DEVELOPMENT APPLICATION

PDPLANPMTD-2025/053519

PROPOSAL: Additions & Alterations (Single Dwelling)

LOCATION: 180 Hanslows Road, Cambridge

RELEVANT PLANNING SCHEME: Tasmanian Planning Scheme - Clarence

ADVERTISING EXPIRY DATE: 04 August 2025

The relevant plans and documents can be inspected at the Council offices, 38 Bligh Street, Rosny Park, during normal office hours until 04 August 2025. In addition to legislative requirements, plans and documents can also be viewed at www.ccc.tas.gov.au during these times.

Any person may make representations about the application to the Chief Executive Officer, by writing to PO Box 96, Rosny Park, 7018 or by electronic mail to clarence@ccc.tas.gov.au. Representations must be received by Council on or before 04 August 2025.

To enable Council to contact you if necessary, would you please also include a day time contact number in any correspondence you may forward.

Any personal information submitted is covered by Council's privacy policy, available at www.ccc.tas.gov.au or at the Council offices.

City of Clarence
38 Bligh St Rosny Park
PO Box 96
Rosny Park TAS, 7018

03 6217 9500
clarence@ccc.tas.gov.au
ccc.tas.gov.au

Application for Development / Use or Subdivision

Use this form to obtain planning approval for developing or using land, including subdividing it into smaller lots or lot consolidation.

Proposal: Addition / Alteration

Location: 180 Hanslows Road Cambridge 7170

Personal Information Removed

Estimated cost of development: 300 000

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Is the property on the Tasmanian Heritage Register? Yes ☐ No ■

If yes, we recommend you discuss your proposal with Heritage Tasmania prior to lodgement as exemptions may apply which may save you time on your proposal.

If you had pre-application discussions with City of Clarence, please provide planner's name:

Current use of site: Residence

Does the proposal involve land administered or owned by the Crown or Council? Yes ☐ No ☐

Declaration

- I have read the Certificate of Title and Schedule of Easements for the land and am satisfied that this application is not prevented by any restrictions, easements or covenants.
- I authorise the provision of a copy of any documents relating to this application to any person for the purposes of assessment or public consultation. I agree to arrange for the permission of the copyright owner of any part of this application to be obtained. I have arranged permission for Council's representatives to enter the land to assess this application
- I declare that, in accordance with Section 52 of the Land Use Planning and Approvals Act 1993, that I have notified the owner of the intention to make this application. Where the subject property is owned or controlled by Council or the Crown, their signed consent is attached.
- I declare that the information in this declaration is true and correct.

Acknowledgement

- I acknowledge that the documentation submitted in support of my application will become a public record held by Council and may be reproduced by Council in both electronic and hard copy format in order to facilitate the assessment process; for display purposes during public consultation; and to fulfil its statutory obligations. I further acknowledge that following determination of my application, Council will store documentation relating to my application in electronic format only.

Applicant's signature: **Personal Information Removed**

Date: 1/7/25

Please refer to the development/use and subdivision checklist on the following pages to determine what documentation must be submitted with your application.

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Development/use or subdivision checklist

Mandatory Documents
This information is required for the application to be valid. We are unable to proceed with an application without these documents.

- ☐ Details of the location of the proposed use or development.
- ☐ A copy of the current Certificate of Title, Sealed Plan, Plan or Diagram and Schedule of Easements and other restrictions for each parcel of land on which the use or development is proposed.
- ☐ Full description of the proposed use or development.
- ☐ Description of the proposed operation. May include where appropriate: staff/student/customer numbers; operating hours; truck movements; and loading/unloading requirements; waste generation and disposal; equipment used; pollution, including noise, fumes, smoke or vibration and mitigation/management measures.
- ☐ Declaration the owner has been notified if the applicant is not the owner.
- ☐ Crown or Council consent (if publically-owned land).
- ☐ Any reports, plans or other information required by the relevant zone or code.
- ☐ Fees prescribed by the City of Clarence.

Application fees (please phone 03 6217 9550 to determine what fees apply). An invoice will be emailed upon lodgement.

Additional Documents
In addition to the mandatory information required above, Council may, to enable it to consider an application, request further information it considers necessary to ensure that the proposed use or development will comply with any relevant standards and purpose statements in the zone, codes or specific area plan, applicable to the use or development.

- ☐ Site analysis and site plan, including where relevant:
  - Existing and proposed use(s) on site.
  - Boundaries and dimensions of the site.
  - Topography, including contours showing AHD levels and major site features.
  - Natural drainage lines, watercourses and wetlands on or adjacent to the site.
  - Soil type.
  - Vegetation types and distribution, and trees and vegetation to be removed.

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- Location and capacity of any existing services or easements on/to the site.
- Existing pedestrian and vehicle access to the site.
- Location of existing and proposed buildings on the site.
- Location of existing adjoining properties, adjacent buildings and their uses.
- Any natural hazards that may affect use or development on the site.
- Proposed roads, driveways, car parking areas and footpaths within the site.
- Any proposed open space, communal space, or facilities on the site.
- Main utility service connection points and easements.
- Proposed subdivision lot boundaries.

☐ Where it is proposed to erect buildings, detailed plans with dimensions at a scale of 1:100 or 1:200 showing:

- Internal layout of each building on the site.
- Private open space for each dwelling.
- External storage spaces.
- Car parking space location and layout.
- Major elevations of every building to be erected.
- Shadow diagrams of the proposed buildings and adjacent structures demonstrating the extent of shading of adjacent private open spaces and external windows of buildings on adjacent sites.
- Relationship of the elevations to natural ground level, showing any proposed cut or fill.
- Materials and colours to be used on rooves and external walls.

☐ Where it is proposed to erect buildings, a plan of the proposed landscaping showing:

- Planting concepts.
- Paving materials and drainage treatments and lighting for vehicle areas and footpaths.
- Plantings proposed for screening from adjacent sites or public places.

☐ Any additional reports, plans or other information required by the relevant zone or code.

This list is not comprehensive for all possible situations. If you require further information about what may be required as part of your application documentation, please contact City of Clarence Planning team on (03) 6217 9550.

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
185044	1
EDITION	DATE OF ISSUE
2	19-Jan-2024

SEARCH DATE : 13-Jun-2025
SEARCH TIME : 08.54 AM

DESCRIPTION OF LAND

City of CLARENCE
Lot 1 on Sealed Plan 185044
Derivation : Part of 1654 Acres Gtd. to Robert Pitcairn
Prior CT 105616/1

SCHEDULE 1

N170202 TRANSFER to JASON MARK APPLEBEE and ANNA LOUISE APPLEBEE Registered 19-Jan-2024 at noon

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
SP185044 FENCING PROVISION in Schedule of Easements
M254115 Application by Aurora Energy Pty Ltd for Noting of a Notable Interest pursuant to Section 12(1) (2) (a) & (b) of the Electricity Wayleaves and Easement Act 2000 Registered 28-Jan-2010 at noon
E368203 MORTGAGE to Commonwealth Bank of Australia Registered 19-Jan-2024 at 12.01 PM

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

OWNER JOHN RAMSAY SPAULDING
HELEN MARGARET SPAULDING

FOLIO REFERENCE C.T.105616/1

GRANTEE PART OF 1684 ACRES GTD. TO ROBERT PITCAIRN

PLAN OF SURVEY

BY SURVEYOR DAVID BRUCE MILLER
BROOKS LARK AND CARRICK SURVEYORS
UNIT 1 - 2 KENNEDY DRIVE, CAMBRIDGE PARK
PH 6248-5878 MOB. 0400-114-824

CITY OF CLARENCE

SCALE 1: 1,500 LENGTHS IN METRES

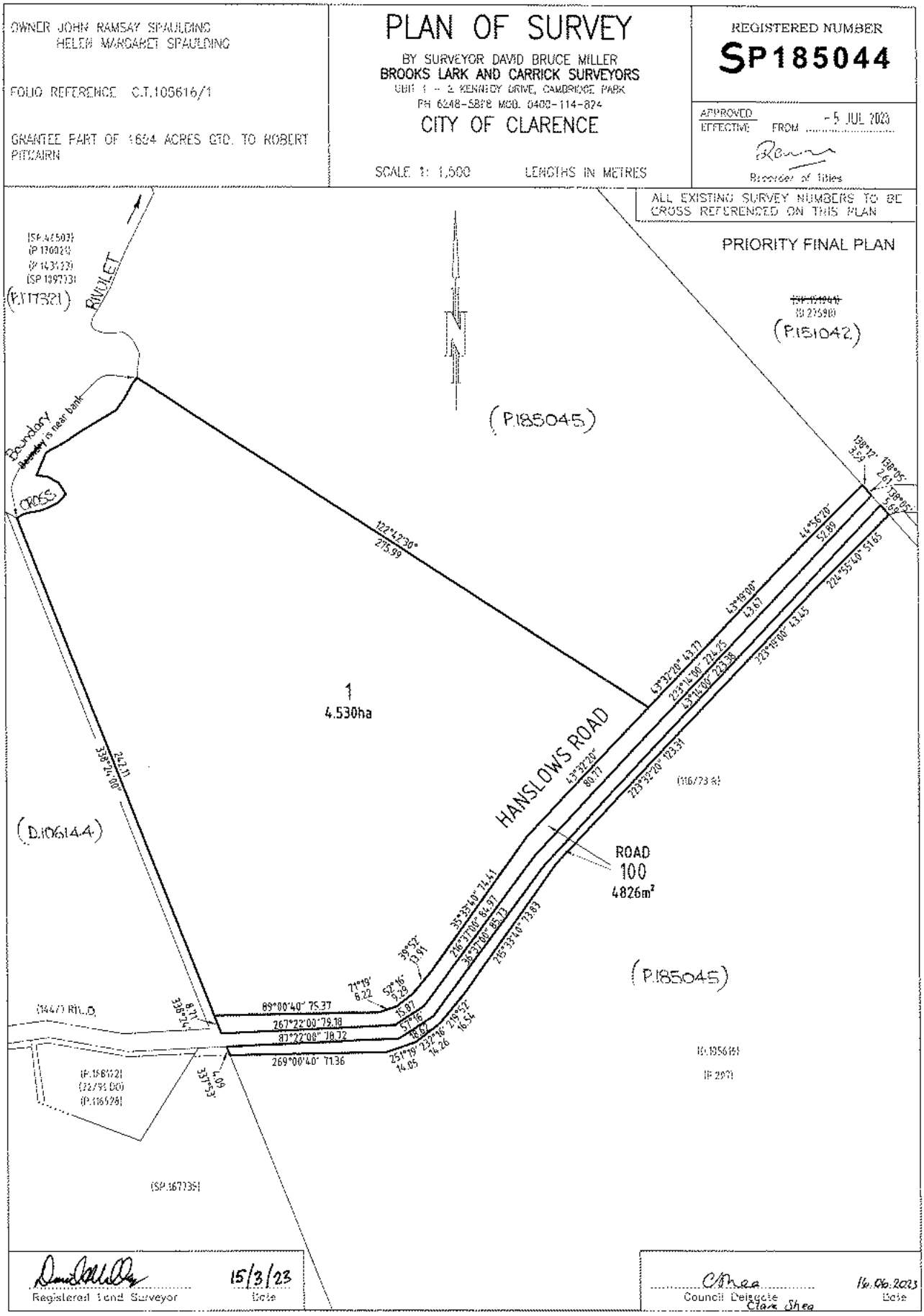
REGISTERED NUMBER
SP185044

APPROVED
EFFECTIVE FROM - 5 JUL 2023

Recorder of Titles

ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

PRIORITY FINAL PLAN



Registered Land Surveyor — 15/3/23 Date

Council Delegate Clark Shea — 16.06.2023 Date

SCHEDULE OF EASEMENTS	Registered Number
NOTE: THE SCHEDULE MUST BE SIGNED BY THE OWNERS & MORTGAGEES OF THE LAND AFFECTED. SIGNATURES MUST BE ATTESTED.	SP 185044

EASEMENTS AND PROFITS

Each lot on the plan is together with:-
(1) such rights of drainage over the drainage easements shown on the plan (if any) as may be necessary to drain the stormwater and other surplus water from such lot; and
(2) any easements or profits a prendre described hereunder.
Each lot on the plan is subject to:-
(1) such rights of drainage over the drainage easements shown on the plan (if any) as passing through such lot as may be necessary to drain the stormwater and other surplus water from any other lot on the plan; and
(2) any easements or profits a prendre described hereunder.
The direction of the flow of water through the drainage easements shown on the plan is indicated by arrows.

FENCING PROVISIONS:

In respect of the lots shown on the Plan, the Vendor (John Ramsay Spaulding and Helen Margaret Spaulding) shall not be required to fence.

EASEMENTS:

There are no easements or profits a pendre.

SIGNED by **John Ramsay Spaulding** and **Helen Margaret Spaulding** the Registered Proprietors of the Land in Certificate of Title Volume 105616 Folio 1 in the presence of:

John Ramsay Spaulding

Helen Margaret Spaulding

Witness Signature:

Witness Full Name:

Witness Address:

Witness Occupation:

Bradley John Welch
Legal Practitioner
Butler McIntyre & Butler
20 Murray Street, HOBART
Tel (03) 6222 9544

Bradley John Welch - Solicitor for the Vendor

(USE ANNEXURE PAGES FOR CONTINUATION) 6/12/2022

SUBDIVIDER: John Ramsay Spaulding and Helen Margaret Spaulding FOLIO REF: 105616/1 SOLICITOR & REFERENCE: Butler McIntyre and Butler: BW222764	PLAN SEALED BY: ~~Tasman~~ Clarence City Council DATE: 16th June 2023 REF NO. PDPLANAMD- 2021/023831 Council Delegate Clare Shea

NOTE: The Council Delegate must sign the Certificate for the purposes of identification.

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Registered Number

SP 185044

COUNCIL APPROVAL

(Insert any qualification to the permit under section 83(5), section 109 or section 111 of the Local Government (Building & Miscellaneous Provisions) Act 1993)
The subdivision shown in this plan is approved

In witness whereof the common seal of

has been affixed, pursuant to a resolution of the Council of the said municipality

passed the 6 day of April 2022, in the presence of us

Member .....

Member .....

Council Delegate .....

Clare Shea
Corporate Secretary
Clarence City Council
38 Bligh Street
Rosny Park 7018

POPLIN/AMTD -

Council Reference 2021/023831

NOMINATIONS

For the purpose of section 88 of the Local Government (Building & Miscellaneous Provisions) Act 1993

the owner has nominated

BUTLER MCINTYRE AND BUTLER	Solicitor to act for the owner
BROOKS LARK AND CARRICK SURVEYORS	Surveyor to act for the owner

OFFICE EXAMINATION: Indexed ..... Computed DH 22/6/23 Examined DH 5/7/23

Hamori, David

From: Martin Gray <Martin@rbsurveyors.com>
Sent: Tuesday, 4 July 2023 1:55 PM
To: Hamori, David
Cc: David Miller
Subject: RE: SP185044
Attachments: 1392102 - Survey Notes - Amendments 4-07-23.pdf

Hi David,

We've had a look through your mark-ups and agree with your findings. Please find attached amendments to be made to the notes.

Let me know if they is anything else I can assist you with.

Regards,

Martin Gray
Surveyor
Rogerson & Birch Surveyors
Unit 1, 2 Kennedy Drive Cambridge TAS 7170
Ph: (03) 6248 5898
martin@rbsurveyors.com
Website: www.rbsurveyors.com.au

Our Ref: APPLA01

From: planslto <planslto@nre.tas.gov.au>
Sent: Thursday, June 22, 2023 3:06 PM
To: David Miller <david@blcsurveyors.com.au>
Cc: Office - RB Surveyors <Office@rbsurveyors.com>
Subject: Re: SP185044

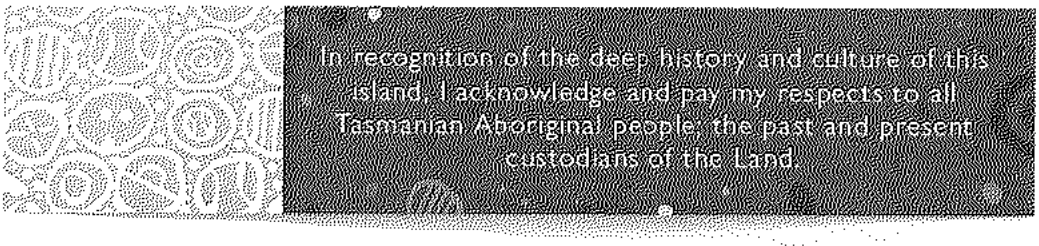
Hi David

Working on this one of yours and minor issues noted requiring consent if you agree, otherwise report.

1. Face plan errors noted for your records.
2. Survey issues
   Sheet 1 – L.O. ref to be shown
   Sheet 2 – Incorrect p.o. dist used from (2b) to (2c) which affects eastern boundary marginally.
   Comparison 4 difference shown incorrect but boundaries have been adjusted correctly.
   Sheet 3 – (2g) to (2h) boundary to change as shown on sheet 2 of notes
   (2e) to (2f) is a calc dist maintaining 6.096 road width rather than p.o. per old road survey.
   Sheet 4 – Dist across road is not a p.o. distance (same as sheet 3 issue noted above).
   Sheet 5 – As shown
3. Wrong balance plan sheet used (needs to be a sketch balance sheet showing excepted lands and incorrect distance shown which I have prepared) due to the basis of the parent title plan.

Regards

David Hamori | Senior Technical Officer
Plan Services Section | Land Titles office
Heritage and Land Tasmania
Department of Natural Resources and Environment Tasmania
134 Macquarie Street Hobart TAS 7000
GPO Box 44 Hobart TAS 7001
T: (03) 6165 4444
E: David.Hamori@nre.tas.gov.au
W: www.nre.tas.gov.au



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SURVEY NOTES

SHEET 1 OF 5 SHEETS

Registered Number

SURVEY CERTIFICATE

I, David Bruce Miller of Bellerive

in Tasmania a Registered Land Surveyor HEREBY CERTIFY that:

(a) this survey is based upon the best evidence that the nature of the case admits.
(b) the survey notes have been truly compiled from surveys made by me or made under my supervision; and
(c) this survey and accompanying survey notes comply with the relevant legislation affecting surveys and are correct for the purpose required.

Signature Date / /

CROSS REFERENCE PLAN NUMBERS USED AS PART OF THIS SURVEY

LENGTHS IN METRES

Owner: JOHN RAMSAY SPAULDING
HELEN MARGARET SPAULDING

Folio Reference: C.T.105616/1

Purpose of Survey: Subdivision of C.T.105616/1

Survey Commenced: 29-06-22	Survey Completed: 21-09-22	Surveyors Ref:	APPLA-01
Horizontal Datum: GDA2020	Bearing Datum: MGA2020	Combined Scale Factor:	0.99961424

MGA2020 COORDINATE ORIGIN

SURCOM	Mark ID:	E	N	EPU	
RTK/STATIC	Local coordinated mark:	E	N	EPU	
AUSPOS	Local coordinated mark:	E	N	EPU	Measurement Duration:
NRTK	Local coordinated mark:	E	N	EPU	CORS provider:

Single base station CORS CORS provider: Trimble VRS Now	Local comparison information SURCOM Check Mark ID: SPM7716RM1	SURCOM: E 535156.299	N 5260016.245	EPU ±0.019
		Measured: E 535156.269	N 5260016.202	EPU ±0.02
		Δ E + 0.030	Δ N +0.043	
	Local coordinated mark: (1) Spk	E 536614.906	N 5260395.656	EPU ±0.04

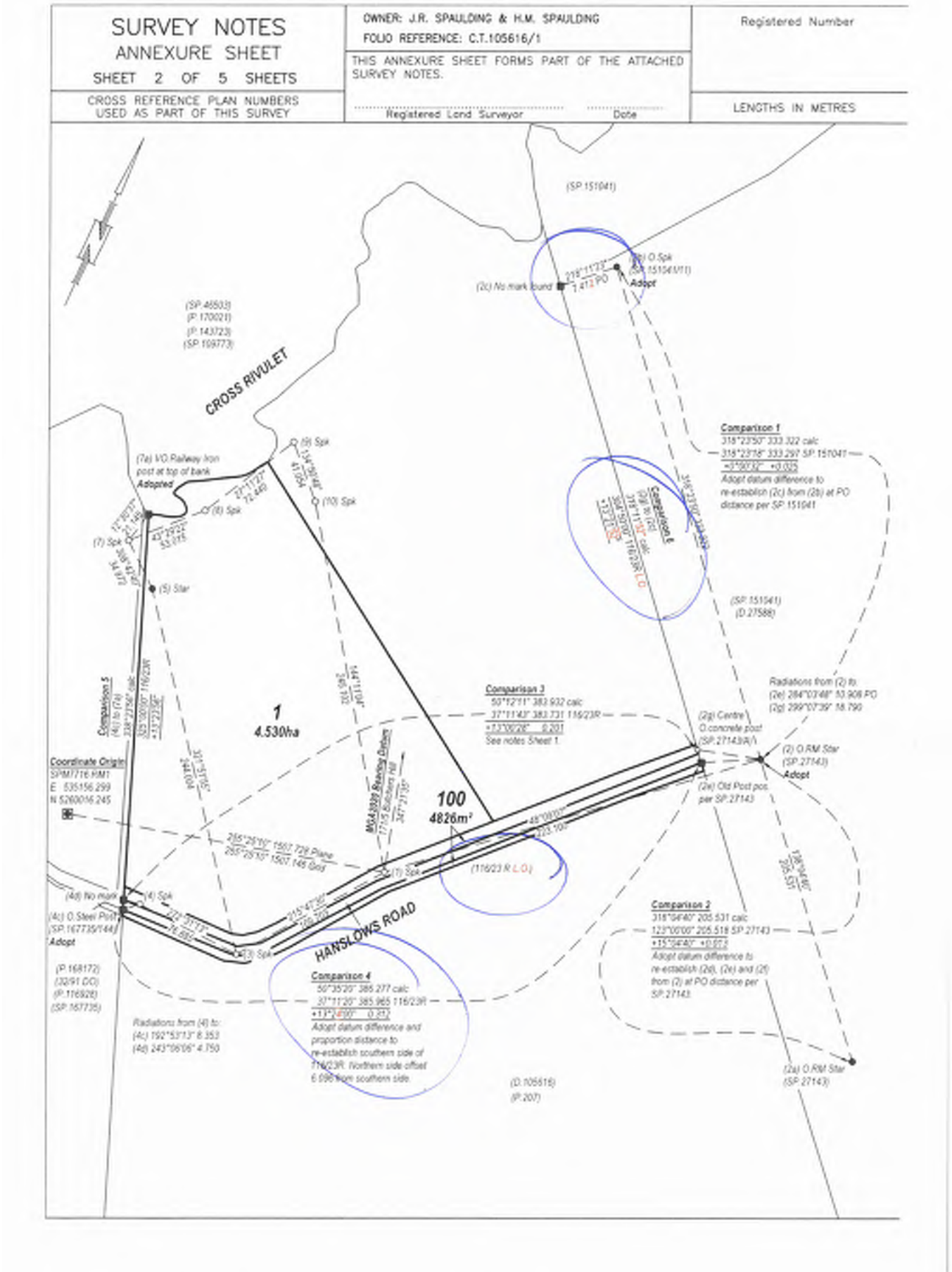
MGA2020 BEARING ORIGIN

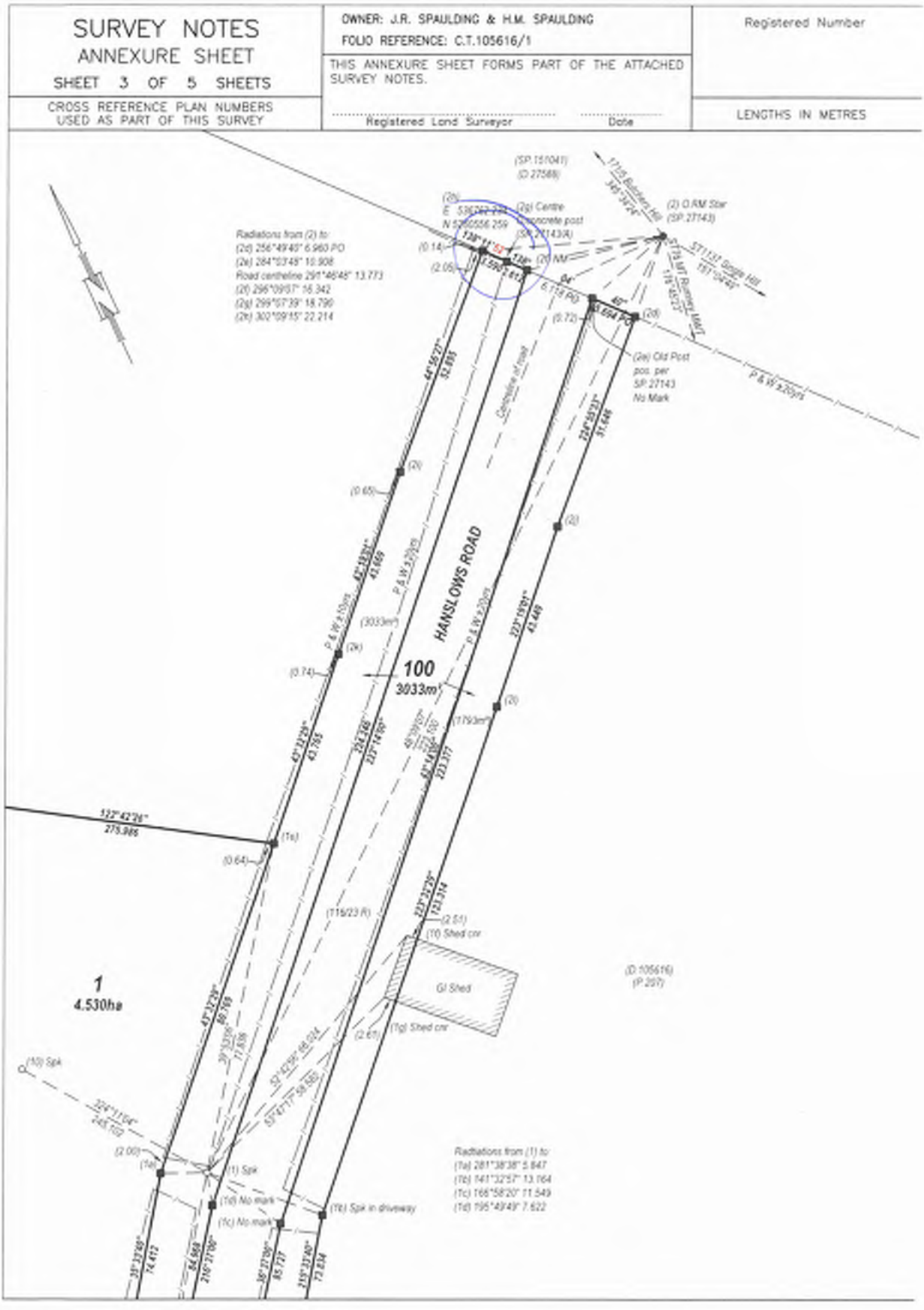
Bearing Calculation
(1) Spk E 536614.906 N 5260395.656
171/5 Butchers Hill E 535226.197 N 5266588.003
CALC/OBS BEARING 347°21'35"

BOUNDARY REINSTATEMENT REPORT

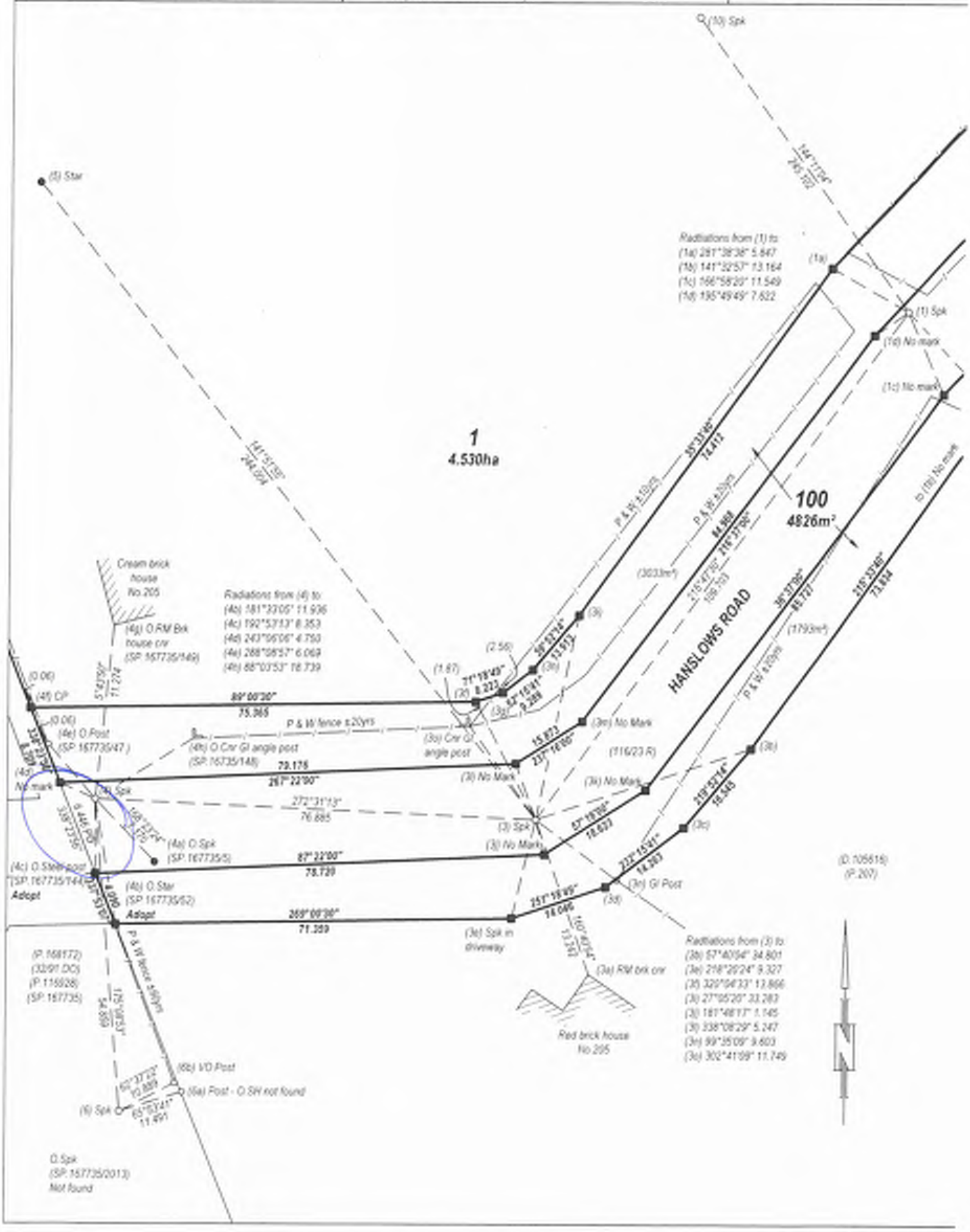
Notes

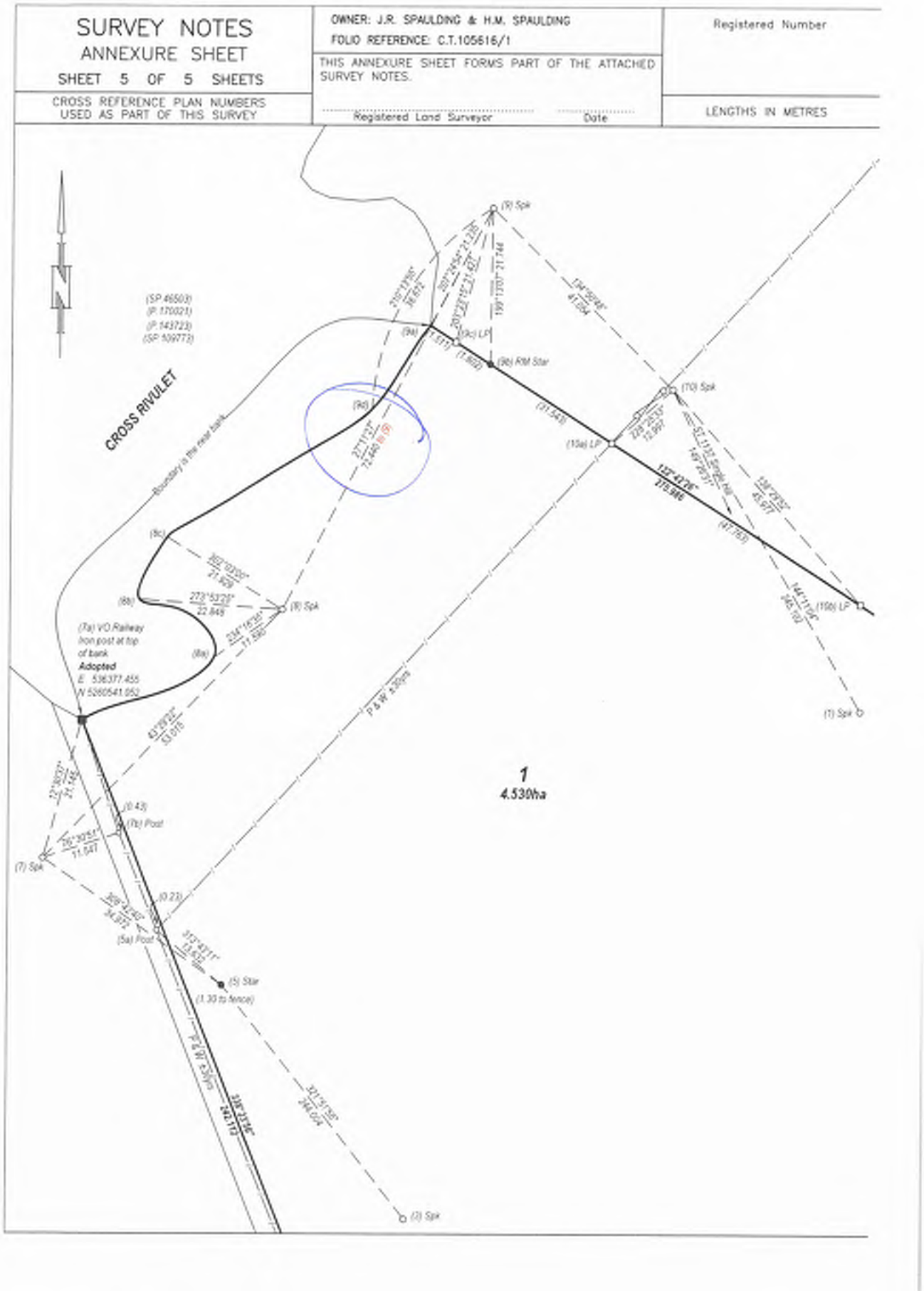
1. This survey has been carried out using conventional total station and RTK GPS techniques.
2. All corners shown are CP's and all boundaries are open unless otherwise stated.
3. Old corners reinstated in this survey were not found.
4. All no marks shown in this survey are disappearing boundaries or used only for calculations purposes.
5. Error of close 1:57,163 adjusted to zero.
6. The estimated positional uncertainty of boundary corner coordinates shown within this survey is ±0.06m.
7. Comparison 1 datum difference adopted to re-establish (2c) from (2b) at PO distance per SP 151041.
8. Comparison 2 datum difference adopted to re-establish (2d), (2e) and (2f) from (2) at PO distance per SP 27143. (2e) re-established to determine the location of an old post on the southern side of the road per SP 27143.
9. Comparison 3 shows a datum difference of +13°00'28" to 115/23R. This is contrary to Comparison 5 and 6 which have datum differences to 116/23R of +13°23'56" and +13°21'49" respectively. SP 27143 has adopted (2g) Conc. Post to fix the northern side of the Public Works Road. The variation in datum difference equates to approx. 2.6m bearing swing over the length of the Public Works Road. (2e) agrees with Comparison 5 and 6 with a datum difference of +13°23'00". The existing road centreline also agrees with this fixation. Comparison 4 datum difference adopted and distance proportioned to re-establish southern side of Public Works Road. Northern side re-established by 5.096 offset from southern side.
10. (7a) O.Railway Iron Post in top of bank adopted and (4d) placed on line at PO distance per 115/23R L.O.
11. These survey notes are compiled from original survey notes and field survey by Registered Candidate, Martin Gray.





SURVEY NOTES ANNEXURE SHEET SHEET 4 OF 5 SHEETS	OWNER: J.R. SPAULDING & H.M. SPAULDING FOLIO REFERENCE: C.T.105616/1	Registered Number
CROSS REFERENCE PLAN NUMBERS USED AS PART OF THIS SURVEY	THIS ANNEXURE SHEET FORMS PART OF THE ATTACHED SURVEY NOTES. .... Registered Land Surveyor .... Date	LENGTHS IN METRES





INDEX

SITE INFORMATION

CERTIFICATE OF TITLE: VOLUME - 185044 FOLIO - 1
PID: 9962832
LAND AREA: 4.52Ha

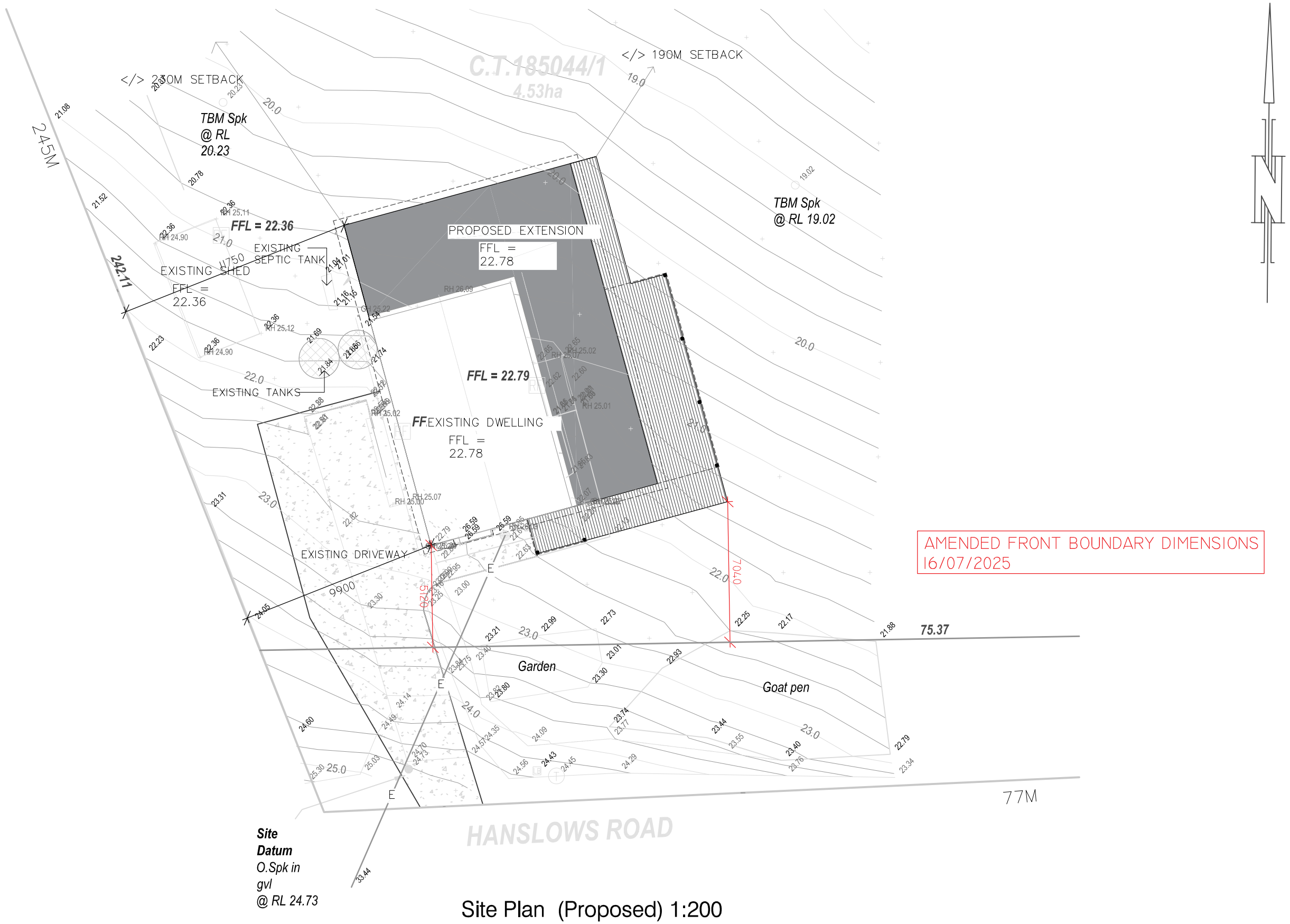
EXISTING DWELLING GROSS FLOOR AREA - 90 m2
PROPOSED ADDITION - LIVING - 105m2
PROPOSED DECK - 72m2

TASMANIAN PLANNING SCHEME - CLARENCE

ZONE: AGRICULTURE
OVERLAY: AIRPORT NOISE EXPOSURE AREA, WATERWAY AND COASTAL PROTECTION AREA, AIRPORT OBSTACLE LIMITATIONS AREA, FLOOR-PRONE AREA, BUSHFIRE PRONE AREA

Site Location Plan (Existing)
NTS

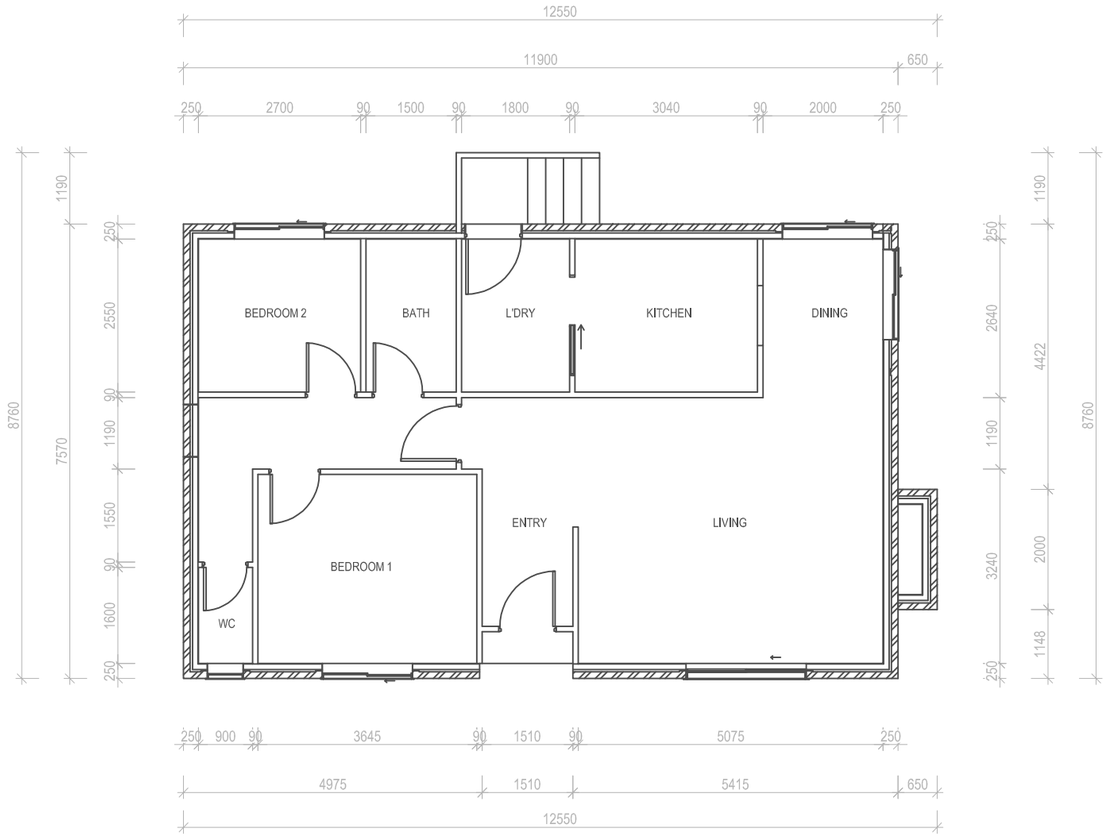
Date: 27th June 2025	Page size: A3	Client: J & A Applebee	Proposal: Addition / Alteration	Darryn White - Building Design and Consulting. P O Box 381 Rosny Park Tasmania 7018 P: 0409 659 358 E: dwbdac@gmail.com W: www.everythingbuilding.com.au ABN: 56130097060 ACCREDITATION NO: CC1623W	Page No: 01/07
Scale: NTS		Address: 180 Hanslows Road Cambridge 7170		MASTER BUILDERS TASMANIA MEMBER	Job No: 2519



Site Plan (Proposed) 1:200

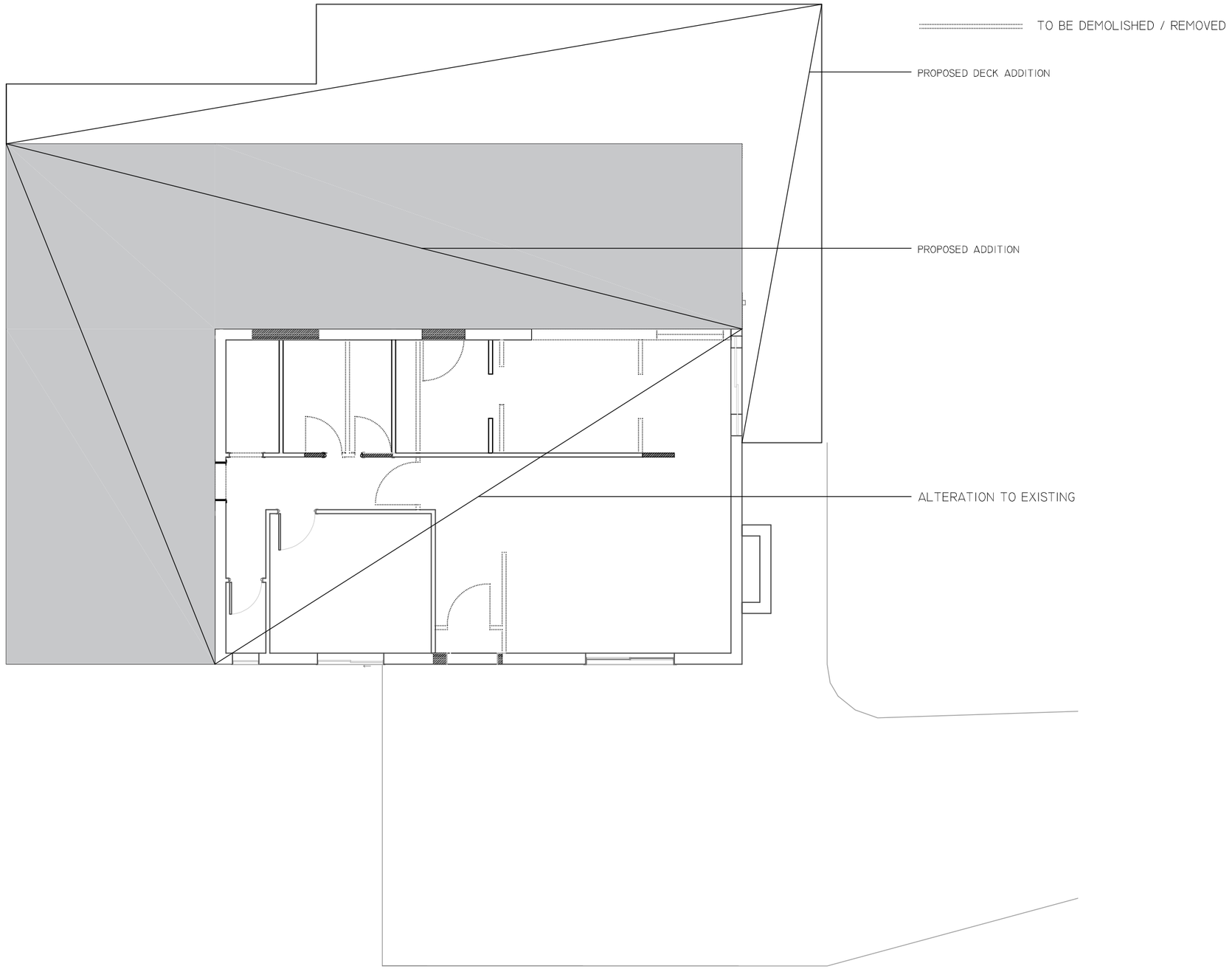
AMENDED FRONT BOUNDARY DIMENSIONS
16/07/2025

Date: 27th June 2025	Page size: A3	Client: J & A Applebee	Proposal: Addition / Alteration	Darryn White - Building Design and Consulting. P O Box 381 Rosny Park Tasmania 7018 P: 0409 659 358 E: dwbdac@gmail.com W: www.everythingbuilding.com.au ABN: 56130097060 ACCREDITATION NO: CC1623W	MASTER BUILDERS TASMANIA MEMBER	Page No: 02/07
Scale: 1:200		Address: 180 Hanslows Road Cambridge 7170				Job No: 2519



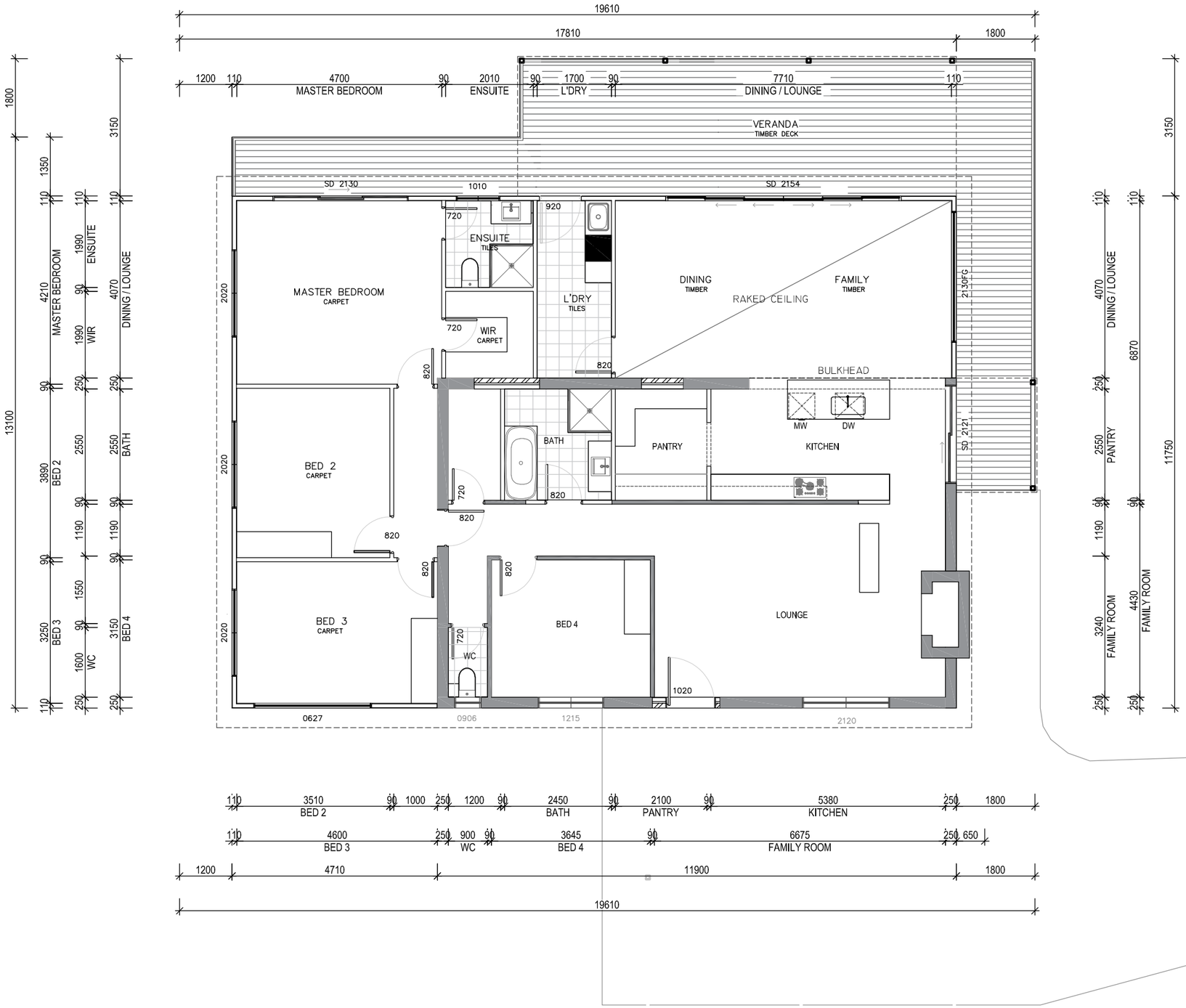
Existing Floor Plan 1:100

Date: 27th June 2025	Page size: A3	Client: J & A Applebee	Proposal: Addition / Alteration	Darryn White - Building Design and Consulting. P O Box 381 Rosny Park Tasmania 7018 P: 0409 659 358 E: dwbdac@gmail.com W: www.everythingbuilding.com.au ABN: 56130097060 ACCREDITATION NO: CC1623W	MASTER BUILDERS TASMANIA MEMBER	Page No: 03/07
Scale: 1:100		Address: 180 Hanslows Road Cambridge 7170				Job No: 2519



Addition / Alteration Layout Plan 1:100

Date: 27th June 2025	Page size: A3	Client: J & A Applebee	Proposal: Addition / Alteration	Darryn White - Building Design and Consulting. P O Box 381 Rosny Park Tasmania 7018 P: 0409 659 358 E: dwbdac@gmail.com W: www.everythingbuilding.com.au ABN: 56130097060 ACCREDITATION NO: CC1623W	MASTER BUILDERS TASMANIA MEMBER	Page No: 04/07
Scale: 1:100		Address: 180 Hanslows Road Cambridge 7170		This drawing is the property of Darryn White. Reproduction in whole or part is strictly forbidden without the written consent of Darryn White. Failure in doing will result in legal action being taken.	© 2025	Job No: 2519



Proposed Floor Plan 1:100

Date: 27th June 2025	Page size: A3	Client: J & A Applebee	Proposal: Addition / Alteration	Darryn White - Building Design and Consulting. P O Box 381 Rosny Park Tasmania 7018 P: 0409 659 358 E: dwbdac@gmail.com W: www.everythingbuilding.com.au ABN: 56130097060 ACCREDITATION NO: CC1623W	Page No: 05/07
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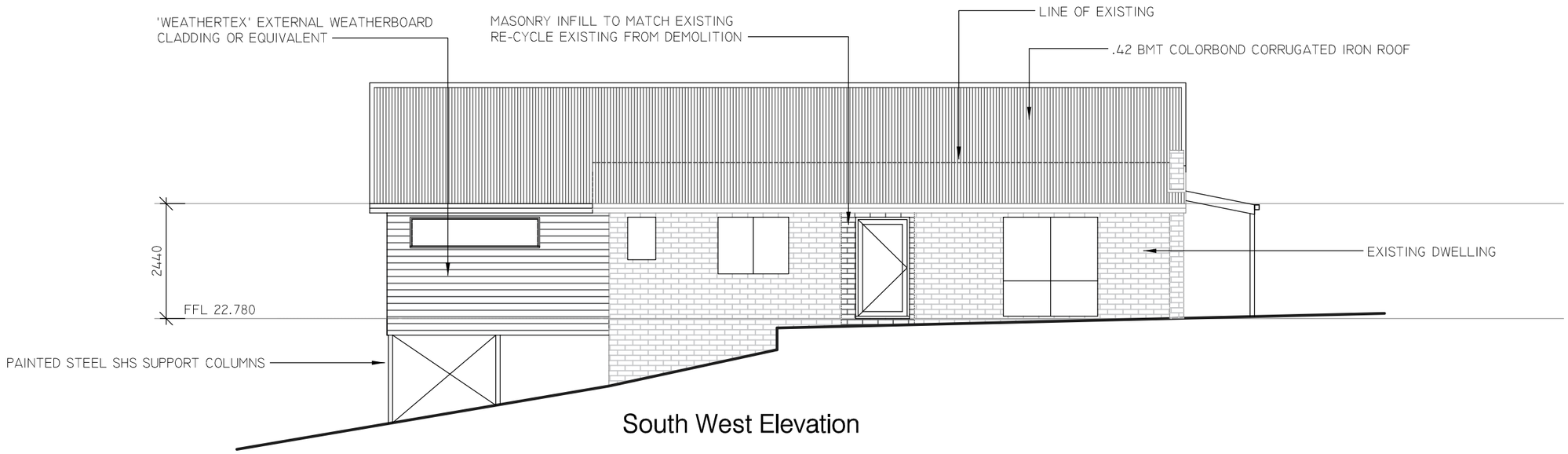
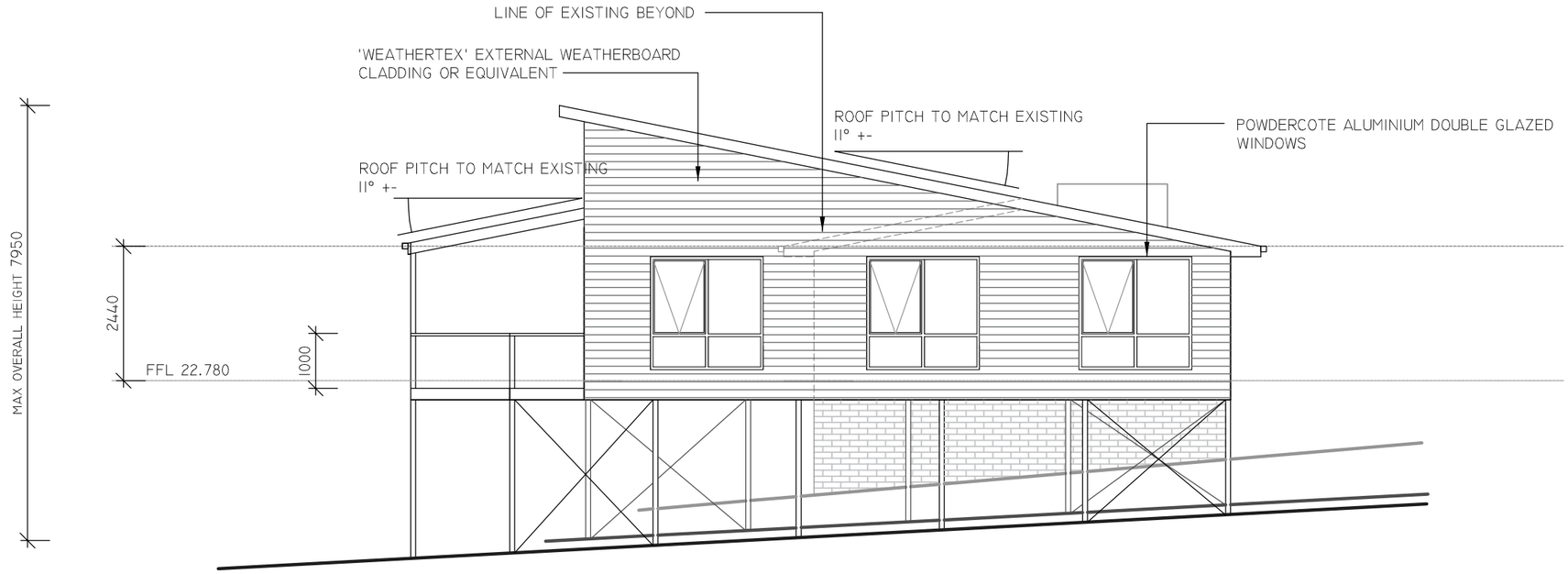
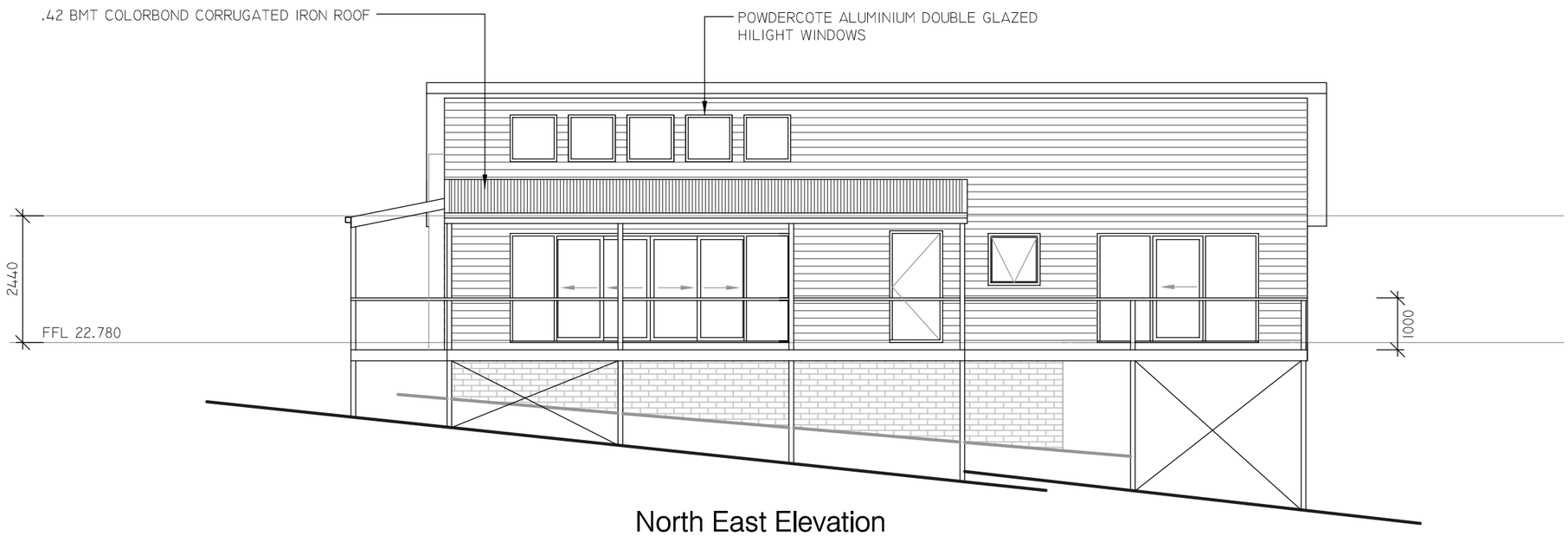


South West Elevation

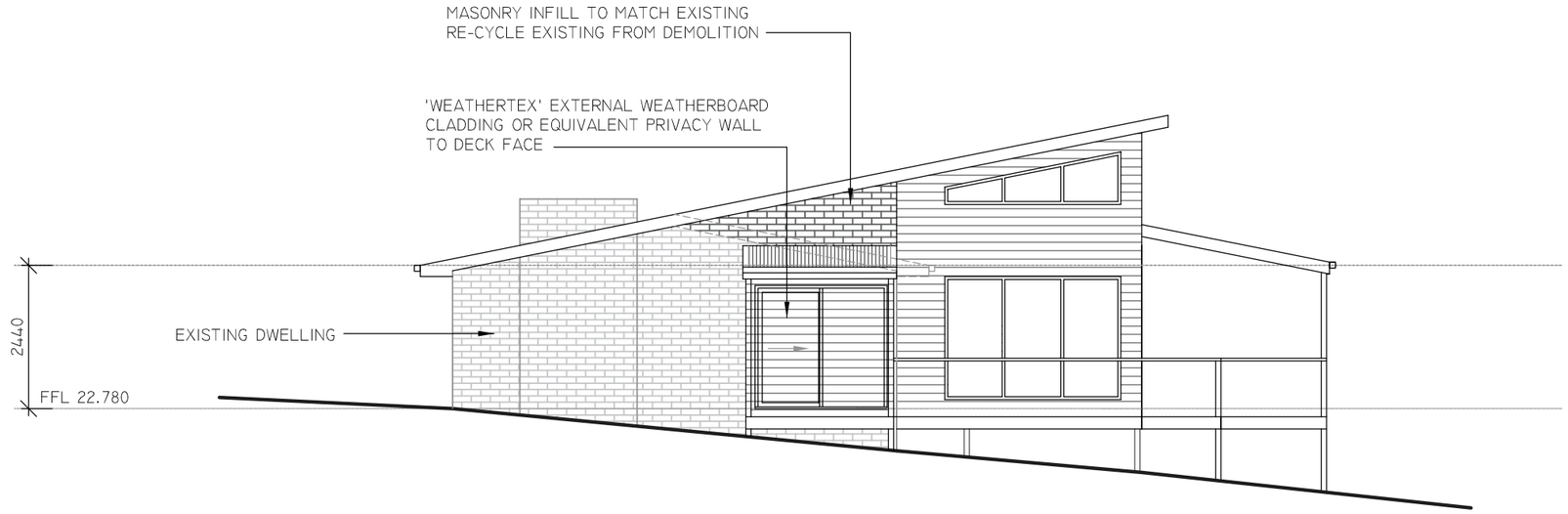


North West Elevation

Date: 27th June 2025	Page size: A3	Client: J & A Applebee	Proposal: Addition / Alteration	Darryn White - Building Design and Consulting. P O Box 381 Rosny Park Tasmania 7018 P: 0409 659 358 E: dwbdac@gmail.com W: www.everythingbuilding.com.au ABN: 56130097060 ACCREDITATION NO: CC1623W	MASTER BUILDERS TASMANIA MEMBER	Page No: 06/07
Scale: 1:100		Address: 180 Hanslows Road Cambridge 7170				Job No: 2519



North East Elevation



South East Elevation

Date: 27th June 2025	Page size: A3	Client: J & A Applebee	Proposal: Addition / Alteration	Darryn White - Building Design and Consulting. P O Box 381 Rosny Park Tasmania 7018 P: 0409 659 358 E: dwbdac@gmail.com W: www.everythingbuilding.com.au ABN: 56130097060 ACCREDITATION NO: CC1623W	MASTER BUILDERS TASMANIA MEMBER	Page No: 07/07
Scale: 1:100		Address: 180 Hanslows Road Cambridge 7170			© 2025	Job No: 2519

ONSITE-WASTEWATER ASSESSMENT

180 Hanslows Road

Cambridge

October 2024

GES

GEO-ENVIRONMENTAL

SOLUTIONS

Investigation Details

Client:	Jason Applebee
Site Address:	180 Hanslows Road, Cambridge
Date of Inspection:	10/09/2024
Proposed Works:	Existing
Investigation Method:	Geoprobe 540UD - Direct Push
Inspected by:	C. Cooper

Site Details

Certificate of Title (CT):	185044/1
Title Area:	Approx. 4.522 ha
Applicable Planning Overlays:	Bushfire-prone areas, Airport obstacle limitation area
Slope & Aspect:	8° NE facing slope
Vegetation:	Grass & Weeds
Ground Surface:	Surface Cracks

Background Information

Geology Map:	MRT 1:250000
Geological Unit:	Jurassic Dolerite
Climate:	Annual rainfall 600mm
Water Connection:	Tank
Sewer Connection:	Unserviced-On-site required
Testing and Classification:	*AS2870:2011, AS1726:2017 & AS1547:2012*

Investigation

A number of bore holes were completed to identify the distribution and variation of the soil materials at the site, bore hole locations are indicated on the site plan. See soil profile conditions presented below. Tests were conducted across the site to obtain bearing capacities of the material at the time of this investigation.

Wastewater Soil Profile Summary

BH 1 Depth (m)	Horizon	Description
0.00-0.20	A1	**Clayey SILT (ML)**: Low plasticity, dark brown, moist, stiff.
0.20-0.70	B2	**Silty CLAY (CH)**: High plasticity, brown, moist, stiff.
0.70-1.40	BC	**Clayey GRAVELS (GC)**: Pale brown, slightly moist, very dense to refusal on weathered dolerite.

Site Notes

Soils on site are developing from Jurassic Dolerite. The soils consist of silty topsoils over clay subsoils developing from weathered rock.

Wastewater Classification & Recommendations

According to AS1547-2012 (on-site waste-water management) the natural soil is classified as **Light Clay (category 5).** It is proposed to install a dual-purpose septic tank with on-site absorption. A Design Loading Rate (DLR) of 7L/m^2/day has been assigned for primary treated effluent.

The proposed renovations will result in a four-bedroom dwelling with a calculated maximum wastewater output of 720L/day. This is based on a tank water supply and a maximum occupancy of 6 people (120L/day/person). The existing wastewater system does not meet the current standards for this wastewater loading therefore it is proposed that it be decommissioned and disconnected. Using the DLR of 7L/m^2/day, an absorption area of at least 108m^2 will be required to accommodate the expected flows. This can be accommodated by three 20m x 1.8m x 0.6m terraced absorption trenches connected to a dual-purpose septic tank (min 3500L) via a three-way splitter box with speed levelers to ensure equal distribution. For all calculations please refer to the Trench summary reports. A cut-off drain will be required upslope of the absorption area and the area excluded from traffic or any future building works.

A 100% reserve area should be set aside for future wastewater requirements. There is sufficient space available on site to accommodate the reserve due to the large property size (>2ha). Therefore, a formal reserve area has not been assigned.

The following setback distances are required to comply with the Building Act 2016:

Upslope or level buildings:	3m
Downslope buildings:	12m
Upslope or level boundaries:	1.5m
Downslope boundaries:	16m
Downslope surface water:	100m

Compliance with Building Act 2016 Guidelines for On-site Wastewater Management Systems is outlined in the attached table.

During construction GES will need to be notified of any variation to the soil conditions or wastewater loading as outlined in this report.
need to be notified of any variation to the soil conditions or wastewater loading as outlined in this report.

Dr John Paul Cumming B.Agr.Sc (hons) PhD CPSS GAICD

Director

GES P/L

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Assessment Report

Site assessment for on-site waste water disposal

Assessment for	Jason Applebee	Assess. Date	18-Oct-24
		Ref. No.	
Assessed site(s)	180 Hanslows Road, Cambridge	Site(s) inspected	10-Sep-24
Local authority	Clarence	Assessed by	John Paul Cumming

This report summarises wastewater volumes, climatic inputs for the site, soil characteristics and sustem sizing and design issues. Site Capability and Environmental sensitivity issues are reported separately, where 'Alert' columns flag factors with high (A) or very high (AA) limitations which probably require special consideration for system design(s). Blank spaces on this page indicate data have not been entered into TRENCH.

Wastewater Characteristics

Wastewater volume (L/day) used for this assessment = 720 (using the 'No. of bedrooms in a dwelling' method)
Septic tank wastewater volume (L/day) = 240
Sullage volume (L/day) = 480
Total nitrogen (kg/year) generated by wastewater = 2.2
Total phosphorus (kg/year) generated by wastewater = 1.3

Climatic assumptions for site (Evapotranspiration calculated using the crop factor method)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean rainfall (mm)	41	36	36	45	36	29	46	47	40	48	44	56
Adopted rainfall (R, mm)	41	36	36	45	36	29	46	47	40	48	44	56
Retained rain (Rr, mm)	35	31	31	38	31	25	39	40	34	41	37	48
Max. daily temp. (deg. C)												
Evapotrans (ET, mm)	130	110	91	63	42	29	32	42	63	84	105	126
Evapotr. less rain (mm)	**95**	**79**	**60**	**25**	**11**	**5**	**-8**	**2**	**29**	**43**	**68**	**78**

Annual evapotranspiration less retained rain (mm) = 489

Soil characterisitics

Texture = Light Clay Category = 5 Thick. (m) = 3
Adopted permeability (m/day) = 0.12 Adopted LTAR (L/sq m/day) = 7 Min depth (m) to water = 3

Proposed disposal and treatment methods

Proportion of wastewater to be retained on site:	All wastewater will be disposed of on the site
The preferred method of on-site primary treatment:	In dual purpose septic tank(s)
The preferred method of on-site secondary treatment:	In-ground
The preferred type of in-ground secondary treatment:	Trench(es)
The preferred type of above-ground secondary treatment:	None
Site modifications or specific designs:	Not needed

Suggested dimensions for on-site secondary treatment system

Total length (m) =	60
Width (m) =	1.8
Depth (m) =	0.6
Total disposal area (sq m) required =	110
comprising a Primary Area (sq m) of:	108
and a Secondary (backup) Area (sq m) of:	

Sufficient area is available on site

To enter comments, click on the line below 'Comments'. (This yellow-shaded box and the buttons on this page will not be printed.)

Comments

The assigned DLR for the application area is 7L/m^2/day and therefore an absorption area of 108sqm is recommended. Therefore the system will have the capacity to cope with predicted climatic and loading events.

GES P/L

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Site Capability Report

Site assessment for on-site waste water disposal

Assessment for	Jason Applebee	Assess. Date	18-Oct-24
		Ref. No.	
Assessed site(s)	180 Hanslows Road, Cambridge	Site(s) inspected	10-Sep-24
Local authority	Clarence	Assessed by	John Paul Cumming

This report summarises data relating to the physical capability of the assessed site(s) to accept wastewater. Environmental sensitivity and system design issues are reported separately. The 'Alert' column flags factors with high (A) or very high (AA) site limitations which probably require special consideration in site acceptability or for system design(s). Blank spaces indicate data have not been entered into TRENCH.

Alert	Factor	Units	Value	Confid level	Limitation Trench	Limitation Amended	Remarks
	Expected design area	sq m	3,000	V. high	Very low		
	Density of disposal systems	/sq km	10	Mod.	Very low		
	Slope angle	degrees	8	High	Low		
	Slope form	Straight simple		High	Low		
	Surface drainage	Imperfect		High	Moderate		
	Flood potential	Site floods <1:100 yrs		High	Very low		
	Heavy rain events	Infrequent		High	Moderate		
	Aspect (Southern hemi.)	Faces NE or NW		V. high	Low	Moderate	
	Frequency of strong winds	Common		High	Low		
	Wastewater volume	L/day	720	High	Moderate	No change	
	SAR of septic tank effluent		1.2	High	Low		
	SAR of sullage		2.1	High	Moderate		
	Soil thickness	m	3.0	V. high	Very low		
	Depth to bedrock	m	3.0	Mod.	Very low		
	Surface rock outcrop	%	0	V. high	Very low		
	Cobbles in soil	%	0	V. high	Very low		
	Soil pH		7.0	High	Very low		
	Soil bulk density	gm/cub. cm	1.5	High	Low		
	Soil dispersion	Emerson No.	7	Guess	Very low		
	Adopted permeability	m/day	0.12	Mod.	Very low		
	Long Term Accept. Rate	L/day/sq m	7	High	Moderate		

To enter comments, click on the line below 'Comments' . (This yellow-shaded box and the buttons on this page will not be printed.)

Comments

The site has the capability to accept onsite wastewater.

GES P/L

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Environmental Sensitivity Report

Site assessment for on-site waste water disposal

Assessment for	Jason Applebee	Assess. Date	18-Oct-24
		Ref. No.	
Assessed site(s)	180 Hanslows Road, Cambridge	Site(s) inspected	10-Sep-24
Local authority	Clarence	Assessed by	John Paul Cumming

This report summarises data relating to the environmental sensitivity of the assessed site(s) in relation to applied wastewater. Physical capability and system design issues are reported separately. The 'Alert' column flags factors with high (A) or very high (AA) limitations which probably require special consideration in site acceptability or for system design(s). Blank spaces indicate data have not been entered into TRENCH.

Alert	Factor	Units	Value	Confid level	Limitation Trench	Limitation Amended	Remarks
	Cation exchange capacity	mmol/100g	70	High	Moderate		
	Phos. adsorp. capacity	kg/cub m	0.6	High	Moderate		
	Annual rainfall excess	mm	-489	High	Very low		
	Min. depth to water table	m	3	High	Very low		
	Annual nutrient load	kg	3.5	High	Very low		
	G'water environ. value	Agric non-sensit		V. high	Low		
	Min. separation dist. required	m	3	High	Very low		
	Risk to adjacent bores	Very low		V. high	Very low		
	Surf. water env. value	Agric non-sensit		V. high	Low		
	Dist. to nearest surface water	m	490	V. high	Low		
	Dist. to nearest other feature	m	190	V. high	Very low	Moderate	
	Risk of slope instability	Very low		V. high	Very low		
	Distance to landslip	m	180	V. high	Low		

To enter comments, click on the line below 'Comments'. (This yellow-shaded box and the buttons on this page will not be printed.)

Comments

There is very low risk of environmental degedation associated with the on-site disposal of wastewater for the proposed development.

Demonstration of wastewater system compliance to *Building Act 2016 Guidelines for On-site Wastewater*

Acceptable Solutions	**Performance Criteria**	**Compliance**
A1 Horizontal separation distance from a building to a land application area must comply with one of the following: a) be no less than 6m; or b) be no less than: (i) 3m from an upslope building or level building; (ii) If primary treated effluent to be no less than 4m plus 1m for every degree of average gradient from a downslope building; (iii) If secondary treated effluent and subsurface application, no less than 2m plus 0.25m for every degree of average gradient from a downslope building.	P1 a) The land application area is located so that (i) the risk of wastewater reducing the bearing capacity of a building's foundations is acceptably low.; and (ii) is setback a sufficient distance from a downslope excavation around or under a building to prevent inadequately treated wastewater seeping out of that excavation	Complies with A1 (b) (i) Land application area will be located with a minimum separation distance of 3m from an upslope or level building. Complies with A1 (b) (ii) Land application area will be located with a minimum separation distance of 12m from a downslope building.
A2 Horizontal separation distance from downslope surface water to a land application area must comply with (a) or (b) (a) be no less than 100m; or (b) be no less than the following: (i) if primary treated effluent 15m plus 7m for every degree of average gradient to downslope surface water; or (ii) if secondary treated effluent and subsurface application, 15m plus 2m for every degree of average gradient to down slope surface water.	P2 Horizontal separation distance from downslope surface water to a land application area must comply with all of the following: a) Setbacks must be consistent with AS/NZS 1547 Appendix R; b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.	Complies with A2 (a) Land application area located > 100m from downslope surface water

A3 Horizontal separation distance from a property boundary to a land application area must comply with either of the following: (a) be no less than 40m from a property boundary; or (b) be no less than: (i) 1.5m from an upslope or level property boundary; and (ii) If primary treated effluent 2m for every degree of average gradient from a downslope property boundary; or (iii) If secondary treated effluent and subsurface application, 1.5m plus 1m for every degree of average gradient from a downslope property boundary.	P3 Horizontal separation distance from a property boundary to a land application area must comply with all of the following: (a) Setback must be consistent with AS/NZS 1547 Appendix R; and (b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.	Complies with A3 (b) (i) Land application area will be located with a minimum separation distance of 1.5m from an upslope or level property boundary Complies with A3 (b) (ii) Land application area will be located with a minimum separation distance of 16m from a downslope property boundary.
A4 Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must be no less than 50m and not be within the zone of influence of the bore whether up or down gradient.	P4 Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must comply with all of the following: (a) Setback must be consistent with AS/NZS 1547 Appendix R; and (b) A risk assessment completed in accordance with Appendix A of AS/NZS 1547 demonstrates that the risk is acceptable	Complies with A4 No bore or well identified within 50m

A5 Vertical separation distance between groundwater and a land application area must be no less than: (a) 1.5m if primary treated effluent; or (b) 0.6m if secondary treated effluent	P5 Vertical separation distance between groundwater and a land application area must comply with the following: (a) Setback must be consistent with AS/NZS 1547 Appendix R; and (b) A risk assessment completed in accordance with Appendix A of AS/NZS 1547 that demonstrates that the risk is acceptable	Complies with A5 (a) No groundwater encountered
A6 Vertical separation distance between a limiting layer and a land application area must be no less than: (a) 1.5m if primary treated effluent; or (b) 0.5m if secondary treated effluent	P6 Vertical setback must be consistent with AS/NZS1547 Appendix R.	Complies with A6 (a)
A7 nil	P7 A wastewater treatment unit must be located a sufficient distance from buildings or neighbouring properties so that emissions (odour, noise or aerosols) from the unit do not create an environmental nuisance to the residents of those properties	Complies

AS1547:2012 – Loading Certificate – Septic System Design

This loading certificate sets out the design criteria and the limitations associated with use of the system.

Site Address: 180 Hanslows Road, Cambridge

System Capacity: 6 people @ 120L/person/day

Summary of Design Criteria

DLR: 7L/m^2/day.

Absorption area: 108m^2

Reserve area location /use: Not Assigned - more than 100% available

Water saving features fitted: Standard fixtures

Allowable variation from design flows: 1 event @ 200% daily loading per quarter

Typical loading change consequences: Expected to be minimal due to capacity of system and site area (provided loading changes within 25% of design)

Overloading consequences: Continued overloading may cause hydraulic failure of the absorption area and require upgrading/extension of the area. Risk considered acceptable due to visible signs of overloading and owner monitoring.

Underloading consequences: Lower than expected flows will have minimal consequences on system operation unless the house has long periods of non occupation. Under such circumstances additional maintenance of the system may be required. Risk considered acceptable.

Lack of maintenance / monitoring consequences: Issues of underloading/overloading and condition of the absorption area require monitoring and maintenance, if not completed system failure may result in unacceptable health and environmental risks. Septic tank de-sludging must also be monitored to prevent excessive sludge and scum accumulation. Monitoring and regulation by the property owner required to ensure compliance.

Other operational considerations: Owners/occupiers must be aware of the operational requirements and limitations of the system, including the following; the absorption area must not be subject to traffic by vehicles or heavy stock and should be fenced if required. The absorption area must be kept with adequate grass cover to assist in evapotranspiration of treated effluent in the absorption trenches. The septic tank must be desludged at least every 3 years, and any other infrastructure such as septic tank outlet filters must also be cleaned regularly (approx. every 6 months depending upon usage). Foreign materials such as rubbish and solid waste must be kept out of the system.

CERTIFICATE OF THE RESPONSIBLE DESIGNER

Section 94
Section 106
Section 129
Section 155

Form **35**

To: Jason Applebee *Owner name*
180 Hanslows Road *Address*
Cambridge 7170 *Suburb/postcode*

Designer details:

Name: John-Paul Cumming
Category: Bld. Srvcs. Dsgnr. - Hydraulic
Business name: Geo-Environmental Solutions
Phone No: 03 6223 1839
Business address: 29 Kirksway Place
Battery Point 7004
Fax No: N/A
Licence No: CC774A
Email address: office@geosolutions.net.au

Details of the proposed work:

Owner/Applicant Jason Applebee
Designer's project reference No. J10842
Address: 180 Hanslows Road
Lot No: 185044/1
Cambridge 7170

Type of work: Building work ☐ Plumbing work ☒ *(X all applicable)*

Description of work:
On-site wastewater management system - design

(new building / alteration / addition / repair / removal / re-erection water / sewerage / stormwater / on-site wastewater management system / backflow prevention / other)

Description of the Design Work (Scope, limitations or exclusions): *(X all applicable certificates)*

Certificate Type:	Certificate	Responsible Practitioner
	☐ Building design	Architect or Building Designer
	☐ Structural design	Engineer or Civil Designer
	☐ Fire Safety design	Fire Engineer
	☐ Civil design	Civil Engineer or Civil Designer
	☒ Hydraulic design	Building Services Designer
	☐ Fire service design	Building Services Designer
	☐ Electrical design	Building Services Designer
	☐ Mechanical design	Building Service Designer
	☐ Plumbing design	Plumber-Certifier; Architect, Building Designer or Engineer
	☐ Other (specify)	

Deemed-to-Satisfy: ☒ Performance Solution: ☐ *(X the appropriate box)*

Other details:

Septic tank and onsite absorption trenches

Design documents provided:

The following documents are provided with this Certificate –

Document description:

Drawing numbers:	Prepared by: Geo-Environmental Solutions	Date: Oct-24
Schedules:	Prepared by:	Date:
Specifications:	Prepared by: Geo-Environmental Solutions	Date: Oct-24
Computations:	Prepared by:	Date:
Performance solution proposals:	Prepared by:	Date:
Test reports:	Prepared by: Geo-Environmental Solutions	Date: Oct-24

Standards, codes or guidelines relied on in design process:

AS1547:2012 On-site domestic wastewater management.

AS3500 (Parts 0-5)-2013 Plumbing and drainage set.

Any other relevant documentation:

Onsite Wastewater Assessment - 180 Hanslows Road Cambridge - Oct-24

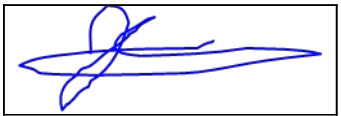
Onsite Wastewater Assessment - 180 Hanslows Road Cambridge - Oct-24

Attribution as designer:

I John-Paul Cumming, am responsible for the design of that part of the work as described in this certificate;

The documentation relating to the design includes sufficient information for the assessment of the work in accordance with the *Building Act 2016* and sufficient detail for the builder or plumber to carry out the work in accordance with the documents and the Act;

This certificate confirms compliance and is evidence of suitability of this design with the requirements of the National Construction Code.

	Name: (print)	*Signed*	*Date*
Designer:	John-Paul Cumming		18/10/2024
Licence No:	CC774A		

Assessment of Certifiable Works: (TasWater)

Note: single residential dwellings and outbuildings on a lot with an existing sewer connection are not considered to increase demand and are not certifiable.

If you cannot check ALL of these boxes, LEAVE THIS SECTION BLANK.

TasWater must then be contacted to determine if the proposed works are Certifiable Works.

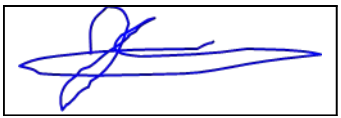
I confirm that the proposed works are not Certifiable Works, in accordance with the Guidelines for TasWater CCW Assessments, by virtue that all of the following are satisfied:

- [x] The works will not increase the demand for water supplied by TasWater
- [x] The works will not increase or decrease the amount of sewage or toxins that is to be removed by, or discharged into, TasWater's sewerage infrastructure
- [x] The works will not require a new connection, or a modification to an existing connection, to be made to TasWater's infrastructure
- [x] The works will not damage or interfere with TasWater's works
- [x] The works will not adversely affect TasWater's operations
- [x] The work are not within 2m of TasWater's infrastructure and are outside any TasWater easement
- [x] I have checked the LISTMap to confirm the location of TasWater infrastructure
- [x] If the property is connected to TasWater's water system, a water meter is in place, or has been applied for to TasWater.

Certification:

I ..... John-Paul Cumming..... being responsible for the proposed work, am satisfied that the works described above are not Certifiable Works, as defined within the *Water and Sewerage Industry Act 2008,* that I have answered the above questions with all due diligence and have read and understood the Guidelines for TasWater CCW Assessments.

Note: the Guidelines for TasWater Certification of Certifiable Works Assessments are available at: www.taswater.com.au

	Name: (print)	*Signed*	*Date*
Designer:	John-Paul Cumming		18/10/2024

GES
GEO-ENVIRONMENTAL
SOLUTIONS
29 Kirksway Place, Battery Point
T| 62231839 E| office@geosolutions.net.au

Wastewater system:

Dual-purpose septic tank (min 3000L)

Cut-off drain
Three-way splitter box

Terraced Absorption Trenches
3 x 20m x1.8m x 0.6m

Min 3m separation

Min 3m from upslope buildings
Min 12m from downslope buildings
Min 1.5m from upslope or level boundaries
Min 16m from downslope boundary
Min 100m from downslope surface water

Refer to GES report

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29 Kirksway Place Battery Point
T| 62231839 E| office@geosolutions.net.au

Dr. John Paul Cumming
Building Services Designer-Hydraulic
CCC774A
18/10/2024

Do not scale from these drawings. Dimensions to take precedence over scale.	Jason Applebee 180 Hanslows Road Cambridge 7170	C.T.: 185044/1 PID: 9962832	Date: 18/10/2024	On-Site Wastewater Management Plan	Drawing Number:	Sheet 1 of 1 Drawn by: LR

Design notes:

1. Absorption trench dimensions of up to 20m long by 0.45m deep by 1.8m wide – total storage volume calculated at average 35% porosity.
2. Base of trenches to be excavated level and smearing and compaction avoided.
3. 350mm Arch should be placed in the centre of trench
4. Geotextile or filter cloth to be placed over the distribution arch to prevent clogging
5. Construction on slopes up to 20% to allow trench depth range 700mm upslope edge to 450mm on down slope edge
6. Dispersive soils gypsum to be incorporated into the base of the trench at a rate of 1kg/m^2
7. All works on site to comply with AS3500 and Tasmanian Plumbing code.

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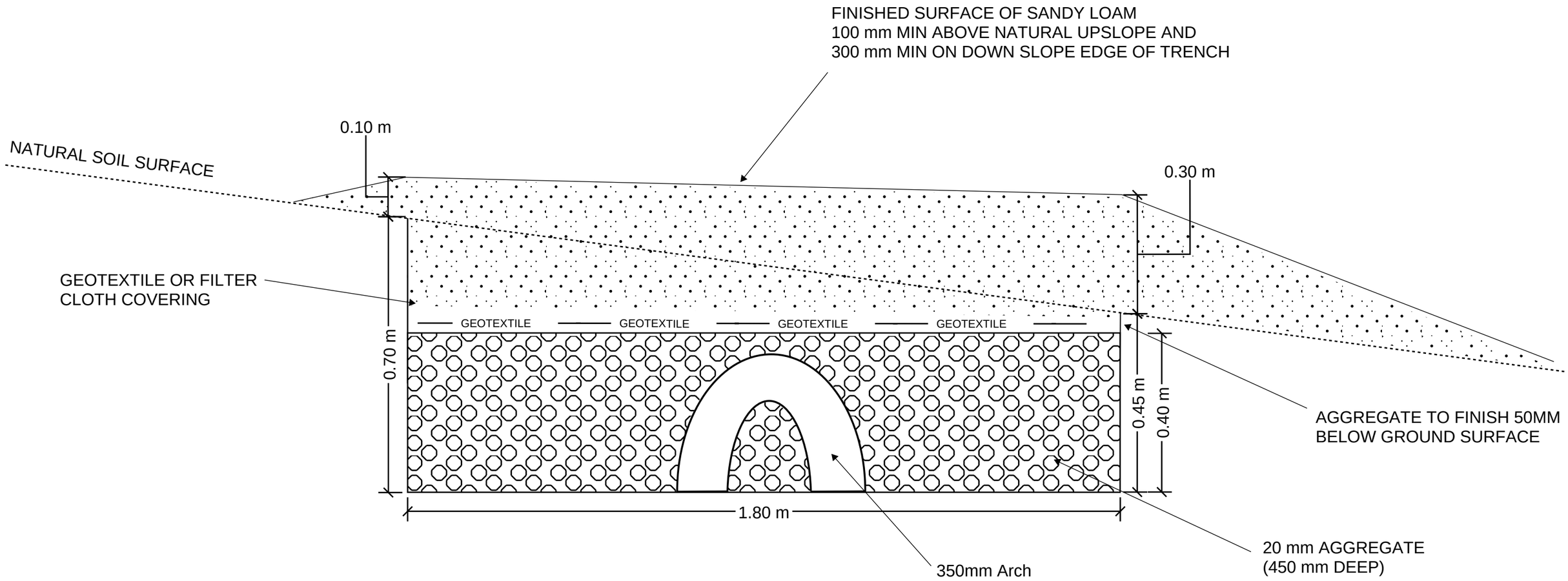

Do not scale from these drawings. Dimensions to take precedence over scale.	Geo-Environmental Solutions			Terraced Absorption Trench Detail	Sheet 1 of 1

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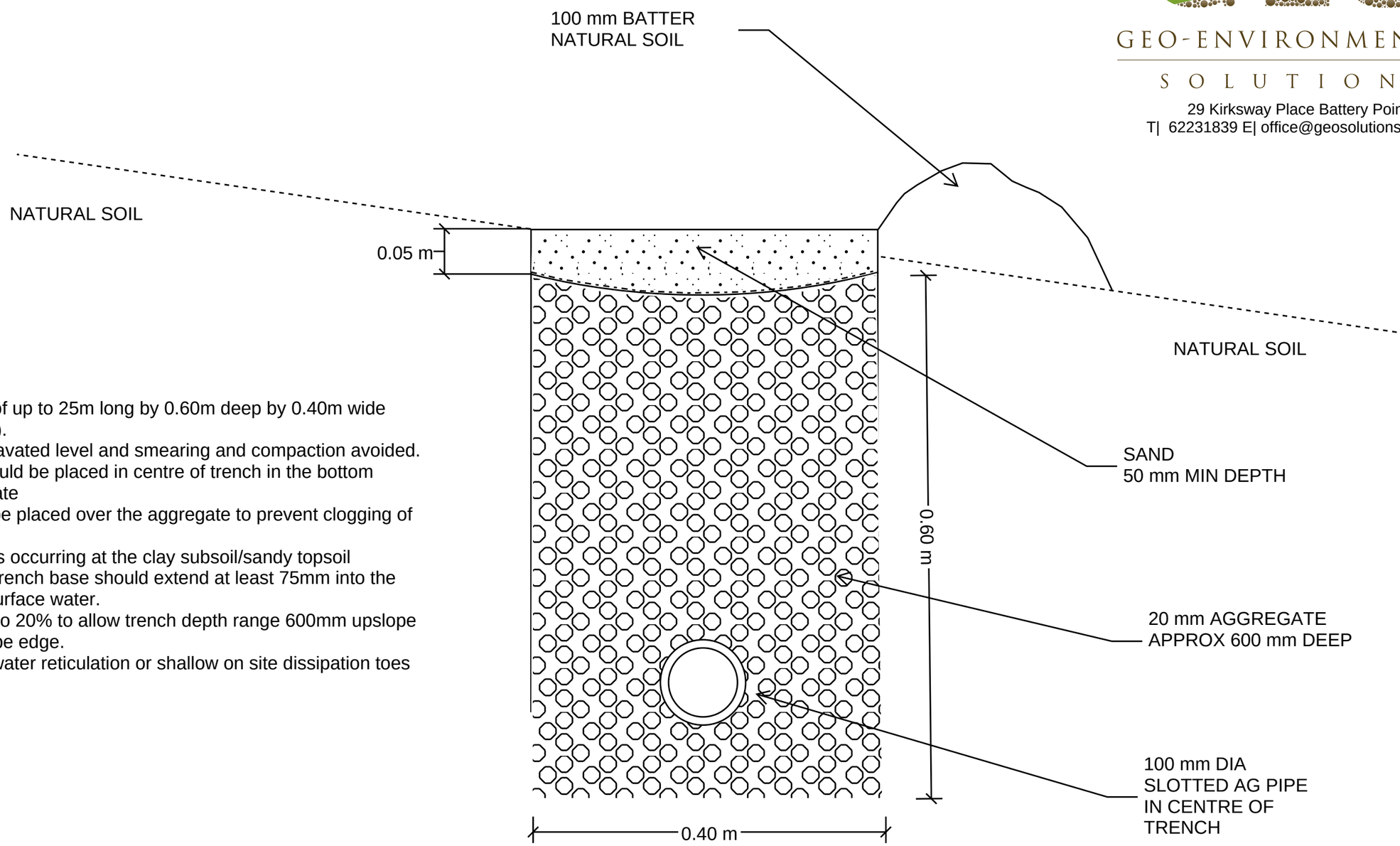
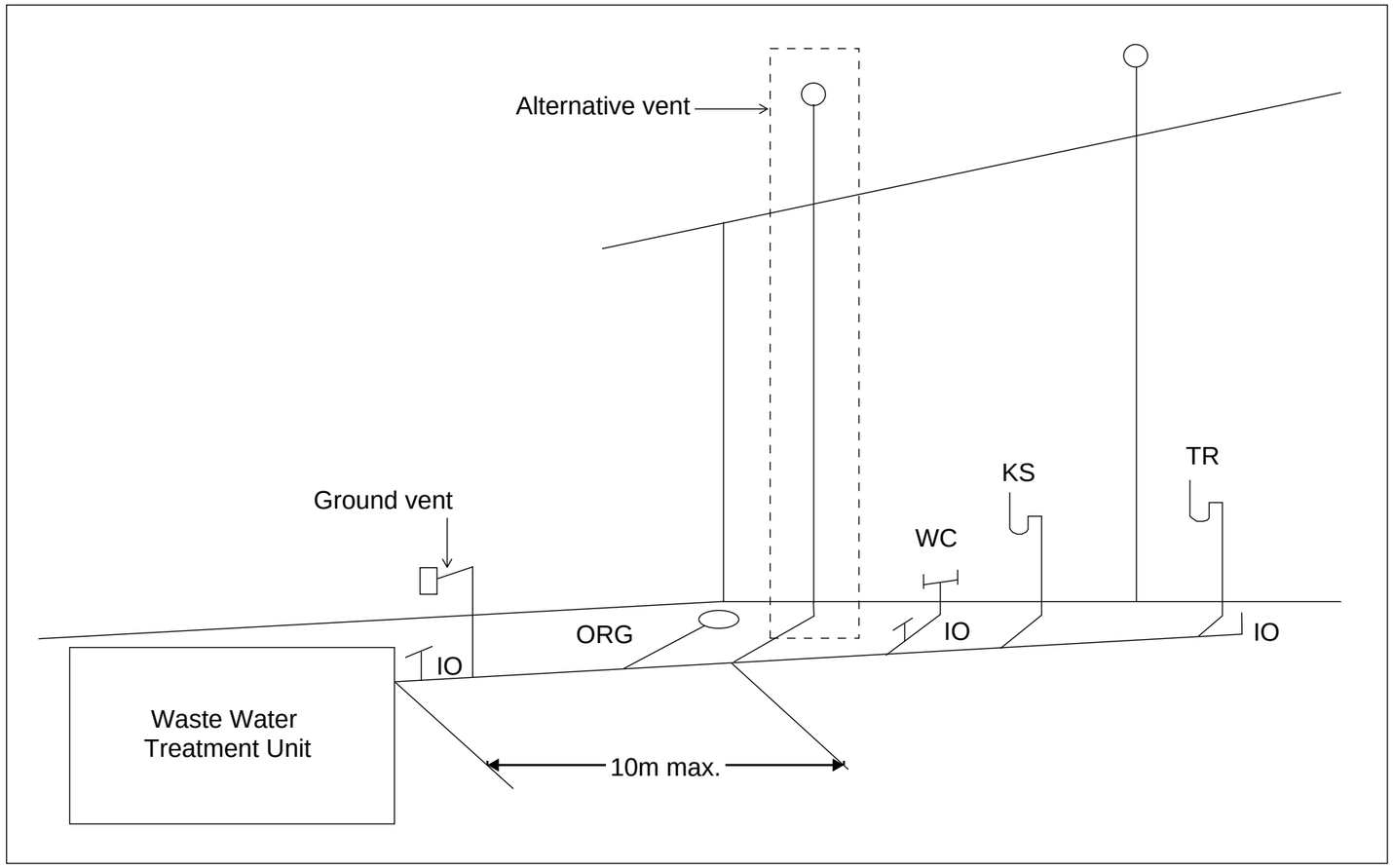


Design notes:

1.Cut-off trench dimensions of up to 25m long by 0.60m deep by 0.40m wide (depths and widths minimum).
2.Base of trenches to be excavated level and smearing and compaction avoided.
3.100mm slotted ag-pipe should be placed in centre of trench in the bottom 100mm of the 20mm aggregate
4.Geotextile or filter cloth to be placed over the aggregate to prevent clogging of the pipes and aggregate
5.If shallow subsurface flow is occurring at the clay subsoil/sandy topsoil boundary (duplex soils), the trench base should extend at least 75mm into the subsoil clay to capture sub-surface water.
6.Construction on slopes up to 20% to allow trench depth range 600mm upslope edge to 400mm on down slope edge.
7.Trench discharge to stormwater reticulation or shallow on site dissipation toes across the contour.

Do not scale from these drawings. Dimensions to take precedence over scale.	Geo-Environmental Solutions			Cut-Off Drain Detail	Sheet 1 of 1

GES
GEO-ENVIRONMENTAL
SOLUTIONS
29 Kirksway Place, Battery Point
T| 62231839 E| office@geosolutions.net.au



Tas Figure H101.2 Alternative Venting Arrangements

Vents must terminate in accordance with AS/NZS 3500.2

Alternative venting to be used by extending a vent to terminate as if an upstream vent, with the vent connection between the last sanitary fixture or sanitary appliance and the on-site wastewater management system. Use of a ground vent in not recommended

Inspection openings must be located at the inlet to an on-site wastewater management system treatment unit and the point of connection to the land application system and must terminate as close as practicable to the underside of an approved inspection opening cover installed at the finished surface level

Access openings providing access for desludging or maintenance of on-site wastewater management system treatment unites must terminate at or above finished surface level

Alternative vent is the preferred arrangement where possible.

Do not scale from these drawings. Dimensions to take precedence over scale.				Tas Figure H101.2 Alternative Venting Arrangements		Sheet 1 of 1

FOUNDATION CLASSIFICATION

185 HANSLOWS ROAD - CAMBRIDGE
PROPOSED EXTENSION

Client:	**Jason Applebee**
Certificate of Title:	**185044/1**
Investigation Date:	**Thursday, 5 October 2023**

Investigation Summary

Site Classification

In accordance with AS2870 – 2011 and after allowing due consideration to known details of the proposed building and works (herein referred to as the Site), the Site geology, soil conditions, soil properties and drainage, soil at the Site has been classified as:

CLASS S on the basis that soil profiles around the proposed building envelope are classified as being slightly reactive to soil moisture variation, with some if not all the test locations being potentially subject to surface movement in the range of 0 through to 20 mm.

Foundations

Ideally, footing concentrated loads (including slab edge or internal beam or strip footings) shall be supported directly on columns with loads transferred onto the Extremely Weathered DOLERITE Bedrock at 0.6 to 1.2 m depth with an allowable bearing capacity of 400 kPa.

Wind Load Classification

The AS 4055-2021 Wind loads for Housing classification is summarised.

Region:	A
Terrain category:	TC1
Shielding Classification:	NS
Topographic Classification:	T0
Wind Classification:	N3
Design Wind Gust Speed (Vh,u) m/s	50

I recommend that during construction that I and/or the design engineer be notified of any major variation to the foundation conditions as predicted in this report.

Kris Taylor BSc (hons)

Environmental & Engineering Geologist

Site Investigation

The Site investigation is summarised in Table 1.

Table 1 Summary of Site Investigation

Client	Jason Applebee
Project Address	185 Hanslows Road - Cambridge
Council	Clarence
Planning Scheme	Tasmanian Planning Scheme
Inundation, Erosion or Landslip Overlays	None
Proposed	Extension
Investigation	Fieldwork was carried out by an Engineering Geologist on the 5/10/2023
Site Topography	The building site has a moderate slope of approximately 12% (7°) to the northeast
Site Drainage	The site receives overland flow runoff directly from the southwest.
Soil Profiling	Three investigation holes were direct push sampled from surface level around the proposed extension (Appendix A):
Investigation Depths	The target excavation depth was estimated at 2.3 m. Borehole BH01 was direct push sampled to 1.3 m (ending in DOLERITE), Borehole BH02 was direct push sampled to 0.8 m (ending in DOLERITE), and Borehole BH03 was direct push sampled to 0.8 m (ending in DOLERITE). Borehole logs and photos are presented in Appendix B & C.
Soil moisture and groundwater	Recovered soil at the site was dry at the time of the investigation. Groundwater was not encountered.
Geology	According to 1:25,000 Mineral Resources Tasmania geological mapping (accessed through The LIST), the geology comprises: Jurassic Dolerite and related rocks

Soil Profiles

The geology of the Site has been logged and described in accordance with Unified Soil Classification System (AS1726). Logged soil and bedrock layers are summarised in Table 2.

Table 2 Soil Summary Table

#	Layer	Details	USCS	BH01	BH02	BH03
1	Sandy SILT	SOIL & BOULDERS/COBBLES: Sandy SILT, dark brown, well sorted, low plasticity, trace roots, 5 % roots; 10% DOLERITE boulders/cobbles, F-H	ML	0-0.4 U50@0.2	0-0.4	0-0.4
2	Silty SAND	SOIL & BOULDERS/COBBLES: Silty SAND, pale brown/orange, well sorted, medium to coarse grained sand, with gravel, trace roots, 5 % roots; sub-rounded gravel; 10% DOLERITE boulders/cobbles, D-VD	SM	0.4-0.6 DS@0.4	0.4-0.7	0.4-0.6
3	SAND	SOIL & COBBLES: SAND with gravel, with silt, pale cream, well sorted, medium to coarse grained sand; sub-angular gravel; 5% DOLERITE cobbles	SW-SM	0.6-1.2 DS@0.8		
4	DOLERITE	Extremely Weathered DOLERITE Bedrock		1.2-1.3 REF	0.7-0.8 REF	0.6-0.8 REF

Consistency[1]	**VS** Very soft; **S** Soft; **F** Firm; **St** Stiff; **Vst** Very Stiff; **H** Hard.
Density[2]	**VL** Very loose; **L** Loose; **MD** Medium dense; **D** Dense; **VD** Very Dense
Rock Strength	**EL** Extremely Low; **VL** Very Low; **L** Low; M Medium; **H** High; **VH** Very High; **EH** Extremely High
PL	Point load test (lump)
DS	Disturbed sample
PV	Pocket vane shear test
FV	Downhole field vane shear test
U50	Undisturbed 48mm diameter core sample collected for laboratory testing.
REF	Borehole refusal
INF	DCP has continued through this layer and the geology has been inferred.

Soil Testing Results

Dynamic Cone Penetrometer (DCP)

Dynamic Cone Penetrometer (DCP)[3] testing was conducted in accordance with AS 1289.6.3.2 with the results presented in Appendix B.

Laboratory Atterberg Limits

Disturbed samples were submitted to ADG labs for NATA accredited Atterberg limit testing. The testing procedures follow AS1289. Analytical results are presented in Table 3 with laboratory certificates presented in **Error! Reference source not found.**.

Table 3 Atterberg Limit Testing Results (ADG Laboratories)

Layer	Soil	Hole ID	Depth (m)	Field Moisture %	Linear Shrinkage %
1	Sandy SILT	BH01	0.2-0.3	15	9
2	Silty SAND	BH01	0.4-0.5	9.2	2

[1] Soil consistencies are derived from a combination of field index, DCP and shear vane readings.
[2] Soil density descriptions presented in engineering logs are derived from the DCP testing.
[3] DCP values are a measure of soil strength and are logged as the number of 9 kg sliding hammer drops (from 510 mm height) required to drive a 20mm diameter cone tipped rod at 100mm intervals.

Soil Dispersion

Select soil samples were tested for sodicity using the Emersion Class number method in accordance with AS1289.3.8.1. Results presented in Table 4 indicate that:

Samples collected from the Site were not observed to be significantly dispersive, and no particular management measures are required (Class 4,5,6,7,8)

Table 4 Summary of emersion class results

Soil Layer and Description	Sample ID	Emersion Class	Date	Water
Layer 1: dark brown SOIL & BOULDERS/COBBLES: Sandy SILT	BH01 0.2	Class 4, 5 or 6	9/10/2023	Deionised 18°C
Layer 2: pale brown/orange SOIL & BOULDERS/COBBLES: Silty SAND	BH01 0.4	Class 4, 5 or 6	9/10/2023	Deionised 18°C
Layer 3: pale cream SOIL & COBBLES: SAND with gravel, with silt	BH01 0.8	Class 4, 5 or 6	9/10/2023	Deionised 18°C

Geotechnical Interpretation

Bearing Capacities

Soil bearing capacity was calculated from correlations with DCP blow counts and where high clay and silt content soils are present, soil undrained shear strength is obtained from vane shear testing. Interpretive values are presented in Table 5.

Table 5 Soil bearing capacities and problematic ground conditions.

Allowable Bearing Capacity (kPa)			
Depth from (m)	**BH01**	**BH02**	**BH03**
0	200	**200***	**230***
0.1	70~	**200**	**230**
0.2	**200***	**200**	**310**
0.3	**>400**	**310**	**360**
0.4	**>400**	**>400**	**>400**
0.5	**REF**	**>400**	**REF**
0.6		**REF**	**DOLERITE**
0.7		**DOLERITE**	**DOLERITE**
0.8			
0.9			
1			
1.1			
1.2	**DOLERITE**		

Correlations drawn from DCP and vane shear testing with 300 mm interval averaging applied.
REF - Penetrometer Refusal
~Problematic soil layers[4]

***Soil type expected at the base of problematic soil layers (where present):**

BH01: Very stiff, dark brown Sandy SILT (Layer 1) at 0.2 m depth

[4] Problematic Soil comprises FILL or is either loose, soft or the bearing capacity is less than 100 kPa. In accordance with AS2870, 'The design bearing capacity at foundation level should be no less than 100 kPa for strip and pad footings and under the edge footing of footing slabs used without tie bars between the edge footing and slab. The design bearing capacity at foundation level shall be no less than 50kPa under all beams and slab panels and support thickenings for slab construction.'

Recommendations – Design Considerations

Filling Works

In the case where filling works are proposed at the Site:

- All footings must be founded through fill material other than sand not exceeding 0.4 m depth or sand not exceeding 0.8 m depth, or otherwise a Class P applies (AS2870 Clauses 2.5.2 and 2.5.3).
- All footings (edge beams, internal beams, and load support thickenings) must be founded on natural soil through the filling
- Filled slopes should not exceed 1V:2H unless supported by a suitably engineered and drained retaining wall.
- Any proposed filling works should be in accordance with AS3798 “Earthworks for Residential and Commercial Developments”.
- Before placing fill for landscaping, all topsoil should be stripped from the filled area.
- The filled area should have benches cut into the slope with a 1V:20H downslope gradient.
- Ideally, the fill material should be free draining and placed to prevent water ponding. The fill should be placed in layers no greater than 150mm height and suitably compacted.
- Fill should not be placed against building structures unless there is allowance for the structure to withstand lateral earth pressures through engineering control.

Earth Retaining Structures

Any excavations higher than 1.0m and exceeding the recommended batter angle should be supported with engineered retaining wall which allows for free drainage of retained soil and rock.

Recommendations – Earthworks

Building Pad Preparation

Any organic matter or other deleterious materials will need to be removed from the building envelope.

Unless otherwise stated in an engineering report, fill material or loose, soft, low bearing capacity soil should either be removed from the building pad, or otherwise footings should ideally be established to the base of this material.

Earthworks should be carried out in accordance with AS3798 ‘Earthworks for Residential and Commercial Developments’. Unsuitable materials in structural fill are listed in AS2870 Section 4.3.

Bored Piers – Impediments

There were no obvious impediments to auguring including cobbles/boulders obstructions or groundwater.

Soft or loose soil will need to be cleaned out from the base of footings and pads to expose the natural soil or bedrock prior to pouring.

Foundation Maintenance

Details on appropriate Site and foundation maintenance practices from CSIRO Information Sheet BTF 18 Foundation Maintenance and Footing Performance: A Homeowner's Guide are presented in Appendix D of this report.

Kris Taylor BSc (hons)

Environmental & Engineering Geologist

Notes About Your Assessment

The Site classification provided, and footing recommendations including foundation depths are assessed based on the subsurface profile conditions present at the time of fieldwork and may vary according to any subsequent *Site works* carried out. *Site works* may include changes to the existing soil profile by cutting exceeding 0.4 m and filling exceeding 0.4 to 0.8 m depending on the material type and footing design. All footings must be founded through fill material *other than* sand not exceeding 0.4 m depth or sand not exceeding 0.8 m depth, or otherwise a Class P applies (AS2870 Clauses 2.5.2 and 2.5.3).

For reference, borehole investigation depths relative to natural soil surface levels are stated in borehole logs where applicable.

In some cases, variations in actual Site conditions may exist between subsurface investigation boreholes. At the time of construction, if conditions exist which differ from those described in this report, it is recommended that the base of all footing excavations be inspected to ensure that the founding medium meets that requirement referenced herein or stipulated by an engineer before any footings are poured.

The Site classification assumes that the performance requirements as set out in Appendix B of AS 2870 are acceptable and that Site foundation maintenance is undertaken to avoid extremes of wetting and drying.

It is up to the homeowner to ensure that the soil conditions are maintained and that abnormal moisture conditions do not develop around the building. The following are examples of poor practices which may result in abnormal soil conditions:

- The effect of trees too close to a footing.
- Excessive or irregular watering of gardens adjacent to the building.
- Failure to maintain Site drainage.
- Failure to repair plumbing leaks.
- Loss of vegetation from near the building.

The pages that form the last six pages of this report are an integral part of this report. The notes contain advice and recommendations for all stakeholders in this project (i.e. the structural engineer, builder, owner and future owners) and should be read and followed by all concerned.

References

AS 1289.6.3.2-2003 Soil strength and consolidation tests—Determination of the penetration resistance of a soil—9 kg dynamic cone penetrometer test, Standards Australia, Sydney, Retrieved from SAI Global

AS 1289.7.1.1-2003 Methods of testing soils for engineering purposes Method 7.1.1: Soil reactivity tests—Determination of the shrinkage index of a soil—Shrink-swell index, Standards Australia, Sydney, Retrieved from SAI Global

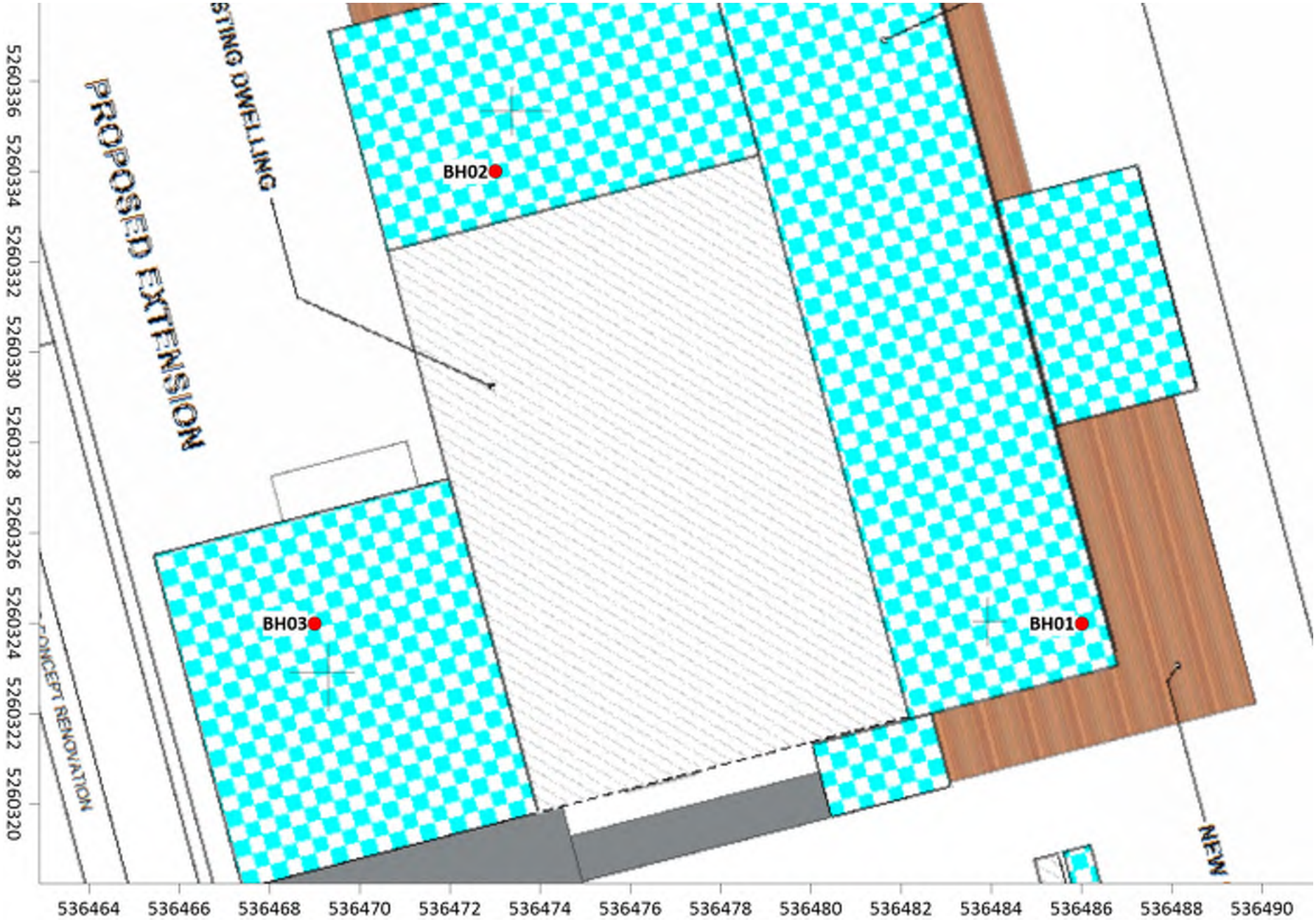
AS 1726-2017, Geotechnical Site investigations, Standards Australia, Sydney, Retrieved from SAI Global

AS 2870-2011, Residential slabs and footings, Standards Australia, Sydney, Retrieved from SAI Global

AS4055 (2021). Australian Standard. Prepared by Committee BD-099, Wind Loads for Housing. Approved on behalf of the Council of Standards Australia on 1st June 2021 and published on 25th June 2021.

DPIPWE 2009. Dispersive Soils and their Management. Technical Reference Manual. Sustainable Land Use Department of Primary Industries Water and Environment.

Appendix A Borehole Locations



Appendix B Borehole Logs

enviro·tech CONSULTANTS

ASSESSMENT: Foundation Classification
STRUCTURE: Extension
EASTING: 536486 **HORIZONTAL**
NORTHING: 5260324 **ACCURACY:** 0.92m

HOLE ID NO.: BH01
DATE TESTED: 5/10/2023
LOGGED BY: M. Scalisi
ELEVATION:

LOCATION: 185 Hanslows Road - Cambridge
CLIENT: Jason Applebee

EQUIPMENT: AMS Powerprobe 9120 RAP
NATURAL SURFACE (RL):

DEPTH (m)	GRAPHIC	DESCRIPTION	LAYER	DENSITY CONSIST-ENCY	MOISTURE INDEX	%	SAMPLES	TEST	Cu (kPa)	UCS (kPa)	BLOW COUNT	DCP blows/100mm 0 5 10 15 20
0.0	ML	SOIL & BOULDERS/COBBLES: Sandy SILT, dark brown, well sorted, low plasticity, trace roots, 5 % roots, 10% DOLERITE boulders/cobbles	1	firm to hard	Dry		DS				7.0 2.0 7.0 17.0	
0.5	SM	SOIL & BOULDERS/COBBLES: Silty SAND, pale brown/orange, well sorted, medium to coarse grained sand, with gravel, trace roots, 5 % roots, gravel 20%, fine grained, sub-rounded; 10% DOLERITE boulders/cobbles	2	very dense	Dry		DS				21.0	
1.0	SW	SOIL & COBBLES: SAND with gravel, with silt, pale cream, well sorted, medium to coarse grained sand, gravel 30%, fine to medium grained, sub-angular; 5% DOLERITE cobbles	3	very dense	Dry		DS				REF	
		Extremely Weathered DOLERITE Bedrock	4									
		Direct Push Sampler Refusal on Extremely Weathered DOLERITE Bedrock End of borehole at 1.3m depth.										

GROUNDWATER: Not Encountered

TESTING: Penetrometer: AS 1289.6.3.2

PAGE 1 of 1

Where blows per 100mm are less than 1, distance travelled per penetrometer blow is measured and converted to blows per 100mm.

DS - Disturbed Sample; U50 - Undisturbed 50mm Core; FV - Field Vane; PP - Pocket Penetrometer; CBR - Californian Bearing Ratio; PV - Pocket Vane

enviro·tech CONSULTANTS

ASSESSMENT: Foundation Classification
STRUCTURE: Extension
EASTING: 536473 **HORIZONTAL**
NORTHING: 5260334 **ACCURACY:** 1.06m

HOLE ID NO.: BH02
DATE TESTED: 5/10/2023
LOGGED BY: M. Scalisi
ELEVATION:

LOCATION: 185 Hanslows Road - Cambridge
CLIENT: Jason Applebee

EQUIPMENT: 50mm Christie Post Driver
NATURAL SURFACE (RL):

DEPTH (m)	GRAPHIC	DESCRIPTION	LAYER	DENSITY CONSIST-ENCY	MOISTURE INDEX	%	SAMPLES	TEST	Cu (kPa)	UCS (kPa)	BLOW COUNT
0.0	ML	SOIL & BOULDERS/COBBLES: Sandy SILT, dark brown, well sorted, low plasticity, trace roots, 5 % roots, 10% DOLERITE boulders/cobbles	1	very stiff to hard	Dry						7.0 7.0 7.0 10.0
0.5	SM	SOIL & BOULDERS/COBBLES: Silty SAND, pale brown/orange, well sorted, medium to coarse grained sand, with gravel, trace roots, 5 % roots, gravel 20%, fine grained, sub-rounded; 10% DOLERITE boulders/cobbles	2	dense to very dense	Dry						13.0 22.0
		Extremely Weathered DOLERITE Bedrock	4								REF
		Direct Push Sampler Refusal on Extremely Weathered DOLERITE Bedrock End of borehole at 0.8m depth.									

DCP blows/100mm: 0, 5, 10, 15, 20

GROUNDWATER: Not Encountered

PAGE 1 of 1

TESTING: Penetrometer: AS 1289.6.3.2

Where blows per 100mm are less than 1, distance travelled per penetrometer blow is measured and converted to blows per 100mm.

DS - Disturbed Sample; U50 - Undisturbed 50mm Core; FV - Field Vane; PP - Pocket Penetrometer; CBR - Californian Bearing Ratio; PV - Pocket Vane

enviro·tech CONSULTANTS

ASSESSMENT: Foundation Classification
STRUCTURE: Extension
EASTING: 536469 **HORIZONTAL**
NORTHING: 5260324 **ACCURACY:** 0.61m

HOLE ID NO.: BH03
DATE TESTED: 5/10/2023
LOGGED BY: M. Scalisi
ELEVATION:

LOCATION: 185 Hanslows Road - Cambridge
CLIENT: Jason Applebee

EQUIPMENT: 50mm Christie Post Driver
NATURAL SURFACE (RL):

DEPTH (m)	GRAPHIC	DESCRIPTION	LAYER	DENSITY CONSIST-ENCY	MOISTURE INDEX	%	SAMPLES	TEST	Cu (kPa)	UCS (kPa)	BLOW COUNT	DCP blows/100mm 0 5 10 15 20
0.0	ML	SOIL & BOULDERS/COBBLES: Sandy SILT, dark brown, well sorted, low plasticity, trace roots, 5 % roots, 10% DOLERITE boulders/cobbles	1	very stiff to hard	Slightly Moist						8.0 8.0 10.0 11.0	
0.5	SM	SOIL & BOULDERS/COBBLES: Silty SAND, pale brown/orange, well sorted, medium to coarse grained sand, with gravel, trace roots, 5 % roots, gravel 20%, fine grained, sub-rounded; 10% DOLERITE boulders/cobbles	2	dense	Dry						8.0	
		Extremely Weathered DOLERITE Bedrock	4								REF	
		Direct Push Sampler Refusal on Extremely Weathered DOLERITE Bedrock End of borehole at 0.8m depth.										

GROUNDWATER: Not Encountered

TESTING: Penetrometer: AS 1289.6.3.2

PAGE 1 of 1

Where blows per 100mm are less than 1, distance travelled per penetrometer blow is measured and converted to blows per 100mm.

DS - Disturbed Sample; U50 - Undisturbed 50mm Core; FV - Field Vane; PP - Pocket Penetrometer; CBR - Californian Bearing Ratio; PV - Pocket Vane

Appendix C Core Photographs

BH01

BH02

BH02

*** 1 metre core tray length**

Appendix D Foundation Maintenance & Footing Performance (CSIRO)

Foundation Maintenance and Footing Performance:
A Homeowner's Guide

CSIRO

BTF 18
replaces
Information
Sheet 10/91

Buildings can and often do move. This movement can be up, down, lateral or rotational. The fundamental cause of movement in buildings can usually be related to one or more problems in the foundation soil. It is important for the homeowner to identify the soil type in order to ascertain the measures that should be put in place in order to ensure that problems in the foundation soil can be prevented, thus protecting against building movement.

This Building Technology File is designed to identify causes of soil-related building movement, and to suggest methods of prevention of resultant cracking in buildings.

Soil Types

The types of soils usually present under the topsoil in land zoned for residential buildings can be split into two approximate groups – granular and clay. Quite often, foundation soil is a mixture of both types. The general problems associated with soils having granular content are usually caused by erosion. Clay soils are subject to saturation and swell/shrink problems.

Classifications for a given area can generally be obtained by application to the local authority, but these are sometimes unreliable and if there is doubt, a geotechnical report should be commissioned. As most buildings suffering movement problems are founded on clay soils, there is an emphasis on classification of soils according to the amount of swell and shrinkage they experience with variations of water content. The table below is Table 2.1 from AS 2870, the Residential Slab and Footing Code.

Causes of Movement

Settlement due to construction
There are two types of settlement that occur as a result of construction:

- Immediate settlement occurs when a building is first placed on its foundation soil, as a result of compaction of the soil under the weight of the structure. The cohesive quality of clay soil mitigates against this, but granular (particularly sandy) soil is susceptible.
- Consolidation settlement is a feature of clay soil and may take place because of the expulsion of moisture from the soil or because of the soil's lack of resistance to local compressive or shear stresses. This will usually take place during the first few months after construction, but has been known to take many years in exceptional cases.

These problems are the province of the builder and should be taken into consideration as part of the preparation of the site for construction. Building Technology File 19 (BTF 19) deals with these problems.

Erosion
All soils are prone to erosion, but sandy soil is particularly susceptible to being washed away. Even clay with a sand component of say 10% or more can suffer from erosion.

Saturation
This is particularly a problem in clay soils. Saturation creates a bog-like suspension of the soil that causes it to lose virtually all of its bearing capacity. To a lesser degree, sand is affected by saturation because saturated sand may undergo a reduction in volume – particularly imported sand fill for bedding and blinding layers. However, this usually occurs as immediate settlement and should normally be the province of the builder.

Seasonal swelling and shrinkage of soil
All clays react to the presence of water by slowly absorbing it, making the soil increase in volume (see table below). The degree of increase varies considerably between different clays, as does the degree of decrease during the subsequent drying out caused by fair weather periods. Because of the low absorption and expulsion rate, this phenomenon will not usually be noticeable unless there are prolonged rainy or dry periods, usually of weeks or months, depending on the land and soil characteristics.

The swelling of soil creates an upward force on the footings of the building, and shrinkage creates subsidence that takes away the support needed by the footing to retain equilibrium.

Shear failure
This phenomenon occurs when the foundation soil does not have sufficient strength to support the weight of the footing. There are two major post-construction causes:

- Significant load increase.
- Reduction of lateral support of the soil under the footing due to erosion or excavation.
- In clay soil, shear failure can be caused by saturation of the soil adjacent to or under the footing.

GENERAL DEFINITIONS OF SITE CLASSES

Class	Foundation
A	Most sand and rock sites with little or no ground movement from moisture changes
S	Slightly reactive clay sites with only slight ground movement from moisture changes
M	Moderately reactive clay or silt sites, which can experience moderate ground movement from moisture changes
H	Highly reactive clay sites, which can experience high ground movement from moisture changes
E	Extremely reactive sites, which can experience extreme ground movement from moisture changes
A to P	Filled sites
P	Sites which include soft soils, such as soft clay or silt or loose sands; landslip; mine subsidence; collapsing soils; soils subject to erosion; reactive sites subject to abnormal moisture conditions or sites which cannot be classified otherwise

Tree root growth
Trees and shrubs that are allowed to grow in the vicinity of footings can cause foundation soil movement in two ways:

- Roots that grow under footings may increase in cross-sectional size, exerting upward pressure on footings.
- Roots in the vicinity of footings will absorb much of the moisture in the foundation soil, causing shrinkage or subsidence.

Unevenness of Movement

The types of ground movement described above usually occur unevenly throughout the building's foundation soil. Settlement due to construction tends to be uneven because of:

- Differing compaction of foundation soil prior to construction.
- Differing moisture content of foundation soil prior to construction.

Movement due to non-construction causes is usually more uneven still. Erosion can undermine a footing that traverses the flow or can create the conditions for shear failure by eroding soil adjacent to a footing that runs in the same direction as the flow.

Saturation of clay foundation soil may occur where subfloor walls create a dam that makes water pond. It can also occur wherever there is a source of water near footings in clay soil. This leads to a severe reduction in the strength of the soil which may create local shear failure.

Seasonal swelling and shrinkage of clay soil affects the perimeter of the building first, then gradually spreads to the interior. The swelling process will usually begin at the uphill extreme of the building, or on the weather side where the land is flat. Swelling gradually reaches the interior soil as absorption continues. Shrinkage usually begins where the sun's heat is greatest.

Effects of Uneven Soil Movement on Structures

Erosion and saturation
Erosion removes the support from under footings, tending to create subsidence of the part of the structure under which it occurs. Brickwork walls will resist the stress created by this removal of support by bridging the gap or cantilevering until the bricks or the mortar bedding fail. Older masonry has little resistance. Evidence of failure varies according to circumstances and symptoms may include:

- Step cracking in the mortar beds in the body of the wall or above/below openings such as doors or windows.
- Vertical cracking in the bricks (usually but not necessarily in line with the vertical beds or perpends).

Isolated piers affected by erosion or saturation of foundations will eventually lose contact with the bearers they support and may tilt or fall over. The floors that have lost this support will become bouncy, sometimes rattling ornaments etc.

Seasonal swelling/shrinkage in clay
Swelling foundation soil due to rainy periods first lifts the most exposed extremities of the footing system, then the remainder of the perimeter footings while gradually permeating inside the building footprint to lift internal footings. This swelling first tends to create a dish effect, because the external footings are pushed higher than the internal ones.

The first noticeable symptom may be that the floor appears slightly dished. This is often accompanied by some doors binding on the floor or the door head, together with some cracking of cornice mitres. In buildings with timber flooring supported by bearers and joists, the floor can be bouncy. Externally there may be visible dishing of the hip or ridge lines.

As the moisture absorption process completes its journey to the innermost areas of the building, the internal footings will rise. If the spread of moisture is roughly even, it may be that the symptoms will temporarily disappear, but it is more likely that swelling will be uneven, creating a difference rather than a disappearance in symptoms. In buildings with timber flooring supported by bearers and joists, the isolated piers will rise more easily than the strip footings or piers under walls, creating noticeable doming of flooring.

As the weather pattern changes and the soil begins to dry out, the external footings will be first affected, beginning with the locations where the sun's effect is strongest. This has the effect of lowering the external footings. The doming is accentuated and cracking reduces or disappears where it occurred because of dishing, but other cracks open up. The roof lines may become convex.

Doming and dishing are also affected by weather in other ways. In areas where warm, wet summers and cooler dry winters prevail, water migration tends to be toward the interior and doming will be accentuated, whereas where summers are dry and winters are cold and wet, migration tends to be toward the exterior and the underlying propensity is toward dishing.

Movement caused by tree roots
In general, growing roots will exert an upward pressure on footings, whereas soil subject to drying because of tree or shrub roots will tend to remove support from under footings by inducing shrinkage.

Complications caused by the structure itself
Most forces that the soil causes to be exerted on structures are vertical – i.e. either up or down. However, because these forces are seldom spread evenly around the footings, and because the building resists uneven movement because of its rigidity, forces are exerted from one part of the building to another. The net result of all these forces is usually rotational. This resultant force often complicates the diagnosis because the visible symptoms do not simply reflect the original cause. A common symptom is binding of doors on the vertical member of the frame.

Effects on full masonry structures
Brickwork will resist cracking where it can. It will attempt to span areas that lose support because of subsided foundations or raised points. It is therefore usual to see cracking at weak points, such as openings for windows or doors.

In the event of construction settlement, cracking will usually remain unchanged after the process of settlement has ceased.

With local shear or erosion, cracking will usually continue to develop until the original cause has been remedied, or until the subsidence has completely neutralised the affected portion of footing and the structure has stabilised on other footings that remain effective.

In the case of swell/shrink effects, the brickwork will in some cases return to its original position after completion of a cycle, however it is more likely that the rotational effect will not be exactly reversed, and it is also usual that brickwork will settle in its new position and will resist the forces trying to return it to its original position. This means that in a case where swelling takes place after construction and cracking occurs, the cracking is likely to at least partly remain after the shrink segment of the cycle is complete. Thus, each time the cycle is repeated, the likelihood is that the cracking will become wider until the sections of brickwork become virtually independent.

With repeated cycles, once the cracking is established, if there is no other complication, it is normal for the incidence of cracking to stabilise, as the building has the articulation it needs to cope with the problem. This is by no means always the case, however, and monitoring of cracks in walls and floors should always be treated seriously.

Upheaval caused by growth of tree roots under footings is not a simple vertical shear stress. There is a tendency for the root to also exert lateral forces that attempt to separate sections of brickwork after initial cracking has occurred.

The normal structural arrangement is that the inner leaf of brickwork in the external walls and at least some of the internal walls (depending on the roof type) comprise the load-bearing structure on which any upper floors, ceilings and the roof are supported. In these cases, it is internally visible cracking that should be the main focus of attention, however there are a few examples of dwellings whose external leaf of masonry plays some supporting role, so this should be checked if there is any doubt. In any case, externally visible cracking is important as a guide to stresses on the structure generally, and it should also be remembered that the external walls must be capable of supporting themselves.

Effects on framed structures
Timber or steel framed buildings are less likely to exhibit cracking due to swell/shrink than masonry buildings because of their flexibility. Also, the doming/dishing effects tend to be lower because of the lighter weight of walls. The main risks to framed buildings are encountered because of the isolated pier footings used under walls. Where erosion or saturation cause a footing to fall away, this can double the span which a wall must bridge. This additional stress can create cracking in wall linings, particularly where there is a weak point in the structure caused by a door or window opening. It is, however, unlikely that framed structures will be so stressed as to suffer serious damage without first exhibiting some or all of the above symptoms for a considerable period. The same warning period should apply in the case of upheaval. It should be noted, however, that where framed buildings are supported by strip footings there is only one leaf of brickwork and therefore the externally visible walls are the supporting structure for the building. In this case, the subfloor masonry walls can be expected to behave as full brickwork walls.

Effects on brick veneer structures
Because the load-bearing structure of a brick veneer building is the frame that makes up the interior leaf of the external walls plus perhaps the internal walls, depending on the type of roof, the building can be expected to behave as a framed structure, except that the external masonry will behave in a similar way to the external leaf of a full masonry structure.

Water Service and Drainage

Where a water service pipe, a sewer or stormwater drainage pipe is in the vicinity of a building, a water leak can cause erosion, swelling or saturation of susceptible soil. Even a minuscule leak can be enough to saturate a clay foundation. A leaking tap near a building can have the same effect. In addition, trenches containing pipes can become watercourses even though backfilled, particularly where broken rubble is used as fill. Water that runs along these trenches can be responsible for serious erosion, interstrata seepage into subfloor areas and saturation.

Pipe leakage and trench water flows also encourage tree and shrub roots to the source of water, complicating and exacerbating the problem.
Poor roof plumbing can result in large volumes of rainwater being concentrated in a small area of soil:

- Incorrect falls in roof guttering may result in overflows, as may gutters blocked with leaves etc.
- Corroded guttering or downpipes can spill water to ground.
- Downpipes not positively connected to a proper stormwater collection system will direct a concentration of water to soil that is directly adjacent to footings, sometimes causing large-scale problems such as erosion, saturation and migration of water under the building.

Seriousness of Cracking

In general, most cracking found in masonry walls is a cosmetic nuisance only and can be kept in repair or even ignored. The table below is a reproduction of Table C1 of AS 2870.

AS 2870 also publishes figures relating to cracking in concrete floors, however because wall cracking will usually reach the critical point significantly earlier than cracking in slabs, this table is not reproduced here.

Prevention/ Cure

Plumbing
Where building movement is caused by water service, roof plumbing, sewer or stormwater failure, the remedy is to repair the problem. It is prudent, however, to consider also rerouting pipes away from the building where possible, and relocating taps to positions where any leakage will not direct water to the building vicinity. Even where gully traps are present, there is sometimes sufficient spill to create erosion or saturation, particularly in modern installations using smaller diameter PVC fixtures. Indeed, some gully traps are not situated directly under the taps that are installed to charge them, with the result that water from the tap may enter the backfilled trench that houses the sewer piping. If the trench has been poorly backfilled, the water will either pond or flow along the bottom of the trench. As these trenches usually run alongside the footings and can be at a similar depth, it is not hard to see how any water that is thus directed into a trench can easily affect the foundation's ability to support footings or even gain entry to the subfloor area.

Ground drainage
In all soils there is the capacity for water to travel on the surface and below it. Surface water flows can be established by inspection during and after heavy or prolonged rain. If necessary, a grated drain system connected to the stormwater collection system is usually an easy solution.

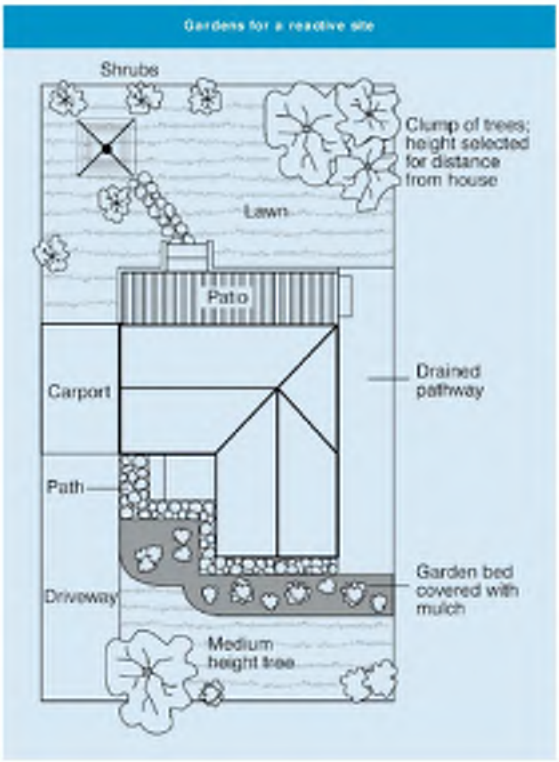
It is, however, sometimes necessary when attempting to prevent water migration that testing be carried out to establish watertable height and subsoil water flows. This subject is referred to in BTF 19 and may properly be regarded as an area for an expert consultant.

Protection of the building perimeter
It is essential to remember that the soil that affects footings extends well beyond the actual building line. Watering of garden plants, shrubs and trees causes some of the most serious water problems.

For this reason, particularly where problems exist or are likely to occur, it is recommended that an apron of paving be installed around as much of the building perimeter as necessary. This paving

CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS

Description of typical damage and required repair	Approximate crack width limit (see Note 3)	Damage category
Hairline cracks	<0.1 mm	0
Fine cracks which do not need repair	<1 mm	1
Cracks noticeable but easily filled. Doors and windows stick slightly	<5 mm	2
Cracks can be repaired and possibly a small amount of wall will need to be replaced. Doors and windows stick. Service pipes can fracture. Weathertightness often impaired	5–15 mm (or a number of cracks 3 mm or more in one group)	3
Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Window and door frames distort. Walls lean or bulge noticeably, some loss of bearing in beams. Service pipes disrupted	15–25 mm but also depend on number of cracks	4



should extend outwards a minimum of 900 mm (more in highly reactive soil) and should have a minimum fall away from the building of 1:60. The finished paving should be no less than 100 mm below brick vent bases.

It is prudent to relocate drainage pipes away from this paving, if possible, to avoid complications from future leakage. If this is not practical, earthenware pipes should be replaced by PVC and backfilling should be of the same soil type as the surrounding soil and compacted to the same density.

Except in areas where freezing of water is an issue, it is wise to remove taps in the building area and relocate them well away from the building – preferably not uphill from it (see BTF 19).

It may be desirable to install a grated drain at the outside edge of the paving on the uphill side of the building. If subsoil drainage is needed this can be installed under the surface drain.

Condensation
In buildings with a subfloor void such as where bearers and joists support flooring, insufficient ventilation creates ideal conditions for condensation, particularly where there is little clearance between the floor and the ground. Condensation adds to the moisture already present in the subfloor and significantly slows the process of drying out. Installation of an adequate subfloor ventilation system, either natural or mechanical, is desirable.

Warning: Although this Building Technology File deals with cracking in buildings, it should be said that subfloor moisture can result in the development of other problems, notably:

- Water that is transmitted into masonry, metal or timber building elements causes damage and/or decay to those elements.
- High subfloor humidity and moisture content create an ideal environment for various pests, including termites and spiders.
- Where high moisture levels are transmitted to the flooring and walls, an increase in the dust mite count can ensue within the living areas. Dust mites, as well as dampness in general, can be a health hazard to inhabitants, particularly those who are abnormally susceptible to respiratory ailments.

The garden
The ideal vegetation layout is to have lawn or plants that require only light watering immediately adjacent to the drainage or paving edge, then more demanding plants, shrubs and trees spread out in that order.

Overwatering due to misuse of automatic watering systems is a common cause of saturation and water migration under footings. If it is necessary to use these systems, it is important to remove garden beds to a completely safe distance from buildings.

Existing trees
Where a tree is causing a problem of soil drying or there is the existence or threat of upheaval of footings, if the offending roots are subsidiary and their removal will not significantly damage the tree, they should be severed and a concrete or metal barrier placed vertically in the soil to prevent future root growth in the direction of the building. If it is not possible to remove the relevant roots without damage to the tree, an application to remove the tree should be made to the local authority. A prudent plan is to transplant likely offenders before they become a problem.

Information on trees, plants and shrubs
State departments overseeing agriculture can give information regarding root patterns, volume of water needed and safe distance from buildings of most species. Botanic gardens are also sources of information. For information on plant roots and drains, see Building Technology File 17.

Excavation
Excavation around footings must be properly engineered. Soil supporting footings can only be safely excavated at an angle that allows the soil under the footing to remain stable. This angle is called the angle of repose (or friction) and varies significantly between soil types and conditions. Removal of soil within the angle of repose will cause subsidence.

Remediation

Where erosion has occurred that has washed away soil adjacent to footings, soil of the same classification should be introduced and compacted to the same density. Where footings have been undermined, augmentation or other specialist work may be required. Remediation of footings and foundations is generally the realm of a specialist consultant.

Where isolated footings rise and fall because of swell/shrink effect, the homeowner may be tempted to alleviate floor bounce by filling the gap that has appeared between the bearer and the pier with blocking. The danger here is that when the next swell segment of the cycle occurs, the extra blocking will push the floor up into an accentuated dome and may also cause local shear failure in the soil. If it is necessary to use blocking, it should be by a pair of fine wedges and monitoring should be carried out fortnightly.

This BTF was prepared by John Lower FAIB, MIAMA, Partner, Construction Diagnosis.

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CITY OF CLARENCE
PLANNING APPROVAL

DEVELOPMENT PERMIT NO: PDPLANPMTD-2021/023831

DATED: 6/4/2022

NOTE: A separate building and plumbing approval may be required BEFORE the commencement of any building works.

BUSHFIRE-PRONE AREAS CODE

CERTIFICATE[1] UNDER S51(2)(d) *LAND USE PLANNING AND APPROVALS ACT 1993*

1. Land to which certificate applies

The subject site includes property that is proposed for use and development and includes all properties upon which works are proposed for bushfire protection purposes.

Street address:	205 Hanslows Road, Cambridge TAS 7170
Certificate of Title / PID:	C.T.105616/1 5170762

2. Proposed Use or Development

Description of proposed Use and Development:	TWO LOT SUBDIVISION C.T.105616/1
Applicable Planning Scheme:	Tasmanian Planning Scheme – Clarence

3. Documents relied upon

This certificate relates to the following documents:

Title	Author	Date	Version
SUBDIVISION PROPOSAL PLAN	BROOKS, LARK & CARRICK SURVEYORS	18/02/2022	01
BUSHFIRE HAZARD REPORT – 205 HANSLOWS ROAD, CAMBRIDGE	JAMES ROGERSON – BROOKS, LARK & CARRICK SURVEYORS	16/03/2022	03
BUSHFIRE HAZARD MANGAEMENT PLAN– 205 HANSLOWS ROAD, CAMBRIDGE	JAMES ROGERSON – BROOKS, LARK & CARRICK SURVEYORS	16/03/2022	03

[1] This document is the approved form of certification for this purpose and must not be altered from its original form.

4. Nature of Certificate

The following requirements are applicable to the proposed use and development:

☐	E1.4 / C13.4 – Use or development exempt from this Code	
	Compliance test	**Compliance Requirement**
☐	E1.4(a) / C13.4.1(a)	

☐	E1.5.1 / C13.5.1 – Vulnerable Uses	
	Acceptable Solution	**Compliance Requirement**
☐	E1.5.1 P1 / C13.5.1 P1	***Planning authority discretion required. A proposal cannot be certified as compliant with P1.***
☐	E1.5.1 A2 / C13.5.1 A2	
☐	E1.5.1 A3 / C13.5.1 A2	

☐	E1.5.2 / C13.5.2 – Hazardous Uses	
	Acceptable Solution	**Compliance Requirement**
☐	E1.5.2 P1 / C13.5.2 P1	***Planning authority discretion required. A proposal cannot be certified as compliant with P1.***
☐	E1.5.2 A2 / C13.5.2 A2	
☐	E1.5.2 A3 / C13.5.2 A3	

☐	E1.6.1 / C13.6.1 Subdivision: Provision of hazard management areas	
	Acceptable Solution	**Compliance Requirement**
☐	E1.6.1 P1 / C13.6.1 P1	***Planning authority discretion required. A proposal cannot be certified as compliant with P1.***
☐	E1.6.1 A1 (a) / C13.6.1 A1(a)	
☒	E1.6.1 A1 (b) / C13.6.1 A1(b)	Provides BAL-19 for all lots (including any lot designated as 'balance')
☐	E1.6.1 A1(c) / C13.6.1 A1(c)	

☐	E1.6.2 / C13.6.2 Subdivision: Public and fire fighting access	
	Acceptable Solution	**Compliance Requirement**
☐	E1.6.2 P1 / C13.6.2 P1	
☐	E1.6.2 A1 (a) / C13.6.2 A1 (a)	
☒	E1.6.2 A1 (b) / C13.6.2 A1 (b)	Access complies with relevant Tables

☐	E1.6.3 / C13.1.6.3 Subdivision: Provision of water supply for fire fighting purposes	
	Acceptable Solution	**Compliance Requirement**
☐	E1.6.3 A1 (a) / C13.6.3 A1 (a)	
☐	E1.6.3 A1 (b) / C13.6.3 A1 (b)	
☐	E1.6.3 A1 (c) / C13.6.3 A1 (c)	
☐	E1.6.3 A2 (a) / C13.6.3 A2 (a)	
☒	E1.6.3 A2 (b) / C13.6.3 A2 (b)	Static water supply complies with relevant Table
☐	E1.6.3 A2 (c) / C13.6.3 A2 (c)	

CITY OF CLARENCE
PLANNING APPROVAL

DEVELOPMENT PERMIT NO: **PDPLANPMTD-2021/023831**

DATED: **6/4/2022**

NOTE: A separate building and plumbing approval may be required BEFORE the commencement of any building works.

5. Bushfire Hazard Practitioner

Name:	JAMES ROGERSON	**Phone No:**	0488372283
Postal Address:	UNIT 1-2 KENNEDY DRIVE, CAMBRIDGE PARK	**Email Address:**	JAMES@RBSURVEYORS.COM
Accreditation No:	BFP – 161	**Scope:**	1, 2, 3B

6. Certification

I certify that in accordance with the authority given under Part 4A of the *Fire Service Act 1979* that the proposed use and development:

☐ Is exempt from the requirement Bushfire-Prone Areas Code because, having regard to the objective of all applicable standards in the Code, there is considered to be an insufficient increase in risk to the use or development from bushfire to warrant any specific bushfire protection measures, or

☒ The Bushfire Hazard Management Plan/s identified in Section 3 of this certificate is/are in accordance with the Chief Officer's requirements and compliant with the relevant **Acceptable Solutions** identified in Section 4 of this Certificate.

Signed: *certifier*

Name: JAMES ROGERSON **Date:** 16/3/22

Certificate Number: 161

(for Practitioner Use only)

CITY OF CLARENCE
PLANNING APPROVAL

DEVELOPMENT PERMIT NO: PDPLANPMTD-2021/023831

DATED: 6/4/2022

NOTE: A separate building and plumbing approval may be required BEFORE the commencement of any building works.

CITY OF CLARENCE
PLANNING APPROVAL

DEVELOPMENT PERMIT NO: PDPLANPMTD-2021/023831

DATED: 6/4/2022

NOTE: A separate building and plumbing approval may be required BEFORE the commencement of any building works.

Brooks, Lark and Carrick SURVEYORS

BUSHFIRE HAZARD REPORT

Proposed 2 Lot Subdivision

Address: 205 Hanslows Road, Cambridge TAS 77170

Title Reference: C.T.105616/1

Prepared by James Rogerson, Bushfire Hazard Practitioner
(BFP-161)
VERSION – 02
Date: 04/03/2022

Brooks, Lark and Carrick SURVEYORS

Content

Disclaimer: The information contained within this report is based on the instructions of AS 3959-2018 the standard states that *"Although this Standard is designed to improve the performance of building when subjected to bushfire attach in a designated bushfire-prone area there can be no guarantee that a building will survive a bushfire event of every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature and behaviour of fire and extreme weather conditions." (Standards Australia Limited, 2011)*

1 INTRODUCTION

1.1 Background

This Bushfire Hazard Report and associated Bushfire Hazard Management Plan (BHMP) has been prepared by James Rogerson of Brooks, Lark and Carrick Surveyors on behalf of the proponent to form part of supporting documentation for the proposed two lot subdivision of 205 Hanslows Road, Cambridge.

Under the Tasmanian Planning Scheme – Clarence (TPS) and C13.0 Bushfire-Prone Areas Code it is a requirement that a subdivision application within a bushfire-prone area must accomplish a minimum Bushfire Attack Level (BAL) rating of BAL-19 for all future dwellings on newly formed allotments. This report also includes an associated BHMP which is also a requirement under the TPS.

The proposed development is within a Bushfire-Prone Area overlay and there is bushfire-prone vegetation within 100m from the site. Therefore, this site is within a bushfire-prone area.

1.2 Scope

This Bushfire Report offers an investigation and assessment of the bushfire risk to establish the level of bushfire threat and vulnerability on the land for the purpose of subdivision. This report includes the following:

- A description of the land and adjacent land, and description of the use or development that may be at threat by a bushfire on the subject site;
- Calculates the level of a bushfire threat and offers opinions for bushfire mitigation measures that are consistent with AS3959:2018, C13.0 and the TPS.
- Subdivision Proposal Plan (Appendix B)
- Bushfire Hazard Management Plan (Appendix C)
- Planning Certificate (Appendix D)

1.3 Scope of BFP Accreditation

I, James Rogerson am an accredited Bushfire Practitioner (BFP-161) to assess bushfire hazard and endorse BHMP's under the the *Chief Officers Scheme for the Accreditation of Bushfire Hazard Practitioners.* I have successfully completed the *Planning for Bushfire Prone Areas Short Course* at University of Technology Sydney.

1.4 Limitations

The site assessment has been conducted and report written on the understanding that:

- The report only deals with the potential bushfire risk, all other statutory assessments are outside the scope of this report;
- The report only classifies the size, volume and status of the vegetation at the time the site assessment was conducted;
- Impacts on future development and vegetation growth have not been considered in this report. No action or reliance is to be placed on this report, other than which it was commissioned.

1.5 Proposal

The proposal is the subdivision of the current title C.T.105616/1 into two resultant titles either side of Hanslows Road. Lot 2 will be in two parts. See proposal plan (Appendix B).

2 PRE-FIELD ASSESSMENT

2.1 Site Details

Table 1

Owner Name(s)	J. R. & H. M. Spaulding
Location	205 Hanslows Road, Cambridge
Title Reference	C.T.105616/1
Property ID	5170762
Municipality	Clarence
Zoning	21 Agriculture
Planning Overlays	12 – Flood-prone areas, 13 – Bushfire-prone areas, 16 – Airport obstacle limitation area, 16 0 Airport noise exposure area, 15 – Low landslip hazard band, 7 – Waterway and coastal protection area
Water Supply for Firefighting	The property is not serviced by reticulated water.
Public Access	Access to the development is via Hanslows Road
Fire History	No fire history recorded on *The LIST*
Existing Development	Two existing class1a dwellings in addition to various sheds and all-weather driveways

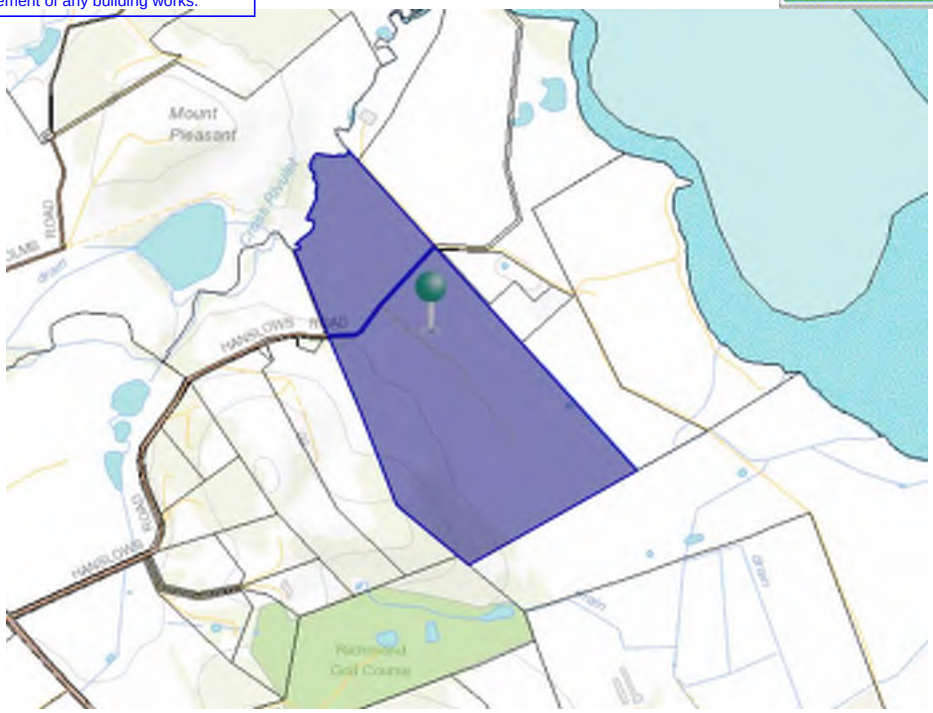

Figure 1 Location of subject site. Source: The LIST, © State of Tasmania

Figure 2 Planning Scheme Zoning of site and surrounding properties. Source: The LIST, © State of Tasmania

2.2 TasVeg 4.0

There are 2 classified vegetation communities on the subject site, and various additional communities on the surrounding land and parcels. Figure 3 below shows the classified vegetation from TASVEG4.0 (Source: The LIST).

Please note that TASVEG4.0 classification does not necessarily reflect ground conditions.

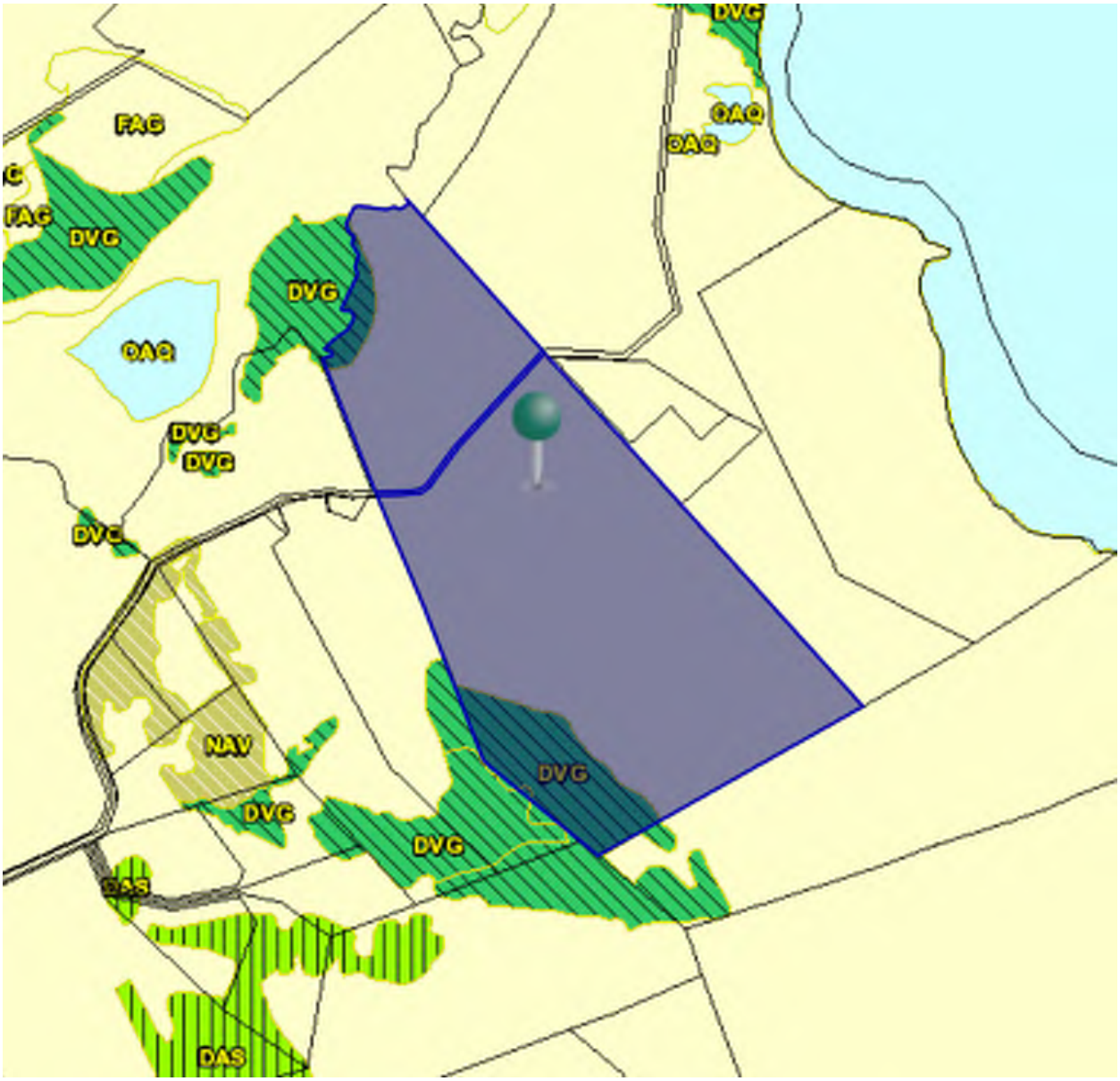

Figure 3 TASVEG4.0 communities on subject site and surrounding land. FAG – Agricultural land, DVG – Eucalyptus viminalis grassy forest and woodland, DAS – Eucalyptus amygdalina forest and woodland on sandstone, NAV – Allocasuarina verticillate forest, OAQ – Water, sea

3 SITE ASSESSMENT

The site assessment was conducted by James Rogerson (BFP-161) on the 2nd February 2022.

3.1 Bushfire Hazard Assessment

C13.0 Bushfire Prone Areas Code and TPS defines Bushfire-prone areas as follows;

> *a) Land that is within the boundary of a bushfire-prone area shown on an overlay on a planning scheme map; or*
>
> *b) Where there is no overlay on a planning scheme map, or where the land is outside the boundary of a bushfire-prone area shown on such map, land that is within 100m of an area of bushfire –prone vegetation equal or greater than 1ha.*

The subject site is within a bushfire-prone areas overlay for the Tasmanian Planning Scheme – Clarence and the subject site is within 100m of an area of bushfire-prone vegetation equal or greater than 1ha. Therefore, this proposed subdivision is within a bushfire-prone area as per the Tasmanian Planning Scheme – Clarence.

For the purposes of the BAL Assessment, vegetation within 100m of the proposed subdivision site were assessed and classified in accordance with AS3959:2018 Simplified Procedure (Method 1) (relevant fire danger index: 50-which applies across Tasmania).

BUSHFIRE THREAT DIRECTION

Bushfire threat to this development is from the grassland fuels within the site and surrounding the site.

Prevailing Winds: The prevailing winds for this site are primarily westerly, north westerly.

3.2 Vegetation and Effective Slope

Vegetation and relevant effective slopes within 100m of the proposed subdivision have been inspected and classified in accordance with AS 3959:2018. Effective Slope refers to the slope of the land underneath the classified bushfire-prone vegetation relative to the building site and not the slope between the vegetation and the building site. The effective slope affects a fires rate of spread and flame length and is an acute aspect of bushfire behaviour.

WITHIN THE SITE & SITE DESCRIPTION

The subject site is an extremely large Agriculture zoned lot, located in the northern area of Cambridge between Richmond Road and *Pitt Water.* The site is either side of Hanslows Road.

Terrain within proposed lots 1 and 2 is fairly flat, with some gentle slope in a north and east aspect for lot 1 away from the existing dwelling and east aspect for lot 2 away from the existing dwelling.

Proposed lot 1

Proposed lot 1 is a large developed lot and is proposed to be 4.69ha in area and is located on the north side of Hanslows Road. The site is consisting of a class1a dwelling, adjacent carport, cultivated garden and a concrete driveway. This lot will front Richardsons Road. The land directly surrounding dwelling is used as private open space and is therefore classed as MANAGED LAND or LOW THREAT VEGETATION per Clause 2.2.3.2 (e)(f) of AS3959:2018. There is a small portion of vegetation on the edge of the creek at the north boundary (which is >100m from the existing dwelling and exempt from the assessment). The vegetation is 2m-6m high with a foliage cover of 50%-70% and is therefore classed as GROUP D SCRUB per Table 2.3 of AS3959:2018. The remainder of the proposed lot is grass kept in an unmanaged condition due to the minimal to nil land use at present. As such, this grass is classed as GROUP G GRASSLAND per Table 2.3 of AS3959:2018.

Proposed lot 2 (in 2 parts)

<u>Existing Dwelling Part</u>

Proposed lot 2 is a large developed lot to be 43.63ha in total area. The portion of lot 2 with the existing dwelling is approx. 37ha in area. The lot is consisting of a class1a dwelling and various class10a sheds, cultivated gardens and all-weather driveways. adjacent carport, cultivated garden and all-weather driveway. This lot will front Richardsons Road. The land directly surrounding dwelling is used as private open space and is therefore classed as MANAGED LAND or LOW THREAT VEGETATION per Clause 2.2.3.2 (e)(f) of AS3959:2018. There is a patch of vegetation on the south-west boundary (which is >100m from the existing dwelling and exempt from the assessment). The vegetation is 2m-6m high with a foliage cover of 50%-70% and is therefore classed as GROUP D SCRUB per Table 2.3 of AS3959:2018. The remainder of the proposed lot is grass kept in an unmanaged condition due to the minimal to nil land use and crop areas out of season or not maintained at present. As such, this grass is classed as GROUP G GRASSLAND per Table 2.3 of AS3959:2018.

Vacant/Undeveloped Part

The vacant part of proposed lot 2 is a large Agricultural zoned lot Proposed is an undeveloped lot to be 6ha in area. This part is adjacent to lot 1. The entirety of the lot is grassed. As this lot is unused, the grass is therefore unmanaged and is classed as GROUP G GRASSLAND per Table 2.3 of AS3959:2018.

Note – due to the size of the subject site, surrounding land to the north, east and south are all >100m from the existing dwellings and were therefore not included in the assessment.

There are no plans to develop the vacant/undeveloped part of lot 2 in the near future. Thus, north and east of this part was also not assessed.

WEST OF LOT 1

To the west of lot 1 is 140 Hanslows Road. The property is a large developed Agricultural zoned lot consisting of a class1a dwelling, various class10a sheds and an all-weather driveway. The land within the 100m assessment zone is grass, that is unmaintained due to minimal to nil land use. The grass is therefore classed as GROUP G GRASSLAND per Table 2.3 of AS3959:2018.

Bordering the proposed lot 1 is a Road Reserve that is both not formed or named. The reserve is grassed that is unmaintained due to the minimal to nil use of the strip. The grass as therefore classed as GROUP G GRASSLAND per Table 2.3 of AS3959:2018.

WEST OF LOT 2 (EX. DWELLING PART)

West of lot 2 (Ex. Dwelling part) is 163 and 171 Hanslows Road. Both properties are owned by the same person. #171 is a small Agricultural zoned lot, consisting of a class1a dwelling, class10a sheds and an all-weather driveway. Land surrounding the dwelling is used as private open space and is therefore classed as MANAGED LAND or LOW THREAT VEGETATION per Clause 2.2.3.2 (e)(f) of AS3959:2018. The remainder of the property was deemed unmanaged grass and appeared used marginally and is therefore classed as GROUP G GRASSLAND per Table 2.3 of AS3959:2018. #163 is a large Agricultural zoned lot, consisting of various class1a sheds and all-weather driveways. The land within the 100m assessment zone is grassed appearing in an unmanaged condition. Despite being various shipping containers in the area, the grass surrounding them was not mowed. Therefore, due to the minimal land use the grass is classed as GROUP G GRASSLAND per Table 2.3 of AS3959:2018.

Figure 4 below shows the relationship between the subject site and the surrounding vegetation.

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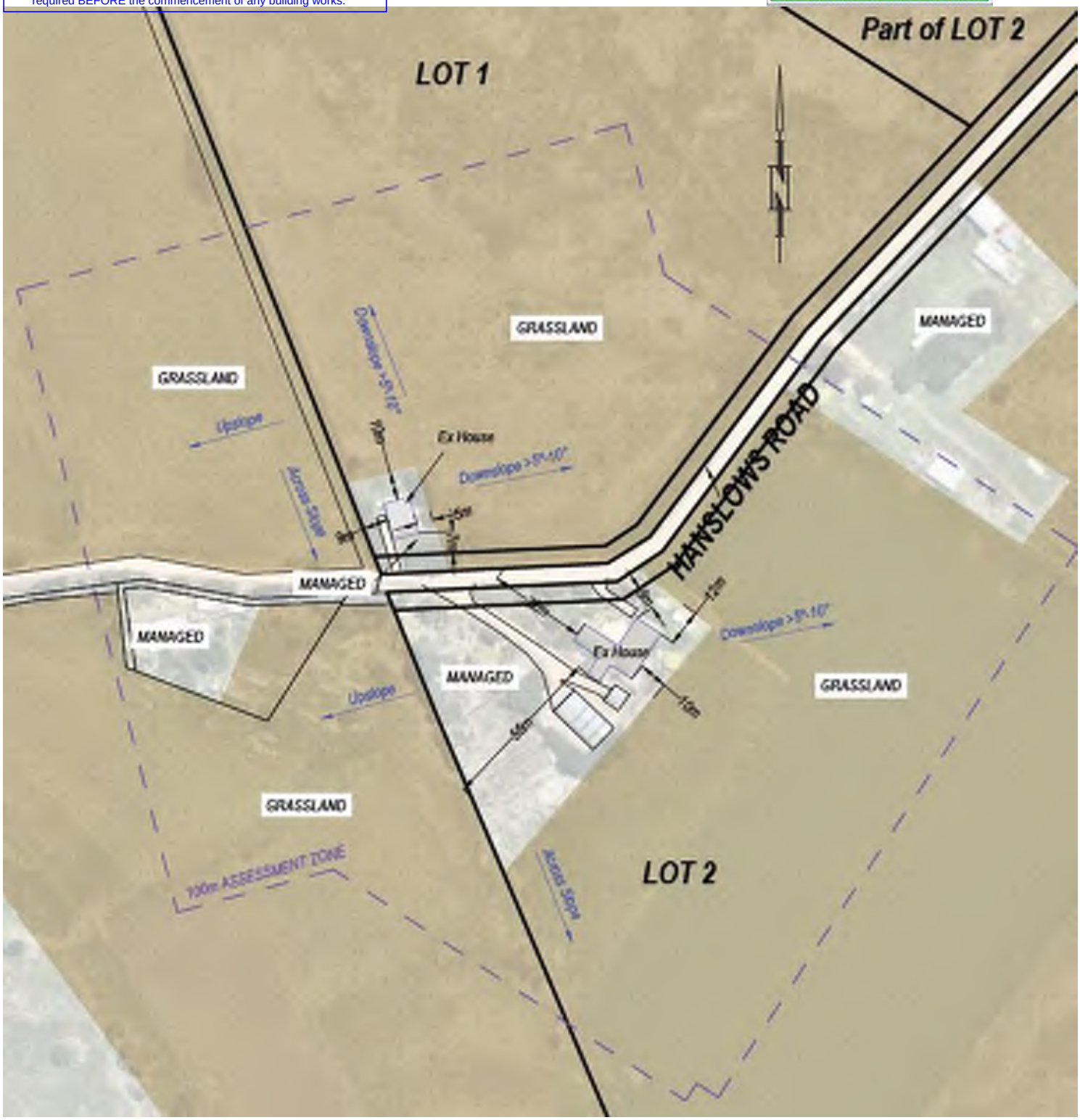

Figure 4 classified vegetation (within 100m of site) and existing separation from bushfire-prone vegetation (not to scale)

3.3 Bushfire Attack Level (BAL)

Table 2 BAL rating for each lot and required separation distances

LOT 1 – EXISTING DWELLING				
DIRECTION OF SLOPE	**NORTH**	**EAST**	**SOUTH**	**WEST**
Vegetation Classification	MANAGED GRASSLAND	MANAGED GRASSLAND	MANAGED	MANAGED GRASSLAND
Existing Horizontal distance to classified vegetation	10m-100m (G)	5m-100m (G)	N/A	9m-100m (G)
Effective Slope under vegetation	Downslope >5°-10°	Downslope >5º-10°	Upslope	Across slope
Exemption			(a)(e)(f)	
Current BAL value for each side of the site	BAL-29	BAL-FZ	BAL-LOW	BAL-29
Separation distances to achieve BAL-19	13m	13m	N/A	10m
Separation distances to achieve BAL-12.5	19m	19m	N/A	14m

LOT 2 – EXISTING DWELLING				
DIRECTION OF SLOPE	**NORTH-EAST**	**SOUTH-EAST**	**SOUTH-WEST**	**NORTH-WEST**
Vegetation Classification	MANAGED GRASSLAND	MANAGED GRASSLAND	MANAGED GRASSLAND	MANAGED GRASSLAND
Existing Horizontal distance to classified vegetation	12m-91m (G)	10m-14m (G)	56m-100m (G)	32m-63m & 84m-100m (G)
-Effective Slope under vegetation	Downslope >5°-10°	Across slope	Upslope	Downslope 0°-5°
Exemption			(G) >50m	
Current BAL value for each side of the site	BAL-29	BAL-19	BAL-LOW	BAL-12.5
Separation distances to achieve BAL-19	13m	10m	N/A	11m
Separation distances to achieve BAL-12.5	19m	14m	N/A	16m

3.4 Definition of BAL-LOW

Bushfire Attack Level shall be classified BAL-LOW per Section 2.2.3.2 of AS3959:2018 where the vegetation is one or a combination of any of the following Exemptions:

a) Vegetation of any type that is more than 100m from the site.
b) Single areas of vegetation less than 1 hectare in area and not within 100m of other areas of vegetation being classified.
c) Multiple areas of vegetation less than 0.25 ha in area and not within 20m of the site, or each other.
d) Strips of vegetation less than 20m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified.
e) Non-vegetated areas, including waterways, roads, footpaths, buildings and rocky outcrops.
f) Low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks.

NOTE: Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short-cropped grass for example, to a nominal height of 100mm).

The BAL level will also be classified as BAL-LOW if Grassland fuel is >50m from the site for any effective slope per Table 2.6 of AS3959:2018.

BAL ratings are as stated below:

BAL LOW	BAL 12.5	BAL 19	BAL 29	BAL 40	BAL FZ
There is insufficient risk to warrant any specific construction requirements, but there is still some risk	Ember attack and radiant heat below 12.5 kW/m²	Increasing ember attack and windborne debris, radiant heat between 12.5 kW/m² and 19 kW/m2	Increasing ember attack and windborne debris, radiant heat between 19kW/m² and 29 kW/m2	Increasing ember attack and windborne debris, radiant heat between 29 kW/m² and 40 kW/m². Exposure to flames from fire front likely	Direct Exposure to flames, radiant heat and embers from the fire front

4 BUSHFIRE PROTECTION MEASURES

4.1 Hazard Management Areas (HMA)

Hazard Management Area as described in the Code "*maintained in a minimal fuel condition and in which there are no other hazards present which will significantly contribute to the spread of a bushfire".* Also as described from Note 1 of AS3959:2018 Clause 2.2.3.2 "*Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short-cropped grass for example, to a nominal height of 100 mm)".*

Compliance

The building areas within lots 1 and 2 require a Bushfire Hazard Management Area to be established and maintained between the bushfire vegetation and the area at a distance equal to, or greater than specified for the Bushfire Attack Level in Table 2.6 of AS3959:2018.

To comply with the Acceptable Solution lots 1 and 2 requires some requisite fuel management of the unmanaged grassland within the HMA. (See TFS advice below).

The HMA's for lots 1 and 2 need to be established prior to sealing of titles

Due to existing developed and managed land, some separation distances may already be achieved.

The developer has advised there is no intent to develop the vacant part of lot 2 in the immediate future. Any future development within this part of lot 2 will require further assessment.

Minimum separation distances for each lot are stated below.

LOT 1 – Separation Distances (Existing Dwelling)				
Aspect	North	East	South	West
BAL-19	13m	13m	N/A	10m
BAL-12.5	19m	19m	N/A	14m

LOT 2 – Separation Distances (Existing Dwelling)				
Aspect	North-East	South-East	South-West	North-West
BAL-19	13m	10m	N/A	11m
BAL-12.5	19m	14m	N/A	16m

The Tasmanian Fire Service provides the following advice regarding the implementation and maintenance of Hazard management areas:

- Removing of fallen limbs, sticks, leaf and bark litter
- Maintaining grass at less than a 100mm height
- Removing pine bark and other flammable mulch (especially from against buildings)
- Thinning out understory vegetation to provide horizontal separation between fuels
- Pruning low-hanging tree branches (<2m from the ground) to provide vertical separation between fuel layers
- Pruning larger trees to maintain horizontal separation between canopies
- Minimize the storage of flammable materials such as firewood
- Maintaining vegetation clearance around vehicular access and water supply points
- Use of low-flammability species for landscaping purposes where appropriate
- Clearing out any accumulated leaf and other debris from roof gutters.

Additional site-specific fuel reduction or management may be required. An effective hazard management area does not require removal of all vegetation. Rather, vegetation must be designed and maintained in a way that limits opportunity for vertical and horizontal fire spread in the vicinity of the building being protected. Retaining some established trees can even be beneficial in terms of protecting the building from wind and ember attack

4.2 Public and Fire Fighting Access

Public Access

The proposed development fronts Hanslows Road, which is an all-weather public road maintained by the Clarence Council. The proposed development 2 is approx. 1.4km north-east along Hanslows Road from where it commences at the intersection with Richmond Road. The approx. carriageway width of Richardsons Road is 4m-4.5m with clear verges.
No upgrades required to Hanslows Road and therefore the public road complies with public access road requirements.

Property Access

Current Conditions:

Both existing dwellings have access' off Hanslows Road. The current access for lot 1 is concrete, approximately 19m long for an average carriageway width of 3m. There is adequate room at the front of the dwelling if turning is required for a fire appliance. There is two access' off Hanslows Road to the existing dwelling on lot 2. The main access is approximately 67m long for an average carriageway width of 4m for the main strip of driveway. The main access forks off to an adjacent shed which will provide adequate room for turning for a fire appliance. The second access is approximately 18m long for an average carriageway width of 3.6m.

Figure 5 – Lot 1 access

Figure 6 – Lot 2 main access

Figure 7 – Lot 2 additional access

Compliance:

Lot 1

Access to the existing dwelling in lot 1 is <30m. However, access is required for a fire appliance and therefore must comply with the relevant standards of Acceptable Solution A1 and Table C13.2 of the Code demonstrated in table 3 below.

Lot 2

Access to the existing dwelling in lot 2 is >30m and access is required for a fire appliance. Therefore, the access must comply with the relevant standards of Acceptable Solution A1 and Table C13.2 of the Code demonstrated in table 3 below.

Required widening/clearing of verges should be done prior to sealing of titles

Table 3 - **Requirements for access length greater than 30m but less than 200m C13.6.2 and Table C13.2**

Access Standards: (access length greater than 30m but less than 200m)

a) All-weather construction;
b) Load capacity of at least 20 t, including bridges and culverts;
c) Minimum carriageway width of 4m;
d) Minimum vertical clearance of 4m;
e) Minimum horizontal clearance of 0.5m from the edge of the carriageway;
f) Cross falls less than 3 degrees (1:20 or 5%)
g) Dips less than 7 degrees (1:8 or 12.5%);
h) Curves with a minimum inner radius of 10m;
i) Maximum gradient of 15 degrees (1:3.5 or 28%) for sealed roads, and 10 degrees (1:5.5 or 18%) for unsealed road; and
j) Terminate with a turning area for fire appliances provided by one of the following
    i. A turning circle with a minimum outer radius of 10m; or
    ii. A property access encircling the building; or
    iii. A hammerhead 'T' or 'y' turning head 4m wide and 8m long.

4.3 Water Supply for Fire Fighting

Current Conditions:

Site assessment confirmed the property is not serviced by reticulated water. Both lots have existing water tanks for domestic uses only.

Compliance:

Both lots 1 and 2 must be provided with a firefighting water supply that meet the requirements for Acceptable Solution A2 of section C13.6.3 and Table C13.5. Firefighting water supply requirements for both lots must be provided prior to sealing of titles. Static water supply requirements are outlined in Table 4 below which is per C13.6.3 and Table C13.5.

Table 4 – **Requirements for Static Water Supply C13.6.3 and Table C13.5**

A. Distance between building area to be protected and water supply
   a) the building area to be protected must be located within 90m of the fire fighting water point of a static water supply; and
   b) the distance must be measured as a hose lay, between the fire fighting water point and the furthest part of the building area

B. Static Water supplies
   a) may have a remotely located offtake connected to the static water supply;
   b) may be a supply for combined use (fire fighting and other uses) but the specified minimum quantity of fire fighting water must be available at all times;
   c) must be a minimum of 10,000L per building area to be protected. This volume of water must not be used for any other purpose including fire fighting sprinkler or spray systems;
   d) must be metal, concrete or lagged by non-combustible materials if above ground; and
   e) if a tank can be located so it is shielded in all directions in compliance with section 3.5 of Australian Standard AS 3959-2009 Construction of buildings in bushfire-prone areas, the tank may be constructed of any material provided that the lowest 400mm of the tank exterior is protected by:
      (i) metal;
      (ii) non-combustible material; or
      (iii) fibre-cement a minimum of 6mm thickness.

C. Fittings, pipework and accessories (including stands and tank supports)
   Fittings and pipework associated with a fire fighting water point for a static water supply must:

   (a) have a minimum nominal internal diameter of 50mm;
   (b) be fitted with a valve with a minimum nominal internal diameter of 50mm;
   (c) be metal or lagged by non-combustible materials if above ground;
   (d) if buried, have a minimum depth of 300mm [S1];
   (e) provide a DIN or NEN standard forged Storz 65mm coupling fitted with a suction washer for connection to fire fighting equipment;

(f) ensure the coupling is accessible and available for connection at all times;
(g) ensure the coupling is fitted with a blank cap and securing chain (minimum 220mm length);
(h) ensure underground tanks have either an opening at the top of not less than 250mm diameter or a coupling compliant with this Table; and
(i) if a remote offtake is installed, ensure the offtake is in a position that is:
    (i) visible;
    (ii) accessible to allow connection by fire fighting equipment;
    (iii) at a working height of 450 – 600mm above ground level; and
    (iv) protected from possible damage, including damage by vehicles.

D. Signage for static water connections

The fire fighting water point for a static water supply must be identified by a sign permanently fixed to the exterior of the assembly in a visible location. The sign must:

a) comply with water tank signage requirements within Australian Standard AS 2304-2011 Water storage tanks for fire protection systems; or
b) comply with the Tasmania Fire Service Water Supply Guideline published by the Tasmania Fire Service.

E. Hardstand

A hardstand area for fire appliances must be:

a) no more than 3m from the fire fighting water point, measured as a hose lay (including the minimum water level in dams, swimming pools and the like);
b) no closer than 6m from the building area to be protected;
c) a minimum width of 3m constructed to the same standard as the carriageway; and
d) connected to the property access by a carriageway equivalent to the standard of the property access.

4.4 Construction Standards

All future habitable buildings or extensions to existing dwellings within the specified building areas on each lot must be designed and constructed to the minimum BAL ratings specified in the Bushfire Hazard Management Plan (Appendix C) and to BAL construction standards in accordance with AS3959:2018 or subsequent edition as applicable at the time of building approval.

The BAL-19 and BAL-12.5 building setback lines on the BHMP defines the minimum setbacks for habitable buildings.

Future class10a buildings within 6m of a Class 1a must be constructed to the same BAL as the dwelling or to provide fire separation in accordance with Clause 3.2.3 of AS3959:2018.

5 STATUTORY COMPLIANCE

The applicable bushfire requirements are specified in State Planning Provisions C13.0 – Bushfire-Prone Areas Code.

Clause	Compliance
C13.4 Use or development exempt from this code	N/A
C13.5 Use Standards	
C13.5.1 Vulnerable Uses	N/A
C13.5.2 Hazardous Uses	N/A
E1.5 Development Standards for Subdivision	
C13.6.1 Provision of Hazard Management Areas.	To comply with the Acceptable Solution A1, the proposed plan of subdivision must; • Show building areas for each lot; and • Show hazard management areas between these building areas and that of the bushfire vegetation with the separation distances required for BAL 19 in Table 2.6 of *Australian Standard AS 3959:2018 Construction of buildings in bushfire-prone areas.* The BHMP demonstrates that both lots can accommodate a BAL rating of BAL-19 or BAL-12.5 with on-site vegetation managing for both lots 1 and 2. The HMA's for both lots 1 and 2 need to be established prior to occupancy of future dwellings. Subject to the compliance with the BHMP the proposal will satisfy the Acceptable Solution C13.6.1(A1)
C13.6.2 Public and firefighting access; A1	The BHMP (through reference to section 4 of this report) specifies requirements for private accesses are consistent with Table C13.2(A)(B). Required upgrades to be constructed prior to sealing of titles. Subject to the compliance with the BHMP the proposal satisfies the Acceptable Solution C13.6.2(A1).
C13.6.3 A1 and A2 Provision of water supply for firefighting purposes.	Static water supply is required for both lots 1 and 2 per C13.6.3 A2. Firefighting water supply requirements for both lots must be provided prior to sealing of titles. Subject to the compliance with the BHMP the proposal satisfies the Acceptable Solution C13.6.3

6 CONCLUSION & RECOMMENDATIONS

The proposed subdivision is endorsed that each lot can meet the requirements of C13.0 Bushfire-prone Areas Code for a maximum BAL rating of BAL-19 or BAL-12.5 for both lots 1 and 2. Providing compliance with measures outlined in the BHMP (Appendix C) and sections 4 & 5 of this report.

Recommendations:

- The HMA's within the subdivision be applied in accordance with section 4.1 of this report and the BHMP (Appendix C).
- Requisite fuel management for both lots 1 and 2 must be done prior to sealing of titles.
- Static water supply, hardstand and turning head area for both lots 1 and 2 needs to be installed prior to sealing of titles
- Clarence Council condition the planning approval on the compliance with the BHMP (as per Appendix C).
- If the vacant part of lot 2 is developed in the future, further assessment is required.

7 REFERENCES

Department of Primary Industries and Water, The LIST, viewed February 2022, www.thelist.tas.gov.au

Standards Australia, 2018, *AS 3959:2018 – Construction of buildings in bushfire-prone areas*, Standards Australia, Sydney.

Tasmanian Planning Commission, 2015, *Tasmanian Planning Scheme - Clarence,* viewed February 2022, www.iplan.tas.gov.au

Building Act 2016. The State of Tasmania Department of Premier and Cabinet. https://www.legislation.tas.gov.au/view/html/inforce/current/act-2016-025

Building Regulations 2016. The State of Tasmania Department of Premier and Cabinet. https://www.legislation.tas.gov.au/view/html/inforce/current/sr-2016-110

8 APPENDIX A – SITE PHOTOS

Figure 8 – Grassland fuel within lot 1, view facing North

Figure 9 – Grassland fuel within lot 2, view facing SE

Figure 10 – Grassland fuel to the west of lot 1, view facing NW from Hanslows Rd

Figure 11 – Grassland fuel west of lot 2, view facing west

Figure 12 – Existing dwelling within lot 1, view facing NE

Figure 13 – Existing dwelling within lot 2, view facing S, SW

Figure 14 – Adequate turning area for fire appliances in lot 2

Figure 15 – Area for remote offtake in lot 1

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9 APPENDIX B – SUBDIVISION PROPOSAL PLAN

Brooks, Lark and Carrick SURVEYORS

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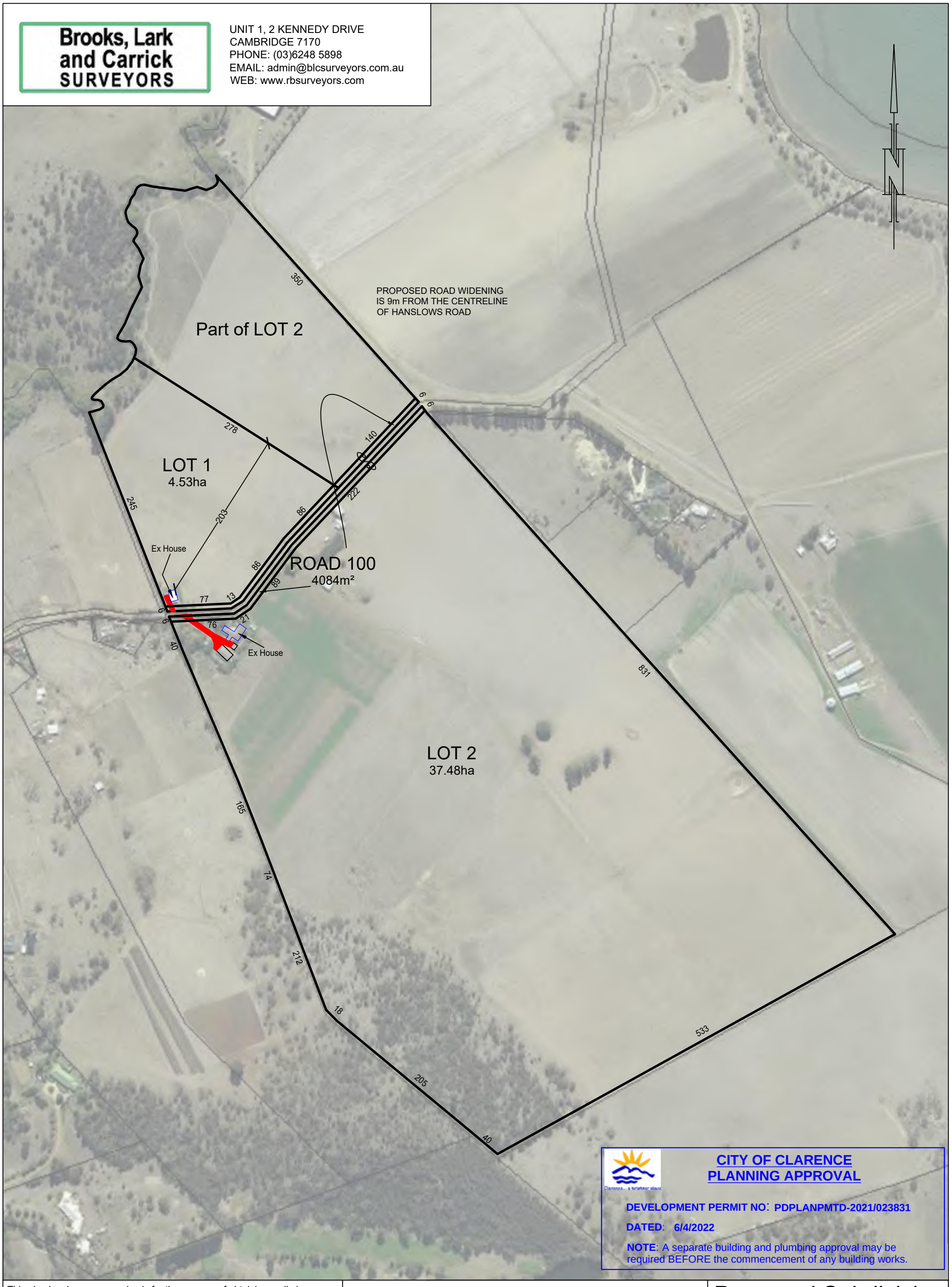


CITY OF CLARENCE
PLANNING APPROVAL

DEVELOPMENT PERMIT NO: PDPLANPMTD-2021/023831

DATED: 6/4/2022

NOTE: A separate building and plumbing approval may be required BEFORE the commencement of any building works.

This plan has been prepared only for the purpose of obtaining preliminary subdivsional approval from the local authority and is subject to that approval.

All measurements and areas are subject to the final survey.

Base image by TASMAP (www.tasmap.tas.gov.au), © State of Tasmania
Base data from the LIST (www.thelist.tas.gov.au), © State of Tasmania

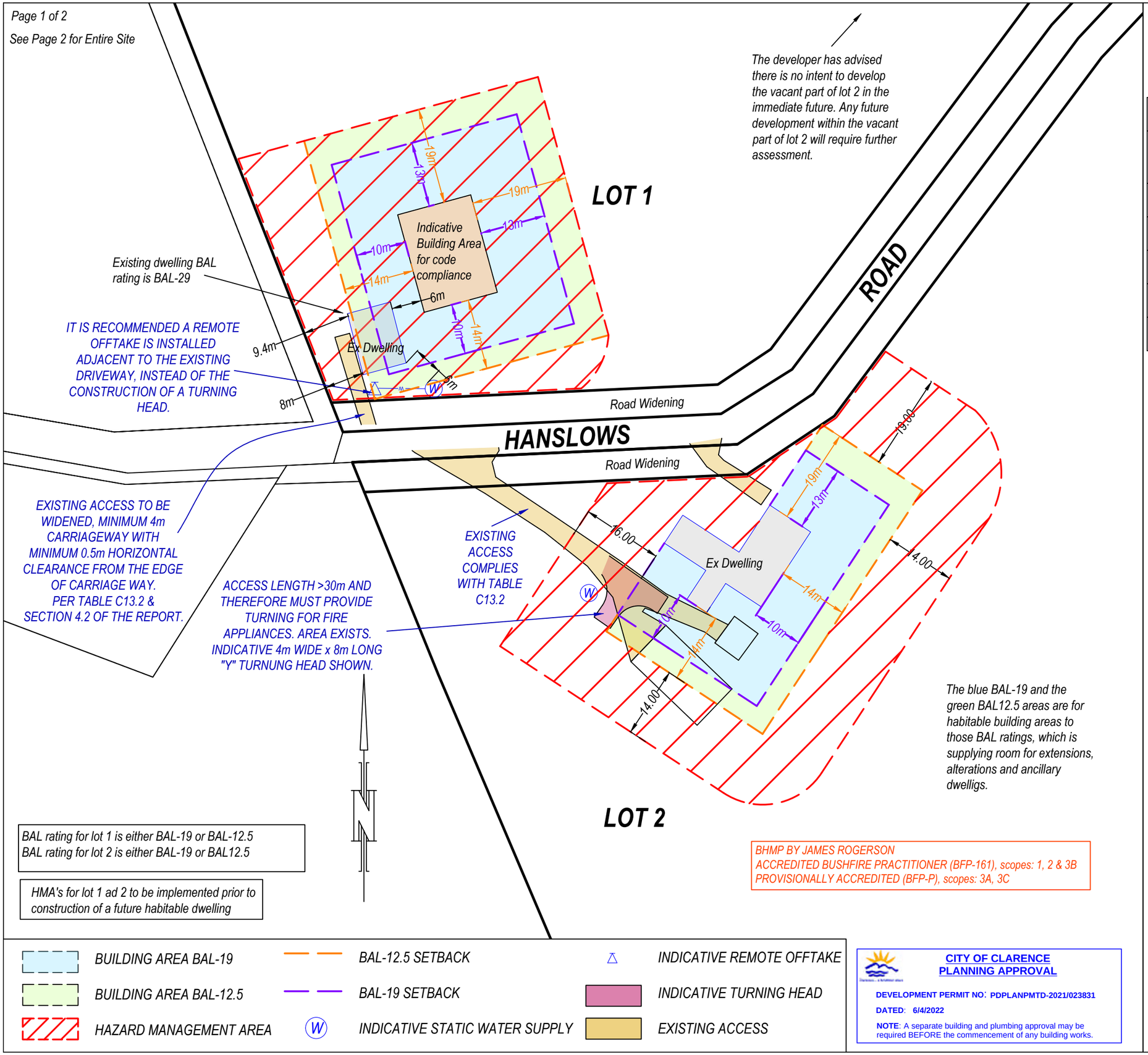
OWNER:	J.R. & H.M. SPAULDING
TITLE REFERENCE:	C.T.105616/1
LOCATION:	205 HANSLOWS ROAD, CAMBRIDGE

Proposed Subdivision

Date: 18-02-2022	Reference: APPLA01 13921-01
Scale: 1:4000 (A3)	Municipality: CLARENCE

10 APPENDIX C – BUSHFIRE HAZARD MANAGEMENT PLAN

See Page 2 for Entire Site



BHMP BY JAMES ROGERSON
ACCREDITED BUSHFIRE PRACTITIONER (BFP-161), scopes: 1, 2 & 3B
PROVISIONALLY ACCREDITED (BFP-P), scopes: 3A, 3C

CITY OF CLARENCE PLANNING APPROVAL

DEVELOPMENT PERMIT NO: PDPLANPMTD-2021/023831

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BUSHFIRE HAZARD MANAGEMENT PLAN

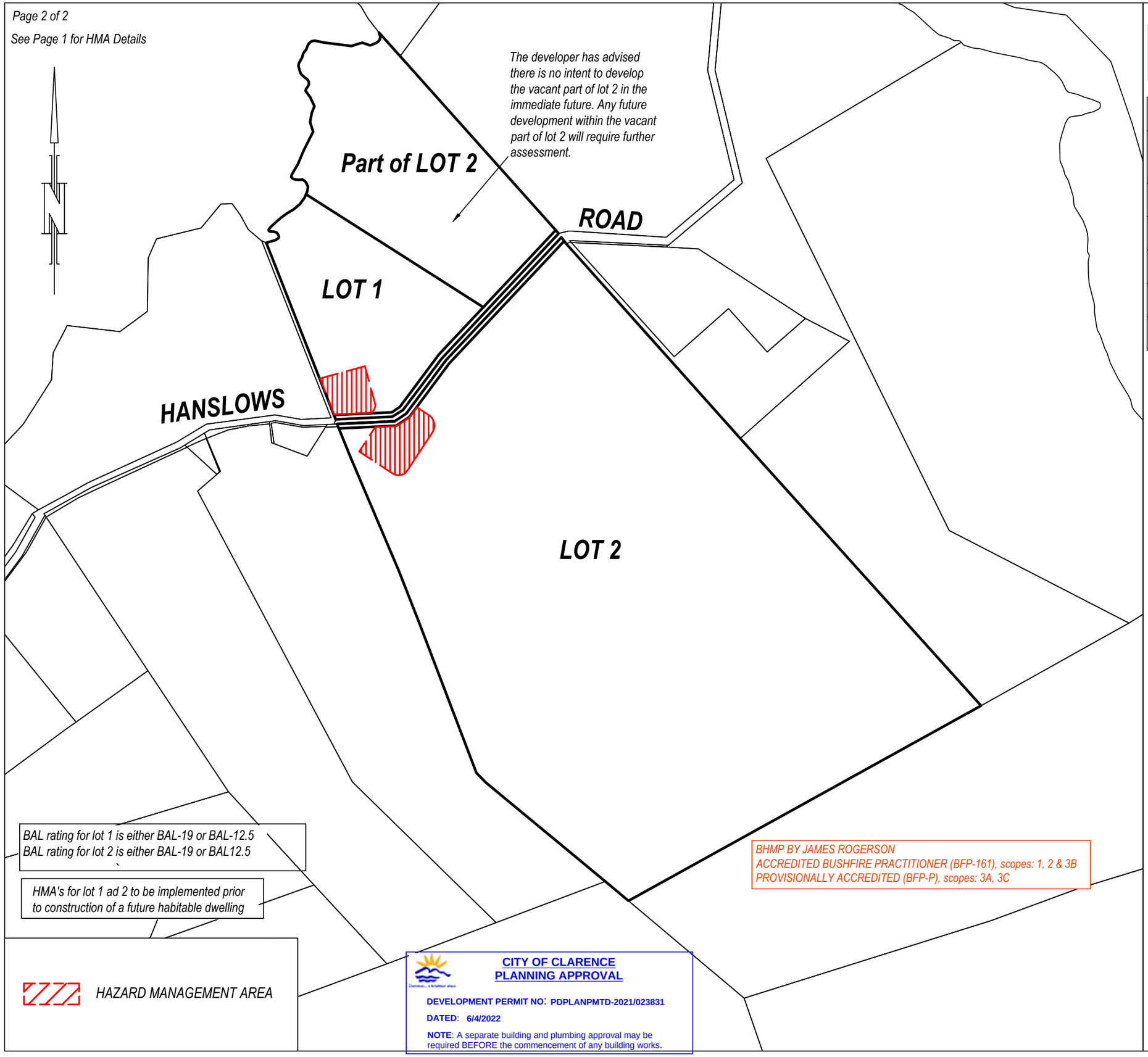
LOCATION:	205 Hanslows Road, Cambridge TAS 7170
TITLE REFERENCE:	C.T.105616/1
PROPERTY ID:	5170762
MUNICIPALITY:	Clarence
DATE:	16th March 2022 (v3)
SCALE: 1:750 @ A3	REFERENCE: APPLA01

REQUIREMENTS

1. HAZARD MANAGEMENT AREAS (HMA)
   - 1.1. HMA to be established to distances indicated on this plan and as set out in Section 4.1 of the Bushfire Hazard Report.
   - 1.2. Vegetation in the HMA needs to be strategically modified and then maintained in a low fuel state to protect future dwellings from direct flame contact and intense radiant heat. An annual inspection and maintenance of the HMA should be conducted prior to the bushfire season. All grasses or pastures must be kept short (<100 mm) within the HMA. Fine fuel loads at ground level such as leaves, litter and wood piles must be minimal to reduce the quantity of wind borne sparks and embers reaching buildings; and to halt or check direct flame attack.
   - 1.3. Some trees can be retained provided there is horizontal separation between the canopies; and low branches are removed to create vertical separation between the ground and the canopy. Small clumps of established trees and/or shrubs may act to trap embers and reduce wind speeds.
   - 1.4. No trees to overhang houses to prevent branches or leaves from falling on the building.
   - 1.5. Non-combustible elements including driveways, paths and short cropped lawns are recommended within the HMA.
   - 1.6. Fine fuels (leaves bark, twigs) should be removed from the ground periodically (pre-fire season) and all grasses or pastures must be kept short (<100 mm).
2. CONSTRUCTION STANDARDS
   - 2.1. Future dwellings within the specified building areas to be designed and constructed to BAL ratings shown on this plan in accordance with AS3959:2018 at the time of building approval
   - 2.2. Future outbuildings within 6m of a class 1a dwelling must be constructed to the same BAL as the dwelling or provide fire separation in accordance with Clause 3.2.3 of AS3959:2018.
   - 2.3. The location of the building areas of lots 1 and 2 are indicative and can be varied as long as the minimum separation distances are still met.
3. PUBLIC AND FIRE-FIGHTING ACCESS REQUIREMENTS
   - 3.1. Access to all lots must comply with the design and construction requirements specifed in Section 4.2 of the Bush Fire Report.
4. STATIC FIRE-FIGHTING WATER SUPPLY

4.1 New habitable dwellings and existing dwellings must be supplied with a static water supply that is;
- Dedicated soley for fire fighting purposes;
- Minimum capacity of 10,000L;
- is accessible by fire fighting vehicles and within 3.0m of a hardstand area; and
- Consistant with the specifications outlined in section 4.3 if the Bushfire Report.

This plan is to be read in conjunction with the preceding *Bushfire Hazard Report "Proposed 2 Lot Subdivision 205 Hanslows Road, Cambridge" dated 04/03/2022.*



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WEB: www.rbsurveyors.com

BUSHFIRE HAZARD MANAGEMENT PLAN

LOCATION:	205 Hanslows Road, Cambridge TAS 7170
TITLE REFERENCE:	C.T.105616/1
PROPERTY ID:	5170762
MUNICIPALITY:	Clarence
DATE:	16th March 2022 (v3)
SCALE: 1:5000 @ A3	REFERENCE: APPLA01

REQUIREMENTS

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   - 1.3. Some trees can be retained provided there is horizontal separation between the canopies; and low branches are removed to create vertical separation between the ground and the canopy. Small clumps of established trees and/or shrubs may act to trap embers and reduce wind speeds.
   - 1.4. No trees to overhang houses to prevent branches or leaves from falling on the building.
   - 1.5. Non-combustible elements including driveways, paths and short cropped lawns are recommended within the HMA.
   - 1.6. Fine fuels (leaves bark, twigs) should be removed from the ground periodically (pre-fire season) and all grasses or pastures must be kept short (<100 mm).
2. CONSTRUCTION STANDARDS
   - 2.1. Future dwellings within the specified building areas to be designed and constructed to BAL ratings shown on this plan in accordance with AS3959:2018 at the time of building approval
   - 2.2. Future outbuildings within 6m of a class 1a dwelling must be constructed to the same BAL as the dwelling or provide fire separation in accordance with Clause 3.2.3 of AS3959:2018.
   - 2.3. The location of the building areas of lots 1 and 2 are indicative and can be varied as long as the minimum separation distances are still met.
3. PUBLIC AND FIRE-FIGHTING ACCESS REQUIREMENTS
   - 3.1. Access to all lots must comply with the design and construction requirements specifed in Section 4.2 of the Bush Fire Report.
4. STATIC FIRE-FIGHTING WATER SUPPLY

4.1 New habitable dwellings and existing dwellings must be supplied with a static water supply that is;

- Dedicated soley for fire fighting purposes;
- Minimum capacity of 10,000L;
- is accessible by fire fighting vehicles and within 3.0m of a hardstand area; and
- Consistant with the specifications outlined in section 4.3 if the Bushfire Report.

This plan is to be read in conjunction with the preceding *Bushfire Hazard Report "Proposed 2 Lot Subdivision 205 Hanslows Road, Cambridge" dated 08/02/2022.*

CITY OF CLARENCE
PLANNING APPROVAL

DEVELOPMENT PERMIT NO: PDPLANPMTD-2021/023831

DATED: 6/4/2022

NOTE: A separate building and plumbing approval may be required BEFORE the commencement of any building works.

Brooks, Lark and Carrick SURVEYORS

11 APPENDIX D – PLANNING CERTIFICATE