

1. FINANCIAL MATTERS

1.1 Particulars of any Rates, Taxes, Charges or Other Similar Outgoings (and any interest on them)

At settlement the rates will be adjusted between the parties, so that they each bear the proportion of rates applicable to their respective periods of occupancy in the property.

Cardinia Shire Council
Yarra Valley Water
State Revenue Office (Land Tax)

(a) Their total does not exceed:

\$4,000.00 p.a.

1.2 Particulars of any Charge (whether registered or not) imposed by or under any Act to secure an amount due under that Act, including the amount owing under the charge

Not Applicable

1.3 Terms Contract

This section 1.3 only applies if this vendor statement is in respect of a terms contract where the purchaser is obliged to make 2 or more payments (other than a deposit or final payment) to the vendor after the execution of the contract and before the purchaser is entitled to a conveyance or transfer of the land.

Not Applicable.

1.4 Sale Subject to Mortgage

This section 1.4 only applies if this vendor statement is in respect of a contract which provides that any mortgage (whether registered or unregistered), is NOT to be discharged before the purchaser becomes entitled to possession or receipts of rents and profits.

Not Applicable.

2. INSURANCE

2.1 Damage and Destruction

This section 2.1 only applies if this vendor statement is in respect of a contract which does NOT provide for the land to remain at the risk of the vendor until the purchaser becomes entitled to possession or receipt of rents and profits.

Not Applicable.

2.2 Owner Builder

This section 2.2 only applies where there is a residence on the land that was constructed by an owner-builder within the preceding 6 years and section 137B of the Building Act 1993 applies to the residence.

Not Applicable.

3. LAND USE

3.1 Easements, Covenants or Other Similar Restrictions

(a) A description of any easement, covenant or other similar restriction affecting the land (whether registered or unregistered):

As attached.

(b) Particulars of any existing failure to comply with that easement, covenant or other similar restriction are:

Not Applicable

The Purchaser/s should note sewers, drains, water pipes, underground and/or overhead electricity cables, underground/or overhead telephone cables, underground NBN cables and underground gas pipes if any, may be laid outside registered easements.

3.2 Road Access

There is NO access to the property by road if the square box is marked with an 'X'

3.3 Designated Bushfire Prone Area

The land is in a designated bushfire prone area within the meaning of regulations made under the *Building Act 1993* if the square box is marked with an 'X'

3.4 Planning Scheme

Attached is a certificate with the required specified information.

4. NOTICES

4.1 Notice, Order, Declaration, Report or Recommendation

Particulars of any notice, order, declaration, report or recommendation of a public authority or government department or approved proposal directly and currently affecting the land, being a notice, order, declaration, report, recommendation or approved proposal of which the vendor might reasonably be expected to have knowledge:

Not Applicable.

The Vendor has no means of knowing decisions of all public authorities and government departments affecting the property unless communicated to the Vendor.

The property is in an area in which is classified as an area in which buildings are likely to be subject to infestation of termites.

4.2 Agricultural Chemicals

There are NO notices, property management plans, reports or orders in respect of the land issued by a government department or public authority in relation to livestock disease or contamination by agricultural chemicals affecting the ongoing use of the land for agricultural purposes. However, if this is not the case, the details of any such notices, property management plans, reports or orders, are as follows:

Nil.

4.3 Compulsory Acquisition

The particulars of any notices of intention to acquire that have been served under section 6 of the *Land Acquisition and Compensation Act 1986* are as follows:

Nil.

5. BUILDING PERMITS

Particulars of any building permit issued under the *Building Act 1993* in the preceding 7 years (required only where there is a residence on the land):

Nil.

6. OWNERS CORPORATION

This section 6 only applies if the land is affected by an owners corporation within the meaning of the *Owners Corporations Act 2006*.

Not Applicable.

7. GROWTH AREAS INFRASTRUCTURE CONTRIBUTION ("GAIC")

Words and expressions in this section 7 have the same meaning as in Part 9B of the *Planning and Environment Act 1987*.

Not Applicable

8. SERVICES

The services which are marked with an 'X' in the accompanying square box are NOT connected to the land:

Electricity supply <input checked="" type="checkbox"/>	Gas supply <input checked="" type="checkbox"/>	Water supply <input checked="" type="checkbox"/>	Sewerage <input checked="" type="checkbox"/>	Telephone services <input checked="" type="checkbox"/>
--	--	--	--	--

- Some services currently noted as connected above may become disconnected prior to settlement. The Purchaser should make their own enquiries in relation to connection and re-connection of services to the land.

9. TITLE

Attached are copies of the following documents:

9.1 Registered Title

A Register Search Statement and the document, or part of a document, referred to as the 'diagram location' in that statement which identifies the land and its location.

10. SUBDIVISION

10.1 Unregistered Subdivision

This section 10.1 only applies if the land is subject to a subdivision which is not registered.

Not Applicable.

10.2 Staged Subdivision

This section 10.2 only applies if the land is part of a staged subdivision within the meaning of section 37 of the *Subdivision Act 1988*.

Not Applicable.

10.3 Further Plan of Subdivision

This section 10.3 only applies if the land is subject to a subdivision in respect of which a further plan within the meaning of the *Subdivision Act 1988* is proposed.

Not Applicable.

11. DISCLOSURE OF ENERGY INFORMATION

(Disclosure of this information is not required under section 32 of the Sale of Land Act 1962 but may be included in this vendor statement for convenience.)

Details of any energy efficiency information required to be disclosed regarding a disclosure affected building or disclosure area affected area of a building as defined by the *Building Energy Efficiency Disclosure Act 2010* (Cth)

- (a) to be a building or part of a building used or capable of being used as an office for administrative, clerical, professional or similar based activities including any support facilities; and
- (b) which has a net lettable area of at least 2000m²; (but does not include a building under a strata title system or if an occupancy permit was issued less than 2 years before the relevant date):

Not Applicable.

12. DUE DILIGENCE CHECKLIST

(The Sale of Land Act 1962 provides that the vendor or the vendor's licensed estate agent must make a prescribed due diligence checklist available to purchasers before offering land for sale that is vacant residential land or land on which there is a residence. The due diligence checklist is NOT required to be provided with, or attached to, this vendor statement but the checklist may be attached as a matter of convenience.)

Is attached.

13. ATTACHMENTS

(Any certificates, documents and other attachments may be annexed to this section 13)

(Additional information may be added to this section 13 where there is insufficient space in any of the earlier sections)

(Attached is an "Additional Vendor Statement" if section 1.3 (Terms Contract) or section 1.4 (Sale Subject to Mortgage) applies)

Cardinia Shire Council Land Information Certificate
Yarra Valley Water Information Statement
State Revenue Office Land Tax Clearance Certificate
OnePlan & SK Spatial Re-establishment and feature plan
OnePlan & SK Spatial Plan of re-establishment
Carney & Stone Arboricultural Consultants Tree Report dated May 2018
MDS Architectural Drawings
Fireguard Australia Bushfire Management Plan
Fireguard Australia Bushfire Management Statement

Torple Energy DTS Report

BSE Consulting Land Capability Assessment

Cardinia Shire Council Planning Permit T190279

Marie Francis Proposed New Dwelling Town Planning Submission

Regulation 126 Certificate of Compliance for proposed building works

Bayside & Suburbs Geotechnical Services Report TP220421

Conditions for approval to construct over Council Easement

Cardinia Shire Council Secondary letter of consent

Stamped endorsed plans

PLANNING CERTIFICATE

Official certificate issued under Section 199 Planning & Environment Act 1987
and the Planning and Environment Regulations 2005

CERTIFICATE REFERENCE NUMBER

944523

APPLICANT'S NAME & ADDRESS

BUY & SELL CONVEYANCING SERVICES C/- TRICONVEY
(RESELLER) C/- LANDATA

DOCKLANDS

VENDOR

BEHRENS, DUSTIN BERNARD

PURCHASER

NOT YET KNOWN, NOT YET KNOWN

REFERENCE

359244

This certificate is issued for:

LOT 18 PLAN LP10554 ALSO KNOWN AS 3 CROSS STREET EMERALD
CARDINIA SHIRE

The land is covered by the:

CARDINIA PLANNING SCHEME

The Minister for Planning is the responsible authority issuing the Certificate.

The land:

- is included in a GREEN WEDGE A ZONE - SCHEDULE 2
- is within a BUSHFIRE MANAGEMENT OVERLAY - SCHEDULE 2
- and a ENVIRONMENTAL SIGNIFICANCE OVERLAY - SCHEDULE 1
- and is AREA OUTSIDE THE URBAN GROWTH BOUNDARY

A detailed definition of the applicable Planning Scheme is available at :
(<http://planningschemes.dpcd.vic.gov.au/schemes/cardinia>)

Historic buildings and land protected under the Heritage Act 1995 are recorded in the Victorian
Heritage Register at:
<http://vhd.heritage.vic.gov.au/>

12 July 2023

Sonya Kilkenny
Minister for Planning

Additional site-specific controls may apply.
The Planning Scheme Ordinance should be checked carefully.
The above information includes all amendments to planning scheme maps placed on public exhibition up to the date of issue of this certificate and which are still the subject of active consideration

Copies of Planning Schemes and Amendments can be inspected at the relevant municipal offices.

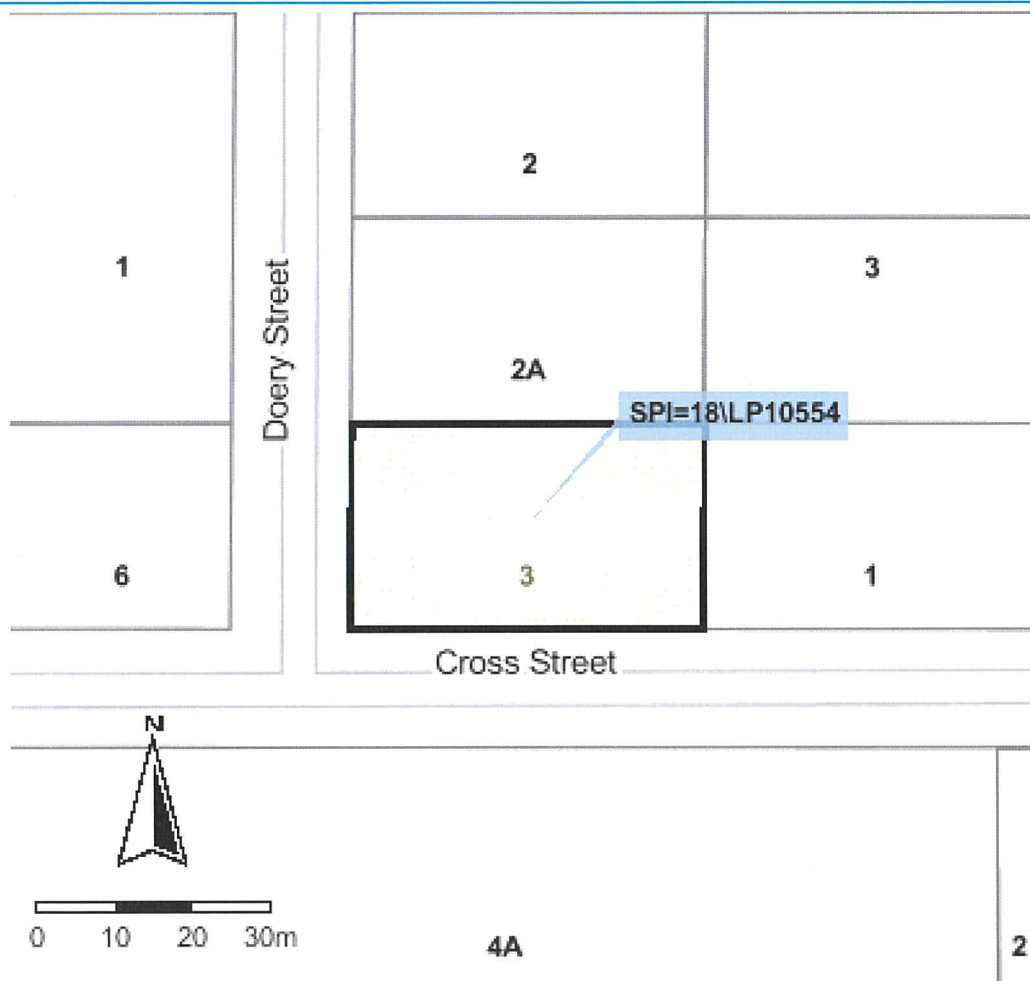
LANDATA®
T: (03) 9102 0402
E: landata.enquiries@servictoria.com.au

The attached certificate is issued by the Minister for Planning of the State of Victoria and is protected by statute.

The document has been issued based on the property information you provided. You should check the map below - it highlights the property identified from your information.

If this property is different to the one expected, you can phone (03) 9102 0402 or email landata.enquiries@servictoria.com.au

Please note: The map is for reference purposes only and does not form part of the certificate.



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Choose the authoritative Planning Certificate

Why rely on anything less?

As part of your section 32 statement, the authoritative Planning Certificate provides you and / or your customer with the statutory protection of the State of Victoria.

Order online before 4pm to receive your authoritative Planning Certificate the same day, in most cases within the hour. Next business day delivery, if further information is required from you.

Privacy Statement

The information obtained from the applicant and used to produce this certificate was collected solely for the purpose of producing this certificate. The personal information on the certificate has been provided by the applicant and has not been verified by LANDATA®. The property information on the certificate has been verified by LANDATA®. The zoning information on the certificate is protected by statute. The information on the certificate will be retained by LANDATA® for auditing purposes and will not be released to any third party except as required by law.

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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 05234 FOLIO 794

Security no : 124107543357A
Produced 12/07/2023 10:59 AM

LAND DESCRIPTION

Lot 18 on Plan of Subdivision 010554.
PARENT TITLE Volume 03963 Folio 410
Created by instrument 1305702 17/02/1927

REGISTERED PROPRIETOR

Estate Fee Simple
Joint Proprietors
DUSTIN BERNARD BEHRENS
FLEUR MICHELLE BEHRENS both of 11 BRISBANES ROAD COCKATOO VIC 3781
AV857234P 15/07/2022

ENCUMBRANCES, CAVEATS AND NOTICES

MORTGAGE AV857235M 15/07/2022
WESTPAC BANKING CORPORATION

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 or imaged folio set out under DIAGRAM LOCATION below.

DIAGRAM LOCATION

SEE LP010554 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: 3 CROSS STREET EMERALD VIC 3782

ADMINISTRATIVE NOTICES

NIL

eCT Control 16977H ST GEORGE BANK
Effective from 15/07/2022

DOCUMENT END

Delivered from the LANDATA® System by InfoTrack Pty Ltd.

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Document Identification	LP010554
Number of Pages (excluding this cover sheet)	1
Document Assembled	12/07/2023 11:34

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The document is invalid if this cover sheet is removed or altered.

PLAN OF SUBDIVISION OF

PART OF CROWN ALLOTMENT 28 SEC. A

PARISH OF NARREE WORRAN

COUNTY OF EVELYN

LP 10554

EDITION 1
 PLAN MAY BE LODGED
 24/01/25

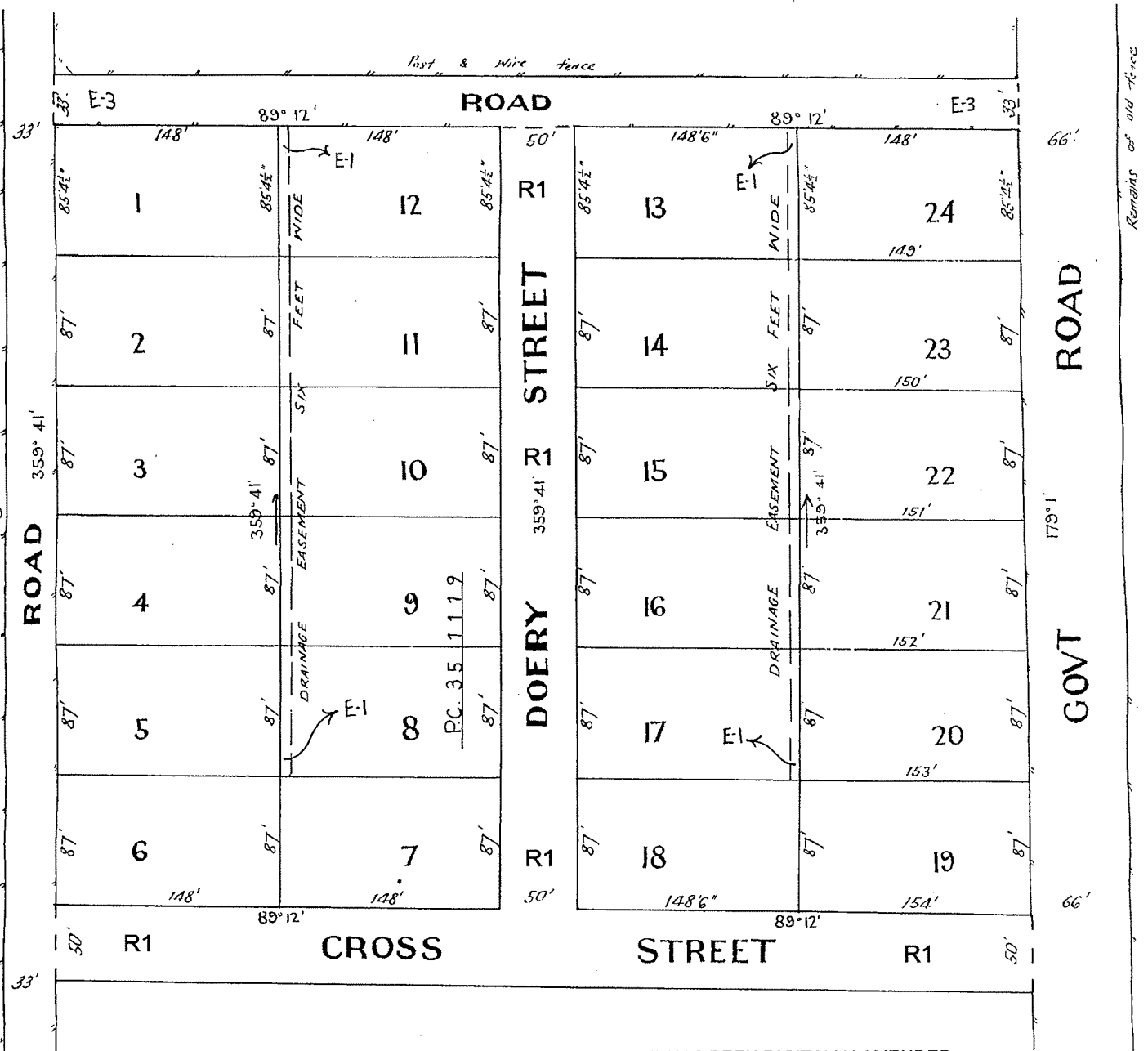
COLOUR CODE

E-1 = BLUE
 R1 = BROWN
 E-3 = YELLOW

ROADS COLOURED BROWN
 AND YELLOW

— Vol. 3963 Fol. 792410 —
 — Vol. 4080 Fol. 815903 —

Measurements are in Feet & Inches
 Conversion Factor
 FEET x 0.3048 = METRES



WARNING: THE IMAGE OF THIS DOCUMENT OF THE REGISTER HAS BEEN DIGITALLY AMENDED.
 NO FURTHER AMENDMENTS ARE TO BE MADE TO THE ORIGINAL DOCUMENT OF THE REGISTER.

**LAND INFORMATION CERTIFICATE
SECTION 121 LOCAL GOVERNMENT ACT 2020
LOCAL GOVERNMENT (LAND INFORMATION)
REGULATIONS 2021**



Buy & Sell Conveyancing Services c/Triconvey (Reseller) c/Landata
DX 250639
Melbourne

CERTIFICATE NO: 75456
APPLICANT REFERENCE: 69604180-015-2
DATE: 20/07/2023

This certificate PROVIDES information regarding valuations, rates, charges, other moneys owing and any orders and notices made under the Local Government Act 2020, the Local Government Act 1989, the Local Government Act 1958 or under a local law or by law of the Council.

This certificate IS NOT REQUIRED to include information regarding planning, building, health, land fill, land slip, other flooding information or service easements. Information regarding these matters may be available from Council or the relevant Authority.
A fee may be charged for such information.

ASSESSMENT NO: 5000024682	VALUATIONS
PROPERTY LOCATION: 3 Cross St	SITE VALUE: 485000
Emerald 3782	CAPITAL IMPROVED VALUE: 485000
TITLE DETAILS: L18 LP10554	NET ANNUAL VALUE: 24250
	LEVEL OF VALUE DATE: 01/01/23
	OPERATIVE DATE: 01/07/23

PROPERTY RATES & CHARGES

Rates and charges for the financial year ending 30 June 2024

<u>RATES & CHARGES</u>	<u>LEVIED</u>	<u>BALANCE</u>
BALANCE BROUGHT FORWARD		(\$310.83)
RATES	\$1,010.40	\$1,010.40
INTEREST		\$0.00
MUNICIPAL CHARGE	\$0.00	\$0.00
FIRE SERVICES PROPERTY LEVY	\$147.31	\$147.31

GARBAGE	\$0.00	\$0.00
GREEN WASTE LEVY	\$0.00	\$0.00

SPECIAL RATES /SPECIAL CHARGES

<u>SCHEME NAME</u>	<u>ESTIMATED AMOUNT</u>	<u>PRINCIPAL BALANCE</u>	<u>INTEREST BALANCE</u>
		\$0.00	\$0.00
		TOTAL SCHEME BALANCE	\$0.00

OPEN SPACE CONTRIBUTION

TOTAL OUTSTANDING **\$846.88**



Billor code: 858944
Reference: 50000246822

**LAND INFORMATION CERTIFICATE
SECTION 121 LOCAL GOVERNMENT ACT 2020
LOCAL GOVERNMENT (LAND INFORMATION)
REGULATIONS 2021**

3 Cross St
Emerald
L18 LP10554

NOTICES AND ORDERS

Other Notices or Orders on the land that have been served by Council under the Local Government Act 2020, the Local Government Act 1989, the Local Government Act 1958 or Local Law of the Council, which have a continuing application as at the date of this certificate if any

OPEN SPACE CONTRIBUTION

Any outstanding amount required to be paid for recreational purposes or any transfer of land required to Council for recreational purposes under Section 18 of the Subdivision of Land Act 1988 or the Local Government Act 1958:

FLOOD LEVEL

A flood level has not been designated under the Building Regulations 1994.
Advice on whether a flood level has been determined, which affects the property, should be sought from Melbourne Water.

POTENTIAL LIABILITIES

Notices and Orders issued as described above:

Other:

ADDITIONAL INFORMATION

In accordance with Section 175 of the Local Government Act a person who becomes the owner of rateable land must pay any rate or charge on the land which is due and payable at the time the person becomes the owner of the land.

I acknowledge having received the sum of \$28.90 being the fee for this certificate.

Delegated Officer: 

**CONFIRMATION OF ANY VARIATION TO THIS CERTIFICATE WILL ONLY BE GIVEN FOR 90 DAYS AFTER ISSUE DATE. PAYMENTS
MADE BY CHEQUE ARE SUBJECT TO CLEARANCE FROM THE BANK.**



YARRA VALLEY WATER
ABN 93 066 902 501

Lucknow Street
Mitcham Victoria 3132

Private Bag 1
Mitcham Victoria 3132

DX 13204

F (03) 9872 1353

E enquiry@yvw.com.au
yvw.com.au

12th July 2023

Buy & Sell Conveyancing Services C/- Triconvey (Re
LANDATA

Dear Buy & Sell Conveyancing Services C/- Triconvey (Re,

RE: Application for Water Information Statement

Property Address:	3 CROSS STREET EMERALD 3782
Applicant	Buy & Sell Conveyancing Services C/- Triconvey (Re LANDATA
Information Statement	30779935
Conveyancing Account Number	7959580000
Your Reference	359244

Thank you for your recent application for a Water Information Statement (WIS). We are pleased to provide you the WIS for the above property address. This statement includes:

- Yarra Valley Water Property Information Statement
- Melbourne Water Property Information Statement
- Asset Plan
- Rates Certificate

If you have any questions about Yarra Valley Water information provided, please phone us on **1300 304 688** or email us at the address enquiry@yvw.com.au. For further information you can also refer to the Yarra Valley Water website at www.yvw.com.au.

Yours sincerely,

Steve Lennox
GENERAL MANAGER
RETAIL SERVICES



YARRA VALLEY WATER
ABN 93 068 902 501

Lucknow Street
Mitcham Victoria 3132

Private Bag 1
Mitcham Victoria 3132

DX 13204

F (03) 9872 1353

E enquiry@yvw.com.au
yvw.com.au

Yarra Valley Water Property Information Statement

Property Address	3 CROSS STREET EMERALD 3782
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STATEMENT UNDER SECTION 158 WATER ACT 1989

THE FOLLOWING INFORMATION RELATES TO SECTION 158(3)

Sewerage services have been provided to this property as part of Yarra Valley Water's Community Sewerage Program. To confirm whether the property is connected to sewerage services, please contact Yarra Valley Water on 1300 853 811. For properties not currently connected to sewerage services, please contact Yarra Valley Water on 1300 651 511 to apply to connect.

Existing sewer mains will be shown on the Asset Plan.

THE FOLLOWING INFORMATION RELATES TO SECTION 158(4)

Provision of a sewerage service to your property is scheduled to occur via Yarra Valley Water's Backlog Sewerage Program. For information on when this area will be sewerred, call our Customer Contact Centre on 1300 304 688 or visit our website www.yvw.com.au. Upon sewer becoming available for connection, the property owner will be subject to a \$500 contribution under section 268 and 269 of the Water Act 1989. Connection of the property to sewer is required within 12 months of the service becoming available unless the existing septic system meets the current EPA Onsite Wastewater Management requirements. Connection must be made at the owner's expense.

This property is located within a pressure sewer area. Yarra Valley Water will be responsible for providing a pressure sewer pump unit to the property including all associated plumbing and electrical works. The owner will be responsible for all internal plumbing works between the pressure sewer pumping unit and the house. Prior to connection, the owner must agree to terms and conditions contained within the document titled Using Your Pressure Sewer System - Owners Manual. Copies of this document are available upon request by calling 1300 304 688 or can be downloaded from our website at www.yvw.com.au.

Please note: Unless prior consent has been obtained, the Water Act prohibits:

1. The erection and/or placement of any building, wall, bridge, fence, embankment, filling, material, machinery or other structure over or under any sewer or drain.
2. The connection of any drain or sewer to, or interference with, any sewer, drain or watercourse.



YARRA VALLEY WATER
ABN 93 066 902 501

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yvw.com.au

Melbourne Water Encumbrance

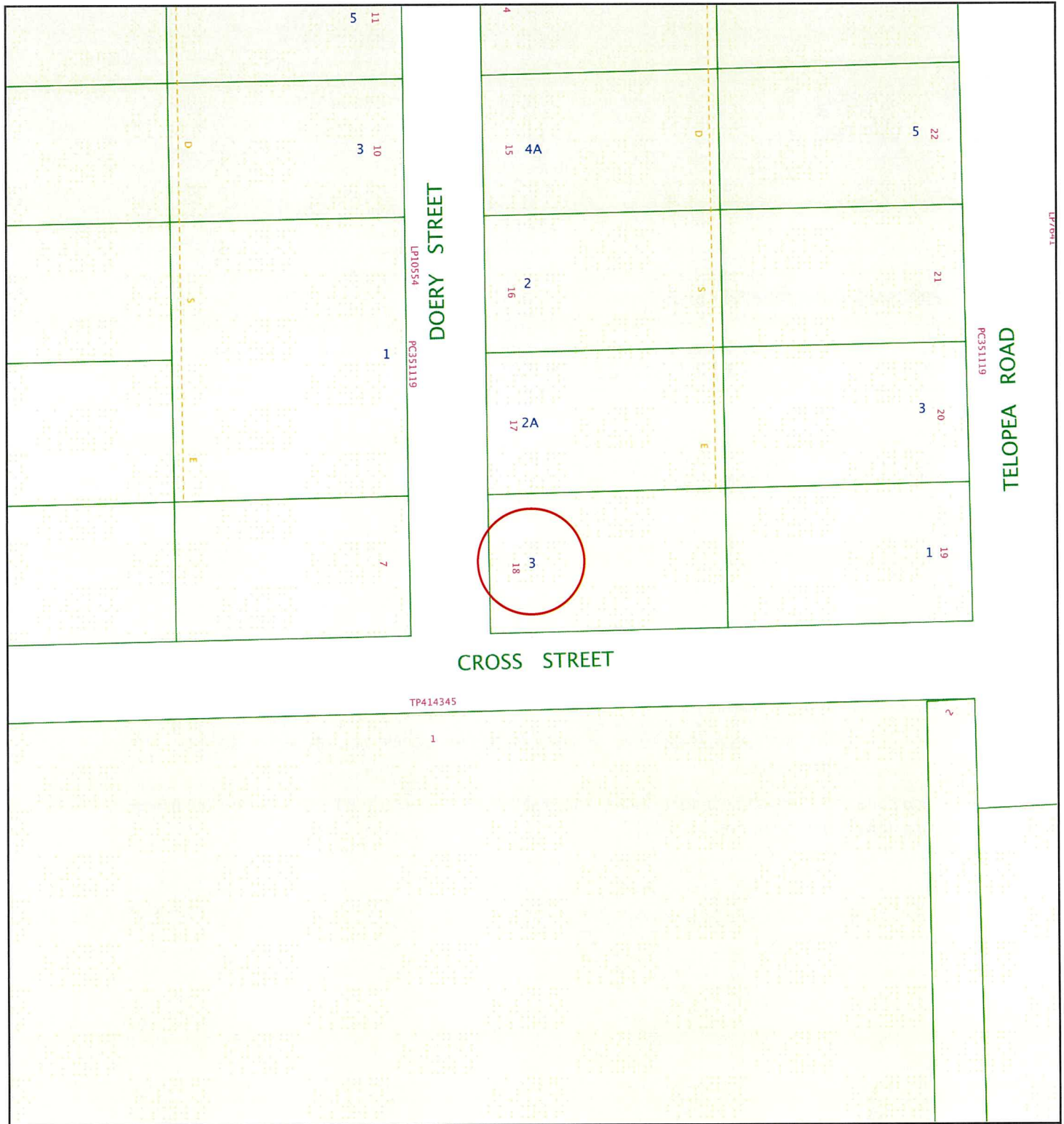
Property Address	3 CROSS STREET EMERALD 3782
------------------	-----------------------------

STATEMENT UNDER SECTION 158 WATER ACT 1989

Please note: Unless prior consent has been obtained, the Water Act prohibits:

1. The erection and/or placement of any building, wall, bridge, fence, embankment, filling, material, machinery or other structure over or under any sewer or drain.
2. The connection of any drain or sewer to, or interference with, any sewer, drain or watercourse.

If you have any questions regarding Melbourne Water encumbrances or advisory information, please contact Melbourne Water on 9679 7517.



**Yarra Valley Water
Information Statement
Number: 30779935**

Address 3 CROSS STREET EMERALD 3782

Date 12/07/2023

Scale 1:1000



ABN 93 066 902 501

Existing Title	Access Point Number	GLV2-42	MW Drainage Channel Centreline	
Proposed Title	Sewer Manhole		MW Drainage Underground Centreline	
Easement	Sewer Pipe Flow		MW Drainage Manhole	
Existing Sewer	Sewer Offset	<1.00>	MW Drainage Natural Waterway	
Abandoned Sewer	Sewer Branch			

Disclaimer: This information is supplied on the basis Yarra Valley Water Ltd:
 - Does not warrant the accuracy or completeness of the information supplied, including, without limitation, the location of Water and Sewer Assets;
 - Does not accept any liability for loss or damage of any nature, suffered or incurred by the recipient or any other persons relying on this information;
 - Recommends recipients and other persons using this information make their own site investigations and accommodate their works accordingly;



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yvw.com.au

Buy & Sell Conveyancing Services C/- Triconvey (Re
LANDATA
certificates@landata.vic.gov.au

RATES CERTIFICATE

Account No: 6257986647
Rate Certificate No: 30779935

Date of Issue: 12/07/2023
Your Ref: 359244

With reference to your request for details regarding:

Property Address	Lot & Plan	Property Number	Property Type
3 CROSS ST, EMERALD VIC 3782	18\LP10554	5197136	Residential

Agreement Type	Period	Charges	Outstanding
Parks Fee *	01-07-2023 to 30-09-2023	\$21.33	\$21.33
Drainage Fee	01-07-2023 to 30-09-2023	\$16.31	\$16.31
Other Charges:			
Interest	No interest applicable at this time		
	No further charges applicable to this property		
	Balance Brought Forward		\$15.02
	Total for This Property		\$52.66

Please note, from 1 July 2023:

* The Parks fee will be charged quarterly instead of annually.

GENERAL MANAGER
RETAIL SERVICES

Note:

1. From 1 July 2023, the Parks Fee will be charged quarterly instead of annually.
2. From 1 July 2023, for properties that have water and sewer services, the Residential Water and Sewer Usage charge replaces the Residential Water Usage and Residential Sewer Usage charges.
3. This statement details all tariffs, charges, and penalties due and payable to Yarra Valley Water as of the date of this statement and includes tariffs and charges (other than for usage charges yet to be billed) which are due and payable to the end of the current financial quarter.
4. All outstanding debts are due to be paid to Yarra Valley Water at settlement. Any debts that are unpaid at settlement will carry over onto the purchaser's first quarterly account and follow normal credit and collection activities - pursuant to section 275 of the Water Act 1989.
5. If the total due displays a (-\$ cr), this means the account is in credit. Credit amounts will be transferred to the

purchaser's account at settlement.

6. Yarra Valley Water provides information in this Rates Certificate relating to waterways and drainage as an agent for Melbourne Water and relating to parks as an agent for Parks Victoria - pursuant to section 158 of the Water Act 1989.

7. The charges on this rates certificate are calculated and valid at the date of issue. To obtain up-to-date financial information, please order a Rates Settlement Statement prior to settlement.

8. From 01/07/2023, Residential Water Usage is billed using the following step pricing system: 249.56 cents per kilolitre for the first 44 kilolitres; 318.98 cents per kilolitre for 44-88 kilolitres and 472.56 cents per kilolitre for anything more than 88 kilolitres. From 1 July 2023, this charge is applicable for properties with water service only.

9. From 01/07/2023, Residential Water and Sewer Usage is billed using the following step pricing system: 334.38 cents per kilolitre for the first 44 kilolitres; 438.73 cents per kilolitre for 44-88 kilolitres and 509.73 cents per kilolitre for anything more than 88 kilolitres. From 1 July 2023, this charge is applicable for residential properties with both water and sewer services.

10. From 01/07/2023, Residential Recycled Water Usage is billed 188.71 cents per kilolitre.

11. From 01/07/2022 up to 30/06/2023, Residential Sewer Usage was calculated using the following equation: Water Usage (kl) x Seasonal Factor x Discharge Factor x Price (/kl) 1.1540 per kilolitre. From 1 July 2023, this charge will no longer be applicable for residential customers with both water and sewer services.

12. The property is a serviced property with respect to all the services, for which charges are listed in the Statement of Fees above.

To ensure you accurately adjust the settlement amount, we strongly recommend you book a Special Meter Reading:

- Special Meter Readings ensure that actual water use is adjusted for at settlement.
- Without a Special Meter Reading, there is a risk your client's settlement adjustment may not be correct.



YARRA VALLEY WATER
ABN 93 066 902 501

Lucknow Street
Mitcham Victoria 3132

Private Bag 1
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DX 13204

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E enquiry@yvw.com.au
yvw.com.au

Property No: 5197136

Address: 3 CROSS ST, EMERALD VIC 3782

Water Information Statement Number: 30779935

HOW TO PAY



Biller Code: 314567
Ref: 62579866471

Amount
Paid

Date
Paid

Receipt
Number

Property Clearance Certificate

Land Tax



INFOTRACK / BUY & SELL CONVEYANCING SERVICES

Your Reference: 23/5148
Certificate No: 66235762
Issue Date: 18 JUL 2023
Enquiries: ESYSPROD

Land Address: 3 CROSS STREET EMERALD VIC 3782

Land Id	Lot	Plan	Volume	Folio	Tax Payable
44874477	18	10554	5234	794	\$0.00

Vendor: FLEUR BEHRENS & DUSTIN BEHRENS
Purchaser: FOR INFORMATION PURPOSES

Current Land Tax	Year	Taxable Value	Proportional Tax	Penalty/Interest	Total
DUSTIN BERNARD BEHRENS	2023	\$515,000	\$805.00	\$0.00	\$0.00

Comments: Land Tax of \$805.00 has been assessed for 2023, an amount of \$805.00 has been paid.

Current Vacant Residential Land Tax	Year	Taxable Value	Proportional Tax	Penalty/Interest	Total
-------------------------------------	------	---------------	------------------	------------------	-------

Comments:

Arrears of Land Tax	Year	Proportional Tax	Penalty/Interest	Total
---------------------	------	------------------	------------------	-------

This certificate is subject to the notes that appear on the reverse. The applicant should read these notes carefully.

Paul Broderick
Commissioner of State Revenue

CAPITAL IMPROVED VALUE:	\$515,000
SITE VALUE:	\$515,000
CURRENT LAND TAX CHARGE:	\$0.00

Notes to Certificate - Land Tax

Certificate No: 66235762

Power to issue Certificate

1. Pursuant to section 95AA of the *Taxation Administration Act 1997*, the Commissioner of State Revenue must issue a Property Clearance Certificate (Certificate) to an owner, mortgagee or bona fide purchaser of land who makes an application specifying the land for which the Certificate is sought and pays the application fee.

Amount shown on Certificate

2. The Certificate shows any land tax (including Vacant Residential Land Tax, interest and penalty tax) that is due and unpaid on the land described in the Certificate at the date of issue. In addition, it may show:
 - Land tax that has been assessed but is not yet due,
 - Land tax for the current tax year that has not yet been assessed, and
 - Any other information that the Commissioner sees fit to include, such as the amount of land tax applicable to the land on a single holding basis and other debts with respect to the property payable to the Commissioner.

Land tax is a first charge on land

3. Unpaid land tax (including Vacant Residential Land Tax, interest and penalty tax) is a first charge on the land to which it relates. This means it has priority over any other encumbrances on the land, such as a mortgage, and will continue as a charge even if ownership of the land is transferred. Therefore, a purchaser may become liable for any such unpaid land tax.

Information for the purchaser

4. Pursuant to section 96 of the *Land Tax Act 2005*, if a purchaser of the land described in the Certificate has applied for and obtained a certificate, the amount recoverable from the purchaser cannot exceed the amount set out in the certificate, described as the "Current Land Tax Charge" overleaf. A purchaser cannot rely on a Certificate obtained by the vendor.

Information for the vendor

5. Despite the issue of a Certificate, the Commissioner may recover a land tax liability from a vendor, including any amount identified on this Certificate.

General information

6. A Certificate showing no liability for the land does not mean that the land is exempt from land tax. It means that there is nothing to pay at the date of the Certificate.
7. An updated Certificate may be requested free of charge via our website, if:
 - The request is within 90 days of the original Certificate's issue date, and
 - There is no change to the parties involved in the transaction for which the Certificate was originally requested.

For Information Only

LAND TAX CALCULATION BASED ON SINGLE OWNERSHIP

Land Tax = \$805.00

Taxable Value = \$515,000

Calculated as \$375 plus (\$515,000 - \$300,000) multiplied by 0.200 cents.

Land Tax - Payment Options

BPAY



Billers Code: 5249
Ref: 66235762

Telephone & Internet Banking - BPAY®

Contact your bank or financial institution to make this payment from your cheque, savings, debit or transaction account.

www.bpay.com.au

CARD



Ref: 66235762

Visa or Mastercard

Pay via our website or phone 13 21 61.
A card payment fee applies.

sro.vic.gov.au/paylandtax

Property Clearance Certificate

Windfall Gains Tax



INFOTRACK / BUY & SELL CONVEYANCING SERVICES

Your Reference: 23/5148

Certificate No: 66235762

Issue Date: 18 JUL 2023

Land Address: 3 CROSS STREET EMERALD VICTORIA 3782

Lot	Plan	Volume	Folio
18	10554	5234	794

Vendor: DUSTIN BERNARD BEHRENS

Purchaser:

WGT Property Id	Event ID	Windfall Gains Tax	Deferred Interest	Penalty/Interest	Total
		\$0.00	\$0.00	\$0.00	\$0.00

Comments: No windfall gains tax liability identified.

This certificate is subject to the notes that appear on the reverse. The applicant should read these notes carefully.

A handwritten signature in black ink, appearing to read 'Paul Broderick'.

Paul Broderick
Commissioner of State Revenue

CURRENT WINDFALL GAINS TAX CHARGE:

\$0.00

Notes to Certificate - Windfall Gains Tax

Certificate No: 66235762

Power to issue Certificate

1. Pursuant to section 95AA of the *Taxation Administration Act 1997*, the Commissioner of State Revenue must issue a Property Clearance Certificate (Certificate) to an owner, mortgagee or bona fide purchaser of land who makes an application specifying the land for which the Certificate is sought and pays the application fee.

Amount shown on Certificate

2. The Certificate shows in respect of the land described in the Certificate:
 - Windfall gains tax that is due and unpaid, including any penalty tax and interest
 - Windfall gains tax that is deferred, including any accrued deferral interest
 - Windfall gains tax that has been assessed but is not yet due
 - Windfall gains tax that has not yet been assessed (i.e. a WGT event has occurred that rezones the land but any windfall gains tax on the land is yet to be assessed)
 - Any other information that the Commissioner sees fit to include such as the amount of interest accruing per day in relation to any deferred windfall gains tax.

Windfall gains tax is a first charge on land

3. Pursuant to section 42 of the *Windfall Gains Tax Act 2021*, windfall gains tax, including any accrued interest on a deferral, is a first charge on the land to which it relates. This means it has priority over any other encumbrances on the land, such as a mortgage, and will continue as a charge even if ownership of the land is transferred. Therefore, a purchaser may become liable for any unpaid windfall gains tax.

Information for the purchaser

4. Pursuant to section 42 of the *Windfall Gains Tax Act 2021*, if a bona fide purchaser for value of land applies for and obtains a Certificate in respect of the land, the maximum amount recoverable from the purchaser is the amount set out in the certificate, described as the "Current Windfall Gains Tax Charge" overleaf.
5. If the certificate states that a windfall gains tax is yet to be assessed, note 4 does not apply.
6. A purchaser cannot rely on a Certificate obtained by the vendor.

Information for the vendor

7. Despite the issue of a Certificate, the Commissioner may recover a windfall gains tax liability from a vendor, including any amount identified on this Certificate.

General information

8. A Certificate showing no liability for the land does not mean that the land is exempt from windfall gains tax. It means that there is nothing to pay at the date of the Certificate.
9. An updated Certificate may be requested free of charge via our website, if:
 - The request is within 90 days of the original Certificate's issue date, and
 - There is no change to the parties involved in the transaction for which the Certificate was originally requested.
10. Where a windfall gains tax liability has been deferred, interest accrues daily on the deferred liability. The deferred interest shown overleaf is the amount of interest accrued to the date of issue of the certificate.

Windfall Gains Tax - Payment Options

BPAY




Billers Code: 416073
Ref: 66235763

Telephone & Internet Banking - BPAY®

Contact your bank or financial institution to make this payment from your cheque, savings, debit or transaction account.

www.bpay.com.au

CARD



Ref: 66235763

Visa or Mastercard

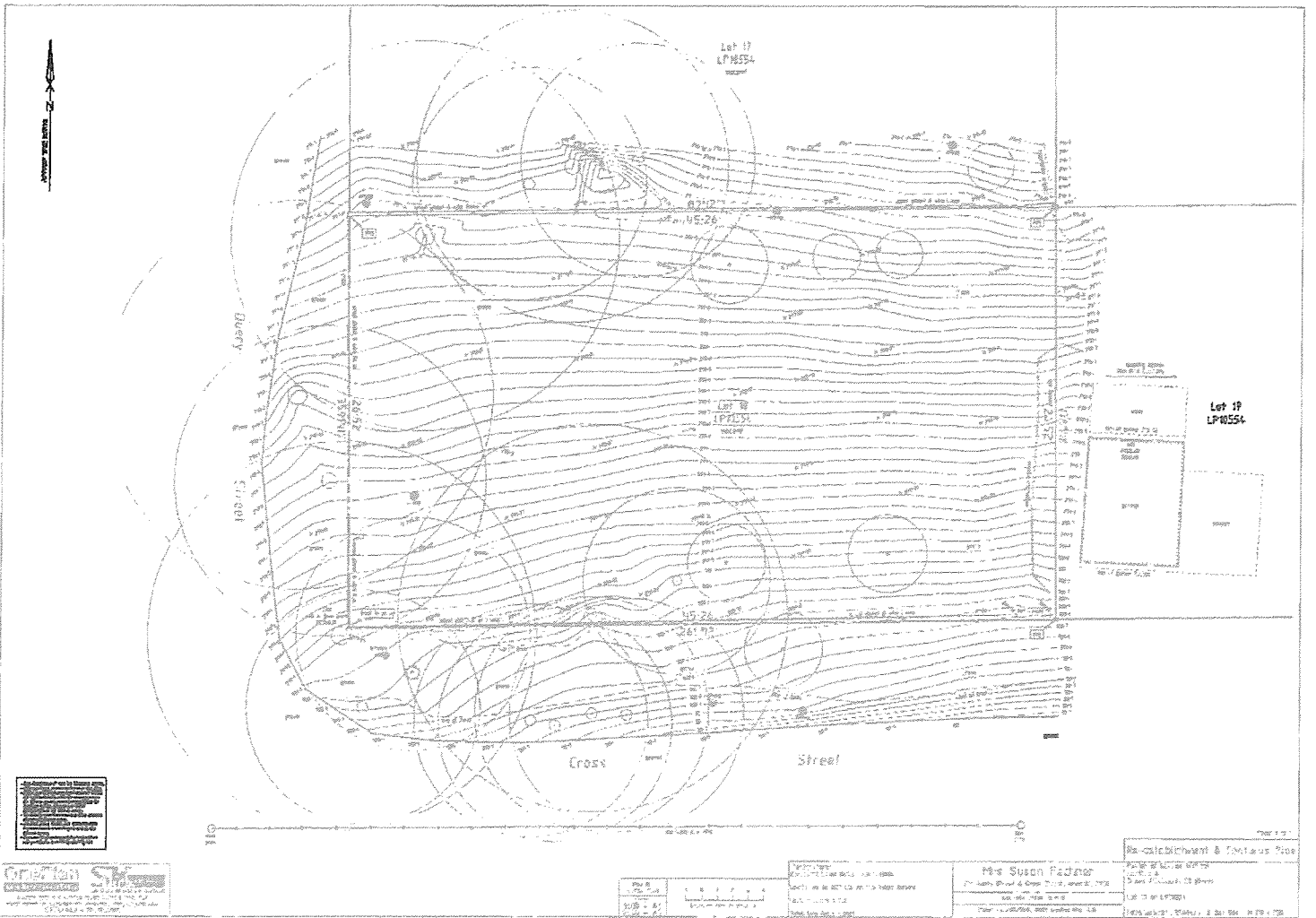
Pay via our website or phone 13 21 61.
A card payment fee applies.

sro.vic.gov.au/payment-options

Important payment information

Windfall gains tax payments must be made using only these specific payment references.

Using the incorrect references for the different tax components listed on this property clearance certificate will result in misallocated payments.



RECORD OF HAVING RE-ESTABLISHED A CADASTRAL BOUNDARY

Surveying (Cadastral Surveys) Regulations 2015 - Schedule 4, Regulation 16

LOCATION OF LAND

PROPERTY ADDRESS: 3 CROSS STREET
EMERALD, 3782
PARISH: NARREE WORRAN
SECTION: A
CROWN ALLOTMENT: 28 (PART)
CROWN PORTION: -
LAST PLAN REFERENCE: Lot 18 on LP10554
TITLE REFERENCE: Vol 5234 Fol 794

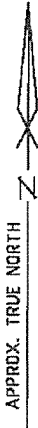
NOTATIONS

Datum (including previous survey references):
Re-establishment Datum 'A'-'B'-'C' vide LP10554.

The position of fencing along or adjacent to boundary lines has been exaggerated for reasons of clarity. Encumbrances are not shown, see Certificate of Title for easement details.

MGA94 Co-ordinates
(of approx. centre
of land in plan) E 361 960 ZONE 55
N 580 320

Alignments and Boundaries Adopted. Diagram of survey control marks and relationship with adopted alignments.



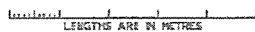
SEE SHEET 2 FOR DIAGRAM

ORIGINAL SHEET SIZE: A3

CERTIFICATION BY SURVEYOR

SHEET 1 OF 2

SCALE



LENGTHS ARE IN METRES

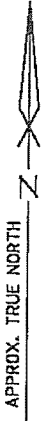
SURVEYORS FILE REF: 16775 RE-1

D.O.S. - 01 / 02 / 2018

SK spatial **OnePlan**
Land Surveying Consultants Land Development Group

P:1300 853 157 F:8456 5995 M:0400 543 157
sks@oneplangroup.com.au www.oneplangroup.com.au
GIPPSLAND - MELBOURNE

SCOTT CHARLES KIMM, VERSION 1



Cascade Road

PH374

33°38'
16.12'

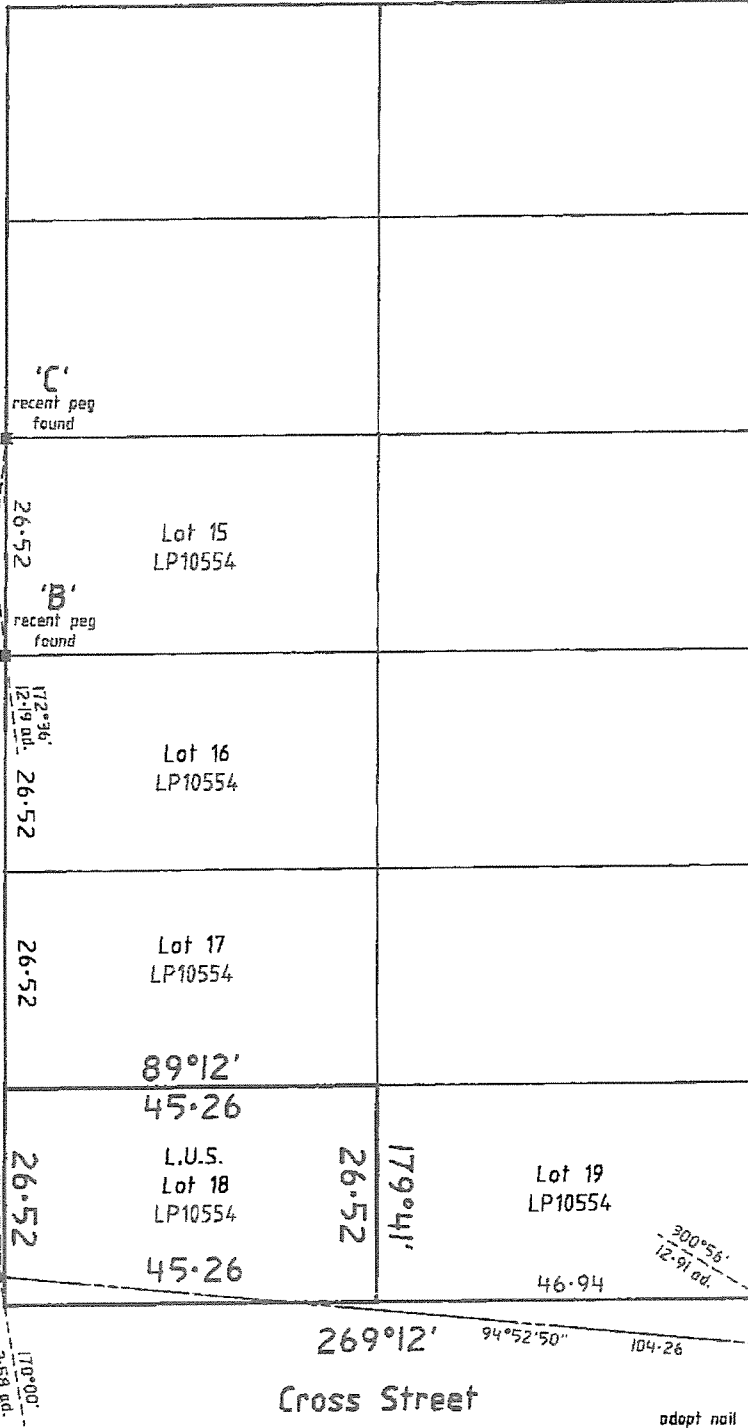
spike placed

Doery Street

Telopoa Road

356°20'40"

156.60



12.19 od.
172°36'
26.52
recent peg found
10'
recent peg found
26.52
spike placed
12.19 od.
172°36'
26.52
spike placed
359°05'50"
359°41'
88.14
spike placed
26.52
170°00'
3.58 od.

recent peg found

recent peg found

'A' old peg found

300°56'
12.91 od.

adopt nail found
23°28'
14.15 od.

Cross Street

269°12'

94°52'50"

104.26

179°41'

26.52

89°12'

45.26

L.U.S.
Lot 18
LP10554

45.26

Lot 19
LP10554

46.94

Lot 15
LP10554

Lot 16
LP10554

Lot 17
LP10554

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Land Surveying Consultants Land Development Group
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GIPPSLAND - MELBOURNE

SCALE 1:600

LENGTHS ARE IN METRES

ORIGINAL SHEET SIZE: A3

SHEET 2

SCOTT CHARLES KIMM, VERSION 1



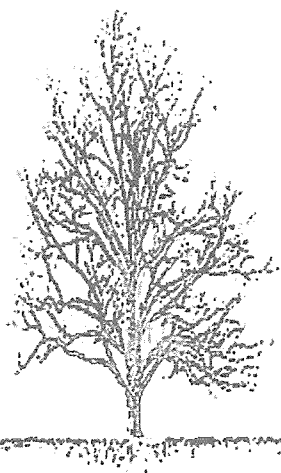
CARNEY & STONE

Arboricultural Consultants

TREE REPORT

3 CROSS ST EMERALD

MAY 2018



CARNEY & STONE

Arboricultural Consultants

Residential Address

145 Kuhnes Rd Mardan 3953

Postal

PO Box 19 Leongatha 3953 Vic

Mobile - 0418865143

Email - arborist@netspace.net.au

TREE REPORT

1. **Location:** 3 Cross St Emerald
2. **Inspection Date:** 15/5/2018
3. **Inspected By:** Leigh Stone
Associate Diploma of Applied Science (Horticulture) Arboriculture
Bachelor of Applied Science (Horticulture)
4. **Purpose of Inspection:**
 - 4.1. To assess the condition of 6 trees located on the subject property, 3 trees in adjoining property to the N and 4 street trees, in view of a proposed residential development.
 - 4.2. To recommend Tree Protection Zones (TPZ) for any of the trees affected by the proposed residential development.
 - 4.3. To suggest the most appropriate methods for protecting the trees during the construction of the proposed residential development.
5. **Methodology:**
 - 5.1. The trees were inspected from the ground.
 - 5.2. Heights and widths were estimated.
 - 5.3. The DBH of all large trees were measured with a diameter tape.
 - 5.4. The trees were photographed.
 - 5.5. Location of the trees was sourced from drawings supplied by Marie Francis Architects.
 - 5.6. Information was collected on a Palm Livedrive PDA using Pendragon software.

6. Observations:

6.1. There is currently a single-story residence on the property as shown below in Photograph 1 from Nearmap 30/11/2017.



6.2. The site is in the Shire of Cardinia.

6.2.1. Zoning – Green Wedge A Zone – Schedule 2 - (GWAZ2).

6.2.2. Overlays – Bushfire Management Overlay – Schedule 2 – (BMO2).

6.2.3. Overlays – Environmental Significance Overlay – Schedule 1 (ESO1).

6.2.4. A permit is required for removal of any vegetation.

6.3. The location of the subject trees is shown on **Drawing 1** Tree Report - 3 Cross St Emerald - May 2018 Trees Assessed.

6.3.1. Several smaller plants were not considered in this report because of their size.

6.3.2. The property is covered by the *Ecological Class (EVC) 45 Shrubby Foothills Forest* from the Highlands – Southern Fall Bioregion. In *EVC 45* trees most commonly found are

Eucalyptus obliqua - Messmate

Eucalyptus sieberi - Silvertop Ash

Eucalyptus baxteri s.l. – Brown Stringybark

Eucalyptus radiata s.l. – Narrow-leaf Peppermint

6.3.3. Adjoining the property to the N approx. 200m is *EVC 29 Damp Forest* with the following commonly found Eucalypt species.

Eucalyptus cypellocarpa – Mountain Grey Gum

Eucalyptus obliqua - Messmate

Eucalyptus globulus ssp. bicostata – Eurabbie

3 CROSS ST EMERALD

6.3.4. From samples gathered below the various trees it was determined that the species of the smooth barked trees was *Eucalyptus cypellocarpa*. The stringy barked trees were assumed to be *Eucalyptus obliqua*. All are considered to be indigenous species.

6.4. The proposed residential development is shown on Drawing 2 Tree Report - 3 Cross St Emerald - May 2018 Proposed Development.

6.5. The proposed residential development with the trees assessed is shown on Drawing 3 Tree Report - 3 Cross St Emerald - May 2018 Proposed Development & Trees Assessed.

6.6. Of the 13 trees inspected on the subject the property, the 4 trees located on the property were recommended for removal.

6.6.1. The trees proposed for removal are 1 *Angophora costata* (Rose Gum), a small/medium sized tree that has developed under a large Messmate resulting in a misshapen tree of little value in the current proposed project.

6.6.2. The 3 other trees are from WA, *Corymbia ficifolia* (Red Flowering Gum). They are not suited to the heavy mountain soils preferring a light sandy soil profile found in their indigenous area of SE coastal Western Australia. As with the Rose Gum above, they are stunted and not suited to the proposed development.

6.7. The trees proposed for removal are shown on Drawing 4 Tree Report - 3 Cross St Emerald - May 2018 Proposed Removals.

Proposed Removals				
Tree Number	Botanical Name	DBH in mm	Remove Tree	Comments - Removals
4	<i>Angophora costata</i>	345	12. Remove - Not Worthy of Retention	Non-indigenous tree - misshapen due to vicinity of Tree 3
5	<i>Corymbia ficifolia</i>	230	12. Remove - Not Worthy of Retention	Non-indigenous tree - small tree - plant indigenous species in its place
6	<i>Corymbia ficifolia</i>	345	12. Remove - Not Worthy of Retention	Non-indigenous tree - small tree - plant indigenous species in its place
7	<i>Corymbia ficifolia</i>	200	12. Remove - Not Worthy of Retention	Non-indigenous tree - poor structure - not worth retaining

3 CROSS ST EMERALD

6.7.1. Photograph 2 – Tree's 4 & 5 – *Angophera costata* & *Corymbia ficifolia*.



6.7.2. Photograph 3 – Tree 6 – *Corymbia ficifolia* – Red Flowered Gum.



6.7.3. Photograph 4 – Tree 7 – *Corymbia ficifolia* – Red Flowered Gum.



7. Conclusion:

7.1. To assess the condition of 6 trees located on the subject property, 3 trees in adjoining property to the N and 4 street trees, in view of a proposed residential development.

7.1.1. The condition of the trees is outlined in the attached Access Condition Report- **Tree Report - 3 Cross St Emerald - May 2018** – 13 trees.

7.2. To recommend Tree Protection Zones (TPZ) for any of the trees retained, in relation to the proposed residential development.

7.2.1. **Tree Roots** - Tree roots supply water and nutrients to the tree and act as the attachment point to the surrounding soil. Tree roots generally expand laterally from the trunk, up to twice the height of the tree, normally in the top 600 mm of soil, and predominantly occupy the top 200 mm of the soil. Water and nutrients are generally taken up at the extremities of growing roots through microscopic root hairs.

At a point close to the trunk, there are a number of large woody roots, recognized as the root plate, that act as the prime connection between the surrounding soil and tree. These roots are known as the *Structural Root Zone (SRZ)* and any construction impact in this area, could affect the tree's stability and future health.

This summary is intended to give an understanding of the cultural requirements of trees during construction and the reasoning behind the tree protection zones which in this report are based on the Australian Standard AS4970:2009 *Protection of trees on development sites* (AS4970:2009).

7.2.2. The Australian Standard AS4970: 2009 *Protection of trees on development sites* bases the protection zones of the trees using two calculations.

7.2.3. In the first calculation, the radius of the Tree Protection Zone (TPZ) is calculated by multiplying the DBH of the subject tree, measured 1400 mm from the ground by 12. Where the tree is multi trunked, each trunk is measured at 1400mm and the value of each trunk is squared. The total of all the squared amounts is then square rooted to give a DBH of the multi trunked tree. This figure is then used to calculate the TPZ.

7.2.4. AS4970:2009 states

'A TPZ should not be less than 2 m nor greater than 15 m (except where crown protection is required).' (AS4970:2009) The condition below applies to Tree 12 which has a DBH of 1380mm which would give a TPZ of $1380 \times 12 = 16.56\text{m}$. The TPZ has been limited to 15m in accordance with AS4970:2009.

7.2.5. Refer Drawing 5 Tree Report - 3 Cross St Emerald - May 2018 Tree Protection Zones - Australian Standard AS4970:2009

7.2.6. The TPZ of the remaining trees which have root zones within or near the development is set out below.

Tree Protection Zones		
Tree No	DBH mm	TPZ Radius in m
1	810	9.72
2	560	6.72
3	940	11.28
8	910	10.92
9	890	10.68
10	655	7.86
11	1060	12.72
12	1380	15.00
13	685	8.22

7.2.7. The second calculation offered by AS4970:2009 states that a 10% allowance may be considered as a reasonable encroachment on the root zone by the proposed dwelling or development. Refer to attached Drawing 5 Tree Report - 3 Cross St Emerald - May 2018 Tree Protection Zones - Australian Standard AS4970:2009

3 CROSS ST EMERALD

7.2.8. AS4970: 2009 states - *Minor encroachment. If the proposed encroachment is less than 10% of the area of the TPZ and is outside the Structural Root Zone (SRZ), detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.*

7.2.9. Below are the areas of each TPZ.

Tree Protection Zone Areas			
Tree No	DBH in mm	Areas of Tree Protection Zones (TPZ) in m ²	10% of Area of TPZ in m ²
1	810	296.93	29.69
2	560	141.93	14.19
3	940	399.89	39.99
8	910	374.77	37.48
9	890	358.48	35.85
10	655	194.16	19.42
11	1060	508.51	50.85
12	1380	707.14	70.71
13	685	212.36	21.24

7.2.10. Below are the percentages of the encroachment of the development on the subject tree – note **10% is the limit for non-investigation of the tree roots.**

% of Tree Protection Zone Effected by Development			
Tree No	DBH in mm	Area Effected in m ²	% of TPZ effected
1	810	0.00	0.00%
2	560	0.00	0.00%
3	940	22.33	5.58%
8	910	12.13	3.24%
9	890	24.04	6.71%
10	655	15.46	7.96%
11	1060	48.71	9.58%
12	1380	24.00	3.39%
13	685	0.00	0.00%

7.2.11. As can be seen on **Drawing 5 Tree Report - 3 Cross St Emerald - May 2018 Tree**

Protection Zones - Australian Standard AS4970:2009, the proposed residential development does not exceed the 10% allowance for a minor encroachment for the trees considered, and as a result no further action on the tree is required except for the protection methods outlined below.

3 CROSS ST EMERALD

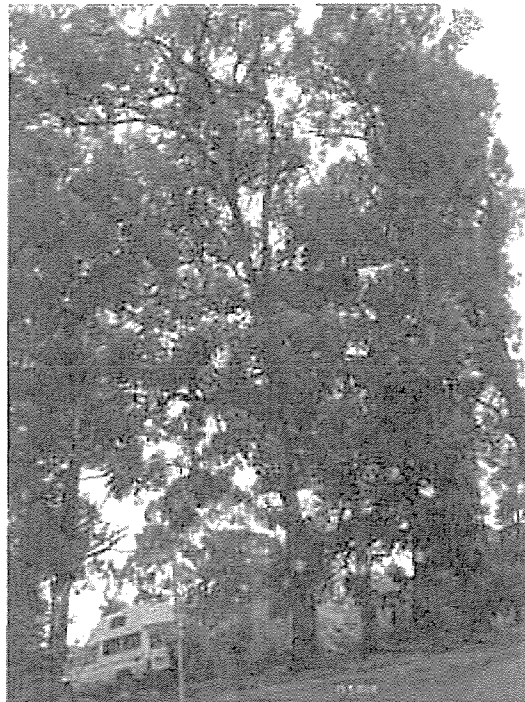
7.2.12. A strict observance of the protection methods will reduce the chance of further damage to any of the tree's root system and consequent reduction in the health of the trees.

7.2.13. In the event that root damage eventuates as the result of faulty construction techniques the liability for any failure would lay with the builder/developer.

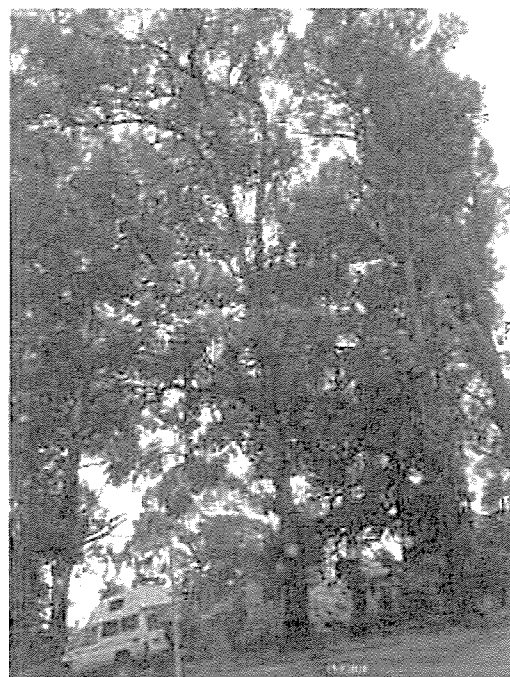
7.2.14. Details of the liability consequences can be found in the Law Journal as presented by Philip Hamilton QC (Hamilton 2000).

7.2.15. Below are photographs of the trees considered in the TPZ calculation.

7.2.16. Photograph 5 – Tree's 1 & 2 – *Eucalyptus obliqua* – Messmate.



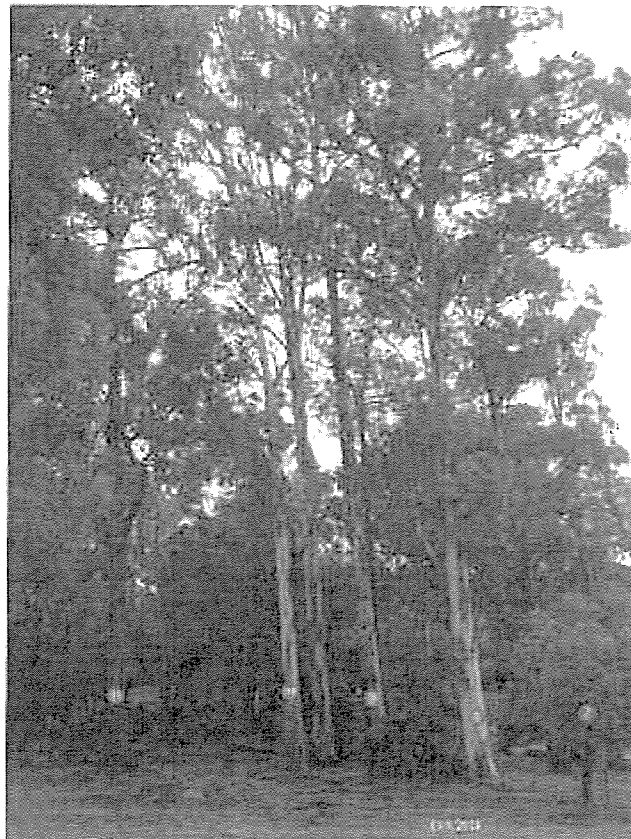
7.2.17. Photograph 6 – Tree's 1 & 2 – *Eucalyptus obliqua* – Messmate.



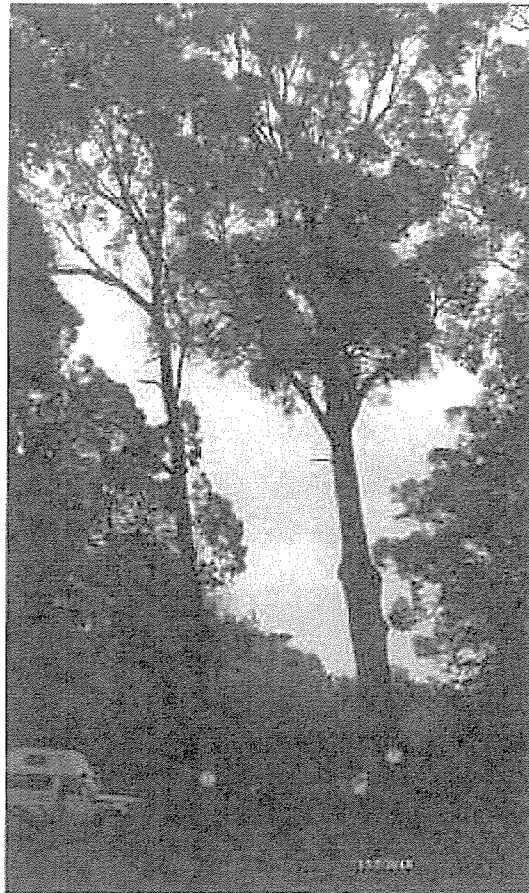
7.2.18. Photograph 7 – Tree 3 - *Eucalyptus obliqua* – Messmate.



7.2.19. Photograph 8 – Tree's 8, 9, 10 & 11 – *Eucalyptus cypellocarpa* & *Eucalyptus obliqua*.



7.2.20. Photograph 9 – Tree’s 12 & 13 – *Angophera costata* & *Corymbia ficifolia*.



7.3. To suggest the most appropriate methods for protecting the trees during the construction of the proposed residential development.

7.3.1. Trees roots will be compromised if the following points are not observed.

7.3.2. Trees with significant root damage don't necessarily die immediately but tend to decline over a period of years, resulting in additional expense for the owners of the property in removing trees or a possible liability if the tree is located in adjoining property.

7.3.3. Decay organisms can invade poorly cut roots establishing a regime that could in time cause the demise of the tree.

7.3.4. Tree roots can die eventually from the effects of compaction of the top soil profile which can be caused by unnecessary vehicle traffic, which often occurs during the construction process.

7.3.5. It is important, due to the size and hazard potential of the remaining trees, to acknowledge that the precautions and conditions set out below are not treated casually and are adhered too precisely.

7.3.6. Temporary Fencing

7.3.6.1. It would be necessary to erect temporary fencing where indicated on Drawing 6 Tree

7.3.6.2. This fencing is to be erected once the proposed removals are completed and any construction starts.

7.3.7. Mulch

7.3.7.1. Spread 100mm of mulch where indicated on Drawing 6.

7.3.7.2. The mulch is to be spread prior to the commencement of construction, after the footings and foundations are completed.

7.3.7.3. The areas for mulching are to be set out for the contractor to follow.

7.3.8. Protective Timber Boarding

7.3.8.1. As shown on Drawing 6 timber boarding is to be installed over the top of the mulch. f

7.3.8.2. The boarding is to be placed prior to the commencement of construction after the mulch is laid.

7.3.9. Excavations for any below ground services are to be excluded at the design stage from the TPZ of all trees.

7.3.10. There is to be no machine intrusion into the TPZ of any tree during the installation of any services. This means that any underground services affecting the TPZ of any tree would need to be hand dug or bored, with the clear direction that no roots in excess of 25mm are to be cut. This would require that any necessary services are laid in sections to prevent root loss.

7.3.11. It would be necessary to give clear instructions to the builder, and trades persons that the trees roots are to be protected, and that no waste products are allowed to permeate the root zone.

7.3.12. All roots in excess of 15 mm that are required to be cut at the perimeter of a designated root protection zone or at the extent of an agreed excavation, must be cut cleanly with a handsaw, secateurs, or root cutting machine.

7.3.13. All equipment, trucks, vehicles, construction materials, building waste, including paint, plaster, and concrete refuse, are to be excluded from the tree protection zone.

7.3.14. Any storm water or sewerage excavations that are deemed necessary to intrude into the TPZ of any tree, the excavation in the TPZ is to be carried out by hand with the express direction that no roots in excess of 25mm are to be cut. Pipes are to be laid in sections to maintain the integrity of the roots.

7.3.15. Any pruning to allow for construction should be carried out by a qualified arborist, preferably as required before construction starts, to Australian Standard for *Pruning of Amenity Trees* AS4373:2007.

8. References:

8.1. Hamilton, P. 2000, Trees, and the Law 2: occupiers liability and negligence, *Victorian Law Journal*, 74 (2) pp. 73-76.

3 CROSS ST EMERALD

8.2. Standards Association of Australia 2009, *Protection of Trees on Development Sites*, AS4970:2009, Standards Association of Australia, North Sydney.

8.3. Standards Association of Australia 2007, *Pruning Amenity Trees*, AS437370:2007, Standards Association of Australia, North Sydney.

9. Attachments:

9.1. Access Tree Condition report - **Tree Report - 3 Cross St Emerald - May 2018** - 13 trees.

9.2. **Drawing 1** Tree Report - 3 Cross St Emerald - May 2018 Trees Assessed

9.3. **Drawing 2** Tree Report - 3 Cross St Emerald - May 2018 Proposed Development

9.4. **Drawing 3** Tree Report - 3 Cross St Emerald - May 2018 Proposed Development & Trees Assessed

9.5. **Drawing 4** Tree Report - 3 Cross St Emerald - May 2018 Proposed Removals

9.6. **Drawing 5** Tree Report - 3 Cross St Emerald - May 2018 Tree Protection Zones - Australian Standard AS4970:2009

9.7. **Drawing 6** Tree Report - 3 Cross St Emerald - May 2018 Construction

10. Glossary:

10.1. **Amenity Trees** – Broadly described as any tree planted, or indigenous that has been influenced by the impact of manmade intrusion.

10.2. **Bifurcated/Codominant** – Where two trunks or stems of near equal diameter emerge from a single point on a tree.

10.3. **Callus Material** – As part of the external wound isolation process, trees tend to create, via the cambium layer, new cells at the edge of the wound that in time tend to cover the wound area. This effect is dependent on the trees condition and the extent of this process is species related.

10.4. **Compaction** – Where soil is compressed so that the infiltration of oxygen and water is reduced. Compacted soil restricts gaseous exchange to the roots thus limiting respiration in the root cells. The ability of water to permeate is also restricted, and the tree may die or can in time, react by shedding limbs in order to accomplish an equilibrium with the available water and nutrient supply. Compaction can be caused by vehicle, human and animal traffic; is difficult to alleviate, with the accepted method of alleviation being removal of the cause and the mulching of the root zone.

10.5. **Cultural Conditions** – Describes the basic requirements for sound tree or plant growth – adequate water and nutrient availability, exposure to sufficient sun light, access to clean air and suitable soil to supply positive growing conditions.

- 10.6. **DBH** – Diameter at breast height, generally accepted as the average of two diameter measurements of a tree's trunk at approx. 1400 mm from the natural ground level.
- 10.7. **Decline** – Describes a tree that may be prematurely senescing.
- 10.8. **Decurrent** – Trees that exhibit weak apical dominance and tend to have a rounded form. Typical are mature *Ulmus* spp. and most Eucalypts.
- 10.9. **Dicot** - A flowering plant with two embryonic seed leaves or cotyledons that usually appear at germination

Embryo with two cotyledons

Pollen with three furrows or pores

Flower parts in multiples of four or five

Major leaf veins reticulated

Stem vascular bundles in a ring

Roots develop from radicle

Secondary growth often present

- 10.10. **Endemic/Indigenous** – Plants occurring naturally in a particular location.
- 10.11. **Epicormic Growth** - Growth emanating from adventitious buds located along branches/trunk or at the site of heavy pruning or lopping. A feature of epicormic growth is the nature of the ongoing attachment of these branches. Unlike conventional branches that have developed an interlocking lamination between trunk and branch, epicormic growth develops quickly on the surface of a branch or trunk in reaction to the reduction of photosynthetic capacity. As the attachment is poor, epicormic branches have been known to fail in moderate storms.
- 10.12. **Excurrent** – Trees that exhibit apical dominance. Typical are most young conifers.
- 10.13. **Fair** –A tree in fair condition exhibits a less than full canopy, presence of deadwood, minor insect infestations, isolated epicormic growth, no visible signs of decay, minor structural problems such as crossing branches, low hazard potential included bark. A fair tree will exhibit most of these features.
- 10.14. **Good** The condition of a tree is described as good when it presents with a full canopy, little or no signs of any insect pests, is free of epicormic growth, no visible signs of decay, little if any deadwood in the canopy, no visible signs of root damage, no obvious structural or morphological problems such as branches with included bark or acutely angled codominant stems. A good tree will have all of these features.
- 10.15. **Hazard** –
- 10.15.1. **Extreme Danger – Target Present**
Tree or significant section of tree is about to fail within 24 hrs

Action – remove tree ASAP, if possible isolate immediately

10.15.2. Imminent Failure – Target Present

Tree, in your opinion, has a significant structural fault with potential to fail within the short term

Action – If possible immediately mitigate problem, or plan for removal

10.15.3. Possible Failure – Target Present

Tree has a significant structural fault that could possibly fail in the future

Action – Immediately mitigate problem and monitor the tree ½ yearly

10.15.4. Failure Long Term – Target Present

Tree has a structural fault, but presents no immediate danger

Action – plan to mitigate the problem, monitor the tree annually

10.15.5. Current Hazard Potential Low – Target Present

Tree has no obvious structural faults

Action – Monitor on a 6 monthly, yearly or two-yearly bases, dependent on target

10.16. Hazard Assessment - Where danger represented by the tree's presence or condition is quantified in relation to the targets present, such as people or buildings or property.

10.17. Heartwood – The central section of the trunk of an established tree, essentially an area in the tree where waste products are stored in old cells, formerly used for the transport of water and nutrients from the roots. All the cells in the heartwood are dead.

10.18. Included Bark –The condition occurs where the angle of branch connection to a trunk or where codominant trunks join, is so acute as to prevent a sound biological union of the two sections. The resulting union can become unstable and fail in moderate storms. Note – All acute codominant stems are not 'included', the rolling in of the bark at the union usually indicates an inclusion.

10.19. Lignotuber – A dense mass of meristematic cells located at the base of some species that allows for the regrowth of the tree after fire event or removal to ground level.

10.20. Lopping and Topping – As defined in the Australian Standard AS 4373 – 2007 *'is the random cutting of branches or stems between branch unions and internodes on young trees. This is an unacceptable practice for the following reasons*

- 1. It increases the rate of shoot production and elongation.*
- 2. The resulting regrowth is weakly attached and becomes prone to failure or collapse.*
- 3. The stubs may decay.*
- 4. The natural habit of the tree is destroyed.*
- 5. It may reduce the lifespan of the tree.*
- 6. It predisposes trees to fungal infections and insect attack.'*

It is considered undesirable to lop mature trees for the reasons stated above.

10.21. **Mature** – Describes the condition of a tree that has grown to a stage where it shows only minor annual growth and has reached close to its maximum size. The onset and duration of maturity is dependent upon the species and cultural conditions in which the tree is growing.

10.22. **Monocot** - Any of various flowering plants, such as grasses, orchids, and lilies, having a single cotyledon in the seed.

Embryo with single cotyledon

Pollen with single furrow or pore

Flower parts in multiples of three

Major leaf veins parallel

Stem vascular bundles scattered

Roots are adventitious

Secondary growth absent

10.23. **Morphological** – Relates to the external structural features of an organism, especially from the aspect of shape and degree of differentiation.

10.24. **Native** – A plant originating in the country where found naturally growing.

10.25. **Poor** – A tree is considered to be in poor condition when it exhibits extensive tip dieback in branches, a depleted canopy, extensive epicormic growth, obvious fungal decay, insect infestations, extensive included bark, and extensive deadwood. A poor tree may have all or most of these features.

10.26. **Semi-Mature** – Describes a tree that shows active annual growth but has reached close to its genetic potential with regards to height and width of canopy. The onset and duration of semi-maturity is dependent on the species and cultural conditions in which the tree is growing.

10.27. **Senescence** – The process of aging; physiological decline. In a tree, the time at which there is little if any new annual growth. The onset of senescence is dependent on the species and cultural conditions in which the tree is growing.

10.28. **Sinker Roots** – Occur in the root systems of many tree species and consist of vertical roots emanating from the large lateral roots close to the trunk. These roots aid the stability of the tree.

10.29. **Soil Horizons A1 & A2** – Generally accepted as the top two layers in a duplex the soil profile. Horizon A1. being the humus layer, darker in colour adjoining the surface. Horizon A2 being the next layer below, below generally lighter in colour of the same texture as horizon A1

10.30. **Sounding** – The technique employed by many foresters to determine the integrity of the internal structure of a tree. The method involves tapping around the trunk, near the base of the tree, using

3 CROSS ST EMERALD

the head of an axe. The variation or otherwise in the sound of the tapping gives the experienced ear an indication of any decay/hollow, that may be present in the trunk of a tree.

10.31. **Tap Root** – The primary root that occurs at the germination of most trees and grows straight down but tends to become subservient to the lateral root system as it develops and subsequently takes over the responsibilities of the taproot. In time, it can become inoperative and disappear.

10.32. **Tree** – A woody plant, usually with a single stem, and more than 5 metres tall.

10.33. **Young** – Describes a tree that is actively growing and shows significant increases in annual growth. The duration and extent of the growth of a young tree depends on the species and cultural conditions in which it is growing.

11. End of Report.

Tree Report - 3 Cross St Emerald - May 2018

Site Location	Street Tree - 3 Cross St Emerald
Tree Number	1
Location of Tree	As per attached Drawing 1
Date	15-05-2018
Botanical Name	<i>Eucalyptus obliqua</i>
Common Name	Messmate
Type	7. Indigenous
Age	3. Mature
DBH in mm	810
DBH in mm Codominant Base	
Height in Metres	28
Width in Metres	17
Condition/Health/Wigour	3. Fair/Poor - Some Deadwood - Some Epicormic Shoots
Tree Structure	9. Poor - Leaning - Codominant Stems - Included Bark
Root System	1. Exposed Damaged Roots
Root Buttress	6. OK
Trunk	9. No Damage
Environmental Conditions	9. Tree in natural setting
Diseases	1. None Seen
Infestations	1. None Seen
Hazard	4. Failure Long Term
Prune	7. None
Deadwood	4. None
Branch Removal	10. None
Monitor Decay	7. No
Remove Tree	1. Do Not Remove
Comments - General	1. Tree in Fair Condition - Monitor
Comments - Removals	Included bark in main trunk should be monitored

Tree Report - 3 Cross St Emerald - May 2018

Site Location	Street Tree - 3 Cross St Emerald
Tree Number	2
Location of Tree	As per attached Drawing 1
Date	15-05-2018
Botanical Name	<i>Eucalyptus obliqua</i>
Common Name	Messmate
Type	7. Indigenous
Age	2. Semi Mature
DBH in mm	560
DBH in mm Codominant Base	
Height in Metres	27
Width in Metres	11
Condition/Health/Vigour	3. Fair/Poor - Some Deadwood - Some Epicormic Shoots
Tree Structure	4. Fair - Codominant Stems
Root System	8. No Damage Seen
Root Burress	6. OK
Trunk	9. No Damage
Environmental Conditions	9. Tree in natural setting
Diseases	1. None Seen
Infestations	1. None Seen
Hazard	4. Failure Long Term
Prune	7. None
Deadwood	4. None
Branch Removal	10. None
Monitor Decay	7. No
Remove Tree	1. Do Not Remove
Comments - General	1. Tree in Fair Condition - Monitor
Comments - Removals	

Tree Report - 3 Cross St Emerald - May 2018

Site Location	3 Cross St Emerald
Tree Number	3
Location of Tree	As per attached Drawing 1
Date	15-05-2018
Botanical Name	<i>Eucalyptus obliqua</i>
Common Name	Messmate
Type	7. Indigenous
Age	3. Mature
DBH in mm	940
DBH in mm Codominant Base	
Height in Metres	30
Width in Metres	20
Condition/Health/Vigour	2. Fair - Some Deadwood
Tree Structure	4. Fair - Codominant Stems
Root System	1. Exposed Damaged Roots
Root Buttress	6. OK
Trunk	9. No Damage
Environmental Conditions	9. Tree in natural setting
Diseases	1. None Seen
Infestations	1. None Seen
Hazard	4. Failure Long Term
Prune	7. None
Deadwood	1. Large Pieces Throughout Canopy
Branch Removal	10. None
Monitor Decay	7. No
Remove Tree	1. Do Not Remove
Comments - General	1. Tree in Fair Condition - Monitor
Comments - Removals	Deadwood

Tree Report - 3 Cross St Emerald - May 2018

Site Location	3 Cross St Emerald
Tree Number	4
Location of Tree	As per attached Drawing 1
Date	15-05-2018
Botanical Name	<i>Angophora costata</i>
Common Name	Rose Gum
Type	2. Native to NSW
Age	2. Semi Mature
DBH in mm	345
DBH in mm Codominant Base	
Height in Metres	11
Width in Metres	7
Condition/Health/Vigour	2. Fair - Some Deadwood
Tree Structure	8. Fair - Leaning Codominant Stems
Root System	8. No Damage Seen
Root Burress	6. OK
Trunk	9. No Damage
Environmental Conditions	9. Tree in natural setting
Diseases	1. None Seen
Infestations	1. None Seen
Hazard	4. Failure Long Term
Prune	7. None
Deadwood	4. None
Branch Removal	10. None
Monitor Decay	7. No
Remove Tree	12. Remove - Not Worthy of Retention
Comments - General	11. Remove Tree
Comments - Removals	Non indigenous tree - misshapen due to vicinity of Tree 3

Tree Report - 3 Cross St Emerald - May 2018

Site Location	3 Cross St Emerald
Tree Number	5
Location of Tree	As per attached Drawing 1
Date	15-05-2018
Botanical Name	<i>Corymbia ficifolia</i>
Common Name	Red Flowering Gum
Type	5. Native to WA
Age	2. Semi Mature
DBH in mm	230
DBH in mm Codominant Base	185,140
Height in Metres	4
Width in Metres	4
Condition/Health/Vigour	3. Fair/Poor - Some Deadwood - Some Epicormic Shoots
Tree Structure	4. Fair - Codominant Stems
Root System	8. No Damage Seen
Root Buttress	6. OK
Trunk	6. Wound Lower
Environmental Conditions	9. Tree in natural setting
Diseases	5. Fungal Activity in Lower Trunk
Infestations	1. None Seen
Hazard	4. Failure Long Term
Prune	7. None
Deadwood	1. Large Pieces Throughout Canopy
Branch Removal	10. None
Monitor Decay	7. No
Remove Tree	12. Remove - Not Worthy of Retention
Comments - General	11. Remove Tree
Comments - Removals	Non indigenous tree - small tree - plant indigenous species in its place

Tree Report - 3 Cross St Emerald - May 2018

Site Location	3 Cross St Emerald
Tree Number	6
Location of Tree	As per attached Drawing 1
Date	15-05-2018
Botanical Name	<i>Corymbia ficifolia</i>
Common Name	Red Flowering Gum
Type	5. Native to WA
Age	3. Mature
DBH in mm	345
DBH in mm Codominant Base	245,240
Height in Metres	5
Width in Metres	8.5
Condition/Health/Vigour	2. Fair - Some Deadwood
Tree Structure	4. Fair - Codominant Stems
Root System	1. Exposed Damaged Roots
Root Buttress	6. OK
Trunk	9. No Damage
Environmental Conditions	9. Tree in natural setting
Diseases	1. None Seen
Infestations	1. None Seen
Hazard	4. Failure Long Term
Prune	7. None
Deadwood	4. None
Branch Removal	10. None
Monitor Decay	7. No
Remove Tree	12. Remove - Not Worthy of Retention
Comments - General	11. Remove Tree
Comments - Removals	Non indigenous tree - small tree - plant indigenous species in its place

Tree Report - 3 Cross St Emerald - May 2018

Site Location	3 Cross St Emerald
Tree Number	7
Location of Tree	As per attached Drawing 1
Date	15-05-2018
Botanical Name	<i>Corymbia ficifolia</i>
Common Name	Red Flowering Gum
Type	5. Native to WA
Age	2. Semi Mature
DBH in mm	200
DBH in mm Codominant Base	
Height in Metres	4.5
Width in Metres	4.5
Condition/Health/Wigour	3. Fair/Poor - Some Deadwood - Some Epicormic Shoots
Tree Structure	10. Poor - Codominant Stems - Included Bark
Root System	8. No Damage Seen
Root Buttress	6. OK
Trunk	9. No Damage
Environmental Conditions	9. Tree in natural setting
Diseases	1. None Seen
Infestations	1. None Seen
Hazard	5. Current Hazard Potential - Low
Prune	7. None
Deadwood	4. None
Branch Removal	10. None
Monitor Decay	7. No
Remove Tree	12. Remove - Not Worthy of Retention
Comments - General	11. Remove Tree
Comments - Removals	Non indigenous tree - poor structure - not worth retaining

Tree Report - 3 Cross St Emerald - May 2018

Site Location	2 Doery Rd Emerald
Tree Number	8
Location of Tree	As per attached Drawing 1
Date	15-05-2018
Botanical Name	<i>Eucalyptus cyellocarpa</i>
Common Name	Mountain Grey Gum
Type	7. Indigenous
Age	3. Mature
DBH in mm	910
DBH in mm Codominant Base	
Height in Metres	35
Width in Metres	16
Condition/Health/Vigour	2. Fair - Some Deadwood
Tree Structure	4. Fair - Codominant Stems
Root System	8. No Damage Seen
Root Buttress	6. OK
Trunk	9. No Damage
Environmental Conditions	9. Tree in natural setting
Diseases	1. None Seen
Infestations	1. None Seen
Hazard	4. Failure Long Term
Prune	7. None
Deadwood	4. None
Branch Removal	10. None
Monitor Decay	7. No
Remove Tree	1. Do Not Remove
Comments - General	1. Tree in Fair Condition - Monitor
Comments - Removals	

Tree Report - 3 Cross St Emerald - May 2018

Site Location	2 Doery Rd Emerald
Tree Number	9
Location of Tree	As per attached Drawing 1
Date	15-05-2018
Botanical Name	<i>Eucalyptus cyelloarpa</i>
Common Name	Mountain Grey Gum
Type	7. Indigenous
Age	3. Mature
DBH in mm	890
DBH in mm Codominant Base	
Height in Metres	40
Width in Metres	14
Condition/Health/Vigour	2. Fair - Some Deadwood
Tree Structure	4. Fair - Codominant Stems
Root System	8. No Damage Seen
Root Buttress	6. OK
Trunk	9. No Damage
Environmental Conditions	9. Tree in natural setting
Diseases	1. None Seen
Infestations	1. None Seen
Hazard	4. Failure Long Term
Prune	7. None
Deadwood	4. None
Branch Removal	10. None
Monitor Decay	7. No
Remove Tree	1. Do Not Remove
Comments - General	1. Tree in Fair Condition - Monitor
Comments - Removals	

Tree Report - 3 Cross St Emerald - May 2018

Site Location	2 Doery Rd Emerald
Tree Number	10
Location of Tree	As per attached Drawing 1
Date	15-05-2018
Botanical Name	<i>Eucalyptus cyellocarpa</i>
Common Name	Mountain Grey Gum
Type	7. Indigenous
Age	2. Semi Mature
DBH in mm	655
DBH in mm Codominant Base	
Height in Metres	35
Width in Metres	16
Condition/Health/Vigour	3. Fair/Poor - Some Deadwood - Some Epicormic Shoots
Tree Structure	4. Fair - Codominant Stems
Root System	8. No Damage Seen
Root Health	6. OK
Trunk	9. No Damage
Environmental Conditions	9. Tree in natural setting
Diseases	1. None Seen
Infestations	1. None Seen
Hazard	4. Failure Long Term
Prune	7. None
Deadwood	4. None
Branch Removal	10. None
Monitor Decay	7. No
Remove Tree	1. Do Not Remove
Comments - General	1. Tree in Fair Condition - Monitor
Comments - Removals	

Tree Report - 3 Cross St Emerald - May 2018

Site Location	3 Cross St Emerald
Tree Number	11
Location of Tree	As per attached Drawing 1
Date	15-05-2018
Botanical Name	<i>Eucalyptus obliqua</i>
Common Name	Messmate
Type	7. Indigenous
Age	3. Mature
DBH in mm	1060
DBH in mm Codominant Base	
Height in Metres	32
Width in Metres	16
Condition/Health/Vigour	2. Fair - Some Deadwood
Tree Structure	8. Fair - Leaning Codominant Stems
Root System	8. No Damage Seen
Root Buttress	6. OK
Trunk	9. No Damage
Environmental Conditions	9. Tree in natural setting
Diseases	1. None Seen
Infestations	1. None Seen
Hazard	4. Failure Long Term
Prune	7. None
Deadwood	4. None
Branch Removal	10. None
Monitor Decay	7. No
Remove Tree	1. Do Not Remove
Comments - General	1. Tree in Fair Condition - Monitor
Comments - Removals	

Tree Report - 3 Cross St Emerald - May 2018

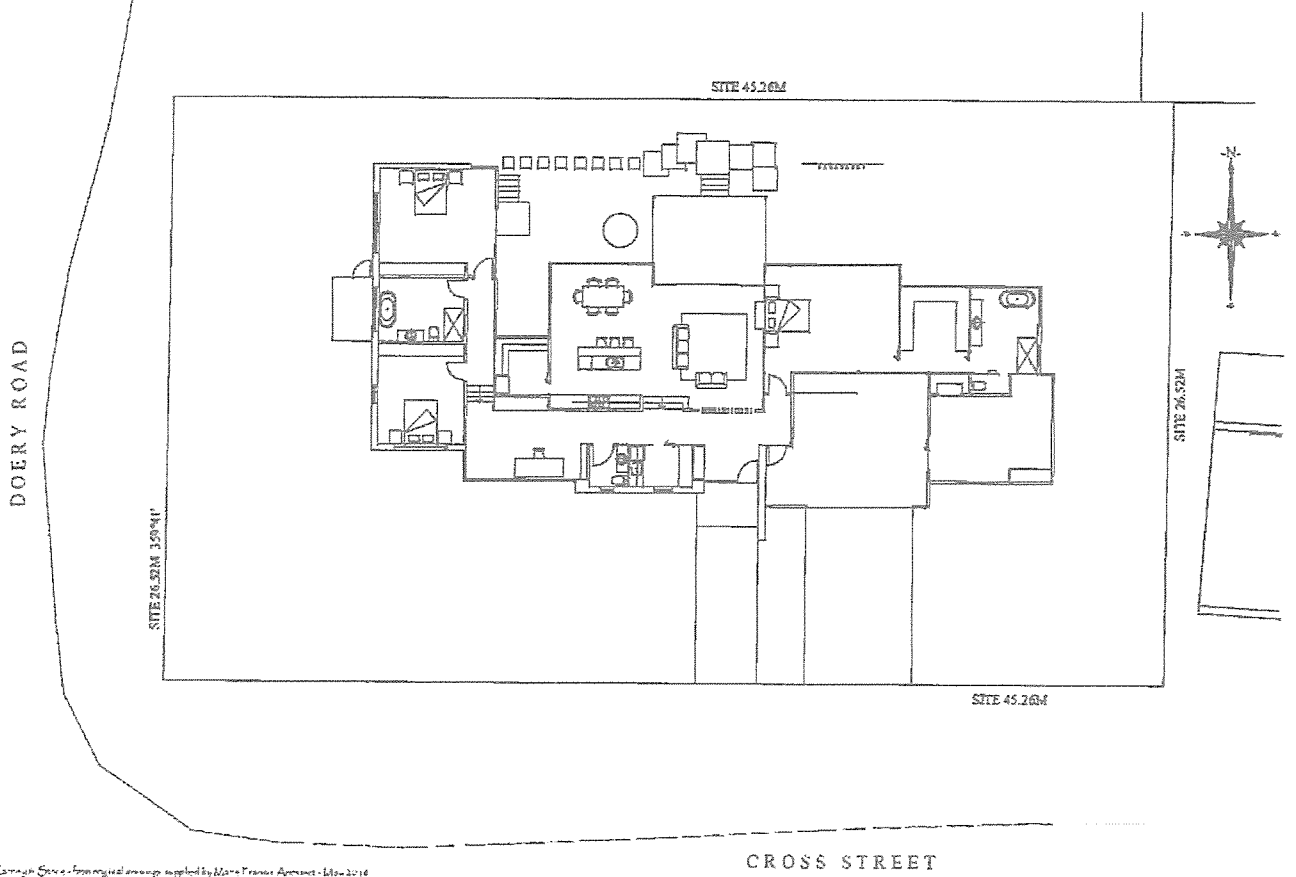
Site Location	Street Tree - Doery Rd Emerald
Tree Number	12
Location of Tree	As per attached Drawing 1
Date	15-05-2018
Botanical Name	<i>Eucalyptus cyellocarpa</i>
Common Name	Mountain Grey Gum
Type	7. Indigenous
Age	3. Mature
DBH in mm	1380
DBH in mm Codominant Base	
Height in Metres	40
Width in Metres	18
Condition/Health/Vigour	2. Fair - Some Deadwood
Tree Structure	4. Fair - Codominant Stems
Root System	8. No Damage Seen
Root Burress	6. OK
Trunk	5. Wound Upper
Environmental Conditions	9. Tree in natural setting
Diseases	6. Fungal Activity in Upper Trunk
Infestations	1. None Seen
Hazard	4. Failure Long Term
Prune	7. None
Deadwood	1. Large Pieces Throughout Canopy
Branch Removal	10. None
Monitor Decay	7. No
Remove Tree	1. Do Not Remove
Comments - General	1. Tree in Fair Condition - Monitor
Comments - Removals	Lost 3 large branches 2 smaller branches - needs to be monitored

Tree Report - 3 Cross St Emerald - May 2018

Site Location	Street Tree - Doery Rd Emerald
Tree Number	13
Location of Tree	As per attached Drawing 1
Date	15-05-2018
Botanical Name	<i>Eucalyptus cypellocarpa</i>
Common Name	Mountain Grey Gum
Type	7. Indigenous
Age	2. Semi Mature
DBH in mm	685
DBH in mm Codominant Base	
Height in Metres	30
Width in Metres	18
Condition/Health/Vigour	3. Fair/Poor - Some Deadwood - Some Epicormic Shoots
Tree Structure	4. Fair - Codominant Stems
Root System	8. No Damage Seen
Root Buttress	6. OK
Trunk	5. Wound Upper
Environmental Conditions	8. Tree located in grass area
Diseases	6. Fungal Activity in Upper Trunk
Infestations	1. None Seen
Hazard	4. Failure Long Term
Prune	7. None
Deadwood	1. Large Pieces Throughout Canopy
Branch Removal	10. None
Monitor Decay	7. No
Remove Tree	1. Do Not Remove
Comments - General	1. Tree in Fair Condition - Monitor
Comments - Removals	Thinning upper canopy dead wood over property - deadwood should be removed

Tree Report - 3 Cross St Emerald - May 2018
Proposed Development

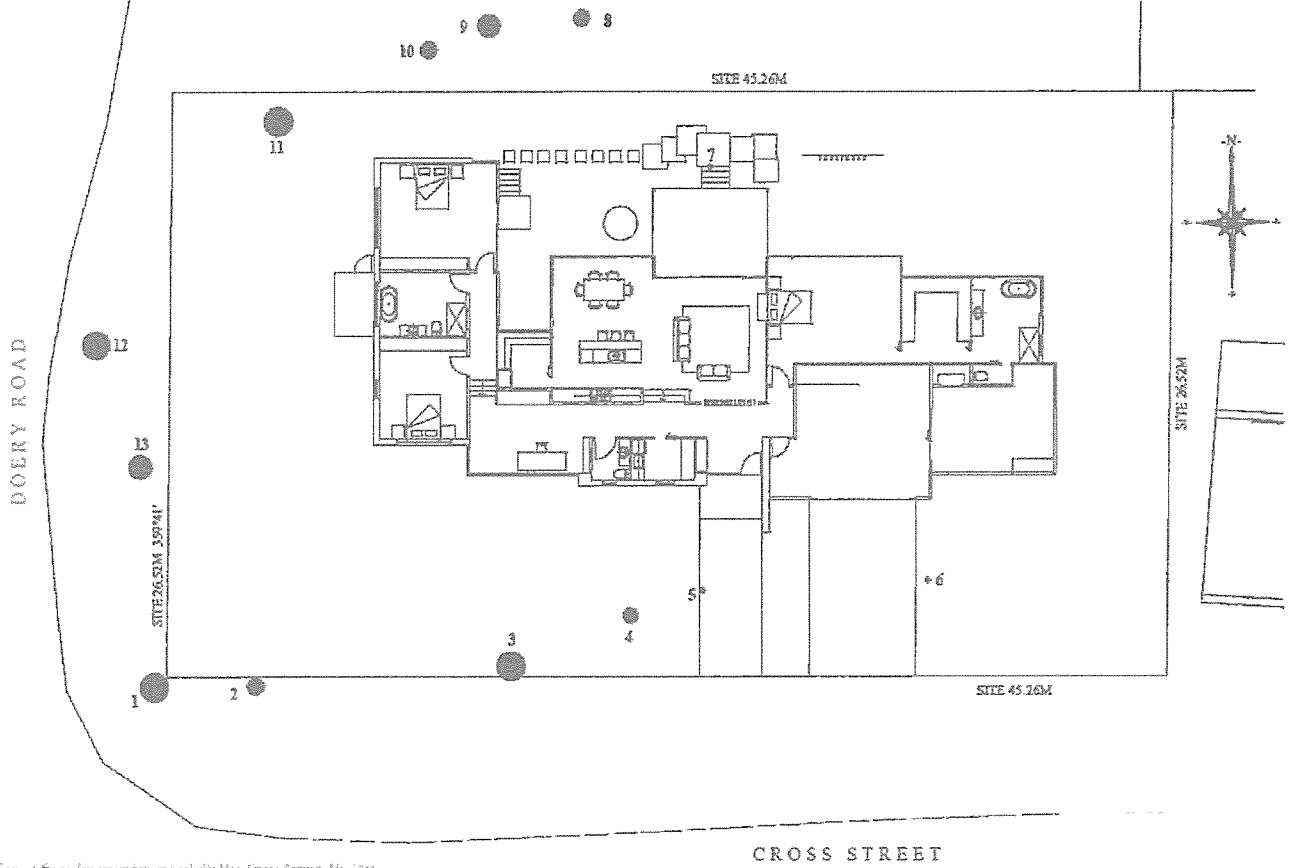
Drawing 2



Drawn by [unclear] Site Plan - Campaign Sites - from original drawings supplied by Marie Frances Architects - May 2018

Tree Report - 3 Cross St Emerald - May 2018
Proposed Development & Trees Assessed

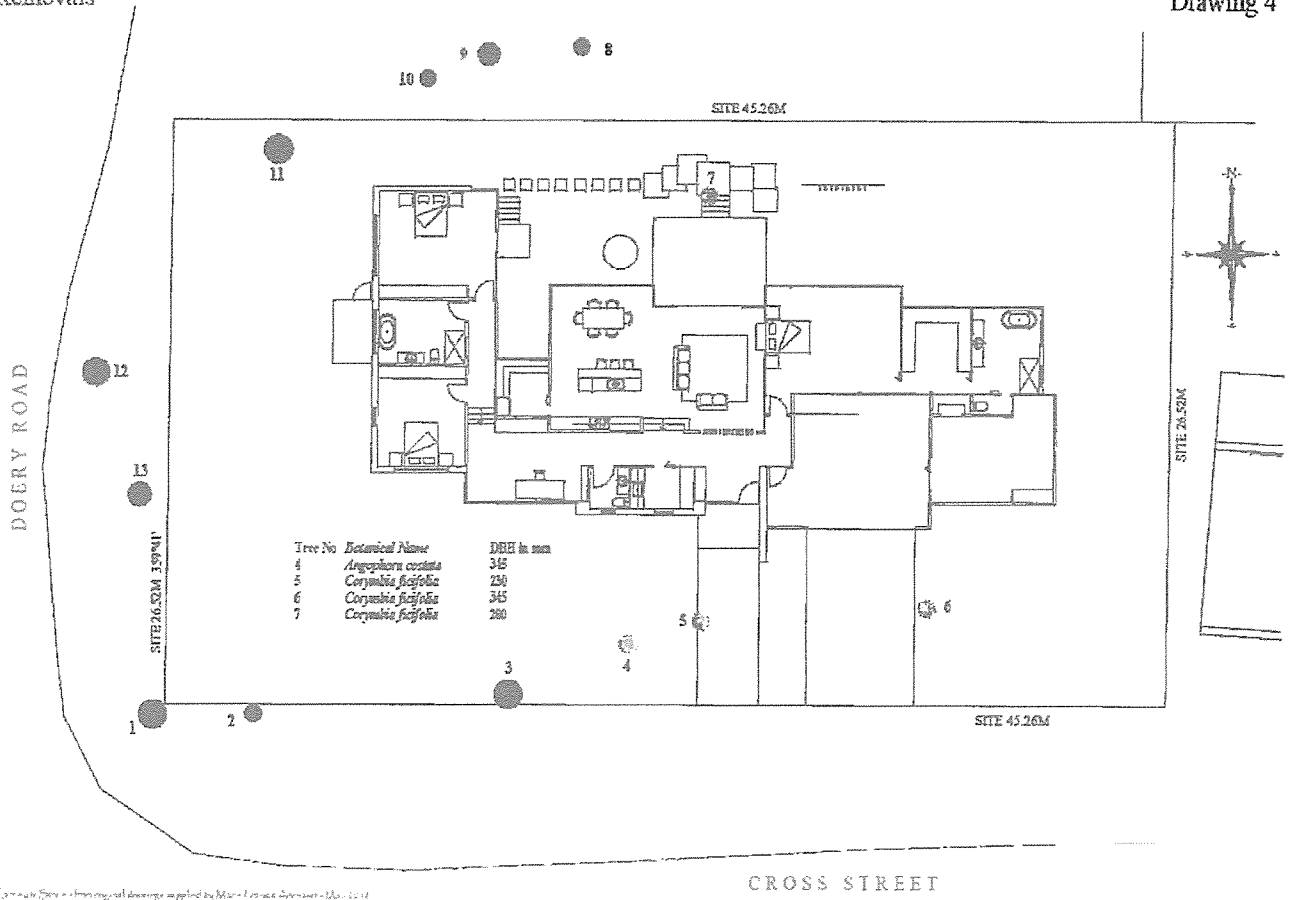
Drawing 3



Drawn by J. Lightfoot & Co. Ltd. Site plan and proposed development prepared by M. J. P. & A. J. P. Architects, May 2018

Tree Report - 3 Cross St Emerald - May 2018
Proposed Removals

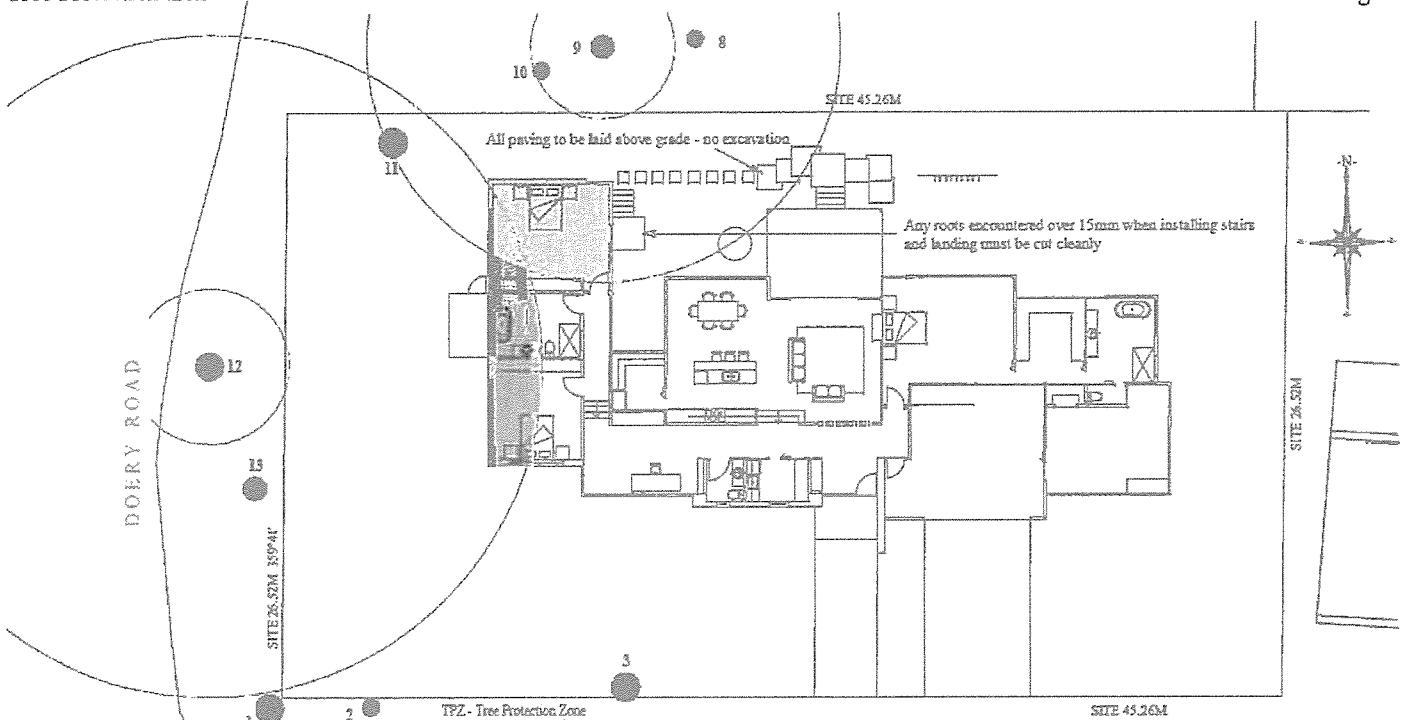
Drawing 4



Drawn by: [Faint Name] - Copyright [Faint Name] - All original drawings supplied by [Faint Name] - Emerald - May 2018

Tree Report - 3 Cross St Emerald - May 2018
 Tree Protection Zones Australian Standard AS4970:2009 - Trees 9 & 12

Drawing 5



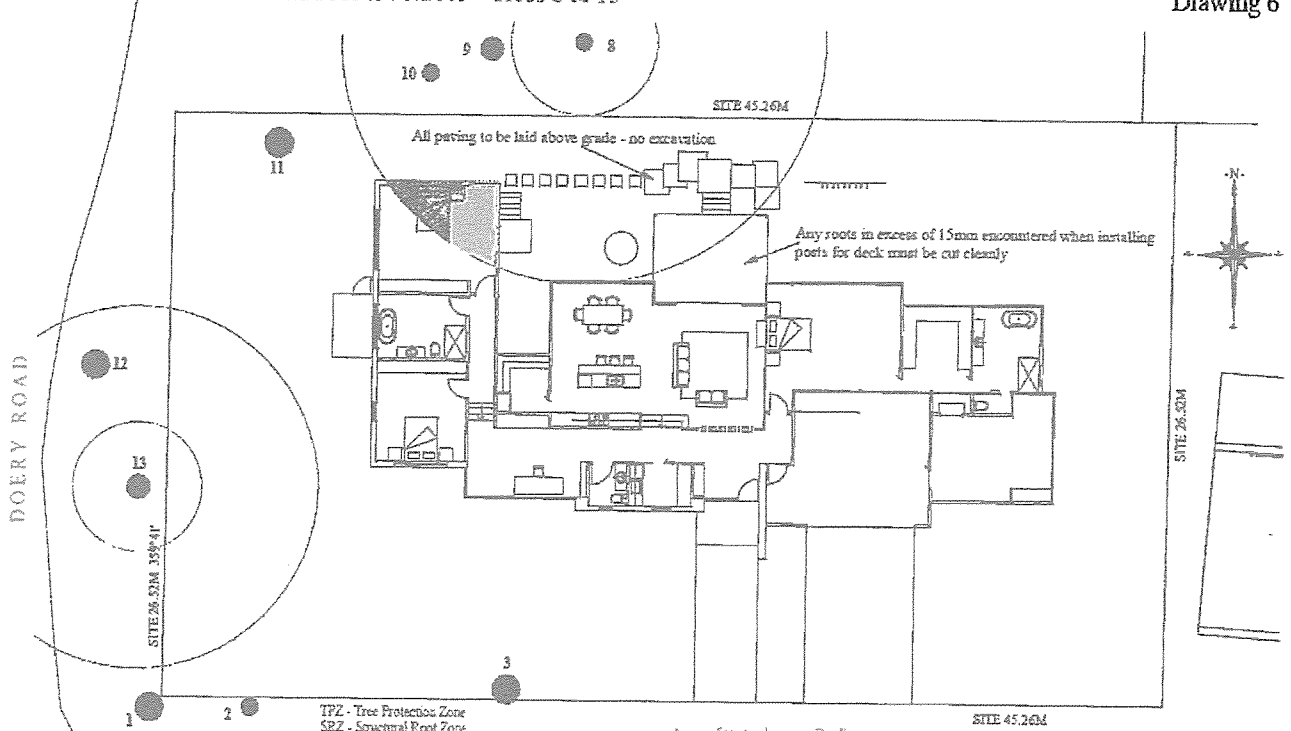
No	DBH in mm	Diam D for SRZ in m	Radius of TPZ 12xDBH in m	Area of TPZ in m ²	Structural Root Zone (SRZ) (D=50) 4x2x0.64 in m ²	Dwelling Distance from tree	10% of TPZ Area in m ²	Area Affected in m ²	% of TPZ Affected
1	810	0.89	9.72	296.93	3.15	14.21	29.69	0.00	0.00%
2	560	0.62	6.72	141.93	2.70	13.17	14.19	0.00	0.00%
3	940	1.03	11.28	399.69	3.36	7.96	39.99	22.33	5.58%
8	910	1.00	10.92	374.77	3.31	7.15	37.46	12.12	3.24%
9	890	0.98	10.68	358.48	3.28	5.69	35.85	24.04	6.71%
10	655	0.72	7.86	194.16	2.88	4.49	19.42	15.59	8.03%
11	1060	1.17	12.72	508.55	3.53	3.87	50.85	46.93	9.22%
12	1380	1.52	13.00	767.14	3.94	11.89	76.71	24.00	3.09%
13	685	0.75	8.22	212.37	2.64	10.00	21.24	0.00	0.00%

The condition below applies to Tree 12.
 *A TPZ should not be less than 2 m nor greater than 15 m
 (except where crown protection is required) * (AS4970:2009)

Drawn by: [unclear] Site Plan & [unclear] from original drawings supplied by [unclear] Emerald - May 2018

Tree Report - 3 Cross St Emerald - May 2018
 Tree Protection Zones Australian Standard AS4970:2009 - Trees 8 & 13

Drawing 6

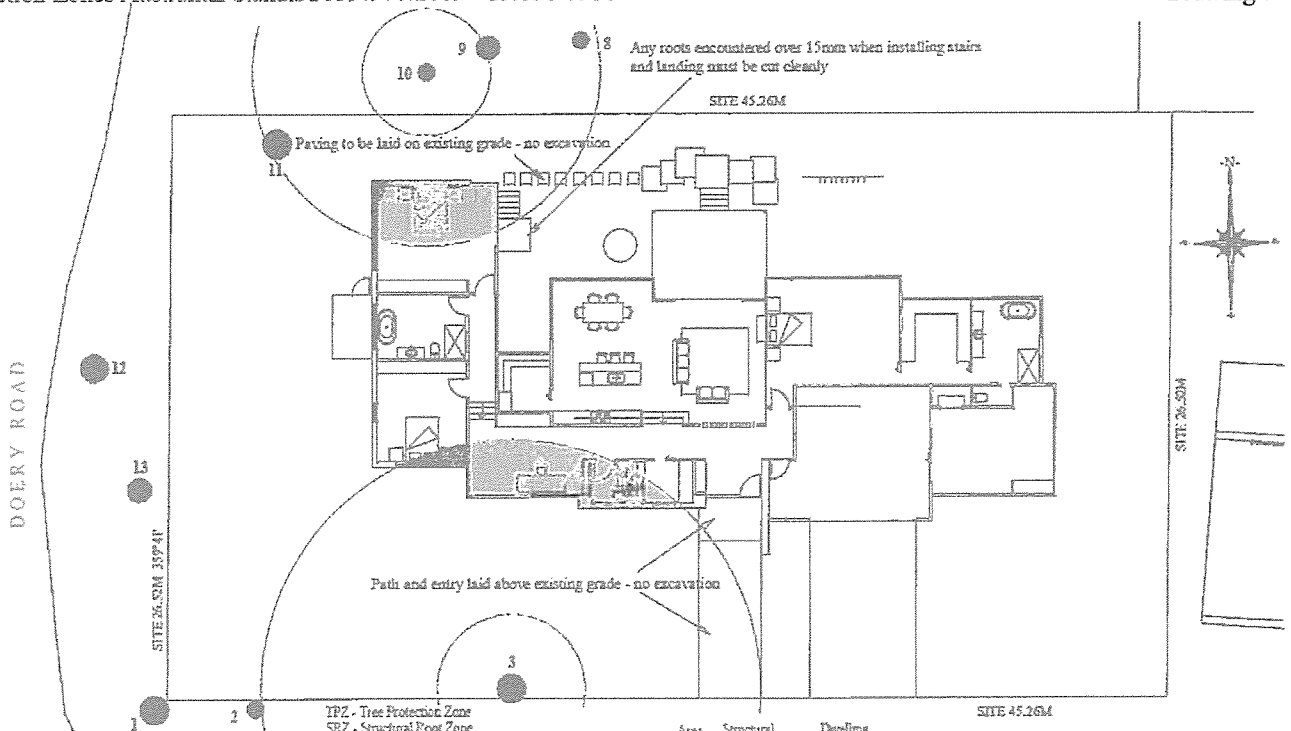


No	DBH mm	Diam D for SRZ m	Radius of TPZ 1.2xDBH m	Area of TPZ m ²	Structural Root Zone (SRZ) Dist ² (D ² x 0.42 x 0.6)	Distance from tree	10% of TPZ Area m ²	Area Affected m ²	% of TPZ Affected
1	810	0.89	9.72	296.93	3.15	14.21	29.89	0.00	0.00%
2	560	0.62	6.72	141.49	2.70	13.17	14.19	0.00	0.00%
3	940	1.09	11.28	399.89	3.36	7.96	39.99	21.33	5.58%
8	910	1.00	10.92	374.77	3.31	7.15	37.48	12.13	3.24%
9	850	0.92	10.08	358.46	3.26	5.69	35.85	24.04	6.71%
10	615	0.72	7.86	194.15	2.86	4.49	19.42	15.55	8.03%
11	1060	1.17	12.72	408.51	3.53	3.87	50.85	48.93	9.62%
12	1280	1.52	15.60	407.14	3.94	11.89	70.71	24.00	3.39%
13	685	0.75	8.22	112.36	2.94	10.00	21.24	0.00	0.00%

Drawn by [Name], Checked by [Name], All tree protection drawings supplied by [Name] on [Date]

Tree Report - 3 Cross St Emerald - May 2018
 Tree Protection Zones Australian Standard AS4970:2009 - Trees 3 & 10

Drawing 7



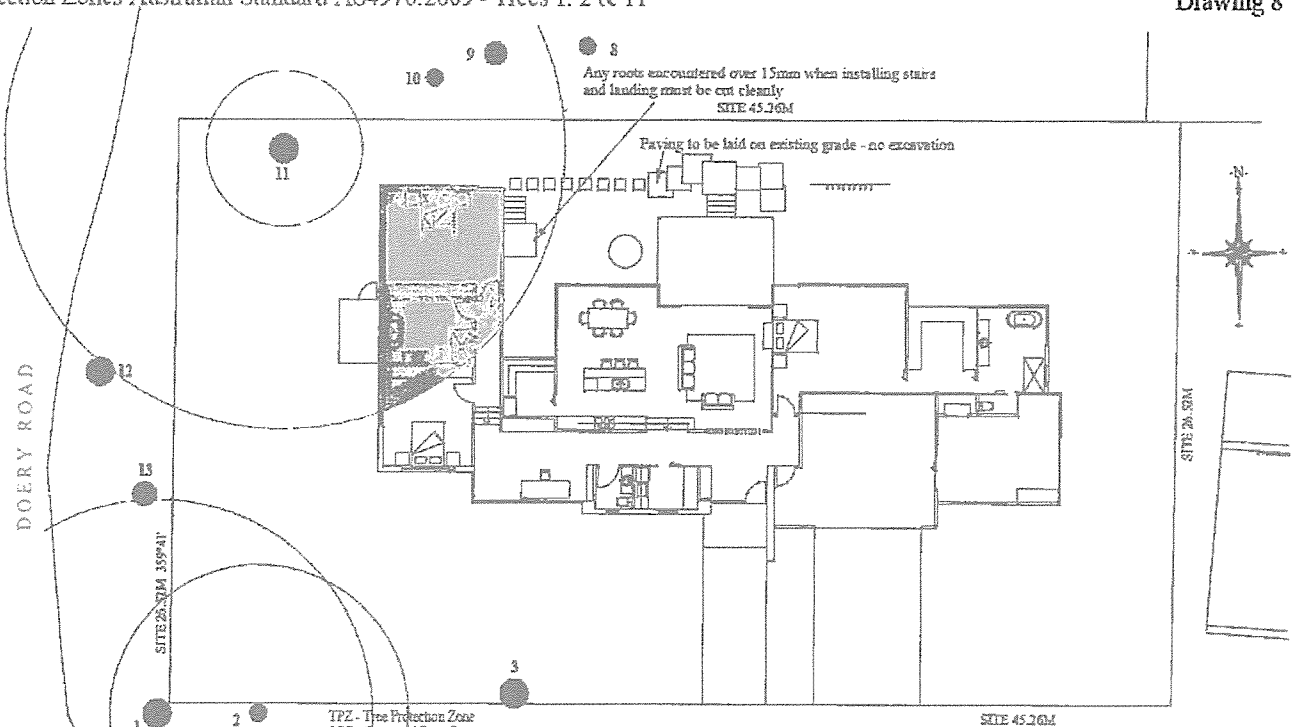
No	DBH in mm	Diam D for SRZ in m	Radius of TPZ 12xDBH in m	Area of TPZ in m ²	Structural Root Zone (SRZ) (D=50) in m ²	Dwelling Distance from tree in m	10% of TPZ in m ²	Area Affected in m ²	% of TPZ Affected
1	810	0.89	9.72	296.93	3.15	14.21	29.69	0.00	0.00%
2	560	0.62	6.72	141.93	2.70	13.17	14.19	0.00	0.00%
3	940	1.03	11.28	399.89	3.36	7.96	39.99	22.35	5.58%
4	910	1.00	10.92	374.77	3.31	7.15	37.48	12.13	3.24%
9	890	0.98	10.68	358.45	3.28	5.69	35.85	24.04	6.71%
10	655	0.72	7.86	194.16	2.68	4.49	19.42	15.55	8.03%
11	1060	1.17	12.72	508.51	3.53	3.87	50.85	4.92	9.62%
12	1380	1.52	15.00	707.14	3.94	11.89	70.71	24.00	3.39%
13	685	0.75	8.22	212.50	2.94	10.00	21.24	0.00	0.00%

The condition below applies to Tree 12.
 A TPZ should not be less than 2 m nor greater than 15 m
 (except where crown protection is required).*(AS4970:2009)

Drawn by [Name] and Checked by [Name] - from original survey supplied by [Name] - Emerald - May 2018

Tree Report - 3 Cross St Emerald - May 2018
 Tree Protection Zones Australian Standard AS4970:2009 - Trees 1, 2 & 11

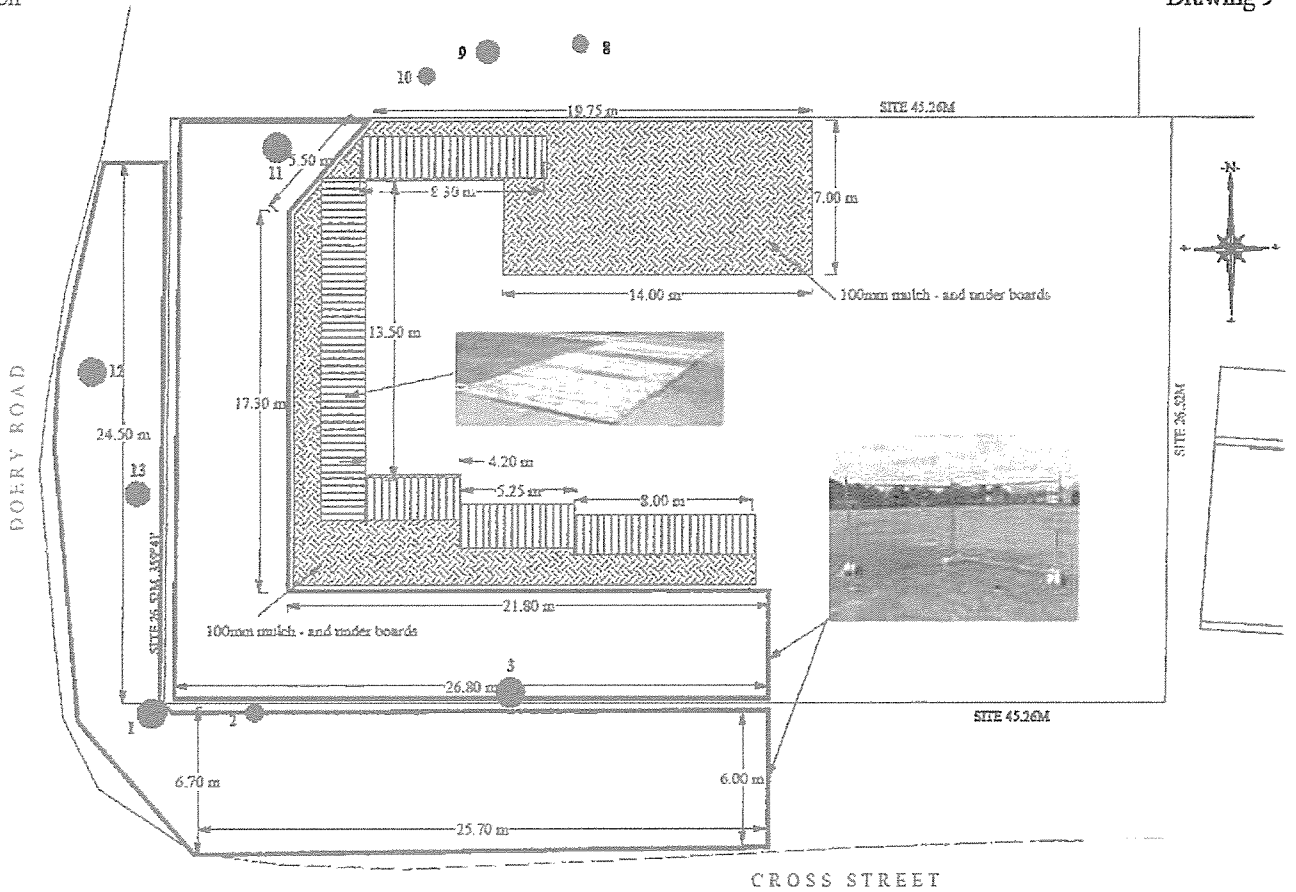
Drawing 8



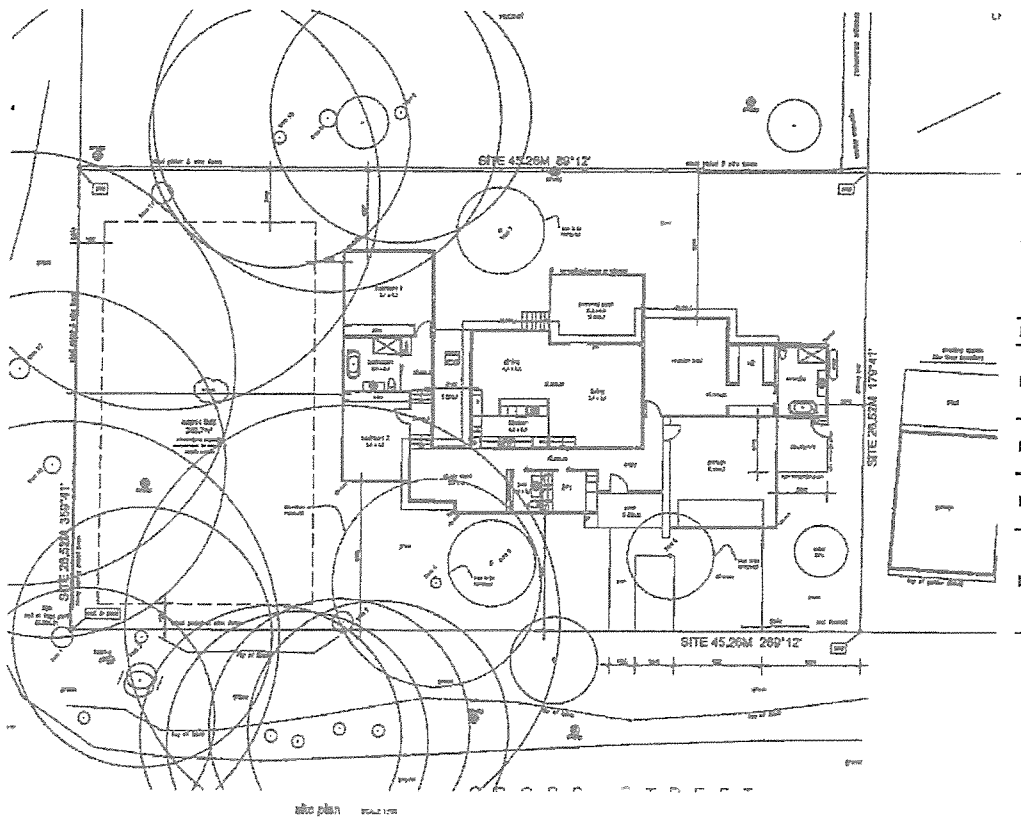
No	DBH in mm	Diam D for SRZ m	Radius of TPZ 1/2xDBH in m	Area of TPZ in m ²	Structural Root Zone (SRZ) (Dx.50/0.42x 0.64) in m ²	Dwelling Distance from tree	10% of TPZ in m ²	Area Affected in m ²	% of TPZ Affected
1	810	0.89	9.72	296.93	3.15	14.71	29.69	0.00	0.00%
2	500	0.62	6.72	141.93	2.70	13.17	14.19	0.00	0.00%
3	940	1.03	11.26	399.59	3.26	7.96	39.99	22.33	5.58%
6	910	1.00	10.92	374.77	3.31	3.15	37.48	12.13	3.24%
9	890	0.92	10.68	358.48	3.28	5.69	35.85	24.04	6.71%
10	655	0.72	7.86	194.16	2.68	4.49	19.42	15.99	8.03%
11	1060	1.17	12.72	508.11	3.52	3.63	50.82	1.93	0.62%
12	1380	1.52	15.90	787.14	3.94	11.89	78.71	24.00	3.39%
13	685	0.75	8.22	212.17	2.94	10.00	21.24	0.00	0.00%

The condition below applies to Tree 12.
 'A TPZ should not be less than 2 m nor greater than 15 m (except where crown protection is required)' (AS4970:2009)

Drawn by: [Name] - Checked by: [Name] - Approved by: [Name] - Date: [Date]



Drawn by: [redacted] Concept Site & Planning drawings supplied by [redacted] Emerald - May 2018



CONSTRUCTION IN SUBURBIA AREA
 This is a preliminary drawing and is not to be used for construction purposes. It is intended for use as a guide only. All dimensions are in meters unless otherwise stated. The drawing is subject to change without notice.

GENERAL NOTES

- 1. All dimensions are in meters unless otherwise stated.
- 2. The drawing is subject to change without notice.
- 3. The drawing is not to be used for construction purposes.
- 4. The drawing is intended for use as a guide only.
- 5. All dimensions are in meters unless otherwise stated.
- 6. The drawing is subject to change without notice.
- 7. The drawing is not to be used for construction purposes.
- 8. The drawing is intended for use as a guide only.
- 9. All dimensions are in meters unless otherwise stated.
- 10. The drawing is subject to change without notice.
- 11. The drawing is not to be used for construction purposes.
- 12. The drawing is intended for use as a guide only.
- 13. All dimensions are in meters unless otherwise stated.
- 14. The drawing is subject to change without notice.
- 15. The drawing is not to be used for construction purposes.
- 16. The drawing is intended for use as a guide only.
- 17. All dimensions are in meters unless otherwise stated.
- 18. The drawing is subject to change without notice.
- 19. The drawing is not to be used for construction purposes.
- 20. The drawing is intended for use as a guide only.

PROJECT SPECIFICATIONS

AUSTRALIAN STANDARDS

STORMWATER DRAINAGE

SITE DRAINAGE

SEWER

EXTERNAL STEPS/DOORS

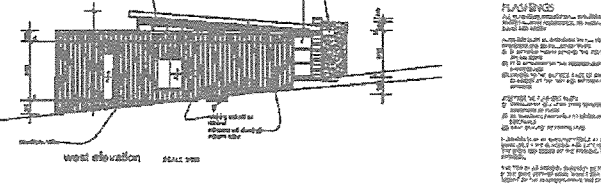
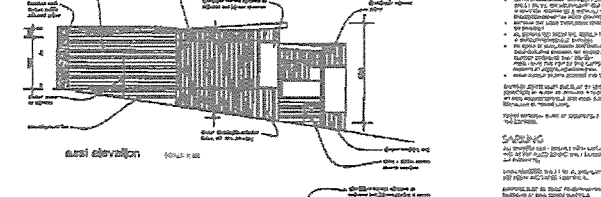
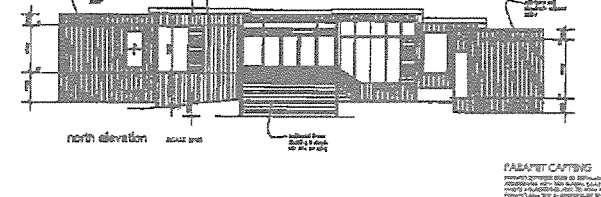
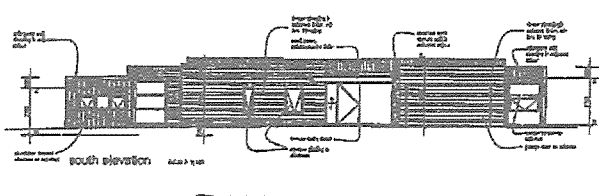
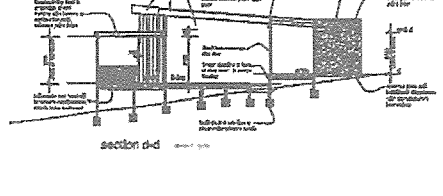
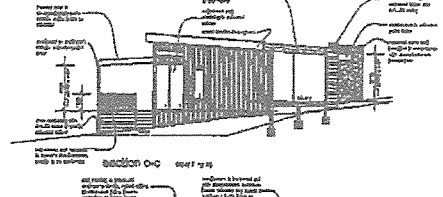
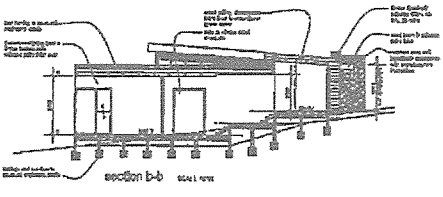
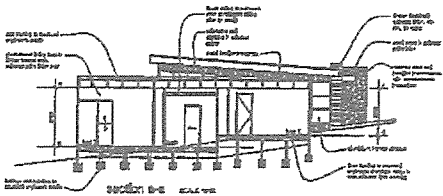
CONCRETE

ENERGY RATINGS

DEVELOPMENT SUMMARY

ITEM	DESCRIPTION	QUANTITY	UNIT
1	CONCRETE	100	m ³
2	STEEL	50	kg
3	BRICKS	1000	no.
4	ROOFING	100	m ²
5	GLASS	10	m ²
6	PAINT	10	liters
7	PLASTER	100	m ²
8	CEILING	100	m ²
9	FLOORING	100	m ²
10	WALLS	100	m ²
11	ROOF	100	m ²
12	FOUNDATION	100	m ²
13	CONCRETE	100	m ³
14	STEEL	50	kg
15	BRICKS	1000	no.
16	ROOFING	100	m ²
17	GLASS	10	m ²
18	PAINT	10	liters
19	PLASTER	100	m ²
20	CEILING	100	m ²
21	FLOORING	100	m ²
22	WALLS	100	m ²
23	ROOF	100	m ²
24	FOUNDATION	100	m ²
25	CONCRETE	100	m ³
26	STEEL	50	kg
27	BRICKS	1000	no.
28	ROOFING	100	m ²
29	GLASS	10	m ²
30	PAINT	10	liters
31	PLASTER	100	m ²
32	CEILING	100	m ²
33	FLOORING	100	m ²
34	WALLS	100	m ²
35	ROOF	100	m ²
36	FOUNDATION	100	m ²
37	CONCRETE	100	m ³
38	STEEL	50	kg
39	BRICKS	1000	no.
40	ROOFING	100	m ²
41	GLASS	10	m ²
42	PAINT	10	liters
43	PLASTER	100	m ²
44	CEILING	100	m ²
45	FLOORING	100	m ²
46	WALLS	100	m ²
47	ROOF	100	m ²
48	FOUNDATION	100	m ²
49	CONCRETE	100	m ³
50	STEEL	50	kg
51	BRICKS	1000	no.
52	ROOFING	100	m ²
53	GLASS	10	m ²
54	PAINT	10	liters
55	PLASTER	100	m ²
56	CEILING	100	m ²
57	FLOORING	100	m ²
58	WALLS	100	m ²
59	ROOF	100	m ²
60	FOUNDATION	100	m ²
61	CONCRETE	100	m ³
62	STEEL	50	kg
63	BRICKS	1000	no.
64	ROOFING	100	m ²
65	GLASS	10	m ²
66	PAINT	10	liters
67	PLASTER	100	m ²
68	CEILING	100	m ²
69	FLOORING	100	m ²
70	WALLS	100	m ²
71	ROOF	100	m ²
72	FOUNDATION	100	m ²
73	CONCRETE	100	m ³
74	STEEL	50	kg
75	BRICKS	1000	no.
76	ROOFING	100	m ²
77	GLASS	10	m ²
78	PAINT	10	liters
79	PLASTER	100	m ²
80	CEILING	100	m ²
81	FLOORING	100	m ²
82	WALLS	100	m ²
83	ROOF	100	m ²
84	FOUNDATION	100	m ²
85	CONCRETE	100	m ³
86	STEEL	50	kg
87	BRICKS	1000	no.
88	ROOFING	100	m ²
89	GLASS	10	m ²
90	PAINT	10	liters
91	PLASTER	100	m ²
92	CEILING	100	m ²
93	FLOORING	100	m ²
94	WALLS	100	m ²
95	ROOF	100	m ²
96	FOUNDATION	100	m ²
97	CONCRETE	100	m ³
98	STEEL	50	kg
99	BRICKS	1000	no.
100	ROOFING	100	m ²

		PRELIMINARY	new dwelling at 9 Cross Street Emerald for: Sue Fectner		1801	1807rd	site plan	1/11/11
								1/11/11



EXTERNAL FINISHES

EXTERNAL FINISHES
 1. EXTERIOR WALLS: 2" MIN. CMU WITH 1/2" GYPSUM BOARD AND FINISH PLASTER OR 4" MIN. CMU WITH 1/2" GYPSUM BOARD AND FINISH PLASTER.
 2. EXTERIOR ROOF: 2" MIN. GYPSUM BOARD WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 3. EXTERIOR FLOORS: 2" MIN. GYPSUM BOARD WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 4. EXTERIOR CEILING: 2" MIN. GYPSUM BOARD WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 5. EXTERIOR DOORS: 1 1/2" MIN. SOLID CORE DOOR WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 6. EXTERIOR WINDOWS: 1 1/2" MIN. SOLID CORE WINDOW WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 7. EXTERIOR STAIRS: 1 1/2" MIN. SOLID CORE STAIR WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 8. EXTERIOR BALCONY: 2" MIN. GYPSUM BOARD WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 9. EXTERIOR TERRACE: 2" MIN. GYPSUM BOARD WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 10. EXTERIOR PORCH: 2" MIN. GYPSUM BOARD WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.

INTERNAL WATERPROOFING

INTERNAL WATERPROOFING
 1. BATHROOMS: 1/2" MIN. POLYETHYLENE GLYCOL (PEGL) MEMBRANE WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 2. KITCHENS: 1/2" MIN. POLYETHYLENE GLYCOL (PEGL) MEMBRANE WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 3. LAUNDRY: 1/2" MIN. POLYETHYLENE GLYCOL (PEGL) MEMBRANE WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 4. TERRACES: 1/2" MIN. POLYETHYLENE GLYCOL (PEGL) MEMBRANE WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 5. PORCHES: 1/2" MIN. POLYETHYLENE GLYCOL (PEGL) MEMBRANE WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 6. BALCONIES: 1/2" MIN. POLYETHYLENE GLYCOL (PEGL) MEMBRANE WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 7. STAIRS: 1/2" MIN. POLYETHYLENE GLYCOL (PEGL) MEMBRANE WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 8. HALLWAYS: 1/2" MIN. POLYETHYLENE GLYCOL (PEGL) MEMBRANE WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 9. BEDROOMS: 1/2" MIN. POLYETHYLENE GLYCOL (PEGL) MEMBRANE WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 10. LIVING ROOMS: 1/2" MIN. POLYETHYLENE GLYCOL (PEGL) MEMBRANE WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.

FABRICATION

FABRICATION
 1. FABRICATE ALL METALWORK TO A FINISH OF POLISHED OR BRUSHED STEEL.
 2. FABRICATE ALL WOODWORK TO A FINISH OF OAK OR MAPLE.
 3. FABRICATE ALL GLASSWORK TO A FINISH OF CLEAR OR TINTED GLASS.
 4. FABRICATE ALL CERAMICWORK TO A FINISH OF GLOSS OR MATTE.
 5. FABRICATE ALL PLASTERWORK TO A FINISH OF SMOOTH OR TEXTURED PLASTER.
 6. FABRICATE ALL GYPSUM BOARD TO A FINISH OF SMOOTH OR TEXTURED GYPSUM BOARD.
 7. FABRICATE ALL DOORS AND WINDOWS TO A FINISH OF SOLID CORE OR ALUMINUM CLAD.
 8. FABRICATE ALL STAIRS TO A FINISH OF SOLID CORE OR ALUMINUM CLAD.
 9. FABRICATE ALL BALCONIES TO A FINISH OF SOLID CORE OR ALUMINUM CLAD.
 10. FABRICATE ALL TERRACES TO A FINISH OF SOLID CORE OR ALUMINUM CLAD.

INTERNAL FINISHES

INTERNAL FINISHES
 1. INTERIOR WALLS: 1/2" MIN. GYPSUM BOARD WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 2. INTERIOR ROOF: 1/2" MIN. GYPSUM BOARD WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 3. INTERIOR FLOORS: 1/2" MIN. GYPSUM BOARD WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 4. INTERIOR CEILING: 1/2" MIN. GYPSUM BOARD WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 5. INTERIOR DOORS: 1 1/2" MIN. SOLID CORE DOOR WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 6. INTERIOR WINDOWS: 1 1/2" MIN. SOLID CORE WINDOW WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 7. INTERIOR STAIRS: 1 1/2" MIN. SOLID CORE STAIR WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 8. INTERIOR BALCONY: 1/2" MIN. GYPSUM BOARD WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 9. INTERIOR TERRACE: 1/2" MIN. GYPSUM BOARD WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 10. INTERIOR PORCH: 1/2" MIN. GYPSUM BOARD WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.



CONCRETE
 ALL CONCRETE SHALL BE 4000 PSI STRENGTH.
 ALL CONCRETE SHALL BE CAST AND CURED PROPERLY.
 ALL CONCRETE SHALL BE FINISHED TO A SMOOTH OR TEXTURED FINISH.

FRAMING
 ALL FRAMING SHALL BE 2x4 OR 2x6 DIMENSIONS.
 ALL FRAMING SHALL BE TYPED AND NAIL SET.
 ALL FRAMING SHALL BE FINISHED TO A SMOOTH OR TEXTURED FINISH.

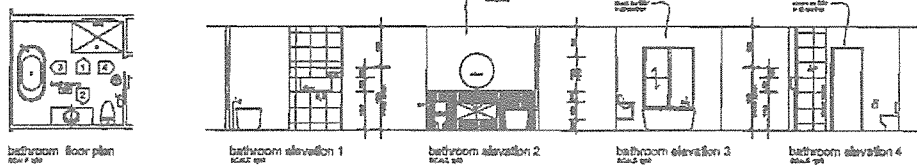
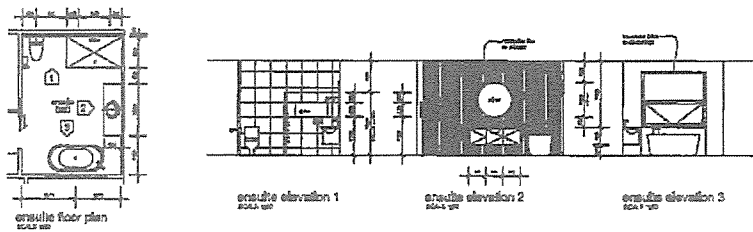
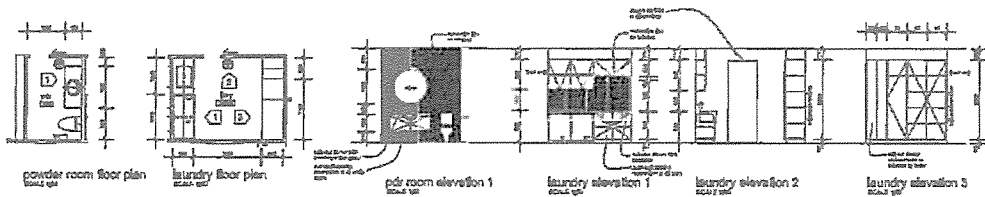
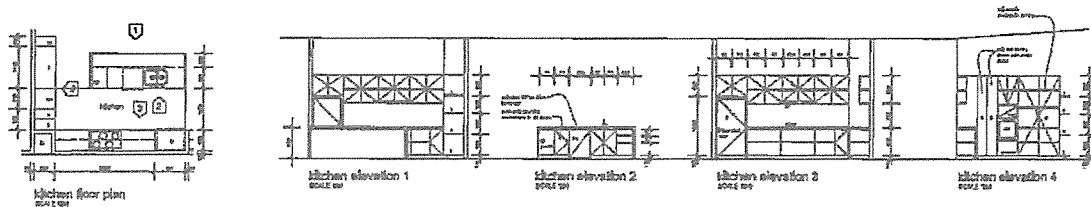
ROOFING
 ALL ROOFING SHALL BE 1/2" MIN. GYPSUM BOARD WITH 1/2" MIN. GYPSUM BOARD AND FINISH PLASTER.
 ALL ROOFING SHALL BE FINISHED TO A SMOOTH OR TEXTURED FINISH.

FINISHES
 ALL FINISHES SHALL BE TO THE SATISFACTION OF THE ARCHITECT.
 ALL FINISHES SHALL BE FINISHED TO A SMOOTH OR TEXTURED FINISH.

GENERAL NOTES
 1. ALL WORK SHALL BE TO THE SATISFACTION OF THE ARCHITECT.
 2. ALL WORK SHALL BE FINISHED TO A SMOOTH OR TEXTURED FINISH.

PROJECT INFORMATION
 PROJECT NO. 1801
 PROJECT NAME: new dwelling at 5 Cross Street Emerald for Sue Fedner

DATE
 1981
SCALE
 1/8"=1'-0"



- PLUMBING SCHEDULE**
 ALL PLUMBING SHALL BE INSTALLED IN ACCORDANCE WITH THE 2015 INTERNATIONAL PLUMBING CODE (IPC) AND THE 2015 INTERNATIONAL RESIDENTIAL CODE (IRC) UNLESS OTHERWISE SPECIFIED.
- 1. 1/2" DIA. GALV. STEEL DWV
 - 2. 1/2" DIA. COPPER DWV
 - 3. 1/2" DIA. COPPER DWV
 - 4. 1/2" DIA. COPPER DWV
 - 5. 1/2" DIA. COPPER DWV
 - 6. 1/2" DIA. COPPER DWV
 - 7. 1/2" DIA. COPPER DWV
 - 8. 1/2" DIA. COPPER DWV
 - 9. 1/2" DIA. COPPER DWV
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 - 97. 1/2" DIA. COPPER DWV
 - 98. 1/2" DIA. COPPER DWV
 - 99. 1/2" DIA. COPPER DWV
 - 100. 1/2" DIA. COPPER DWV



Bushfire Mitigation Measures - Mandatory Condition
 The bushfire protection measures forming part of this permit or shown on the endorsed plans, including those relating to construction standards, defendable space, water supply and access, must be maintained to the satisfaction of the responsible authority on a continuing basis. This condition continues to have force and effect after the development authorised by this permit has been completed.

- a) **Defendable Space**
 Defendable space is provided for a distance of 30 metres around the dwelling or to the property boundary whichever is the lesser and managed in accordance with the following:
- Grass must be short cropped and maintained during the declared fire danger period.
 - All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
 - Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.
 - Plants greater than 10 centimetres in height must not be placed within 3m of a window or glass feature of the building.
 - Shrubs must not be located under the canopy of trees.
 - Individual and clumps of shrubs must not exceed 5 sq. metres in area and must be separated by at least 5 metres.
 - Trees must not overhang or touch any elements of the building.
 - The canopy of trees must be separated by at least 5 metres.
 - There must be a clearance of at least 2 metres between the lowest tree branches and ground level.
- b) **Construction Standard**
 Dwelling designed and constructed to a minimum Bushfire Attack Level of BAL29
- c) **Water Supply**
 A static water tank dedicated solely for firefighting must be provided and must meet the following requirements:
- An effective capacity of 10,000 litres
 - Be stored in an above ground water tank constructed of concrete or metal.
 - Have all fixed above ground water pipes and fittings required for firefighting purposes made of corrosion resistant metal.
 - Include a separate outlet for occupant use.
- A 10,000 litre water supply is required, therefore the following fire authority fittings and access must be provided:
- Be readily identifiable from the building or appropriate identification signage to the satisfaction of the relevant fire authority.
 - Be located within 60 metres of the outer edge of the approved building.
 - The outlet/s of the water tank must be within 4 metres of the accessway and unobstructed.
 - Incorporate a separate ball or gate valve (British Standard Pipe (BSP) 65 millimetre) and coupling (64 millimetre CFA 3 thread per inch male fitting).
 - Any pipework and fittings must be a minimum of 65 millimetres (excluding the CFA coupling).
- d) **Access**
 Access Required: Yes. The following design and construction requirements apply:
- All-weather construction.
 - A load limit of at least 15 tonnes.
 - Provide a minimum trafficable width of 3.5 metres.
 - Be clear of encroachments for at least 0.5 metres on each side and at least 4 metres vertically.
 - Curves must have a minimum inner radius of 10 metres.
 - The average grade must be no more than 1 in 7 (14.9%) (6.1°) with a maximum grade of no more than 1 in 5 (20%) (11.3°) for no more than 50 metres.
 - Dips must have no more than a 1 in 6 (12.5%) (7.1°) than 0.50 metres.] entry and exit angle.



BUSHFIRE CONSULTANT

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 Email: bushfireconsultants@bushfireconsultants.com.au

Rev	Description	Date
A	FAST SUBMISSION	20/04/24
B	FAST SUBMISSION	20/04/24

SCALE: BUILDING PERMIT

CLIENT: BLUE PIGEONER

TITLE: BUSHFIRE MANAGEMENT PLAN

PROJECT: NEW SINGLE STORY DWELLING

3 CROSS STREET EMERALD

NO.	DATE	BY
1	20/04/24	AS SHOWN
2	20/04/24	AS SHOWN

PROJECT NO.	DRAWING NO.	REVISED
1017	101	B

Construction BAL Rating = 29





BPAD3

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CONSULTANT**

SBMS19017

3 Gross Street Emerald

23-Mar-2020



SBMS19017

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BUSHFIRE MANAGEMENT STATEMENT**Information Table**

Application Pathway	Pathway Smarter Application Preset Scheduled Single Dwelling	
Document ID	SBMS19017	
Property Address	3 Cross Street Emerald	
Lot & Plan Number	Lot 18 LP10554	
Area	1210sqm	
Council	CARDINIA	
Applicant		
Name	Sue Fechner	
Phone		
Email	suefech@gmail.com	
Address		
Agent		
Company	Marie Francis Architects	
Contact	Marie Francis	
Phone	03 9511 0438	
Email	marie@mariefrancisarchitect.com.au	
Address	PO Box Mount Waverley 3149	
Fireguard Australia		
Consultant	Laurie Heath	
Mobile	0417 728 845	
Email	bushfireconsultant@fireguardaustralia.com.au	
Postal	PO Box 5020 HEATHWOOD Ringwood VICTORIA 3134	
Revision	Date	Details
A	20-Aug-2018	First Submission
B	23-Mar-2020	Revised Siting Plan of Dwelling on BMP and Report

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Smarter Application Bushfire Management Statement (SBMS)



1. Introduction

Smarter bushfire protection measures for single dwellings have been preset in some locations by a Schedule to the Bushfire Management Overlay. This Smarter Application Bushfire Management Statement has been prepared as the property is in a Schedule to the Bushfire Management Overlay.

This is a Smarter Pathway application - Construction of a single dwelling in a Scheduled Bushfire Management Overlay zone.

1.1 Preparation of this report

Accredited Practitioner	David Heath	
FPAA Accreditation No	30269	
Signature		
Date	23-Mar-2020	

1.2 Notes pertaining to the compilation of this report

The site assessment was conducted on:	17 August 2018
The owner was:	not at the site.

2. Project Outline

2.1 Project Description

New Single Story Dwelling on residential block



3. Site Details

3.1 Council Details

Name	CARDINIA	
Postal	PO Box 7 Pakenham VIC 3810	
Address	Civic Centre at 20 Siding Avenue, Officer.	
Telephone	1300 787 624	
Email	mail@cardinia.vic.gov.au	

3.2 Zoning Details

BMO Schedule Note	In addition to the Bushfire Management Overlay, this site is subject to a BMO2 schedule & the following planning zone:	
Overlay and Zone Classification	GREEN WEDGE A ZONE (GWAZ) GREEN WEDGE A ZONE - SCHEDULE 2 (GWAZ2) BUSHFIRE MANAGEMENT OVERLAY - SCHEDULE 2 (BMO2) ENVIRONMENTAL SIGNIFICANCE OVERLAY (ESO)	
Special Condition		

4. Project Proposal Drawings

The Client has provided: 1 Plan	drawings of the proposed construction.
The Client has provided: 1 Plan	drawings of the site.

4.1 Drawing Register

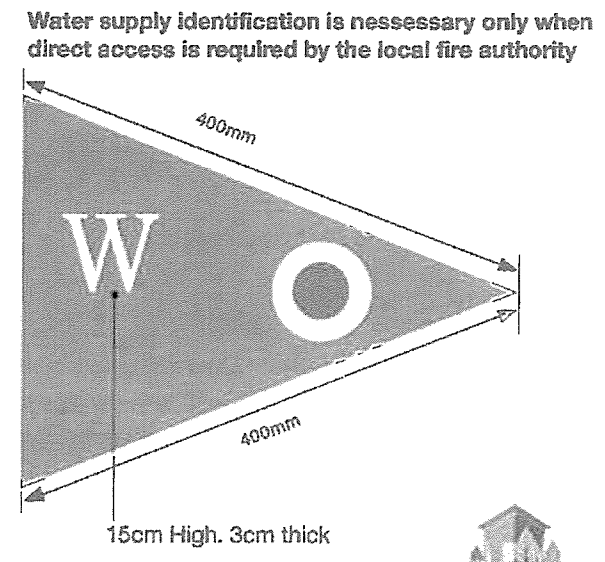
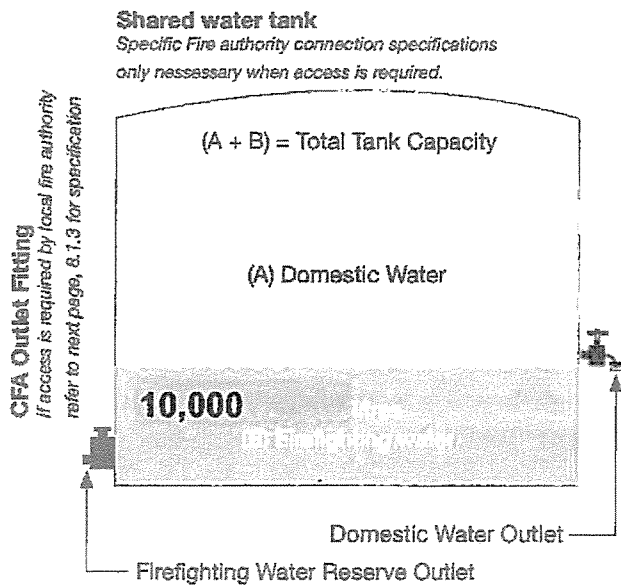
Title	Date	Revision
bal site plan _ 20200320.pdf	20-Mar-2020	02
bal elevs _ 20200320.pdf	20-Mar-2020	02

5. Reference VPPs

- Clause 44.06 Bushfire Management Overlay
- Clause 53.02 Bushfire Planning

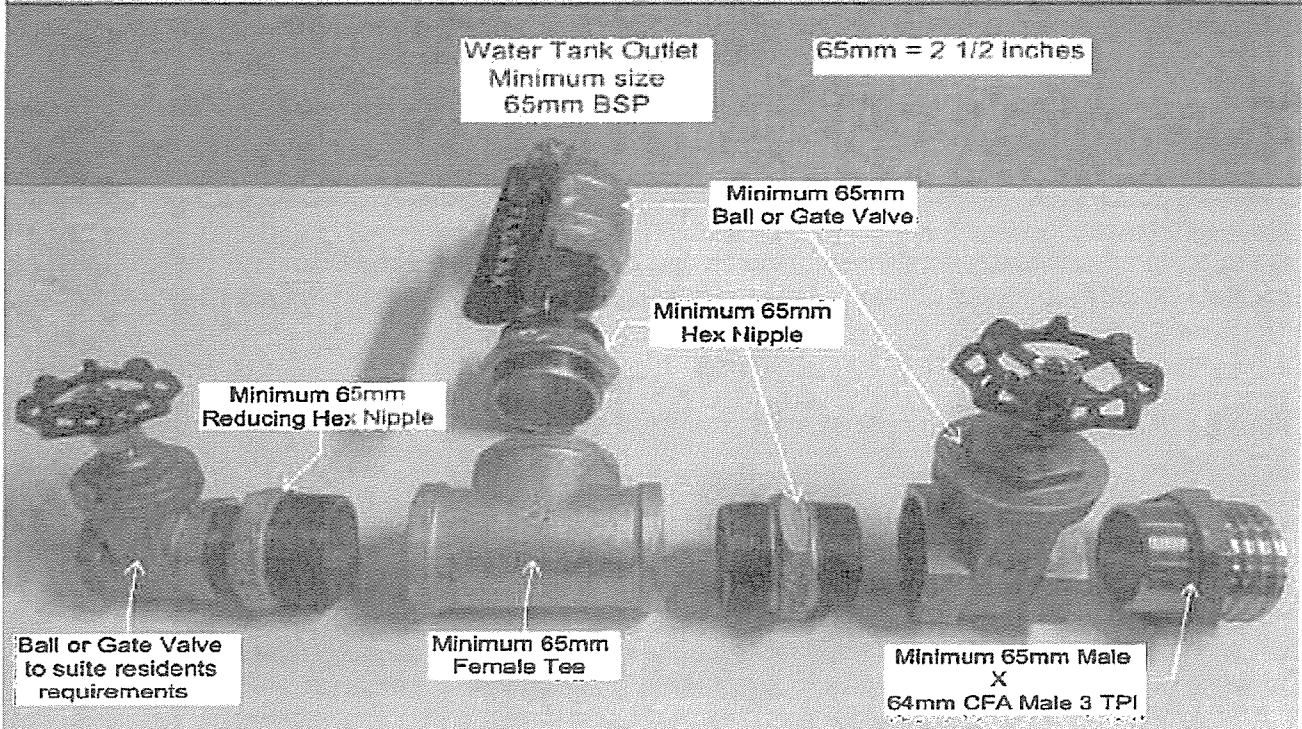


Static Water Supply and Fittings				Checklist
Lot Sizes (Square metres)	Hydrant available	Capacity (litres)	Fire authority fittings and access required	
1,001 and above	Not applicable	10,000	Yes	<input checked="" type="checkbox"/>
Design Requirements				Checklist
<p>For all water tank capacities the following requirements apply:</p> <ul style="list-style-type: none"> be stored in an above ground water tank constructed of concrete or metal have all fixed above ground water pipes and fittings required for fire fighting purposes made of corrosive resistant material, and include a separate outlet for occupant use. <p>Where a 10,000 & greater litre water supply is required the following fire authority fittings apply:</p> <ul style="list-style-type: none"> the water supply must be readily identifiable from the building or appropriate identification signage to the satisfaction of the relevant fire authority. The water supply must be located within 60 metres of the outer edge of the approved building. The outlet/s of the water tank must be within 4 metres of the accessway and unobstructed. The water supply must incorporate a separate ball or gate valve British Standard Pipe (BSP 65 millimetre) and coupling (64 millimetre CFA 3 thread per inch male fitting). Any pipework and fittings must be a minimum of 65 millimetres (excluding the CFA coupling). <p>(Refer to Diagram Below)</p>				<input checked="" type="checkbox"/>

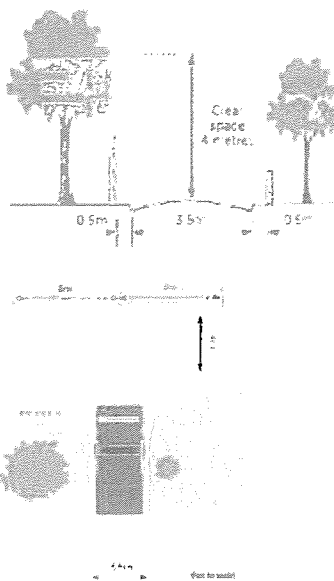


Static Water Supply and Fittings (cont.) & Access for Fire Fighting

Requirement Diagrams - Fittings Above, Access for Fire Fighting Below

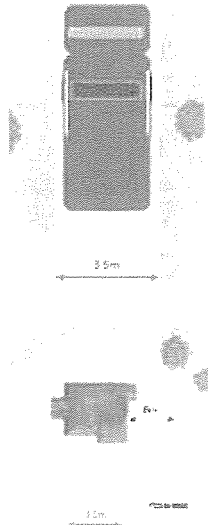


Encroachments for >30m



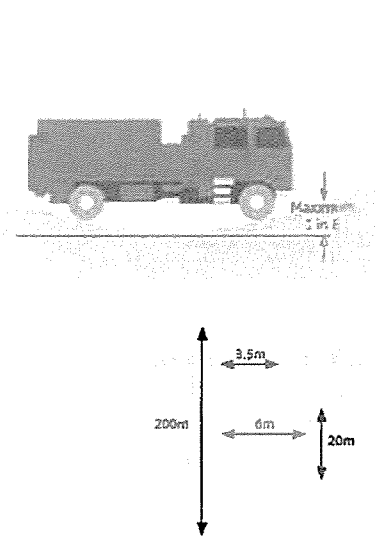
For >100m

Width for >30m



For >100m

Dips & Gradients >30m



For >200m

Note: A hydrant is available if it is located within 120 metres of the rear of the building.
 Note: The length of access should be measured from a public road to either the building or the water supply outlet, whichever is longer.



7.2 Vehicle access (or part thereof) of a length specified below implements the design and construction requirements specified.		Checklist
Access for Fire Fighting		
Less than 30m	<ul style="list-style-type: none"> Where fire authority access to the water supply is required, fire authority vehicles must be able to get within 4 metres of the water supply outlet. There are no other design and construction requirements. 	<input checked="" type="checkbox"/>
Is access required?		
Greater than 30m	<p>If access is required, the following Design and Construction requirements apply:</p> <ol style="list-style-type: none"> All-weather construction. A load limit of at least 15 tonnes. Provide a minimum trafficable width of 3.5 metres. Be clear of encroachments for at least 0.5 metres on each side and at least 4 metres vertically. Curves must have a minimum inner radius of 10 metres. The average grade must be no more than 1 in 7 (14.4%) (8.1°) with a maximum grade of no more than 1 in 5 (20%) (11.3°) for no more than 50 metres. Dips must have no more than a 1 in 8 (12.5 per cent) (7.1 degrees) entry and exit angle. 	<input type="checkbox"/>
Greater than 100m	<p>In addition to the above requirements:</p> <ol style="list-style-type: none"> A turning area for fire fighting vehicles must be provided close to the building by one of the following: <ul style="list-style-type: none"> - A turning circle with a minimum radius of 8 metres - A driveway encircling the dwelling The provision of other vehicle turning heads – such as T or Y head – which meet the specification of Austroad Design for an 8.8 metre Service Vehicle. 	<input type="checkbox"/>
Greater than 200m	<p>In addition to the above requirements:</p> <ol style="list-style-type: none"> Passing bays must be provided at least every 200 metres. Passing bays must be a minimum 20 metres long with a minimum trafficable width of six metres. 	<input type="checkbox"/>

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Below Banner displayed onsite during site assessment

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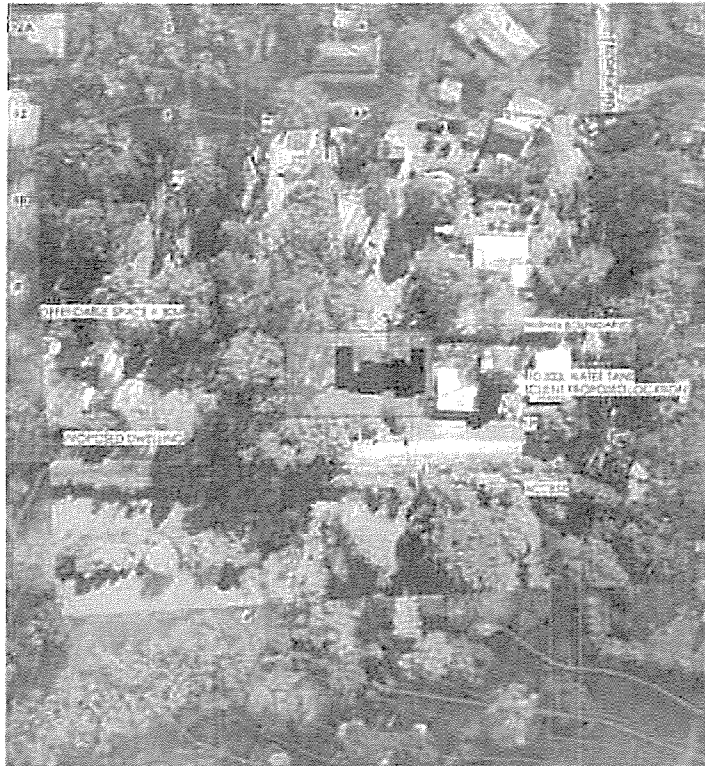



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Bushfire, Drone, CAD + Mngt. Services Fire Protection Reports and Services

8. Bushfire Management Plan

Note: Reduced BMP Only. Please refer to the Fullsize A3 Copy



Construction BAL Rating = 29



Bushfire Mitigation Measures - Mandatory Condition
The bushfire protection measures, forming part of this permit or shown on the endorsed plans, including those relating to construction standards, defensible space, water supply and access, must be maintained to the satisfaction of the responsible authority on a continuing basis. This condition continues to have force and effect until the development outlined by this permit has been completed.

- a) Defendable Space**
Defensible space is provided for a minimum of 30 metres around the dwelling or to the property boundary whichever is the lesser and managed in accordance with the following:
- Grass must be short cropped and maintained during the declared fire danger period.
 - All extra and vegetation weeds must be removed at regular intervals during the declared fire danger period.
 - Within 10 metres of a building flammable objects must not be located close to the vulnerable parts of the building.
 - Plants greater than 10 centimetres in height must not be placed within 5m of a window or glassed area of the building.
 - Shrubs must not be located under the canopy of trees.
 - Individual and clumps of shrubs must not exceed 5 sq. metres in area and must be separated by at least 5 metres.
 - Trees must not overhang or overhangy structures of the building.
 - The canopy of trees must be separated by at least 5 metres.
 - There must be a clearance of at least 2 metres between the lowest live branches and ground level.

b) Construction Standard
Dwelling designed and/or constructed to a minimum Bushfire Attack Level of BAL29.

c) Water Supply
A static water tank dedicated solely for firefighting must be provided and must meet the following requirements:

- An effective capacity of 10,000 litres.
- Be stored in an above ground water tank constructed of concrete or metal.

- Have an 80mm above ground water pipe and fitting, required for firefighting purposes made of corrosion resistant metal.
- Include a separate outlet for occupational use.
- A 10,000 litre water supply is required, therefore the following fire authority fittings and access must be provided:
 - Be readily identifiable from the building or appropriate identification signage to the satisfaction of the relevant fire authority.
 - Be located within 40 metres of the site edge of the approved building.
 - The outlets of the water tank must be within 4 metres of the accessibility and unobstructed.
 - Incorporate a separate ball or gate valve (British Standard Pipe (BSP) 65 mm (2 1/2 inch) and coupling (44 millimetre CFA 3 thread per inch male fitting).
 - Any pipework and fittings must be a minimum of 25 millimetres (excluding the CFA coupling).

- d) Access**
Access Required: Yes. The following design and construction requirements apply:
- All-weather construction.
 - A least 4m of at least 15 tonnes.
 - Provide a minimum trafficable width of 3.5 metres.
 - Be clear of encroachments for at least 0.5 metres on each side and at least 4 metres vertically.
 - Curves must have a minimum inner radius of 10 metres.
 - The average grade must be no more than 1 in 7 (14.3%) (2.1%) with a maximum grade of no more than 1 in 5 (20%) (1.3%) for no more than 30 metres.
 - Driveway must have no more than a 1 in 5 (20%) (1.3%) entry and exit angle.



Approved by Fireguard Australia

For a permit to be issued, a copy of this plan must be submitted to Fireguard Australia.

Approved by Fireguard Australia

Approved by Fireguard Australia

Approved by Fireguard Australia

Approved by Fireguard Australia

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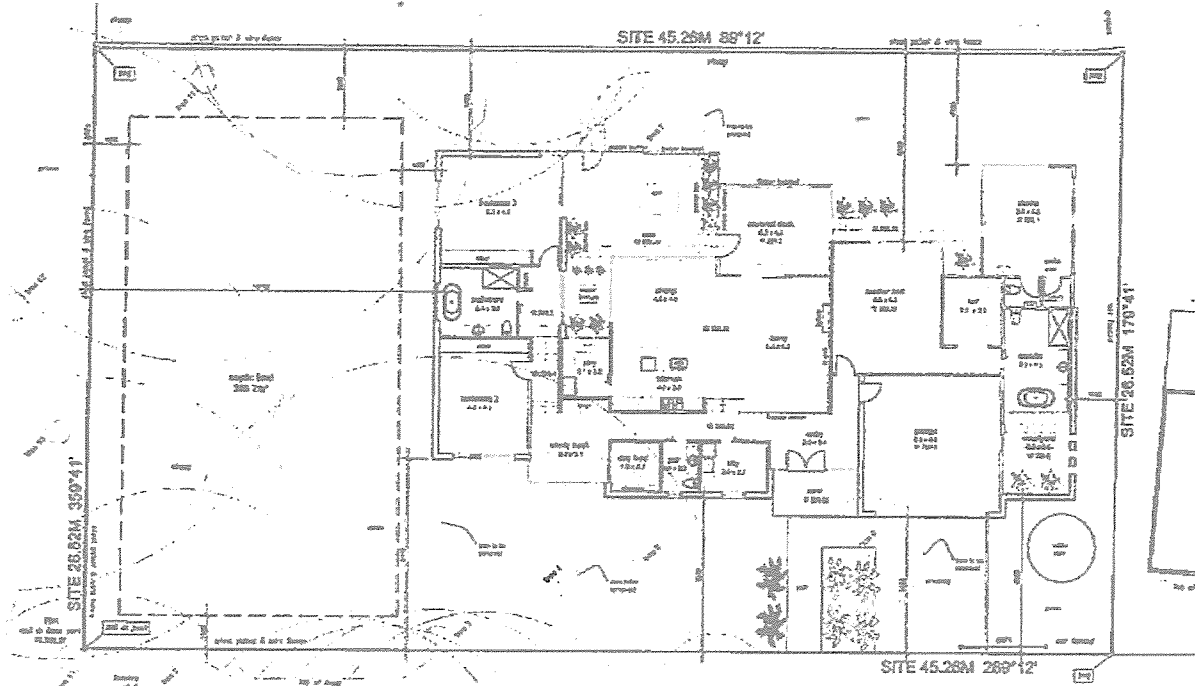
Approved by Fireguard Australia

Fireguard Australia in promulgating this Bushfire Management Statement (BMP) undertook a site assessment and has addressed the following BMP aspects:

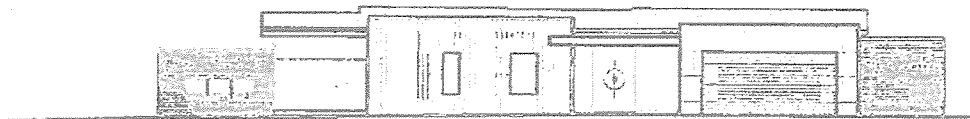
8.1 Bushfire Management Plan Checklist	Checklist
The location of the dwelling and all other buildings on the site (are shown on the BMP)	<input checked="" type="checkbox"/>
The area to be managed for defensible space (has been identified in the BMP)	<input checked="" type="checkbox"/>
Location of any hydrants within 120 metres of building (shown on the BMP)	<input checked="" type="checkbox"/>
Access to the property (identified on BMP) including construction details	<input checked="" type="checkbox"/>
The dwelling bushfire attack level construction is detailed in the BMP	<input checked="" type="checkbox"/>
The location of the static water supply is shown on the BMP	<input checked="" type="checkbox"/>
The size of the static water supply (in litres) is detailed	<input checked="" type="checkbox"/>
Written conditions of bushfire protection measures contained in BMP according to checklist.	<input checked="" type="checkbox"/>



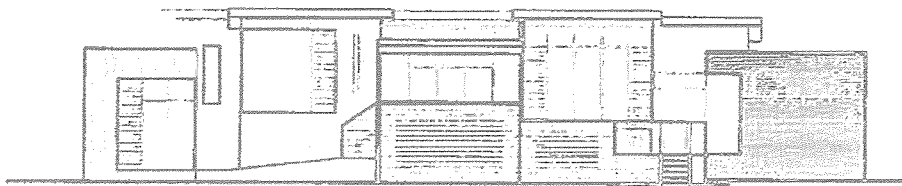
9. Appendix 1.0: Client's proposed development drawings



floor plan SCALE 1:100



south elevation SCALE 1:100



north elevation SCALE 1:100



10. Directional Site Assessment Photographs: Vegetation & Topography

10.1 North of Site



Figure 1 North Low threat vegetation View Position ground

Residential property maintained with 7-8 degree downslope for at least 80m.

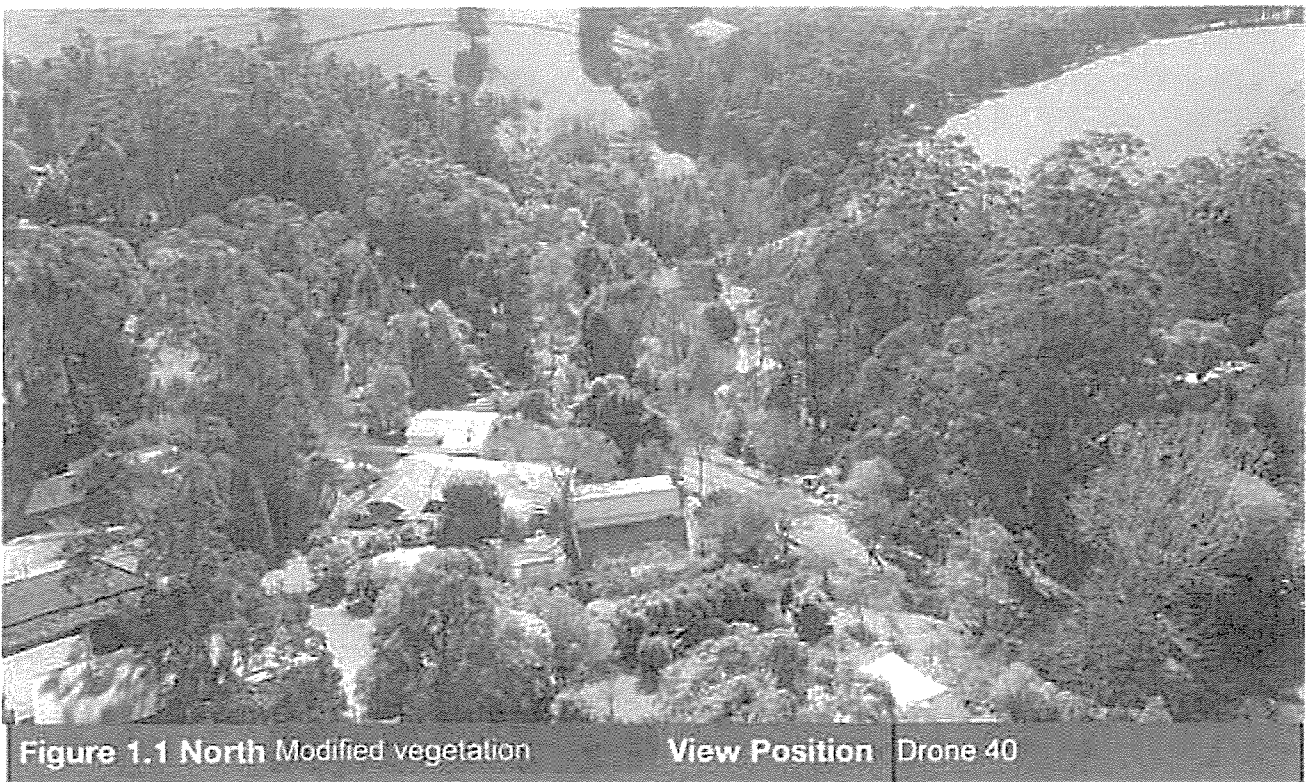
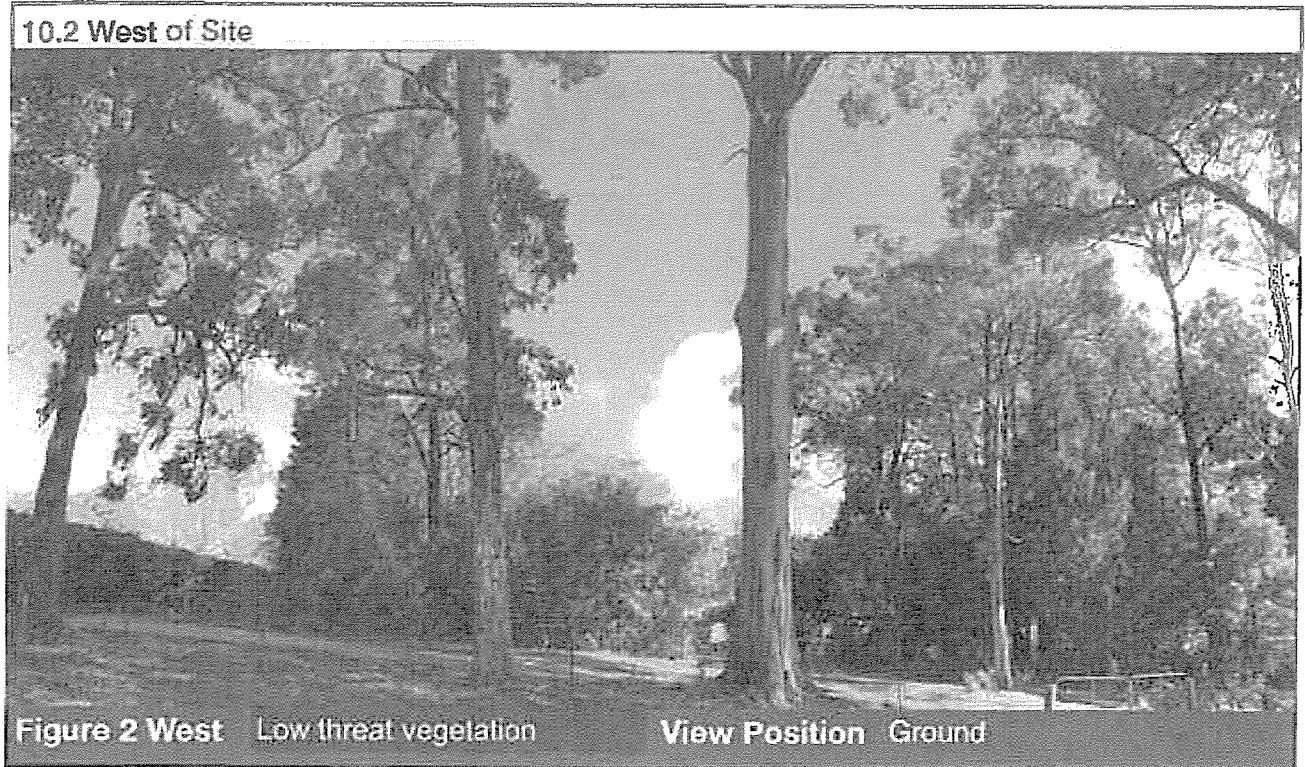


Figure 1.1 North Modified vegetation View Position Drone 40

Residential property maintained with 7-8 degree downslope descending into a gully beyond 150m





34-41m tall trees along property boundary.



34m to 41m tall trees along western boundary, with vegetation extending over roadway into adjacent property. 2.8 degrees downslope for at least 60m to next residential house.



10.3 South of Site



Figure 3 South Modified vegetation View Position Ground

14m, 34m upto 40m high trees along property boundary.



Figure 3.1 South Modified vegetation View Position Drone @60

Upslope from road.



10.4 East of Site



Figure 4 East Low threat vegetation View Position Ground

Setout from property fenceline 5100mm.
Flat for near 65+m to return road.

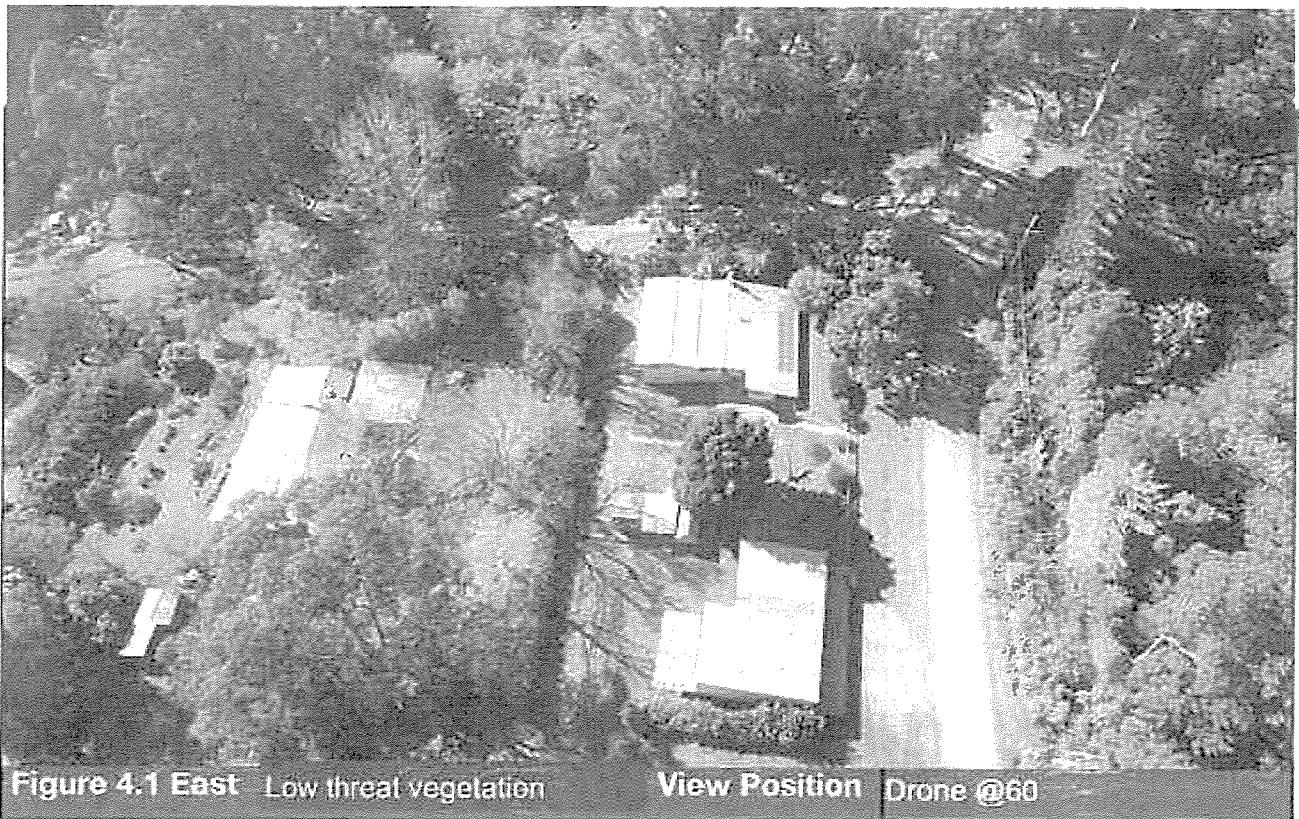


Figure 4.1 East Low threat vegetation View Position Drone @60

2x residential blocks to roadway corner where nearest FP is located.



2.5 Access of Site



Figure 5 Access

View Position Ground

Proposed driveway runs through the centre of the rear wheel of the car within image. Slope down at 7.5 degrees from road curb.



Figure 5.1 Main Threat

Modified vegetation

View Position

Ground

Large 34-41m high Trees surround the Western end of the property.



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**BPAD3
BUSHFIRE
CONSULTANT**

Proposed New dwelling

3 Cross Street, Emerald

VIC 3782

**PROPOSED DEEMED-TO-SATISFY ELEMENTAL PROVISIONS
FOR DEMONSTRATING COMPLIANCE WITH
NCC 2019 Vol 2.0 Part 2.6 (Energy Efficiency)**

19 July 2021

File EMD0715



Revision	Date	Prepared	Approved	Status
0	19/07/2021	MA - PT	AK	Submitted for client review

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10. Appendix D: Building Drawings	25

2. Executive Summary

Subject to the conditions and requirements noted in this report, the proposed building is considered to comply with NCC Volume two, Part 2.6 requirements.

The thermal performance requirements of building fabric are summarised in the table below. Refer to insulation mark-ups indicating the extent of any added insulations.

Roof/ceilings	Ceiling type	Solar Absorptance	Total R-value (m ² K/W)	Added Insulation R-value (m ² K/W)	Insulation equivalent to
External roof	-	any	5.29	0.98*	Bradford Thermoseal Roof Metal Wall (double-sided anti-glare foil)
Ceilings	Flat/raked	-	-	4.1	Bradford Gold ceiling batts (215mm)

* Reflective insulation must be double-sided reflective foil and installed as per manufacturer guideline to create the assumed reflective air gaps. The air gap thickness, ventilation of the air gap and type of foil define whether reflective insulation is installed correctly or not.

Walls	Cavity type	Total R-value (m ² K/W)	Added Insulation R-value (m ² K/W)	Insulation equivalent to
External timber cladding walls	-	2.82	2.5	Knauf acoustic roll (24 kg/m ³ - 90mm)
External metal cladding walls	-	2.92	2.7	Knauf acoustic roll (32 kg/m ³ - 90mm)
Garage external rammed earth wall	-	2.91	2.5	Knauf acoustic roll (24 kg/m ³ - 90mm)

Glazing	Location	U-value (W/m ² K)	SHGC	Glazing equivalent to
W03-W04	Refer to Glazing Calculator	2.60	0.55	Dowell TB Aluminium Awning DG 4Clr/12Ar/4Clr (DOW-021-04 B)
W06	Refer to Glazing Calculator	2.71	0.56	Sovereign 900 Series Double Hung-Al Spacer 4/14/4 (SOV-020-01 W)
All other windows & glazed doors	Refer to Glazing Calculator	2.91	0.61	Bradnams Signature Fixed 100 DG 4ET-10Ar-4Clr (BRD-086-13 A)

Floors	Flooring	Total R-value (m ² K/W)	Added Insulation R-value (m ² K/W)	Insulation equivalent to
External suspended floors	any	2.87	2.1	Bradford Optimo Underfloor Insulation Batt (75mm)

Note: The proposed insulation is just an example. Any equivalent brand/model that can provide similar added R-values can be used instead of the above.

Prescriptive Requirements; In addition to the compliance requirements above, there are further prescriptive Part 2.6 requirements that must be adhered to. These are outlined in different sections of this report. Note that Part 2.6 Deemed to Satisfy (DtS) energy compliance approach is elemental and prescriptive and it cannot be changed. The above energy requirements can only be changed using the energy Performance Solution compliance approach.

To assure that the final "For Construction" documents follow the conditions and requirements stipulated in this document, please refer to the notes across this energy compliance report. Refer to appendices for the illustration of the location of the proposed added insulation.

3. Introduction

Torple Energy has been engaged to summarize the Deemed to Satisfy (DtS) thermal Performance Requirement for the proposed new dwelling at 3 Cross St, Emerald, Victoria in compliance with Part 2.6 of the NCC 2019 (Volume 2.0). This report is based on plans that are attached in Section 10 of this report.

Note that the final "For construction" plans (refer to Section 10) should be updated to reflect the proposed provisions listed in this report.

Compliance to NCC Vol 2.0 Part 2.6 is described in Part 3.12. Note that Part 2.6 energy compliance approach in this report is Elemental Provisions which is described in explanatory information of NCC Vol 2.0 Part 3.12.0 as Option 2. Therefore, this report provides elemental provisions and minimum information for the proposed building to meet:

- Part 3.12.1, for the building fabric; and
- Part 3.12.2, for the external glazing and shading; and
- Part 3.12.3, for building sealing; and
- Part 3.12.4, for air movement
- Part 3.12.5, Services

As these provisions are elemental and prescriptive and it cannot be changed. Torple Energy can also provide energy compliance under NCC 2019 Performance Solution (also called Verification Using a Reference Building). Performance solution is used instead of the DtS Provisions of Parts 3.12.1 to 3.12.4. It provides flexibility where the Elemental Provisions may not work for certain building design. The Performance Solution allows for innovation by considering the interaction of the building's fabric elements and services to increase building energy efficiency.

For instance, under the NCC performance solution energy modelling, we can cost-effectively add more insulation to some parts of walls and roofs to compensate for reducing the glazing panes in windows or insulation requirements in other parts of the building such as the building floors. This modelling approach also ascertains that the thermal comfort level inside the building is better than a similar DtS building.

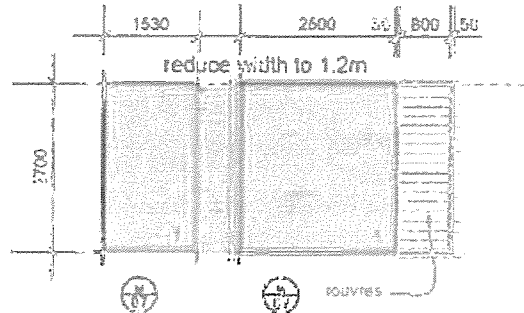
In summary, the NCC Performance Solution allows for:

- Lower cost of insulation
- Lower cost of glazing

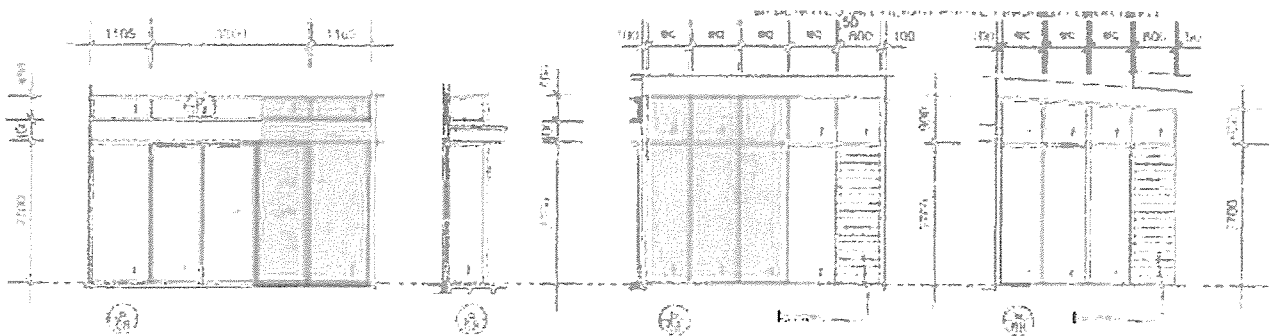
4. Assumptions

This report assumes that:

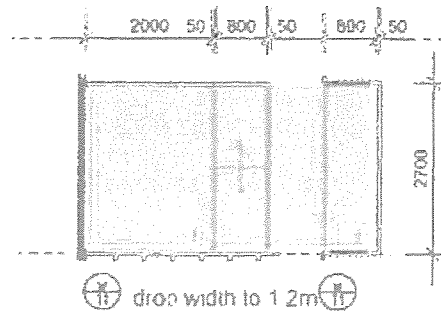
- 1- Roof cladding solar absorptance is more than 0.4
- 2- There are some changes to the window schedule of the plans attached in the Section 10. Below are the summary of these changes:
 - a. W07 width is reduced to 1.2m



- b. Highlighted parts of W08 are removed while keeping openable area of the window as is:



- c. W11 width is reduced to 1.2m while keeping openable area of the window as is:



If the assumption above is not valid, please let us know, and Torple Energy will update this report at no extra cost.

5. Assessor Qualifications

The energy modelling has been undertaken by Dr. Amir Kivi, Energy Assessor from Torple Energy Australia. Amir has 9 years' experience in energy modelling. In particular, he has carried out dozens of energy analyses for commercial and residential energy compliance, and air conditioning design of commercial systems. In the following, a summary of Amir's qualifications is presented:

EDUCATION

- 2015-2016: Certificate 4 in Building and Construction.
- 2015-2016: Certificate 4 in NatHERS (6-star building energy assessment).
- 2011- 2015: PhD in Energy systems (geothermal), Infrastructural Engineering Department, University of Melbourne.
- 2007- 2010: M.Sc. in Civil Engineering
- 2003- 2007: B.Sc. in Civil Engineering

SOFTWARE USED

- Energy Modelling: DesignBuilder, TRNSYS, TRNBuild, LBNL WINDOW, FirstRate5, Carrier HAP, LEAD.
- Other: STORM, NREL System Advisor Model, AutoCAD, Revit.

6. Building function, classification and climate zone

The following Building Classifications (as defined by NCC Vol.2 Part A6) have been identified for this development:

BCA Class	Type of building/structure	Indication
1a	Residential dwelling	✓
1b	Boarding house/guest house	X
2	Apartments	X
2	Common areas	X
3	Hotel, residential care building, ...	X
4	Dwelling in a commercial building	X
5	Office	X
6	Shop	X
6	Restaurant/café	X
7a	Carpark	X
7b	Storage/warehouse	X
8	Laboratory/factory	X
9a	Clinic	X
9a	Ward area	X
9b	Theatre/cinema	X
9b	Conference facility	X
9b	School	X
9c	Aged-care facility	X
10a	Garage/shed	✓

Class 1a
 Class 10a
 — Building envelope

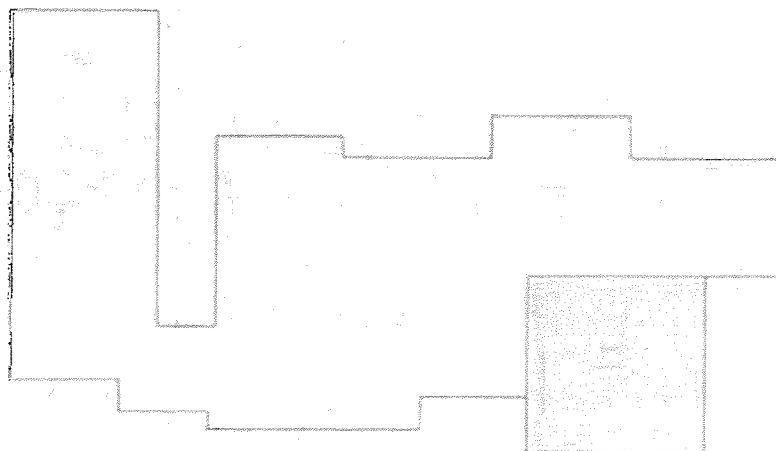


Figure 1: Classification variation and location

The following NCC climate zone (as defined by NCC Vol.2 page 498) applies to this building:



Part 3.12.1 - Building Fabric

The minimum DTS requirements (Elemental Provisions) for the building envelope constructions are listed in the following subsections and is applied to:

- **Class 1 building with an attached Class 10a building.**
Refer to Section 3.12.1.6 for more explanatory information.

3.12.1.1 Building fabric thermal insulation

Where required, insulation must comply with AS/NZS 4859.1 and be installed so that it—

- abuts or overlaps adjoining insulation other than at supporting members such as columns, studs, noggings, joists, furring channels and the like where the insulation must butt against the member; and
- forms a continuous barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and
- does not affect the safe or effective operation of a domestic service or fitting.

Where required, reflective insulation must be installed with—

- the necessary airspace, to achieve the required R-Value between a reflective side of the reflective insulation and a building lining or cladding; and
- the reflective insulation closely fitted against any penetration, door or window opening; and
- the reflective insulation adequately supported by framing members; and
- each adjoining sheet of roll membrane being—
 - o overlapped greater than or equal to 150 mm; or
 - o taped together

Where required, bulk insulation must be installed so that—

- it maintains its position and thickness, other than where it crosses roof battens, water pipes, electrical cabling or the like; and
- in a ceiling, where there is no bulk insulation or reflective insulation in the external wall beneath, it overlaps the external wall by greater than or equal to 50 mm.

3.12.1.2 – Roofs

Selected roof cladding colour determines degree of added insulation to the roof. Assuming roof cladding colour is selected with any solar absorptance value and upward direction of heat flow (Table 3.12.1.1f):

Skillion roof with Colorbond cladding and flat or raked ceiling:

Required minimum total R-value: R5.1– Minimum added insulation: R5.08, Total R-value: R5.29

Section roof with Colorbond cladding and flat or raked ceiling

	Current R value	Added R value
1. Outdoor air film (7 m/s)	0.04	
2. Colorbond cladding	0	
2a. Unventilated air space		0.41
2b. Bradford Thermoseal Roof Metal Wall (double-sided anti glare foil)	0	
2c. Reflective air space		0.56
3. Bradford Cbk ceiling batts (215mm); PC 11171S		5.08
4. Plasterboard Gypsum (10mm)	0.06	
5. Indoor air film (still air)	0.11	
Total R-Value: R5.29	0.21	5.08

The following figure shows the extent of minimum added insulation to the ceilings.

- R0.98 - minimum added reflective insulation (double sided anti-glare foil) to the roof- similar to Bradford Thermoseal Roof Metal Wall
- R4.1 - minimum added bulk insulation to the ceiling - similar to Bradford Gold ceiling batts (215mm)

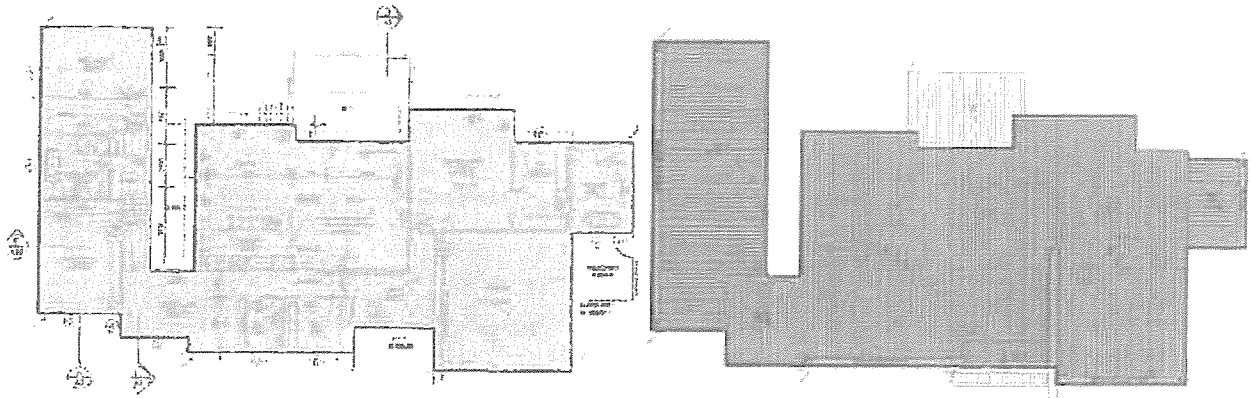


Figure 2: Added insulation to the ceiling

According to the figure below, percentage of ceiling area uninsulated is calculated to be 0.43% and therefore, according to Table 3.12.1.1h, no adjustments is required to compensate for the loss of ceiling insulation (% of loss is less than 0.5).

Location	Chimney	Unflued gas heater	Exhaust fan		Vent/opening to outside		Downlight		Total Penetration area (m ²)
	Sealed?	Sealed?	Number	Sealed?	Area (m ²)	Sealed?	Number	Sealed?	
Master bed + W/R							8	YES	0.06
Ensuite			1	YES			1	YES	0.07
Living/dining/kitchen	YES		1	YES	0.5	YES	13	YES	0.67
Entry/study nook							6	YES	0.05
Powder			1	YES			2	YES	0.08
Laundry			1	YES			2	YES	0.08
Bedroom 2							4	YES	0.03
Bedroom 3							4	YES	0.03
Corridor							2	YES	0.02
Bathroom			1	YES			2	YES	0.08
Garage							4	YES	0.03

Total Ceiling Area =	277
Penetration percentage =	0.43%
Adjustment required to the loss of ceiling insulation?	NO

Assumptions for loss of ceiling insulation calculation:

- Downlight or ceiling sensor penetration dimensions: 90mm x 90mm
- Exhaust fan ceiling penetration dimensions: 250mm x 250mm

3.12.1.3 – Roof Lights

Not applicable.

3.12.1.4 – External walls

Compliance to Part 3.12.1.4 is met provided the external walls meet pre-scribed minimum Total R-values for Climate Zone 6 [Part 3.12.1.4 (b)(ii)].

The following figures show the added R-Value to different wall sections:

External timber cladding walls:

Required minimum total R-value: R2.8– Minimum added insulation: R2.5, Total R-value: R2.82

	Inherent R-Value	Added R-Value
1. Outdoor air film (7 m/s)	0.04	
2. Timber cladding	0.10	
3. Knauf acoustic roll (18 kg/m ³ - 90mm) - PC672651		2.5
4. Plasterboard Gypsum (10mm)	0.06	
5. Indoor air film (still air)	0.12	
Total R-Value: R2.82	0.32	2.5

External metal cladding walls:

Required minimum total R-value: R2.8– Minimum added insulation: R2.7, Total R-value: R2.92

	Inherent R-Value	Added R-Value
1. Outdoor air film (7 m/s)	0.04	
2. Colorbond Cladding	0	
3. Knauf acoustic roll (18 kg/m ³ - 90mm) - PC672651		2.7
4. Plasterboard Gypsum (10mm)	0.06	
5. Indoor air film (still air)	0.12	
Total R-Value: R2.92	0.22	2.7

External metal cladding walls:

Required minimum total R-value: R2.8– Minimum added insulation: R2.5, Total R-value: R2.91

	Inherent R-Value	Added R-Value
1. Outdoor air film (7 m/s)	0.04	
2. Rammed earth wall (400mm)	0.19	
3a. Knauf acoustic roll (18 kg/m ³ - 90mm) - PC672651		2.5
3a. Plasterboard Gypsum (10mm)	0.06	
3. Indoor air film (still air)	0.12	
Total R-Value: R2.91	0.41	2.5

Figure below demonstrates added insulation location and specification:

R2.5 - minimum added bulk insulation to the external timber cladding walls - similar to Knauf acoustic roll (24 kg/m³ - 90mm)

R2.5 - minimum added bulk insulation to the garage external rammed earth wall - similar to Knauf acoustic roll (24 kg/m³ - 90mm)

— R2.7 - minimum added bulk insulation to the external metal cladding walls - similar to Knauf acoustic roll (32 kg/m³ - 90mm)

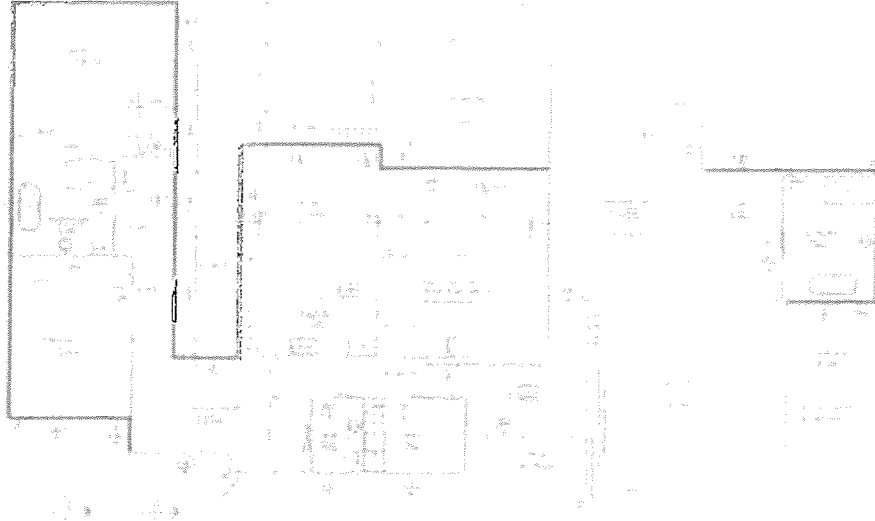


Figure 3: Added Insulation to the Walls

3.12.1.5 – Floors

Enclosed suspended timber floor:

Required minimum total R-value: **R2.25** – Subfloor air thermal resistance: **R0.46** (Refer to Section 0).

Minimum added insulation: **R2.1**, Total R-value: **R2.87**

Enclosed suspended timber floor		Inherent R-Value	Added R-Value
	1. Indoor air film (still air)	0.16	
	2. Particleboard flooring	0.15	
	3a. Bradford Optimo Underfloor Insulation Batts (75mm) - PC 122433		2.10
	3. Subfloor air resistance	0.46	
	Total R-Value: R2.87 *	0.77	2.10
<small>* Suspended floor inherent total R-value obtained from NCC Vol 2.0 Table 3.12.1.5a - subfloor air resistance derived from inherent total R-value</small>			

Figure below demonstrates added insulation location and specification:

- R2.1 - minimum added bulk insulation to the suspended floor - similar to Bradford Optimo Underfloor Insulation Batts (75mm)

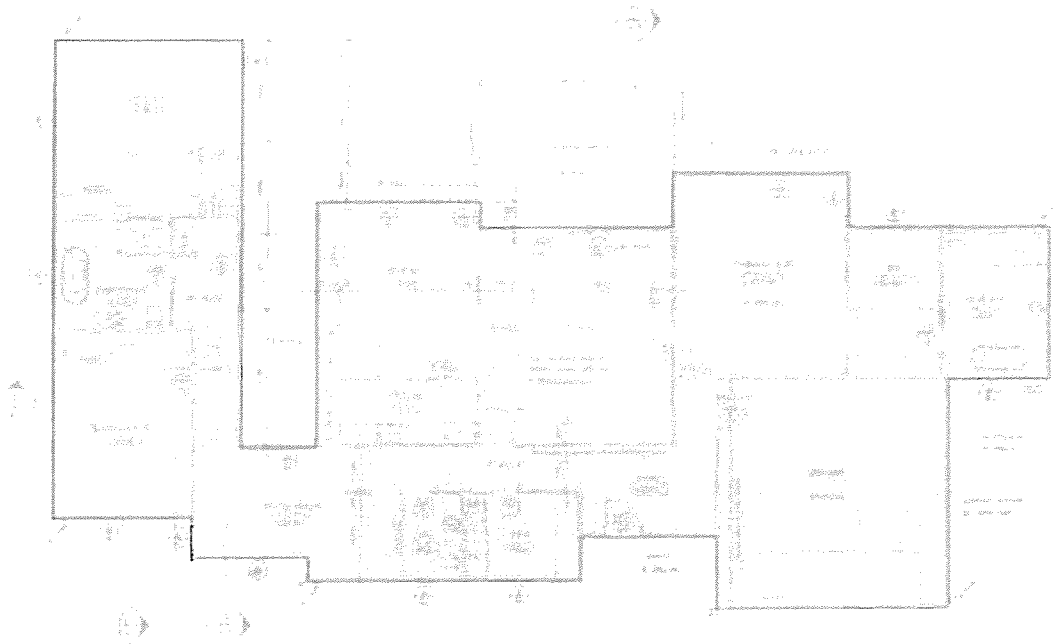


Figure 4: Added Insulation to the floors

3.12.1.6 – Attached Class 10a Building

For the purpose of this report, the garage (Class 10a) attached to the proposed building (Class 1):

- has an external fabric that achieves the required level of thermal performance for a Class 1 building; This simply means that the required thermal performance of the proposed building also applies to the garage (external wall, floor & roof insulation and glazing thermal performance). hence, in accordance with Part 3.12.1.6, “Explanatory information”, the Class 10a building is insulated and so assists the Class 1 building achieve the required thermal performance (i.e. glazing thermal performance or loss of ceiling insulation). This is referred to as **option (b)** in the following figure:

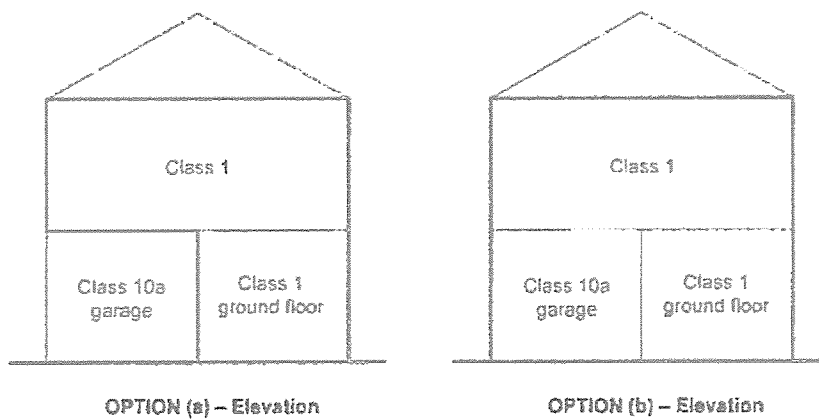


Figure 5: Types of Class 10a attachment to the Class 1 building

Part 3.12.2 – External glazing

External glazing thermal performance (U-value & SHGC) is obtained from NCC Glazing Calculator and is described as below:

Table 1: Minimum glazing thermal performance required for the proposed building.

Location	U-value (W/m ² K)	SHGC	Example of a Typical Window with equivalent performance
W03-W04	2.60	0.55	Dowell TB Aluminium Awning DG 4Clr/12Ar/4Clr (DOW-021-04 B)
W06	2.71	0.56	Sovereign 900 Series Double Hung-Al Spacer 4/14/4 (SOV-020-01 W)
All other windows & glazed doors	2.91	0.61	Bradnams Signature Fixed 100 DG 4ET-10Ar-4Clr (BRD-086-13 A)

NCC Glazing Calculator result is presented below:

The screenshot displays the NCC Glazing Calculator interface. At the top, it shows the ABCB logo and the title 'Glazing'. Below this, there are input fields for project details like '1000 Street, Emerald, VIC 3173'. The main part of the interface is a large table titled 'Glazing Elements, Orientation, Area and Performance Characteristics'. The table has columns for 'Glazing element', 'Orientation', 'Size', 'Performance', 'FRC (%)', 'GRC (%)', 'Area (m²)', and 'Contribution (PASSED)'. The table lists 22 different glazing elements, including various window types like 'W03', 'W04', 'W06', 'W07', 'W08', 'W09', 'W10', 'W11', 'W12', 'W13', 'W14', 'W15', 'W16', 'W17', 'W18', 'W19', 'W20', 'W21', and 'W22'. Each row provides specific performance metrics for that element. A large green checkmark is visible in the bottom right corner of the screenshot, indicating that all elements have passed the performance requirements.

Part 3.12.3 – Building sealing

- **J3.2 Chimneys and flues**

The chimney or flue of an open solid-fuel burning appliance must be provided with a damper or flap that can be closed to seal the chimney or flue.

- **J3.3 Roof lights**

No requirement.

- **J3.4 Windows and Doors**

a) A door, openable window or the like serving habitable rooms must be sealed in Climate zone 6.

b) A seal to restrict air infiltration—

(i) for the bottom edge of a door, must be a draft protection device; and

(ii) for the other edges of a door or the edges of an openable window or other such opening, may be a foam or rubber compressible strip, fibrous seal or the like.

- **J3.5 Exhaust Fans**

An exhaust fan must be fitted with a sealing device such as a self-closing damper, filter or the like when serving a habitable room in Climate zone 6.

- **J3.6 Construction of ceilings, walls and floors**

a) Ceilings, walls, floors and any opening such as a window frame, door frame, roof light frame or the like must be constructed to minimise air leakage in accordance with (b) when forming part of the external fabric of a habitable room in climate zones 6.

b) Construction required by above must be enclosed by internal lining systems that are close fitting at ceiling, wall and floor junctions; or sealed at junctions and penetrations with:

- close-fitting architrave, skirting or cornice; or
- expanding foam, rubber compressible strip, caulking or the like.

- **J3.7 Evaporative Coolers**

No Requirement

Part 3.12.4 – Air movement

Air movement must be provided to habitable rooms in accordance with Table 3.12.4.1.

In Climate zone 6, total ventilation opening area for suitable air movement is defined in NCC Vol 2.0, Part 3.8.5 as below:

- Ventilation must be provided to a habitable room, sanitary compartment, bathroom, shower room, laundry and any other room occupied by a person for any purpose by any of the following means:
 - o Openings, windows, doors or other devices which can be opened
 - with a ventilating area not less than 5% of the floor area of the room required to be ventilated; and
 - open to—
 - a suitably sized court, or space open to the sky; or
 - an open verandah, carport, or the like; or
 - an adjoining room in accordance with 3.8.5.2 (b), or
- An exhaust fan or other means of mechanical ventilation may be used to ventilate a sanitary compartment, laundry, kitchen or bathroom, or where mechanical ventilation is provided in accordance with 3.8.5.3(b), provided contaminated air exhausts comply with 3.8.7.3

Following is the air movement calculator that represents above criteria for air movement compliance to the Part 3.12.4

Natural Ventilation:

Geoflow Air Movement Calculator

Room	Floor area (m ²)	Window Height (m)	Ventilation Width (m)	Circumferential window/door Area (m ²)	Door	Openable Percentage	Total ventilation area (m ²)	Ventilation area to floor area (%)	Air impermeable door	
Study (EWC)	20.9	2.00	1.00	2.00	Window	100%	2.00	9.57%		
Bed 1	15.3	2.00	1.00	2.00	Window	100%	2.00	13.07%		
Bed 2	30.0	2.00	1.00	2.00	Window	100%	2.00	6.67%		
Master Bedroom	17.9	2.00	1.00	2.00	Window	100%	2.00	11.17%		
Living & Other	52.5	2.00	1.00	2.00	Window	100%	2.00	3.81%		
Total floor area (m²)	136.6									
Ventilation area to floor area weighted average (%)								9.2%		
Air impermeable								1.84		

As seen above, openings, windows and doors of the habitable rooms provide ventilation area of more than 9.2% of the total floor areas of all habitable rooms, and therefore, value of 1.84 is extracted and used to determine glazing thermal performance using NCC Glazing Calculator.

Mechanical ventilation:

Sanitary compartment	Ventilation system	Ventilation type available	Flow rate (L/s)	Minimum flow rate (L/s)
Bathroom	Mechanical ventilation	NCC Vol 2.0 Part 3.8.5.2 (c)	25 L/s	NCC Vol 2.0 Part 3.8.7.3 (a)
PDR	Mechanical ventilation	NCC Vol 2.0 Part 3.8.5.2 (c)	25 L/s	NCC Vol 2.0 Part 3.8.7.3 (a)
Master ENS	Mechanical ventilation	NCC Vol 2.0 Part 3.8.5.2 (c)	25 L/s	NCC Vol 2.0 Part 3.8.7.3 (a)
CPD	Mechanical ventilation	NCC Vol 2.0 Part 3.8.5.2 (c)	40 L/s	NCC Vol 2.0 Part 3.8.7.3 (a)
Laundry	Mechanical ventilation	NCC Vol 2.0 Part 3.8.5.2 (c)	40 L/s	NCC Vol 2.0 Part 3.8.7.3 (a)

Exhaust from a bathroom, sanitary compartment, or laundry must be discharged—

- directly or via a shaft or duct to outdoor air; or
- to a roof space that is ventilated in accordance with 3.8.7.4.

Part 3.12.5 – Services

3.12.5.0 – Application

A heated water supply system must be designed and installed in accordance with Part B2 of NCC Volume Three — Plumbing Code of Australia

3.12.5.1– Insulation of services

Thermal insulation for central heating water piping and heating and cooling ductwork must—

- be protected against the effects of weather and sunlight; and
- be able to withstand the temperatures within the piping or ductwork; and
- use thermal insulation material in accordance with AS/NZS 4859.1

3.12.5.2 – Central heating water piping

Central heating water piping that is not within a conditioned space must be thermally insulated to achieve the minimum material R-Value as follows:

- Internal piping including
 - o flow and return piping that is:
 - within an unventilated wall space; or
 - within an internal floor between storeys; or
 - between ceiling insulation and a ceiling; and
 - o heated water piping encased within a concrete floor slab (except that which is part of a floor heating system)

must have a minimum material R-Value of **0.4 (similar to 9 mm of closed cell polymer insulation)**
- Piping located within a ventilated wall space, an enclosed building subfloor or a roof space, including
 - o flow and return piping; and
 - o cold water supply piping within 500 mm of the connection to the central water heating system; and
 - o relief valve piping within 500 mm of the connection to the central water heating system

must, in **Climate zone 6**, have a minimum material R-Value of **0.9 (similar to 19 mm of closed cell polymer insulation)**
- Piping located outside the building or in an unenclosed building subfloor or roof space, including
 - o flow and return piping; and
 - o cold water supply piping within 500 mm of the connection to the central water heating system; and
 - o relief valve piping within 500 mm of the connection to the central water heating system

must, in **Climate zone 6**, have a minimum material R-Value of **1.3 (similar to 25 mm of closed cell polymer or glasswool insulation)**

3.12.5.3 – Heating and cooling ductwork

Heating and cooling ductwork and fittings must

- be sealed against air loss
 - o by closing all openings in the surface, joints and seams of ductwork with adhesives, mastics, sealants or gaskets in accordance with AS 4254.1 and AS 4254.2 for a Class C seal; or
 - o for flexible ductwork, with a draw band in conjunction with a sealant or adhesive tape.
- Duct insulation must
 - o abut adjoining duct insulation to form a continuous barrier; and
 - o be installed so that it maintains its position and thickness, other than at flanges and supports; and
 - o where located outside the building, under a suspended floor, in an attached Class 10a building or in a roof space—
 - be protected by an outer sleeve of protective sheeting to prevent the insulation becoming damp; and
 - have the outer protective sleeve sealed with adhesive tape not less than 48 mm wide creating an airtight and waterproof seal.

Heating and cooling ductwork and fittings must achieve the material R-Value as described below:

- o In a heating-only system or cooling-only system including an evaporative cooling system
 - ductwork must have a minimum material R-Value of **1.0 (similar to 38 mm glasswool (22 kg/m³) for sheet metal ductwork or 45 mm glasswool (11 kg/m³) for flexible ductwork)**
 - fittings must have a minimum material R-Value of **0.4 (similar to 11 mm polyurethane)**
- o In a combined heating and refrigerated cooling system
 - ductwork must have a minimum material R-Value of **1.5 (similar to 50 mm glasswool (22 kg/m³) for sheet metal ductwork or 63 mm glasswool (11 kg/m³) for flexible ductwork)**
 - fittings must have a minimum material R-Value of **0.4 (similar to 11 mm polyurethane)**
- Above requirements do not apply to heating and cooling ductwork and fittings located within the insulated building envelope including a service riser within the conditioned space, internal floors between storeys and the like.

3.12.5.4 – Electrical resistance space heating

An electric resistance space heating system that serves more than one room must have

- separate isolating switches for each room; and
- a separate temperature controller and time switch for each group of rooms with common heating needs; and
- power loads of not more than 110 W/m² for living areas, and 150 W/m² for bathrooms

3.12.5.5 – Artificial lighting

The maximum illumination power density is extracted from NCC 2019, Vol.2, Part 3.12.5.5 (a) as per the following figure:

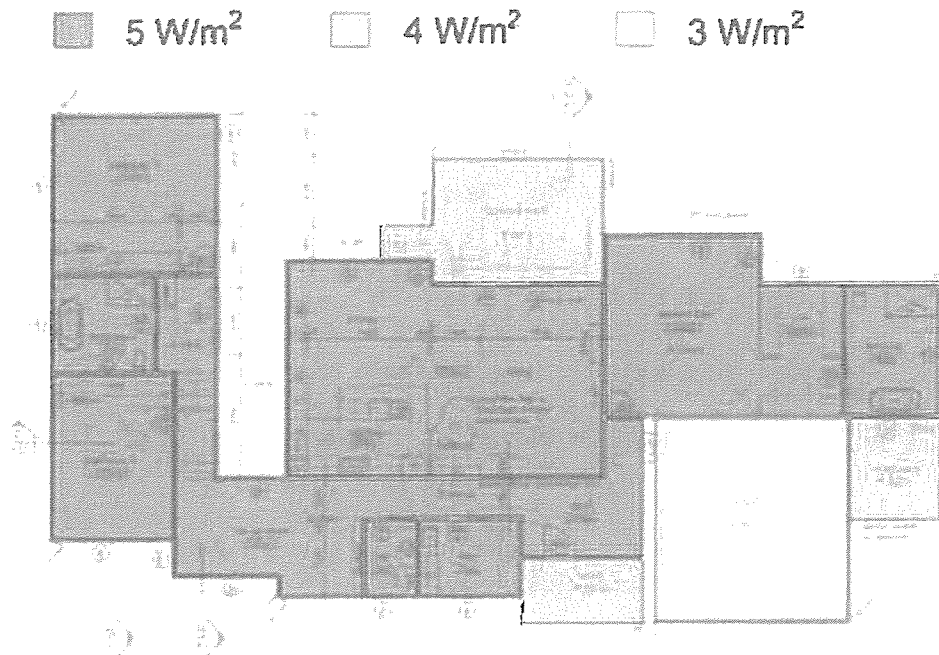


Figure 6: Maximum illumination power density allowed by NCC Vol 2.0 Part 3.12.5.5

According to the results from the NCC Lighting Calculator (Section 9 of this report), the illumination power density shown in the above figure, compliance to NCC Vol 2.0, Part 3.12.5.5 is met.

3.12.5.6 – Water heater in a heated water supply system

A water heater in a heated water supply system must be designed and installed in accordance with Part B2 of NCC Volume Three – Plumbing Code of Australia

3.12.5.7 – Swimming pool heating and pumping

Not applicable.

3.12.5.8 – Spa pool heating and pumping

Not applicable.

Regards,

Dr. Amir Kivi
Energy Consultant

7. Appendix A: Definitions

Building Fabric: means the basic building structural elements and components of a building including the roof, ceilings, walls and the floors.

Climate Zone: means an area defined in for specific locations, having energy efficiency provisions based on a range of similar climatic characteristics

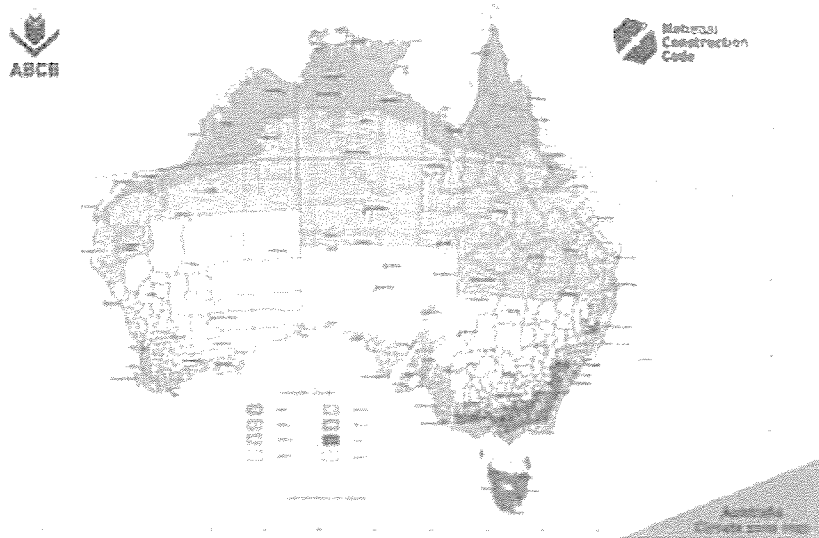


Figure 7: Australia climate zone map

Common Wall: means a wall that is common to adjoining buildings.

Conditioned space: for the purposes of Volume Two, means a space within a building that is heated or cooled by the building's domestic services, excluding a non-habitable room in which a heater with a capacity of not more than 1.2 kW or 4.3 MJ/hour is installed.

Cooling load: means the calculated amount of energy removed from the cooled spaces of the building annually by artificial means to maintain the desired temperatures in those spaces.

Deemed-to-Satisfy Provisions: means provisions which are deemed to satisfy the Performance Requirements.

Envelope: means for the purposes of Section J, means the parts of a building's fabric that separate a conditioned space or habitable room from—

- (a) the exterior of the building; or
- (b) a non-conditioned space including—
 - (i) the floor of a rooftop plant room, lift-machine room or the like; and
 - (ii) the floor above a carpark or warehouse; and
 - (iii) the common wall with a carpark, warehouse or the like.

External wall: for the purposes of Volume Two, means an outer wall of a building which is not a separating wall.

Floor area: for the purposes of Volume Two, means in relation to a room, the area of the room measured within the finished surfaces of the walls, and includes the area occupied by any cupboard or other built-in furniture, fixture or fitting.

Glazing: for the purposes of Part 2.6 and Part 3.12 in Volume Two, means a transparent or translucent element and its supporting frame located in the external fabric of the building, and includes a window other than a roof light.

Habitable room: means a room used for normal domestic activities, and—

(a) includes a bedroom, living room, lounge room, music room, television room, kitchen, dining room, sewing room, study, playroom, family room, home theatre and sunroom; but

(b) excludes a bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes-drying room, and other spaces of a specialized nature occupied neither frequently nor for extended periods.

Heating load: means the calculated amount of energy delivered to the heated spaces of the building annually by artificial means to maintain the desired temperatures in those spaces.

Insulation: mean a material used in reduction of passage, transfer or leakage of heat.

Insulative product	Conductivity	Thickness to provide R-value below (metres)										
		1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
Cellulose fibre	0.040	40	60	80	100	120	140	160	180	200	220	240
Glass fibre (low density, 7 kg/m ³)	0.057	33	50	67	84	101	118	135	152	169	186	203
Glass fibre (high density, 12 kg/m ³)	0.044	45	68	91	114	137	160	183	206	229	252	275
Polyethylene foam	0.041	41	62	83	104	125	146	167	188	209	230	251
Polyester (low density, 8 kg/m ³)	0.052	37	55	73	91	109	127	145	163	181	199	217
Polyester (high density, 16 kg/m ³)	0.045	44	66	88	110	132	154	176	198	220	242	264
Polystyrene (expanded)	0.039	43	65	87	109	131	153	175	197	219	241	263
Polystyrene (extruded)	0.028	57	86	115	144	173	202	231	260	289	318	347
Polystyrene (rigid board)	0.028	57	86	115	144	173	202	231	260	289	318	347
Rockwool loose fill	0.04	40	60	80	100	120	140	160	180	200	220	240
Rockwool batt	0.033	48	72	96	120	144	168	192	216	240	264	288
Styrofoam	0.014	14	21	28	35	42	49	56	63	70	77	84
Urethane foam (R)	0.021	47	71	95	119	143	167	191	215	239	263	287
Acid/polyester batt (low density)	0.038	50	75	100	125	150	175	200	225	250	275	300
Acid/polyester batt (high density)	0.045	44	66	88	110	132	154	176	198	220	242	264

Figure 8: Typical thickness of different insulation materials to satisfy specific R-values

Performance Requirements: means a requirement which states the level of performance which a Building Solution must meet.

R-Value: means the thermal resistance (m².K/W) of a component calculated by dividing its thickness by its thermal conductivity.

Solar Heat Gain Coefficient (SHGC): means the fraction of incident irradiance on glazing or a roof light that adds heat to a building's space.

Sole-occupancy Unit: means a room or other part of a building for occupation by one or joint owner, lessee, tenant, or other occupiers to the exclusion of any other owner, lessee, tenant, or other occupier and includes—

(a) a dwelling; or

(b) a room or suite of rooms in a Class 3 building which includes sleeping facilities; or

(c) a room or suite of associated rooms in a Class 5, 6, 7, 8 or 9 building; or

(d) a room or suite of associated rooms in a Class 9c aged care building, which includes sleeping facilities and any area for the exclusive use of a resident.

U-Value: means the thermal transmittance ($W/m^2.K$) of the composite element allowing for the effect of any airspaces and associated surface resistances.


8. Appendix B: Thermal resistance (R-value) of subfloor air

Referring to NCC Vol.2, Table 3.12.1.5a, Total R-value of suspended timber floor is obtained to be R0.77. This Total R-value comprises of inherent R-value and subfloor air thermal resistance. By subtracting inherent R-value from Total R-value, subfloor air thermal resistance is defined.

Table 3.12.1.5a Total R-Value for typical suspended timber floor


Enclosure and height of floor and direction of heat flow	Cavity masonry	190 mm concrete masonry	Single skin masonry	9 mm fibre-cement sheet
Enclosed ≤ 0.6 m high with an upwards heat flow	Total R-Value: 1.00	Total R-Value: 0.93	Total R-Value: 0.88	Total R-Value: 0.77
Enclosed ≤ 0.6 m high with a downwards heat flow	Total R-Value: 1.11	Total R-Value: 1.06	Total R-Value: 1.01	Total R-Value: 0.90
Enclosed > 0.6 m but to ≤ 1.2 m high with an upwards heat flow	Total R-Value: 0.86	Total R-Value: 0.81	Total R-Value: 0.76	Total R-Value: 0.65
Enclosed > 0.6 m but to ≤ 1.2 m high with a downwards heat flow	Total R-Value: 1.00	Total R-Value: 0.94	Total R-Value: 0.89	Total R-Value: 0.77
Enclosed > 1.2 m to ≤ 2.4 m high with an upwards heat flow	Total R-Value: 0.76	Total R-Value: 0.72	Total R-Value: 0.67	Total R-Value: 0.57
Enclosed > 1.2 m to ≤ 2.4 m high with a downwards heat flow	Total R-Value: 0.89	Total R-Value: 0.84	Total R-Value: 0.79	Total R-Value: 0.69
Unenclosed with an upwards heat flow	Total R-Value: 0.39	Total R-Value: 0.39	Total R-Value: 0.39	Total R-Value: 0.39
Unenclosed with a downwards heat flow	Total R-Value: 0.51	Total R-Value: 0.51	Total R-Value: 0.51	Total R-Value: 0.51

9. Appendix C: Lighting calculator



Lighting

Class 1 Lighting



Lighting Calculation Input

Number of zones provided in table below: (As currently provided)

Classification

Class 1 Lighting

NOTE: Aggregate dimensions are rounded to 2m x 2m x 2.5m for a maximum in lighting of the 0.5m of lighting. The % of illumination shall continue until the maximum dimension.

Description	Type of zone	Floor area of the zone	Design Level or Illuminance (Foot-candle)	Location	Adjustment Factor	Equipment Factor			SATISFIES PART 5.12.3.3		
						General Lighting	Emergency Lighting	Class 1 Lighting	System Reference	System Design	System Design % of Reference
1. Major Hall	Recessed	27.6 m ²	100 W	Class 1 Lighting	1.0	1.0	1.0	1.0	1.0	11% of 100%	
2. Hall 2	Recessed	10.2 m ²	50 W	Class 1 Lighting	1.0	1.0	1.0	1.0	1.0	11% of 100%	
3. Hall 1	Recessed	24.4 m ²	100 W	Class 1 Lighting	1.0	1.0	1.0	1.0	1.0	11% of 100%	
4. Sign room	Recessed	2.8 m ²	40 W	Class 1 Lighting	1.0	1.0	1.0	1.0	1.0	11% of 100%	
5. Reception	Other	46.3 m ²	211 W	Class 1 Lighting	1.0	1.0	1.0	1.0	1.0	11% of 100%	
6. LBB	Other	1.4 m ²	10 W	Class 1 Lighting	1.0	1.0	1.0	1.0	1.0	11% of 100%	
7. Major Hall	Recessed	11.7 m ²	100 W	Class 1 Lighting	1.0	1.0	1.0	1.0	1.0	11% of 100%	
8. Sign	Other	3.7 m ²	10 W	Class 1 Lighting	1.0	1.0	1.0	1.0	1.0	11% of 100%	
9. Large kitchen	Living room	21.6 m ²	50 W	Class 1 Lighting	1.0	1.0	1.0	1.0	1.0	11% of 100%	
10. Plant	Ventilation or security	1.6 m ²	50 W	Ventilation or security	0.5	0.5	0.5	0.5	0.5	23% of 100%	
11. Control room	Ventilation or security	12.2 m ²	80 W	Ventilation or security	0.5	0.5	0.5	0.5	0.5	23% of 100%	
12. Storage	Other	27.3 m ²	100 W	Class 1 Lighting	1.0	1.0	1.0	1.0	1.0	68% of 100%	
13. Control	Ventilation or security	3.8 m ²	30 W	Ventilation or security	0.5	0.5	0.5	0.5	0.5	33% of 100%	

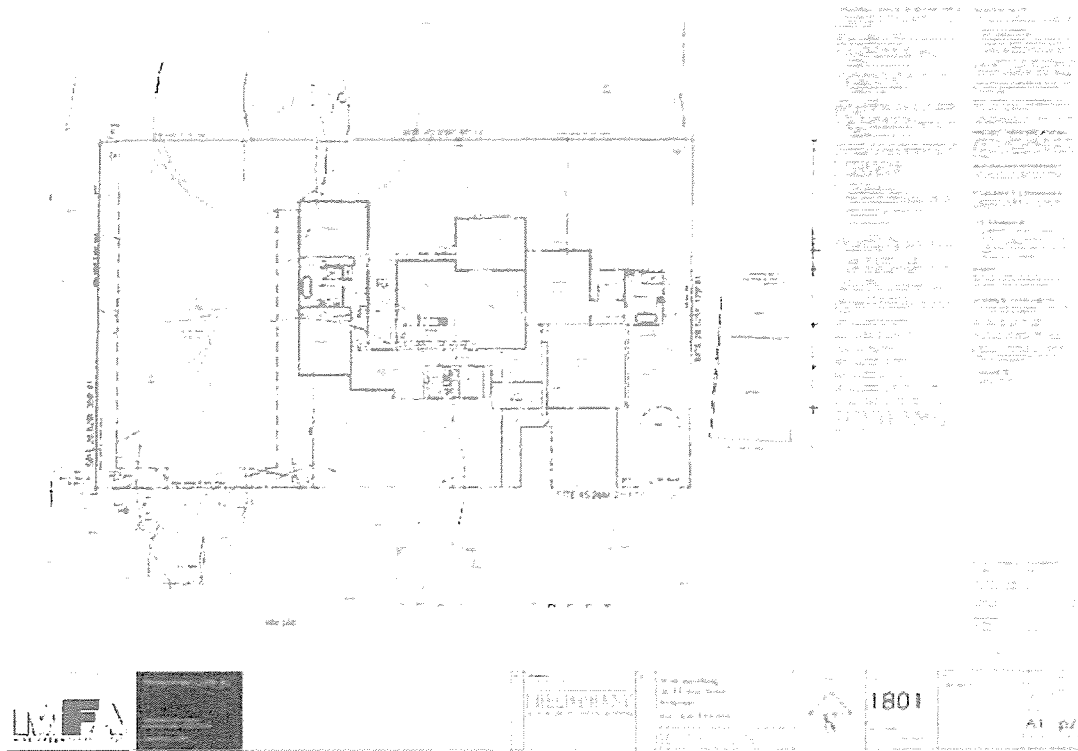
20.7 m² | 12.2 W

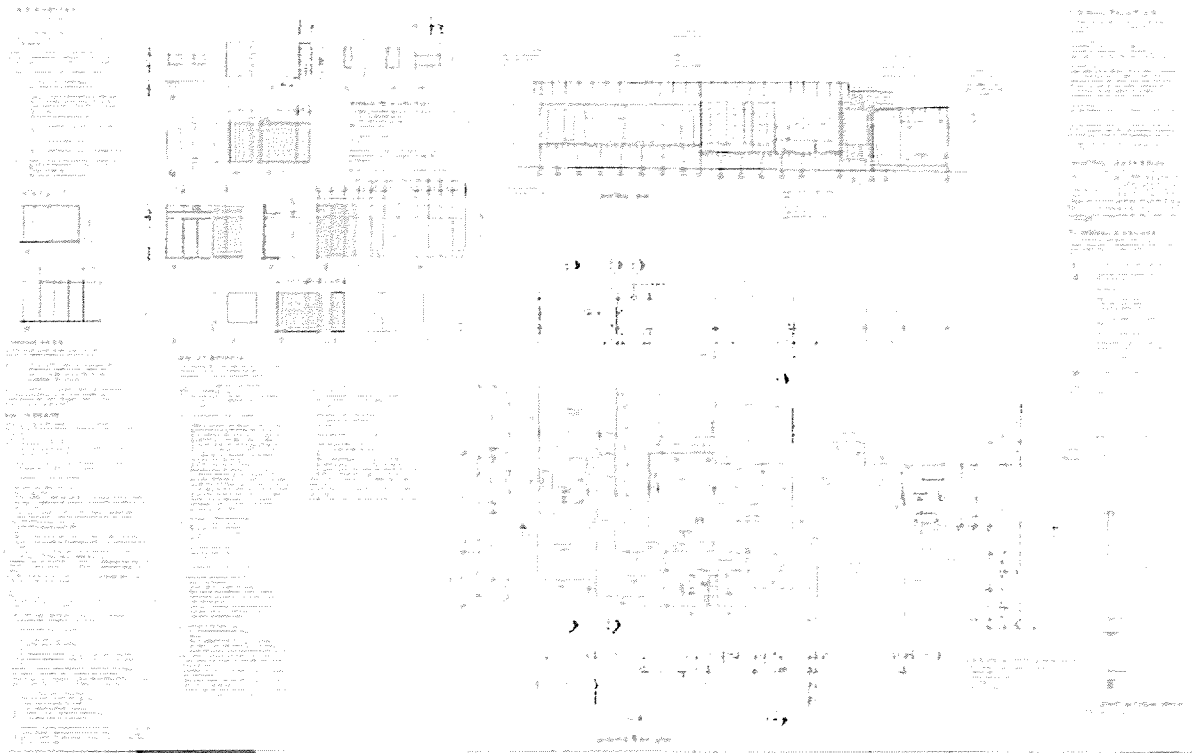
Class 1 Lighting	Emergency Lighting
1.0	1.0
1.0	1.0
1.0	1.0

Class 1 Lighting (Emergency) 100% Class 1 Lighting

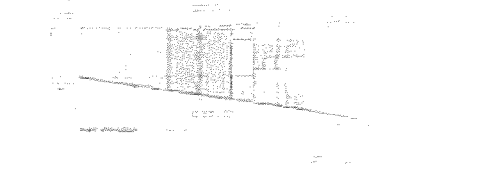
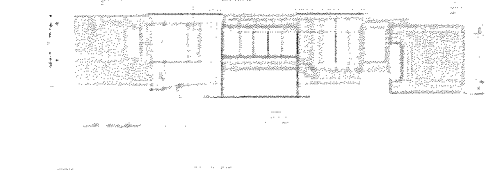
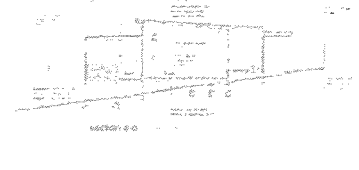
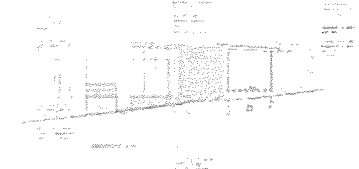
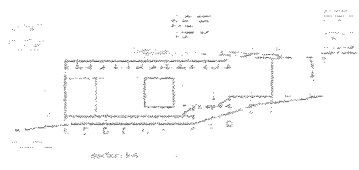
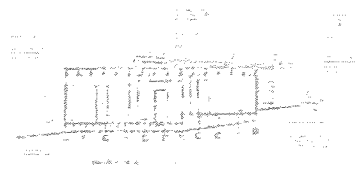
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10. Appendix D: Building Drawings





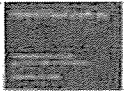
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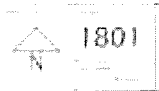
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 SECTION 5-5
 SECTION 6-6
 SECTION 7-7
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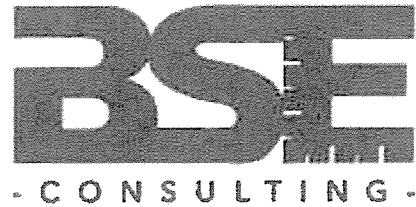
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Land Capability Assessment

Conducted in accordance with:

- AS 1547:2012 On-site Domestic Wastewater Management
- EPA Victoria Code of Practice – On-site Wastewater Management 2016
- Victorian Land Capability Assessment Framework 2014
- Model Land Capability Assessment Report 2014

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Version 2.0

03 Feb 20

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Preliminaries

Executive Summary

The site has been assessed as suitable for on-site treatment of domestic waste water. The following land application system has been designed with consideration to specific site and soil characteristics;

- Primary and secondary treatment: Fuji Clean CE1500EX Advanced Wastewater Treatment System.
- Land application: Sub-surface irrigation with a minimum area of 265m². Vegetation of the land application area is critical to the sustained operation of the system.
- Top soil will need to be imported to achieve the 300mm total top soil depth and prevent excavation within the tree protection zones.

3 Cross st, Emerald is a constrained site with limited available space for land application. The lack of available space and soil conditions has provided limited options for this evaluation.

The availability of advanced wastewater treatment systems that produce high quality treated effluent have provided a feasible system design representing low risk.

All required buffer distances are achieved and exceeded. The land use and occupancy profile all represent low risk in relation to on-site domestic waste-water treatment. Water balance is favourable. Advanced secondary treated effluent dispersal via Sub-surface irrigation is used to mitigate risk.

Scope

This report presents the finding of a land capability assessment (LCA) conducted in accordance AS1547:2012 On-site domestic wastewater management Section 5.2.

The objectives of LCA are to;

- 1) Provide sufficient information for deciding whether or not a development area, subdivision, or lot is suitable for an on-site system(s);
- 2) Provide detailed site-specific information identifying the site-and-soil characteristics to be taken into account when selecting and designing an on-site system;
- 3) Identify, analyse, and evaluate any risks posed by site-and-soil characteristics which might compromise the long-term effectiveness of the on-site system(s);
- 4) Identify, analyse, and evaluate any risks of contamination of groundwater or surface water and of associated health risks; and
- 5) Specify measures required to reduce and monitor such risks.

Reference

A reference to a specific clause (such as cl. 5.2.2.4) is a reference to corresponding clause in AS 1547:2012 On-site domestic wastewater management unless noted otherwise. A reference to AS1547 is a reference to AS 1547:2012 On-site domestic wastewater management as the current version.

Document Control

Prepared

Approved



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03-Feb-20

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Revision/Issue	Comments	Date	Author Initial	Approver Initial
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1 Introduction

1.1 Land Capability Assessment

The Land Capability Assessment consists of a staged process: a comprehensive desktop study, a Site and Soil Check (SSC), a detailed site and soil assessment, evaluation of results and preparation of this LCA report. In accordance with cl. 5.2.2.4, the desk top study acts of determine the extent of the evaluation of the later assessments (Standards Australia, 2012). Where the desktop study identified data that is not required it is marked 'N/A' in this and subsequent sections of this report. Section 2 of this report establish the findings of the desktop study. The information in this section is confirmed during the conduct of the subsequent sections and amended as required.

2 Site Assessment

2.1 General site information

2.1.1 Date LCA commenced

01 Nov 19.

2.1.2 Address of site

3 Cross Street, Emerald, VIC 3240.

2.1.3 Lot and PS Number:

Lot 18 LP10554.

2.1.4 Lot size:

1207m².

2.1.5 Lot land use zone:

GWAZ. GWAZ2.

2.1.6 Local Government Area:

Cardinia.

2.1.7 Site Plan:

Refer to Appendix A

2.1.8 System water supply:

Reticulated.

2.1.9 Occupancy profile:

Occupancy type: (full-time or part time/holiday occupation, number etc) Full time occupation.

Proposed dwelling is 3 bedrooms. The studio has been considered, however, due to the building layout it will not be used as an additional bedroom.

Number of occupants: 3+1 = 4 occupants typical.

2.1.10 Design flow/Expected wastewater quantity

AS1547 gives several values for calculating the design flow of a system. These values are useful in determining the design capacity of components of the system. However, care should be taken to apply suitable assumptions in this selection. It is often appropriate to select more than one design value for the system. This reflects the different risks associated with each component of the system.

Land application design flows

The two authoritative standards for calculation of design flows sight different methods of calculation. The Australian Standard uses a flow rate per occupant with consideration of the water source, whereas the EPA Vic Code of Practice uses a flow rate per 'number of bedrooms plus one' method and only considers the source of the water supply if there is no conceivable likelihood that the premise will be provided reticulated water (isolated rural houses etc).

There is a reticulate water source onsite, therefore use the EPA Vic (cl. 3.4) method of calculation.

2.1.10.1.1 EPA Vic Method of design flow calculation

Land application (secondary treatment) design flows are calculated using the actual anticipated peak occupancy (in accordance with EPA Vic Table 4).

Parameter	Value	Unit	Reference	Comment
System water supply:	Reticulated water supply			
Occupancy profile:	Full-time			
Number of bed rooms plus 1:	3+1=4	No#.		
Water-reduction features	Yes			use 150L/BR /d
Design flows				
Secondary treatment:	4*150=600	L/day	Table 4	

2.1.11 Climate

Extended periods of temperatures of less than 15 degrees C are expected. Light frosts are expected.

2.1.12 Approximate annual rainfall:

(Bureau of Meteorology, 2019a): 855mm average annual rainfall (Scoresby Research Institute).

2.1.13 Approximate annual evaporation:

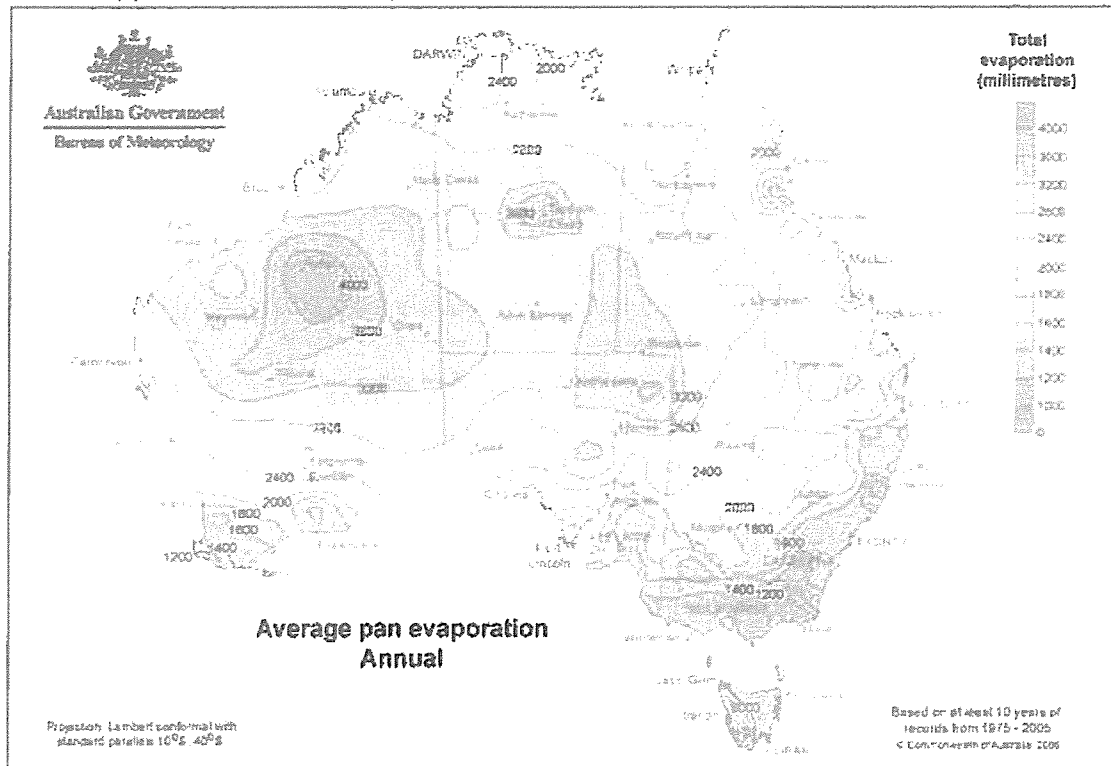


Figure 1 - Average Annual Pan Evaporation

(Bureau of Meteorology, 2019b):1197mm average pan evaporation.

2.1.14 Flood Potential:

Negligible, i.e., all components are to be located above the 1:100 flood level.

2.1.15 Exposure:

Medium (Partial sun and wind).

2.1.16 Slope/ topography:

Development site is located at 299 AHD. The site has an approximate crossfall of 6-9 degrees. The surrounding area is generally hilly bushland with cleared area for residential properties. No rocky outcrops present on site. Refer to Appendix A for the site plan.

The land application area has a cross fall of approximately 7 degrees.

2.1.17 Landform:

Sloped site.

2.1.18 Run-off and Seepage:

Site run-off is dominant to the North. No signs of natural springs within or surrounding the site.

2.1.19 Erosion Potential:

No signs of existing erosion issues detected. Exposed/disturbed soil would be susceptible following excavation however will regain stability following re-establishment of vegetation.

2.1.20 Fill

None detected. All bores and test pits showed clean, in-situ soil.

2.2 Setbacks and buffer distances

2.2.1 Groundwater:

Distance to domestic groundwater bore: Approx. 1500m to nearest domestic groundwater bore (64191)

Other bores: No other bores located within 250m of the proposed land application site. Table 1 details the groundwater bores located within 250 – 1500m of the proposed land application site.

Table 1 - Groundwater bores within 250-1000m of site

Bore ID	Bore Depth (m)	Drilled Date	Purpose	Latitude	Longitude
WRK968007	100	-	Unknown	-37.926686	145.420621
64191	4.87	01-05-79	Stock and Domestic	-37.917593	145.443544

Information in this section was confirmed by a search of the BOM Ground water explorer database (Bureau of Meteorology, 2019c).

2.2.2 Buffer Distances

Required buffer distances

The required buffer distance to be considered low risk are shown in Figure 2.

Landscape feature or structure	Setback distances (m)		
	Primary sewage and greywater systems	Secondary sewage and greywater systems	Advanced secondary greywater systems ³
Wastewater field up-slope of building ⁷	6	3	3
Wastewater field down-slope of building	3	1.5	1.5
Wastewater up-slope of cutting/escarpment ¹²	15	15	15
Wastewater field up-slope of adjacent lot	6	3	1
Wastewater field down-slope of adjacent lot	3	1.5	0.5
Water supply pipe	3	1.5	1.5
Wastewater up-slope of potable supply channel	300	150	150
Wastewater field down-slope of potable supply channel	20	10	10
Gas supply pipe	3	1.5	1.5
In-ground water tank ¹⁴	15	7.5	3
Stormwater drain	6	3	2
Children's grassed playground ¹⁵	6	3 ¹⁶	2 ¹⁶
In-ground swimming pool	6	3 ¹⁶	2 ¹⁶
Dam, lake or reservoir (potable water supply) ^{9,12}	300	300 ⁴	150
Waterways (potable water supply) ^{9,12}	100	100 ^{4,9,17}	50
Waterways, wetlands (continuous or ephemeral, non-potable); estuaries, ocean beach at high-tide mark; dams, reservoirs or lakes (stock and domestic, non-potable) ^{9,9}	60	30	30
Category 1 and 2a soils	NA ¹	50 ¹⁸	20
Category 2b to 6 soils	20	20	20
Vertical depth from base of trench to the highest seasonal water table ¹⁸	1.5	1.5	1.5
Vertical depth from irrigation pipes to the highest seasonal water table ¹⁸	NA	1.5	1.5

Figure 2 – Set back distances. Table sourced directly from (Environment Protection Authority Victoria, 2016, p. 41)

Actual set back distances

Table 2 -Actual set back distances

Set Backs and Buffer Distances

Feature	Feature Name	Direction	Distance
Permanent waters (m):	Menzies Creek	NE	330m
Other waters (m):	Nil		
Other sensitive environments (m):	Menzies Creek Linear Reserve	NE	380m
Allotment Boundary (m):		N, S & W	3 & 1.5m
Buildings (m):	Building envelope	E	1.5m

2.3 Environmental factors requiring further consideration

Nil

3 Soil assessment

3.1 Field tests

Refer to Appendix B for Soil Bore Logs and details of filed test outcomes.

Bore logs in Appendix B show a Silty Clay LOAM (layer A) commencing immediately below ground level. The underlying layers (layer B & layer C) consists of light CLAY. Layer C has a higher clay content than Layer B.

Table 3 - Field Soil Test Results Bore S012-02

Soil horizon	Depth mm	Soil texture (Table E1 AS1457):	Permeability category:	Coarse fragments, abundance (%) (Table E2 AS1547):
Layer A	450	Silty Clay LOAM	4	Few 2-10%.
Layer B	450-1000	Light CLAY	5	Few 2-10%.
Layer C	1000-1500	Light CLAY	5	Very few (<2%).

3.2 Laboratory tests

Refer to Appendix C for laboratory certificate and test results.

3.3 Geology & soil landscape survey

Presence of discontinuities: None observed.

Presence of fractured subsoil: Not present.

Depth to bedrock or hardpan (m): Not encountered within proposed land application area.

Depth to high watertable (m): Watertable not encountered during boring. No signs of springs within or near site area. Estimated water table depth >5m. Groundwater flow is predicted to be from South to North.

3.3.1 Hydraulic loading

Soil permeability was not directly measured but can be inferred with reference to Appendix A - Tables 9 EPA VIC Code of practice – Onsite wastewater management, that describe design loading rates (DLRs) and Design Irrigation Rates (DIRs) for various effluent application systems according to soil type. Critical soil properties are texture and structure, but depth, colour and degree of mottling are also used to infer drainage conditions.

Hydraulic loading recommended for soil absorption system (mm/day):

- Secondary treated effluent applied to Sub-surface irrigation: Table 9: 3.5mm/d

Reasons for the hydraulic loading recommendation:

The recommended hydraulic loading is appropriate for the soil classification, structure and composition. There is sufficient treatment depth in the depth to bedrock. Layer A (cat. 4 - refer Appendix B) will be used as the primary treatment layer, 150mm of imported topsoil will provide sufficient treatment depth above underlying soils. The geology and landscape features are favourable.

4 System Design

4.1 Primary and Secondary Treatment

Fuji Clean CE1500EX Advanced Wastewater Treatment – Refer Appendix F.

4.2 Land application type

Type of land application system considered best suited to site: Sub-surface Irrigation.

Reasoning: Specific site conditions including 6-9 degree slopes and tree protection areas; favour the use of Sub-surface Irrigation system. In addition to this, the limited available space for land application, prevents the use of alternative land application types as a reserve area cannot be provided. The likelihood of transportation off site is mitigated by applying the secondary treated effluent through the Sub-surface Irrigation System with adequate buffer distances. By treating the consequence and likelihood the risk is reduced to low level.

4.3 Land application area/ Effluent Management Area

The minimum land application area that is required on the site is determined by adopting the largest of the follow area calculations;

- Water balance min. area.
- Nitrogen Balance.
- Phosphorus Balance.

The water balance worksheets are provided in Appendix D. Nitrogen and phosphorus balance worksheets are provided in Appendix E.

4.3.1 Water balance

Method of water balance calculation: Nominated area with zero storage.

The water balance for the site confirms the adequacy of the Effluent Management Area of 265m² as the water balance requires 265m² to maintain a neutral water balance over time using a DLR of 3.5mm/day.

This area is provided within the property boundary and recommended setbacks of the Code of Practice – On-site wastewater management Environment Protection Authority Victoria , 2016. The water balance calculation is contained at Appendix D.

4.3.2 Adopted land application area

A land application area of minimum 265m² is required for the Sub-surface Irrigation System.

4.4 Reserve area

A reserve area is not provided as the land application method and calculation procedure are compliant with the EPA Victoria Code of Practice – On-site Wastewater Management 2016.

EPA Victoria Code of Practice – On-site Wastewater Management 2016 cl. 3.10.2 Irrigation systems:

A reserve area is not required for a surface or sub-surface pressure-compensating irrigation system where the size of the system has been calculated and designed using the latest version of the Model LCA Report and the recommended Design Irrigation Rates in Tables 3 and 9, unless Council considers the site maybe subject to environmental or operational risks. The low application rates are designed to create irrigation systems that are sustainable over the life of the system. If a fault occurs with a

pressure-compensating irrigation system it is an equipment fault which needs maintenance, it is not a soil degradation problem. Pumps and disc/mesh filters will fail before the soil is overloaded.

Details of the system design, layout and land application configurations are provided in Appendix A.

5 Additional system requirements

5.1 Topsoil

Good quality topsoil needs to be imported to provide adequate treatment depth. The topsoil will also prevent any excavation within the tree protection zones. 300mm of topsoil depth is required within the LAA. This will bring the treatment depth to 600mm above underlying category 5 soils. It will also provide 150mm of cover to subsurface irrigation drip lines.

5.2 Gypsum

Sufficient Gypsum (min. 1kg/m²) should be applied to the Land Application Area to displace sodium from the soil particles and replace lost calcium.

5.3 Vegetation of LAA

Vegetation of the land application area is critical to the sustained operation of the system. Grass is the most suitable type of vegetation for subsurface irrigation. Larger shrubs and trees may cause damage to the LAA through their roots.

5.4 Monitoring and Maintenance

All land application systems require on-going monitoring and maintenance. Building occupants should refer to cl. 3.11.2 of in EPA Code of practice – onsite wastewater management Publication 891.4 July 2016 (the Code) for maintenance and best practice guidelines.

6 References

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Standards Australia, 2012. *AS 1547 On-site domestic wastewater management*, s.l.: SIA Global.

Appendix A Site Plan

Page left blank. Refer attached document.

Appendix B Soil test bore logs

CLIENT: Maria Francis		TESTBORE LOG		BSE CONSULTING															
PROJECT: FRA02-01		EQUIPMENT TYPE: Hand Auger / Mechanical Auger		METHOD: H.A / M.A															
BORE NO: 01		DATE EXCAVATED: 01 Nov 19		LOGGED BY: T TUOR															
LOCATION: 3 Cross St, Emerald VIC, 3782		CHECKED BY: [Signature]																	
DEPTH (m)	0.0	MATERIAL DESCRIPTION Soil type, plasticity or particle characteristics, colour, Secondary and trace components	CLASSIFICATION	REMARKS P. Or as Observed															
		Layer A Silty clay LOAM 25-35% clay. 30% silt	D F	Peccal / Highly Str. h...															
		Layer B Light CLAY 30-40% clay	M F	Moderate structure															
		Layer C Light CLAY 35-45% clay	M F	Moderate Structure															
		Terminated at target depth																	
<table border="1"> <thead> <tr> <th>WATER / MOISTURE</th> <th>SAMPLES & FIELD TESTS</th> <th>CONSISTENCY</th> <th>RELATIVE DENSITY</th> <th>ROCK STRENGTH</th> <th>ROCK WEATHERING</th> <th>DCP Vs BIODUCTIVE ASP</th> </tr> </thead> <tbody> <tr> <td>D - Dr M - Mod W - Wet C&C - Coburn MC R - Resid. rate B - Bulk inflow</td> <td>U - Undisturbed Sample D - Disturbed Sample ES - Environmental Sample B - Bulk Disturbed Sample SPT - Standard Penetration Test NP - Non-Plastic Parameter</td> <td>VS - Very Soft S - Soft F - Firm B - Bk V - Very Stiff H - Hard</td> <td>VL - Very Loose L - Loose ML - Medium Loose D - Dense VL - Very Dense H - Hard</td> <td>E - Extreme V - Very L - Low M - Medium H - High VH - Very High EH - Extremely High</td> <td>RD - Residual soil DW - Disturbed weathered SW - Strongly weathered F - Fresh rock</td> <td>1 - 100% Core 2 - 100% 3 - 100% 4 - 100% 5 - 100% 6 - 100% 7 - 100% 8 - 100% 9 - 100% 10 - 100%</td> </tr> </tbody> </table>						WATER / MOISTURE	SAMPLES & FIELD TESTS	CONSISTENCY	RELATIVE DENSITY	ROCK STRENGTH	ROCK WEATHERING	DCP Vs BIODUCTIVE ASP	D - Dr M - Mod W - Wet C&C - Coburn MC R - Resid. rate B - Bulk inflow	U - Undisturbed Sample D - Disturbed Sample ES - Environmental Sample B - Bulk Disturbed Sample SPT - Standard Penetration Test NP - Non-Plastic Parameter	VS - Very Soft S - Soft F - Firm B - Bk V - Very Stiff H - Hard	VL - Very Loose L - Loose ML - Medium Loose D - Dense VL - Very Dense H - Hard	E - Extreme V - Very L - Low M - Medium H - High VH - Very High EH - Extremely High	RD - Residual soil DW - Disturbed weathered SW - Strongly weathered F - Fresh rock	1 - 100% Core 2 - 100% 3 - 100% 4 - 100% 5 - 100% 6 - 100% 7 - 100% 8 - 100% 9 - 100% 10 - 100%
WATER / MOISTURE	SAMPLES & FIELD TESTS	CONSISTENCY	RELATIVE DENSITY	ROCK STRENGTH	ROCK WEATHERING	DCP Vs BIODUCTIVE ASP													
D - Dr M - Mod W - Wet C&C - Coburn MC R - Resid. rate B - Bulk inflow	U - Undisturbed Sample D - Disturbed Sample ES - Environmental Sample B - Bulk Disturbed Sample SPT - Standard Penetration Test NP - Non-Plastic Parameter	VS - Very Soft S - Soft F - Firm B - Bk V - Very Stiff H - Hard	VL - Very Loose L - Loose ML - Medium Loose D - Dense VL - Very Dense H - Hard	E - Extreme V - Very L - Low M - Medium H - High VH - Very High EH - Extremely High	RD - Residual soil DW - Disturbed weathered SW - Strongly weathered F - Fresh rock	1 - 100% Core 2 - 100% 3 - 100% 4 - 100% 5 - 100% 6 - 100% 7 - 100% 8 - 100% 9 - 100% 10 - 100%													
See Explanatory notes for details of abbreviations & tests of descriptions																			



82 Plain Street Tamworth NSW 2340
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 f 02 6765 9109
 abn 82 125 442 382

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ANALYSIS REPORT SOIL

PROJECT NO: EW191675	Date of Issue: 15/11/2019
Customer: BSE CONSULTING	Report No: 1
Address: LEVEL 3-77 MOORABOOL ST Level 3-77 Moorabool Street Geelong, NSW 3220 GEELONG VIC 3220	Date Received: 8/11/2019
Attention: Tom Tudor	Matrix: Soil
Phone: 0429 082 430	Location: Land Capability Assess
Fax:	Sampler ID: Client
Email: tom.tudor@bseconsulting.com.au	Date of Sampling: 1/11/2019
	Sample Condition: Acceptable

Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

Signed:


Anne Michie



East West is certified by the Australian-Asian Soil & Plant Analysis Council to perform various soil and plant tissue analysis. The tests reported herein have been performed in accordance with our terms of accreditation.

This report must not be reproduced except in full and EWEA takes no responsibility of the end use of the results within this report.

This analysis relates to the sample submitted and it is the client's responsibility to ensure certain the sample is representative of the matrix to be tested.

Samples will be discarded one month after the date of this report. Please advise if you wish to have your samples returned.

results you can rely on

Page 1 of 1

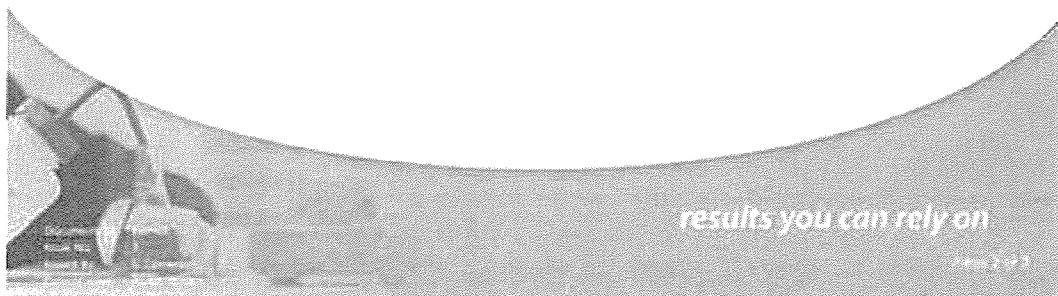


ANALYSIS REPORT

PROJECT NO: EW191675

Location: Land Capability Assessment

					CLIENT SAMPLE ID	FRA02-01-01-B			
					DEPTH	1m			
Test Parameter	Method Description	Method Reference	Units	LOR	191675-1				
Bulk Density	Cylinder	ASTM F 1815 57	g/cm ³	na	1.2				
pH (1:5 in H ₂ O)	Electrode	NEL 442	pH units	na	5.45				
Electrical Conductivity	Electrode	RAL 15A1	dSm	0.01	0.03				
Total N (LECO)	LECO	RAL 7A5	mg/kg	50	728				
Phosphorus (Total)	HNO ₃ HClO ₄ ICP	ICP-03	mg/kg	40	350				
Phosphorus Buffer Index	UV-Vis	PMS-12	mg/kg	na	1006				
Phosphorus (Cowell)	Reads-UV-Vis	RAL 16F1	mg/kg	1	5.82				
Phosphorus Sorption Capacity	Calc	PMS-12	mg/kg	na	6630				
Exchangeable Potassium	NH ₄ Cl/ICP	RAL 15A1	mg/kg	10	83.9				
Exchangeable Calcium	NH ₄ Cl/ICP	RAL 15A1	mg/kg	20	350				
Exchangeable Magnesium	NH ₄ Cl/ICP	RAL 15A1	mg/kg	10	292				
Exchangeable Sodium	NH ₄ Cl/ICP	RAL 15A1	mg/kg	10	34.3				
Exchangeable Potassium	RAL 15A1	RAL 15A1	cmol/kg	na	0.22				
Exchangeable Calcium	RAL 15A1	RAL 15A1	cmol/kg	na	1.75				
Exchangeable Magnesium	RAL 15A1	RAL 15A1	cmol/kg	na	2.43				
Exchangeable Sodium	RAL 15A1	RAL 15A1	cmol/kg	na	0.15				
ECEC	Calculation	PMS-15A1	cmol/kg	na	4.55				
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.72				
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.09				
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	4.73				
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	38.5				





ANALYSIS REPORT

PROJECT NO: EW191675

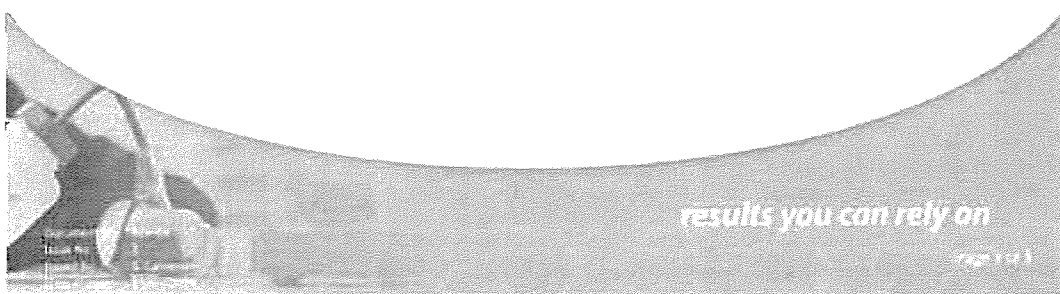
Location: Land Capability Assessment

CLIENT SAMPLE ID					FRA02-01-01-B			
DEPTH					1m			
Test Parameter	Method Description	Method Reference	Units	LOR	191675-1			
Exchangeable Magnesium %	Calculation	PRE 15A1	%	na	53.5			
Exchangeable Sodium %	Calculation	PRE 15A1	%	na	3.28			
Mod Emerson Agg Test (SAR _s)	513 01	PRE 21	Class	na	6			
Saturated Hydraulic Conductivity	30cm tension	ASTM F 1615-97	mm/hr	0.1	6.28			
Texture	Field	Nutrient	Class	na	LC			

This Analysis Report shall not be reproduced except in full without the written approval of the laboratory.

NB: LOR is the Lowest Obtainable Reading.

DOCUMENT END



Appendix D Water Balance

Irrigation area sizing using Nominated Area Water Balance for Zero Storage																	
Site Address:		3 Cross Street, Emerald, VIC 3240.															
Date:		29/11/2019			Assessor:		Tom Tudor BSE Consulting										
INPUT DATA																	
Design Wastewater Flow	Q	600	L/day	Based on maximum potential occupancy and derived from Table 4 in the EPA Code of Practice (2013)													
Design Irrigation Rate	DIR	3.5	cm/day	Based on soil texture class/permeability and derived from Table 9 in the EPA Code of Practice (2013)													
Nominated Land Application Area	L		m ²														
Crop Factor	C	0.6-0.8	unitless	Estimates evapotranspiration as a fraction of pan evaporation; varies with season and crop type ²													
Rainfall Runoff Factor	RF	0.9	unitless	Proportion of rainfall that remains onsite and infiltrates, allowing for any runoff													
Mean Monthly Rainfall Data	SCORESBY RESEARCH INSTITUTE			Boml Station													
Mean Monthly Pan Evaporation Data	SCORESBY RESEARCH INSTITUTE			Boml Station													
Parameter	Symbol	Formula	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	
Days in month	D		days	31	28	31	30	31	30	31	31	30	31	30	31	365	
Rainfall	R		mm/month	51.0	52.2	62.8	66.6	87.1	66.4	75	79.9	62.6	62.4	60.6	76.4	835.2	
Mean Daily Evaporation	E _{av}		mm/day	5.5	5.5	4	2.7	1.7	1.3	1.4	1.9	2.6	3.4	4.4	5		
Evaporation	E	D x E _{av}	mm/month	173.0	154	124.0	81.0	52.7	39.0	43.4	59.9	78.0	105.4	131.0	155.0	1187	
Crop Factor	C		unitless	0.80	0.80	0.70	0.70	0.60	0.60	0.60	0.60	0.70	0.80	0.80	0.80		
OUTPUTS																	
Evapotranspiration	ET	E/C	mm/month	139	123	87	57	32	23	26	36	55	84	100	124	696.5	
Percolation	B	DIR x D - ET	mm/month	108.0	98	109.5	109.0	105.5	105.0	105.5	105.0	105.0	105.0	105.0	105.0	105.5	1277.5
Outflow	Q _{out}	ET - B	mm/month	247.4	221.2	195.2	181.7	140.1	129.4	134.5	143.6	160.6	182.6	210.6	232.6	2169.0	
INPUTS																	
Retained Rainfall	RR	R x RF	mm/month	41.52	41.64	42.24	43.26	69.08	65.82	66.4	63.92	66.08	65.92	64.04	61.12	684.16	
Applied Effluent Inflow	W	(Q/D) x L	mm/month	70.2	63.4	70.2	67.9	70.2	67.9	70.2	70.2	67.9	70.2	67.9	70.2	828.4	
Outflow	RR-W		mm/month	111.7	105.2	112.4	121.2	139.0	123.4	129.6	134.1	134.0	136.1	132.9	131.3	1599.6	
STORAGE CALCULATION																	
Storage remaining from previous month	S	(RR+W)-(ET+B)	mm/month	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Storage for this month	M		mm	-106.7	-118.0	-32.0	-40.5	-0.3	-5.0	-3.0	-2.7	-25.0	-28.7	-70.0	-101.2		
Comulative Storage	N		mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Maximum Storage for Nominated Area	V	NL	L	0													
LAND AREA REQUIRED FOR ZERO STORAGE																	
			m ²	60	94	122	168	294	247	244	233	182	147	123	100		
MINIMUM AREA REQUIRED FOR ZERO STORAGE:				265.0 m ²													

Appendix E Nitrogen and Phosphorus Balance

Nitrogen Balance								
Site Address:		3 Cross Street, Emerald, VIC 3240.						
SUMMARY - LAND APPLICATION AREA REQUIRED BASED NITROGEN BALANCE							135	m²
INPUT DATA¹								
Wastewater Loading				Nutrient Crop Uptake				
Hydraulic Load		L/day	Crop N Uptake	220	kg/ha/yr	which equals	60.27	mg/m ² /day
Effluent N Concentration	17	mg/L						
% N Lost to Soil Processes (Geary & Gardiner 1996)		Decimal						
Total N Loss to Soil	2040	mg/day						
Remaining N Load after soil loss	8160	mg/day						
NITROGEN BALANCE BASED ON ANNUAL CROP UPTAKE RATES								
Minimum Area required with zero buffer			Determination of Buffer Zone Size for a Nominated Land Application Area (LAA)					
Nitrogen	135	m ²	Nominated LAA Size				m ²	
			Predicted N Export from LAA	-2.65	kg/year			
			Minimum Buffer Required for excess nutrient	0			m ²	
CELLS								
		Please enter data in blue cells						
		Red cells are automatically populated by the spreadsheet						
		Data in yellow cells is calculated by the spreadsheet, DO NOT ALTER THESE CELLS						
NOTES								
¹ Model sensitivity to input parameters will affect the accuracy of the result obtained. Where possible site specific data should be used. Otherwise data should be obtained from a reliable source such as:								
- EPA Guidelines for Effluent Irrigation								
- Appropriate Peer Reviewed Papers								
- Environment and Health Protection Guidelines: Onsite Sewage Management for Single Households								
- USEPA Onsite Systems Manual								

Phosphorus Balance

Parameter	Value	Unit
C = concentration of phosphorus	2.33	mg/L
Lp = critical loading rate of phosphorus		mg/m ² /d
Soil bulk density	1.2	g/cm ³
Soil bulk density	1.2	kg/m ³
Phosphate Sorption Capacity	5630	mg P sorbed/kg
Phosphorus Sorption Capacity	79560	kg/ha to 1m depth
Safe Phosphorus Sorption Capacity	26520	kg/m ²
Phosphorus uptake (50 year)	11220	kg/m ²
Phosphorus generated (50 year)	11220	kg
A = land area	0.30	ha

Reference	Comment
Accreditation certificate NSW OSMG p 154 and AS1547 p 193	
Lab test report	Assumed typical soil density
Lab test report NSW OSMG p 153	Using lower value of two layers tested to 1m depth
NSW OSMG p 153	Using 1/3 safe P capacity without leaching

Appendix F Photographs



Figure 3 - Land application area - Looking North.



Figure 4 - Land application area - Looking East.



Figure 5 – Land application area – Looking South.



Figure 6 - Land application area - Looking West.



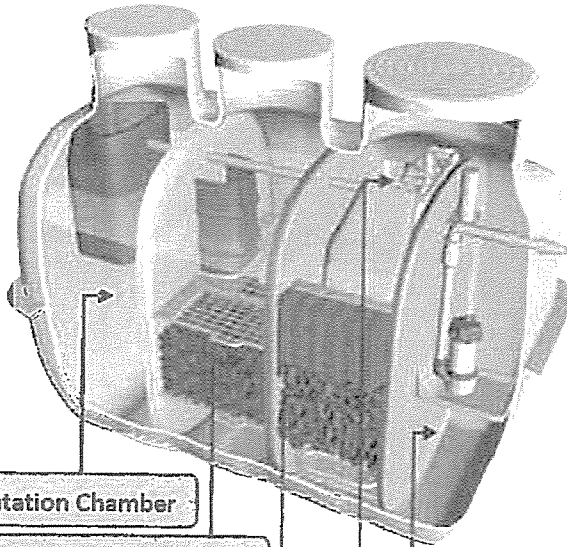
Figure 7 - Bore spoil: FRA02-01.

Appendix G Fuji Clean - CE 1500EX Brochure

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Advanced Wastewater Treatment System

CE-1500EX AWTS



Sedimentation Chamber

Anaerobic Filtration Chamber

Aerobic Contact Filtration Chamber

Clarification Chamber

Pump Chamber

Australian Standard

AS/NZS 1646.1
1 to 50AKHD/1997
AS/NZS 1546.3
Lic SMK/H21996
SAS Global

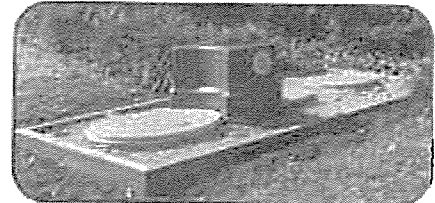


The FujiClean CE-1500EX Aerated Wastewater Treatment System successfully treats all household wastewater to advanced secondary quality, enabling the recycled water to be used for lawn & garden irrigation.

Treatment Capacity

- 1500 Litres per day
 - 10EP (EP = Equivalent Persons)
- NOTE: 1EP = 150L/person/day

Finished Product



COMPACT

- Lightweight single tank design
- Minimal footprint
- Visually discrete installation

EFFICIENT

- Light weight transport & installation
- Low operation and running costs
- Minimum maintenance requirements

RELIABLE

- Proudly manufactured in Australia
- Effectively handles shock loading
- Dependable quality & performance

SAFE & SECURE

- Treatment process contained inside the tank
- Produces high quality treated effluent
- Alarm monitor protection

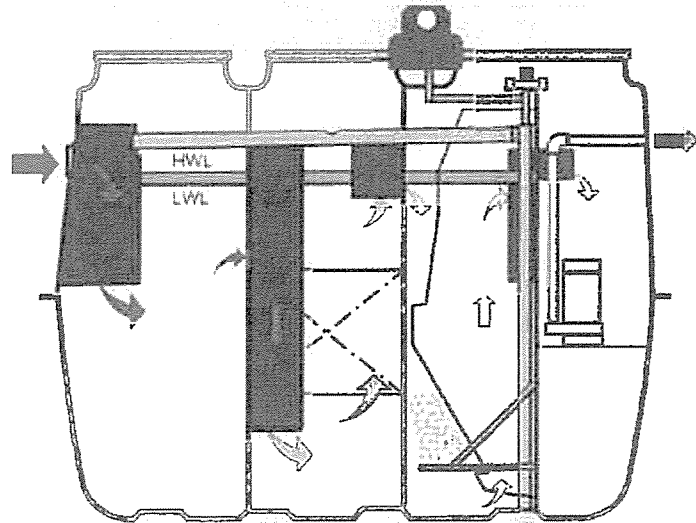
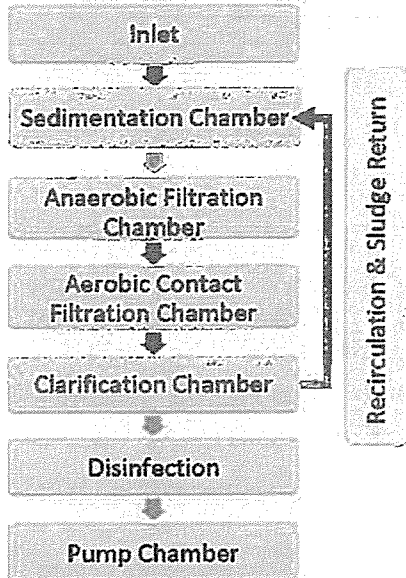
SUSTAINABLE

- Extended service life - 15 years minimum
- Minimal environmental impact
- Reuse all water for garden and lawn irrigation

PROVEN DESIGN

- 50 Years experience with wastewater treatment
- Continued research & development
- 50,000 installations per year worldwide

FujiClean Treatment Process & Flow Diagram



NOTE: The 6 stage treatment has been developed by FujiClean & is known as: Contact Media Filtration Process - CMFP

Warranty

Structural Tank

15 Years

Electrical Components

2 Years

Treatment: Advanced Secondary

BOD <10mg/L
SS <10mg/L
E.coli <10cfu/100ml

Nutrient Removal
54% Nitrogen Reduction
87% Phosphorus Reduction

NOTE: The FujiClean CE-1500EX is approved for use in all states and territories of Australia.

System Dimensions

Weight (empty)	430kg
Length	2,510mm
Width	1,440mm
Height – no risers	1,870mm
Height – 300mm risers	2,170mm
Height – 500mm risers	2,370mm
Inlet Invert Options	460, 760 or 960mm
Inlet Pipe	100mm dia
Outlet Pipe	25 or 40mm dia

Working Capacity

Sedimentation Chamber	1,114L
Anaerobic Filtration Chamber	982L
Aerobic Filtration Chamber	580L
Clarification Chamber	281L
Pump Chamber	308L
Total Working Capacity	3,265L
Emergency Storage	1,094L
Total Volume	4,359L
Aeration – MAC80R	80L/min

Land Application Area Details

For:
Susan Fechner
 At:
 3 Cross Street, Emerald VIC 3782

Drawing List			
Sheet Number	Sheet Name	Current Revision Date	Current Revision
C0	Title Page	03 Feb 20	2
C1	Land Application Area Layout	03 Feb 20	2
C2	Land Application Area Details	03 Feb 20	2

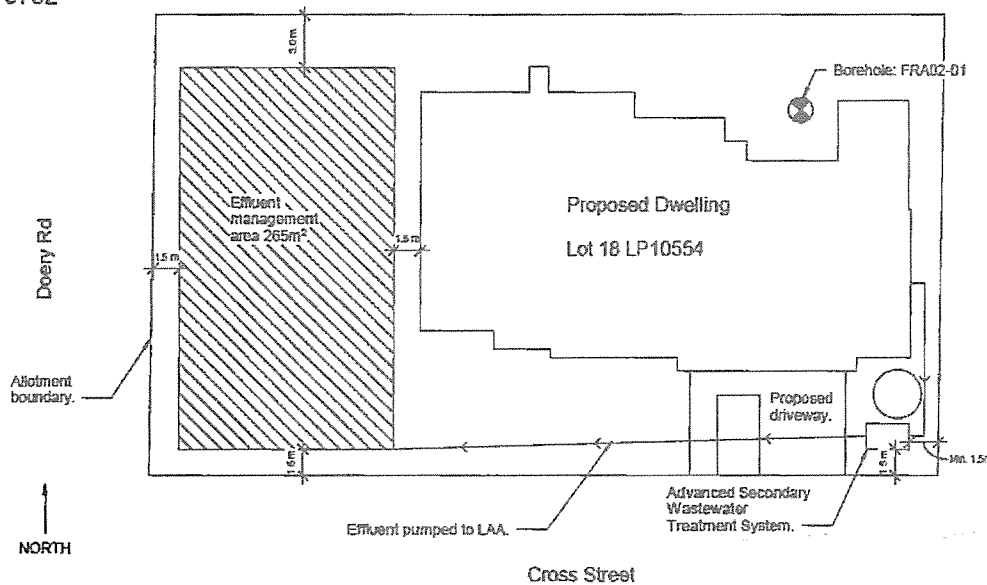
- System Details**
- Advanced Secondary Wastewater Treatment System: PUP Clean CS140000.
 - Land Application:
 - A. Method: Sub-surface drip irrigation - LAA: 265m² x 12.1m long 80-centimetre irrigation lines, 1m clear spacing between lines.

Design Wastewater Characteristics:

- Design flow: 600L/day.

Environmental Design Statement:
 The following design elements have been used in the design of this Land Application System:

- ABASIS 15-07-2012 On-site domestic wastewater management.
- EPA Victoria Code of Practice - On-site Wastewater Management 2016.



1 Site Plan
 1 : 200

For
 National Engineers Register & Engineers Australia membership No. 2661122
 Victorian Building Authority registration No. VCA19118
 Board of Professional Engineers of Queensland registration No. 12265
 Queensland Building Futures Fund Board registration No. 25762240



For:
 Susan Fechner
 At:
 3 Cross Street, Emerald VIC
 3782

No.	Description	Date
1	ISS_1	02 Dec 19
2	ISS_2	03 Feb 20

Land Application Area
 Details

Title Page		
Project number	FRA02 - 01	C0
Checked by	H Braby	
Drawn by	T Juss	
Approved by	H Braby	
Scale	@ A3	No Scale

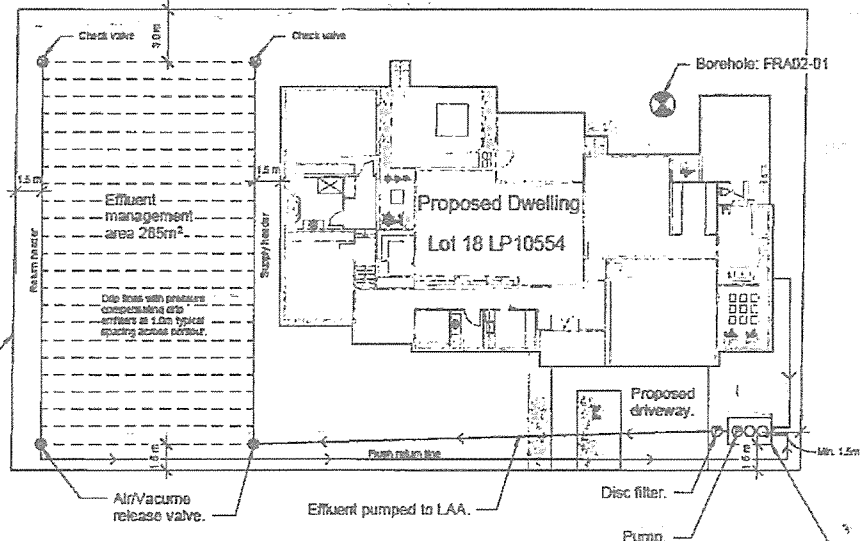
All dimensions in millimetres unless noted otherwise. Do not scale.

11/03/2020 1:28:27 PM

Doery Rd

Allotment boundary.

NORTH



- Notes:**
1. Contours are approximate only, exact slope of land to be confirmed onsite.
 2. Sub-surface drip irrigation lines to be installed parallel to contour.
 3. Location of Advanced Secondary Treatment Wastewater System may be altered from what is shown here provided not closer than 1.5m downslope of allotment boundary or building; or 3m up-slope of allotment boundary or building.
 4. Imported topsoil edge batter to be max. 1:3 slope; alternatively, non-structural retaining wall/garden edging may be used.

Fuji Clean: Advanced Secondary Wastewater Treatment System.

① Layout Plan
1 : 200



For:
Susan Fechner

At:
3 Cross Street, Emerald VIC
3782

No.	Description	Date
1	Iss. 1	02 Dec 19
2	Iss. 2	03 Feb 20

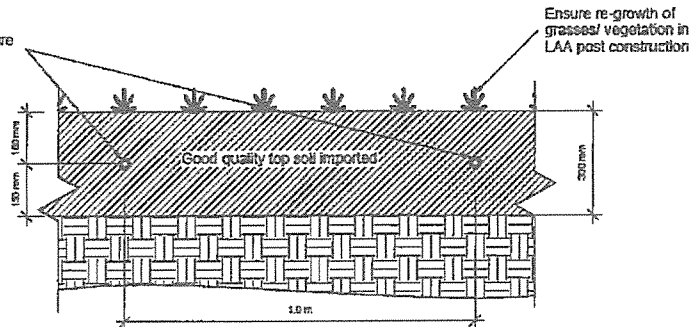
Land Application Area
Details

Land Application Area Layout		
Project number	FRA02-01	C1
Checked by	M Brady	
Drawn by	T Tustor	
Approved by	M Brady	
Scale	A3	1:200

All dimensions in millimeters unless noted otherwise. Do not scale.

1:200/200 13/2/27 PM

Sub-surface drip irrigation lines with pressure compensating drip emitters at 1m C/C



Subsurface Irrigation Area Construction

1. Secondary treatment system – the irrigation pump must provide a *minimum* 20 m head and a flow rate that matches the design output of the selected dripline. Flow rate will vary depending on emitter spacing, flow rate and lineal metres of line. A full hydraulic design must be carried out by installer when selecting products. The land application area should be capable of discharging a minimum of 80 L/min.
2. Filtration and flushing mechanism – a field flush valve must be installed on the return line to facilitate periodic flushing to the treatment tank. An additional filter flush valve should be installed downstream of the field flush valve. A 100-150 micron cylindrical filter should be installed and cleaned regularly. Where there are potential problems in returning irrigation field flush back to the treatment tank, a small (approximately 3 m x 0.6 m) absorption area sited below the effluent irrigation area can be used to accommodate the flushed effluent.
3. An automatic, hydraulically operated sequencing valve should be installed to deliver effluent evenly to the two areas if reserve area employed.
4. Air release valves must be installed at high points in each area. Additional air release valves may be required in undulating terrain.
5. Check valves are required for each irrigation field to facilitate periodic flushing.
6. Distribution manifolds should be 25 mm uPVC or polyethylene pipe buried 300 mm below the ground surface.
7. Flushing return manifold should be 25 mm uPVC or polyethylene pipe buried 100-150 mm below the ground surface within the irrigation area. Outside this area, the pipe must be buried at a minimum of 300 mm depth.
8. Pressure compensating subsurface drip line laterals (typically 16 mm) with emitters and laterals at approximately 600 mm spacings (maximum 1,000 mm spacings) and buried to a depth 150mm in good quality top soil. Only subsurface dripline specifically designed for effluent irrigation must be used.

1 Sub-surface Drip Irrigation
1 : 10



For:
Susan Fechner

At:
3 Cross Street, Emerald VIC
3782

No.	Description	Date
1	ISS-1	02 Dec 19
2	ISS-2	03 Feb 20

All drawings in columns please noted separately. Do not scale.

Land Application Area Details

Land Application Area Details

Project number	FRACR - 01	C2
Checked by	M Brady	
Drawn by	T Yuzor	
Approved by	M Brady	
Scale @ A3		1 : 10

11/02/2020 13:27 PM



Cardinia

13 May 2020

Mr Russell Hocking
CITYSHIRE PLANNING PTY LTD
14/333 Collins Street
Melbourne VIC 3000

russellhocking@yahoo.com.au

Dear Russell,

Application No.: T190279
Property No.: 5000024682
Address: L18 LP10554, 3 Cross Street, Emerald VIC 3782
Proposal: Use and development of the land for a dwelling and vegetation removal

I refer to the above planning permit application and wish to advise that a permit has been granted. Please find enclosed your copy of the permit.

Your attention is drawn to the conditions of the permit. Please read these conditions carefully and check as to whether there are any steps which you need to take prior to commencing the use or the development, including submission of additional plans.

Please be aware that it is your responsibility to ensure that all of the conditions on the permit are complied with and that the permit remains valid. Council does not advise you when the permit will expire.

Please note if the permit relates to a subdivision a change in street number allocation may occur.

This permit should be kept in a safe place for future reference.

If you have any further queries regarding this matter, please contact Council's Development Services department on **03-5943-4532** or mail@cardinia.vic.gov.au.

Yours faithfully,

Melanie Wright
Senior Statutory Planner

PLANNING PERMIT

Form 4

Planning Scheme: Cardinia Planning Scheme
Responsible Authority: Cardinia Shire Council

PLANNING PERMIT NUMBER: T190279

ADDRESS OF THE LAND: L18 LP10554, 3 Cross Street, Emerald VIC 3782

THIS PERMIT ALLOWS: Use and development of the land for a dwelling and vegetation removal, generally in accordance with the approved plans

THE FOLLOWING CONDITIONS APPLY TO THIS PERMIT:

- 1) Before the use and development starts, amended plans to the satisfaction of the Responsible Authority must be submitted to and approved by the Responsible Authority. When approved, the plans will be endorsed and will then form part of the permit. The plans must be drawn to scale with dimensions and three copies must be provided. The plans must be generally in accordance with the plans submitted with the application but modified to show:
- Hedging along the eastern boundary deleted from development plans; and
 - Earthworks to be shown and dimensioned on development elevation plans.

Environment:

- 2) Prior to endorsement of development plans it must be demonstrated that the vegetation approved for removal has been replaced through one of the following methods:
- The permit holders must prepare and submit a Replacement Planting Plan to compensate for the removal of vegetation approved under this permit, to the satisfaction of the Responsible Authority. When approved by the Responsible Authority, the plan will be endorsed and will form part of this permit. The plan must show:
 - Eight (8) indigenous plants are to be planted within three months of completion of development/works to compensate for the loss of 4 non-native trees to the satisfaction of the responsible authority. All replacement plantings must be in accordance with any Bushfire Management Plan that may apply.
 - Plantings must include a range of indigenous trees, shrubs and grasses with a minimum of one canopy tree planted per every tree removed.
 - A list of indigenous plant species to be used and the name of the indigenous nursery where plants will sourced from.
 - Show area of replacement planting on a site plan.
 - Actions and timing of all planting preparation and follow up maintenance works including tree guards and mulch.

OR

- The permit holder must purchase replacement plantings for a total of 8 trees providing for works to be implemented offsite by council, or a combination of onsite plantings with the remainder purchased from council to the satisfaction of the Responsible Authority.

Note: Replacement plantings can be purchased through Council's Environment Unit.

- 3) Trees 4, 5, 6 and 7 are approved for removal to meet the defensible space requirements. These trees must be marked onsite prior to removal to provide clear demarcation to trees that will be retained.

Date issued: 12 May 2020

Signature for the Responsible Authority:



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- 4) Tree protection measures described in section 7.3 and Drawing 9 (Construction) of the Tree Report prepared by Carney & Stone Arboricultural Consultants, dated May 2018, must be followed and form part of this permit. All references to 'should' in the arborist report are to be considered 'must'.
- 5) Where the permit holder chooses permit condition 2a to complete replacement planting works themselves onsite, photographic evidence must be submitted to Council within three months of the completion of development that shows the indigenous plants have been planted to the satisfaction of the Responsible Authority.
- 6) The replacement planting must be maintained for a minimum of 2 years to the satisfaction of the responsible authority.
- 7) Except where specified on the endorsed plan, no vegetation may be removed, destroyed or lopped without the written consent of the Responsible Authority.

General:

- 8) The use and layout of the buildings and works, as shown on the approved plans, must not be altered or modified without the consent in writing of the Responsible Authority.
- 9) Once the development has commenced, it must be continued and completed to the satisfaction of the Responsible Authority.
- 10) The exterior colour and cladding of the development must not result in any adverse visual impact on the environment of the area and all external cladding and trim of the development must be of a non-reflective nature in accordance with the endorsed plans.
- 11) Before the dwelling is occupied:
 - a) Access to the dwelling must be provided via an all-weather road with dimensions adequate to accommodate emergency vehicles as shown on the endorsed plans.
 - b) The vehicle crossing as shown on the approved plans must be constructed in accordance with the approved plans and to the satisfaction of the Responsible Authority. If the construction of the proposed rural vehicle crossing requires the installation of a drainage culvert to the satisfaction of the Responsible Authority.
 - c) The dwelling must be connected to a reticulated potable water supply or have an alternative potable water supply, with appropriate storage capacity, to the satisfaction of the Responsible Authority.
 - d) The dwelling must be connected to a reticulated electricity supply or have an alternative energy supply to the satisfaction of the Responsible Authority.
 - e) The dwelling allowed by this permit must be connected to a sewerage disposal system as approved by the Responsible Authority. All wastewater from proposed dwelling must be treated and contained within the property boundaries in accordance with the current EPA Code of Practice - Onsite Wastewater Management: Guidelines for Environmental Management, Australian Standards 1547 and Council requirements.

Date Issued: 12 May 2020

Signature for the Responsible Authority:



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THE FOLLOWING CONDITIONS APPLY TO THIS PERMIT:

Engineering:

- 12) Sediment control measures must be undertaken during construction to the satisfaction of the Responsible Authority to ensure that the development subject land is adequately managed in such a way that no mud, dirt, sand, soil, clay or stones are washed into or allowed to enter the stormwater drainage system.
- 13) All stormwater must be conveyed by means of drains to satisfactory points or areas of discharge approved by the Responsible Authority, so that it will have no detrimental effect on the environment or adjoining property owners. 92 – stormwater overflows.
- 14) Earthworks must be undertaken in a manner that minimises soil erosion. Exposed areas of soil must be stabilised to prevent soil erosion. The time for which soil remains exposed and unestablished must be minimised to the satisfaction of the Responsible Authority.

Bushfire:

- 15) The bushfire protection measures forming part of this permit or shown on the endorsed plans, including those relating to construction standards, defendable space, water supply and access, must be maintained to the satisfaction of the responsible authority on a continuing basis. This condition continues to have force and effect after the development authorised by this permit has been completed.

Septic Conditions:

- 16) All wastewater from proposed dwelling/lots must be treated and contained within the property boundaries in accordance with the current EPA Code of Practice – Onsite Wastewater Management: Guidelines for Environmental Management, Australian Standards 1547 and Council requirements (Primary and secondary treatment - Fuji Clean CE1500EX Advanced Wastewater Treatment System has been proposed as per Land Capability Assessment).
- 17) No part of the septic tank system may be located within a fill pad.
- 18) The area set aside for the disposal of waste referred to in this permit shall not be developed by the erection of buildings or the construction of hard standing surfaces (Land Capability Assessment indicates Sub-surface irrigation with a minimum area of 265m². Vegetation of the land application area is critical to the sustained operation of the system). Top soil will need to be imported to achieve the 300mm total top soil depth and prevent excavation within the tree protection zones.
- 19) All waste water and liquid is to be contained and treated on site by an approved septic tank system or equivalent. The system must be at least 60 metres from any watercourse and/or dam (non-potable water supply), on the subject or neighbouring properties, and must meet the Guidelines for Environmental Management: Code of Practice – Onsite Wastewater Management 891. 4 (2016).
- 20) Waste water disposal systems must be installed inside the waste water envelope indicated on the endorsed plan unless with written consent of the Responsible Authority.
- 21) No buildings or works shall occur over any part of the approved waste disposal system including the septic tank in accordance with the requirements of the Environment Protection Act 1970, the

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THE FOLLOWING CONDITIONS APPLY TO THIS PERMIT:

Guidelines for Environmental Management: Code of Practice - Onsite Wastewater Management 891. 4 (2016).

- 22) The area set aside for the disposal of wastes referred to in this permit and shown on the endorsed plans must not be developed or changed by the erection of buildings or the construction of hard standing surfaces without prior written consent from the responsible authority.
- 23) The proposed waste water system must hold a current Jas-ANZ certificate of conformance in compliance with AS/NZS 1546 and be approved to treat waste to a 20/30 treatment level for suspended solids and biological oxygen demand and disposed of via pressure compensating subsurface irrigation in accordance with the Environment Protection Act 1970, The Guidelines for Environmental Management: Code of Practice - Onsite Wastewater Management 891. 4 (2016) and the Land Capability Assessment (prepared by BSE Consulting, dated 3 February 2020, or as amended).

Expiry:

A permit for the development and use of land expires if—

- the development does not start within two (2) years after the issue of the permit; or
- the development is not completed within four (4) years after the issue of the permit; or
- the use does not start within two (2) years after the completion of the development; or
- the use is discontinued for a period of two (2) years.

In accordance with Section 69 of the *Planning and Environment Act 1987*, an application may be submitted to the Responsible Authority for an extension of the periods referred to in this condition.

Notes:

Environment:

- The web link to Council's indigenous plant guide
<https://www.cardinia.vic.gov.au/indigenousplantguide>
- The web link to local indigenous nurseries
https://www.cardinia.vic.gov.au/downloads/file/609/list_of_local_indigenous_plant_nurseries

Health:

- Should the future development be used for a commercial enterprise involving handling of food or drink, hairdressing, beauty therapy, myotherapy, colonic irrigation, skin penetration or tattooing or be providing accommodation to more than four (4) persons then the applicant must contact the Environmental Health Department for further advice concerning legislative requirements.
- In view of the potential for noise generation and traffic movements affecting nearby residential lots, compliance with EPA requirements relating to noise generation from this commercial/industrial premises are necessary.

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THE FOLLOWING CONDITIONS APPLY TO THIS PERMIT:

- Permission given under planning legislation cannot be construed as permission relating to any other legislation under Council jurisdiction, such as Public Health & Wellbeing, Food or Tobacco Acts.
- Prior to installation works commencing on the septic tank system, a Permit to Install must be obtained from Council.
- Prior to any alteration works commencing on the septic tank system, a Permit to Alter must be obtained from Council. An application for a permit must include a report from a licensed plumber which details:
 - the position, type and condition of the present septic tank system including wastewater dispersal details;
 - whether the existing septic tank system has been desludged within the last three years; and
 - that the septic tank system, once altered, is capable of containing all wastewater from the proposed, and existing buildings, on site in accordance with the current EPA Code of Practice – Onsite Wastewater Management: Guidelines for Environmental Management, Australian Standards 1547 and Council requirements.
- Please note that additional drainage, or other works, may still be required to ensure that all wastewater is treated and contained on-site.
- If any proposed buildings, new boundaries or works encroach over any part of the existing septic tank system, including buffer zones, the system must be relocated to the satisfaction of Council.

Building:

- Prior to commencement of the proposed use a Building Permit must be obtained for any retaining wall exceeding 1.0 metres in height.

Vehicle Crossings:

- A 'Vehicle Crossing Permit' must be obtained from Council prior to the commencement of any works associated with the proposed vehicle crossing.

Date issued: 12 May 2020

Signature for the Responsible Authority:



Due diligence checklist

What you need to know before buying a residential property

Before you buy a home, you should be aware of a range of issues that may affect that property and impose restrictions or obligations on you, if you buy it. This checklist aims to help you identify whether any of these issues will affect you. The questions are a starting point only and you may need to seek professional advice to answer some of them. You can find links to organisations and web pages that can help you learn more, by visiting the [Due diligence checklist page on the Consumer Affairs Victoria website](http://consumer.vic.gov.au/duediligencechecklist) (consumer.vic.gov.au/duediligencechecklist).

Urban living

Moving to the inner city?

High density areas are attractive for their entertainment and service areas, but these activities create increased traffic as well as noise and odours from businesses and people. Familiarising yourself with the character of the area will give you a balanced understanding of what to expect.

Is the property subject to an owners corporation?

If the property is part of a subdivision with common property such as driveways or grounds, it may be subject to an owners corporation. You may be required to pay fees and follow rules that restrict what you can do on your property, such as a ban on pet ownership.

Growth areas

Are you moving to a growth area?

You should investigate whether you will be required to pay a growth areas infrastructure contribution.

Flood and fire risk

Does this property experience flooding or bushfire?

Properties are sometimes subject to the risk of fire and flooding due to their location. You should properly investigate these risks and consider their implications for land management, buildings and insurance premiums.

Rural properties

Moving to the country?

If you are looking at property in a rural zone, consider:

- Is the surrounding land use compatible with your lifestyle expectations? Farming can create noise or odour that may be at odds with your expectations of a rural lifestyle.
- Are you considering removing native vegetation? There are regulations which affect your ability to remove native vegetation on private property.
- Do you understand your obligations to manage weeds and pest animals?

Can you build new dwellings?

Does the property adjoin crown land, have a water frontage, contain a disused government road, or are there any crown licences associated with the land?

Is there any earth resource activity such as mining in the area?

You may wish to find out more about exploration, mining and quarrying activity on or near the property and consider the issue of petroleum, geothermal and greenhouse gas sequestration permits, leases and licences, extractive industry authorisations and mineral licences.

Soil and groundwater contamination

Has previous land use affected the soil or groundwater?

You should consider whether past activities, including the use of adjacent land, may have caused contamination at the site and whether this may prevent you from doing certain things to or on the land in the future.

(04/10/2016)

Land boundaries

Do you know the exact boundary of the property?

You should compare the measurements shown on the title document with actual fences and buildings on the property, to make sure the boundaries match. If you have concerns about this, you can speak to your lawyer or conveyancer, or commission a site survey to establish property boundaries.

Planning controls

Can you change how the property is used, or the buildings on it?

All land is subject to a planning scheme, run by the local council. How the property is zoned and any overlays that may apply, will determine how the land can be used. This may restrict such things as whether you can build on vacant land or how you can alter or develop the land and its buildings over time.

The local council can give you advice about the planning scheme, as well as details of any other restrictions that may apply, such as design guidelines or bushfire safety design. There may also be restrictions – known as encumbrances – on the property's title, which prevent you from developing the property. You can find out about encumbrances by looking at the section 32 statement.

Are there any proposed or granted planning permits?

The local council can advise you if there are any proposed or issued planning permits for any properties close by. Significant developments in your area may change the local 'character' (predominant style of the area) and may increase noise or traffic near the property.

Safety

Is the building safe to live in?

Building laws are in place to ensure building safety. Professional building inspections can help you assess the property for electrical safety, possible illegal building work, adequate pool or spa fencing and the presence of asbestos, termites, or other potential hazards.

Building permits

Have any buildings or retaining walls on the property been altered, or do you plan to alter them?

There are laws and regulations about how buildings and retaining walls are constructed, which you may wish to investigate to ensure any completed or proposed building work is approved. The local council may be able to give you information about any building permits issued for recent building works done to the property, and what you must do to plan new work. You can also commission a private building surveyor's assessment.

Are any recent building or renovation works covered by insurance?

Ask the vendor if there is any owner-builder insurance or builder's warranty to cover defects in the work done to the property.

Utilities and essential services

Does the property have working connections for water, sewerage, electricity, gas, telephone and internet?

Unconnected services may not be available, or may incur a fee to connect. You may also need to choose from a range of suppliers for these services. This may be particularly important in rural areas where some services are not available.

Buyers' rights

Do you know your rights when buying a property?

The contract of sale and section 32 statement contain important information about the property, so you should request to see these and read them thoroughly. Many people engage a lawyer or conveyancer to help them understand the contracts and ensure the sale goes through correctly. If you intend to hire a professional, you should consider speaking to them before you commit to the sale. There are also important rules about the way private sales and auctions are conducted. These may include a cooling-off period and specific rights associated with 'off the plan' sales. The important thing to remember is that, as the buyer, you have rights.