLOOR LWING 172 m²
 CHANGE 22 m²
 TOTAL GFA 194 m²
 GROUND FLOOR DECKS 30 m²
 INDICATIVE BLOCK SIZE 544 m²
 NOTE: GFA CALCULATED DOES NOT INCLUDE DECKS, GARAGE AND COMPARTMENTS OUTSIDE OF THE WALLS

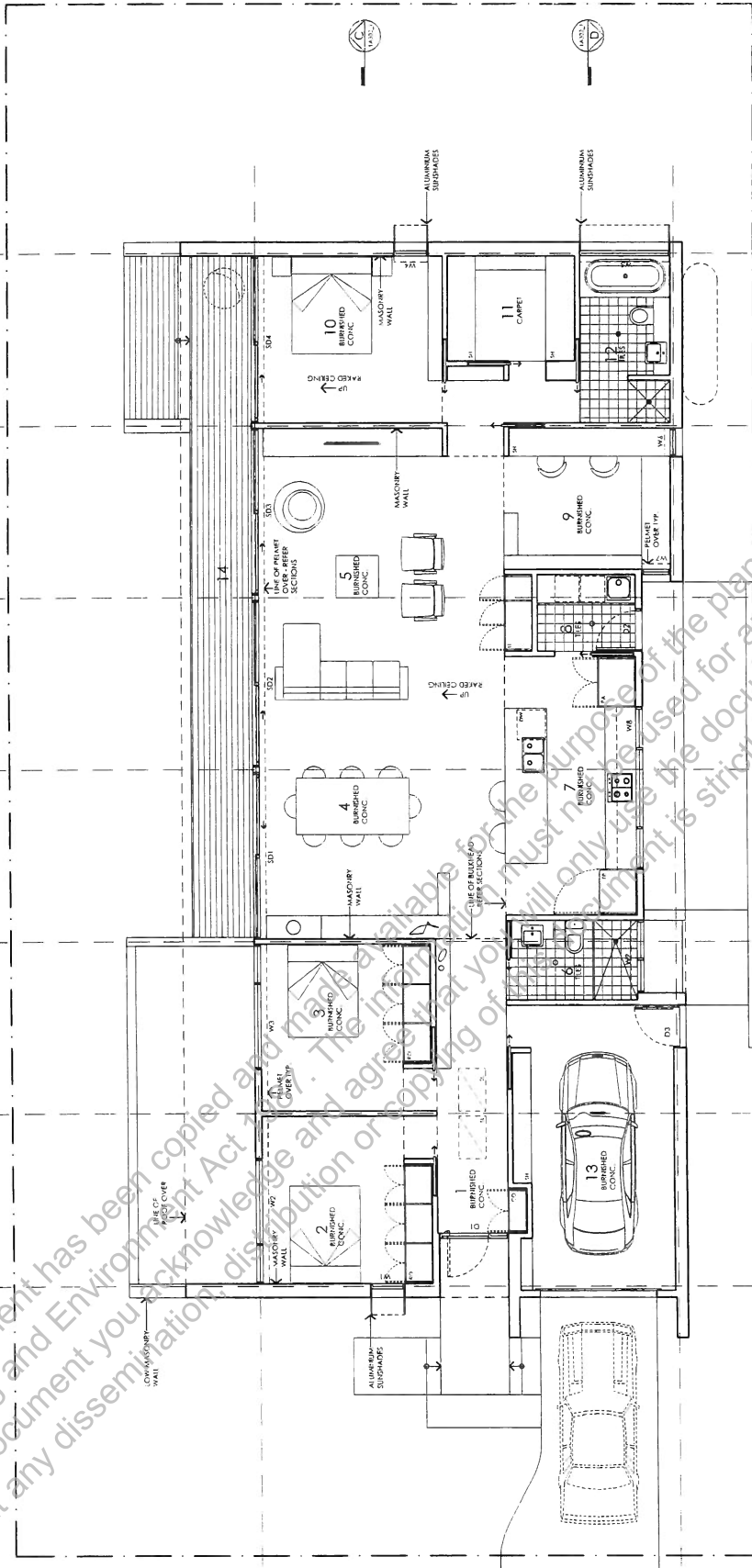
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BANKSIA HOUSE

LEGEND N/A	PROJECT   	DESIGN Banksia House DESIGNED FOR Melbourne	DETAILS Drawing title: Site Plan Scale: 1:200 Paper size: A3 Drawing number: 1/13 Date issued: March 2020 Project stage: Preliminary
DISCLAIMER This house plan is a guide only. It does not constitute legal or other professional advice. You should seek legal or other professional advice in relation to your specific circumstances before adopting any recommendation made within it e.g. advice on structural engineering or building certification requirements. The Commonwealth does not accept responsibility for the accuracy or completeness of this plan, its fitness for a particular purpose, or compliance with any regulatory requirements and standards. Further, the Commonwealth also disclaims liability, to the extent permitted by law, for any liabilities, losses, damages and costs arising from any reliance on the contents of this plan.	Technical drawings should be read with the Banksia House Melbourne Design Options' document which includes building specifications and rating information.		

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BANKSIA HOUSE



KEY	AREA
1	GROUND FLOOR LIVING 172 m ²
2	BEDROOM 3
3	BEDROOM 2
4	BEDROOM 1
5	DINING
6	LIVING
7	BATHROOM
8	KITCHEN
9	LAUNDRY
10	STUDY
11	BEDROOM 1
12	WALK IN ROBE
13	ENSUITE
14	GARAGE
14	DECK

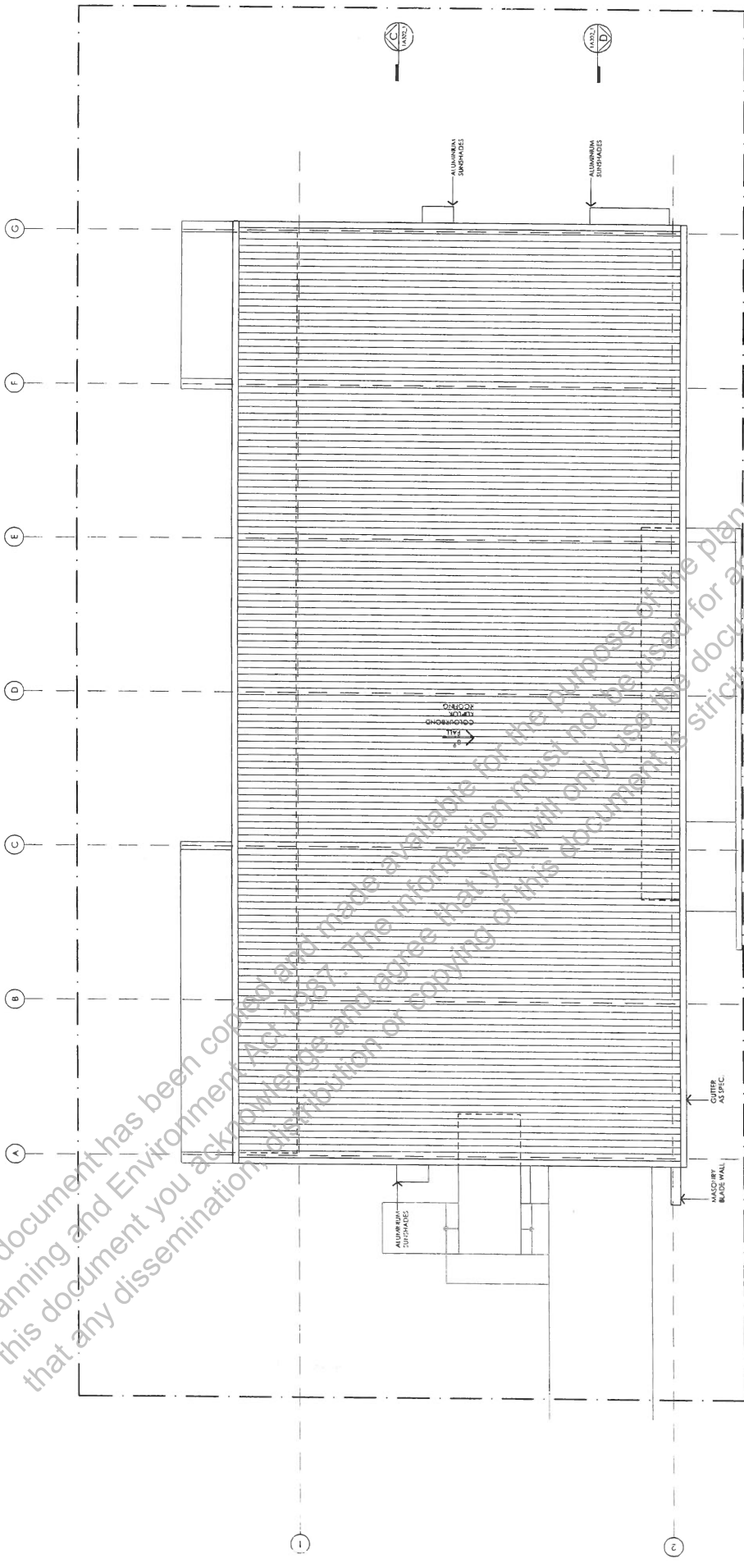
AREA	VALUE
GROUND FLOOR LIVING	172 m ²
GARAGE	22 m ²
TOTAL GFA	194 m²
GROUND FLOOR DECKS	30 m ²
INDICATIVE BLOCK SITE	544 m ²

NOTE: AREA CALCULATED PER METERS COORDINATES. VERTICALS FOR FIRE WALLS.





LEGEND N/A	PROJECT  Australia's guide to environmentally sustainable homes 	DESIGN Banksia House DESIGNED FOR Melbourne	DETAILS Drawing title: Floor Plan Scale: 1:100 Paper size: A3 Drawing number: 27/13 Date issued: March 2020 Project stage: Preliminary
	DISCLAIMER This house plan is a guide only. It does not constitute legal or other professional advice. You should seek legal or other professional advice in relation to your specific circumstances before adopting any recommendation made within it e.g. advice on structural engineering or building certification requirements. The Commonwealth does not accept responsibility for the accuracy or completeness of this plan, its fitness for a particular purpose, or compliance with any regulatory requirements and standards. Further, the Commonwealth also disclaims liability, to the extent permitted by law, for any liabilities, losses, damages and costs arising from any reliance on the contents of this plan.		Technical drawings should be read with the Banksia House Melbourne Design Options' document which includes building specifications and rating information.

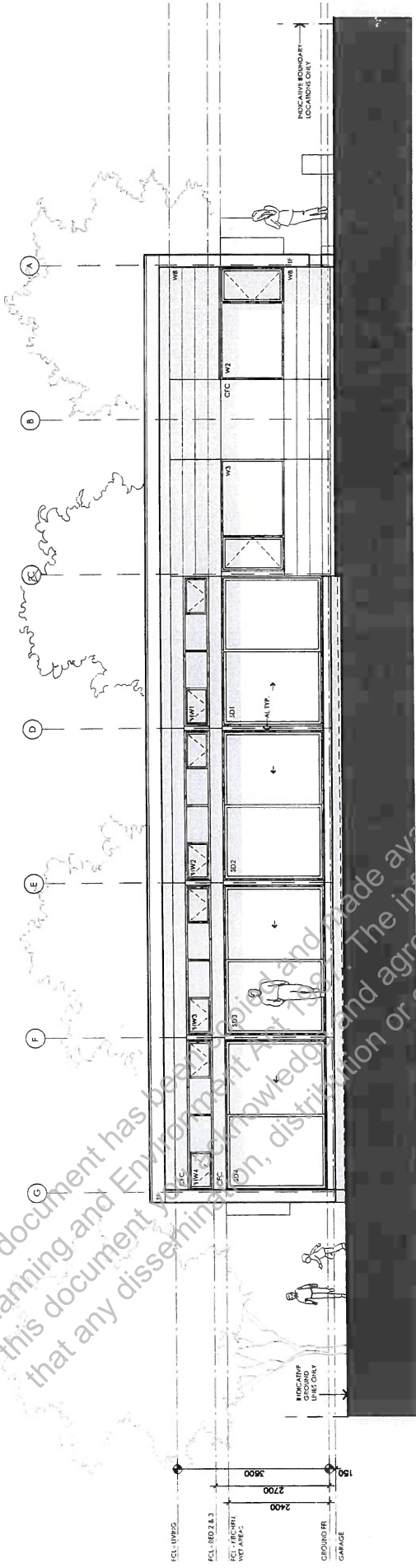


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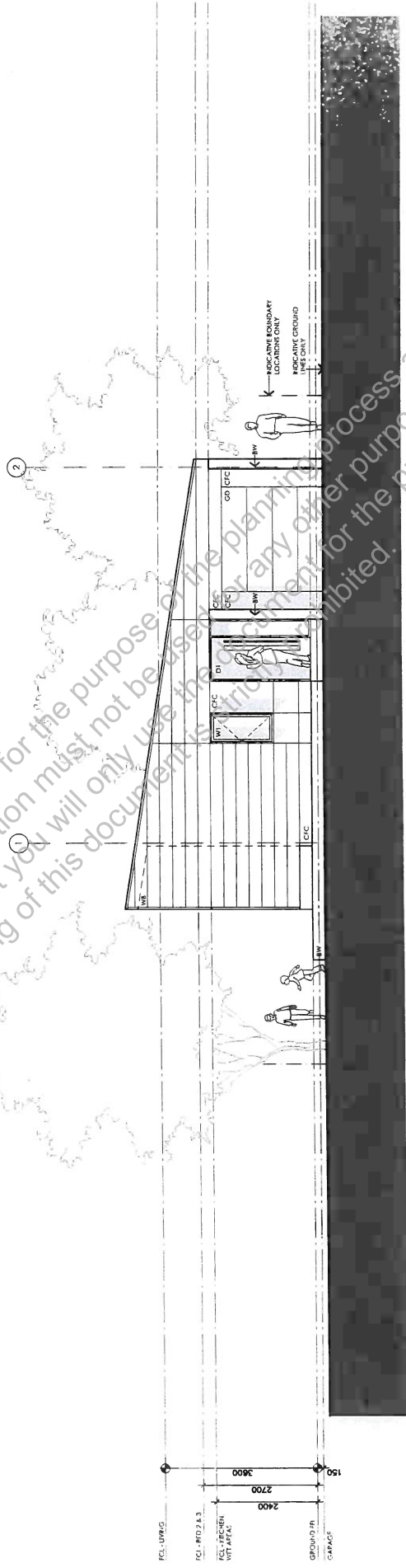
BANKSIA HOUSE

<p>LEGEND N/A</p>	<p>PROJECT</p>  <p>Australia's guide to environmentally-sustainable homes</p> 	<p>DESIGN Banksia House DESIGNED FOR Melbourne</p> <p>Technical drawings should be read with the Banksia House Melbourne Design Options' document which includes building specifications and rating information.</p>	<p>DETAILS Drawing title: Roof Plan Scale: 1:100 Paper size: A3 Drawing number: 3/13 Date issued: March 2020 Project stage: Preliminary</p>
<p>DISCLAIMER</p> <p>This house plan is a guide only. It does not constitute legal or other professional advice. You should seek legal or other professional advice in relation to your specific circumstances, before adopting any recommendation made within it (e.g. advice on structural engineering or building certification requirements). The Commonwealth does not accept responsibility for the accuracy or completeness of this plan. Its fitness for a particular purpose, or compliance with any regulatory requirements and standards. Further, the Commonwealth also disclaims liability, to the extent permitted by law, for any liabilities, losses, damages and costs arising from any reliance on the contents of this plan.</p>		<p>DESIGN FOR FLEX</p> 	



01 | NORTH ELEVATION






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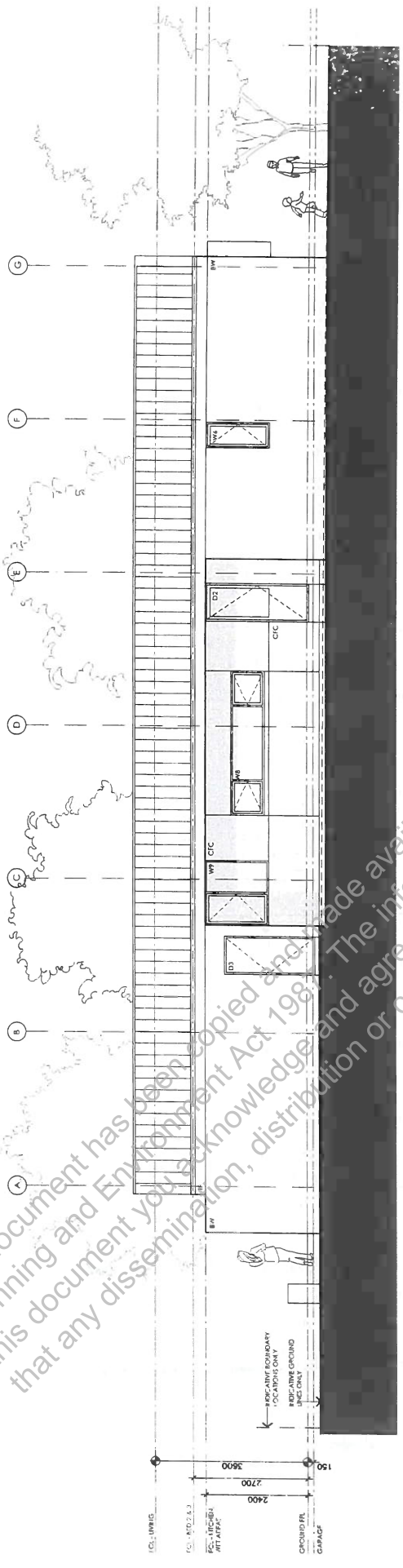
02 | WEST ELEVATION

1:4200.1 | 1:100

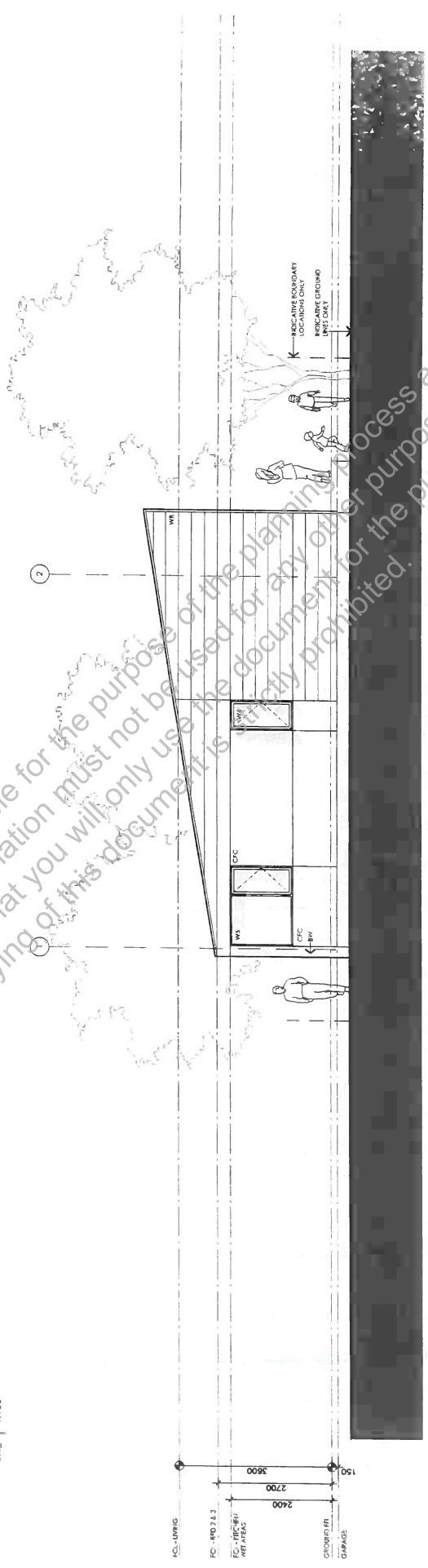
BANKSIA HOUSE

LEGEND		PROJECT		DISCLAIMER	
T1	TIMBER FACIA PROFECCO/TP AS SPEC	 Australia's guide to environmentally sustainable homes		 <p>DISCLAIMER</p> <p>This house plan is a guide only. It does not constitute legal or other professional advice in relation to your specific circumstances before adopting any recommendation made within it e.g. advice on structural engineering or building certification requirements. The Commonwealth does not accept responsibility for the accuracy or completeness of this plan, its fitness for a particular purpose, or compliance with any regulatory requirements and standards. Further, the Commonwealth also disclaims liability, to the extent permitted by law, for any liabilities, losses, damages and costs arising from any reliance on the contents of this plan.</p>	
M1	MEAN BEARING BOARD BRIG ON TIMBER PROFECCO/TP AS SPEC				
BW	FACE BRICK WORK MFC AS SPEC				
CFC	CONCRETE SLAB ON TIMBER PROFECCO/TP AS SPEC				
S1	STEEL BEAM PARTNER AS SPEC	 Design For Earth		<p>Technical drawings should be read with the Banksia House Melbourne Design Options' document which includes building specifications and rating information.</p>	
CD	GLASS CURTAIN WALL AS SPEC	 Australia's guide to environmentally sustainable homes		<p>Options' document which includes building specifications and rating information.</p>	
A1	ALUMINIUM COVER PANEL - HOLLOW FRP/COLICUP TO MATCH WINDOW FRAMES	 <p>DISCLAIMER</p> <p>This house plan is a guide only. It does not constitute legal or other professional advice in relation to your specific circumstances before adopting any recommendation made within it e.g. advice on structural engineering or building certification requirements. The Commonwealth does not accept responsibility for the accuracy or completeness of this plan, its fitness for a particular purpose, or compliance with any regulatory requirements and standards. Further, the Commonwealth also disclaims liability, to the extent permitted by law, for any liabilities, losses, damages and costs arising from any reliance on the contents of this plan.</p>		<p>Options' document which includes building specifications and rating information.</p>	
<p>LEGEND</p> <p>T1 TIMBER FACIA PROFECCO/TP AS SPEC</p> <p>M1 MEAN BEARING BOARD BRIG ON TIMBER PROFECCO/TP AS SPEC</p> <p>BW FACE BRICK WORK MFC AS SPEC</p> <p>CFC CONCRETE SLAB ON TIMBER PROFECCO/TP AS SPEC</p> <p>S1 STEEL BEAM PARTNER AS SPEC</p> <p>CD GLASS CURTAIN WALL AS SPEC</p> <p>A1 ALUMINIUM COVER PANEL - HOLLOW FRP/COLICUP TO MATCH WINDOW FRAMES</p>		<p>PROJECT</p> <p>YourHome Australia's guide to environmentally sustainable homes</p> <p>Australian Government</p>		<p>DISCLAIMER</p> <p>This house plan is a guide only. It does not constitute legal or other professional advice in relation to your specific circumstances before adopting any recommendation made within it e.g. advice on structural engineering or building certification requirements. The Commonwealth does not accept responsibility for the accuracy or completeness of this plan, its fitness for a particular purpose, or compliance with any regulatory requirements and standards. Further, the Commonwealth also disclaims liability, to the extent permitted by law, for any liabilities, losses, damages and costs arising from any reliance on the contents of this plan.</p>	
<p>DETAILS</p> <p>Drawing title: Elevation</p> <p>Scale: 1:100</p> <p>Paper size: A3</p> <p>Drawing number: 4/13</p> <p>Date issued: March 2020</p> <p>Project stage: Preliminary</p>		<p>DESIGN</p> <p>Banksia House DESIGNED FOR Melbourne</p>		<p>Technical drawings should be read with the Banksia House Melbourne Design Options' document which includes building specifications and rating information.</p>	

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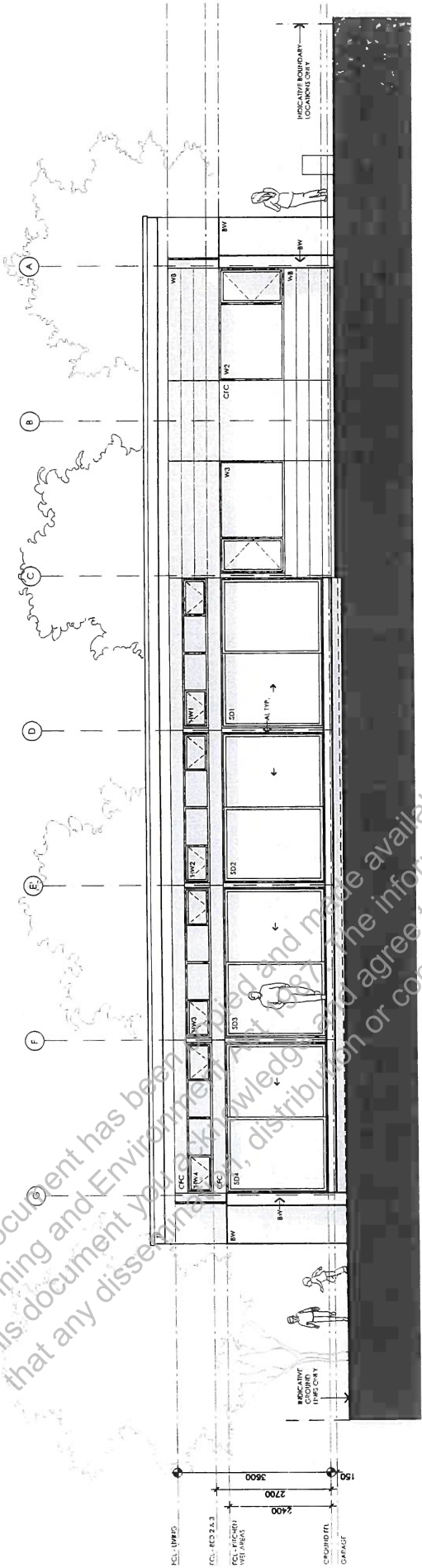
01 SOUTH ELEVATION
1A202_1 1:100



02 EAST ELEVATION
1A202_1 1:100

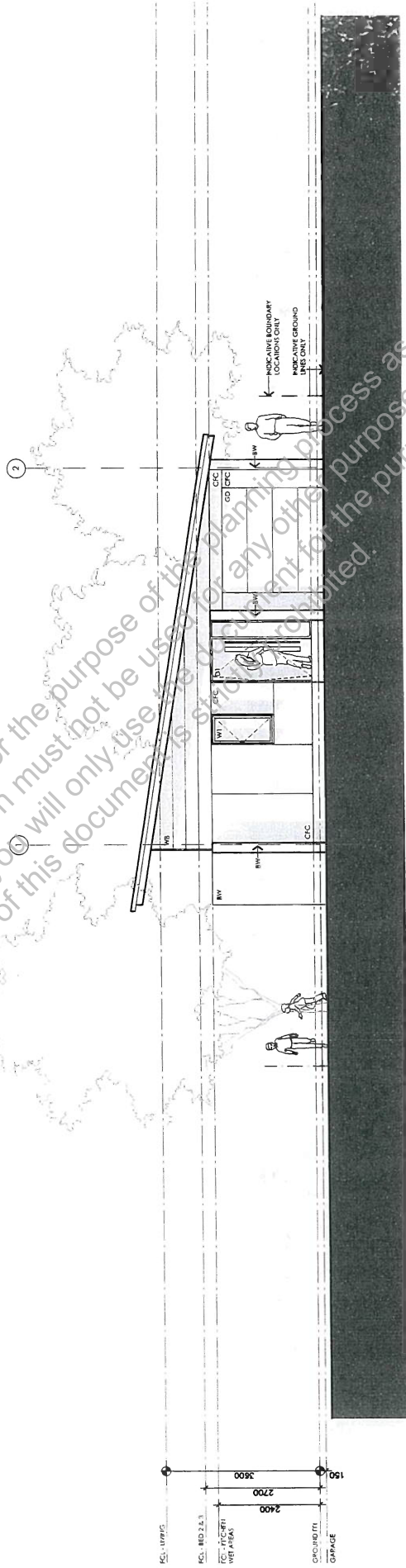
BANKSIA HOUSE

<p>LEGEND</p> <ul style="list-style-type: none"> TF TIMBER FACIA PF01 FACE COLOUR AS SPEC WB WEATHERBOARD LINING ON TIMBER PF02 FACE COLOUR AS SPEC BW FACE BRICK WORK BRICK AS SPEC C/C COMPRESSED FC CLADDING ON TIMBER PF03 FACE COLOUR AS SPEC SB STEEL SILL PAINT BRN AS SPEC GD GARAGE DOOR MAVE R. COLOUR AS SPEC AI RUSHWOOD TO MATCH WINDOW FRAMES 	<p>PROJECT</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p style="text-align: center; font-size: small;">Australia's guide to environmentally-sustainable homes</p>	<p>DESIGN Banksia House DESIGNED FOR Melbourne</p> <p style="font-size: x-small;">Technical drawings should be read with the Banksia House Melbourne Design Options' document which includes building specifications and rating information.</p>	<p>DETAILS</p> <p>Drawing title: Elevations Scale: 1:100 Paper size: A3 Drawing number: 5/23 Date issued: March 2020 Project stage: Preliminary</p>
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01 NORTH ELEVATION

1:100



02 WEST ELEVATION

1:100

BANKSIA HOUSE

<p>LEGEND</p> <ul style="list-style-type: none"> 15 TIMBER FACIA 16 PROFIBRECCOMP A3:SPC 17 WEATHERBOARD LINING ON TIMBER 18 WEATHERBOARD LINING ON TIMBER 19 PROFIBRECCOMP A3:SPC 20 FACE BRICK, WORK 21 BRICK A3:SPC 22 COMPRESSED FC CLADDING ON TIMBER 23 PROFIBRECCOMP A3:SPC 24 STEEL BEAM 25 PAINT FINISH A3:SPC 26 GARAGE DOOR 27 GARAGE DOOR 28 ALUMINIUM CORNER PANE - EQUAL 29 ALUMINIUM CORNER PANE - EQUAL 30 RHTM350C30P TO MATCH WINDOW FRAMES 	<p>PROJECT</p> <p>DISCLAIMER</p> <p>This house plan is a guide only. It does not constitute legal or other professional advice. You should seek legal or other professional advice in relation to your specific circumstances before adopting any recommendation made within it e.g. advice on structural engineering or building certification requirements. The Commonwealth does not accept responsibility for the accuracy or completeness of this plan, its fitness for a particular purpose, or compliance with any regulatory requirements and standards. Further, the Commonwealth also disclaims liability, to the extent permitted by law, for any liabilities, losses, damages and costs arising from any reliance on the contents of this plan.</p>	<p>DESIGN</p> <p>Banksia House</p> <p>DESIGNED FOR</p> <p>Melbourne</p>	<p>DETAILS</p> <p>Drawing title: Elevations - all roof line</p> <p>Scale: 1:100</p> <p>Paper size: A3</p> <p>Drawing number: 6/13</p> <p>Date issued: March 2020</p> <p>Project stage: Preliminary</p>
<p>YourHome Australia's guide to environmentally sustainable homes</p> <p>Design For Place</p>	<p>Technical drawings should be read with the Banksia House Melbourne Design Options' document which includes building specifications and rating information.</p>		


BANKSIA HOUSE

DETAILS
 Drawing title: Elevations - alt. roof line
 Scale: 1:100
 Paper size: A3
 Drawing number: 7/13
 Date issued: March 2020
 Project stage: Preliminary


DESIGN
 Banksia House
 DESIGNED FOR
 Melbourne

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PROJECT



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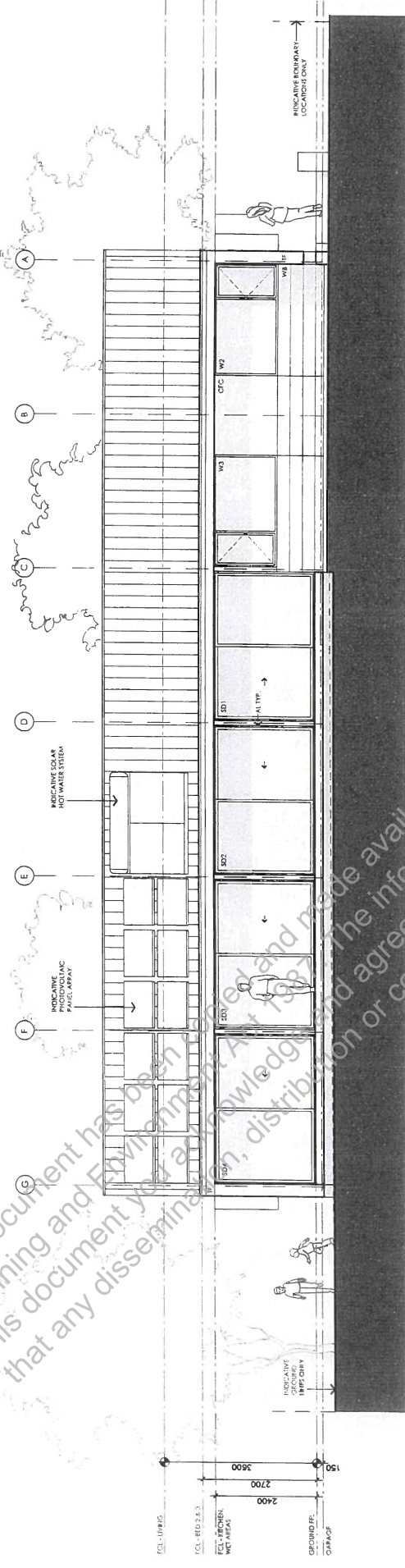
Design Eye Flyer

DISCLAIMER

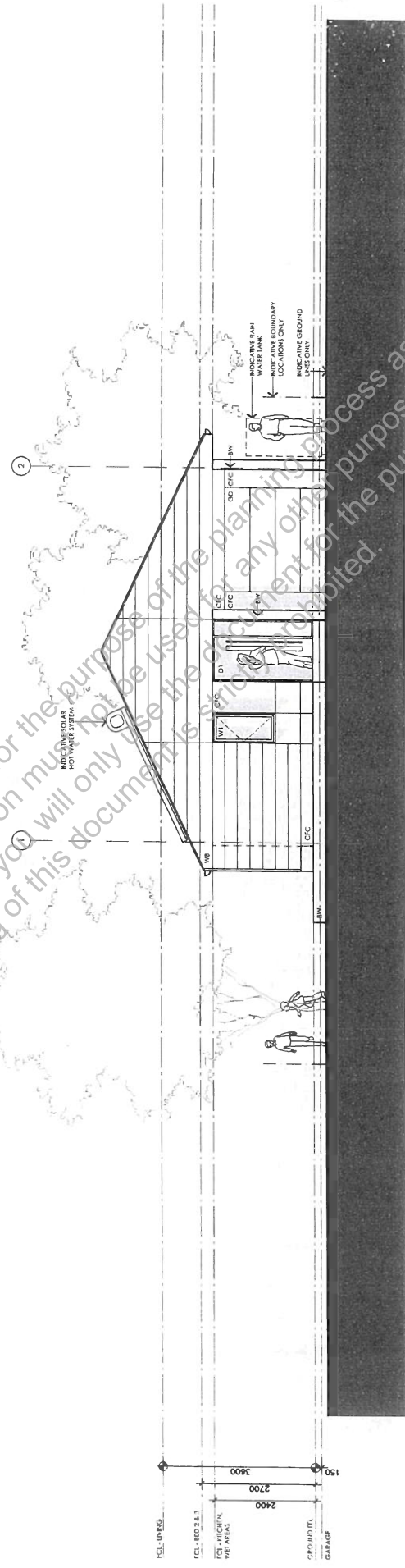
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LEGEND

- T1 TIMBER SASH
- PF1 PROFILE CORRUG AS SPEC
- WB WEATHERBOARD CLADDING ON TIMBER
- FR1 FRAMING & BATTENS
- FR2 FRAMING & BATTENS AS SPEC
- BW FACE BRICK WORK
- RECT AS SPEC
- CFC COMPRESSED FFC CLADDING ON TIMBER
- FR3 FRAMING & BATTENS
- PF2 PROFILE CORRUG AS SPEC
- PA1 PAINT SYSTEM AS SPEC
- GD GARAGE DOOR
- MAVE & COLOUP AS SPEC
- AL ALUMINUM COVER PANEL - FOLDED
- PF3 PROFILE CORRUG ON BRICK FRAMES

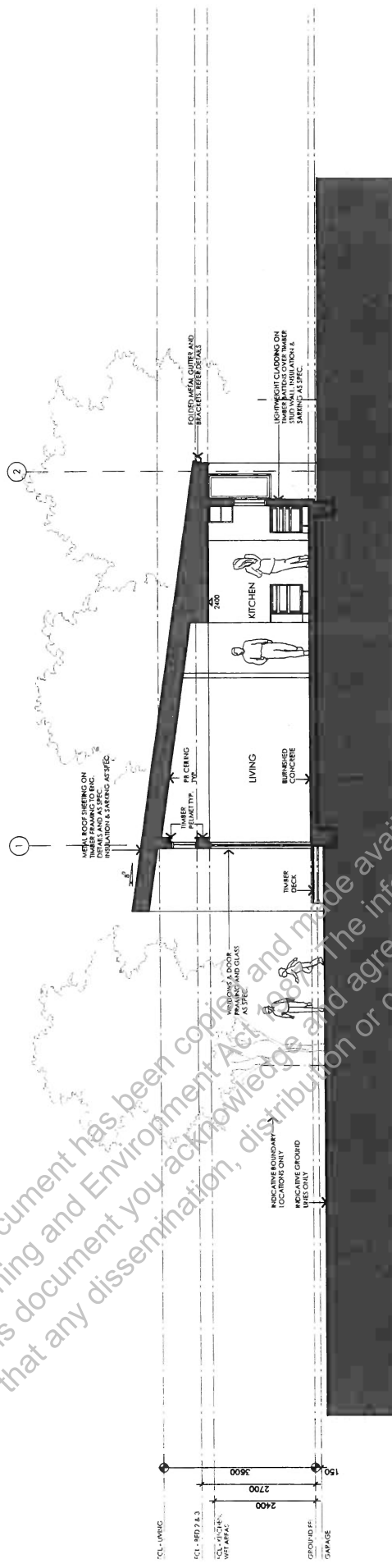


01 NORTH ELEVATION
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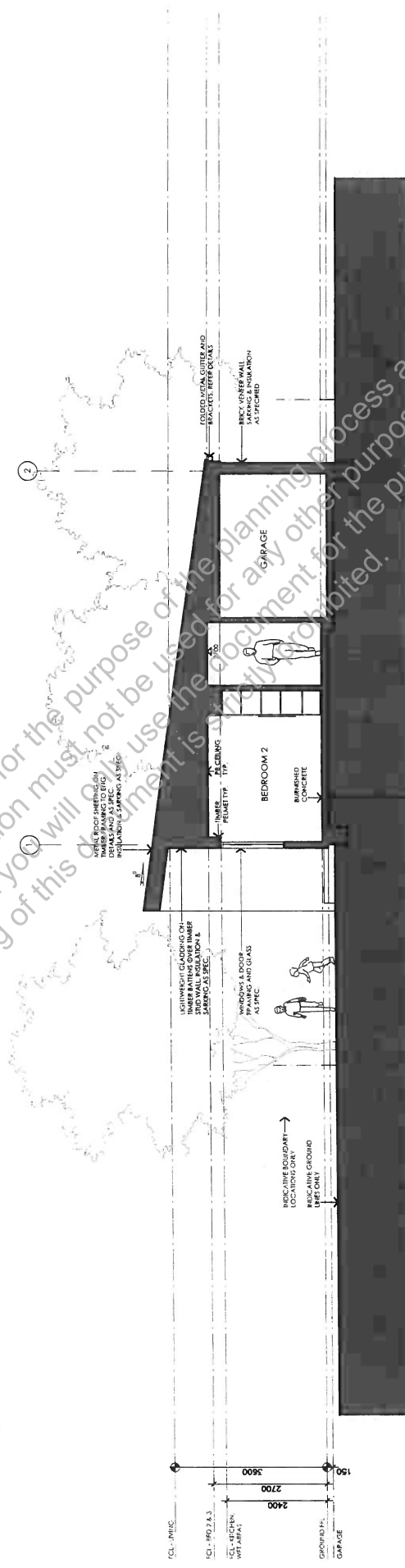


02 WEST ELEVATION
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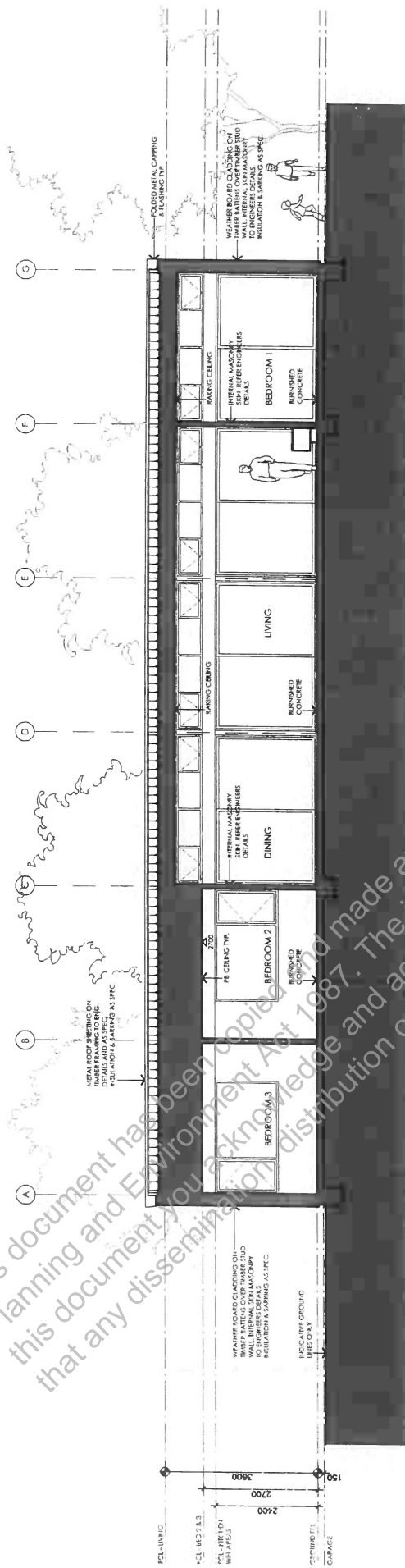
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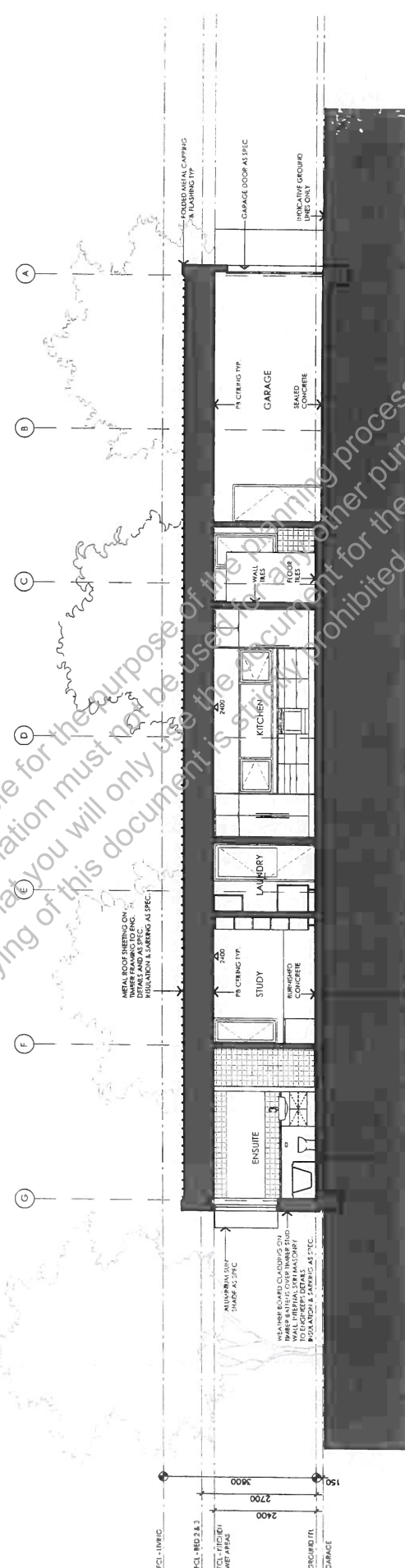
02 SECTION BB
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BANKSIA HOUSE

<p>LEGEND</p> <ul style="list-style-type: none"> T1 TIMBER FACIA PROF/COG/UP AS SPEC M8 WEATHERBOARD/SHEATH ON TIMBER PROF/COG/UP AS SPEC BW FACE BRICK WORK BRICK AS SPEC CFC COMPRESSION CLADDING ON TIMBER PROF/COG/UP AS SPEC S3 STEEL BEAM PATTERN AS SPEC GD GYPSUM BOARD AS SPEC AL ALUMINIUM COVER PATH - HOLLOW FRB/FRM/COG/UP TO MATCH WINDOW FRAME 	<p>PROJECT</p> <p> Australia's guide to environmentally sustainable homes</p> <p></p> <p>DISCLAIMER</p> <p>This house plan is a guide only. It does not constitute legal or other professional advice. You should seek legal or other professional advice in relation to your specific circumstances before adopting any recommendation made within it e.g. advice on structural engineering or building certification requirements. The Commonwealth does not accept responsibility for the accuracy or completeness of this plan, its fitness for a particular purpose, or compliance with any regulatory requirements and standards. Further, the Commonwealth also disclaims liability, to the extent permitted by law, for any liabilities, losses, damages and costs arising from any reliance on the contents of this plan.</p>	<p>DESIGN</p> <p>Banksia House DESIGNED FOR Melbourne</p> <p>Technical drawings should be read with the Banksia House Melbourne Design Options' document which includes building specifications and rating information.</p>	<p>DETAILS</p> <p>Drawing title: Sections Scale: 1:100 Paper size: A3 Drawing number: 8/13 Date issued: March 2020 Project stage: Preliminary</p>
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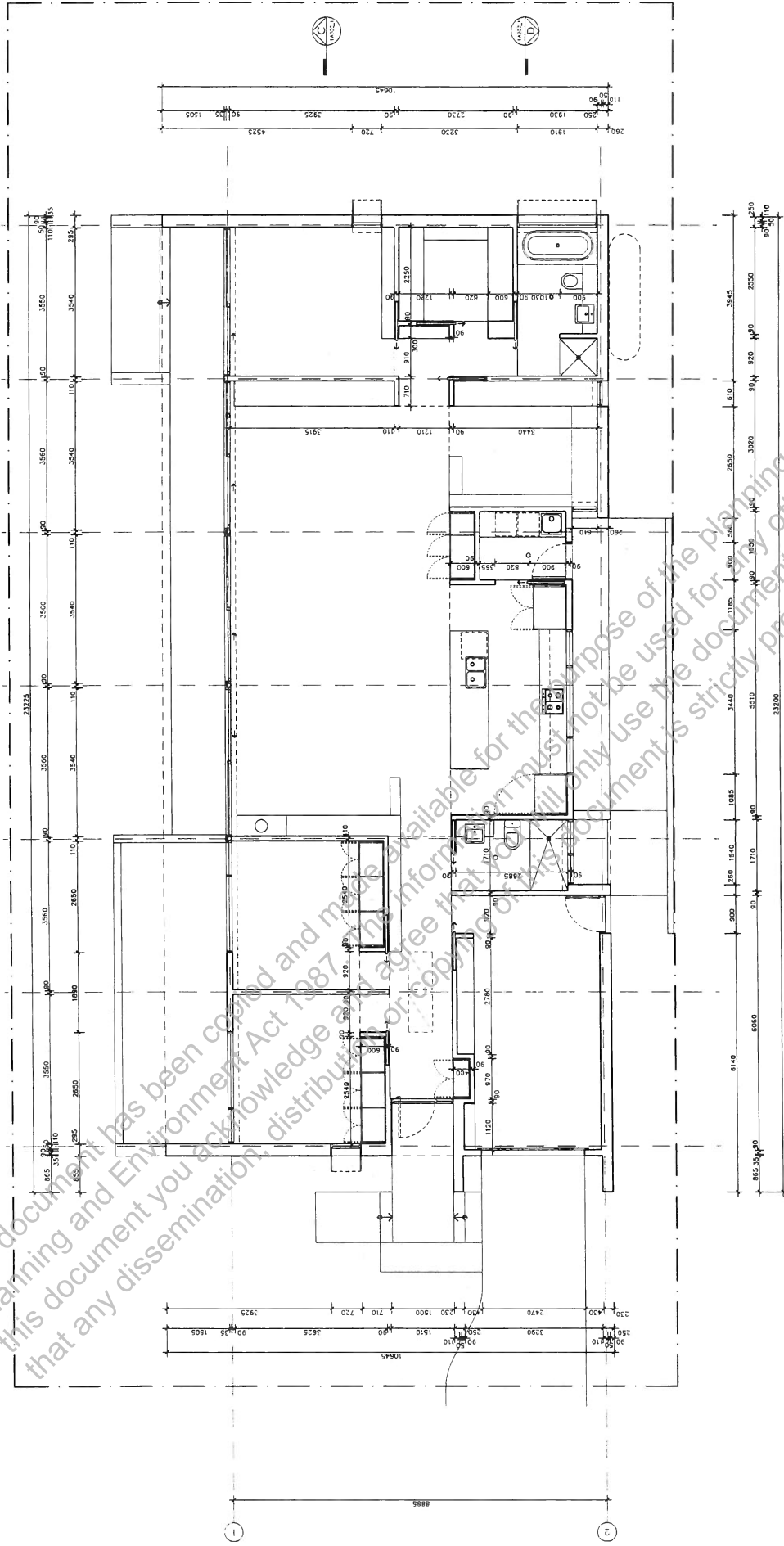
01 SECTION CC
1A392.1 | 1:100



02 SECTION DD
1A392.1 | 1:100

BANKSIA HOUSE

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<p>DISCLAIMER</p> <p>This house plan is a guide only. It does not constitute legal or other professional advice. You should seek legal or other professional advice in relation to your specific circumstances before adopting any recommendation made within it e.g. advice on structural engineering or building certification requirements. The Commonwealth does not accept responsibility for the accuracy or completeness of this plan. Its fitness for a particular purpose, or compliance with any regulatory requirements and standards. Further, the Commonwealth also disclaims liability to the extent permitted by law, for any liabilities, losses, damages and costs arising from any reliance on the contents of this plan.</p>	<p style="text-align: right;">Design For People</p>	<p>DESIGN</p> <p style="text-align: center;">Banksia House</p> <p style="text-align: center;">DESIGNED FOR</p> <p style="text-align: center;">Melbourne</p> <p>Technical drawings should be read with the Banksia House Melbourne Design Options document which includes building specifications and rating information.</p>	<p>DETAILS</p> <p>Drawing title: SECTIONS Scale: 1:100 Paper size: A3 Drawing number: 9/13 Date issued: March 2020 Project stage: Preliminary</p>



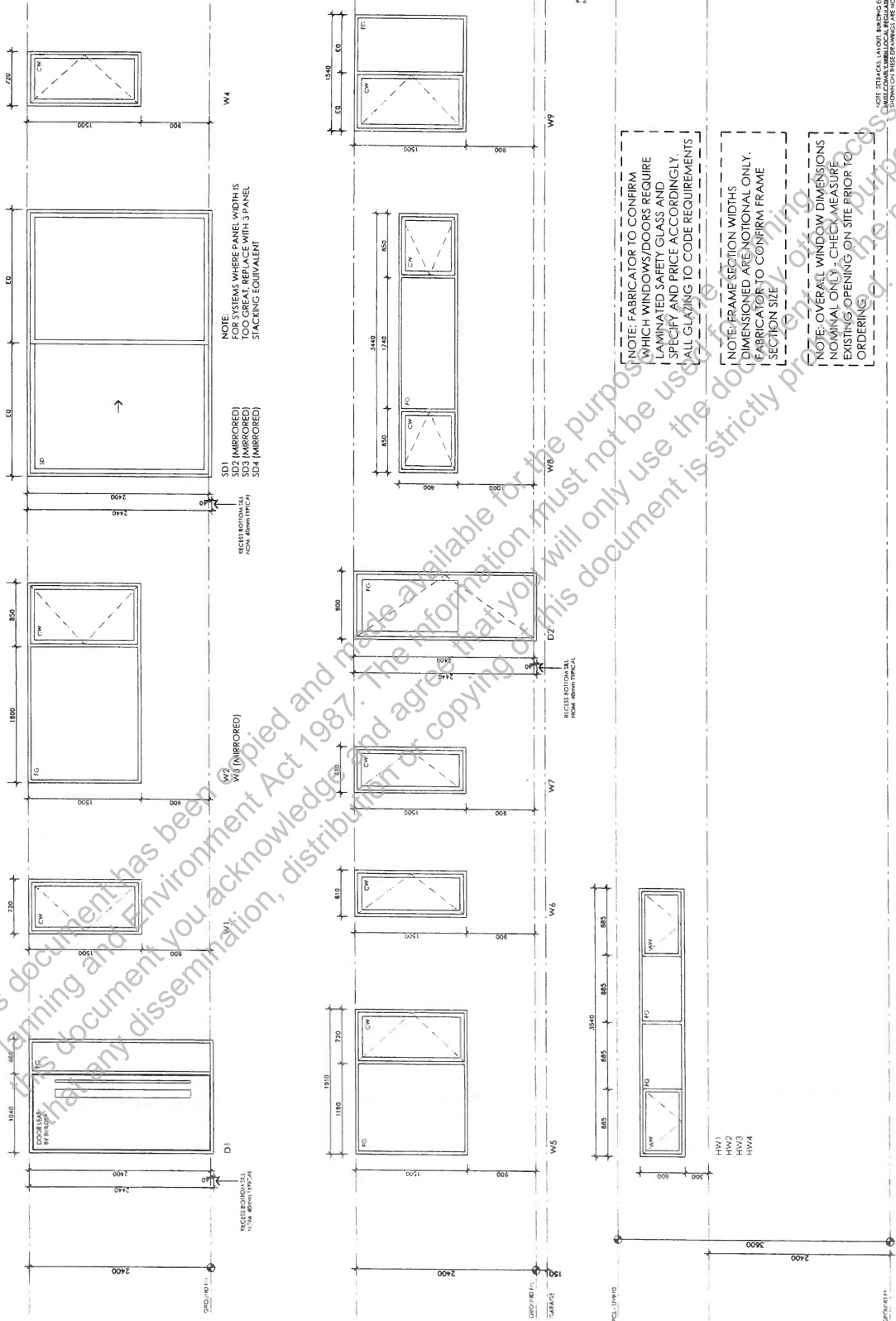
BANKSIA HOUSE

<p>LEGEND N/A</p>	<p>PROJECT</p> <p>Australian Government Australia's guide to environmentally sustainable homes</p> <p>YourHome Design For Place</p>	<p>DESIGN Banksia House DESIGNED FOR Melbourne</p> <p>Technical drawings should be read with the Banksia House Melbourne Design Options' document which includes building specifications and rating information.</p>	<p>DETAILS Drawing title: Wall Setback Flat Scale: 1:100 Paper size: A3 Drawing number: 10/13 Date issued: March 2020 Project stage: Preliminary</p>
<p>DISCLAIMER This house plan is a guide only. It does not constitute legal or other professional advice. You should seek legal or other professional advice in relation to your specific circumstances before adopting any recommendation made within it e.g. advice on structural engineering or building certification requirements. The Commonwealth does not accept responsibility for the accuracy or completeness of this plan, its fitness for a particular purpose, or compliance with any regulatory requirements and standards. Further, the Commonwealth also disclaims liability, to the extent permitted by law, for any liabilities, losses, damages and costs arising from any reliance on the contents of this plan.</p>	<p>DETAILS Drawing title: Wall Setback Flat Scale: 1:100 Paper size: A3 Drawing number: 10/13 Date issued: March 2020 Project stage: Preliminary</p>		

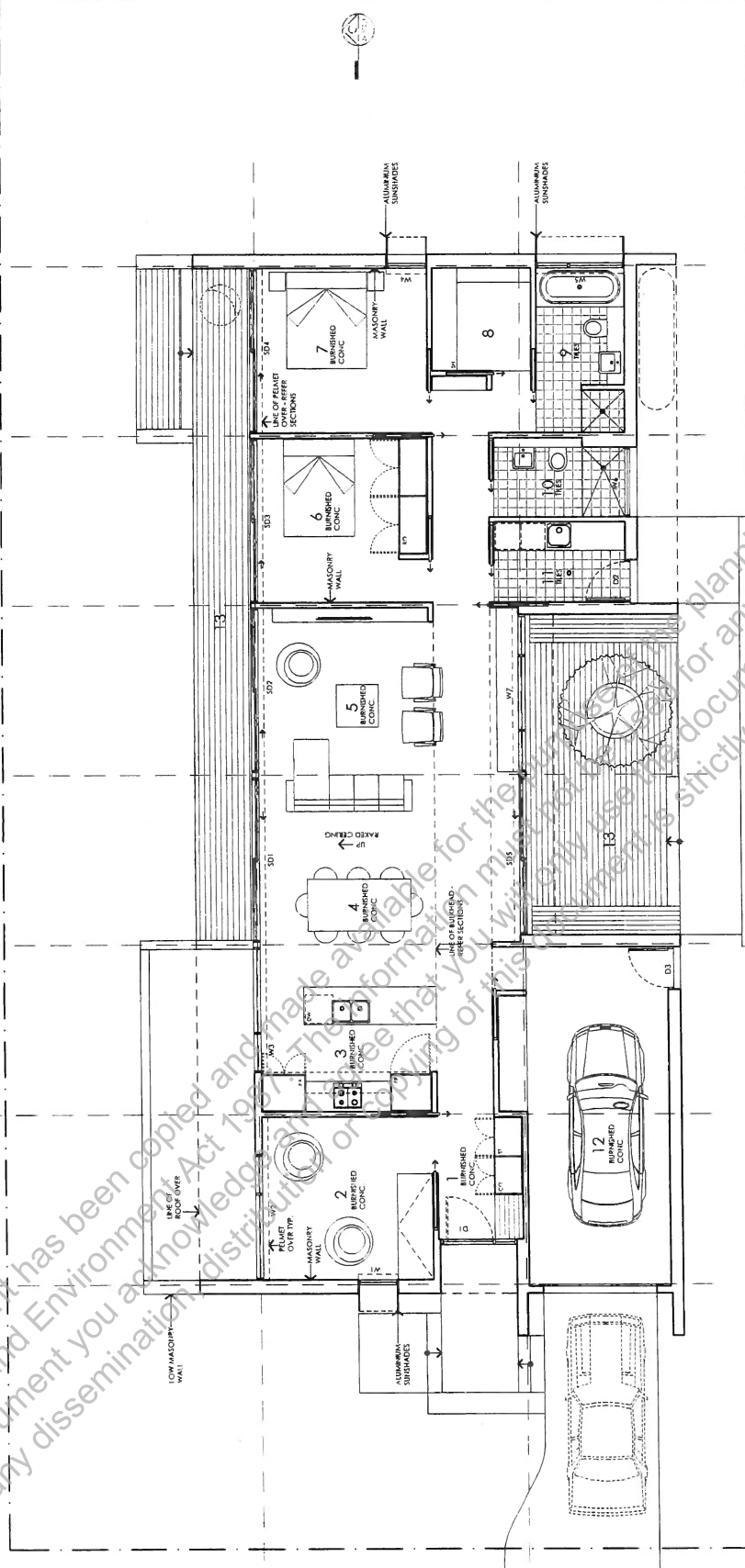
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BANKSIA HOUSE

- LEGEND**
- FG FIXED GLASS
 - GLAZING TO CODE REQUIREMENTS
 - CW CURTAIN WALL
 - GLAZING TO CODE REQUIREMENTS
 - AW AWMING SASH
 - GLAZING TO CODE REQUIREMENTS
 - SD SLIDING STACKER DOOR
 - GLAZING TO CODE REQUIREMENTS
 - SSD SLIDING STACKER DOOR
 - GLAZING TO CODE REQUIREMENTS
 - SW SLIDING WINDOW
 - GLAZING TO CODE REQUIREMENTS
- NOTES**
- 1. ALL WINDOWS TO BE CONFORMANT OR SIMILAR TO THE REQUIREMENTS OF THE COMMONWEALTH BUILDING REGULATIONS TO MANUFACTURERS SPEC. PROVIDE MATCHING FINISHES TO ALL OPERABLE SECTIONS AND MATCH TO FINISHES TO ALL WINDOW SILL AND TRIMS AS REQUIRED.
 - 2. ALL WINDOWS AND DOORS TO BE DOUBLE GLAZED. NOTE THE NEED FOR TOUCHSCREEN LAMINATED SAFETY GLASS TO CODE REQUIREMENTS WHERE REQUIRED.
 - 3. ALL GLAZING TO AS 1288 AND BCA REQUIREMENTS. PROVIDE PERFORMANCE VALUES TO MATCH ENERGY RATING.
 - 4. ALL WINDOWS & DOORS VIEWED FROM OUTSIDE UNLESS NOTED OTHERWISE.



<p>LEGEND</p> <p>N/A</p>	<p>DESIGN</p> <p>Banksia House</p> <p>DESIGNED FOR</p> <p>Melbourne</p>	<p>DETAILS</p> <p>Drawing title: Window Schedule</p> <p>Scale: 1:100</p> <p>Paper size: A3</p> <p>Drawing number: 1/13</p> <p>Date issued: March 2020</p> <p>Project stage: Preliminary</p>
<p>PROJECT</p> <p>Australian Government</p> <p>YourHome Australia's guide to environmentally sustainable homes</p>	<p>DISCLAIMER</p> <p>This house plan is a guide only. It does not constitute legal or other professional advice. You should seek legal or other professional advice in relation to your specific circumstances before adopting any recommendation made within it e.g. advice on structural engineering or building certification requirements. The Commonwealth does not accept responsibility for the accuracy or completeness of this plan, its fitness for a particular purpose, or compliance with any regulatory requirements and standards. Further, the Commonwealth also disclaims liability to the extent permitted by law for any liabilities, losses, damages and costs arising from any reliance on the contents of this plan.</p>	<p>Technical drawings should be read with the Banksia House Melbourne Design Options' document which includes building specifications and rating information.</p>



KEY

1	ENTRY	BEDROOM 3
2	STUDY	BEDROOM 2
3	KITCHEN	BEDROOM 1
4	DINING	POBE
5	LIVING	ENSUITE
6	BEDROOM 2	BATHROOM
7	BEDROOM 1	LAUNDRY
8	POBE	GARAGE
9	ENSUITE	DECK
10	BATHROOM	
11	LAUNDRY	
12	GARAGE	
13	DECK	

AREA	GROUND FLOOR LIVING	141 m ²
GARAGE		28 m ²
TOTAL GFA		169 m ²
GROUND FLOOR DECKS		35 m ²
INDICATIVE B.L.O.C.H.E		544 m ²

* GFA CALCULATED FROM POINT TO POINT
 * EXCLUDES CARPORTS, COURTYARDS, TERRACES, PERIMETER WALLS

BANKSIA HOUSE

DETAILS
 Drawing title: All Floor Plans - 1:100
 Scale: 1:100
 Paper size: A3
 Drawing number: 12.13
 Date issued: March 2020
 Project stage: Preliminary

DESIGN
 Banksia House
 DESIGNED FOR
 Melbourne

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LEGEND

N/A

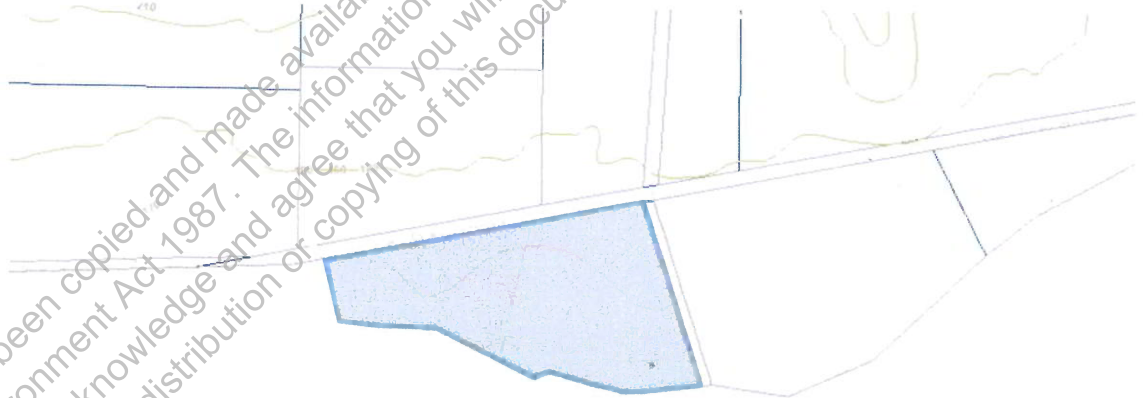
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Geoscience + Planning

LAND CAPABILITY ASSESSMENT

1170 LAKE MOKOAN ROAD
CHESNEY VALE



Introduction 5

Methodology 5

Site Assessment 6

Soil Assessment 7

Site Risk Analysis 9

Wastewater Management 10

Conclusion and Recommendations 14

References 19

Appendices

- Appendix A – Site Photos
- Appendix B – Site Plan
- Appendix C – Soil Excavation Logs
- Appendix D – Water and Nutrient Balance
- Appendix E – Soil Laboratory Results
- Appendix F – Groundwater Resource Report

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This report has been prepared for:
Sue Paterson

This report has been prepared by:
GeoPlan Consulting
PO Box 92
Tawonga Sth
3698

Report Date	October 2024
Assessors Academic and Professional Qualifications	Bachelor Applied Science (Environmental Management) Advanced Diploma Spatial Information and Surveying Graduate Diploma Land Rehabilitation Graduate Diploma Rural and Regional Planning Master of Science (Geoscience)

LIMITATIONS

The findings contained within this Land Capability Assessment are derived from methodologies provided by relevant Code of Practice and Australian Standard and due regard has been given to undertake all aspects of the study in accordance with the requirements with best practice and relevant standards. Whilst the findings contained in this report represent a reasonable interpretation of site conditions, it does not indicate that these findings represent the actual state of the site at all points. The Information contained in this document have been produced by GeoPlan Consulting for the use of the person or organisation for which it has been prepared and GeoPlan undertakes no duty to or accepts any responsibility to any third party who may rely on this document.

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EXECUTIVE SUMMARY SITE AND SOIL ASSAY	
SOIL DEPTH	Soil depths across the study area are greater than 1.0 metres – impermeable layer not encountered. Given landscape position shallow soils are unlikely to be encountered.
DEPTH TO WATERTABLE	Groundwater not encountered. According to the DEECA Groundwater Resource Report depth to water table is <5m: https://mapshare.vic.gov.au/Geocortex/Essentials/EXT/REST/TempFiles/groundwater_report_20241018_053502.pdf?guid=e6585221-92e4-4f23-bf1e-f738ea3a6d1e&contentType=application%2Fpdf There is no evidence of groundwater discharge in the vicinity of the study area and the nominated Land Application Area (LAA).
TOPOGRAPHY	Linear Planar
COARSE FRAGMENTS (%) (SUBSOIL)	<2%
SUBSOIL – B2 (DESIGN) HORIZON	Yellowish grey, moderately structured, light (sandy) clay
EMERSON CLASS	B1 Horizon - 2
pH* (1:5 Water)	B1 Horizon – 6.5
ELECTRICAL CONDUCTIVITY (1:5 WATER) * dS/m	B1 Horizon – 0.02
EXCHANGEABLE SODIUM % (ESP) *	B1 Horizon 4.9%
SUBSOIL SOIL PERMEABILITY (Ksat) (m/day)	~0.06 m/day Soil permeability was determined using the Talsma-Hallam and visual / tactile methods.
SOIL CATEGORY (AS/NZ1547:2012)	5b
DESIGN LOADING RATE (TRENCHES & BEDS) (mm/day)	5 Refer to notes 2 and 3 to Table L1 in <i>Australian Standard AS/NZS 1547:2012</i>
DESIGN IRRIGATION RATE (mm/day)	3
DESIGN LOADING RATE (EVAP/TRANS) (mm/day)	5
* Determined by Nutrient Advantage Laboratories	

Executive Summary – System Design Options Summary				
Indicative Design Recommendations Summary (Using CoP Day Flow Rate and CoP BOD)				
Treatment Method	Septic Tank Capacity (Litres)	Land Application Method	Construction Requirements (Relevant AS/NZS 1547/2012 or CoP Construction Diagram)	Indicative LAA Area (m²)
Option 1 Dry Compost Toilet / Secondary Grey Water Treatment [†]	3500L (4BR)	Mature compost from approved dry composting toilet must be buried in a hole at least 300 mm deep in the 'ornamental' section of the property (i.e. away from food crops and drainage depression) and covered with loamy topsoil / Subsurface irrigation of secondary treated grey water*	M1	460 m ² - 4 BR (Standard Fixtures) 380 m ² - 4 BR (Water Saving Fixtures)
Option 2 Secondary Treatment of all Wastewater (AWTS)	3500L (4BR)	Subsurface irrigation*	M1	460 m ² - 4 BR (Standard Fixtures) 380 m ² - 4 BR (Water Saving Fixtures)
Option 3 Aerobic Biological Filter (wet composting, vermiculture)	3500L (4BR)	ETA/ETS*	L6	257 m ² - 4 BR (Standard Fixtures) 214 m ² - 4 BR (Water Saving Fixtures)
<p>*Using water balance as shown at Appendix D (9th Decile wet year rainfall – Benalla Weather Station & standard fixtures)</p> <p>[†]The CoP requires that the separate greywater treatment system treat the wastewater to secondary standard (20/30) or better. In this instance the LAA is sized by water balance to match the LAA size to intrinsic site attributes and also sized to accommodate a future conventional toilet should the dwelling be modified in the future.</p> <p>* Where: Trench length does not exceed 30m Trench/Bed Width = 0.7m Trench/Bed Spacing = 2m</p> <p>Perimeter Land Application Area Buffer Required - 2m</p>				

Introduction

An investigation has been undertaken to assess the overall capability of 1170 Lake Mokoan Road Chesney Vale for the purpose of on-site wastewater management and to investigate the merits of undertaking future un-sewered development on the land. This report provides information about:

- Soil conditions;
- Site constraints;
- General indicative advice about appropriate wastewater treatment system and land application methods in response to overall site and soil characteristics; and
- Indicative wastewater land application area sizing.

The findings of this report have been made in context of prioritising public and environmental health with generic design recommendations framed on achieving sustainable wastewater disposal with acceptable residual environmental and public health risk.

Methodology

The field component of the land capability assessment was undertaken on 3 October 2024 employing the methodology of Victorian EPA publication No. 746.1 *Land Capability Assessment for Onsite Domestic Wastewater Management* and Publication 891.4 *Victorian Code of Practice – Onsite Wastewater Management 2016 (CoP)*. It was also undertaken in accordance with *Australian Standard AS/NZS 1547:2012 On-site Domestic Wastewater Management*. The indicative wastewater disposal system dimensions have been calculated using the *Code of Practice* and water balance modelling.

The study methodology has comprised the following:

- A desktop study of relevant geological, topographical, climate and soil references;
- Soil and site assessment;
This included the drilling, logging and sampling of two investigation bore holes across the subject land in order to establish soil profile conditions and identify spatial variations across the subject land. A 75mm hand auger was used to drill the bore holes;
- Soil permeability was derived using the Talsma-Hallam method and the visual / tactile method which included an assessment of sub-soil texture and structure;
- Water and nutrient balance analysis based on the 9th decile wet year rainfall derived from the mean monthly rainfall data for the Benalla Weather Station (Bureau of Meteorology Station No. 082170); and
- Analysis of findings and report writing.

Benalla Planning Scheme

Farming Zone (FZ)

The Schedule to Clause 35.07-2 (Farming Zone) of the *Benalla Planning Scheme* seeks *inter alia* to protect water quality and waterways as natural resources in accordance with the provisions of relevant State Environment Protection Policies, and particularly in accordance with Clauses 33 and 35 of the *State Environment Protection Policy (Waters of Victoria)*. A key purpose of this LCA is to demonstrate compliance with the requirements of the Farming Zone of the *Benalla Planning Scheme*.

Site Assessment

**Table 1
Site Summary**

Response

Site Address	1170 Lake Mokoan Road Chesney Vale
Zone	Farming Zone (FZ)
Overlays	Nil
Catchment Status	Not a Declared Special Water Supply Catchment
Existing Development	The study area portion of the subject land is cleared with no existing development.
Climate Benalla Weather Station (Bureau of Meteorology Station No. 02002)	Rainfall – 644mm 9 th Decile – 773mm Evaporation – Approx 1400mm http://www.bom.gov.au/climate/averages/tables/cw_082002.shtml
Aspect	Shallow southerly aspect - excellent solar exposure
Vegetation	Pasture with no hydrophilic species within immediate study area
Landform	Linear-planar
Slope	<55%
Fill	None evident - natural profiles observed
Rocks and Rock Outcrop	None observed
Surface Water	The nearest drainage line is located approximately 100m west of the study area. This is not likely to be a determined waterway as it does not have evidence of spring activity, a defined channel and has a small catchment, therefore CoP setbacks need not apply. Winton Wetland is located 430m south of the Land Application Area.
Flood Potential	Less than 1:100 AEP (not located within FO)
Stormwater run-on and upslope seepage	Given the location of the study area and topography significant stormwater run-on is not expected
Depth to Groundwater	Groundwater not encountered. According to the DEECA Groundwater Resource Report depth to water table is <5m: https://mapshare.vic.gov.au/Geocortex/Essentials/EXT/REST/TempFiles/groundwater_report_20241018_053502.pdf?guid=e6585221-92e4-4f23-bf1e-f738ea3a6d1e&contentType=application%2Fpdf There is no evidence of groundwater discharge in the vicinity of the study area and the nominated LAA.
Site Drainage and Subsurface Drainage	The presence of limited red mottling within the observed profiles is indicative of a soil moisture regime that has fluctuation

Soil Assessment

Overview

Two assessment boreholes were drilled within the study area (**Appendix B**). This was sufficient to adequately characterise the soils of the immediate landscape and subject land for the purpose of the dwelling proposal. Excavation logs are provided at **Appendix C**. The soils are characterised by:

- Brown, moderately pedal Sandy Clay Loam A1 horizons to a depth of 200-300mm;
- Greyish brown, moderately pedal, Light (Sandy) Clay A2 Horizons to a depth of 500mm;
- Yellowish grey moderately pedal Light (Sandy) Clay to depths of 500mm +;
- Some red mottles in the subsoil indicate some minor fluctuations in the soil moisture regime.

Table 2: Soil Profile Summary

Horizon	Lower Horizon Depth (mm)	Colour	Field Texture	Structure
A1	0- ~2/300	Brown	Sandy Clay Loam	Moderate
A2	~2/300 - ~500	Greyish Brown	Light (Sandy) Clay	Moderate
B1*	~500 - 1000	Yellowish Grey	Light (Sandy) Clay	Moderate

Yellow / grey colour of subsoil indicates that the subsoil has relatively slow drainage
 Limited mottles (red) indicate some soil moisture fluctuations
 Subsoil was moderately pedal
 *B1 Horizon has been adopted as the design horizon

Nutrients

Clay-rich soils such as those found on this site can fix large amounts of phosphorous. Phosphate-rich effluent seeping through these soils will lose most of the phosphorous within a few metres. The limiting nutrient for this site is nitrogen and no phosphorous balance is required.

Nitrogen, that is contained in organic compounds forms nitrate-N when processed in an aerated treatment plant. Alternate periods of wetting and drying, with the presence of organic matter promotes reduction to nitrogen gas (denitrification). Plant roots absorb nitrates at varying rates depending on the plant species however a feature of nitrate is that it is mobile and can be readily leached. Accordingly, it can enter groundwater via deep seepage and surface waters via overland flow and near-surface lateral flow. Indicative site land application sizing has been made with reference to a nitrogen balances shown at **Appendix D** and **Table 8**.

Subsoil Sodicity, Emerson Class, Salinity and pH

Soil particle flocculation is important because water moves mostly in large pores between soil aggregates. Soils with a high Exchangeable Sodium Percentage (ESP) will have reduced permeability (Ksat). Aggregate stability is also impacted by the amount of soluble salts (EC) in the soils. A summary of design horizon ESP, Emerson Class, Salinity and pH is provided at **Table 3** and **Appendix E**. The Emerson class 2 suggests that soils may be dispersive.

Table 3: Sodicty Emerson Class Salinity and pH*		
Design Horizon	B1	Major Constraint Limit
Electrical Conductivity (1:5 Water) d/Sm	0.02	>2
pH (1:5 Water)	6.5	<4.5, >8
Emerson Class	2	Class 1, 2, 3
Sodium % of cations	4.9	> 8%
* Determined by Nutrient Advantage Laboratory		

Permeability and AS/NZ1547:2012 Soil Category

Saturated hydraulic conductivity was measured using a constant head permeameter. The visual / tactile method which included an assessment of sub-soil texture and structure was also employed. A summary of results is provided in **Table 4**. Pursuant to EPA publication 891.4 (CoP) the indicative permeability of soils in the study area was ~0.06 m/day (Category 5b soil).

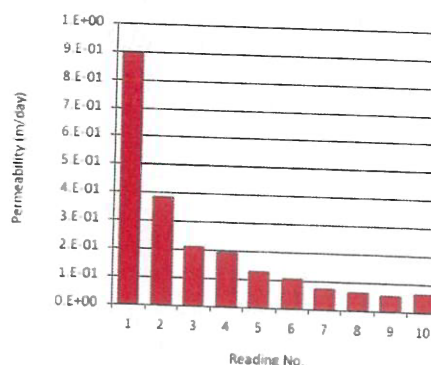
Table 4: Hydraulic Conductivity

TEST 1

Depth interval (m) tested 0.6 to 0.8
Test duration (mins)

Reading No.	Water infiltrated (L)	Time to infiltrate (min)	Infiltration rate (L/min)	Permeability (m/day)
1	0.07	1	7.0E-02	9.0E-01
2	0.06	2	3.0E-02	3.8E-01
3	0.05	3	1.7E-02	2.1E-01
4	0.06	4	1.5E-02	1.9E-01
5	0.05	5	1.0E-02	1.3E-01
6	0.05	6	8.3E-03	1.1E-01
7	0.04	7	5.7E-03	7.3E-02
8	0.04	8	5.0E-03	6.4E-02
9	0.04	9	4.4E-03	5.7E-02
10	0.05	10	5.0E-03	6.4E-02

Soil type tested



Site Risk Analysis Land Capability Assessment

A range of site features have been assessed in terms of the degree of limitation they present for a range of onsite wastewater management systems (**Table 5**). Reference is made to the rating scale described in Table 1 of EPA Publication 746. *Land Capability Assessment for On-site Domestic Wastewater Management*.

LAND FEATURES	TABLE 5 - LAND CAPABILITY CLASS RATING				
	Low	Medium	High	Limiting / unsuitable	Ameliorative Measures & Risk Reduction
Available land for Land Application Area (LAA)	Lot size exceeds LAA and duplicate LAA requirements	Meets LAA and duplicate LAA requirements	Meets LAA and partial duplicate LAA requirements	Insufficient LAA area	
Aspect	North, north-east or north-west	East, west, or south-west	South or south-east	South - full shade	
Exposure	Full sun and / or high wind or minimal shading	Partial shade	Limited light, little wind, heavily shaded area	Perpetual shade	
Slope Form	Convex or divergent side slopes	Straight sided slopes	Concave or convergent side slopes	Locally depressed	
Slope Gradient	< 5%	5 - 10%	10 - 15%	> 15%	
Trenches & beds				> 40%	
Slope Gradient Subsurface Irrigation	< 10%	10 - 30%	30 - 40%		
Site drainage Run off / run on	Low Likelihood	Moderate likelihood	High likelihood	Cut off drain not possible	
Landslip *	Low Potential	Mod Potential	High Potential	Existing	
Erosion Potential	Low	Moderate	High	No practical amelioration	
Flood / inundation	Never	< 1 AEP	< 5%AEP	> 5% AEP	
Distance to surface waters (m)	Buffer distances exceeds all Code requirements	Buffer distances complies with all Code requirements	Buffer distances do not comply with all/some Code requirements	< 40 m	Minor drainage line ~100m west of LAA
Distance to groundwater bores (m)	No bores on site or within a significant distance	Buffer distances comply with the Code	Buffer distances do not comply with the Code	No suitable treatment method	
Vegetation	Plentiful / healthy vegetation	Moderate vegetation	Sparse or limited vegetation	Propagation not possible	
Depth to water table (potentiometric) (m)	> 2 m	2 - 1.5 m	1.5 m	1.5 m - Surface	No evidence of groundwater discharge at LAA
Depth to water table (seasonal parched) (m)	> 1.5 m	< 0.5 m	0.5 - 1.5 m	0.5m - Surface	
Rainfall ** (9th decile) (mm)	< 500 mm	500 - 750 mm	750 - 1000 mm	> 1000 mm	Land application area sizing based on water balance
Pan evaporation (mean) (mm)	1250 - 1500 mm	1000 - 1250 mm	750 - 1000 mm	< 750 mm	
Soil Profile Characteristics					
Structure	High or moderately structured	Weakly structured	Structureless, massive or hardpan		Application of Gypsum will assist
Fill materials	Nil or mapped good quality topsoil	Mapped variable depth and quality materials	Variable quality and / or uncontrolled filling	Uncontrolled poor quality / unsuitable filling	
Thickness of soil (m) at the location of:					
Trenches & beds	> 1.4 m	> 1.4m	< 1.4 m	< 1.2 m	
Subsurface irrigation	> 1.5 m	1 - 1.5 m	0.75 m	< 0.75 m	
Permeability					
Permeability *** (limiting horizon) (m / day) Measured in situ	0.15 - 0.3	0.03 - 0.15 0.3 - 0.6	0.01 - 0.03 0.6 - 3.0	> 3.0 < 0.03	Larger LAA

Edis Algorithm Risk Assessment

Initially developed for the *Mansfield Domestic Wastewater Management Plan*, the *Edis Algorithm* has become a widely used on-site wastewater management risk assessment tool and recognised as an accurate measure of risk. Using the *Edis Algorithm*, the risk rating for the subject land is **2.2 (low)**.

Table 6 Edis Algorithm Risk Assessment				
Feature	Low (Rating of 1)	Medium (Rating of 2)	High (Rating of 3)	Risk Rating
R res Distance to reservoir	>15km	2-15km	<2km	1
R Soil Soil Type Rating	1	2	3	2
R riv Distance to River	>80m	40-80m	<40m	1
R str Distance to stream	>80m	40-80m	<40m	1
R drain Distance to drain	>40m	10-40m	<10m	1
R Lot Lot Size (ha)	>10ha	2-10ha	0.2-2ha	1
R LCA LCA rating	1-2	3	4	2
R Fail System fail rate	<5%	5-10%	>10%	2
R Dens Density (dwellings / KM2)	<20	20-40	>40	1
$R_n = ((R_{Res} + R_{soil}) \times (R_{riv} + R_{str} + R_{drain} + R_{lot}) + (2 \times R_{LCA}) + (3 \times R_{fail} \times R_{den})) / 10$ <p>Edis Risk Rating 2.2 (Low)</p> <p>Low Risk = Rn of <2.5 Medium Risk = Rn of 2.5 – 5 High Risk = Rn of >5</p>				

Wastewater Management

This Land Capability Assessment has been prepared to provide general advice as to the most appropriate treatment and land application systems at the proposed lot given the intrinsic site and soil characteristics of the study site. The following sections provide an overview of suitable systems at the subject land with general advice about sizing and design considerations, and their justification for selection.

Buffer Distances and Land Application Area Siting

As a general rule, future land application areas shall be sited so that:

- Where practical, they are exposed to prevailing winds and not shaded from sunlight, or are placed where nearby plants can help evapotranspiration of the effluent;
- They do not affect, or are not affected by and comply with requirements for setback distances from buildings, property boundaries, retaining walls and embankments; and
- Sufficient setbacks from surface water buffer distances are provided to prevent human contact, maintain public amenity and protect sensitive environments.

These principles will be required to inform land application area siting as will the prescribed setbacks within Publication 891.4 *Victorian Code of Practice – Onsite Wastewater Management* July 2016. The nominated land application area shown at **Appendix B** provides CoP compliant surface water setbacks.

Theoretical Wastewater Flow and Organic Material Loading Rate Calculations

To calculate a theoretical land application area size appropriate for the site and for the purpose of determining a minimum lot size risk threshold and ultimately lot yield for the site, the assumptions of **Section 3.4.1** and **Table 4 of the Code of Practice** have been adopted. Calculations have been based on one scenario – a four-bedroom dwelling (maximum occupancy). Redundancy is built into the calculations by assuming on-going occupation by maximum numbers of residents, 9th decile wet year rainfall and using standard water fixtures in water balance calculations.

Table 7 Indicative Design Daily Wastewater Flowrate and Organic Material Loading Rate Calculations		
	Calculation Input	Notes
No. Bedrooms	4	
Calculated occupancy	5	As per CoP
Design hydraulic flow rates (L/person/day)	180 (standard water fixtures) 150 (water saving fixtures)	As per CoP
Daily wastewater flow rate*	900 (standard water fixtures) 750 (standard water fixtures)	Calculated as per CoP
Organic material loading design rates (g BOD / Person / day)	60	As per CoP
Total Organic Material Loading Design Rate (g BOD / day)	300	Calculated as per CoP
*Design hydraulic flow rate and organic material design rate calculated in accordance with EPA publication 891.4		

Septic Tank Capacity

Pursuant to Table J1 of AS/NZS 1547:2012, the minimum operational capacity for an all-waste septic tank in this instance is recommended to be:

- 3500L (4 Bedroom)

This capacity provides for sludge storage capacity providing for a maximum interval prior to desludging / pump out of 5 years (based on scum and sludge accumulation rates in AS/NZS 1547:2012).

Treatment and Land Application Options

Appendix K of AS/NZS 1547:2012 provides guidance on system selection. It summarizes common site and soil constraints and provides advice on land application systems that are best suited to the prevailing conditions. As a general rule, the more severe and numerous the constraints the fewer options, the riskier the system and greater maintenance and installation costs.

AS/NZS 1547:2012 requires, inter alia, the selection of the land application system to take into account:

- The volume of wastewater produced;
- The quality of the effluent discharging from the wastewater treatment unit;
- The nature of the soil profile and resulting soil category;
- The DLR/DIR associated with the soil category, (based on best available knowledge of the LTAR);
- The required spacing between trenches/beds/irrigation lines or sprays;
- Surface water and groundwater levels and movements; and
- Local climate.

The chief constraint at the study site are:

- Low permeability Category 5b subsoils,

Pursuant to Table K2 of AS/NZS 1547/2012 the following are recommended to address mitigate this constraint:

- Reduce wastewater flow using water-saving devices;
- Irrigation systems designed using water balance (**Appendix D**);
- Dose effluent so as to wet the soil more than once a day;
- Placement of soil of good permeability around LAA;
- Install when soils are dry or slightly moist;
- Avoid heavy equipment on application area when soils are moist or wet;
- Avoid smearing sides and bottoms of trenches and beds;
- Minimise domestic water use;
- Minimise discharge of sodium salts to application area; and
- Alternate application between different parts of the land application area.

- Potentially dispersive soils

Pursuant to Table K2 of AS/NZS 1547/2012 the following are recommended to address mitigate this constraint:

- Avoid smearing bottoms of trenches and beds;
- Fill and close trenches as required and cover with good topsoil as soon as possible;
- Avoids soaps and detergents with high sodium content;
- Minimise discharges containing sodium salts;
- Apply Gypsum to receiving soil (min 1kg/m²) to all disturbed soil surface areas; and
- Avoid construction during wet weather.

- **Shallow Water Table**

Pursuant to Table K2 of AS/NZS 1547/2012 the following are recommended to address mitigate this constraint:

- Employ a larger land application area;
- Reduce Design Loading Rate;
- Import soil to raise ground surface level;
- Select dry or slightly moist conditions for installation;
- Minimise water use; and
- Minimise pedestrian traffic on land application area.

Three treatment options are proposed. These are:

Option 1 – Dual Onsite system (Dry Compost Toilet and Separate Greywater Treatment)

Option 1 is for household dual onsite system with separate treatment for:

1. Toilet waste that is treated in a dry composting toilet, designed and installed in accordance with *Australian Standard AS/NZS 1546.2: On-site domestic wastewater treatment units – Part 2: Waterless composting toilets* with mature compost buried onsite; and
2. Greywater including kitchen wastewater treated to secondary standard (20/30 or better – refer to Sections 2.1.3 and 2.2.2 of CoP) using Aerated Waste Water Treatment Systems (AWTS).

Dry composting toilets collect urine and faeces in a sealed chamber beneath the toilet and microorganisms decompose the mixture of human waste and extra organic matter. Most of the material is converted to carbon dioxide and water vapour. Air drawn through the compost pile removes these gases and assists the microorganisms to break down the material. The remaining compost moves slowly down a sloping floor by gravity as more material is added to the pile. It then moves under a dividing baffle into a humus chamber. After a period of time that varies with usage (from every 2-3 months to once a year) this material is suitable to remove. Dry composting toilets collect and treat only toilet waste (black water) to a primary standard. Any excess liquids will need to be collected and treated with the greywater. Greywater from the other sources such as the bathroom and laundry will need to be treated separately.

It is contended that this option is valid for the site as the generous lot size and absence of site constraints provides scope for compost disposal consistent with Section 2.1.3. of the CoP. The CoP will require that mature compost from an approved dry composting toilet is buried in a hole at least 300 mm deep in an 'ornamental' section of the property (i.e. away from food crops) and covered with loamy topsoil. There is scope within the subject site for this to occur.

With a dual system scenario, the CoP requires that the separate greywater treatment system treat the wastewater to secondary standard (20/30) or better. In this instance the LAA will be sized by water balance to match the LAA size to intrinsic site attributes and also be sized to accommodate a future conventional toilet should the dwelling be modified in this manner in the future.

Option 2 – Secondary Treatment and Subsurface Irrigation

Option 2 is for all wastewater to be treated to secondary standard (20/30) or better with land application via subsurface irrigation. Given the relatively low Ksat of the subsoil, potentially shallow water table and potentially dispersive subsoil it is recommended that wastewater be treated to a secondary standard via an Aerated Wastewater Treatment System (AWTS). Subsurface irrigation would be the most appropriate land application method, particularly given the Category 5b subsoils and minor drainage

line proximity. On-site wastewater disposal systems designed, constructed, operated and maintained in accordance with the recommendations of AS/NZS 1547:2012 with appropriate regard to the site constraints is unlikely to impact on the beneficial use of surface waters and groundwater in the area.

Option 3 – Aerobic Biological Filter (wet composting, vermiculture)

Vermiculture provides a primary treatment option that use worms to form compost from organic waste. Effluent can be discharged to land through a series of underground ETA/ETS trenches.

Land Application Area Sizing Calculations

Secondary Treatment - Subsurface Irrigation

Within the proposed lot subsurface irrigation would be an appropriate land application method, particularly given the Category 5b subsoils. The preferred approach to calculate subsurface irrigation area land application area sizing is to undertake a water and nutrient balance calculation using AS/NZS 1547:2012. This method takes into account rainfall, evaporation and soil porosity to calculate the appropriate land application area.

The water balance seeks to find the minimum disposal area for a given wastewater discharge rate in this instance. The CoP indicates that the appropriate Design Irrigation Rate (DIR) as being 3mm / day in the Category 5b subsoils. Water and nutrient balance also assumes 30mg/litre N in the effluent, a denitrification rate of 20%, with N uptake of 220 kg/ha/year for a pasture comprising a rye/clover mix and sequential zoned dosing of the irrigation area, providing a conservative estimate of the nitrogen content in the deep seepage and lateral flow.

Without taking into account further expected denitrification below the root zone and in the groundwater (reported to be in the vicinity of 80%), denitrification in the lateral flow (external to the irrigation areas but within the curtilage of the allotment) and plant uptake in the lateral flow, the area required for Nitrogen uptake is shown in **Table 8** and **Appendix D** using **9th decile wet year rainfall** from the nearby Benalla weather station **within the Category 5b subsoils**. A land application area of this size should provide a sustainable land application area with no surface discharge in the 9th decile wet year and adequate on-site attenuation of nutrients.

Table 8: Area for Nitrogen Uptake [^]	4 Bedroom Dwelling	
	Standard Fixtures	Water Saving Fixtures
Land Application Area	460 m ²	380 m ²
Area for Nitrogen Uptake	358 m ²	299 m ²

[^] Using water balance using Code of Practice hydraulic load, 9th decile wet year, Category 5b soils

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Primary or Secondary Treatment - ETA/ETS

ETA land application systems operate in a similar manner to absorption trenches or beds, with wastewater evaporating from the trench / bed and being absorbed through the soil. In addition, the trenches / beds are also planted over with vegetation so that the process of transpiration can further assist in the treatment of effluent through the root zone of plants. Evapo-transpiration can also provide an additional factor of safety for the operation of soil absorption systems, helping soils to dry and promoting the aeration and biological treatment of effluent.

Guidelines for the design of trench systems are outlined in the Standard AS/NZS 1547:2012. Pursuant to Appendix L4.2 of AS/NZS 1547/2012, trench, bed and ETA/ETS dimensions shall be determined from the relationship:

$$L = \frac{Q}{\text{DLR} \times W}$$

Where:

L = Length in metres

Q = Design daily flow in L/day (900L/750L)

DLR = 5 mm/d

W = 0.7m

L = 257m (Standard Fixtures)

L = 214m (Water Saving Fixtures)

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