contract for sale of land or strata title by offer and acceptance

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firstnational Genesis

NOTICE: Contracts must be lodged with the Office of State Revenue for duty assessment within two (2) months of the date the last person executes the Contract
WARNING - If the Buyer is not an Australian Citizen or Permanent Resident or a New Zealand Citizen then FIRB approval (and a special condition to this Contract) may be required and additional Duty will be payable. Any non Australian resident will need to give the ATO notice of their purchase within 30 days after settlement.
WARNING - A Withholding Amount **may** apply to this Contract (see 2022 General Condition 3.7).
WARNING - If GST is relevant to this transaction then the relevant GST provision should be outlined in the Special Conditions or in an attached GST Annexure, which forms part of this Contract.

TO: BJK Genesis Property Pty Ltd
Address 6/160 Scarborough Beach Road
Suburb Mount Hawthorn State WA Postcode 6016
As Agent for the Seller / ~~Buyer~~

THE BUYER
Name
Address
Suburb State Postcode
Name
Address
Suburb State Postcode
EMAIL: The Buyer consents to Notices being served at:

OFFERS TO PURCHASE the Land and Property Chattels set out in the Schedule ("Property") with vacant possession unless stated otherwise in the Special Conditions at the Purchase Price on the terms set out in the Schedule, the Conditions and Special Conditions as:

☐ Sole owner ☐ Joint Tenants ☐ Tenants in Common specify the undivided shares

SCHEDULE

The **Property** at:
Address 8 Draper Road
Suburb Mahogany Creek State WA Postcode 6072
Lot 24 Deposited/~~Survey/Strata/Diagram~~/Plan 428021 Whole / ~~Part~~ Vol 4093 Folio 157
A **deposit** of $ of which $ 0 is paid now and $ to be paid within 7 days of acceptance
to be held by First National Real Estate Genesis
("the Deposit Holder"). The balance of the Purchase Price to be paid on the Settlement Date.

Purchase Price
Settlement Date
Property Chattels including

GST WITHHOLDING

1. Is this Contract concerning the taxable supply of new residential premises or potential residential land as defined in the GST Act? ☐ YES ☑ NO
2. If NO is ticked or no box is ticked (in which case the answer is deemed to be NO), then the Buyer is not required to make a payment under section 14-250 of the Taxation Administration Act 1953 (Cth).
3. If YES is ticked, then the 'GST Withholding Annexure' should be attached to this Contract.

FINANCE CLAUSE IS APPLICABLE

LENDER/
MORTGAGE BROKER (NB. If blank, can be any)
LATEST TIME: 4pm on:
AMOUNT OF LOAN:
SIGNATURE OF BUYER

FINANCE CLAUSE IS NOT APPLICABLE

Signature of the Buyer if Finance Clause IS NOT applicable

NOTE: IF THIS DOCUMENT IS ON SEPARATE PAGES OR IS TO BE FAXED THEN ALL PARTIES SHOULD SIGN ALL PAGES.

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CONDITIONS

1. SUBJECT TO FINANCE

If the Buyer signs the "Finance Clause is not Applicable" box in the Schedule, or if no information is completed in the 'Finance Clause is Applicable' box in the Schedule, then this Clause 1 does not apply to the Contract.

If any information is completed in or the Buyer signs the 'Finance Clause is Applicable' box in the Schedule then this Clause 1 applies to the Contract.

1.1 Buyer's Obligation to Apply for Finance and Give Notice to the Seller

(a) The Buyer must:
  (1) immediately after the Contract Date make a Finance Application to a Lender or a Mortgage Broker using, if required by the Lender, the Property as security; and
  (2) use all best endeavours in good faith to obtain Finance Approval.

(b) If the Buyer does not comply with Clause 1.1(a) or 1.1(c)(1) then the Contract will not come to an end pursuant to clause 1.2 and the Buyer may not terminate the Contract under Clause 1.3. The rights of the Seller under this Clause 1.1 will not be affected if the Buyer does not comply with Clause 1.1.

(c) The Buyer must immediately give to the Seller or Seller Agent:
  (1) an Approval Notice if the Buyer obtains Finance Approval; or
  (2) a Non Approval Notice if the Finance Application is rejected;

at any time while the Contract is in force and effect.

1.2 No Finance Approval by the Latest Time: Non Approval Notice Given

This Contract will come to an end without further action by either Party if on or before the Latest Time:

(a) the Finance Application has been rejected; or

(b) a Non Approval Notice, is given to the Seller or Seller Agent.

1.3 No Finance Approval by the Latest Time: No Notice Given

If by the Latest Time the Seller or Seller Agent has not been given:

(a) an Approval Notice; or

(b) a Non Approval Notice;

then this Contract will be in full force and effect unless and until either the Seller gives written Notice of termination to the Buyer or the Buyer terminates this Contract by giving a Non-Approval Notice to the Seller or Seller Agent.

1.4 Finance Approval: Approval Notice Given

If by the Latest Time, or if Clause 1.5 applies, before the Contract is terminated:

(a) Finance Approval has been obtained; or

(b) an Approval Notice has been given to the Seller or Seller Agent;

then this Clause 1 is satisfied and this Contract is in full force and effect.

1.5 Notice Not Given by Latest Time: Sellers Right to Terminate

If by the Latest Time an Approval Notice or a Non Approval Notice has not been given to the Seller or Seller Agent then at any time until an Approval Notice or a Non Approval Notice is given, the Seller may terminate this Contract by written Notice to the Buyer.

1.6 Buyer Must Keep Seller Informed: Evidence

(a) If requested in writing by the Seller or Seller Agent the Buyer must:
  (1) advise the Seller or Seller Agent of the progress of the Finance Application; and
  (2) provide evidence in writing of:
    (i) the making of a Finance Application in accordance with Clause 1.1 (a) and of any loan offer made, or any rejection; and/or
    (ii) in the case of any Finance Application made to a Mortgage Broker, any "preliminary assessment" of the suitability of the proposed credit contract provided to the Buyer by the Mortgage Broker pursuant to section 116 of the Credit Protection Act; and
  (3) if applicable, advise the Seller or Seller Agent of the reasons for the Buyer not accepting any loan offer.

(b) If the Buyer does not comply with the request within 2 Business Days then the Buyer authorises the Seller or Seller Agent to obtain from the Lender and/or Mortgage Broker the information referred to in Clause 1.6(a).

1.7 Right To Terminate

If a Party has the right to terminate under this Clause 1, then:

(a) termination must be effected by written Notice to the other Party;

(b) Clauses 23 and 24 of the 2022 General Conditions do not apply to the right to terminate;

(c) upon termination the Deposit and any other monies paid by the Buyer must be repaid to the Buyer;

(d) upon termination neither Party will have any action or claim against the other for breach of this Contract, except for a breach of Clause 1.1 by the Buyer.

1.8 Waiver

The Buyer may waive this Clause 1 by giving written Notice to the Seller or Seller Agent at any time before the Latest Time, or if Clause 1.5 applies, before the Contract is terminated. If waived this Clause is deemed satisfied.

1.9 Definitions

In this Clause:

Amount of Loan means the amount referred to in the Schedule, any lesser amount of finance referred to in the Finance Application or any lesser amount of finance acceptable to the Buyer. If the amount referred to in the Schedule is blank, then the amount will be an amount equivalent to the Purchase Price.

Approval Notice means a statement in writing given by the Buyer, a Lender or a Mortgage Broker to the Seller, or Seller Agent to the effect that Finance Approval has been obtained.

Credit Protection Act means the *National Consumer Credit Protection Act, 2009* (Cwth).

Finance Application means an application made by or on behalf of the Buyer:

(a) to a Lender to lend any monies payable under the Contract: or

(b) to a Mortgage Broker to facilitate an application to a Lender.

Finance Approval means a written approval by a Lender of the Finance Application, a written offer to lend or a written notification of an intention to offer to lend made by a Lender:

(a) for the Amount of Loan;

(b) which is unconditional or subject to terms and conditions:
  (1) which are the Lender's usual terms and conditions for finance of a nature similar to that applied for by the Buyer; or
  (2) which the Buyer has accepted by written communication to the Lender, but a condition which is in the sole control of the Buyer to satisfy will be treated as having been accepted for the purposes of this definition; or
  (3) which, if the condition is other than as referred to in paragraphs (1) and (2) above includes:
    (i) an acceptable valuation of any property;
    (ii) attaining a particular loan to value ratio;
    (iii) the sale of another property; or
    (iv) the obtaining of mortgage insurance;

  and has in fact been satisfied.

Latest Time means:

(a) the time and date referred to in the Schedule; or

(b) if no date is nominated in the Schedule, then 4pm on the day falling 15 Business Days after the Contract Date.

Lender means any bank, building society, credit union or other institution which makes loans and in each case carries on business in Australia.

Mortgage Broker means means a holder of an Australian Credit Licence pursuant to section 35 of the Credit Protection Act or a credit representative pursuant to sections 64 or 65 of that legislation.

Non Approval Notice means:

(a) advice in writing given by the Buyer or a Lender to the Seller, or Seller Agent to the effect that the Finance Application has been rejected or Finance Approval has not been obtained; or

(b) advice in writing from a Mortgage Broker to the Seller or Seller Agent to the effect that:
  (1) (i) they have made inquiries about the Buyer's requirements and objectives under this Contract;
    (ii) they have conducted a "preliminary assessment" pursuant to sections 116 and 117 of the Credit Protection Act of the suitability of the credit contract proposed for the Buyer arising from the Finance Application; and
    (iii) they have assessed that proposed credit contract as being unsuitable for the Buyer; or
  (2) the Finance Application to a Lender has been rejected.

2. Acceptance of an offer by one Party to the other Party will be sufficiently communicated by the accepting Party to the other Party if verbal or written notification is given by the accepting Party or their Representative or Real Estate Agent that the accepting Party has signed the Contract.
3. The 2022 General Conditions together with the Annexure of Changes to the 2022 General Conditions Caused by changes to the transfer of Land Act 1893 are incorporated into this Contract so far as they are not varied by or inconsistent with the Conditions or Special Conditions of this Contract.
4. The parties consent to the information in this Contract being used/disclosed by REIWA and the Seller Agent in accordance with the privacy collection notices pursuant to the Australian Privacy Principles that appear on the REIWA and Seller Agent's websites.

SPECIAL CONDITIONS

1.The Buyer is aware that they will be required, prior to settlement, to complete and lodge a Foreign Transfer Duty Declaration which may result in the payment by them of Foreign Transfer Duty which is not included in the purchase price. The buyer acknowledges they have made all necessary enquiries to satisfy themselves about their responsibilities regarding Foreign Transfer Duty.

2. The buyer has received a copy of the Bushfire Management Plan

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SPECIAL CONDITIONS - Continued

BUYER [If a corporation, then the Buyer executes this Contract pursuant to the Corporations Act.]

Signature	Date	Signature	Date
Signature	Date	Signature	Date

THE SELLER (FULL NAME AND ADDRESS) ACCEPTS the Buyer's offer

Name Danelle Maree Warne
Address 12 Draper Road
Suburb Mahogany Creek State WA Postcode 6072

Name Danny Mark Critchell
Address 12 Draper Road
Suburb Mahogany Creek State WA Postcode 6072

EMAIL: The Seller consents to Notices being served at:

[If a corporation, then the Seller executes this Contract pursuant to the Corporations Act.]

Signature	Date	Signature	Date
Signature	Date	Signature	Date

RECEIPT OF DOCUMENTS
The Buyer acknowledges receipt of the following documents:
1. This offer and acceptance
2. Strata disclosure & attachments (if strata)
3. 2022 General Conditions
4. Annexure of changes to General Conditions (form 198)

Signature Signature

RECEIPT OF DOCUMENTS
The Seller acknowledges receipt of the following documents:
1. This offer and acceptance
2. 2022 General Conditions
3. Annexure of changes to General Conditions (form 198)

Signature Signature

CONVEYANCER (Legal Practitioner/Settlement Agent)
The Parties appoint their Representative below to act on their behalf and consent to Notices being served on that Representative's email address.

	BUYER'S REPRESENTATIVE	SELLER'S REPRESENTATIVE
Name		
Signature		

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ANNEXURE OF CHANGES TO THE 2022 GENERAL CONDITIONS CAUSED BY CHANGES TO THE TRANSFER OF LAND ACT 1893

LANDGATE WILL NOT ISSUE, OR REQUIRE DUPLICATE CERTIFICATES OF TITLE FOR LAND TO BE PRODUCED, FROM THE 7TH AUGUST 2023, CONSEQUENTLY THE PARTIES AGREE TO VARY THE 2022 GENERAL CONDITIONS IN THE FOLLOWING MANNER:

	CONDITION	**CHANGES**
1.	3.10(a)	Delete subclause (1).
2.	3.11	Delete clause 3.11.
3.	26.1 definition of "*Duplicate Certificate of Title*"	Delete the definition of *"Duplicate Certificate of Title".*

Buyer

Signature _____

Name _____

Date _____

Signature _____

Name _____

Date _____

Signature _____

Name _____

Date _____

Signature _____

Name _____

Date _____

Seller

Signature _____

Name Danelle Maree Warne

Date _____

Signature _____

Name Danny Mark Critchell

Date _____

Signature _____

Name _____

Date _____

Signature _____

Name _____

Date _____

WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
4093	**157**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 24 ON DEPOSITED PLAN 428021

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DANNY MARK CRITCHELL
DANELLE MAREE WARNE
BOTH OF 8 DRAPER ROAD MAHOGANY CREEK WA 6072
AS JOINT TENANTS

(AF Q792306) REGISTERED 11/3/2026

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. Q408487 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA REGISTERED 2/5/2025.
2. Q792307 NOTIFICATION CONTAINS FACTORS AFFECTING THE WITHIN LAND. LODGED 11/3/2026.
3. Q792308 NOTIFICATION SECTION 165 PLANNING & DEVELOPMENT ACT 2005 LODGED 11/3/2026.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	DP428021
PREVIOUS TITLE:	1121-538
PROPERTY STREET ADDRESS:	8 DRAPER RD, MAHOGANY CREEK.
LOCAL GOVERNMENT AUTHORITY:	SHIRE OF MUNDARING

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Plan Information

Tenure Type	Freehold
Plan Type	Deposited Plan
Plan Purpose	Subdivision

Plan Heading

LOTS 23 & 24

Locality & Local Government

Locality	MAHOGANY CREEK
Local Government	SHIRE OF MUNDARING

Department of Planning, Lands and Heritage

File Number	

Examination

E. Milewska 12.12.2025

Examined | Date

Planning Approval

Planning Authority	WAPC
Reference	163221

Delegated under S. 16 P&D Act 2005 | Date 18-Dec-2025

In Order For Dealings

Subject To

SEC 70A OF THE TLA
SEC 165 OF THE P&D ACT

19.12.2025

For Inspector of Plans and Surveys | Date

Plan Approved

11.3.2026

Inspector of Plans and Surveys / Authorised Land Officer | Date

Survey Details

Survey Method	Conventional Survey
Field Records	162365
Declared as Special Survey Area	NO

Survey and Plan Notation

Survey Certificate - Regulation 54

I, J. M. SCANLAN
hereby certify that this plan is accurate and is a correct representation of the -
(a) survey; and
(b) calculations from measurements recorded in the field records,
undertaken for the purposes of this plan and that it complies with the relevant written law(s) in relation to which it is lodged.

2025.09.30 13:13:20 +08'00'

Licensed Surveyor | Date

Survey Organisation

Name	SCANLAN SURVEYS
Address	P.O. BOX 429 MIDLAND 6936
Phone	9250 2261
Fax	
Email	reception@scanlansurveys.com.au
Reference	8709/22

Former Tenure

New Lot / Land	Parent Plan Number	Parent Lot Number	Title Reference	Subject Land Description
LOTS 23 & 24	P 4465	LOT 94	1121 - 538	

New Notifications and Memorials

Subject	Purpose	Statutory Reference	Origin	Land Burdened	Benefit To	Comments
	NOTIFICATION	SEC 70A OF THE TLA	DOC Q792307	LOTS 23 & 24		NO RETICULATED SEWERAGE
	NOTIFICATION	SEC 165 OF THE P & D ACT	DOC Q792308	LOTS 23 & 24		BUSHFIRE PRONE AREA

SCANLAN SURVEYS LICENSED SURVEYORS
23 SPRING PARK ROAD
MIDLAND, WA, 6056
PO BOX 429, MIDLAND, 6936
PH: 08 9250 2261
www.scanlansurveys.com.au
reception@scanlansurveys.com.au

DRAWING NUMBER: 8709/22/2 LF

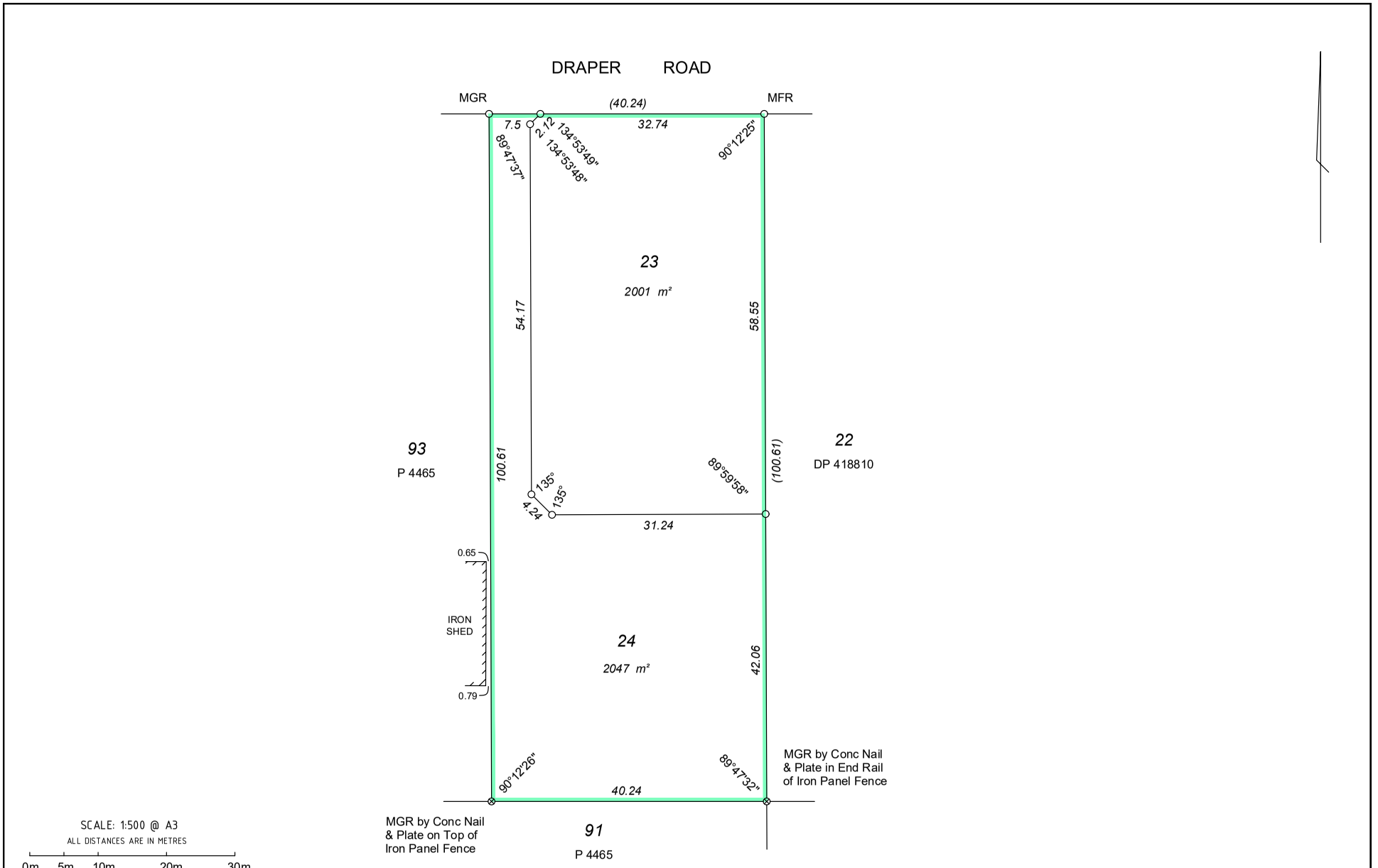
ADDITIONAL SHEETS

SHEET 1 OF SHEETS 2

VERSION NUMBER 1

DEPOSITED PLAN 428021

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SCANLAN SURVEYS LICENSED SURVEYORS
23 SPRING PARK ROAD
MIDLAND, WA, 6056
PO BOX 429, MIDLAND, 6936
PH: 08 9250 2261
www.scanlansurveys.com.au
reception@scanlansurveys.com.au

DRAWING NUMBER: 8709/22/3 LF

ADDITIONAL SHEETS

SHEET	OF	SHEETS	VERSION NUMBER	DEPOSITED PLAN
2		2	1	428021

Deposited Plan 428021

Lot	Certificate of Title	Lot Status	Part Lot
23	4093/156	Registered	
24	4093/157	Registered	

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GOVERNMENT OF WESTERN AUSTRALIA

Landgate

Q792308 NO
11 Mar 2026 15:36:41 ACCPP4

Notification

Approved form 2017-98207 *Reg 3 of the Transfer of Land Regulations 2004*
The information in this form is collected under statutory authority and used for the purpose of maintaining publicly searchable registers and indexes.

Jurisdiction

State of Western Australia

Legislation

Transfer of Land Act 1893

Planning and Development Act 2005

Lodging party details

Name Deanne Murray Conveyancing
Address PO Box 1050
Issuing box 9 888 V
Phone 9307 3082
Fax
Email deanne@dmconveyancing.com.au
Reference

Preparer details

Name	Scanlan Surveys
Phone	+61 8 9250 2261
Reference	8709/22

Notification details

Act	Planning and Development Act 2005
Section	165
File No	163221
Hazards or other factors seriously affecting the land	This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner is subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land.
Statements	The land set out in the schedule is land to which section 165 of the Planning and Development Act 2005 applies.

Land / Interest

Title(volume-folio)	Extent	Land description	Interest
	Whole	LOT 23 ON DP 428021	FEE SIMPLE
	Whole	LOT 24 ON DP 428021	FEE SIMPLE

Registered proprietor(s)(Land)

DANNY MARK CRITCHELL OF 12 DRAPER ROAD MAHOGANY CREEK WA 6072

DANELLE MAREE WARNE OF 12 DRAPER ROAD MAHOGANY CREEK WA 6072

Authorising party

WESTERN AUSTRALIAN PLANNING COMMISSION (ABN 35482341493) OF GORDON STEPHENSON HOUSE 140 WILLIAM STREET PERTH WA 6000

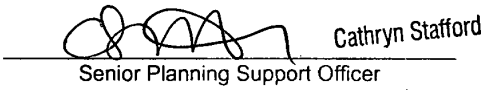
Execution date

17 December 2024

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Western Australian Planning Commission



Senior Planning Support Officer
Under authority delegated pursuant to s.16
of the Planning & Development Act 2005

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Document Notes:

IMPORTANT: THIS PAGE FORMS PART OF DOCUMENT [Q792308] AND MAY CONTAIN REFERENCES TO AMENDMENTS OR CORRECTIONS TO THE DOCUMENT

20/4/2026 10:35:14
The address of the registered proprietors is amended to
"8 DRAPER ROAD MAHOGANY CREEK WA 6072"
See letter dated 20 April 2026 from Deanne Murray Conveyancing.

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DEANNEMURRAY
CONVEYANCING

0417 939 175 08 9307 3082
deanne@dmconveyancing.com.au
www.dmconveyancing.com.au
PO Box 1050 Hillarys WA 6923

20 April 2026

Registrar and Commissioner of Titles
Landgate
PO Box 2222
MIDLAND WA 6936

Dear Sir/Madam

Dealing number Q792306

We have been appointed to act for the registered proprietor Applicant.

We hereby authorise and request that you amend the address of the registered proprietor on Notification 165 Document number Q792308 to read 8 Draper Road Mahogany Creek WA 6072

If you have any queries please contact our office.

Yours faithfully
Deanne Murray Conveyancing

Deanne Murray
deanne@dmconveyancing.com.au

Licensee: Deanne Kay Murray trading as Deanne Murray Conveyancing ABN: 989 597 442 85, independent licensed real estate settlement agent

AIC AUSTRALIAN INSTITUTE OF CONVEYANCERS

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GOVERNMENT OF WESTERN AUSTRALIA

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Q792307 NR
11 Mar 2026 15:36:41 ACCPP4

Notification

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State of Western Australia

Legislation

Transfer of Land Act 1893

Lodging party details

Name Deanne Murray Conveyancing
Address Po Box 1050
Issuing box 888V
Phone 9307 3082
Fax
Email deanne@dmconveyancing.com.au
Reference

Preparer details

Name	Scanlan Surveys
Phone	+61 8 9250 2261
Reference	8709/22

Notification details

Act	Transfer of Land Act 1893
Section	70A
Factor affecting use or enjoyment of land	A reticulated sewerage service is not available to the lot(s).

Land / Interest

Title(volume-folio)	Extent	Land description	Interest
	Whole	LOT 23 ON DEPOSITED PLAN 428021	FEE SIMPLE
	Whole	LOT 24 ON DEPOSITED PLAN 428021	FEE SIMPLE

Registered proprietor(s)(Land)

DANNY MARK CRITCHELL OF 8 DRAPER ROAD MAHOGANY CREEK WA 6072
DANELLE MAREE WARNE OF 8 DRAPER ROAD MAHOGANY CREEK WA 6072

Authorising party

SHIRE OF MUNDARING (ABN 20431487930) OF SHIRE OF MUNDARING 7000 GREAT EASTERN HIGHWAY MUNDARING WA 6073

Execution date

* 9 October 2025

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Registered proprietor(s)(Land) execution

Witness must be an adult person. The witness must state their full name, address and occupation.

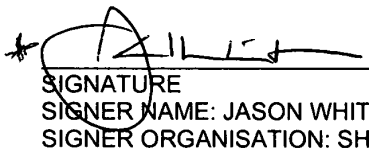
Witness signature	AM	Signature	
Witness full name	AMY MILLAR	Signer name	DANNY MARK CRITCHELL
Witness address	54 LANARK ST COOLBINIA WA		
Witness occupation	TEACHER		
Witness phone	0407 982 356		

Witness must be an adult person. The witness must state their full name, address and occupation.

Witness signature	AM	Signature	
Witness full name	AMY MILLAR	Signer name	DANELLE MAREE WARNE
Witness address	54 LANARK ST COOLBINIA WA		
Witness occupation	TEACHER		
Witness phone	0407 982356		

Authorising party execution

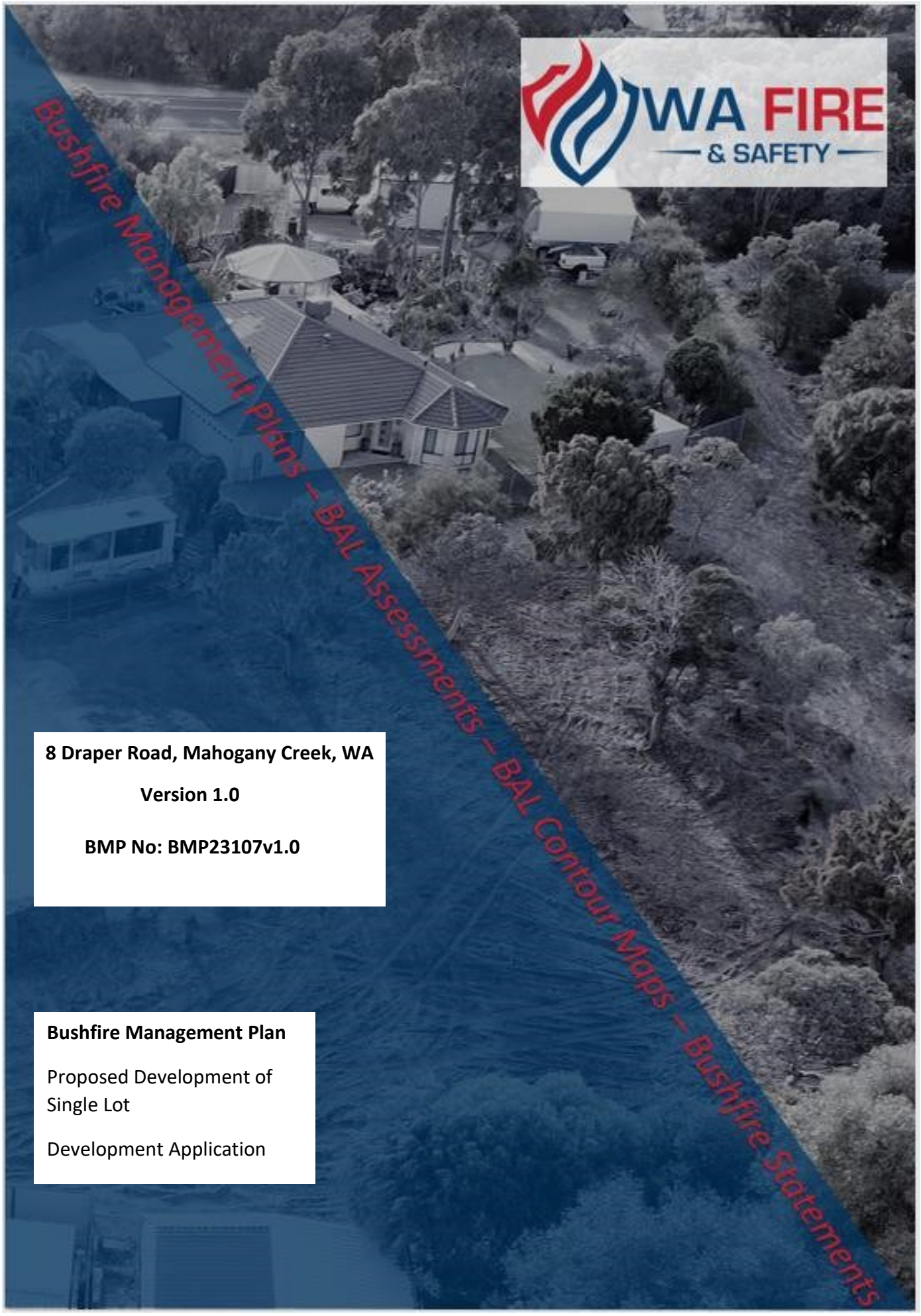
Executed on behalf of the SHIRE OF MUNDARING under authority of the LOCAL GOVERNMENT ACT 1995 PURSUANT TO SECTION 9.49A(4)



SIGNATURE
SIGNER NAME: JASON WHITEAKER
SIGNER ORGANISATION: SHIRE OF MUNDARING
SIGNER DESIGNATION: CHIEF EXECUTIVE OFFICER

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8 Draper Road, Mahogany Creek, WA

Version 1.0

BMP No: BMP23107v1.0

Bushfire Management Plan

Proposed Development of Single Lot

Development Application

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Bushfire Management Plan Coversheet

Addressing the Bushfire Protection Criteria

Site Address: 8 Draper Road, Mahogany Creek, Western Australia,

Site Visit: Yes☒ No☐
Date of site visit: 11 November 2022

Report Author: Noel English, WA Fire & Safety

(BMP) Bushfire Management Plan Number: BMP 23107v1.0

BMP Date: 18/11/22

	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?		X
Have any of the bushfire protection criteria elements been addressed using a performance principle (tick no if only acceptable solutions have been used to address all the bushfire protection criteria elements)?		X
Is the proposal any of the following (see SPP 3.7 for definitions)?		
Unavoidable development (in BAL-40 or BAL-FZ)		X
Strategic planning proposal (including rezoning applications)		X
High risk land-use		X
Vulnerable land-use		X

Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

The information provided within this bushfire management plan to the best of my knowledge is true and correct:



Dwayne Griggs, WA Fire & Safety, 18 November 2022

Document control

Report version	Purpose	Author/reviewer and accreditation details	Date submitted
1.0	Approval of 2 lot subdivision	Author Dwayne Griggs BPAD40466	18 November 2022

Disclaimer

The Bushfire Management Plan prepared by WA Fire & Safety (Dwayne Griggs BPAD40466), is solely intended for the use of:

1. Current & future landowners
2. Developers & contractors engaged by the current landowners
3. Local Government Authority (LGA)

The enclosed strategies intended for the mitigation of the bushfire risk for this development are the minimum standard and the risk is assessed to the ability of the bushfire consultant and provided information from all stakeholders at the time of the accepted task.

This BMP considers the bushfire aspects of planning only and does not consider all the environmental aspects involved. A limited environmental survey has been completed and further consultation and/or approval for vegetation clearances is up to the Local Government Authority (LGA).

The setbacks and distances for the Asset Protection Zone(s) APZs should be confirmed at the time of vegetation modification for the proposed structures and after the vegetation clearance a final inspection may be required to provide a to confirm distance and issue a BAL certificate, thus ensuring the correct risk mitigation distances has been achieved, the decision for a final inspection is up to the LGA.

There is no guarantee that in the event of a bushfire that property loss will not occur, and the author has used the information provided, appropriate guidelines and due care to provide what they believe is the best possible solution to combat a relatively unpredictable fire threat.

WA Fire & Safety (Dwayne Griggs) excludes all liability for any damage, loss, injury or claim from any fire event, by the acceptance of this BMP the property owner is made aware and agrees to this exclusion of liability.

The ongoing responsibility falls on the landowner for the correct site maintenance to maintain the BAL Levels outlined inside this BMP and their continuance to mitigate the risks involved with extreme fire behaviour. The poor maintenance of vegetation, fuel loads, APZ requirements, Local government fire break notices and fire risk mitigation strategies provided within this BMP can severely impact the level of risk that a fire event can have. If the landowner believes that any factors have changed or modified the potential risk, then the bushfire consultant should be informed, and a new BMP may be required.

On submission of this BMP the landowner authorises direct contact from the LGA to the bushfire consultant for any issues, changes, or queries, contact details are below.

This Bushfire Management Plan is Valid for 3 years from the date completed.

Compliance Statement

This document has been prepared in accordance to the State Planning Policy 3.7 Planning in bushfire prone areas 2021 and the Guidelines for planning in bushfire prone areas v1.4 December 2021.

Bushfire Management Plan Author:

WA Fire & Safety, Maida Vale, Western Australia

Dwayne Griggs

Level 2 FPAA Accredited Practitioner

Accreditation Number: BPAD40466

Phone: 0415684681

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1.0 Introduction and Proposal Details

This BMP has been requested by the landowners for the proposed development of 8 Draper Road, Mahogany Creek, Western Australia, within the LGA of the Shire of Mundaring.

The zoned residential lot is currently identified as inside the Bushfire Prone area. Currently this lot is in an developed state with a single dwelling on the northern part of the lot.

This proposed development consists of dividing the 4048m^2 single lot into two lots, 23 and 24 on the subdivision plans. The closest lot to the street being 23 would be 2001m^2 and have approximately 33m of street frontage. The rear lot being 24 will be a battle-axe block with an area of 2047m^2 and a street footage of 7.5m.

The assessed bushfire risk for the lot 24 is extreme. BAL-29 is achievable for a future dwelling by locating within the specified building envelope, vegetation modification within the lot 24 and an APZ (Asset Protection Zone) of the subject lot in entirety.

Determined BAL rating is BAL-FZ on the day of the site visit and further vegetation modification is required to achieve BAL-29 or less within the lot, this BMP demonstrates that BAL-29 is achievable for the proposed lot 24 to the south.

1.1 Site Location

The proposed development is located 3km west of Mundaring centre on Draper Road having access from both from east and west.

1.2 Aims and Objectives

The aim of this Bushfire Management Plan is to identify issues, requirements and provide bushfire risk mitigation measures for the proposed development. Aims for this site include:

- avoid increasing the threat to people, property and infrastructure
- reduce the developments vulnerability from extreme bushfire behaviour
- allow ingress and egress for fire and emergency services
- consider and minimize environmental impacts by reducing vegetation modification.

The objectives of this Bushfire Management Plan are to:

- demonstrate suitability for development
- display bushfire risk levels, fuels, vegetation types and the impact before and after
- show Bushfire management strategies recommended for the site
- demonstrate compliance with the bushfire protection criteria and the use of acceptable solutions for the site.

1.3 Document Preparation

Dwayne Griggs from WA Fire & Safety a BPAD Level 2 accredited practitioner with the Fire Protection Association of Australia has conducted the site assessment and prepared this BMP.

FIGURE 1: Copy of Site Plans

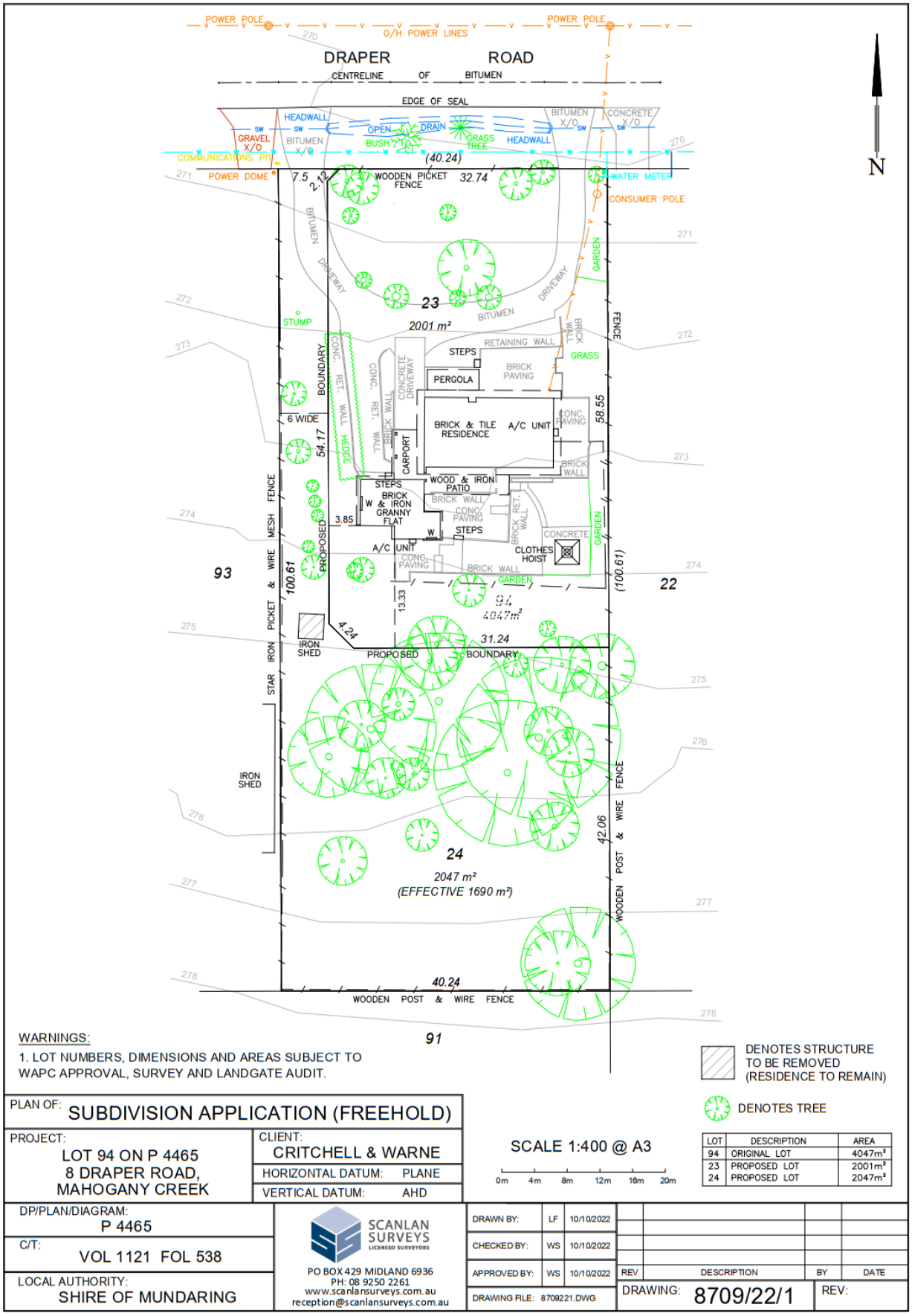


FIGURE 2: Proposed Location



FIGURE 3: **Map of Bushfire Prone Areas for the subject site**



Site is entirely inside the bushfire prone area.

2.0 Environmental Considerations

Limited considerations below have been assessed with no issues:

Department of Biodiversity, Conservation and Attractions (DBCA)
Nil
Department of Planning, Lands and Heritage
Nil
Department of Water and Environmental Resources (DWER)
Nil
Department of Primary Industries and Regional Development (DPIRD)
Nil
Mundaring Local Natural Areas
Nil

2.1 Native vegetation – Modification and Clearing

Vegetation modification of 221m2 of Class A Forest inside of proposed lot 24 is required to achieve BAL-29 within the proposed lot. An environmental Asset Inspection from the Shire of Mundaring has not been conducted.

There are no alternative bushfire management design solutions that will reduce the extent of vegetation clearing as the dwelling location has not been provided.

2.2 Revegetation/Landscape Plans

Revegetation inside the APZ will be designed and maintained as per the standards for APZ's (Appendix 1) and the Local Government Authority Firebreak Notice (Appendix 2).

3.0 Bushfire Assessment Results

The site requires a BAL assessment in accordance with clause 6.5 of SPP 3.7. The assessment of this site or development was undertaken by Dwayne Griggs of WA Fire & Safety, a BPAD Accredited Level 2 Practitioner for the purpose of determining the Bushfire Attack Level in accordance with AS 3959 - 2018 Simplified Procedure (Method 1). All vegetation within 150m of the proposed site has been assessed and classified in accordance with AS3959.

3.1 Vegetation Classification

Vegetation and land use within 150 m of the site has been classified as per descriptions included in *AS 3959 – 2018 Construction of Buildings within Bushfire Prone Areas*.

All classifiable vegetation inside the 150m Vegetation survey is either Class A Forest or Class G Grassland.

FIGURE 5: Vegetation Classification Map



Photo ID:	-	**Plot:**	1
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
This plot was totally on private land and at the time of the site visit, was inaccessible. The slope was determined on site from a distance and using the available contours. In accordance with the precautionary principal, this plot has been classified as Class A.			

No Photo

Photo ID:	6	**Plot:**	2
Vegetation Classification or Exclusion Clause			
Class G Grassland			
Description / Justification for Classification			
Grassland of >100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Moderate surface, Near surface and Intermediate Fuel loads			



Photo ID:	7	Plot:	2
Vegetation Classification or Exclusion Clause			
Class G Grassland			
Description / Justification for Classification			
Grassland of >100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Moderate surface, Near surface and Intermediate Fuel loads			

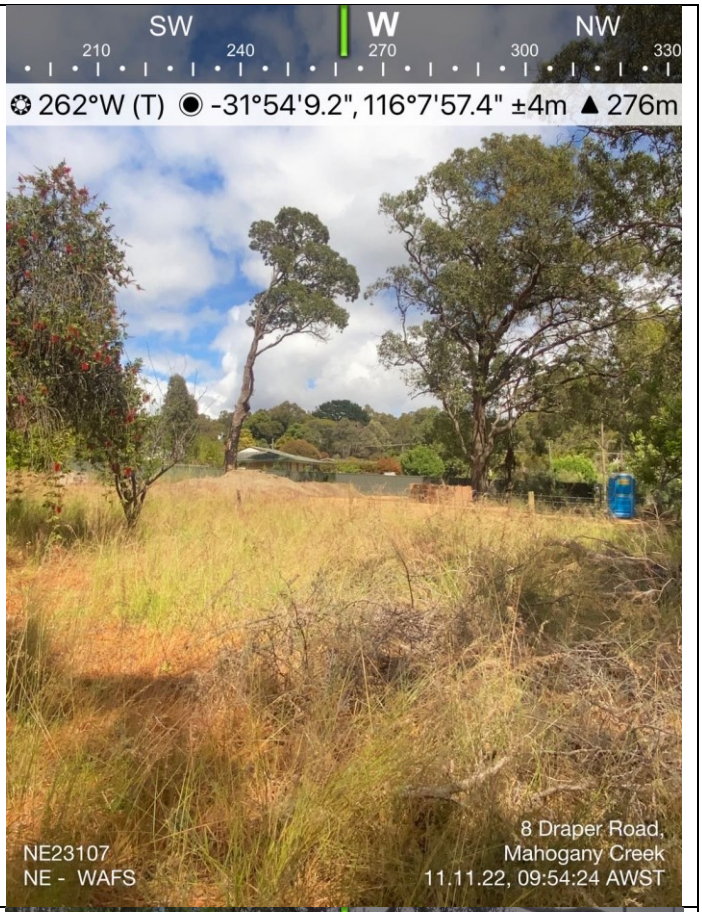


Photo ID:	9	Plot:	3
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Grassland of <100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads			



Photo ID:	12	Plot:	3

Vegetation Classification or Exclusion Clause

Class A Forest

Description / Justification for Classification

Grassland of <100mm in Height
Canopy Cover of Less than 10%
Understorey of Grasses
Minimal surface, Near surface and Intermediate Fuel loads



Photo ID:	19	Plot:	4

Vegetation Classification or Exclusion Clause

Class A Forest

Description / Justification for Classification

Grassland of <100mm in Height
Canopy Cover of Less than 10%
Understorey of Grasses
Minimal surface, Near surface and Intermediate Fuel loads



Photo ID:	53	Plot:	4
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Grassland of <100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads			



Photo ID:	55	Plot:	4
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Grassland of <100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads			



Photo ID:	15	Plot:	5
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Grassland of <100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads			



Photo ID:	21	Plot:	5
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Grassland of <100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads			



Photo ID:	24	Plot:	5
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Grassland of <100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads			



Photo ID:	27	Plot:	5
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Grassland of <100mm in Height Canopy Cover of Less than 10% Understorey of Grasses Minimal surface, Near surface and Intermediate Fuel loads			



Photo ID:	2	Plot:	6
Vegetation Classification or Exclusion Clause			
Excludable - 2.2.3.2 (e) (f) Low Threat Vegetation/Non Vegetated			
Description / Justification for Classification			
Residential Areas Maintained Areas Non-Vegetated Areas Minimal surface, Near surface and Intermediate Fuel loads			



Photo ID:	8	Plot:	6
Vegetation Classification or Exclusion Clause			
Excludable - 2.2.3.2 (e) (f) Low Threat Vegetation/Non Vegetated			
Description / Justification for Classification			
Residential Areas Maintained Areas Non-Vegetated Areas Minimal surface, Near surface and Intermediate Fuel loads			

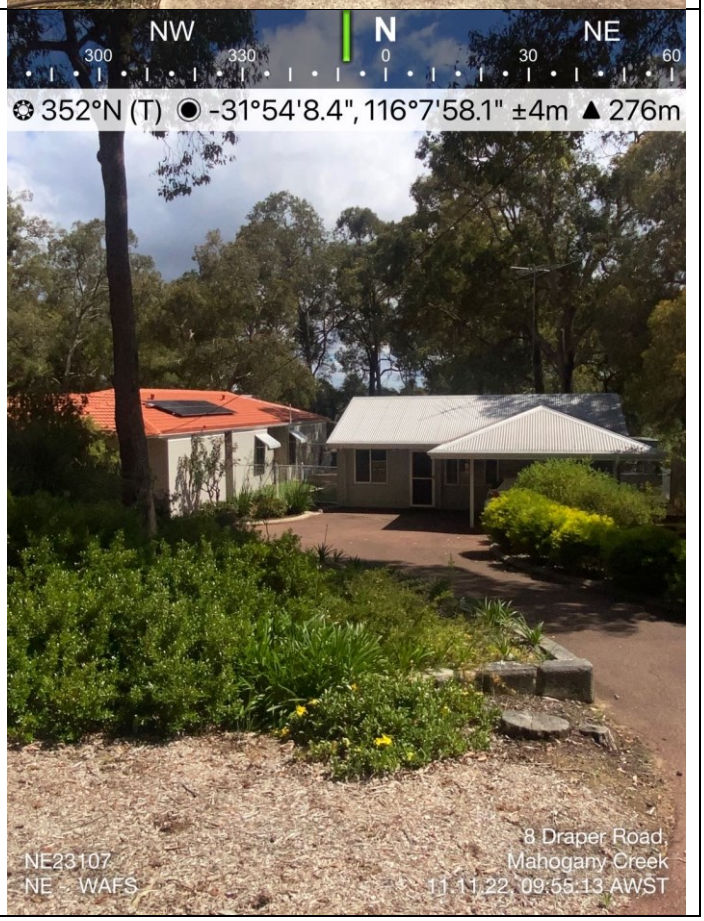


Photo ID:	16	Plot:	6
Vegetation Classification or Exclusion Clause			
Excludable - 2.2.3.2 (e) (f) Low Threat Vegetation/Non Vegetated			
Description / Justification for Classification			
Residential Areas Maintained Areas Non-Vegetated Areas Minimal surface, Near surface and Intermediate Fuel loads			



Photo ID:	18	Plot:	6
Vegetation Classification or Exclusion Clause			
Excludable - 2.2.3.2 (e) (f) Low Threat Vegetation/Non Vegetated			
Description / Justification for Classification			
Residential Areas Maintained Areas Non-Vegetated Areas Minimal surface, Near surface and Intermediate Fuel loads			

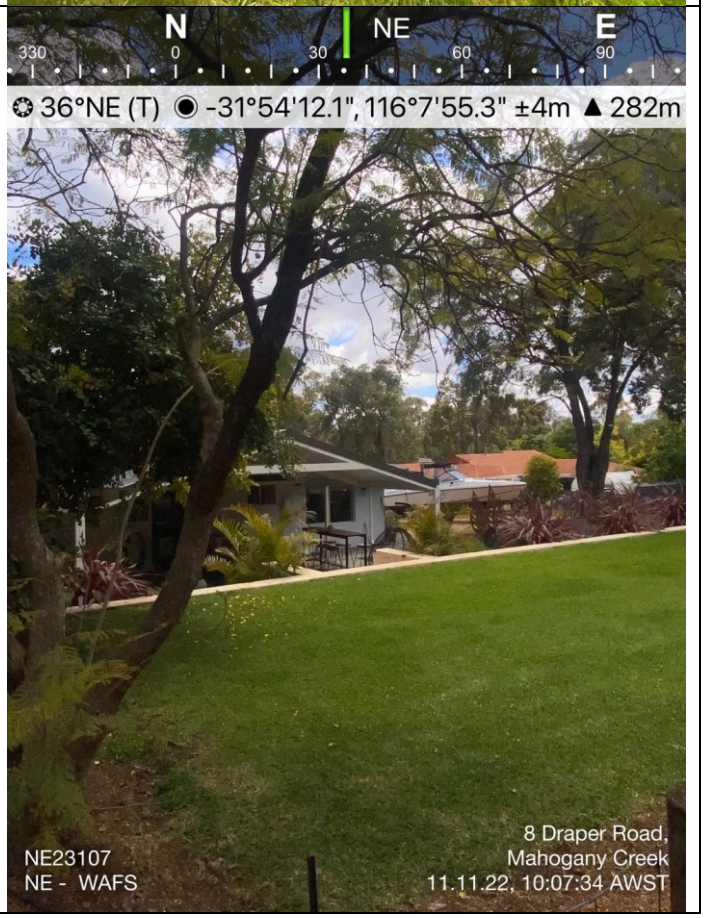


Photo ID:	34	Plot:	6
Vegetation Classification or Exclusion Clause			
Excludable - 2.2.3.2 (e) (f) Low Threat Vegetation/Non Vegetated			
Description / Justification for Classification			
Residential Areas Maintained Areas Non-Vegetated Areas Minimal surface, Near surface and Intermediate Fuel loads			



Photo ID:	40	Plot:	6
Vegetation Classification or Exclusion Clause			
Excludable - 2.2.3.2 (e) (f) Low Threat Vegetation/Non Vegetated			
Description / Justification for Classification			
Residential Areas Maintained Areas Non-Vegetated Areas Minimal surface, Near surface and Intermediate Fuel loads			



Photo ID:	42	Plot:	6
Vegetation Classification or Exclusion Clause			
Excludable - 2.2.3.2 (e) (f) Low Threat Vegetation/Non Vegetated			
Description / Justification for Classification			
Residential Areas Maintained Areas Non-Vegetated Areas Minimal surface, Near surface and Intermediate Fuel loads			



3.2 Slope

This site is on the side of a hill sloping down towards great Eastern Highway to the north, no slopes were steeper than -5° Downslope.

Table 3A: Vegetation Classification and Slopes

Plot	Vegetation Classification	Effective Slope
1	Class A - Forest	0-5 Downslope
2	Class G Grassland	0-5 Downslope
3	Class A - Forest	0-5 Downslope
4	Class A - Forest	0-5 Downslope
5	Class A - Forest	0/Upslope
6	Excluded 2.2.3.2 (e)(f)	-

3.3 Fire Danger Index

The nominated fire danger index (FDI) for Western Australia is 80.

3.4 BAL- Contour Assessment

The BAL Contour assessment show the subject lot with the proposed Building Envelope that is able to achieve and maintain the BAL-29 or less rating in perpetuity.

Figure 6: BAL Contour Map

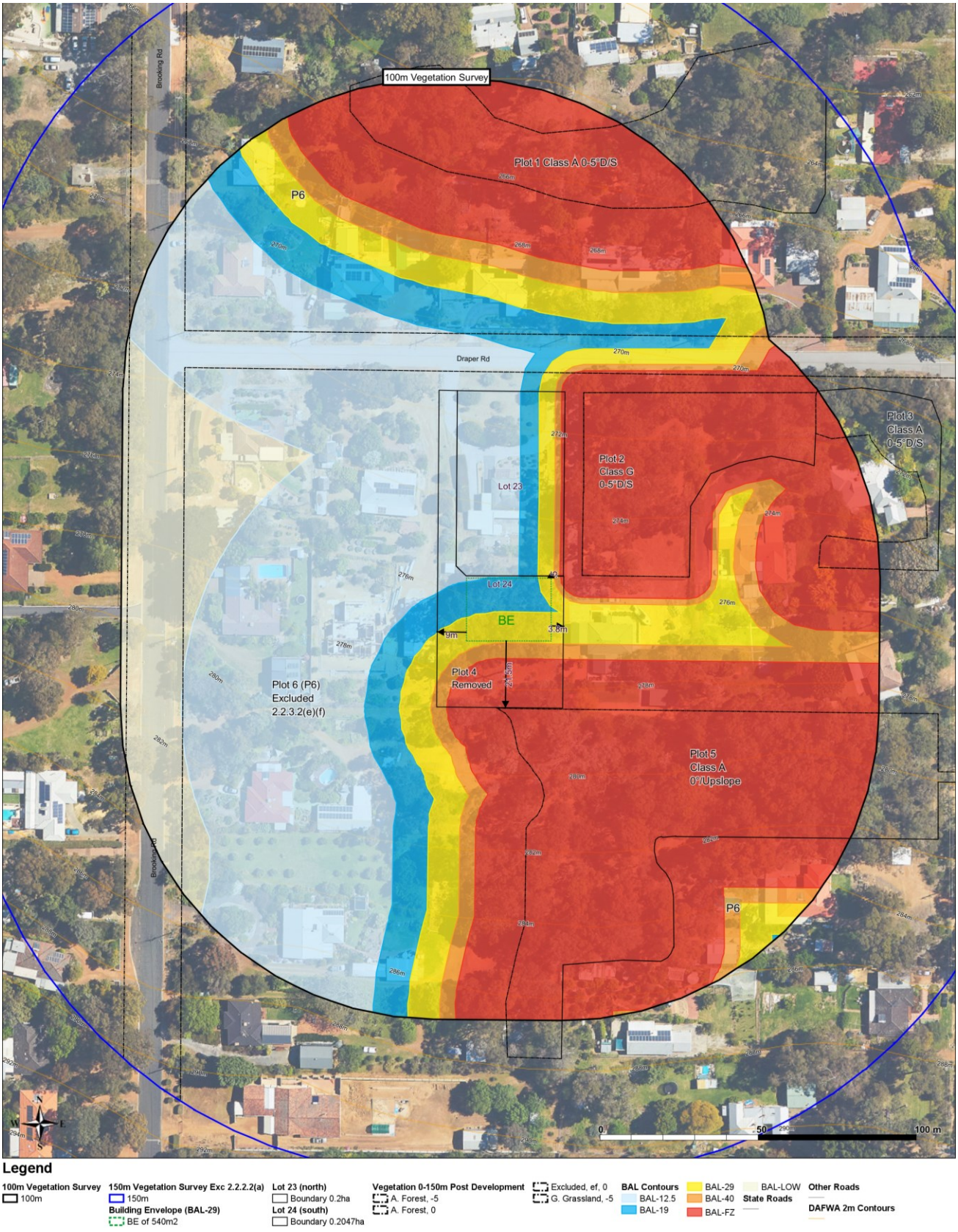


Table 3A provides the indicative BAL contours within the subject lot (lot 24) after development has been completed and the APZ has been implemented by removing Plot 4, class A inside the subject lot.

Table 3A: Indicative BAL contour Ratings for Lot 24

Lot	Vegetation Class	Effective Slope	Separation (m)	Highest BAL	Lowest BAL
1	Class A - Forest	0-5 Downslope	68m Driveway	BAL – 12.5	BAL – LOW
2	Class G Grassland	0-5 Downslope	6	BAL – FZ	BAL – 12.5
3	Class A - Forest	0-5 Downslope	91	BAL – 12.5	BAL – LOW
4	Removed	-	-	BAL – LOW	BAL – LOW
5	Class A - Forest	0/Upslope	0	BAL – FZ	BAL – 12.5

3.5 Additional Bushfire Hazard Issues

Below are the identified bushfire hazard issues relating to this site:

- The development is bounded by class A Forest to the south and Class G Grassland to the north-east.
- Subject lot has Class A within the boundaries that would need modification.
- Asset Protection Zone for subject lot will be lot in entirety are to be established and maintained in perpetuity upon approval.
- The indicative BAL ratings are to demonstrate compliance only and will need to be established during the building process with a BAL Assessment, Report and Certificate.
- As this development is above BAL-LOW the relevant bushfire protection criteria apply and will need to be addressed (section 4.0).

4.0 Compliance and Justifications

4.1 SPP 3.7 Objectives and Application of Policy Measures

The intent of *State Planning Policy (SPP) 3.7 Planning in Bushfire Prone Areas* (Department of Planning and Western Australian Planning Commission, 2015) is to ensure that bushfire risks are considered in a timely manner and that planning documents demonstrate the appropriate application of the various policy measures. Table 3 summarises the intent and objectives of SPP 3.7 and provides evidence of how the site complies.

Table 3: Evidence of compliance with SPP 3.7 intent and objectives

SPP Reference	Description	Evidence of Compliance
Intent	▪ Ensure that risks associated with bushfires are planned using a risk-based approach	▪ Preparation of a bushfire management plan in accordance with SPP 3.7 ▪ BAL assessment indicates risks associated with bushland are manageable
Objective 1	▪ Avoid any increase in the threat of bushfire to people, property and infrastructure	▪ BAL assessment indicates risks associated with bushland are manageable ▪ Structures within 100 m of vegetation assigned BAL-rating as per AS-3959 – 2018
Objective 2	▪ Reduce vulnerability to bushfire	▪ BAL assessment indicates risks associated with bushland are manageable ▪ Structures within 100 m of vegetation assigned BAL-rating as per AS-3959 – 2018

SPP Reference	Description	Evidence of Compliance
Objective 3	▪ Ensure that higher order strategic planning documents and proposals consider bushfire protection requirements at an early stage	▪ Planning at the site is largely complete, with bushfire risk being considered at an appropriate stage of the development ▪ This bushfire management plan documents the risks as they stand
Objective 4	▪ Achieve an appropriate balance between bushfire risk management and biodiversity conservation	▪ Biodiversity values will remain in the surrounding bushland area ▪ Site environmental values have been considered during previous stages of the planning approvals process

4.2 Compliance table

The Bushfire protection criteria have been provided to assist in the assessment of proposed bushfire risk management measures required for development applications in bushfire prone areas. Table 4 demonstrates the Site's Compliance with Bushfire Protection Criteria.

Table 4: Compliance with bushfire protection criteria

Bushfire protection criteria Intent	Acceptable solutions	Proposed bushfire management strategies/solutions
Element 1: Location Ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure	**A1.1 Development location** 1. Bushfire hazard level is or on completion will be moderate or low or 2. BAL Rating is BAL-29 or lower	BAL Contour concludes BAL-29 rating is possible inside the subject lot within the proposed 27m x 20m Building Envelope only. Outside the Building Envelope only non-associated 10a structures will be supported if they are more than 6m from the class 1a Dwelling and do not impact the turn-around area.
Element 2: Siting and design To ensure that the siting and design of development minimises the level of bushfire impact	**A2.1 Asset Protection Zone** Every habitable building is surrounded by, and every proposed lot can achieve an APZ depicted on plans that meets the following: 1. Width – bushfire radiant heat does not exceed radiant heat of 29 kW/m^2 (BAL-29) as measured from any external wall or supporting post or column in all circumstances 2. Location – APZ contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot(s) will be managed in a low-fuel state on an ongoing basis, in perpetuity 3. Management – the APZ is managed in accordance with the requirements of Schedule 1 '*Standards for Asset Protection Zones*' (BMP Appendix 1)	APZ is to be established and maintained in perpetuity to: 1. Lot in entirety APZ and BE has been designed to minimise environmental impact within the lot boundary and position the dwelling at the furthermost distance from the south where the highest risk Class A Forest is located. APZ's are to be maintained in perpetuity in accordance with: 1. Schedule 1 of the Guidelines for Planning in Bushfire Prone Areas (Appendix 1) and 2. Local Government Authority Firebreak Notice (Appendix 2).
Element 3: Vehicular access	**A3.1 Public Roads** Minimum requirements under the acceptable solution are applicable to all proposed and existing roads.	N/A

Bushfire protection criteria Intent	Acceptable solutions	Proposed bushfire management strategies/solutions
Vehicular access servicing a subdivision/development is available and safe during a bushfire event	1. Public Roads are to meet minimum technical requirements in Table 6, Column 1 (BMP Appendix 3) SP – Strategic planning proposal and structure plan where the lot layout is not known Sb – Structure plan where the lot layout is known and subdivision application Do – Development application for any other development	
	A3.2a Multiple Access Routes Public road access is to be provided in two different directions to at least two different destinations with an all-weather surface (Two Way Access) 1. If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200m from the subject lot(s) boundary to and intersection providing two way access. 2. The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met: a. the no-through road travels towards a suitable destination; and the balance of the no-through road, that is greater than 200 metres from the subject b. site, is wholly within BAL-LOW, or is within a residential built-out area SP – Strategic planning proposal and structure plan where the lot layout is not known Sb – Structure plan where the lot layout is known and subdivision application Do – Development application for any other development	N/A,

Bushfire protection criteria Intent	Acceptable solutions	Proposed bushfire management strategies/solutions
	A3.2b Emergency Access Way Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution. An emergency access way is to meet all the following requirements: 1. requirements in Table 6, Column 2 (BMP Appendix 3); 2. provides a through connection to a public road. 3. be no more than 500 metres in length; and 4. must be signposted and if gated, gates must open the whole trafficable width and remain unlocked. SP – Strategic planning proposal and structure plan where the lot layout is not known Sb – Structure plan where the lot layout is known and subdivision application Do – Development application for any other development	N/A
	A3.3 Through Roads All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where: 1. it is demonstrated that no alternative road layout exists due to site constraints; and 2. the no-through road is a maximum length of 200 metres to an intersection providing 3. two-way access, unless it satisfies the exemption provisions in A3.2a of this table. 4. A no-through road is to meet all the following requirements: 5. requirements of a public road Table 6, Column 1 (BMP Appendix 3); and 6. turn-around area as shown in (BMP Appendix 3) SP – Strategic planning proposal and structure plan where the lot layout is not known Sb – Structure plan where the lot layout is known and subdivision application	

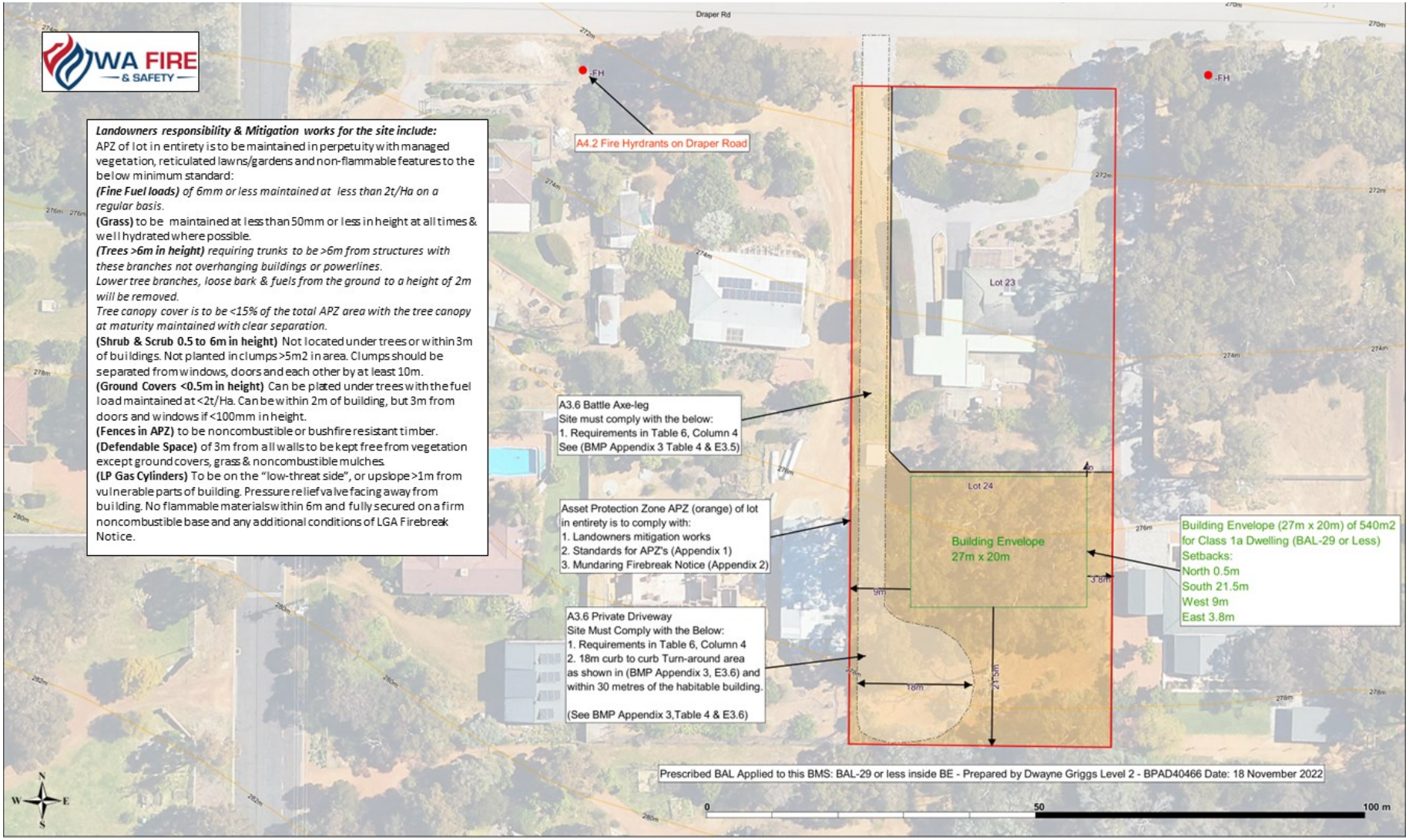
Bushfire protection criteria Intent	Acceptable solutions	Proposed bushfire management strategies/solutions
	A3.4a Perimeter roads A perimeter road is a public road and should be provided for greenfield or infil development where 10 or more lots are being proposed (including staged subdivision) with the aim of: 1. Separating areas of classified vegetation under AS3959, which adjoin the subject site, from the proposed lot(s)l and 2. Removing the need for battle-axe lots that back onto the areas of classified vegetation A perimeter road is to meet the requirements contained in Table 6, Column 1 (BMP Appendix 3) A Perimeter Road may not be required where: 1. The adjoining classified vegetation is class G 2. Lots are zoned for rural living or equivalent 3. It is demonstrated that it cannot be provided due to site constraints; or 4. All lots have frontage to an existing public road SP – Strategic planning proposal and structure plan where the lot layout is not known Sb – Structure plan where the lot layout is known and subdivision application	
	A3.4b Fire service access route (FSA) Where proposed lots adjoin classified vegetation under AS3959, and a perimeter road is not required in accordance with A3.4a, a FSA route can be considered as an acceptable solution to provide fire fighter access, where access is not available to the classified vegetation. FSA is to meet all the following requirements:	N/A

Bushfire protection criteria Intent	Acceptable solutions	Proposed bushfire management strategies/solutions
	1. Table 6, column 3 (BMP Appendix 3) 2. Be “through roads” with no dead ends 3. Linked to an internal road system at regular intervals, every 500 metres 4. Be signposted 5. No further than 500 metres to a public road 6. If gated, gates must open the required horizontal clearance and can be locked by the LGA or emergency services, if keys are provided for each gate 7. Have turn-around areas for 3.4 fire appliances every 500m SP – Strategic planning proposal and structure plan where the lot layout is not known Sb – Structure plan where the lot layout is known and subdivision application	
	A3.5 Battle-axe access legs Where it is demonstrated that a battle-axe cannot be avoided due to site constraints, it can be considered as an acceptable solution. There are no battle-axe technical requirements where the point the battle-axe access leg joins the effective area of the lot, is less than 50 metres from a public road in a reticulated area. In circumstances where the above condition is not met, or the battle-axe is in a non-reticulated water area, the battle-axe is to meet all the following requirements: 1. requirements in Table 6, Column 4; and 2. passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres). See (BMP Appendix 3 E3.5) Sb – Structure plan where the lot layout is known and subdivision application	Site must comply with the below: 1. requirements in Table 6, Column 4; and See (BMP Appendix 3 E3.5)
	A3.6 Private Driveways	Site Must Comply with the Below: 1. Requirements in Table 6, Column 4;

Bushfire protection criteria Intent	Acceptable solutions	Proposed bushfire management strategies/solutions
	There are no private driveway technical requirements where the private driveway is: 1. within a lot serviced by reticulated water; 2. no greater than 70 metres in length between the most distant external part of the development site and the public road measured as a hose lay; and 3. accessed by a public road where the road speed limit is not greater than 70 km/h. In circumstances where all of the above conditions are not met, or the private driveway is in a non-reticulated water area, the private driveway is to meet all the following requirements: 1. Requirements in Table 6, Column 4; 2. Passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres); and 3. Turn-around area as shown in (BMP Appendix 3, E3.6) and within 30 metres of the habitable building. See BMP Appendix 3, E3.6 **Dd** – Development application for a single dwelling, ancillary dwelling or minor development **Do** – Development application for any other development	2. Turn-around area as shown in (BMP Appendix 3, E3.6) and within 30 metres of the habitable building. See BMP Appendix 3, E3.6
Element 4: Water Water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire	A4.1 Identification of future water supply Evidence that a reticulated or sufficient non-reticulated water supply for bushfire fighting can be provided at the subdivision and/or development application stage, in accordance with the specifications of the relevant water supply authority or the requirements of Schedule 2 (BMP Appendix 4, Schedule 2). Where the provision of a strategic water tank(s) is required a suitable area within a road reserve or a dedicated lot the location should be identified, should be identified on the structure plan, to the satisfaction of the local government.	N/A

Bushfire protection criteria Intent	Acceptable solutions	Proposed bushfire management strategies/solutions
	SP – Strategic planning proposal and structure plan where the lot layout is not known	
	A4.2 Provision of water for firefighting purposes Where a reticulated water supply is existing or proposed, hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority. Where these specifications cannot be met, then the following applies: 1. The provision of a water tank(s), in accordance with the requirements of Schedule 2 (BMP Appendix 4, Schedule 2); and 2. Where the provision of a strategic water tank(s) is applicable, then the following requirements apply: 3. land to be ceded free of cost to the local government for the placement of the tank(s); 4. the lot or road reserve where the tank is to be located is identified on the plan of subdivision. 5. tank capacity, construction, and fittings, provided in accordance with the requirements of Schedule 2(BMP Appendix 4, Schedule 2); and 6. a strategic water tank is to be located no more than 10 minutes from the subject site (at legal road speeds). Where a subdivision includes an existing habitable building(s) that is to be retained, a water supply should be provided to this existing habitable building(s), in accordance with the requirements listed above. Sb – Structure plan where the lot layout is known and subdivision application Dd – Development application for a single dwelling, ancillary dwelling or minor development Do – Development application for any other development that is not a single dwelling, ancillary dwelling or minor development	Hydrants on Draper Road

5.0 Bushfire Management Strategies



6.0 Roles & Responsibilities

Responsibilities & implementation measures for the proposed development, these are shared by the Current and future landowners, project developer and the Local Government Authority (LGA).

Table 5: Roles & Responsibilities

DEVELOPER/LANDOWNER/CONSULTANT – PRIOR TO USE	
No.	Implementation action
1	A notification, pursuant to Section 165 of the Planning and Development Act 2005, is required to be placed on the certificate(s) of title of the proposed lot(s) with a Bushfire Attack Level (BAL) rating of 12.5 or above, advising of the existence of a hazard or other factor. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows "This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and is/may be subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land." (Western Australian Planning Commission).
2	On LGA approval establish an Asset Protection Zone (APZ) to the dimensions (Table 4 A 2.1), the standard stated in this BMP. (Appendix 1), Schedule 1 of the Guidelines for Planning in Bushfire Prone Areas – Appendices and to the requirements outlined in the Local Government Authority Firebreak Notice (Appendix 2).
3	Maintain the lot to required standard in perpetuity as per Local Government Authority Firebreak Notice (Appendix 2)
4	Construct / maintain all driveways and turn around areas to the standard stated in this BMP including a trafficable width of 4m and 6m total clearance as per table 4 A3.6) and the standard stated in BMP (Appendix 3) and Table 6, column 3 and E3.5 of the Guidelines for Planning in Bushfire Prone Areas – Appendices
LANDOWNER – ONGOING	
No.	Management action
1	Maintain an Asset Protection Zone (APZ) to the dimensions (Table 4 A 2.1), the standard stated in this BMP. (Appendix 1), Schedule 1 of the Guidelines for Planning in Bushfire Prone Areas – Appendices and to the requirements outlined in the Local Government Authority Firebreak Notice (Appendix 2)
2	Maintain the lot to required standard in perpetuity as per Local Government Authority Firebreak Notice (Appendix 2).
3	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954 and the Local Government Authority Firebreak Notice (Appendix 2)
4	Maintain vehicular access routes driveways, turnaround points, [passing bays and defendable spaces within the lot to allow free movement for emergency personnel as per (table 4 A3.5 & A3.6) and the standard stated in BMP (Appendix 3 Table 6, Column 4 – E3.5 & E3.6).
LOCAL GOVERNMENT AUTHORITY (LGA) – ONGOING MANAGEMENT	
No.	Management action

1	Fuel load reduction and management of surrounding vegetation and reserves, where required.
2	Inspection and issue of works orders or fines for non-compliance, this includes firebreaks, access, APZ and water supply.

Bushfire Management Plan Appendices

Appendix 1 – Information and SPP3.7, Schedule 1 - Standards for APZ's

An APZ is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level. The width of the required APZ varies with slope and vegetation. The APZ should at a minimum be of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m² (BAL-29). It should be lot specific and will extend from the walls and supporting posts of a dwelling or any structure that is associated (<6m) from the dwelling.

In the case, the APZ will cover the entire lot being Lot 24.



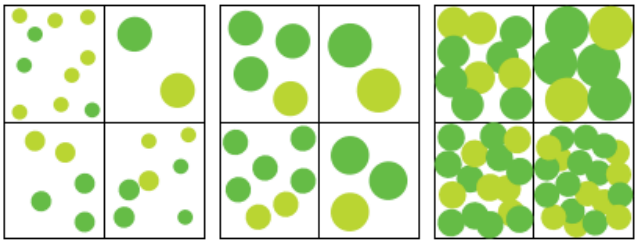
The APZ includes a defendable space which is an area adjoining the asset within which firefighting operations can be undertaken to defend the structure. Vegetation within the defendable space should be kept at an absolute minimum and the area should be free from combustible items and obstructions. The width of the defendable space is dependent on the area which is available on the property, but as a minimum should be 3 metres.

The APZ should be contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity or rating of BAL-29 or less is achieved.

APZs can adversely affect the retention of native vegetation. Where the loss of vegetation is not acceptable or causes conflict with landscape or environmental objectives, such as waterway foreshore areas and wetland buffers, reducing lot yield may be necessary in order to minimise the removal and modification of remnant vegetation.

It is the responsibility of the landowner/proponent to maintain their APZ in accordance with Schedule 1 'Standards for Asset Protection Zones'. It is further recommended that maintenance of APZs is addressed through the local government firebreak notice, issued under s33 of the Bushfires Act 1954, and preferably included in a Bushfire Management Plan specifically as a how-to guide for the landowner.

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

OBJECT	REQUIREMENT
Fences within the APZ	• Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959).
Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness)	• Should be managed and removed on a regular basis to maintain a low threat state. • Should be maintained at <2 tonnes per hectare (on average). • Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch >6 millimetres in thickness.
Trees* (>6 metres in height)	• Trunks at maturity should be a minimum distance of six metres from all elevations of the building. • Branches at maturity should not touch or overhang a building or powerline. • Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation. • Canopy cover within the APZ should be <15 per cent of the total APZ area. • Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ. **Figure 19:** Tree canopy cover – ranging from 15 to 70 per cent at maturity  15% 30% 70%
Shrub* and scrub* (0.5 metres to six metres in height). Shrub and scrub >6 metres in height are to be treated as trees.	• Should not be located under trees or within three metres of buildings. • Should not be planted in clumps >5 square metres in area. • Clumps should be separated from each other and any exposed window or door by at least 10 metres.
Ground covers* (<0.5 metres in height. Ground covers >0.5 metres in height are to be treated as shrubs)	• Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above. • Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.

Grass	• Grass should be maintained at a height of 100 millimetres or less, at all times. • Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.
Defendable space	• Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
LP Gas Cylinders	• Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building. • The pressure relief valve should point away from the house. • No flammable material within six metres from the front of the valve. • Must sit on a firm, level and non-combustible base and be secured to a solid structure.

E2 Managing an Asset Protection Zone (APZ) to a low threat state

An APZ is a low fuel area maintained around a habitable building to increase the likelihood that it will survive a bushfire, by providing a defendable space and reducing the potential for direct flame contact, radiant heat exposure and ember attack.

Vegetation management within an APZ should provide defendable space and be maintained to a low threat state, in perpetuity, in accordance with the requirements outlined in Schedule 1.

The width of an APZ varies with slope and vegetation type, however it should only be as wide as needed to ensure the potential radiant heat impact of a bushfire does not exceed 29kW/m² (BAL-29), or 10kW/m² where a building is identified for use as an on-site shelter. An APZ is generally not required where a building or development site achieves 29kW/m² (BAL-29) or lower in its pre-development state (prior to any vegetation clearing or modification).

An APZ should include an area of defendable space immediately adjoining a building, that is kept free from combustible items and obstructions, within which firefighting operations can be undertaken to defend the structure. Where a lot contains a building envelope, it may not be necessary for the entire building envelope to achieve 29kW/m² (BAL-29) as this may result in significant unnecessary clearing. It is recommended that the BMP identifies that a sufficient APZ can be accommodated within the building envelope, with the development site and associated APZ to be determined at the development approval stage.

An APZ should be contained within the boundaries of the lot on which the building is situated, except in instances where it is demonstrated that the vegetation on the adjoining land is managed in a low threat state, as per cl. 2.2.3.2 of AS 3959, such as a road, managed park, rocky outcrop or a water body.

The siting of a habitable building and associated APZ should aim to minimise the clearing of vegetation. The BMP should demonstrate that the proposed APZ has minimised the unnecessary loss of vegetation or potential for conflict with landscape or environmental objectives; and complies with environmental approvals/exemptions (where necessary). A re-design or reduction in lot yield may be necessary to minimise the removal and modification of remnant vegetation.

It is recommended that development be located on flat areas or slopes less than 20 degrees (especially where classified vegetation is located downslope to a building) and away from ridge tops, crests or narrow gullies, as bushfire can spread rapidly in these areas. Circumstances where these locations may be suitable for development to occur include where the land is already cleared, and 29kW/m² (BAL-29) or lower can be achieved for the whole development site without the use of an APZ. To ensure soil stability within an APZ, vegetation removal on slopes exceeding 18 degrees is discouraged.

Fine fuel load should be maintained to less than two tonnes per hectare, however this is often a subjective assessment. Reducing fuel load levels does not necessarily require the removal of existing vegetation. A combination of methods can be utilised to reduce fuel load such as raking, weed removal, pruning, mulching and/or the removal of plant material.

A simple method to estimate fuel load is to roughly equate one tonne of fuel load per hectare as 100 grams per square metre. For example, two tonnes per hectare of leaf litter is roughly 200 grams of leaf litter per square metre and eight tonnes per hectare is roughly 800 grams. Eucalyptus leaf litter is approximately 100 grams per handful, so two handfuls of litter per square metre will roughly equate to two tonnes per hectare. Different types of fine fuel, like mulch or pine needles may be more or less than a handful, however the 100 grams per square metre rule of thumb can still be used.

The landowner or proponent is responsible for maintaining an APZ in accordance with Schedule 1 - Standards for Asset Protection Zones. Ongoing maintenance of an APZ is usually enforced through the local government firebreak notice issued under section 33 of the *Bushfires Act 1954*, and/or through a condition of a development approval, which requires the implementation of measures identified within a BMP.

A copy of the firebreak notice and Schedule 1 should be included in a BMP specifically as a how-to guide for the landowner, and to demonstrate to decision-makers that the measures outlined in the BMP to achieve the appropriate BAL rating through provision and ongoing management of an APZ, can be implemented.

Regardless of whether an Asset Protection Zone exists in accordance with the acceptable solutions and is appropriately maintained, it should be noted that fire fighters are not obliged to protect an asset if they think the separation distance between the dwelling and vegetation is unsafe.

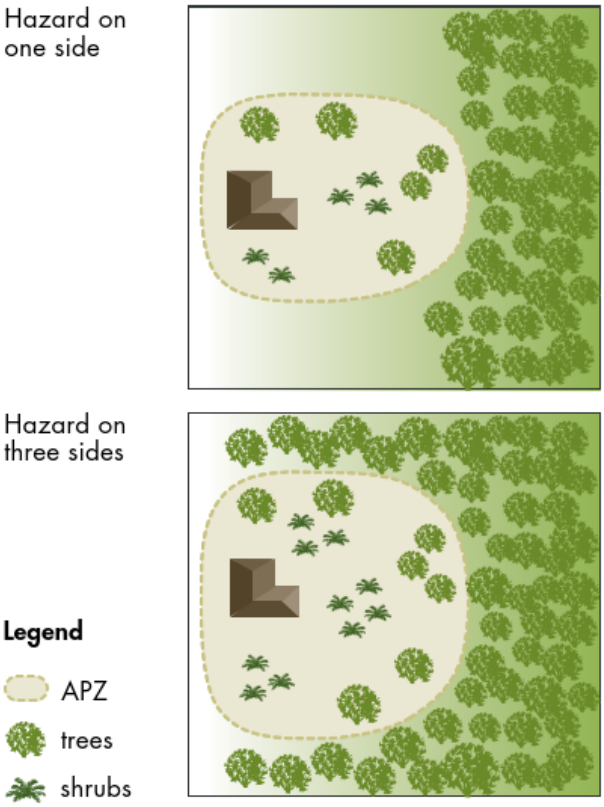


Figure 18: Design of Asset Protection Zone

E2 Landscaping and design of an asset protection zone

Landscaping, design, and maintenance of an APZ in a bushfire prone area can significantly improve the bushfire resilience of a building. An APZ should not be seen as an area entirely cleared of vegetation, but as a strategically designed space that gives holistic consideration to how existing or proposed vegetation or non-combustible features interact with, or affect the building's bushfire resilience.

A well designed APZ provides a greater level of vegetation management within the first few metres of a building with, for example, less vegetation or inclusion of non-combustible materials. The vegetation within the remainder of an APZ can increase further away from the building with carefully considered plant selection and landscaping techniques.

Strategic landscaping measures can be applied, such as replacing weeds with low flammability vegetation (refer to E2 Plant Flammability) to create horizontal and vertical separations between the retained vegetation. The accumulation of fine fuel load from different plants is an important consideration for ongoing maintenance in accordance with Schedule 1. For example, when planting ground covers under deciduous trees within an APZ, the total fine fuel load prescribed in Schedule 1 will include any dead plant material from ground covers and leaf litter from the trees.

Plant density and final structure and form of mature vegetation should be considered in the initial landscaping stages. For example, clumps of sapling shrubs planted at a density without consideration of future growth, may increase the bushfire risk as a clump will quickly grow to exceed 5m^2. It should be noted that in some cases, a single shrub in a mature state may be so dense as to fill a 5m^2 clump alone.

The location of plants within an APZ is a key design technique. Separation of garden beds with areas of low fuel or non-combustible material, will break up fuel continuity and reduce the likelihood of a bushfire running through an APZ and subjecting a dwelling to radiant heat or direct flame contact. It is important to note, where mature trees are separated from a building by six metres, but the canopy has grown to extend or overhang a building, maintenance and pruning to remove the overhanging branches should be undertaken without the entirety of the tree being removed.

Mulches used within the APZ should be non-combustible. The use of stone, gravel, rock and crushed mineral earth is encouraged. Wood mulch >6mm in thickness may be used, however it is recommended that it is used in garden beds or areas where the moisture level is higher by regular irrigation. These materials could be sourced from non-toxic construction and demolition waste giving the added benefit of reducing the environmental impact of any 'hard landscaping' actions.

Combustible objects, plants, garden supplies such as mulches, fences made from combustible material, should be avoided within 10 metres of a building. Vines or climbing plants on pergolas, posts or beams, should be located away from vulnerable parts of the building, such as windows and doors. Non-flammable features can be used to provide hazard separation from classified vegetation, such as tennis courts, pools, lawns and driveways or paths that use inorganic mulches (gravel or crushed rock). Consider locating firewood stacks away from trees and habitable buildings.

Incorporation of landscaping features, such as masonry feature walls can provide habitable buildings with barriers to wind, radiant heat and embers. These features can include noise walls or wind breaks. Use of Appendix F of AS 3959 for bushfire resistant timber selection within areas of 29kW/m^2 (BAL-29) or below, or the use of non-combustible fencing materials such as iron, brick, limestone, metal post and wire is encouraged.

In addition to regular maintenance of an APZ, further bushfire protection can be provided at any time by:

- ensuring gutters are free from vegetation;
- installing gutter guards or plugs;
- regular cleaning of underfloor spaces, or enclosing them to prevent gaps;
- trimming and removing dead plants or leaf litter;
- pruning climbing vegetation (such as vines) on a trellis, to ensure it does not connect to a building, particularly near windows and doors;
- removing vegetation in close proximity to a water tank to ensure it is not touching the sides of a tank; and/or
- following the requirements of the relevant local government section 33 fire break notice, which may include additional provisions such as locating wood piles more than 10 metres from a building.

Preparation of a property prior to the bushfire season and/or in anticipation of a bushfire is beneficial even if your plan is to evacuate. As embers can travel up to several kilometres from a bushfire and fall into small spaces and crevices or land against the external walls of a building, best practice recommends that objects within the APZ are moved away from the building prior to any bushfire event. Objects may include, but are not limited to:

- door mats;
- outdoor furniture;
- potted plants;
- shade sails or umbrellas;
- plastic garbage bins;
- firewood stacks;
- flammable sculptures; and/or
- playground equipment and children's toys.

E2 Plant flammability

There are certain plant characteristics that are known to influence flammability, such as moisture or oil content and the presence and type of bark. Plants with lower flammability properties may still burn during a bushfire event, but may be more resistant to burning and some may regenerate faster post-bushfire.

There are many terms for plant flammability that should not be confused, including:

- Fire resistant – plant species that survive being burnt and will regrow after a bushfire and therefore may be highly flammable and inappropriate for a garden in areas of high bushfire risk.
- Fire retardant – plants that may not burn readily or may slow the passage of a bushfire.
- Fire wise – plants that have been identified and selected based on their flammability properties and linked to maintenance advice and planting location within a garden.

Although not a requirement of these Guidelines, local governments may develop their own list of fire wise or fire-retardant plant species that suit the environmental characteristics of an area. When developing a recommended plant species list, local governments should consult with ecologists, land care officers or environmental authorities to ensure the plants do not present a risk to endangered ecological communities, threatened, or endangered species or their habitat.

When selecting plants, private landholders and developers should aim for plants within the APZ that have the following characteristics:

- grow in a predicted structure, shape and height;
- are open and loose branching with leaves that are thinly spread;
- have a coarse texture and low surface-area-to-volume ratio;
- will not drop large amounts of leaves or limbs, that require regular maintenance;
- have wide, flat, and thick or succulent leaves;
- trees that have bark attached tightly to their trunk or have smooth bark;
- have low amounts of oils, waxes, and resins (which will often have a strong scent when crushed);
- do not produce or hold large amounts of fine dead material in their crowns; and/or
- will not become a weed in the area.

Appendix 2 – Local Government Authority Firebreak Notice

FIREBREAK AND FUEL LOAD NOTICE

Bush Fires Act 1954

Section 33

Notice to all owners and/or occupiers of land situated within Shire of Mundaring

As a measure to assist in the control of bush fires, or preventing the spread or extension of a bush fire which may occur, notice is hereby given to all owners and/or occupiers of land within the Shire of Mundaring that pursuant to the powers conferred in Section 33 of the *Bush Fires Act 1954*, works in accordance with the requisitions of this notice must be carried out before the 1st day of November in each year, or within 14 days of becoming the owner or occupier of land if after that date. All work specified in this Notice is to be maintained up to and including the 31st day of March in the following calendar year.

DEFINITIONS
For the purpose of this Notice the following definitions apply:

Alternative Fire Management Arrangement includes a variation as defined in Section 6 of this Notice and, a Bushfire Management Plan, Bushfire Management Statement, or Fuel Load Management Plan, approved by the Shire of Mundaring to reduce and mitigate fire hazards within a particular subdivision, lot or other area of land anywhere in the district.

Authorised Officer means an employee of the Shire of Mundaring appointed as a Bush Fire Control Officer pursuant to the powers conferred in Section 38 of the *Bush Fires Act 1954*.

Firebreak means a strip or area of ground, not less than 3 metres in width, and 4 metres in height, immediately inside all external boundaries of any lot owned and/or occupied by you and situated within Shire of Mundaring, constructed to a trafficable surface that is kept and maintained totally clear of all flammable material and includes the pruning and removal of any living or dead trees, scrub or any other material encroaching into the vertical axis of the firebreak area. Such firebreaks may be constructed by one or more of the following methods: PLOUGHING, CULTIVATING, SCARIFYING, RAKING, BURNING, CHEMICAL SPRAYING OR OTHER METHOD as approved by an Authorised Officer.

Flammable Material means any plant, tree, grass, substance, object, thing or material that may or is likely to catch fire and burn or any other thing deemed by an Authorised Officer to be capable of combustion.

Fuel Depot / Fuel Storage Area means an area of land, a building or structure where fuel, (ie petrol, diesel, kerosene, liquid gas or any other fossil fuel) is kept in any container or manner.

Fuel Load is the leaf litter on the ground inclusive of leaves, twigs (up to 6mm in diameter) and bark. A litter depth of 5mm from the top of the layer to the mineral earth beneath is indicative of approximately 2.5 tonnes per hectare. A litter depth of 15mm from the top of the layer to the mineral earth beneath is indicative of approximately 8 tonnes per hectare. The Shire of Mundaring can provide advice on determining fuel load levels and provides a fuel load measurement guide for your use on request.

Habitable Buildings means a dwelling, workplace, place of gathering or assembly, a building used for the storage or display of goods or produce for sale by wholesale in accordance with classes 1-9 of the Building Code of Australia. The term habitable building includes attached and adjacent structures like garages, carports, verandas or similar roofed structure(s) that are attached to, or within 6 metres of the dwelling or primary building.

Maintaining Fuel Loads relates to the management of leaf litter as described in this Notice. Reducing fuel load levels does not necessarily require the removal of existing natural vegetation. A combination of methods can be utilised inclusive of safe burning, raking, weed removal, pruning and/or the removal of dead plant material.

Managed Vegetation includes vegetation that is pruned away from buildings, under pruned to minimise contact with ground fuels and that is kept free of dead suspended matter such as twigs, leaves and bark.

Trafficable means to be able to travel from one point to another in a four-wheel drive fire appliance on a clear surface, unhindered without any obstruction that may endanger such fire appliances. A firebreak is not to terminate, or lead to a dead end, without provision for egress to a safe place or a cleared turn around area of not less than a 19 metre diameter.

Vertical Axis means a continuous vertical uninterrupted line at a right angle to the horizontal line of the firebreak to a minimum height of 4 metres from the ground.

LAND CATEGORIES

The specific requirements below relating to land categories within the Shire are to be implemented and maintained to the satisfaction of an Authorised Officer.

1. All land with an area of less than 5000sqm with a building on it

Maintain an Asset Protection Zone in line with the requirements of Section 5 of this Notice.
For the remainder of the land on the lot outside of the Asset Protection Zone:

- Maintain all grass on the land to a height no greater than 5cm.
- Ensure no tree crowns overhang a building.
- Prune trees and shrubs, and remove dead flammable material within 1.5 metres around all buildings.
- Ensure the roofs, gutters and walls of all buildings on the land are free of flammable matter.
- Maintain fuel loadings in natural bush areas at less than 8 tonnes per hectare across the land.

2. All land with an area of 5000sqm or greater, with a building on it

Maintain an Asset Protection Zone in line with the requirements of Section 5 of this Notice.

For the remainder of the land on the lot outside of the Asset Protection Zone:

- If the land is an area of less than 50,000sqm (5 Hectares) all grass must be maintained on the land to a height no greater than 5cm.
- If the land is an area of 50,000sqm (5 Hectares) or greater, the grass must be maintained on the land to a height no greater than 5cm for a distance of 10m from any firebreak.
- Install a firebreak around all structures and immediately inside all external boundaries of the land.

- Prune trees and shrubs, and remove dead flammable material around all structures.
- Ensure the roofs, gutters and walls of all buildings on the land are free of flammable matter.
- Maintain fuel loadings in natural bush areas at less than 8 tonnes per hectare across the land.

3. All vacant land

- Install a firebreak immediately inside all external boundaries of the land.
- If the land is an area of less than 50,000sqm (5 Hectares) all grass must be maintained on the land to a height no greater than 5cm.
- If the land is an area of 50,000sqm (5 Hectares) or greater, the grass must be maintained on the land to a height no greater than 5cm for a distance of 10m from any firebreak.
- Maintain fuel loadings in natural bush areas to less than 8 tonnes per hectare across the land.

4. Fuel Depot / Fuel Storage Area / Haystacks / Stockpiled Flammable Material

- Remove all inflammable matter within 10 metres of where fuel drums, fuel ramps or fuel dumps are located, and where fuel drums, whether containing fuel or not, are stored.
- Install a firebreak immediately adjacent to any haystacks or stockpiled flammable material.

5. Asset (Building) Protection Zone Specification

The Asset Protection Zone (APZ) for habitable buildings and related structures, as defined within this Notice, must meet the following requirements, unless varied under an approved 'Alternative Fire Management Arrangement' as defined within this Notice, and applies only within the boundaries of the lot on which the habitable building is situated:

- APZs for habitable buildings must extend a minimum of 20 metres out from any external walls of the building, attached structures, or adjacent structures within 6 metres of the habitable building.
- On sloping ground the APZ distance shall increase at least 1 metre for every degree in slope on the sides of the habitable building that are exposed to down slope natural vegetation.
- APZs predominantly consist of managed vegetation, reticulated lawns and gardens and other non-flammable features.
- All grass is maintained to or under 5cm.
- Fuel loads must be maintained at 2 tonnes per hectare or lower.
- Clear separation distance between adjoining or nearby tree crowns.
- A small group of trees within close proximity to one another may be treated as one crown provided the combined crowns do not exceed the area of a large or mature crown size for that species.
- Trees are to be low pruned (or under pruned) to at least a height of 2 metres from ground.
- No tree, or shrub over 2 metres high are to be within 2 metres of a habitable building.
- Tall shrubs over 2 metres high are not planted in groups close to the habitable building and ensure there is a gap of at least three times the height (at maturity) of the shrub away from the habitable building.
- There are no tree crowns or branches hanging over habitable buildings.
- Ensure the roofs, gutters and walls of all buildings on the land are free of flammable matter.
- Install paths and non-flammable features immediately adjacent to the habitable building.
- Wood piles and flammable materials stored a safe distance from habitable buildings.

6. Application to vary the above requirements

If it is considered impracticable for any reason whatsoever to implement any of the requirements of this Notice, you may apply in writing to the Shire of Mundaring by **no later than the 15th day of September** each year for permission to implement alternative measures to assist in the control of bush fires, or preventing the spread or extension of a bush fire which may occur. If permission is not granted in writing by the Shire of Mundaring you must comply with the requirements of this Notice.

7. Additional Works

In addition to the requirements of this Notice, you may be required to carry out further works which are considered necessary by an Authorised Officer and specified by way of a separate written notice forwarded to the address of the owner/s as shown on the Shire of Mundaring rates record for the relevant land.

TAKE NOTICE that pursuant to Section 33(4) of the *Bush Fires Act 1954*, where the owner and/or occupier of land fails or neglects to comply with the requisitions of this Notice within the times specified, the Shire of Mundaring may, by its officers and with such servants, workmen and contractors, vehicles and machinery as the officers deem fit, enter upon the land and carry out the requisitions of this Notice which have not been complied with and pursuant to Section 33(5) of the *Bush Fires Act 1954*, the amount of any costs and expenses incurred may be recovered from you as the owner and/or occupier of the land.

Section 24F and 24G (Restricted Burning)

BURNING OF GARDEN REFUSE

- 1sqm piles of garden refuse may be burnt without a permit between 6pm and 11pm and must be fully extinguished before midnight. Fully extinguished means no heat, smoke or steam and no white ash present where the fire was situated.
- No more than ONE pile of garden refuse is to be burnt at any one time.
- You must obtain a permit to burn before 6pm, and follow all permit conditions.
- There must be one adult person/s in attendance at all times or as specified on your permit.

If the requirements of this Notice are carried out by burning, such burning must be in accordance with the relevant provisions of the *Bush Fires Act 1954*.

The PENALTY FOR FAILING TO COMPLY with this Notice is a fine not exceeding $5000 and a person in default is also liable, whether prosecuted or not, to pay the costs of performing the work directed by this Notice if it is not carried out by the owner and/or occupier by the date required by this Notice.

By order of the Council.



Jonathan Throssell
CHIEF EXECUTIVE OFFICER

Please be advised that the Fire and Burning Information booklet is now issued once every three years. If you would like a copy mailed to you, please call 9290 6666 or visit the Shire website to download the booklet.

Shire of Mundaring
7000 Great Eastern Highway, MUNDARING WA 6073
(08) 9290 6666 Email: shire@mundaring.wa.gov.au
Website: mundaring.wa.gov.au Facebook: facebook.com/ShireofMundaring

Appendix 3 – Vehicular Access Requirements

Table 6: Vehicular access technical requirements

TECHNICAL REQUIREMENTS	1 Public roads	2 Emergency access way [1]	3 Fire service access route [1]	4 Battle-axe and private driveways [2]
Minimum trafficable surface (metres)	In accordance with A3.1	6	6	4
Minimum horizontal clearance (metres)	N/A	6	6	6
Minimum vertical clearance (metres)	4.5			
Minimum weight capacity (tonnes)	15			
Maximum grade unsealed road[3]	As outlined in the IPWEA Subdivision Guidelines	1:10 (10%)		
Maximum grade sealed road[3]		1:7 (14.3%)		
Maximum average grade sealed road		1:10 (10%)		
Minimum inner radius of road curves (metres)		8.5		

E3.6 Private driveways

In areas serviced by reticulated water, where the road speed limit is not greater than 70 km/h, and where the distance from the public road to the further part of the habitable building is no greater than 70 metres, emergency service vehicles typically operate from the street frontage.

In the event the habitable building cannot be reached by hose reel from the public road, then emergency service vehicles will need to gain access within the property. Emergency service vehicles will also need to gain access within the property, where access to reticulated water (fire hydrants) is not possible. In these situations, the driveway and battle-axe (if applicable) will need to be wide enough for access for an emergency service vehicle and a vehicle to evacuate.

Turnaround areas should be available for both conventional two-wheel drive vehicles of residents and Type 3.4 fire appliances. Turn-around areas should be located within 30 metres of habitable buildings. Circular and loop driveway design may also be considered. Note that the design requirements for a turn-around area for a private driveway or battle-axe differ to a cul-de-sac.

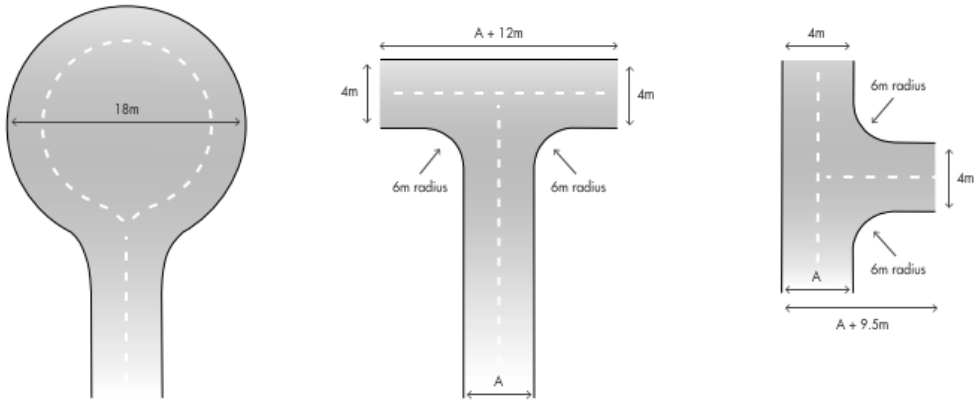


Figure 28: Design requirements for a turn-around area for a private driveway or battle-axe

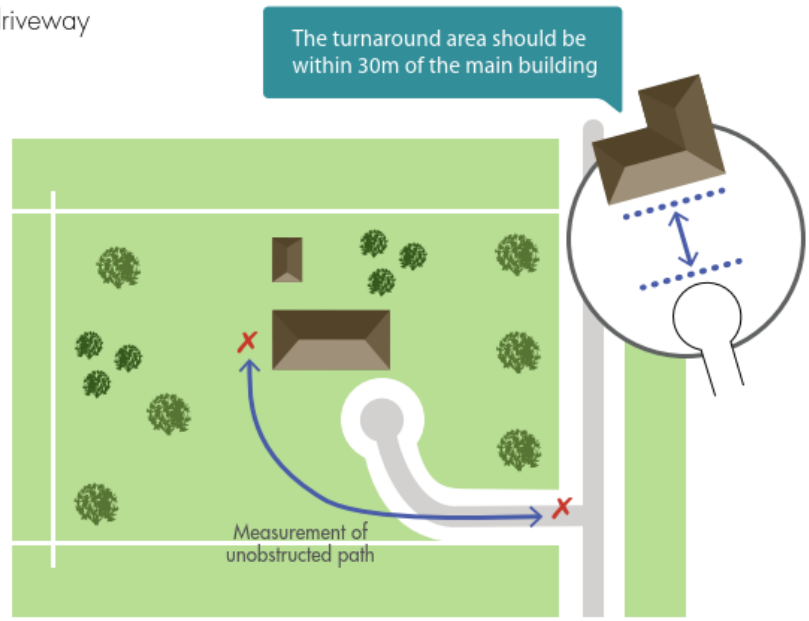


Figure 29: Design requirements for a private driveway where required under A3.6

E3.5 Battle-axe access legs

In bushfire prone areas, lots with battle-axe access legs should be avoided because they:

- do not enable the habitable building to be located close to a public road where it is visible to emergency services;
- result in longer than necessary access routes for evacuation and the response of emergency services;
- may be blocked by falling trees or debris; and
- may not provide certainty for emergency services regarding the width, length and ability to turn emergency services vehicle around.

In some instances, it may be appropriate for battle-axe access legs to be used to overcome specific site or design constraints created by the existing road networks or lot layout. The Bushfire Management Plan should provide justification for proposed battle-axe access leg(s), including exploration of a redesign of the proposal, and the decision-maker should determine whether the justification is valid.

The measurement of the battle-axe access leg should be from the edge of the public road to where the access leg joins the effective area of the lot. Effective lot area means that part of the battle-axe lot that is capable of development and excludes the access leg and associated truncations for vehicle maneuverability. Where a proposed battle-axe lot has an existing habitable building that will be retained, the private driveway requirements and/or the battle-axe requirements (as appropriate) should be satisfied.

Battle-axe access should be 6 metres in width where the battle-axe is more than 50m in length or for lots serviced by a water source within the property, such as a water tank. It is acceptable for a single battle-axe to have a trafficable width of 4 metres with a traversable edge of 1 metre on either side of the carriageway.

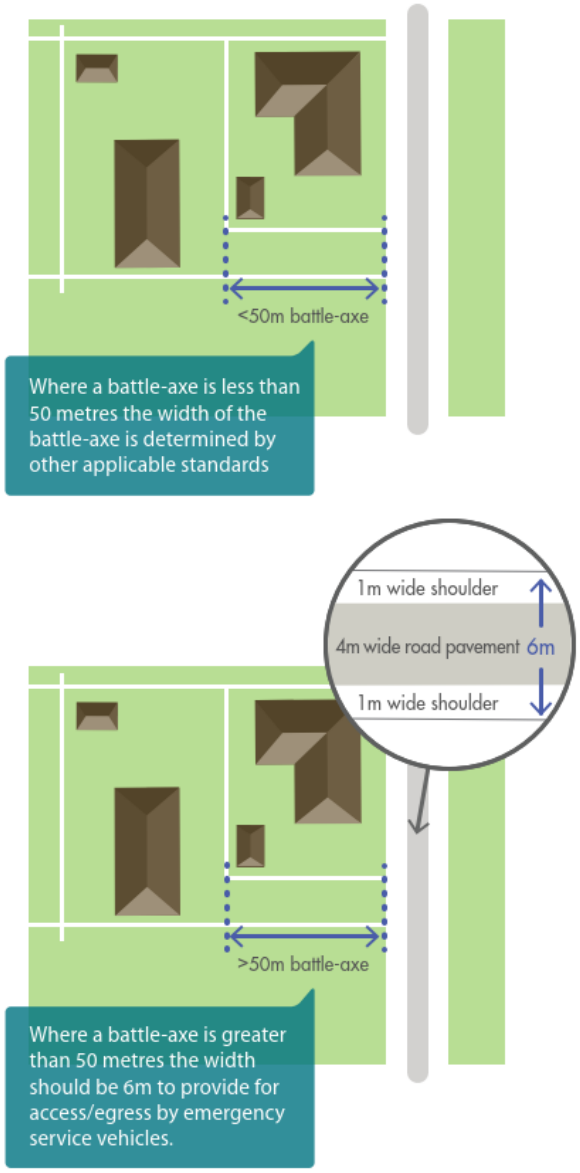


Figure 27: Battle-axe design requirements where required under A3.5

Appendix 4 – Water Supply & Schedule 2

Fire Hydrants on Draper Road.

8 DRAPER RD, MAHOGANY CREEK

GEOTECHNICAL INVESTIGATION REPORT

CLIENT:
Danelle Warne

PROJECT:
8 Draper Rd, Mahogany Creek

DATE:
20 September 2022

WA GEOTECHNICS REF:
WA004-pri-248 (r001-a)

PO Box 564
NORTH PERTH WA 6906
Tel: +61 478 221 995
Email: info@wageotechnics.com.au

Date: 20 September 2022

Ms Danelle Warne
12 Draper Road
Mahogany Creek WA 6072

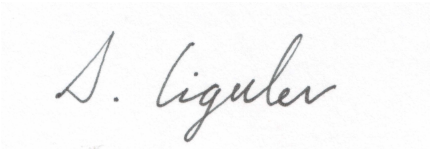
Dear Madam,

RE: 8 DRAPER ROAD, MAHOGANY CREEK
GEOTECHNICAL INVESTIGATION REPORT

WA Geotechnics Pty Ltd is pleased to provide this report on a geotechnical investigation carried out at the above site.

If you have any questions related to the report or we can be of further assistance, please do not hesitate to contact the undersigned.

For and on behalf of
WA GEOTECHNICS PTY LTD



SIMON CIGULEV

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WA GEOTECHNICS
Tel: +61 478 221 995
Email: info@wageotechnics.com.au

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B Dynamic Cone Penetrometer (DCP) Results

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SECTION 1.0 - INTRODUCTION

WA Geotechnics Pty Ltd was commissioned by Ms Rachel Whan (the client) on 7 September 2022 to perform a geotechnical investigation for a proposed subdivided Lot at 8 Draper Rd, Mahogany Creek and to classify the proposed shed site in accordance with the definitions provided in Australian Standard AS2870.

SECTION 2.0 - FIELDWORK

Fieldwork for the geotechnical site investigation was carried out on 14 September 2022 and consisted:

- Walkover and description of the site.
- Excavation of three test holes using a 75 mm diameter hand auger at selected locations on the site to a target depth of 2.0 m.
- Dynamic Cone Penetrometer (DCP) testing from the surface level to a target depth of 1.0 m alongside each test hole location. Blow counts were recorded every 100 mm test depth interval.
- Sampling of hand auger hole HA1.

The fieldwork was carried out by a geotechnical engineer from WA Geotechnics Pty Ltd. The test holes were backfilled with the excavated spoil. The Site Description Sheet is presented in **Figure 1**. The Site Location Sheet with test locations is presented in **Figure 2**.

SECTION 3.0 - SUBSURFACE CONDITIONS/PROFILE

The Perth Groundwater Map on the Department of Water and Environmental Regulation website[5] indicates the site is situated in an area that comprises Laterite overlying Mesozoic sediments and Precambrian crystalline rocks. The subsurface profile encountered within the test holes is summarised below.

TOPSOIL, LATERITE GRAVEL	Non-plastic, fine to medium, dark orange/brown, with trace of organic matter. The gravel was loose to medium dense in relative density and this layer ranged from the surface to 0.1 m depth below ground level; and overlaid
LATERITE GRAVEL	Non-plastic, fine to medium, becoming fine to coarse with depth, orange/brown in colour. The gravel was generally medium dense in relative density, except for the top 0.5 m of the surface at HA2 and this layer ranged from 0.1 to the maximum excavated depth of 0.7 m below ground level.

Hand auger holes HA1 to HA3 did not achieve their excavation target depth of 2.0 m due to hand auger refusal at 0.7 m, 0.7 m and 0.35 m depth, respectively on coarse laterite gravel or cobble (inferred). The hand auger excavation logs of the site investigation are presented in **Appendix A**.

3.1 DYNAMIC CONE PENETROMETER TESTING

DCP testing was performed alongside each hand auger hole. The DCP tests performed achieved their target depth of 1.0 m. Results indicated the relative density of the laterite gravel is generally medium dense, except for the top 0.5 m of the surface in the vicinity of HA2. The DCP test results are shown in **Appendix B**.

3.2 GROUNDWATER

Groundwater was not encountered in the hand auger holes excavated at the time of field work. It must be noted that groundwater levels are subject to variations due to the effects of rainfall, temperature and local drainage

3.3 LABORATORY TESTING

Testing by a NATA (National Association of Testing Authorities, Australia) registered laboratory was carried out on a disturbed sample for assessment of the following parameters:

- Percentage Fines < 0.075mm in size.
- Atterberg Limits.

Table 3.3 shows a summary of the laboratory test results.

Table 3.3: - Summary of Laboratory Test Results

Test Location	Sample Depth (m)	% Fines <0.075mm size	Atterberg Limits				Group Symbol
			Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Linear Shrinkage (%)	
HA1	0.1 – 0.6	9	27	NP	NP	1.0	GM

NP – Non-Plastic

The sample taken and tested to have 9% fines and assessed as silty gravel. All tests were carried out in accordance with current AS 1289 standard test procedures. The laboratory test certificate is presented in **Appendix C**.

3.4 ACID SULPHATE SOILS

The 2004 Perth Groundwater Atlas published by Water and Rivers Commission (used in conjunction with the latest information on their website)[5] indicates no known risk of acid sulphate soil occurring that could be disturbed by land development activities in the site.

SECTION 4.0 - DISCUSSION

4.1 SITE CLASSIFICATION

Australian Standard 2870 provides a system of site classification for residential slabs and footing design as follows:

Table 4.1: - Site Classification from AS2870-2011

Class	Foundation Type	Characteristic Surface Movement Y_s (mm)
A	Most sand and rock sites with little or no ground movement from moisture changes	Little or no ground movement
S	Slightly reactive clay sites, which may experience only slight ground movement from moisture changes	0 < Ys ≤ 20
M	Moderately reactive clay or silt sites, which may experience moderate ground movement from moisture changes	20 < Ys ≤ 40
H1	Highly reactive clay site, which may experience high ground movement from moisture changes	40 < Ys ≤ 60
H2	Highly reactive clay site, which may experience very high ground movement from moisture changes	60 < Ys ≤ 75
E	Extremely reactive sites, which may experience extreme ground movement from moisture changes	Ys > 75
P	Problematic sites, sites consisted of soft soils, soft clay or silt or loose sand; landfills, mine subsidence, collapsing soils, very reactive soils, subjected to erosion and sites which cannot be classified as A to E.	-

The above system is only applicable to one or two storey residential buildings or other structures of similar loadings.

For the soil profile encountered in the holes excavated and based on the results of laboratory tests carried out, the characteristic surface movement (Y_s Value) for the site is assessed to be **3mm**. This assumes a depth of soil suction change of 1.8 metres depth. Based on these findings the site is assigned a site classification of **S** in accordance with the definitions provided in Australian Standard AS2870, subject to good building practice.

4.2 SITE PREPARATION

Earthworks should be carried out in accordance with AS3798, “Guidelines on Earthworks for Commercial and Residential developments”. The topsoil should be removed and replaced with clean fill sand.

The base should be compacted or proof rolled to achieve a minimum of 95% of maximum dry density of modified compaction to at least 300mm below the base surface before any placement of fill. A thin sand pad is recommended where entry/ exit of services are connected to building(s).

Imported fill, should comprise free draining sand with no more than 5% passing a 75μm sieve, and free of organic matter and other deleterious materials. The clean fill sand should be compacted to achieve a minimum density index of 70% (96% of maximum dry density of modified compaction). Typically for Perth sands a minimum of 8 blows for the test depth interval 150 mm to 450 mm is required to achieve the minimum relative compaction of 96% of maximum dry density (modified compaction). To allow for depth effects, this implies that

PSP blow counts should not be less than 10 blows for the test interval 450 mm to 750 mm, and not less than 13 blows for the test interval 750 mm to 1050 mm.
The level of compaction should at least extend 2.0 m past the building envelope.

4.3 EXCAVATIONS

Shallow excavations within the development area could require a large (>13T) excavator or excavator with rockbreaker attachment due to the near surface laterite formation encountered on the site.

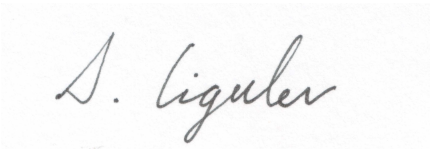
4.4 DRAINAGE AND STORMWATER RUNOFF

It is recommended a cut-off trench excavated into the laterite gravel layer on the uphill side of the proposed building site to intercept water running down the hill.
It is recommended a well contoured site surface at the proposed building site will be critical to ensure water does not pond on the surface that may saturate and soften soils in the vicinity of the building or any pavement area as in AS2870, Appendix B[2]. Furthermore, a covered or paved site surface bordering the proposed building will help stop water infiltrating the surface that could saturate and soften soils in the vicinity of the proposed shed.

4.5 SITE MAINTENANCE

It is recommended to follow the CSIRO publication “Guide to Home Owners on Foundation Maintenance and Footing Performance” in Building Technology File Number 18[7]. This document provides important information about implications of plumbing, property maintenance, site classification on foundation design, drainage and performance expectations.

For and on behalf of
WA GEOTECHNICS PTY LTD



SIMON CIGULEV
MIEAust, Member No. 2727537

SECTION 5.0 - STANDARDS AND REFERENCES

1. AS 1726, *Geotechnical Site Investigations*
2. AS 2870, *Australian Standard for residential slabs and footings*
3. AS 3798, *Australian Standard for Earthworks for Residential and Commercial Developments*
4. AS 1289, *Methods of Testing Soils for Engineering Purposes*
5. https://maps.water.wa.gov.au/#/webmap/gwm, Perth Groundwater Map, Department of Water and Environmental Regulation, Government of Western Australia
6. Australian Geomechanics, May 2002, AGS Sub-Committee, *Landslide Risk Management*
7. CSIRO Information Sheet BTF (Building Technology File) 18, *Foundation Maintenance and Footing Performance: A Homeowner's Guide*
8. Standards Australia, Hand Book HB 160-2006, *Soil Testing*

SECTION 6.0 - INFORMATION ABOUT YOUR REPORT

This report presents the results of a geotechnical investigation prepared for the purpose of this commission. The data and advice provided herein relate only to the project and structures described herein and must be reviewed by a competent geotechnical engineer before being used for any other purpose. WA Geotechnics accepts no responsibility for other use of the data.

Where drill hole or test pit logs, cone tests, laboratory tests, geophysical tests and similar work have been performed and recorded by others the data is included and used in the form provided by others. The responsibility for the accuracy of such data remains with the issuing authority, not with WA Geotechnics.

The advice tendered in this report is based on information obtained from the investigation location's test points and sample points and is not warranted in respect to the conditions that may be encountered across the site at other than these locations. It is emphasised that the actual characteristics of the subsurface materials may vary significantly between adjacent test points and sample intervals and at all locations other than where observations, explorations and investigations have been made. Subsurface conditions, including groundwater levels and contaminant concentrations can change in a limited time. This should be borne in mind when assessing the data.

It should be noted that because of the inherent uncertainties in subsurface evaluations, changed or unanticipated subsurface conditions may occur that could affect total project cost and / or execution. WA Geotechnics does not accept responsibility for the consequences of significant variances in the conditions and the requirements for execution of the work.

The subsurface and surface earthworks, excavations and foundations should be examined by a suitably qualified and experienced Engineer who shall judge whether the revealed conditions accord with both the assumptions in this report and / or the design of the works. If they do not accord, the Engineer shall modify advice in this report and / or design of the works to accord with the circumstances that are revealed.

An understanding of the geotechnical site conditions depends on the integration of many pieces of information, some regional, some site specific, some structure specific and some experienced based. Hence this report should not be altered, amended or abbreviated, issued in part and issued incomplete in any way without prior checking and approval by WA Geotechnics. WA Geotechnics accepts no responsibility for any circumstances, which arise from the issue of the report, which has been modified in any way as outlined above.

FIGURE 1

Site Description and Test Locations
Page 1 of 1

Client: Danelle Warne **Job No:** WA004-pri-248

Project: Site Classification **Date Tested:** 14 Sep 2022

Location: 8 Draper Rd, Mahogany Creek

SITE DESCRIPTION	
Topography: **General:** Hilly. **Local:** Gentle slope.	***Adjacent Structures:*** Approximately 45 y/o single B + T home in average condition.
Drainage: Fair.	***Movement Noted:*** No.
Groundwater Noted: Not encountered to 0.7 m depth below surface.	***Boundary Conditions:*** No.
Vegetation: Natural bushland with moderate cover of large Eucalypt trees.	
Fill Encountered: No.	***Fall Across Site:*** ~1.5 m north. ***Fall Across Building Envelope:*** N/A.

SITE SKETCH (NOT TO SCALE)

(Refer to Figure 2 - Site Plan)

FIGURE 2


Site Location Plan
Untitled Map
Write a description for your map.
Legend
8 Draper Rd
8 Draper Rd
HA1
E116°07'56.64"
HA2
HA3
HA1 - Hand Auger Hole
N
30 m
Google Earth

APPENDIX A

HAND AUGER LOGS

SOIL DESCRIPTION

DEFINITION:

In engineering terms, soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

CLASSIFICATION SYMBOL AND SOIL NAME:

Soils are described in accordance with the Unified Soil Classification (UCS) as shown attached.

PARTICLE SIZE DESCRIPTIVE TERMS

NAME	SUBDIVISION	SIZE
Boulders		> 200 mm
Cobbles		63 mm to 200 mm
Gravel	Coarse	20 mm to 63 mm
	Medium	6 mm to 20 mm
	Fine	2.36 mm to 6 mm
Sand	Coarse	600 µm to 2.36 µm
	Medium	200 µm to 600 µm
	Fine	75 µm to 200 µm

MOISTURE CONDITION

Dry Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.

Moist Soil feels cool and darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.

Wet As for moist but with free water forming on hands when handled.

CONSISTENCY OF COHESIVE SOILS

TERM	UNDRAINED STRENGTH Su (kPa)	FIELD GUIDE
Very Soft	< 12	A finger can be pushed well into the soil with little effort.
Soft	12 - 25	A finger can be pushed into the soil to about 25 mm depth.
Firm	25 - 50	The soil can be indented about 5 mm with the thumb, but not penetrated.
Stiff	50 - 100	The surface of the soil can be indented with the thumb, but not penetrated.
Very Stiff	100 - 200	The surface of the soil can be marked but not indented with thumb pressure.
Hard	> 200	The surface of the soil can be marked only with the thumbnail.
Friable	-	Crumbles or powders when scraped by thumbnail.

DENSITY OF GRANULAR SOILS

TERM	DENSITY INDEX (%)
Very Loose	Less than 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	Greater than 85

MINOR COMPONENTS

TERM	ASSESSMENT GUIDE	PROPORTION OF MINOR COMPONENT IN:
Trace of	Presence just detectable by feel or eye. but soil properties little or no different to general properties of primary component.	Coarse grained soils: <5% Fine grained soils: <15%
With some	Presence easily detected by feel or eye, but soil properties little different to general properties of primary component.	Fine grained soils: 15% - 30%

Soil and Rock Description Explanation Sheets
Updated May 2009
Page 1 of 3

SOIL STRUCTURE

ZONING		CEMENTING	
Layers:	Continuous across exposure or sample.	Weakly Cemented:	Easily broken up by hand in air or water.
Lenses:	Discontinuous layers of lenticular shape.	Moderately Cemented:	Effort is required to break up the soil by hand in air or water.
Pockets:	Irregular inclusions of different material.		

GEOLOGICAL ORIGIN

Weathered in Place Soils	
Extremely weathered material	Structure and fabric of parent rock visible.
Residual soil	Structure and fabric of parent rock not visible.
Transported Soils	
Aeolian soil	Deposited by wind.
Alluvial soil	Deposited by streams and rivers.
Colluvial soil	Deposited on slopes (transported down slope by gravity).
Fill	Man made deposit. Fill may be significantly more variable between tested locations than naturally occurring soils.
Lacustrine soil	Deposited by lakes.
Marine soil	Deposited in ocean basins, bays, beaches and estuaries.

SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

FIELD IDENTIFICATION PROCEDURES (excluding particles larger than 60mm and basing fractions on estimated mass)							USC	PRIMARY NAME
COARSE GRAINED SOILS More than 50% of material less than 63mm is larger than 0.075mm.	(A 0.075mm particle is about the smallest particle visible to the naked eye)	GRAVELS More than half of coarse fraction is larger than 2.0mm.	CLEAN GRAVELS (little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes.			GW	GRAVEL
				Predominantly one size or a range of sizes with more intermediate sizes missing.			GP	GRAVEL
			GRAVELS WITH FINES (appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below).			GM	SILTY GRAVEL
				Plastic fines (for identification procedures see CL below).			GC	CLAYEY GRAVEL
		SANDS More than half of coarse fraction is smaller than 2.0mm.	CLEAN SANDS (little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes.			SW	SAND
				Predominantly one size or a range of sizes with more intermediate sizes missing.			SP	SAND
			SANDS WITH FINES (appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below).			SM	SILTY SAND
				Plastic fines (for identification procedures see CL below).			SC	CLAYEY SAND
FINE GRAINED SOILS More than 50% of material less than 63mm is smaller than 0.075mm.		IDENTIFICATION PROCEDURES ON FRACTIONS < 0.2mm						
		SILTS & CLAYS Liquid limit < 50	DRY STRENGTH	DILATANCY	TOUGHNESS			
			None to low	Quick to slow	None		ML	SILT
			Medium to high	None	Medium		CL	CLAY
			Low to medium	Slow to very slow	Low		OL	ORGANIC SILT
		SILTS & CLAYS Liquid limit > 50	Low to medium	Slow to very slow	Low to medium		MH	SILT
			High	None	High		CH	CLAY
			Medium to high	None	Low to medium		OH	ORGANIC CLAY
HIGHLY ORGANIC SOILS		Readily identified by colour, odour, spongy feel and frequently by fibrous texture.					Pt	PEAT

▪Low plasticity – Liquid Limit W_L < 35% ▪Medium plasticity - W_L between 35% and 50% ▪High plasticity – Liquid Limit W_L > 50%

Soil and Rock Description Explanation Sheets
Updated May 2009
Page 2 of 3

ROCK DESCRIPTION

The descriptive terms used by WAG are given below. They are broadly consistent with Australian Standard AS1726-1993.

DEFINITIONS: Rock substance, defect and mass are defined as follows:

Rock Substance	In engineering terms rock substance is any naturally occurring aggregate of minerals and organic matenal which cannot be disintegrated or remoulded by hand In air or water Other material is described using soil descriptive terms effectively homogenous material, may be isotropic or anisotropic.
Defect	Discontinuity or break in the continuity of a substance or substances.
Mass	Any body of material which is not effectively homogenous. It can consist of two or more substances without detects, or one or more substances with one or more defects.

SUBSTANCE DESCRIPTIVE TERMS:

ROCK NAME	Simple rock names are used rather than precise geological classification.
PARTICLE SIZE	Grain size terms for sandstone are:
Coarse grained	Mainly 0.6mm to 2mm
Medium grained	Mainly 0.2mm to 0.6mm
Fine grained	Mainly 0.06mm (just visible) to 0.2mm
FABRIC	Terms for layering or penetrative fabric (eg. Bedding, cleavage etc.) are:
Massive	No layering or penetrative fabric.
Indistinct	Layering or fabric just visible. Little effect on properties.
Distinct	Layering or fabric is easily visible. Rock breaks more easily parallel to layering or fabric.

CLASSIFICATION OF WEATHERING PRODUCTS

Term	Abbreviation	Definition
Residual Soil	**RS**	Soil derived from the weathering of rock; the mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly transported.
Extremely Weathered Material	**XW**	Material is weathered to such an extent that It has soil properties, ie. it either disintegrates or can be remoulded in water. Original rock fabric still visible.
Highly Weathered Rock	**HW**	Rock strength is changed by weathering. The whole of the rock substance is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Some minerals are decomposed to clay minerals. Porosity may be increased by leaching or may be decreased due to the deposition of minerals in pores.
Moderately Weathered Rock	**MW**	The whole of the rock substance is discoloured, usually by iron staining or bleaching, to the extent that the colour at the fresh rock is no longer recognisable.
Slightly Weathered Rock	**SW**	Rock substance affected by weathering to the extent that partial staining or partial discolouration of the rock substance (usually by limonite) has taken place. The colour and texture of the fresh rock is recognisable. strength properties are essentially those of the fresh rock substance.
Fresh Rock	**FR**	Rock substance unaffected by weathering.

Notes on Weathering:

1. AS1726 suggests the term "Distinctly Weathered" (**DW**) to cover the range of substance weathering conditions between **XW and SW**. For projects where it is not practical to delineate between HW and MW or it is judged that there is no advantage of making such a distinction. DW may be used with the definition given in AS1726.
2. Where physical and chemical changes were caused by hot gasses and liquids associated with igneous rocks, the term "altered" may be substituted for weathering to give the abbreviations XA, HA., MA, SA, and DA.

ROCK SUBSTANCE STRENGTH TERMS

Term	Abbrev-iation	Point Load Index, I_s50 (MPa)	Field Guide
Very Low	**VL**	**< 0.1**	Material crumbles under firm blows with sharp end of pick; can be peeled with a knife; pieces up to 30mm thick can be broken by finger pressure.
Low	**L**	**0.1 to 0.3**	Easily scored with a knife; indentations 1mm to 3mm show with firm blows of a pick point; has a dull sound under hammer. Pieces of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium	**M**	**0.3 to 1.0**	Readily scored with a knife; a piece of core l50mm long by 50mm diameter can be broken by hand with difficulty.
High	**H**	**1 to 3**	A piece of core 150mm long by 5Omm can not be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High	**VH**	**3 to 10**	Hand specimen breaks after more than one blow of a pick; rock rings under hammer.
Extremely High	**EH**	**> 10**	Specimen requires many blows with geological pick to break; rock rings under hammer.

Notes on Rock Substance Strength:

1. In anisotropic rocks the field guide to strength applies to the strength perpendicular to the anisotropy. High strength anisotropic rocks may break readily parallel to the planar anisotropy.
2. The term "extremely low" is not used as a rock substance strength term. While the term is used in AS1726-1993, the field guide therein makes It clear that materials in that strength range are Soils in engineering terms.
3. The unconfined compressive strength for isotropic rocks (and anisotropic rocks which fail across the planar anisotropy) is typically 10 to 25 times the point load index (ls5O). The ratio may vary for different rock types. Lower strength rocks often have lower ratios than higher strength rocks.

Soil and Rock Description Explanation Sheets
Updated May 2009
Page 3 of 3

Hand Auger Log

Page 1 of 1

Client:	Danelle Warne	**Test Location:**	See Figure 2
Project:	Site Classification	**Test Number:**	**HA1**
Location:	8 Draper Rd, Mahogany Creek	**Job Number:**	WA004-pri-248
Date Tested:	14-Sep-2022	**Site Coordinates:**	Not Recorded
Equipment:	75mm diameter Hand Auger	**Logged By:**	SC

Soil type: plasticity or particle characteristics, colour, secondary and minor components, cementing, moisture, origin	Depth (metres)	Sample	Remarks
TOPSOIL, Silty GRAVEL (GM) - medium dense, orange/brown, fine to medium, subrounded laterite gravel, moist			
LATERITE GRAVEL (GM) - medium dense, non-plastic, orange/brown, fine to medium, subrounded laterite gravel, moist		D	
0.6 m depth....becoming fine to coarse gravel			
Sharp Refusal at 0.7 m depth on coarse laterite gravel/ cobble (inferred).			
Target depth of 2.0 m not achieved.	1.00		
Groundwater not encountered.	2.00		
	3.00		
	4.00		

Notes:	B - Bulk Sample	PL - Plastic Limit	Groundwater Observations:	
	D - Disturbed Sample	LL - Liquid Limit	Depth water noted (m)	N/A
	U - Undisturbed Tube Sample		Depth to steady level (m)	N/A

Hand Auger Log

Page 1 of 1

Client:	Danelle Warne	**Test Location:**	See Figure 2
Project:	Site Classification	**Test Number:**	**HA2**
Location:	8 Draper Rd, Mahogany Creek	**Job Number:**	WA004-pri-248
Date Tested:	14-Sep-2022	**Site Coordinates:**	Not Recorded
Equipment:	75mm diameter Hand Auger	**Logged By:**	SC

Soil type: plasticity or particle characteristics, colour, secondary and minor components, cementing, moisture, origin	Depth (metres)	Sample	Remarks
TOPSOIL, Silty GRAVEL (GM) -loose, orange/brown, fine to medium, subrounded laterite gravel, trace organics, moist			
LATERITE GRAVEL (GM) - medium dense, non-plastic, orange/brown, fine to medium, subrounded laterite gravel, moist			
0.5 m depth....becoming fine to coarse gravel			
Sharp Refusal at 0.7 m depth on coarse laterite gravel/ cobble (inferred).			
Target depth of 2.0 m not achieved.			
Groundwater not encountered.	1.00		
	2.00		
	3.00		
	4.00		

Notes:	B - Bulk Sample	PL - Plastic Limit	Groundwater Observations:	
	D - Disturbed Sample	LL - Liquid Limit	Depth water noted (m)	N/A
	U - Undisturbed Tube Sample		Depth to steady level (m)	N/A

Hand Auger Log

Page 1 of 1

Client:	Danelle Warne	**Test Location:**	See Figure 2
Project:	Site Classification	**Test Number:**	HA3
Location:	8 Draper Rd, Mahogany Creek	**Job Number:**	WA004-pri-248
Date Tested:	14-Sep-2022	**Site Coordinates:**	Not Recorded
Equipment:	75mm diameter Hand Auger	**Logged By:**	SC

Soil type: plasticity or particle characteristics, colour, secondary and minor components, cementing, moisture, origin	Depth (metres)	Sample	Remarks
TOPSOIL, Silty GRAVEL (GM) -loose, orange/brown, fine to medium, subrounded laterite gravel, trace organics, moist **LATERITE GRAVEL (GM)** - medium dense, non-plastic, orange/brown, fine to medium, subrounded laterite gravel, moist **Sharp Refusal at 0.35 m depth on coarse laterite gravel/ cobble (inferred).** **Target depth of 2.0 m not achieved.** **Groundwater not encountered.**	1.00 2.00 3.00 4.00		

Notes:	B - Bulk Sample	PL - Plastic Limit	Groundwater Observations:	
	D - Disturbed Sample	LL - Liquid Limit	Depth water noted (m)	N/A
	U - Undisturbed Tube Sample		Depth to steady level (m)	N/A

APPENDIX B

DCP TEST RESULTS

PERTH SAND PENETROMETER
AS1289.6.3.3 - 1997
SCALA PENETROMETER TEST ✓
AS1289.6.3.2 - 1997

Test Report No.
Job No: WA004-pri-248
Office: Perth

Client: Danelle Warne Project: Site Classification Location: 8 Draper Rd, Mahogany Creek Soil type: Laterite Gravel Soil moisture: moist Depth to water: N/E to 1.0 m depth	Date: 14/09/2022 Tested by: SC Hammer mass: 9kg Hammer drop: 510mm Penetrometer used: 1AA

Test Location	HA1	HA2	HA3			
Start Depth bgl (mm)	0	0	0			
Depth to Water (mm)	N/A	N/A	N/A			
	Blows/100mm					
0-100	2	1	2			
100-200	2	1	3			
200-300	2	1	3			
300-400	2	1	3			
400-500	2	1	4			
500-600	2	3	7			
600-700	2	3	8			
700-800	3	5	9			
800-900	4	7	13			
900-1000	5	9	11			

Notes: bgl – below ground level; N/E – Not Encountered; R – Penetrometer Refusal

APPENDIX C

LABORATORY TEST RESULTS

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

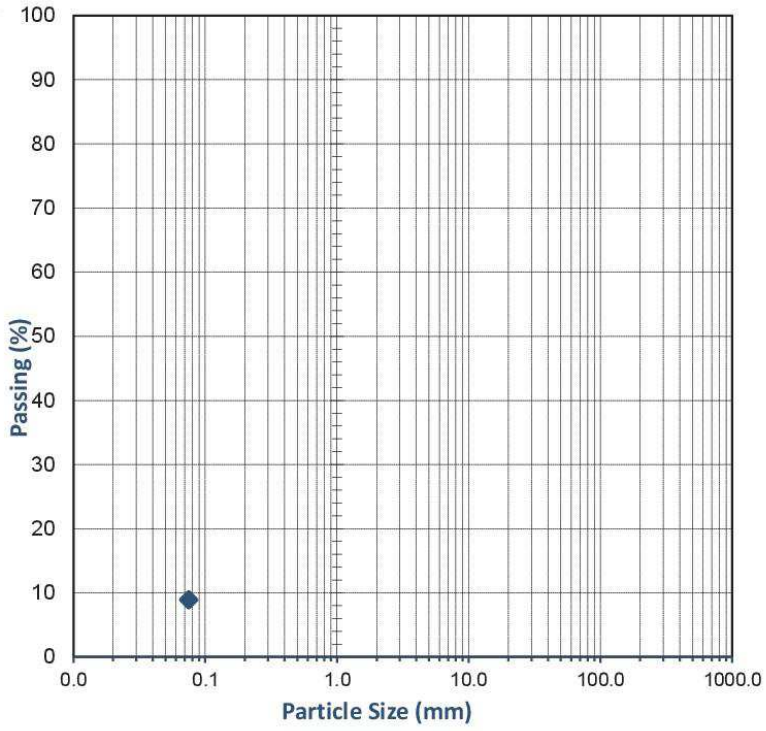
TEST REPORT - AS 1289.3.6.1 (% Fines)

Client:	WA Geotechnics	*Ticket No.*	S7398
Client Address:	P.O. Box 564 North Perth WA 6906	*Report No.*	WG22.14041_1_%FINES
Project:	Site Classification	*Sample No.*	WG22.14041
Location:	8 Draper Rd, Mahogany Creek	*Date Sampled:*	14-09-2022
Sample Identification:	HA1: 0.1 - 0.6m	*Date Tested:*	16/09 - 19/09/2022

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	
1.18	
0.600	
0.425	
0.300	
0.150	
0.075	9



Comments: Clients request for the % Fines of Material passing 0.075mm only.

Approved Signatory:

Name: Cody O'Neill
Date: 19-September-2022

NATA Accreditation No. 20599
Accredited for compliance with ISO/IEC 17025 - Testing

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.9.2, 3.2.1, 3.3.2 & 3.4.1

Client:	WA Geotechnics	*Ticket No.*	S7398
Client Address:	P.O. Box 564 North Perth WA 6906	*Report No.*	WG22.14041_1_PI
Project:	Site Classification	*Sample No.*	WG22.14041
Location:	8 Draper Rd, Mahogany Creek	*Date Sampled:*	14/09/2022
Sample Identification:	HA1: 0.1 - 0.6m	*Date Tested:*	19/09/2022

TEST RESULTS - Consistency Limits (Cone)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.9.2	**Liquid Limit (%)**	**27**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.2	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**1.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen**	**-**

Comments:

Approved Signatory: Cody O'Neill

Name: Cody O'Neill
Date: 20/September/2022

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WG_AS 1289.3.9.2,3.2.1,3.3.1,3.4.1_TR_2