
Application for Planning

S.57 Land Use Planning and Approvals Act 1993

The following application has been received:

Application No.: **DA2025186**

Location: **45 Sice Avenue, Heybridge**

Proposal: **Residential - dwelling extension**

The application may be inspected at the Administration Centre, 19 King Edward Street, Ulverstone during Office hours and on the council's website: www.centralcoast.tas.gov.au Any person may make representation in relation to the applications (in accordance with S.57(5) of the Act) by writing to the Chief Executive Officer, PO Box 220, Ulverstone 7315 or by email to admin@centralcoast.tas.gov.au and quoting the Application No. Any representations received by the Council are classed as public documents and will be made available to the public where applicable under the *Local Government (Meeting Procedures) Regulations 2025*.

The representation must be made on or before 24 November 2025

Date of Notification: **08 November 2025**

CENTRAL COAST COUNCIL
PO Box 220
19 King Edward Street
ULVERSTONE TASMANIA 7315
Ph: (03) 6429 8900
Email: planning@centralcoast.tas.gov.au
www: centralcoast.tas.gov.au



Land Use Planning and Approvals Act 1993
Tasmanian Planning Scheme – Central Coast
PLANNING PERMIT APPLICATION

CENTRAL COAST COUNCIL
**CENTRAL COAST COUNCIL
LAND USE PLANNING**
Received: 13/08/2025
Application No: DA2025186
Doc ID: 527954

Office use only: Zone: Permit Pathway – NPR/Permitted/Discretionary

Use or Development Site:

Site Address: 45 SICE AVENUE MEGARIDGE.

Certificate of Title Reference: 138382 FOLIO 30

Land Area: 892 Heritage Listed Property: NO YES

Applicant(s)

First Name(s): ADAM Surname(s): WEEDA.

Company name (if applicable): WEEDA DRAFTING & BUILDING CONSULTANTS Contact No: 0427 333 129

Postal Address: 95 QUEEN STREET
WEST ULVERSTONE 7315

Email address: ADMIN@WEEDADRAFTING.COM.AU

Please tick box to receive correspondence and any relevant information regarding your application via email.

Owner(s) (note – if more than one owner, all names must be indicated)

First Name(s): BROOKE Middle Names(s): KRISTINA

Surname(s): BLOMER Company name (if applicable): N/A.

Postal Address: 45 SICE AVENUE MEGARIDGE

PERMIT APPLICATION INFORMATION (If insufficient space for proposed use and development, please attach separate documents)

"USE" is the purpose or manner for which land is utilised.
Proposed Use PRIVATE USE
Use Class Office use only

"Development" is the works required to facilitate the proposed use of the land, including the construction or alteration or demolition of buildings and structures, signs, any change in ground level and the clearing of vegetation.
Proposed Development (please submit all documentation in PDF format to planning@centralcoast.tas.gov.au separating A4 documents & forms from A3 documents).
EXTENSION BALCONY + ATRIUM.

Value of the development – (to include all works on site such as outbuildings, sealed driveways and fencing)
\$. 250 K Estimate/ Actual
Total floor area of the development 300 m² TOTAL.

Declaration of Notice to Landowner

If land is NOT in the applicant's ownership

I ADAM WESSON, declare that the owner/each of the owners of the land has been notified of the intention to make this permit application under section 52(1) of the *Land Use Planning and Approvals Act 1993*.
Signature of Applicant [Signature] Date 12/08/25

If the application involves land within a Strata Corporation

I _____, declare that the owner/each of the owners of the body corporation has been notified of the intention to make this permit application.
Signature of Applicant _____ Date _____

If the application involves land owned or administered by the CENTRAL COAST COUNCIL

Central Coast Council consents to the making of this permit application.

General Managers Signature _____ Date

If the permit application involves land owned or administered by the CROWN

I, _____ the Minister

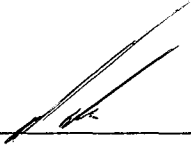
responsible for the land, consent to the making of this permit application.

Minister (Signature) _____ Date

NB: If the site includes land owned or administered by the Central Coast Council or by a State government agency, the consent in writing (a letter) from the Council or the Minister responsible for Crown land must be provided at the time of making the application - and this application form must be signed by the Council or the Minister responsible.

Applicants Declaration


I/ we ADAM NEEDA
declare that the information I have given in this permit application to be true and correct to the best of my knowledge.

Signature of Applicant/s  Date 12/08/25

Office Use Only	
Planning Permit Fee	\$
Public Notice Fee	\$
Permit Amendment / Extension Fee	\$
No Permit Required Assessment Fee	\$
TOTAL	\$
Validity Date	

SEARCH OF TORRENS TITLE

VOLUME 138382	FOLIO 30
EDITION 5	DATE OF ISSUE 27-Feb-2025

 CENTRAL COAST COUNCIL LAND USE PLANNING	
Received:	13/08/2025
Application No:	DA2025186
Doc ID:	527952

SEARCH DATE : 11-Aug-2025
SEARCH TIME : 07.33 PM

DESCRIPTION OF LAND

Parish of STOWPORT Land District of DEVON
Town of HEYBRIDGE
City of BURNIE
Lot 30 on Plan 138382 (Section 27A of the Land Titles Act.)
Derivation : Whole of Lot 30 on Plan 138382 Gtd. to The Crown

SCHEDULE 1

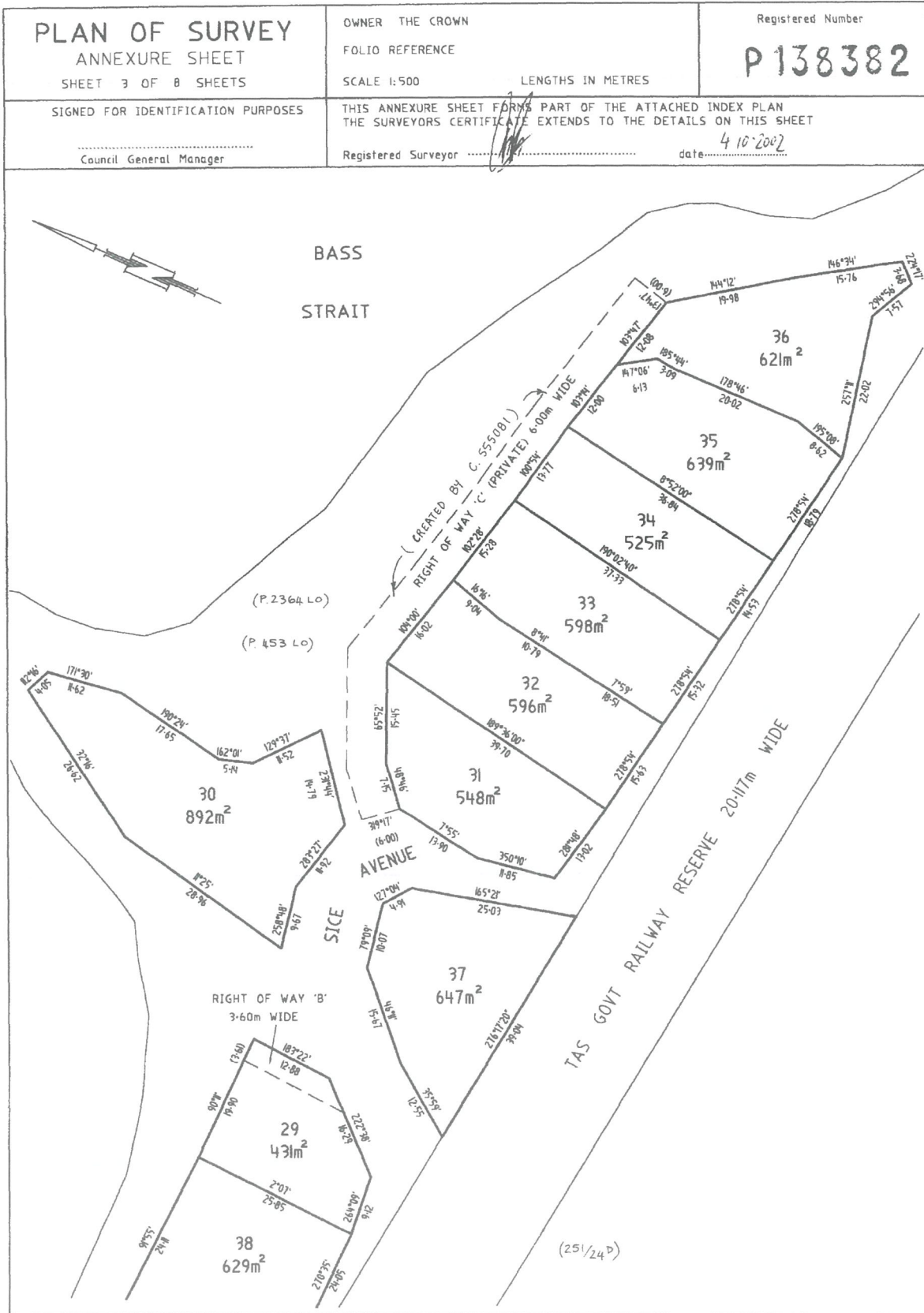
N236404 TRANSFER to BROOKE KRISTINA BLOMER Registered
27-Feb-2025 at noon

SCHEDULE 2

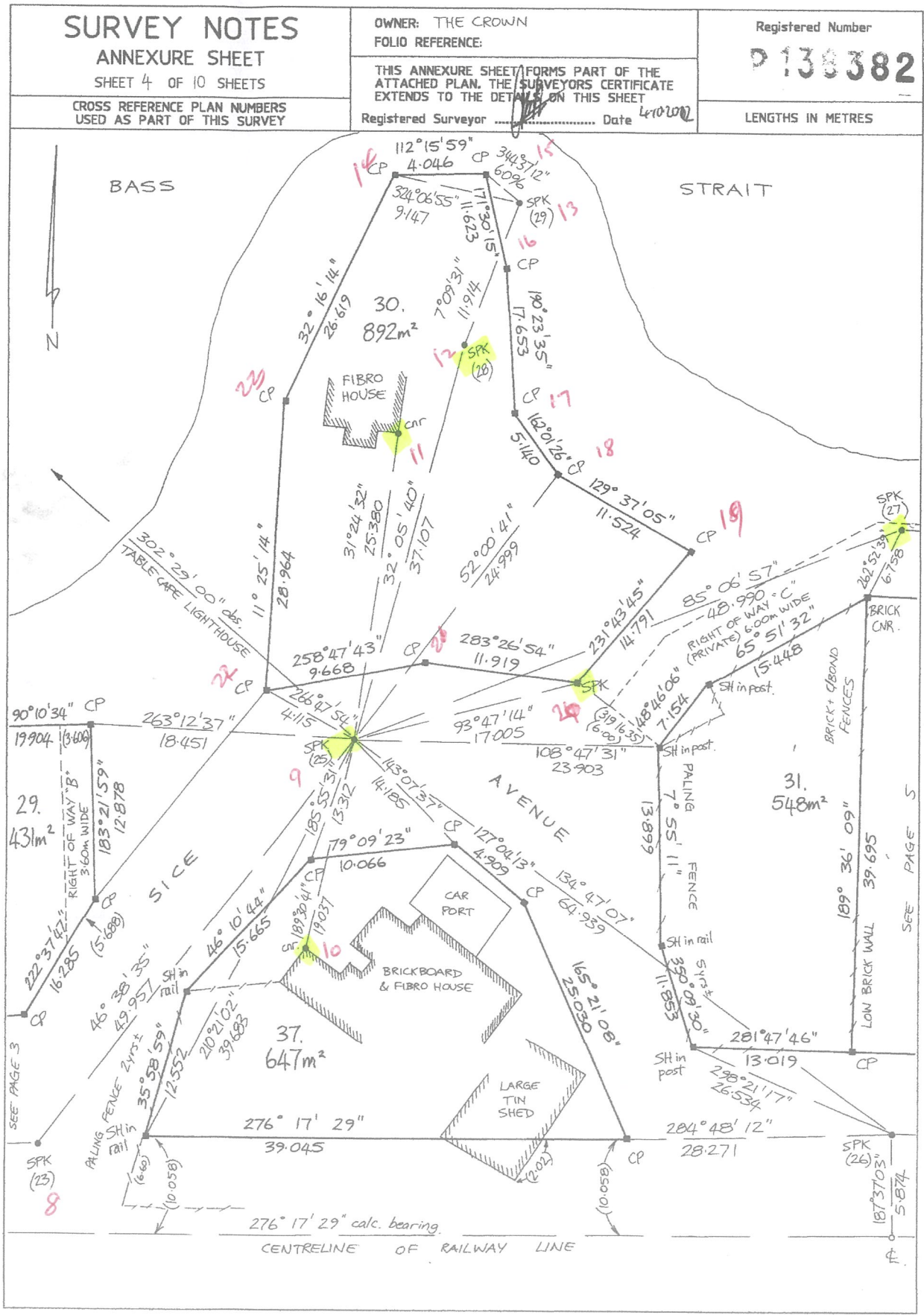
C373988 Land is limited in depth to 15 metres, excludes minerals and is subject to reservations relating to drains sewers and waterways in favour of the Crown
C588105 Land is limited in depth to 15 metres, excludes minerals and is subject to reservations relating to drains sewers and waterways in favour of the Crown
C588105 FENCING PROVISION in Transfer
C549025 NOTICE to Record Bar to Action Section 30 Crown Lands (Shack Sites) Act 1997 Registered 21-Apr-2004 at noon
C489984 Order setting forth Covenants Registered 26-Apr-2004 at noon
E406472 MORTGAGE to Westpac Banking Corporation Registered 27-Feb-2025 at 12.01 PM

UNREGISTERED DEALINGS AND NOTATIONS

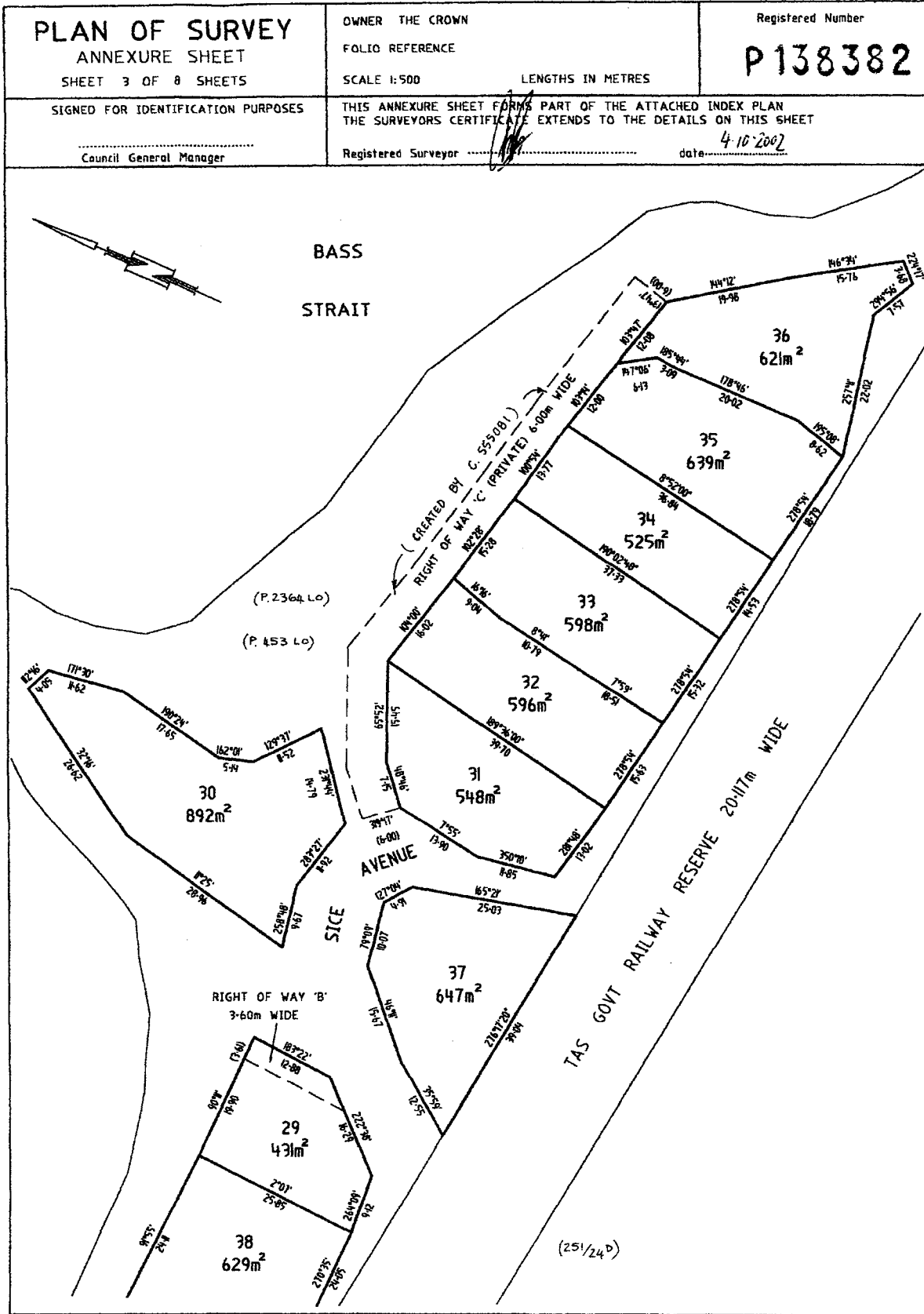
No unregistered dealings or other notations



138382



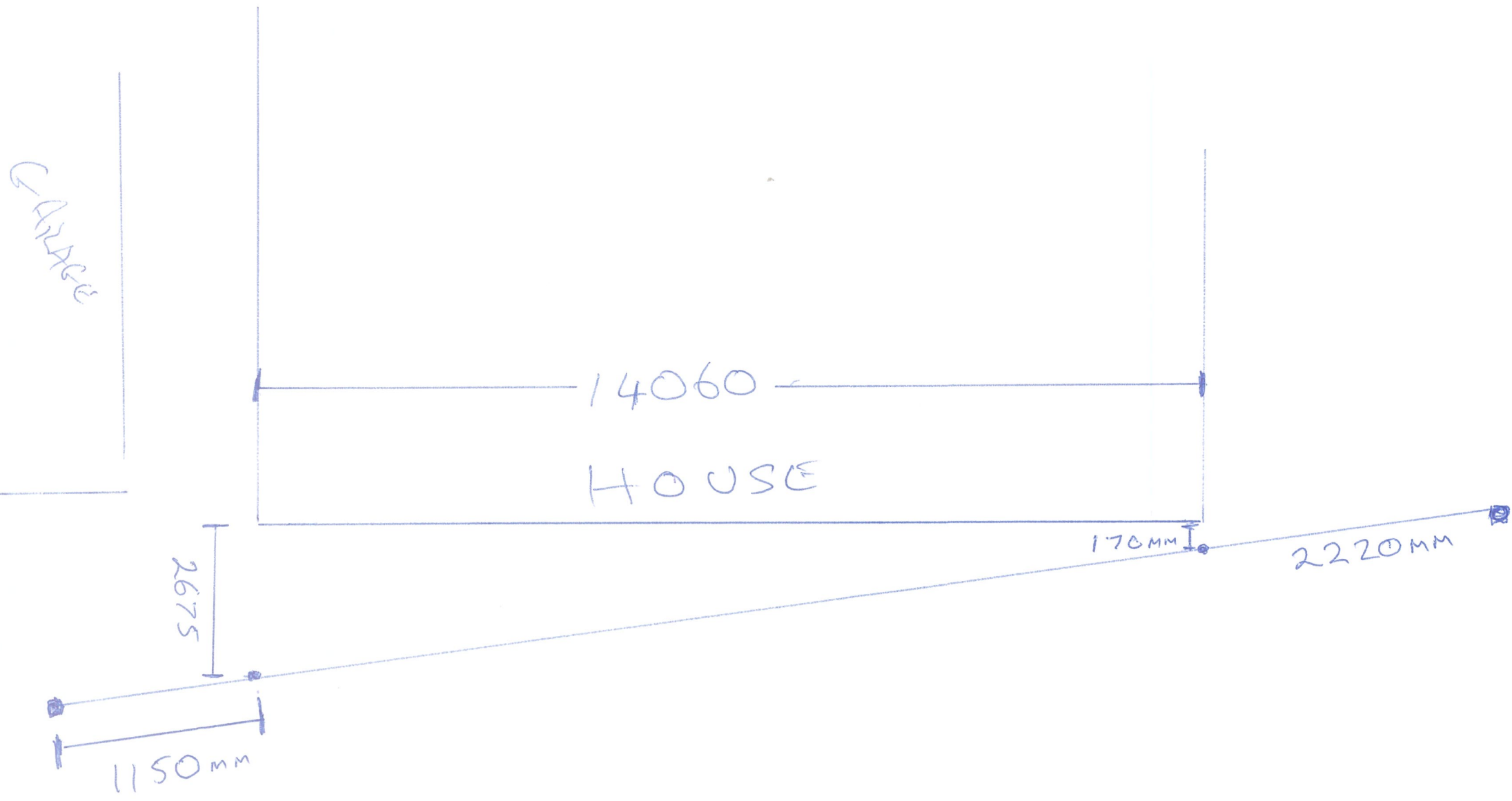
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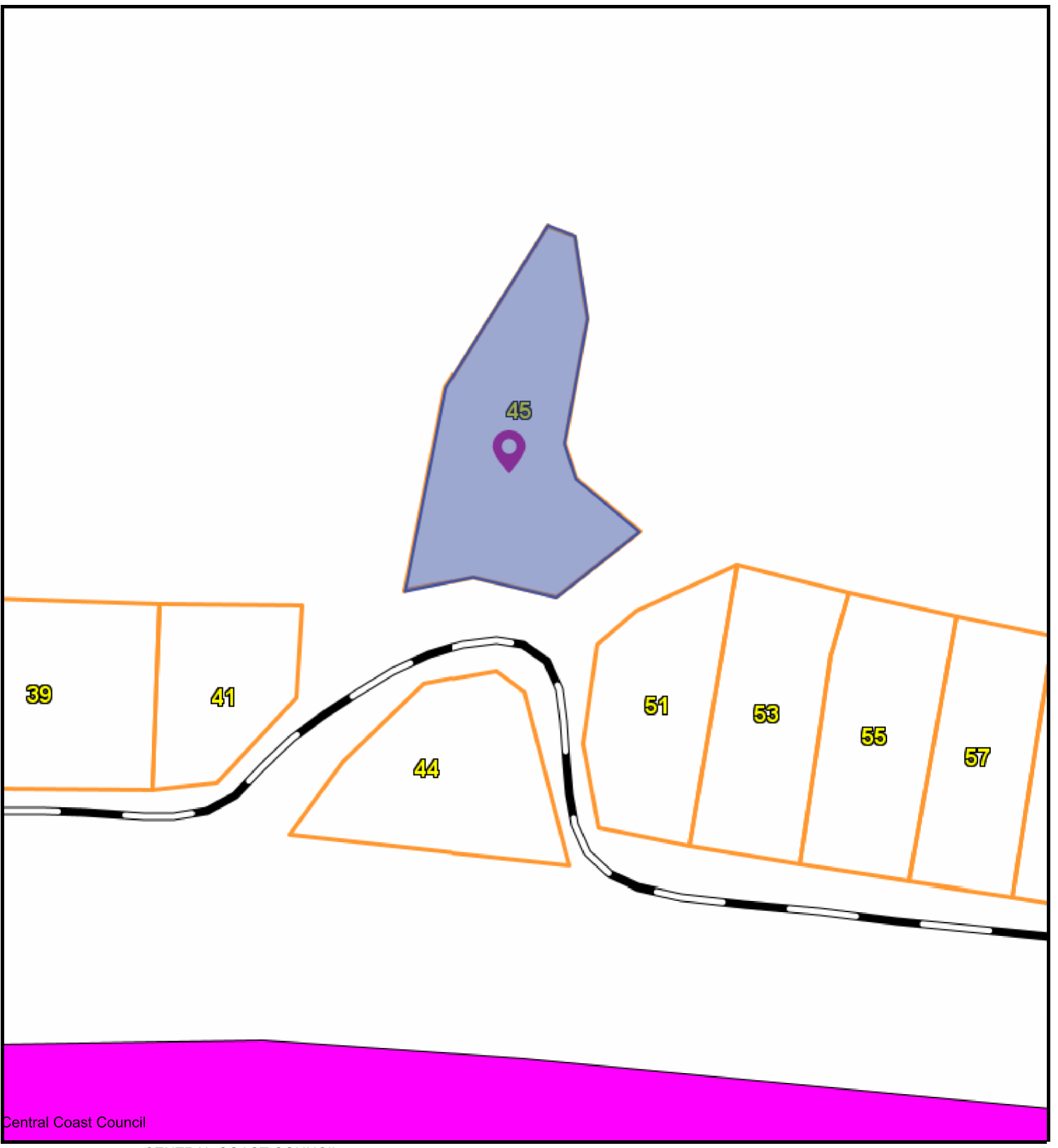


MACKENZIE + ASSOC. WYN YARD SURVEYORS DAD LEN

0400 749 451

ADAM IS SON





Central Coast Council



CENTRAL COAST COUNCIL
 19 King Edward St
 Ulverstone
 TAS 7315
 Telephone: 03 6429 8900
 admin@centralcoast.tas.gov.au



6-Nov-2025

**45 SICE AVENUE,
 HEYBRIDGE
 DA2025186**

IMPORTANT
 This map was produced on the GEOCENTRIC DATUM OF AUSTRALIA 1994 (GDA94), which has superseded the Australian Geographic Datum of 1984 (AGD66/84). Heights are referenced to the Australia Height Datum (AHD). For most practical purposes GDA94 coordinates, and satellite derived (GPS) coordinates based on the World Geodetic Datum 1984 (WGS84), are the same.

Disclaimer
 This map is not a precise survey document
 All care is taken in the preparation of this plan; however, Central Coast Council accepts no responsibility for any misprints, errors, omissions or inaccuracies. The information contained within this plan is for pictorial representation only. Do not scale. Accurate measurement should be undertaken by survey.
 © The List 2025.
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20 m

 Scale =
1:737.100



HOTMANN SERVICES

- FOUNDATION SITE AND SOIL EVALUATION
 - WINDLOADING ASSESSMENT
- COASTAL VULNERABILITY ASSESSMENT



45 Sice Avenue, Heybridge, 7316, 25th July 2025





CORE SITE INFORMATION

Address: 45 SICE AVENUE, Heybridge (138382/30)

Property ID: 7153560

Site Size: Approximately 892m²

Date of inspection: 25/07/2025

Building type: Extension to existing structure.

Services: Mains water and sewer.

Mapped Geology – As per Mineral Resources Tasmania 1:250 000 Hobart sheet: **CSS** atop **WT** = Quaternary sediments: stabilised aeolian coastal sand atop marine sands. Beneath this lithology lies Siliceous quartzwacke turbidites of the Neoproterozoic Undifferentiated Oonah Formation.

Drainage lines/water courses: Existing water and sewage main infrastructure.

Soil Depth:

- Refusal at 0.5m (DCP #1)
- Refusal at 0.5m (DCP #2) and at 0.9m (TH1)
- Refusal at 1.8m (DCP #3) and at 0.95m (TH2)
- No refusal at 2.6m (DCP #4)
- Refusal at 1.4m (DCP #5)

Subsoil Drainage: Sand-dominated subsoil generally provides satisfactory drainage. Refer to National Construction Code Vol 2, section 3.2.2 for class A, S, & M (sandy soils) building and plumbing requirements.

Vegetation & Relief: Grass. Significantly established biota along steep topography changes provide erosion protection. Gradual northern slope. Roadside extent of property 6m above sea level. DCP 1, 2, 5 at similar elevation. DCP 3 & 4, 0.5m lower than DCP 1, 2 & 5.

Rainfall in the previous 7 days: Significant rainfall. 19mm on July 23rd and 20mm between 16 & 20 July.

SITE CLASSIFICATION DETERMINATIONS

Acceptable solutions to Sections C10.1 and C11.1 of the Tasmanian Planning Scheme (2025)

This study has identified the shoreline and headland surrounding 45 Sice Avenue to be a discordant, erosion-resistant headland with minimal morphological changes due to substrate hardness, and the established ever-increasing vegetation constitutes a resilient shore, and therefore, the site is considered an acceptable coastal erosion hazard band and is NOT CONSIDERED to be vulnerable to coastal erosion by the year 2100.

The site is outside areas identified for projected permanent inundation and storm events by 2050 and 2100.

The site is located within a high coastal erosion hazard band, however the ongoing use within a coastal erosion investigation area can achieve and maintain a tolerable risk from coastal erosion. Significant aerial photography analysis depicts neither the vegetation nor the rock mass has receded between 1960 and 2025. The site is **unlikely to suffer significant erosion under current environmental conditions.**

Therefore, the proposed development is identified as having an acceptable risk from sea level rise and permanent and temporary inundation. **It is considered that the proposed domicile changes** do not require any mitigation or other control measures as no damage is likely to occur or will be manageable in the normal course of events were it to occur.

This is an acceptable solution under Sections C10.1, C10.5.4, C10.5.1 P1.1, C10.5.1 P1.2 and C11.1 of the Tasmanian Planning Scheme (2025). An Engineering Certificate addressing the Coastal Erosion and Inundation Hazard Code is provided in Appendix 4 (Form 55).

WIND CLASSIFICATION DETERMINATIONS

In accordance with **AS 4055-2021**:

Region: **A**

Terrain category: **TC2**

Shielding Classification: **PS-NS**

Topographic Classification: **T0**

Wind Classification: **N1**

Design Wind Gust Speed (V_{h,u}) **28 m/sec**

LABORATORY RESULTS

In accordance with **AS 1289.3.1.1, AS 1289.3.2.1, AS 1289.3.3.1, AS 1289.3.4.1, AS 1289.3.6.1**

Liquid limit ranging from **12.5-37%**

Plasticity index ranging from **0-5.1%**

Linear shrinkage ranging from **1.8-8.9%**

Testing determined USCS Soil classification as **Inorganic silt, fine sand and gravels.**

SITE CLASSIFICATION DETERMINATIONS

In accordance with guidance provided by **AS2870 - 2011**

Surface to 1.5m depth: **Class S.** Silt and fine sands with slight ground movement potential.

As per director's determination: **Class P.**

In accordance with "Director's Determination – Coastal Erosion Hazard Areas v 1.2" the AS2870 site classification of any land located within a coastal erosion hazard area must be Class P, due to the potential for to coastal erosion.

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SITE ASSESSMENT, SAMPLE ACQUISITION AND TESTING

Site investigation and soil classification, and recommendations are determined in accordance with:

- AS 4055-2012** *Wind load for Housing*
- AS 4360-2004** *Determination of Risk Management*
- AS 3798-2007** *Guidelines on earthworks for commercial and residential developments*
- AS 2870-2011** *Residential slabs and footings*
- AS 1726-2017** *Geotechnical Site Investigations.*
- AS 1289.3.1.1** *Determination of the liquid limit of a soil - four-point Casagrande Method*
- AS 1289.3.2.1** *Determination of the plastic limit of a soil - Standard Method*
- AS 1289.3.3.1** *Calculation of the plasticity index of a soil*
- AS 1289.3.4.1** *Determination of the linear shrinkage of a soil - Standard Method*
- AS 1289.3.6.1** *Determination of soil particle size - Standard method of analysis by sieving*

Two drill cores sourced at site with effective refusal @ 0.9m (TH1) & 0.95m (TH2).

Dynamic Cone Penetrometer (DCP) test results:

- DCP #1: 5m south of TH1. Refusal at 0.5m
- DCP #2: 0.2m south of TH1. Refusal at 0.5m
- DCP #3: 0.5m west of TH2. Refusal at 1.8m
- DCP #4: 2m north of TH2. Refusal at 2.6m.
- DCP #5: 3m south of TH6. Refusal at 1.4m

Linear shrinkage tests on both test holes (TH1 & TH2). Liquid Limit, Plastic Limits and Plasticity Index assessments were made to determine the soil classification per the Unified Soil Classification System (USCS). Test holes were dug using a Christie Post Driver Soil Sampling Kit, comprising CHPD78 Christie Post Driver with Soil Sampling Tube (38 mm OD x 1600 mm).

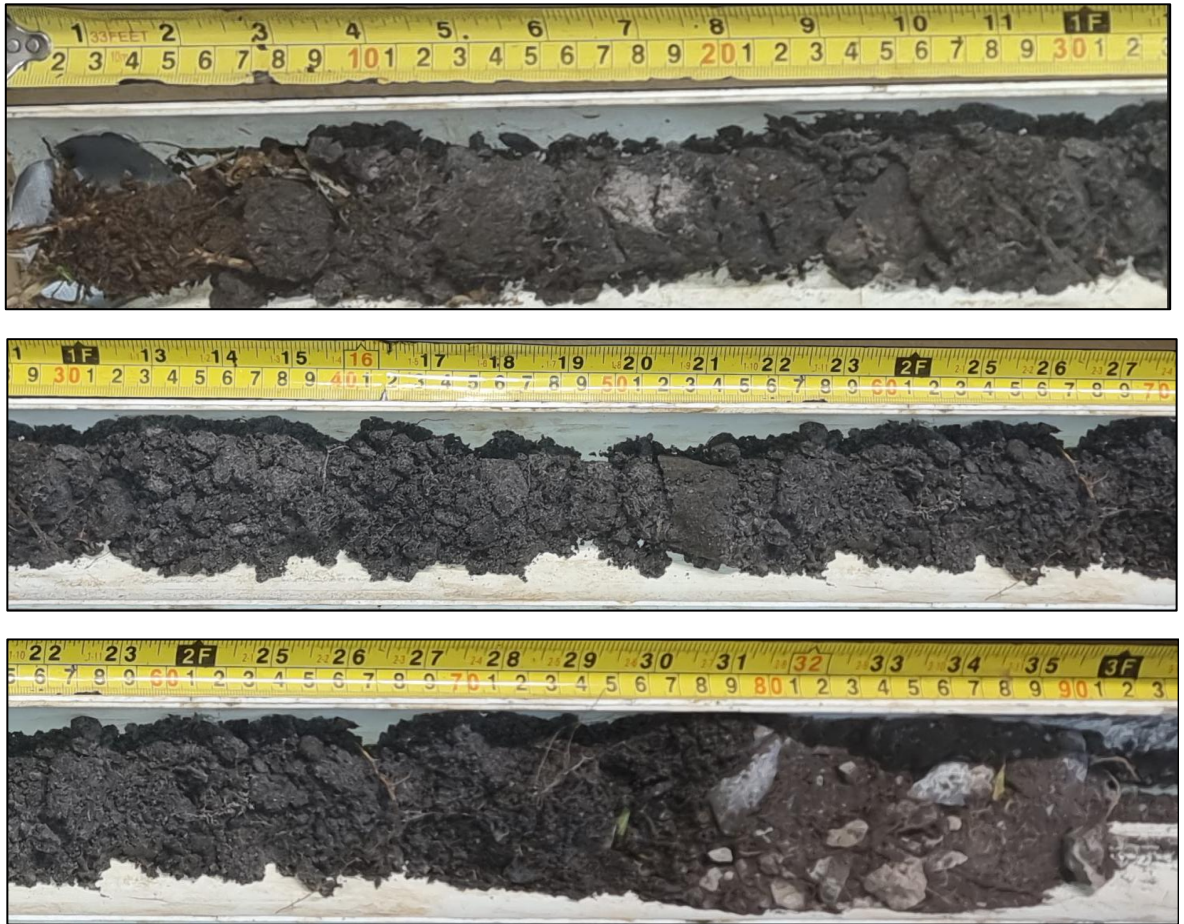


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SOIL PROFILES 45 Sice Avenue, Heybridge

Figure 1. TH1



Figure 2. TH1 lithology transitions at 0.1m from Organic-dominated facies to stabilised aeolian coastal sand atop marine sands. Roots throughout. Transition to B2 layer begins at 70cm. Hard rocks encountered.



TH1 Depth (m)	Horizon	Description and field texture grade	Observed soil class	Lab-derived USCS Class
0.0 – 0.1m	A	Very Dark Grey 2.5YR 3/1, inorganic silts, silty sands, slightly moist. Fine texture. Roots throughout. Very soft.	SM	CL-ML
0.1 – 0.70m	B	Grey 2.5YR 5/1, inorganic silts, very-fine clayey sands, Dry, loose	SM	ML
0.7 – 0.9m	B2	Brownish Grey 2.5YR 6/2, Friable. Dry, Loose. Decaying sediments. Rocks throughout, Refusal.	SM	ML-CH

Figure 3. TH1 location depicted, along with positions of nearby DCP's.



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SOIL PROFILES 45 Sice Avenue, Heybridge

Figure 4. TH2



Figure 5. TH2 lithology transitions at 0.1m, 0.3m, & 0.6m with refusal at 0.95m. Stabilised aeolian coastal sand atop marine sands. Base of core sample dominated by highly weathered rock that features a slight increase in clay alteration.



TH2 Depth (m)	Horizon	Description and field texture grade	Observed soil class	Lab derived USCS Class
0.0 – 0.1m	A	Very Dark Grey 2.5YR 3/1, inorganic silts, silty sands, sandy loam & peds, Strong structure, slightly moist. Fine texture. Very Soft. Roots throughout.	SM	CL-ML
0.1 – 0.3m	A2 / B	Grey 2.5YR 5/1, inorganic silts, very-fine clayey sands, Dry, loose	SM	CL-ML
0.3 – 0.6m	B / B2	Light Olive Brown 2.5YR 5/3, inorganic silts / sands, very fine clayey sands, Dry, loose. Hard. Decaying sediments. Gritty / Friable.	SM	ML-CH
0.6 – 0.95m	B2	Light Brown Grey, 2.5YR 8/2, Loamy sand, gritty, low / weak structure, rock throughout, friable. Refusal.	CL	CL-ML

Figure 6. TH2 location depicted along with positions of nearby DCP's.



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The author of this report completed a similar report in 2023. In the two years between, there has been no degradation of the slope, or removal of biota. Figure .7 depicts a photograph of the area down dip of the property being assessed taken in 2023. Figure .11 depicts the same location nearly 24 months apart.

Figure 7. (Below) View from balcony of #45 Sice Avenue looking eastward (2023).



Figure 8. (Below) View from balcony of #45 Sice Avenue looking eastward (2025).



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Figure 9. (Below) View from balcony of #45 Sice Avenue looking east, northeast. Resilient wave dampening quartzite, greywacke bedrock. Image at the base of the page depicts the reverse POV, with the balcony of #45 Sice Avenue depicted beneath established trees.



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Figure 10. (Below) View from rocky outcrops west of 45 Sice Avenue, looking north. Resilient wave dampening quartzite, greywacke bedrock. Image at the base of the page depicts the POV looking towards #45 Sice Avenue, with the shed depicted surrounded by established plants.



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DCP TESTS AND ESTIMATED BEARING CAPACITY

A minimum bearing capacity of 100 kPa is required for strip and pad footings and under the edge footings and associated slab foundations. The Dynamic Cone Penetrometer (DCP) test estimates bearing capacity with tests carried out within 0.5m north of each test hole. DCP bearing capacity test results can be influenced by moisture content, as such seasonal changes associated with heavier rains will have an impact; very noticeable in clay lithologies that can be dehydrated and made deceptively hard/stiff in drier seasons. In the week leading up to the site inspection, significant rain events occurred with 19mm recorded on the 23rd, and 20mm observed between 16th & 20th July. The horizons indicated no significant water retention with the 45 Sice Avenue soil examined being dry to slightly moist when tested. Note that this assessment occurred in the middle of winter, as such the field DCP values are likely to be higher than in very moist to saturated soil conditions associated with deep winter and spring.

The yellow values for the following DCP tables indicate very low-capacity layers.

DCP #1 & DCP #2 data indicates the bearing capacity of the soil is at a suitable strength at a depth of 0.1 to 0.2m. With the upper 10-20mm of material removed, footings can then be considered for the more competent ground.

DCP #3 data indicate that the bearing capacity of the soil is at a suitable strength at a depth of 1.3m. Beneath which the bearing capacity of the soil noticeably improves. Refusal occurs for both after 1.8m depth. This would be coincident with observations of steeply dipping bedrock visible in outcrops just south of the test area.

DCP #4 and DCP #5 are similar, with the minor differences in depth of coherent material readily potentially attributed to their collar point offset along the slope (approximately 0.4m height and 8m lateral space between them). Consistent coherent ground occurs after 1.2m. No refusal encountered for DCP #4.

This competence may reduce when the soil is moist to very moist, and the immediate layers below will decrease in strength; deep excavation is an option to capitalise upon the coherent rock beneath the sand dominated material (refer to DCP tables below and AS2870-2011 clause 2.4.5) however the core extracted indicates a significant amount of soil removal would be required to access this basement. This report highlights areas of concern regarding lowest bearing as yellow in tales below, where the potential exists for bearing capability to fall below 100 kPa.

DCP #1 Readings

Depth (mm)	DCP n-number (Blows / 100mm)	DCP penetration index (mm/blow)	Estimated Bearing Capability (kPa = n x 30)	Likely Variance (+/-)
0 - 100	3	33.3	90	30
100 - 200	7	14.3	210	70
200 - 300	12	8.3	360	120
300 - 400	13	7.7	390	130
800 - 900	REFUSAL			

DCP #2 Readings

Depth (mm)	DCP n-number (Blows / 100mm)	DCP penetration index (mm/blow)	Estimated Bearing Capability (kPa = n x 30)	Likely Variance (+/-)
0 - 100	3	33.3	90	30
100 - 200	8	12.5	240	80
200 - 300	20	5.0	600	200
300 - 400	14	7.1	420	140
400 - 500	REFUSAL			

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DCP #3 Readings

Depth (mm)	DCP n-number (Blows / 100mm)	DCP penetration index (mm/blow)	Estimated Bearing Capability (kPa = n x 30)	Likely Variance (+/-)
000 - 100	1	100.0	30	10
100 - 200	1	100.0	30	10
200 - 300	2	50.0	60	20
300 - 400	4	25.0	120	40
400 - 500	1	100.0	30	10
500 - 600	3	33.3	90	30
600 - 700	2	50.0	60	20
700 - 800	3	33.3	90	30
800 - 900	4	25.0	120	40
900 - 1000	6	16.7	180	60
1000 - 1100	2	50.0	60	20
1100 - 1200	3	33.3	90	30
1200 - 1300	4	25.0	120	40
1300 - 1400	6	16.7	180	60
1400 - 1500	8	12.5	240	80
1500 - 1600	10	10.0	300	100
1600 - 1700	15	6.7	450	150
1700 - 1800	REFUSAL			

DCP #4 Readings

Depth (mm)	DCP n-number (Blows / 100mm)	DCP penetration index (mm/blow)	Estimated Bearing Capability (kPa = n x 30)	Likely Variance (+/-)
000 - 100	1	100.0	30	10
100 - 200	1	100.0	30	10
200 - 300	3	33.3	90	30
300 - 400	1	100.0	30	10
400 - 500	5	20.0	150	50
500 - 600	2	50.0	60	20
600 - 700	1	100.0	30	10
700 - 800	3	33.3	90	30
800 - 900	1	100.0	30	10
900 - 1000	3	33.3	90	30
1000 - 1100	4	25.0	120	40
1100 - 1200	8	12.5	240	80
1200 - 1300	9	11.1	270	90
1300 - 1400	6	16.7	180	60
1400 - 1500	6	16.7	180	60
1500 - 1600	6	16.7	180	60
1600 - 1700	15	6.7	450	150
1700 - 1800	16	6.3	480	160
1800 - 1900	17	5.9	510	170
1900 - 2000	18	5.6	540	180
2000 - 2100	19	5.3	570	190
2100 - 2200	20	5.0	600	200
2200 - 2300	21	4.8	630	210
2300 - 2400	22	4.5	660	220
2400 - 2500	23	4.3	690	230

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DCP #5 Readings

Depth (mm)	DCP n-number (Blows / 100mm)	DCP penetration index (mm/blow)	Estimated Bearing Capability (kPa = n x 30)	Likely Variance (+/-)
0 - 100	1	100.0	30	10
100 - 200	1	100.0	30	10
200 - 300	2	50.0	60	20
300 - 400	4	25.0	120	40
400 - 500	1	100.0	30	10
500 - 600	3	33.3	90	30
600 - 700	2	50.0	60	20
700 - 800	3	33.3	90	30
800 - 900	4	25.0	120	40
900 - 1000	6	16.7	180	60
1000 - 1100	6	16.7	180	60
1100 - 1200	8	12.5	240	80
1200 - 1300	10	10.0	300	100
1300 - 1400	REFUSAL			

SOIL COMMENTARY

The soils are Neoproterozoic Undifferentiated Oonah formation quartzwacke turbidite sequences overlain by younger Quaternary sediments (sands). The profile is moderately deep with refusal occurring consistently between some DCP tests (0.5m, 1.4m, 1.8m, no refusal, etc), and the results reflected similar values to results from DCP testing of adjacent lots. Field textures of the soil profile are dominated by sands which is weakly to moderately to strongly structured with moderate bearing capacity throughout.

LINEAR SHRINKAGE AND SOIL REACTIVITY

Samples of all test hole subsoils were tested for reactivity using the linear shrinkage (LS) test. Linear shrinkage provides guidance to soil classification of reactivity of clays for foundations. The tests suggest the soils are uniform in their shrinkage potential with **most results sitting at approximately 2%**. Fig. 12 depicts a contextualisation chart for these values.

Figure 11. (Below) Linear Shrinkage results.

Sample	Depth (m)	Length of mould (L) in mm	Longitudinal Shrinkage (LS) in mm	LS (%)
TH1 A	0.1m – 0.7m	124	0.8	1
TH1 B	0.7m – 0.95m	123	1.6	2
TH2 A	0.3m - 0.6m	123	1.6	2
TH2 B	0.6m – 0.95m	122	2.4	3

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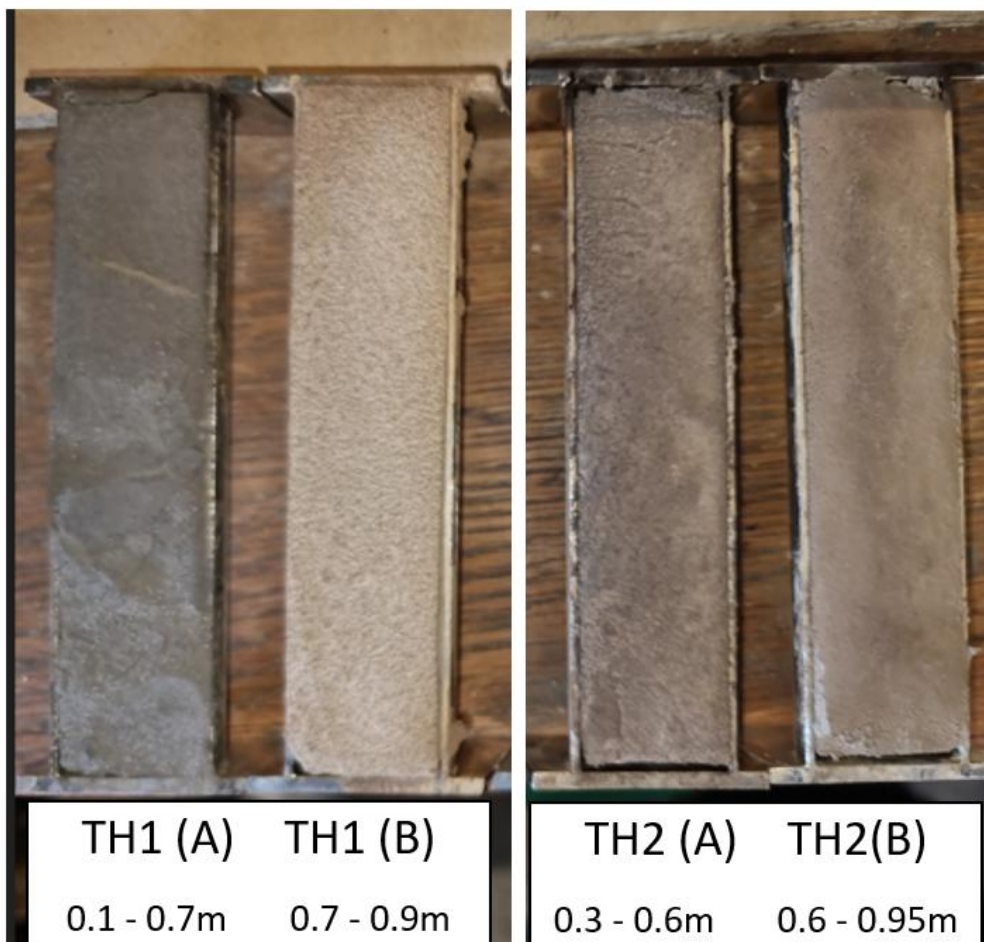
Figure 12. (Below) CSIRO definitions linear shrinkage, and plasticity index volume change potentials (relevant to Plasticity Testing results)

*, specific design criteria need to be incorporated in building foundations to prevent movement problems.

Category	Linear shrinkage (%)	Expansive rating
Low	0–12	non-critical
Medium	12–17	marginal
High	17–22*	critical*
Very high	>22*	very critical*

Source: NSW Department of Natural Resources (2007); Mills *et al.* (1980); Hicks (2007).

Figure 13. (Below) Linear Shrinkage samples have between 1 and 3mm of shrinkage for a maximum LS of 3%. These values place the category of risk likelihood as “Low” with an Expansive rating of “non-critical”; see figure 13: CSIRO definitions of linear shrinkage.



PLASTICITY TESTING:

Plasticity testing is one measure of the fine particle content of a soil; this analysis involves the gradual removal of moisture from the system and applying Atterberg Limit tests. The moisture content of a soil dictates physical properties of a soil wherein the soil can exist as one of four states: liquid, plastic, semi solid and solid. The transition from a semi-solid to plastic state is termed the Plastic Limit (PL), with the transition from a plastic to liquid state termed the Liquid Limit (LL). The difference between the PL and LL is the Plasticity Index (PI).

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The liquid state is achieved when enough water has been added that the soil behaves as a thick viscous liquid. The plastic state is achieved by gradual dehydration, the soil eventually begins to take on a dough texture that offers minimal deformation resistance. The semi solid state is achieved by further dehydration, resulting in clay shrinkage, and the overall stiffness of the material increases to the point of brittle deformation (no plasticity). The solid state is achieved at a point where the water loss is proportional to the amount of shrinkage.

The tests suggest the soils are low plasticity clays, gravels, and silts with multiple plasticity index readings between 0 and 6%. These values are indicative of a low PI which means the soils will generally have low clay content and exhibit less plastic behaviour. Implications for a low PI soil are:

1. **Reduced shrink-swell potential:** Soils with low PI tend to have lower shrink-swell potential compared to high PI soils. This means they are less prone to significant volume changes with variations in moisture content. Consequently, structures built on low PI soils **may experience fewer issues related to soil movement and differential settlement**. There is a high correlation between the plasticity index can be a reliable parameter to estimate the characteristics of potential surface movement (Reynolds, 2013).
2. **Better drainage characteristics:** Low PI soils typically have higher permeability due to their lower clay content. This can result in improved drainage capabilities and reduced risk of water accumulation or poor drainage conditions. It can be beneficial for foundations, pavement, and other construction projects that require good drainage.
3. **Potential for erosion:** Soils with low PI and low clay content may have reduced cohesion and may be more susceptible to erosion, especially when exposed to heavy rainfall or water flow. Erosion can lead to the loss of topsoil, compromising the stability and fertility of the soil.

Figure 14. (Below) CSIRO definitions pertaining to plasticity index (PI) volume change potentials.

Potential volume change	Arid to semi-arid climate		Humid climate	
	Plasticity index (%)	Linear shrinkage (%)	Plasticity index (%)	Linear shrinkage (%)
Low	0–15	0–5	0–30	0–12
Medium	15–30	5–12	30–50	12–18
High	>30	>12	>50	>18

Source: NSW Department of Natural Resources (2007); Holland (1981).

Figure 15. (Below) CSIRO charts depicting potential ratings for shrink-swell & compressibility based upon both the PI % and LI %.

Rating	Plasticity index (%)
Low	<25
Medium	25–35
High	35–45
Very high	>45

Rating	Liquid limit (%)
Low	<45
Medium	45–55
High	55–75
Very high	>75

Source: Public Works Department (1977); Mills *et al.* (1980).

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Figure 16. Atterberg limits analysis data TH1 (left: 0.1m-0.7m, right: 0.7m-0.9m).

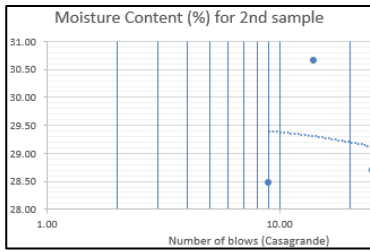
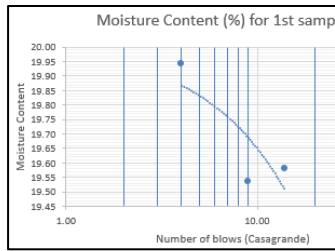
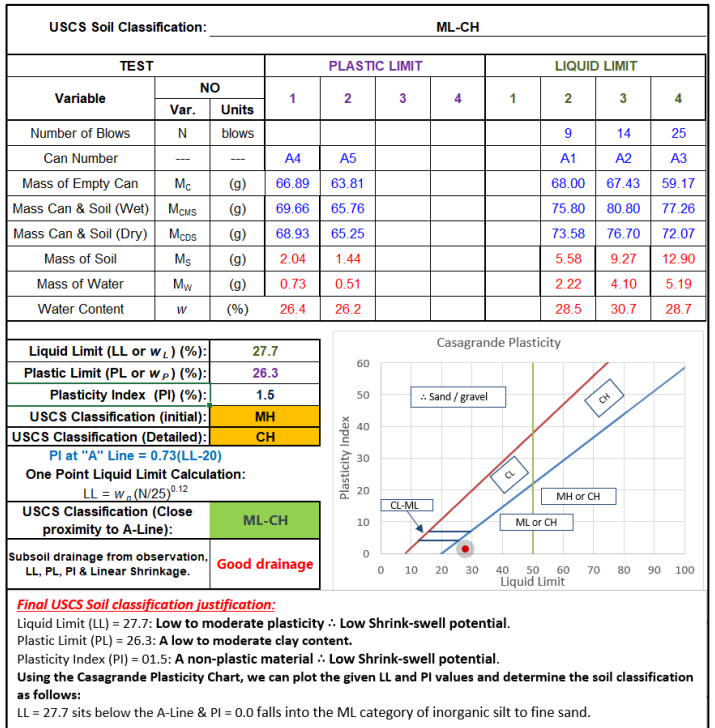
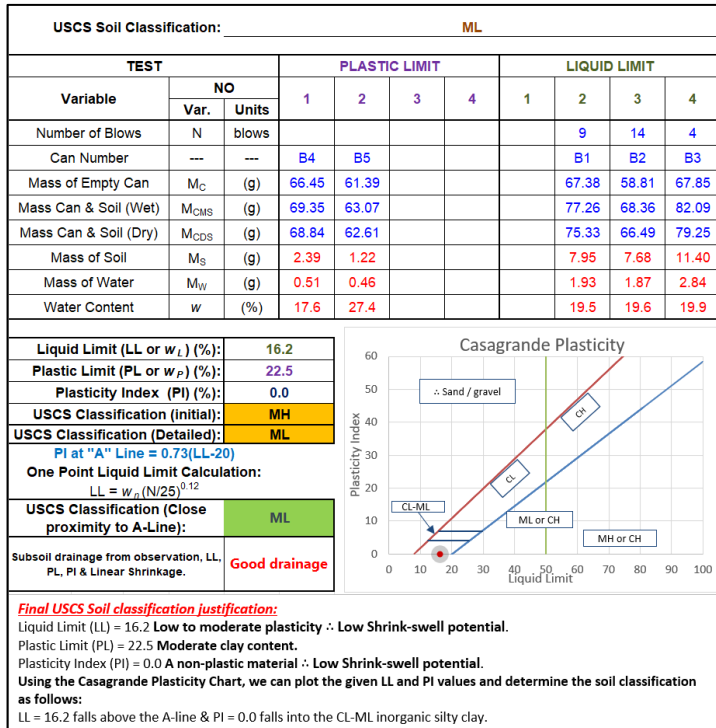
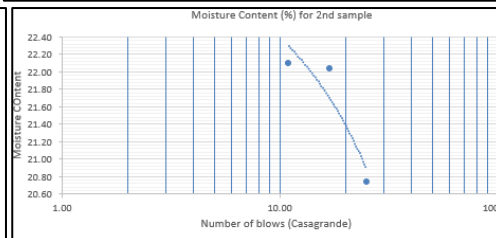
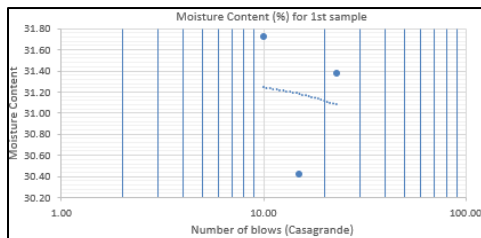
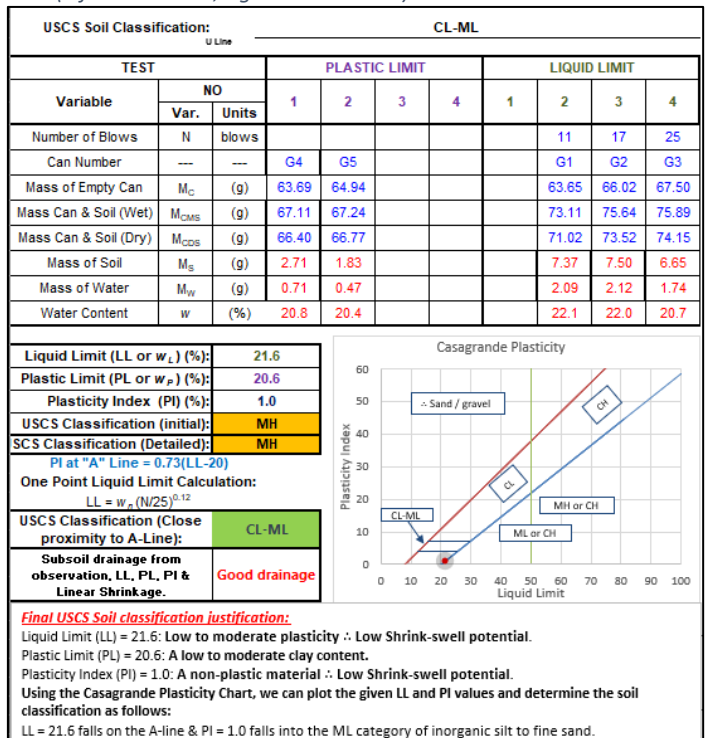
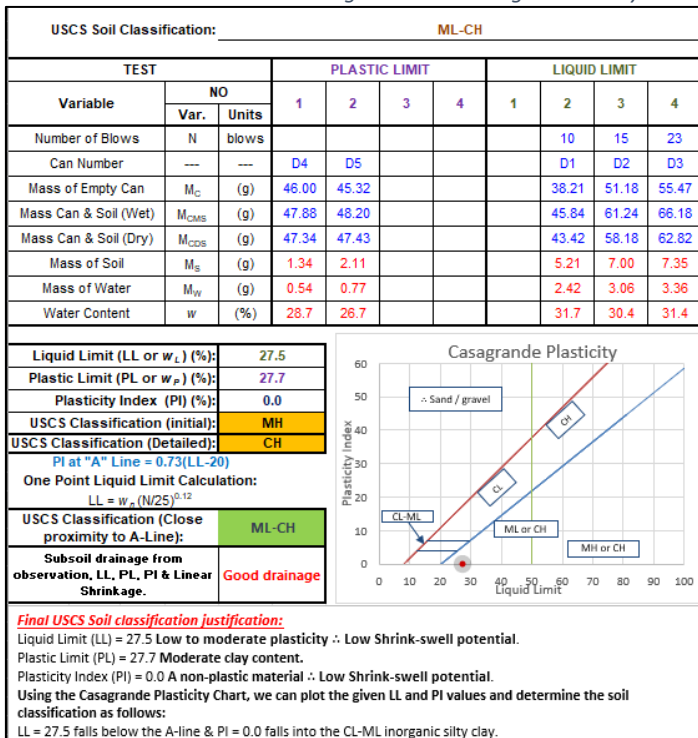


Figure 17. Atterberg limits analysis data TH2 (left: 0.3m-0.6m, right: 0.6m-0.95m).



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COASTAL VULNERABILITY ASSESSMENT:**

The objectives of this analysis:

- Identify which local ordinances and codes need to be satisfied in terms of coastal vulnerability and identify the required criteria that need to be addressed.
- Compile a critique of site-specific geomorphological and soil investigations.
- Assess site erosion vulnerability in terms of beach recession and erosion.
- Generate a site risk assessment for the proposed development.
- Where applicable, provide guidance on methods to reduce impacts of erosion, recession, and inundation.

45 Sice Avenue is located along the northern coastline (fig.21-fig.25) of Tasmania and is potentially exposed to:

- Coastal storm surge and tidal processes prevalent within Bass Strait.
- Sea level rise; and
- Wind wave conditions from the north and northwest.

The site is proximal to, but not located within, Inundation Prone Areas Code (IPAC) zones as depicted below. The easement sits between the proposed extension site, and the “Low hazard band zone” (boundary is 10m+ from 45 Sice Avenue). The hazard exposure within the low zone dictates the area as vulnerable to a 1% Annual Exceedance Probability (AEP) storm event in 2100. Figure .21 depicts the “High hazard band zone” which dictates the area vulnerable to the highest astronomical tide at present, and to inundation from mean high tide by 2050. #45 Sice is surrounded by this zone however the elevated nature of the property makes inundation unlikely. Significant biota assists in maintaining ground cohesion, no signs of cracking or erosion were observed, and the visible bedrock is by its nature, a strong material resistant to weathering.

Planning requirements:

This report provides an overview of the site's vulnerability to coastal erosion and inundation processes. The assessment focuses on the year 2100, which aligns with a 'normal' building design life category of 100 years based on a baseline established in by the Australian Building Code Board (ABCB). According to the ACBC (2015), it is essential to consider minimum design life requirements for buildings. It is recommended that the design life of buildings be considered as 'Normal' for all building importance categories, unless specified otherwise.

Figure 18. Expected longevity of building, plumbing and components as per design life.

Building design life category	Building design life in years	Planned life for components or sub systems readily accessible and economical to replace in years	Planned life for components or sub systems moderately accessible but difficult / costly to replace/repair in years	Planned life for components or sub systems inaccessible or impossible to replace/repair in years
Normal duration	50	5	15	50
Long duration	100+	10	25	100

The State Coastal Policy Validation Act 2003 was enacted on 16 April 2003, replacing the previous definition of a Coastal Zone. This Act also confirms the validity of all previous decisions made under the Policy. The clauses identified in fig.19 are relevant to the scope of this report.

In terms of building within a zone defined as a hazardous area, this development falls within the purview of the Tasmanian Building Regulations of 2016 (fig.21). These zones are outlined and are freely accessible via theList website: <https://maps.thelist.tas.gov.au/listmap/app/list/map> (fig.21-25).

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Figure 19. Excerpt from the State Coastal Policy Validation Act 2003

NATURAL RESOURCES AND ECOSYSTEMS

1.1.2. The coastal zone will be managed to protect ecological, geomorphological, and geological coastal features and aquatic environments of conservation value.

COASTAL HAZARDS

1.4.1. Areas subject to significant risk from natural coastal processes and hazards such as flooding, storms, erosion, landslip, littoral drift, dune mobility and sea-level rise will be identified and managed to minimise the need for engineering or remediation works to protect land, property, and human life.

1.4.2. Development on actively mobile landforms such as frontal dunes will not be permitted except for works consistent with Outcome 1.4.1.

1.4.3. Policies will be developed to respond to the potential effects of climate change (including sea-level rise) on use and development in the coastal zone.

Figure 20. Excerpt from the Tasmanian Building Regulations 2016.

BUILDING IN HAZARDOUS AREAS

Hazardous areas include areas which are bushfire prone, comprise reactive soils or substances, or are subject to coastal erosion, coastal flooding, riverine flooding, and landslip.

Division 4 - Coastal erosion. Section 58. Works in coastal erosion hazard areas

1. A person must not perform work in a coastal erosion hazard area unless he or she is authorised to do so under the Act.
2. If a person intends to perform work in an investigation area of a coastal erosion hazard area, the person must, before performing the work, ensure that the land is classified in accordance with the coastal erosion determination (a) as being an acceptable risk.
3. A responsible person for work being performed in a coastal erosion hazard area must ensure that the work is being performed in accordance with the Act and the coastal erosion determination.
4. A person performing work in a coastal erosion hazard area must ensure that the work complies with the Act and the coastal erosion determination.

The site is proximal to the Coastal Inundation Hazard Bands 20161001 (fig.21), the Coastal Projected Storm Tide 20161201 overlay (fig.22), the Coastal Projected Sea Level Rise 20161201 (fig.23) and is partially located within the Coastal Erosion Component and Hazard Bands 20161201 overlay (fig.24).

The proposed site developments fall within the Acceptable hazard zone, however the northernmost decking area is located within the S1 + S5 Storm bite hazard zone (fig.24). Special requirements may be required to meet, for example, footing any new foundations into the bedrock.

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Figure 21. (Below) Coastal Inundation Hazard Bands overlay near site.

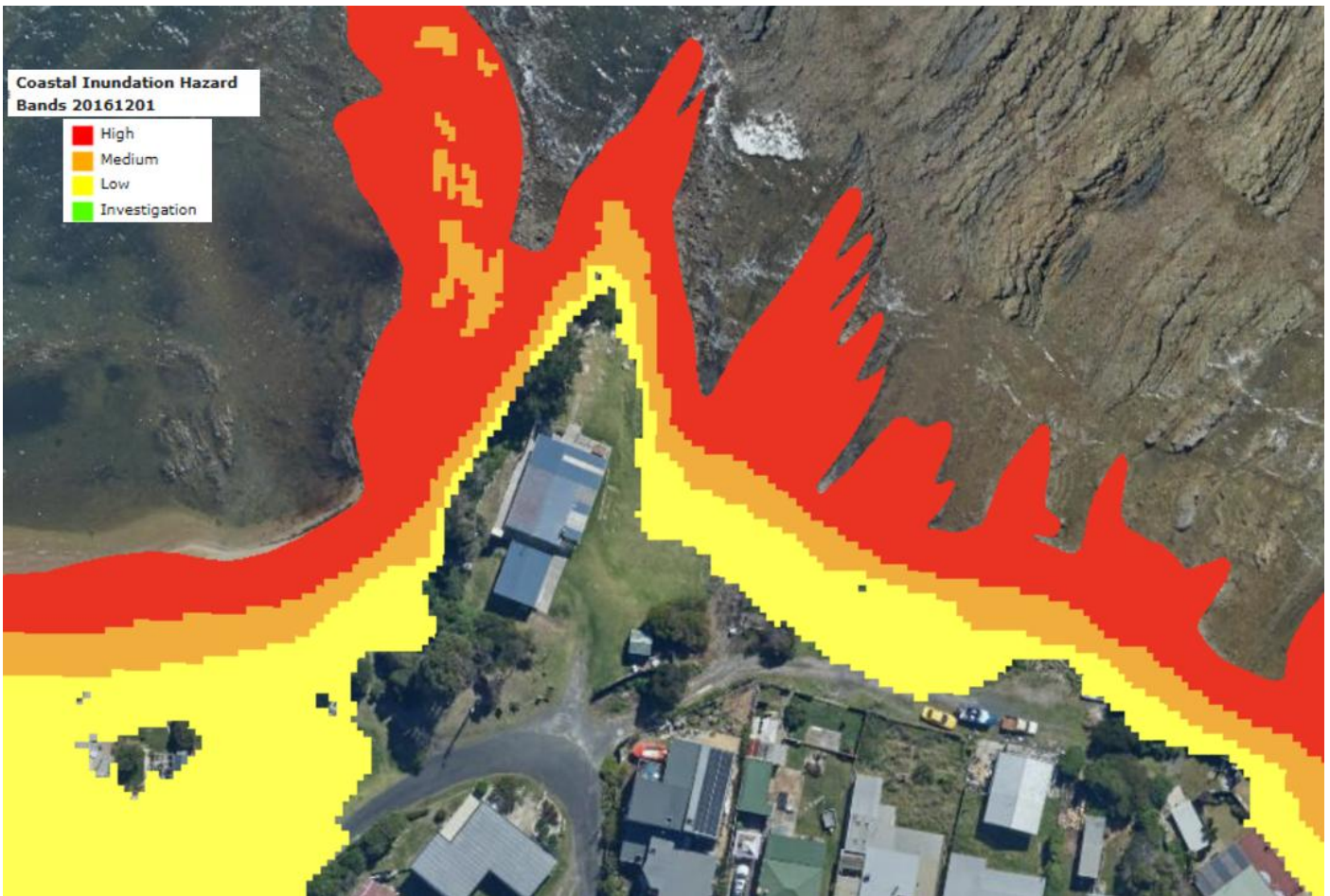


Figure 22. (Below) Coastal Projected Storm Tide overlay near site.

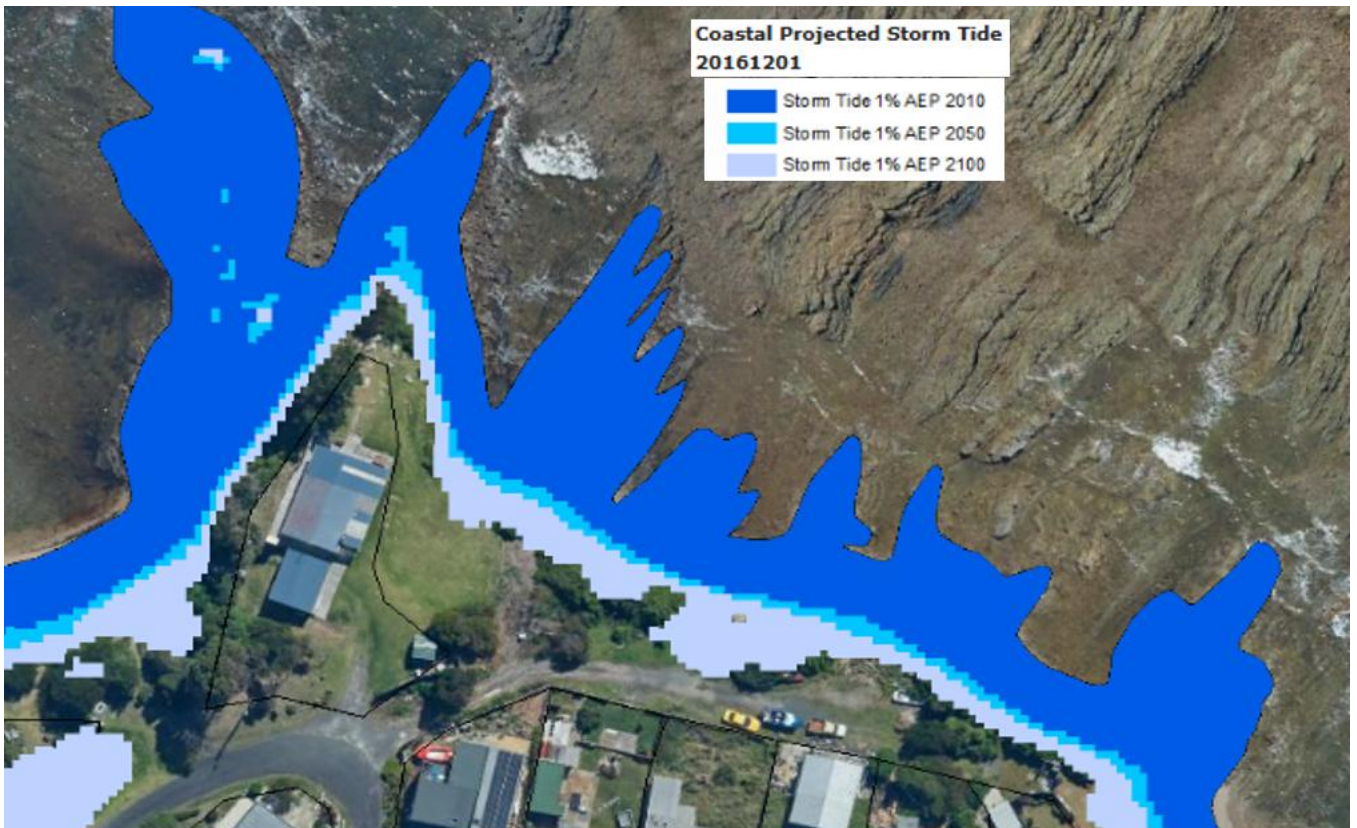


Figure 23. (Below) Coastal projected sea level rise near site.

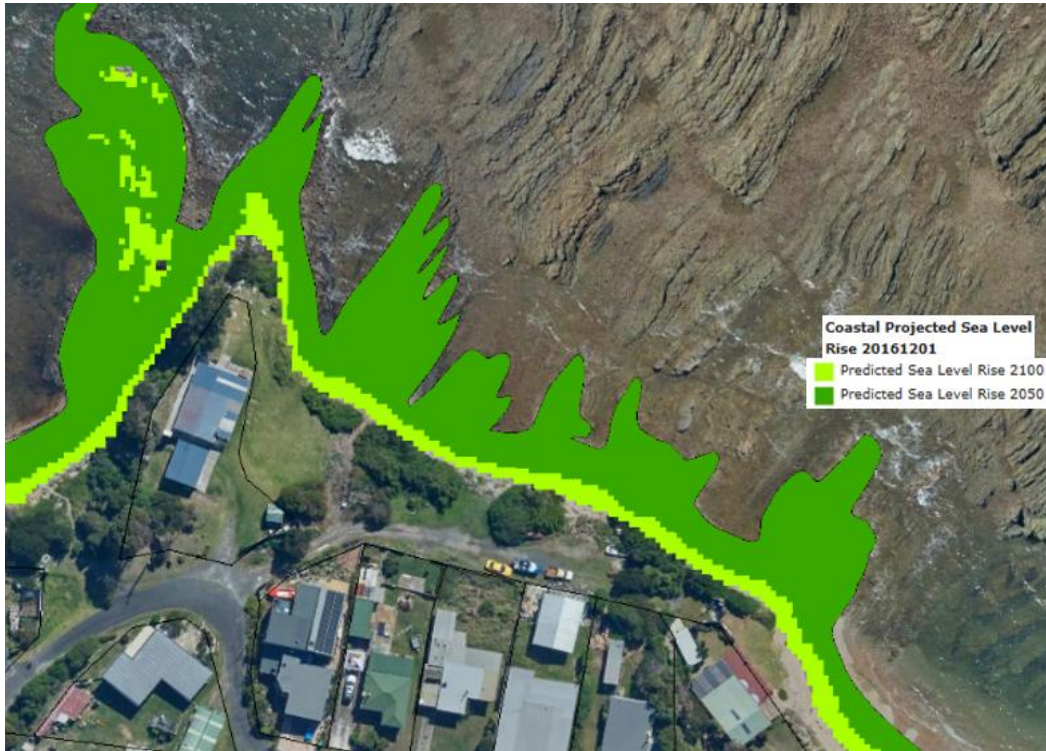
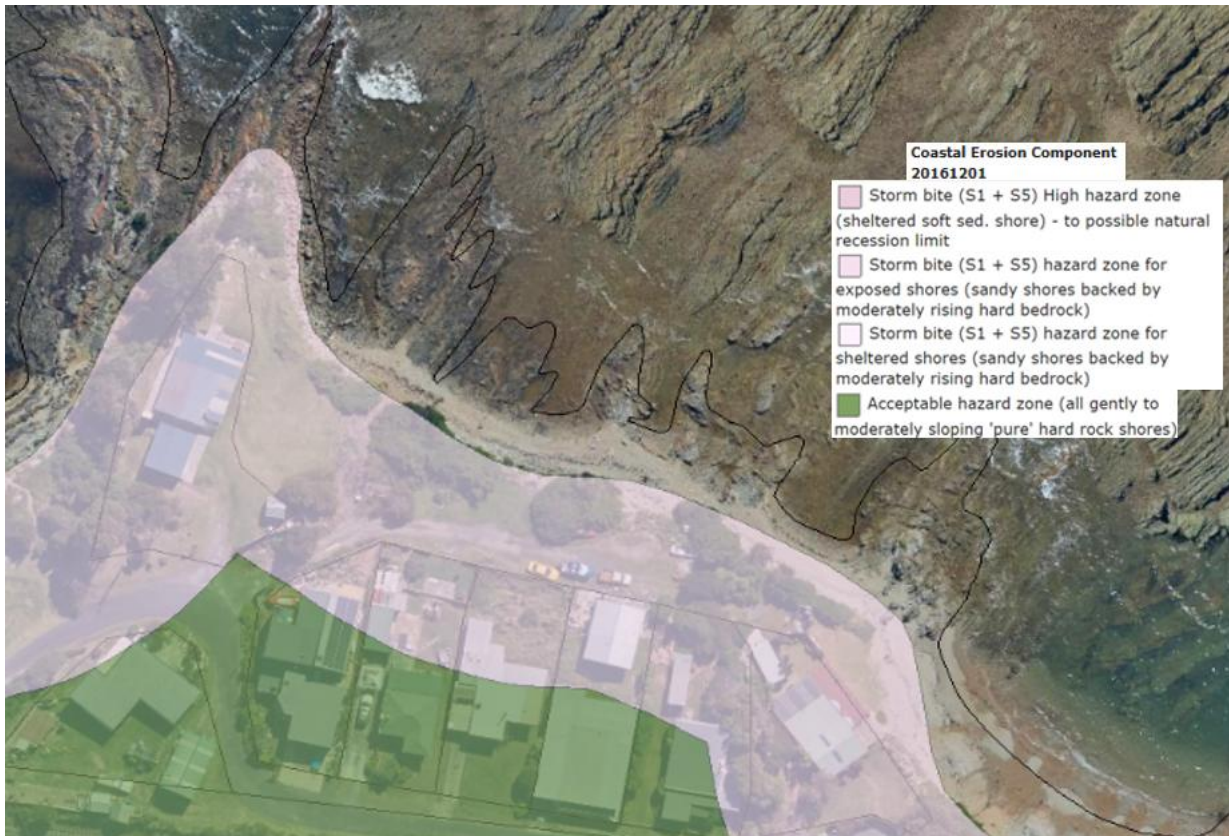


Figure 24. (Below) Storm bite High hazard zone apparent within footprint of proposed decking expansion.



In the scenario where any proposed additional developments fall within the Coastal Erosion Hazard Code (CEHC) Area (fig.25), and there are **no acceptable solutions** for buildings and works in a CEHC Area, **C10.1** and **C11.1** performance criteria must be met (fig.26).

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Figure 25. 45 Sice Ave within the CEHC Area (red band below).

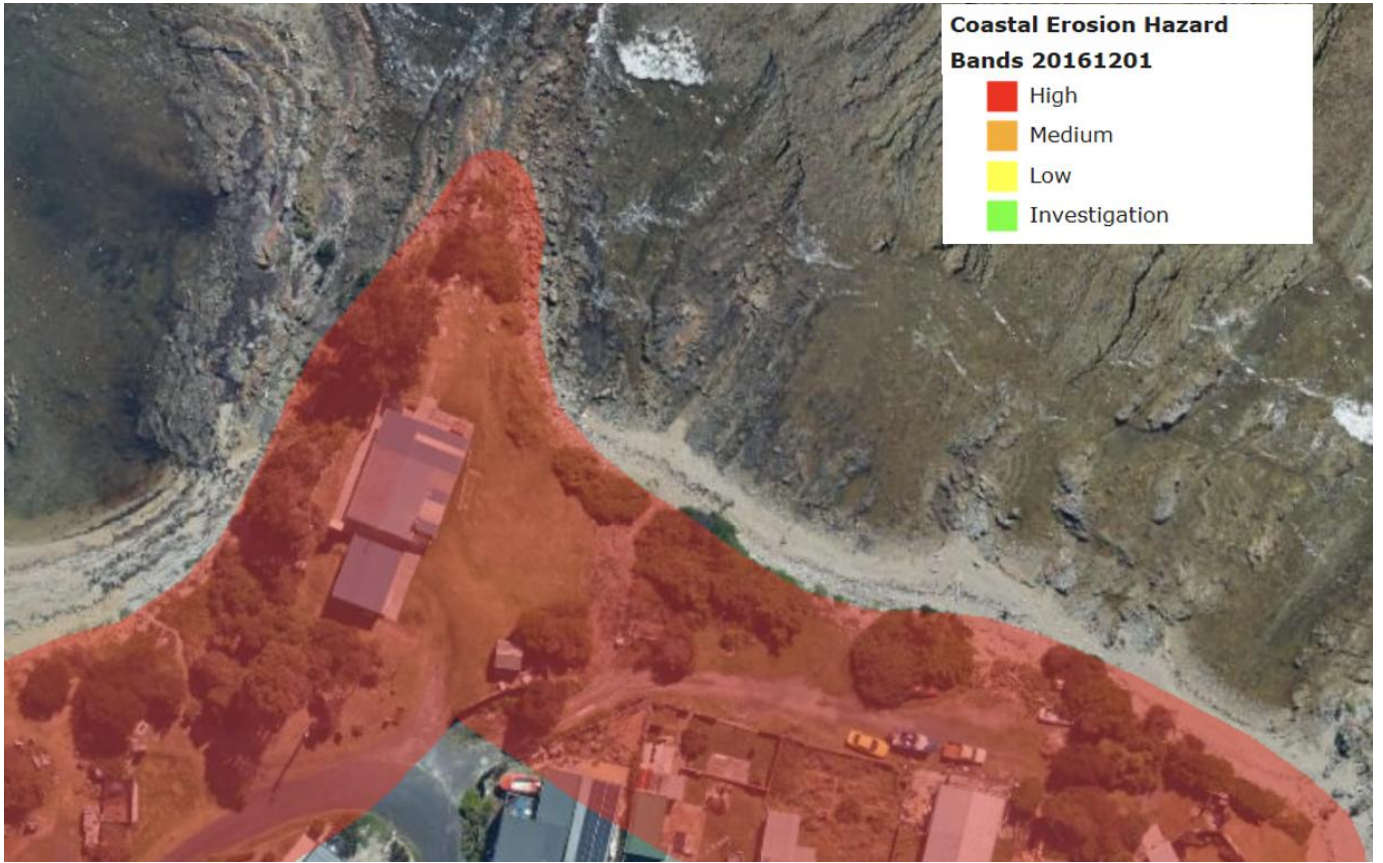


Figure 25a. 45 Sice Ave and the Digital Earth Australia (DEA) recorded annual shoreline recordings between 1980 and 2024 indicate a peak of sea level occurring in 1992, and in the 30 years since, the annual shoreline recordings have been receding, not encroaching closer to land.



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Figure 25b. 45 Sice Ave. 1960 Sourced from "Tasmanian Government Land Tasmania (2025). Aerial Photo Viewer



Figure 25c. 45 Sice Ave. 1992 Sourced from "Tasmanian Government Land Tasmania (2025). Aerial Photo Viewer



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Figure 25d. 45 Sice Ave. 2003 Sourced from "Tasmanian Government Land Tasmania (2025). Aerial Photo Viewer



Figure 25e. 45 Sice Ave. 2006 Sourced from "Tasmanian Government Land Tasmania (2025). Aerial Photo Viewer



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Figure 25f. 45 Sice Ave. 2011 Sourced from "Tasmanian Government Land Tasmania (2025). Aerial Photo Viewer



Figure 25g. 45 Sice Ave. 2016 Sourced from "Tasmanian Government Land Tasmania (2025). Aerial Photo Viewer



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Figure 25h. 45 Sice Ave. 2019 Sourced from "Tasmanian Government Land Tasmania (2025). Aerial Photo Viewer"



Figure 25i. 45 Sice Ave. 2025 image sourced from LISTMap



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Figure 25j. 45 Sice Ave. Side-by-side images in similar orientations depicting aerial coastal comparison of the site in 1975 (L) and 2025 (R). Sourced from "Tasmanian Government Land Tasmania (2025). Aerial Photo Viewer" No noticeable erosion is apparent.



Figure 26. Sourced from "Tasmanian Planning Scheme – State Planning Provisions 2025" p.p. 381 - 397

Essential performance criteria

As per Sections C10.1 and C11.1 of the Tasmanian Planning Scheme, the Director's Determination – Coastal Erosion Hazard Areas, and the Director's Determination – Coastal Inundation Hazard Areas, developments within an area at risk of coastal erosion or subject to risk from coastal inundation are to be appropriately located and managed so that they meet Performance Criteria P1 to satisfy the following:

- People, property and infrastructure are not exposed to an unacceptable level of risk.
- Future costs associated with options for adaptation, protection, retreat or abandonment of property and infrastructure are minimised.
- The proposed work can achieve and maintain a tolerable risk for the intended life of the building without requiring any specific coastal erosion protection measures.
- The proposed work does not increase the risk from coastal inundation or coastal erosion to other land or public infrastructure.
- Works to protect land from coastal erosion or inundation are undertaken in a way that provides appropriate protection without increasing risks to other land; and
- The proposed work will not be located on actively mobile landforms, except where the work relates to protection measures or remediation works to protect land, property or human life.

The Tasmanian Government has developed a series of projected sea level rise planning allowances and coastal hazards maps based on research presented in Department of Premier and Cabinet Coastal Hazards Technical Report: Mitigating Natural Hazards through Land Use Planning and Building Control (2016).

The coastal hazard maps are accessible via the Land Information Systems Tasmania (the LIST) site. The Coastal Vulnerability mapping series provides a general geomorphic description of the shoreline type around Tasmania's coast, together with an indicative ('first pass') assessment of the vulnerability of each coastal segment to erosion and recession due to sea level rise.

Figure 27. Percentages of proposed site developments falling within potential coastal vulnerability zones

Site Location	CEHC (E16) Overlay	WCPA (E11) Overlay	IPAC (E15.7.3) Overlay Low Risk	IPAC (E15.7.2) Overlay Medium Risk	IPAC (E15.7.1) Overlay High Risk	CEHC (E16) Overlay
Proposed Decking	100%	-	-	-	-	5m
Proposed Extensions	100%	-	-	-	-	5m

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The geology of the area has been previously mapped by Mineral Resources Tasmania (MRT), with the site immediately atop marine sands, and beneath this lithology lies Siliceous quartzwacke turbidites of the Neoproterozoic Undifferentiated Oonah Formation.

Coastal processes and erosion susceptibility:

Coastal modelling has not been conducted for this site as the proposed dwellings are considered a very low risk due to the shallow land gradient with steeply dipping, resilient sedimentary beds apparent as basement. These basement rocks extend a long way from the property to the north and are not uniform so will serve to attenuate wave action.

Sandy soils are susceptible to slumping due to wave scour and excessive steepening in the wave runup zone. Throughout the anticipated life of the proposed development, there is a minimal likelihood of sea level rise causing significant erosion and slumping. Although there may be occasional “once-a-century” severe storms, the associated erosion and slumping are not expected to exceed 4 meters by 2100. Consequently, the geotechnical stability in the vicinity of the proposed works is anticipated to remain intact.

In contrast to engineered or artificial shorelines, certain natural coastlines inherently exhibit high resistance to erosion over extended periods. In the case of the shoreline surrounding 45 Sice Avenue, the coast displays features of a concordant coastline, with equally resilient Siliceous quartzwacke turbidites extending along the northern coastline. The headland itself upon which the property has been established is of harder material still, and shows no indications of erosion upon site inspection, or assessment of sea level recording; in this the headland has characteristics of a discordant, erosion-resistant headland. This minimal morphological change due to the hardness of the substrate, which has become increasingly stabilised over time as pioneer vegetation colonises and secures accumulated sediment is reinforced through assessment of the aerial and satellite photography; depicting that neither the vegetation nor rock mass has receded, and the site remains **unlikely to suffer significant erosion under current environmental conditions**.

Assessment of the shoreline via records maintained by Geoscience Australia: Digital Earth Australia (DEA, 2025) indicate the shoreline in the immediate vicinity to the site has not undergone any significant erosion in the past 50 years (fig.25j). Satellite and aerial images accessed via Google Earth, LISTMap and the Land Tasmania Aerial Photo Viewer (APV) were reviewed for historical evidence of coastal erosion. **No discernible shoreline erosion was indicated from this analysis of images dating back to 1975** (fig.25a-25j). Earlier images were assessed as far back as 1946, with suburban development comparisons available from images post-1960. Even in the relatively lower resolution images from 1960, no significant erosion events are discernible.

Risk Assessment

The development of the qualitative risk assessment criteria aims to identify significant risks associated with construction activities in areas susceptible to erosion or inundation hazards. The assessment of risks is predicated on the projected lifespan of the building, extending up to 2100.

The criteria used in this evaluation adhere to a risk assessment matrix aligned with the Australian Standard AS4360 on Risk Management (AS4360). The qualitative assessment of risk severity and likelihood, as outlined in Appendix 2, was employed to facilitate a comprehensive qualitative risk assessment. This assessment was derived from the coastal vulnerability evaluation conducted specifically for the site.

A detailed risk assessment addressing the performance criteria is presented in Appendix 1. Based on the risk assessment conducted by Hotmann Services, it has been determined that the level of risk associated with the proposed development works is deemed acceptable throughout its expected lifespan. There are no identified medium or high-risk factors associated with the proposed development.

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The proposed development is interpreted to be within the stable foundation zone based on the modelled 1% AEP 2069 storm erosion and recession assessment and is adequately set back from coastline. The site is elevated well above the modelled 1% AEP 2100 wave runup levels.

In accordance with Division 2 – Work in a Coastal Erosion Hazard Area: Section 4 sub-section C as defined within the “Director’s Determination – Coastal Erosion Hazard Areas v 1.2”, conclusions based on the consideration of the proposed work are as follows:

- i) The works will not deleteriously cause or contribute to coastal erosion on the land or on adjacent land, and will act to prevent erosion potential by driving footings into the ground as land stabilisation.**
- ii) The works proposed are not on actively mobile landforms.**
- iii) The works proposed at 45 SICE AVENUE indicate the elevated nature of any development to the southern side of the property will maintain a tolerable risk for the intended life of the building.**

WIND CLASSIFICATION

In accordance with AS 4055-2021 *Wind load for Housing* classification follows for the proposed houses situated upon 45 SICE AVENUE, Heybridge.

Region: **A**

Terrain category: **TC2.5**

Open terrain including grassland with well-scattered obstructions having heights generally from 1.5 m to 5 m with no more than two obstructions per hectare, e.g., farmland and cleared subdivisions with isolated trees and uncut grass.

Shielding Classification: **NS-PS** (property abutting against large coastal expanse and surrounded on all other sides by residential structures and established trees.).

No shielding shall apply where there are no permanent obstructions or where there are less than 2.5 obstructions per hectare, such as a row of houses or single houses abutting open parklands, open water or airfields. Partial shielding shall apply to intermediate situations where there are at least 2.5 houses or sheds per hectare, such as acreage-type suburban development or wooded parkland.

Topographic Classification: **T0**

Area is a coastal setting 1 in 20m elevation drop. Located at an elevation of apx' 7m above sea level.

Wind Classification: **N1**

Design Wind Gust Speed (V_{h,u}) **28 m/sec**

SITE CLASSIFICATION OVERVIEW AND RECOMENDATIONS

In accordance with guidance provided by AS2870 - 2011 regarding moisture related seasonal ground movement, based upon the limited subsurface information collected in this analysis, the soil profiles observed bear a classification of ML-CH (**inorganic silts to fine sand - inorganic gravelly clay**).

Laboratory results indicated:

TH1) liquid limit ranging from 16.2 – 27.7%, plasticity index of 0 – 1.5% and linear shrinkage of 0.8 – 1.6%.

TH2) liquid limit ranging from 18.8 – 21.5%, plasticity index from 0 – 2.7% and linear shrinkage of 1.6 – 2.4%.

Site classification in accordance with AS2870 - 2011 (Ref 2) provides guidance on the patterns and magnitude of moisture related seasonal ground movements that must be considered in design.

Based on the current data the site classification is determined to be **Surface to 1.5m depth: Class S**. Mostly inorganic silt, fine sand & gravels with slight ground movement attributed to moisture changes indicate a Class S. **However, in accordance with “Director’s Determination – Coastal Erosion Hazard Areas v 1.2” the AS2870 site classification of any land located within a coastal erosion hazard area must be Class P, on the basis that it may be subject to coastal erosion.**

The site classification must be reassessed should the subsurface profile change by either cutting or filling and/or if the presence of service trenches, retaining walls or submerged structures within the zone of influence of the proposed footings. Refer to CSIRO foundation management BTF 18 sheets included with this report.

GENERAL NOTES AND REPORT LIMITATIONS

This report relates to the soil and site conditions on the property at the time of the site assessment. Minor variability in subsurface conditions must be anticipated. Additional topsoils could foreseeably be deposited after this investigation. Moisture condition of site soils and/or the presence of groundwater may vary considerably from time of investigation compared to at the time of construction. Examples of abnormal moisture conditions developing after construction include the following:

- The effect of plants too close to the footings.
- Saturation watering of gardens adjacent to the footings.
- Failure to install or maintain site drainage affecting footings.
- Failure to repair plumbing leaks affecting footings.
- Loss of vegetation from near the building.
- Regional environmental events.

Other limitations of this report pertain to the assets used in assessing the risk of building in hazardous areas, relying upon the content of:

- Climate Futures Light Detection and Ranging (LIDAR) digital elevation model is used for the site modelling.
- ListMAP cadastral information.
- The estimations in this report assessing climate change impacts and in particular climate change induced sea level rise impacts are based on a collation of existing information and data, with some site-specific modelling for planning purposes.

Details pertaining to mains water and sewer infrastructure comes from governmental sources (ListMAP) and word-of-mouth conversations with local stakeholders / neighbouring persons. Site preparation prior to the construction should include removal of all vegetation, topsoil and any uncontrolled filling.

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This report is specific to the project at hand and should not be used or relied upon for other projects or purposes, whether on the same site or elsewhere, by any party. The author of this report strongly recommends that footing excavations be inspected by a geotechnical engineer.

It is important to note that any modifications or excavations on the site have the potential to alter the site classification. Therefore, all new fill materials must be placed under controlled conditions in accordance with AS 3798-2007. Failure to adhere to these controls may require assuming a subsequent classification of Class P.

All earthworks related to the findings presented in this report must comply with the guidelines outlined in AS 3798-2007, which provide guidance on earthworks for both commercial and residential developments. The longevity and performance of footings depend on ongoing maintenance by the property owner(s).

While every effort has been made to accurately describe the subsurface conditions, it is important to acknowledge that natural variations, as well as variations caused by intentional infrastructure works, may occur and cannot be fully determined or predicted through limited soil testing. Therefore, it is possible that unforeseen variations or discrepancies may arise between the results presented in this report and the actual observations made during construction.

The intention of the author is to provide the most probable soil conditions and categorization based on the area assessed. However, due to the focused nature of the sampling and the potential variations in lithological type, depth, and physical site conditions, some variations may occur.

We accept no responsibility for any differences between what we have reported and actual site and soil conditions for regions we could not directly assess at the time of inspection.

During construction, Hotmann Services PTY LTD and the design engineer should be notified of any major variation to the foundation conditions as determined within this report, and we invite the owner/s to commission a reclassification via updated report. This report requires certification via a form 55 certificate from Hotmann Services PTY LTD to validate its contents.

Mark Hotson – Engineering Geologist

B.A.Sc. (Hons), GradDip.

RP GEO 10291 (Certified Prof Geologist)

Membership:

Australian Institute of Geoscientists #6560

Soil Science Australia



A handwritten signature in blue ink, appearing to read "Mark Hotson", on a white rectangular background.

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References:

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- AS 4360-2004.** Australian and New Zealand Standard. *Determination of Risk Management*
- AS 3798-2007.** Australian and New Zealand Standard. *Guidelines on earthworks for commercial and residential developments*
- AS 1726-2017.** Australian and New Zealand Standard. *Geotechnical Site Investigations.*
- AS 2870-2011.** Australian and New Zealand Standard. *Residential slabs and footings*
- AS 1289.3.1.1.** Australian and New Zealand Standard. *Determination of the liquid limit of a soil - four-point Casagrande Method*
- AS 1289.3.2.1.** Australian and New Zealand Standard. *Determination of the plastic limit of a soil - Standard Method*
- AS 1289.3.3.1.** Australian and New Zealand Standard. *Calculation of the plasticity index of a soil*
- AS 1289.3.4.1.** Australian and New Zealand Standard. *Determination of the linear shrinkage of a soil - Standard Method*
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Appendices 1: Qualitative Risk Assessment Tables

Consequence	Details - Storm Erosion and Inundation	Details – Coastal Protection
Catastrophic	Loss of human life and irreparable damage to significant environmental values resulting from a pollution incident with no foreseeable possibility of recovery	Severe environmental impacts leading to the impairment of ecosystem function and causing long-term, extensive effects on significant environments such as RAMSAR Wetlands.
Major	Extensive damage including severe injuries, complete structural failure of development, destruction of significant property and infrastructure, significant environmental damage necessitating remediation efforts and a long-term recovery period.	Significant environmental impacts resulting in notable impairment of ecosystem function. Medium to long-term effects that extend across a relatively wide area.
Moderate	Necessary treatment needed due to notable damage to buildings or infrastructure, including the loss of minor outbuildings such as car ports and garages. Replacement of significant property components such as linings, hard paved surfaces, cladding, and flooring. Moderate environmental damage with a relatively short-term recovery period through natural processes or remedial actions.	Moderate impacts on the biological or physical environment, including air and water, without significant disruption to ecosystem function. Moderately widespread effects over the short term, such as notable spills or incidents.
Minor	Moderate level of loss - restoration of outbuildings and repair, along with minor replacement of building components. Replacement of floor/window coverings and some furniture. Minimal environmental damage that can be easily remedied.	Negligible impact on the biological or physical environment. Minor, short-term damage confined to a small area of limited importance.
Insignificant	No injuries, minimal losses - no need to replace essential building components, with some necessary maintenance of garden beds, gravel driveways, etc. The environment can naturally withstand and recover without requiring remediation. The site experiences inundation, but ground-based access remains easily accessible, and habitable buildings, including incorporated garages, are not affected by the inundation.	Limited impact to smallest area of limited significance.

Level	Descriptor	Description	Guideline
A	Almost Certain	Consequence is expected to occur in most circumstances.	Occurs more than once per month.
B	Likely	Consequence will probably occur in most circumstances.	Occurs once every 1 month – 1 year.
C	Occasionally	Consequence should occur at some time.	Occurs once every 1 year - 10 years.
D	Unlikely	Consequence could occur at some time.	Occurs once every 10 years – 100 years.
E	Rare	Consequence may only occur in exceptional circumstances.	Occurs less than once every 100 years.

Source: AS/NZS 4360:2004 Risk Management

Likelihood of the Consequence	Maximum Reasonable Consequence				
	(1) Insignificant	(2) Minor	(3) Moderate	(4) Major	(5) Catastrophic
(A) Almost certain	11 High	16 High	20 Extreme	23 Extreme	25 Extreme
(B) Likely	7 Moderate	12 High	17 High	21 Extreme	24 Extreme
(C) Occasionally	4 Low	8 Moderate	13 High	18 Extreme	22 Extreme
(D) Unlikely	2 Low	5 Low	9 Moderate	14 High	19 Extreme
(E) Rare	1 Low	3 Low	6 Moderate	10 High	15 High

Source: AS/NZS 4360:2004 Risk Management

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Appendices 2: Qualitative assessment of risk severity and likelihood applied to the proposed 45 Sice Avenue development indicate there are no medium or high-risk concerns for this property development.

Performance Criteria E16.7.1 P1 Buildings and works must satisfy all of the following:	Relevance	Management Options	Preliminary Risk Assessment			Further Assessment Required
			Consequence	Likelihood	Risk	
Do not increase the level of risk to the life of the users of the site or hazard for adjoining or nearby properties or public infrastructure;	No projected erosion in building areas based on 2073 1% AEP scenario		Insignificant (1)	Rare (E)	Low (1)	No
Account for erosion risk arising from wave run-up, including impact and material suitability, may be mitigated to an acceptable level through structural or design methods used to avoid damage to, or loss of, buildings or works;	Low wave runup erosion risk. Significant wave attenuation occurs through the extensive exposed basement rocks.		Insignificant (1)	Rare (E)	Low (1)	No
Ensure erosion risk is mitigated to an acceptable level through measures to modify the hazard where these measures are designed and certified by an engineer with suitable experience in coastal, civil and/or hydraulic engineering;	No mitigation required		-	-	-	No
The need for future remediation works	Negligible site erosion hazard		Minor (2)	Unlikely (D)	Low (5)	No
Health and safety of people is not placed at risk	Negligible site erosion hazard		Minor (2)	Unlikely (D)	Low (5)	No
Important natural features are adequately protected	No natural features of value at the site.		-	-	-	No
Public foreshore access is not obstructed where the managing public authority requires it to continue to exist	Not Applicable		-	-	-	No
Access to the site will not be lost or substantially compromised by expected future erosion whether on the proposed site or off-site	Negligible site erosion hazard		Insignificant (1)	Rare (E)	Low (1)	No
Provision of a developer contribution for required mitigation works consistent with any adopted Council Policy, prior to commencement of works.	No need for structural mitigation.		Insignificant (1)	Rare (E)	Low (1)	No
Not be located on an actively mobile landform	Not a mobile landform		Insignificant (1)	Rare (E)	Low (1)	No

FOUNDATION MAINTENANCE AND FOOTING PERFORMANCE



Preventing soil-related building movement

This Building Technology Resource is designed as a homeowner's guide on the causes of soil-related building movement, and suggested methods to prevent resultant cracking.

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 home owner 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. Generally soil classification is provided by a geotechnical report.

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.

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. Table 1 below is a reproduction of Table 2.1 from Australian Standard AS 2870-2011, Residential slabs and footings.

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 may be the province of the builder and should be taken into consideration as part of the preparation of the site for construction.

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, from AS 2870). 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.

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.

TABLE 1. 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, which may experience only slight ground movement from moisture changes
M	Moderately reactive clay or silt sites, which may experience moderate ground movement from moisture changes
H1	Highly reactive clay sites, which may experience high ground movement from moisture changes
H2	Highly reactive clay sites, which may experience very high ground movement from moisture changes
E	Extremely reactive sites, which may experience extreme ground movement from moisture changes

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FIGURE 1 Trees can cause shrinkage and damage.

- ▶ 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 through absorption. The swelling process will usually begin at the uphill extreme of the building, or on the weather side where the land is flat. Shrinkage usually begins on the side of the building 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 perpend).

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 causes 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. Table 2 below is a reproduction of Table C1 of AS 2870-2011.

AS 2870-2011 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 AND 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 may 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 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.

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.

TABLE 2. CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS.

Description of typical damage and required repair	Approximate crack width limit	Damage category
Hairline cracks	<0.1 mm	0 – Negligible
Fine cracks which do not need repair	<1 mm	1 – Very Slight
Cracks noticeable but easily filled. Doors and windows stick slightly.	<5 mm	2 – Slight
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 – Moderate
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 depends on number of cracks	4 – Severe

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Warning: Although this Building Technology Resource 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, and mould.
- ▶ 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

Existing trees may cause problems with the upheaval of footings by their roots, or shrinkage from soil drying. 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. Soil drying is a more complex issue and professional advice may be required before considering the removal or relocation of the tree.

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.

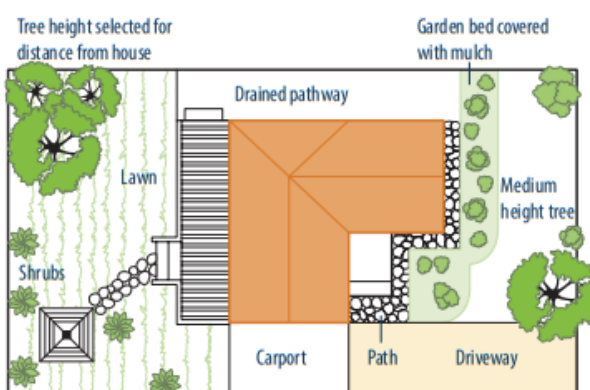


FIGURE 2 Gardens for a reactive site.

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.

REMEDICATION

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 home owner 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.

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Laws and regulations may vary in different places. Seek specialist advice for your particular circumstances.

To the extent permitted by law, CSIRO excludes all liability to any person for any loss, damage, cost or other consequence that may result from using this information.

HOTMANN SERVICES PTY LTD
Appendices 4: Form 55 specific to 30 Alexander Terrace.

CERTIFICATE OF QUALIFIED PERSON – ASSESSABLE ITEM

Section 321

Form **55**

To: Owner /Agent
 Address
 Suburb/postcode

Qualified person details:

Qualified person:
Address: Phone No:
 Fax No:
Licence No: Email address:

Qualifications and Insurance details: (Description from Column 3 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)

Speciality area of expertise: (description from Column 4 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)

Details of work:

Address: Lot No:
 Certificate of title No:

The assessable item related to this certificate: (Description of the assessable item being certified)
Assessable item includes –
- a material;
- a design
- a form of construction
- a document
- testing of a component, building system or plumbing system
- an inspection, or assessment, performed

Certificate details:

Certificate type: (Description from Column 1 of Schedule 1 of the Director's Determination - Certificates by Qualified Persons for Assessable Items n)

This certificate is in relation to the above assessable items, at any stage, as part of – (tick one)

building work, plumbing work or plumbing installation or demolition work

OR

a building, temporary structure or plumbing installation

HOTMANN SERVICES PTY LTD

In issuing this certificate, the following matters are relevant –

Documents: The attached Geotechnical Assessment Report for the address detailed above in 'Details of Work'.

Relevant calculations: Refer to the above report.

References: Building Act 2016: Directors Determination – Coastal Erosion Hazard Areas
Building Act 2016: Directors Determination – Coastal Inundation Hazard Areas

AS 4055-2012 Wind load for Housing
AS 3798-2007 Guidelines on earthworks for commercial and residential developments
AS 2870-2011 Residential slabs and footings
AS1726-2017 Geotechnical site investigations
AS 1289.3.1.1 Determination of the liquid limit of a soil - four-point Casagrande Method
AS 1289.3.2.1 Determination of the plastic limit of a soil - Standard Method
AS 1289.3.3.1 Calculation of the plasticity index of a soil
AS 1289.3.4.1 Determination of the linear shrinkage of a soil - Standard Method
AS 1289.3.6.1 Determination of soil particle size - Standard method of analysis by sieving
CSIRO Building Technology File -18

Substance of Certificate: (what it is that is being certified)

Coastal Hazards assessment

Site classification consistent with AS2870-2011
Site classification consistent with AS4055-2012

The site exists outside Coastal Inundation Hazard Bands. Inspection determined the site exists partially within the Coastal Erosion Hazard Band – (High). Follow-up investigations determine the shoreline to be a resilient entity with no significant erosion in the past 50 years and a mean annual shoreline of 0m above sea level observed to be receding at the site since 1992 grants the assessed site to be within an acceptable Coastal Erosion Hazard Band.

By the primary domicile modifications proposed, this variation:

1. Is unlikely to cause or contribute to coastal erosion or inundation.
2. Is not proposed on actively mobile landforms.
3. Will achieve and maintain a tolerable risk for the intended life of the building (100 years) with specific regard for:
 - The intensity and duration of use, or the type, form and duration of development.
 - The low potential change in risk across the intended building life, and the ability for the property to adapt to a change in risk.
 - The ability for maintaining access to utilities and services.
 - The need for specific coastal erosion or inundation hazard reduction or protective measures for the site, or such measures beyond the boundary of the assessed site.
 - Any coastal erosion or inundation management plan in place for the site including adjacent land.

Based upon the findings of the investigation into the proposed changes for 45 Sice Avenue, the proposed changes would not adversely impact the site, the immediate surroundings, or increase the current Coastal Erosion or Inundation risk. This is an acceptable solution under the Tasmanian Planning Scheme, Sections C10.6.1 and C11.6.1

Scope and/or limitations

The classification applies to the site as inspected and assessed in accordance with geological observations detailed within the attached report relating to coastal hazard risks (coastal erosion and inundation risk specifically) and does not account for future alteration to foundation conditions as a result of earthworks, significant climate events, drainage condition changes or variations in site maintenance.

I certify the matters described in this certificate.

Qualified person:

Signed:



Certificate No:

010015

Date:

28/07/2025



CERTIFICATE OF QUALIFIED PERSON – ASSESSABLE ITEM

Section 321

To: Owner /Agent
 Address
 Suburb/postcode

Form **55**

Qualified person details:

Qualified person:
Address: Phone No:
 Fax No:
Licence No: Email address:

Qualifications and Insurance details:
(Description from Column 3 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)

Speciality area of expertise:
(description from Column 4 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)

Details of work:

Address: Lot No:
 Certificate of title No:
The assessable item related to this certificate:
(Description of the assessable item being certified)
Assessable item includes –
- a material;
- a design
- a form of construction
- a document
- testing of a component, building system or plumbing system
- an inspection, or assessment, performed

Certificate details:

Certificate type:
(Description from Column 1 of Schedule 1 of the Director's Determination - Certificates by Qualified Persons for Assessable Items n)

This certificate is in relation to the above assessable items, at any stage, as part of – (tick one)

building work, plumbing work or plumbing installation or demolition work

OR

a building, temporary structure or plumbing installation

In issuing this certificate, the following matters are relevant –

Documents:	The attached Geotechnical Assessment Report for the address detailed above in 'Details of Work'.
Relevant calculations:	Refer to the above report.
References:	Building Act 2016: Directors Determination – Coastal Erosion Hazard Areas Building Act 2016: Directors Determination – Coastal Inundation Hazard Areas AS 4055-2012 Wind load for Housing AS 3798-2007 Guidelines on earthworks for commercial and residential developments AS 2870-2011 Residential slabs and footings AS1726-2017 Geotechnical site investigations AS 1289.3.1.1 Determination of the liquid limit of a soil - four-point Casagrande Method AS 1289.3.2.1 Determination of the plastic limit of a soil - Standard Method AS 1289.3.3.1 Calculation of the plasticity index of a soil AS 1289.3.4.1 Determination of the linear shrinkage of a soil - Standard Method AS 1289.3.6.1 Determination of soil particle size - Standard method of analysis by sieving CSIRO Building Technology File -18

Substance of Certificate: (what it is that is being certified)

Coastal Hazards assessment

Site classification consistent with AS2870-2011

Site classification consistent with AS4055-2012

The site exists outside Coastal Inundation Hazard Bands. Inspection determined the site exists partially within the Coastal Erosion Hazard Band – (High). Follow-up investigations determine the shoreline to be a resilient entity with no significant erosion in the past 50 years and a mean annual shoreline of 0m above sea level observed to be receding at the site since 1992 grants the assessed site to be within an acceptable Coastal Erosion Hazard Band.

By the primary domicile modifications proposed, this variation:

1. Is unlikely to cause or contribute to coastal erosion or inundation.
2. Is not proposed on actively mobile landforms.
3. Will achieve and maintain a tolerable risk for the intended life of the building (100 years) with specific regard for:
 - The intensity and duration of use, or the type, form and duration of development.
 - The low potential change in risk across the intended building life, and the ability for the property to adapt to a change in risk.
 - The ability for maintaining access to utilities and services.
 - The need for specific coastal erosion or inundation hazard reduction or protective measures for the site, or such measures beyond the boundary of the assessed site.
 - Any coastal erosion or inundation management plan in place for the site including adjacent land.

Based upon the findings of the investigation into the proposed changes for 45 Sice Avenue, the proposed changes would not adversely impact the site, the immediate surroundings, or increase the current Coastal Erosion or Inundation risk. This is an acceptable solution under the Tasmanian Planning Scheme, Sections C10.6.1 and C11.6.1

Scope and/or limitations

The classification applies to the site as inspected and assessed in accordance with geological observations detailed within the attached report relating to coastal hazard risks (coastal erosion and inundation risk specifically) and does not account for future alteration to foundation conditions as a result of earthworks, significant climate events, drainage condition changes or variations in site maintenance.

I certify the matters described in this certificate.

Qualified person: *Signed:* *Certificate No:* *Date:*



010015

28/07/2025



PROPOSED EXTENSION, BALCONY & ATRIUM TO THE TIMBER FRAMED DWELLING AT 45 SICE AVENUE HEYBRIDGE FOR *B.K. BLOMER.*

FOR PLANNING PERMIT
 APPLICATION ONLY

OCTOBER 2025

PROJECT No. 7425

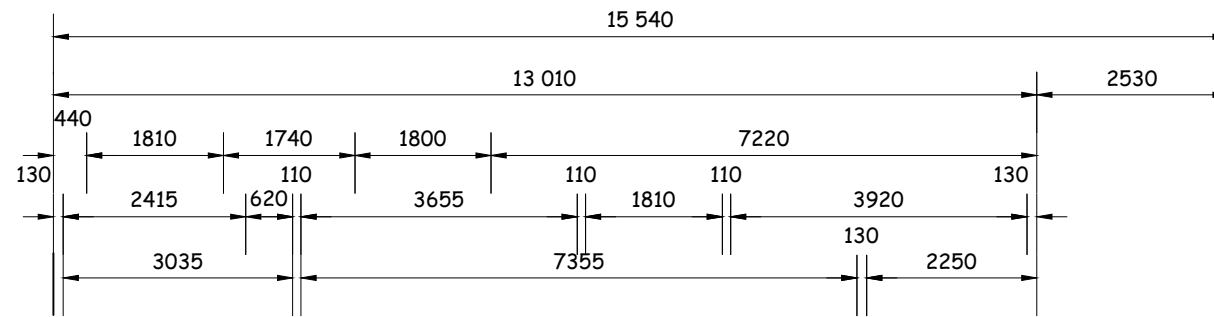
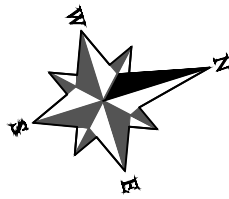
KNOWN SITE HAZARDS REFER TO SAFETY SITE PLAN		UNDERGROUND SERVICES		WORKING AT HEIGHTS		BUSHFIRE ATTACK LEVEL B.A.L. - LOW						
DISTRIBUTION	DRAFT	PLANNING APPROVAL	BUILDING APPROVAL	BUILDING SURVEYOR	TITLE HOLDER	BUILDER						
TITLE REFERENCE Volume 138382 Folio 30		DESIGN WIND SPEED 'N2'	SOIL CLASS. 'M'	BUILDING CLASS. 1(a)	CLIMATE ZONE SEVEN	ALPINE AREA NO	KNOWN SITE HAZARDS UNDERGROUND SERVICES					
AREAS EXISTING MAIN FLOOR		88.85 m ²	NEW ATRIUM		26.00 m ²	EXISTING LOT AREA 892.00 m ²						
NEW MAIN FLOOR EXTENSION		81.95 m ²	REMAINDER VERANDAH		21.65 m ²	TOTAL FOOTPRINT 218.55 m ²						
NEW FIRST FLOOR EXTENSION		81.95 m ²	TOTAL		300.50 m ²	SITE COVERAGE 24.50 %						
TITLE PAGE		7425 - 1 OF 9		PROPERTY IDENTIFICATION NUMBER 7153560								
EXISTING FLOOR PLAN 1:100		7425 - 2 OF 9		CERTIFICATE OF TITLE NUMBER 138382 FOLIO 30								
PROPOSED GROUND FLOOR PLAN 1:100		7425 - 3 OF 9		<p>NOTE: THE BUILDING CONTRACTOR SHALL ENSURE THAT THE WHOLE SET OF DRAWINGS AND SUPPORTING DOCUMENTATION IS PASSED ONTO ALL SUB CONTRACTORS & SUPPLIERS PRIOR TO THOSE ENTITIES COMMENCING MANUFACTURING OR SUPPLYING MATERIALS FOR THE PROJECT. WEEDA DRAFTING & BUILDING CONSULTANTS Pty. Ltd. WILL NOT BE LIABLE FOR ANY ACTION IF THESE CONDITIONS ARE NOT FOLLOWED. IF THERE ARE ANY DISCREPANCIES IN THE DRAWINGS OR SUPPORTING DOCUMENTS, THEY MUST BE REFERRED TO THE DESIGNER/DRAFTSMAN FOR RESOLUTION. THESE DRAWINGS ARE SUBJECT TO COPYRIGHT © AND SHALL NOT BE REPRODUCED OR ALTERED IN ANY WAY WITHOUT THE WRITTEN APPROVAL OF BOTH THE OWNERS AND WEEDA DRAFTING & BUILDING CONSULTANTS Pty. Ltd. PRIOR TO WORK COMMENCING ON SITE THE OWNER & BUILDER SHALL CHECK THAT THE APPROVED SET OF DRAWINGS ARE CORRECT & ARE THE SET OF DRAWINGS STATED IN THE BUILDING CONTRACT.</p>								
PROPOSED FIRST FLOOR PLAN 1:100		7425 - 4 OF 9										
NORTHERN & SOUTHERN ELEVATIONS		7425 - 5 OF 9										
EASTERN & WESTERN ELEVATIONS		7425 - 6 OF 9										
PROPOSED ELECTRICAL PLANS		7425 - 7 OF 9										
SITE LOCATION & SERVICES PLAN		7425 - 8 OF 9										
SITE LOCATION & SETTING OUT PLAN		7425 - 9 OF 9										
PROPOSED EXTENSION, BALCONY & ATRIUM TO THE TIMBER FRAMED DWELLING AT 45 SICE AVENUE HEYBRIDGE FOR B.K. BLOMER.								DATE:	SCALE:	CHECKED BY	DRAWN BY	DWG No.
								28/10/2025	1:100	J WEEDA	A WEEDA	7425 - 1 OF 9

WEEDA Drafting

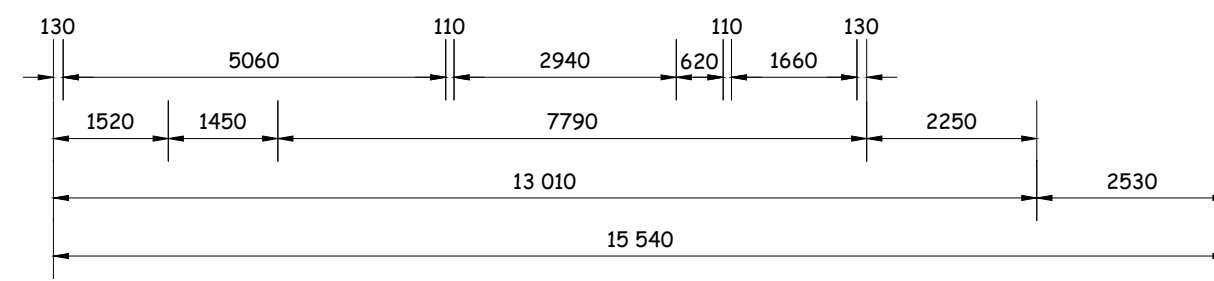
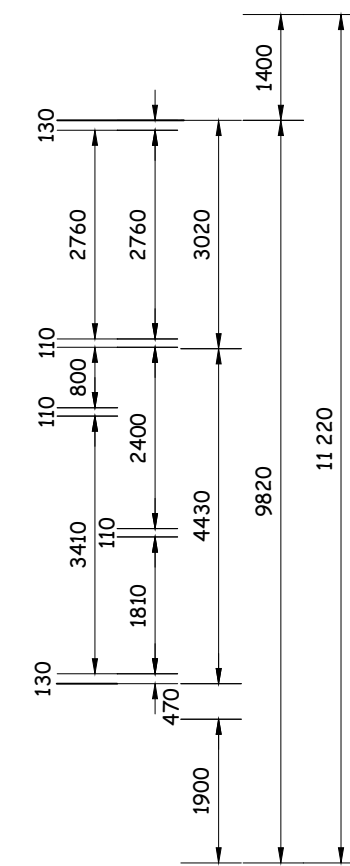
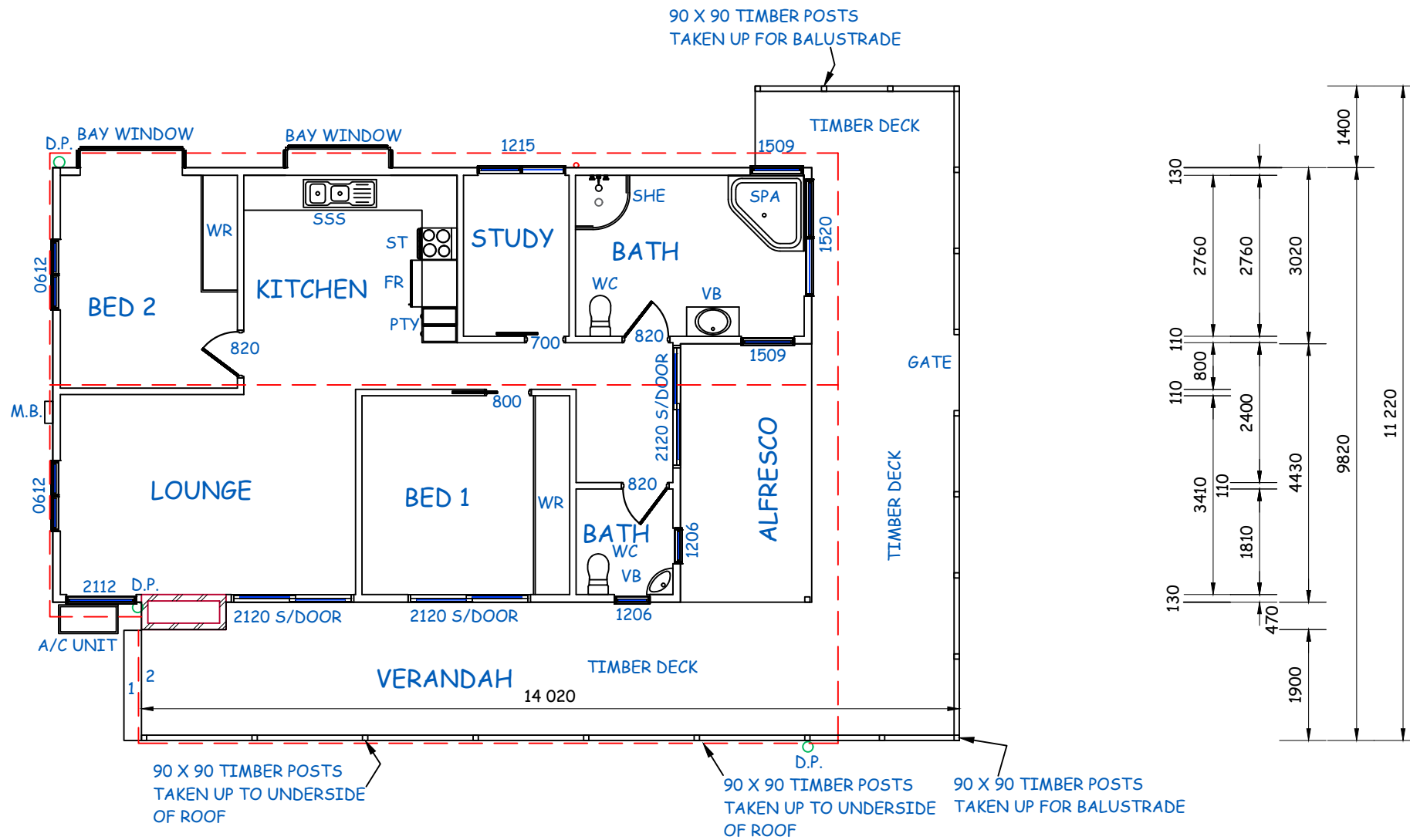
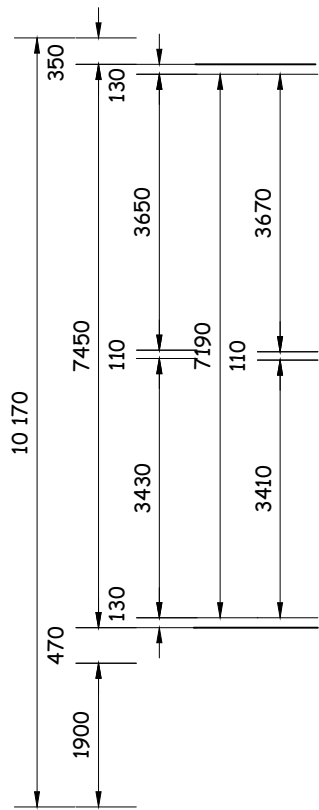
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95 Queen Street, West Ulverstone, 7315
 Phone: (03) 6425 9333
 Email: admin@weedadrafting.com.au

WORKPLACE STANDARDS TASMANIA BUILDING PRACTITIONER AC
 NUMBERS, ADAM; CC 5317 P Cat B.D.



**FOR PLANNING PERMIT
 APPLICATION ONLY**



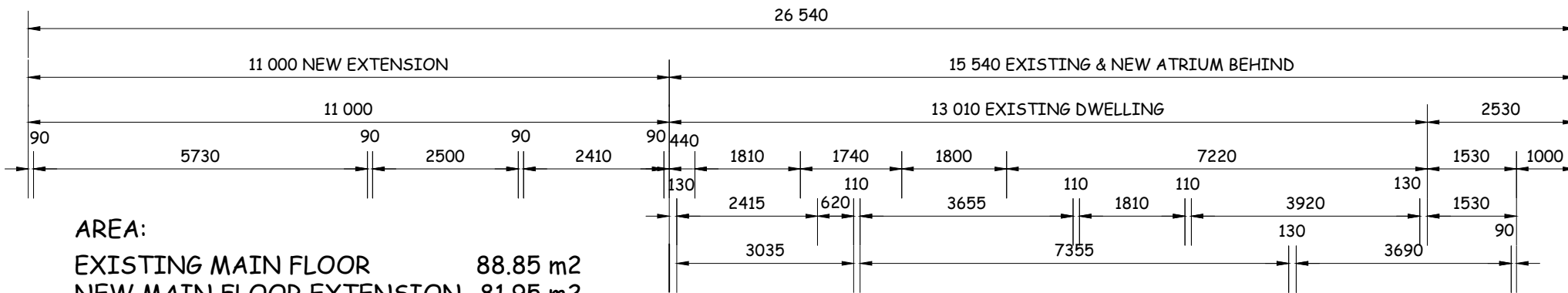
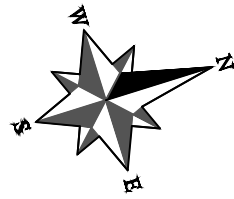
EXISTING FLOOR PLAN 1:100

LEGEND

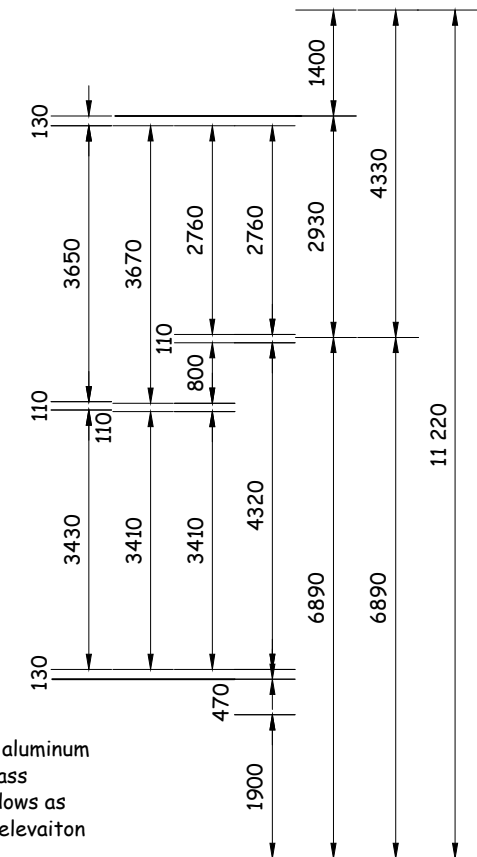
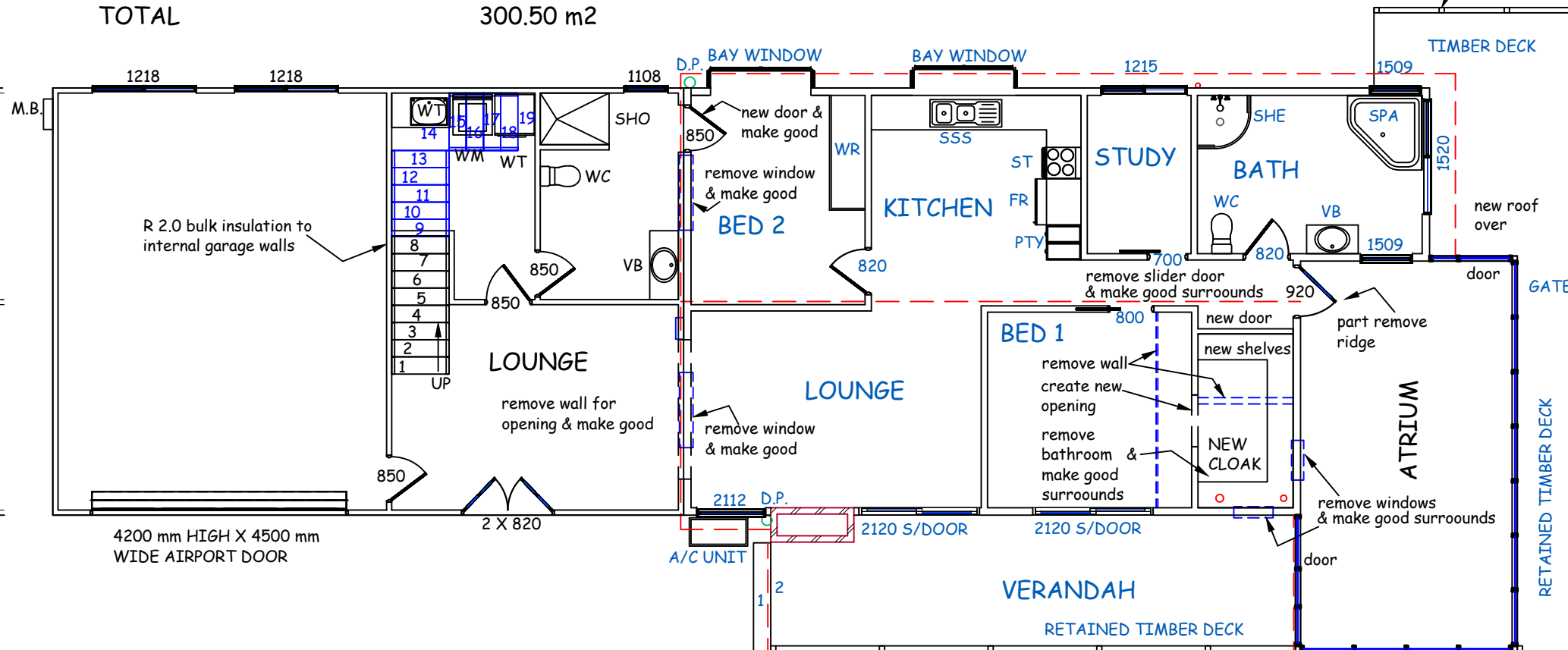
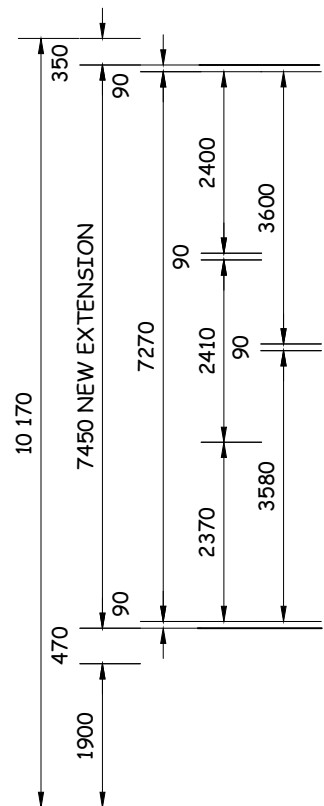
- WT- WASH TROUGH
- WM- WASHING MACHINE
- DR - DRYER
- WR- WARDROBE
- WIWR - WALK IN ROBE
- WC - TOILET
- VB- VANITY BASIN
- BA - BATH
- SHO- SHOWER OPEN
- SHE- SHOWER ENCLOSED
- HW- HOT WATER
- PTY - PANTRY
- ST- STOVE
- UBO - UNDER BENCH OVEN
- HP- HOT PLATES
- SSS - S/STEEL SINK
- MW - MICRO WAVE OVEN
- RH - RANGE HOOD
- MB- METER BOX
- FR- FRIDGE
- FRZ- FREEZER
- DW- DISHWASHER
- RAD- ROLLER DOOR
- AJ-ARTICULATION JOINT
- ⊕ SMOKE DETECTOR
- TL - CERAMIC TILE
- TF - TIMBER FLOOR
- FF - FLOATING FLOOR
- CP - CARPET
- SD - SLIDER DOOR
- FW - FLOOR WASTE
- DP - DOWNPIPES
- SUB FLOOR VENTS
- ⊞ BATHROOM FAN, LIGHT, HEATER.
- ▭ VENTED SKYLIGHT WITH DIFFUSER
- ▭ ROOF SPACE ACCESS HATCH

AREA:

DWELLING	88.85 m2
ALFRESCO	10.00 m2
VERANDAH	27.25 m2
TOTAL	126.10 m2

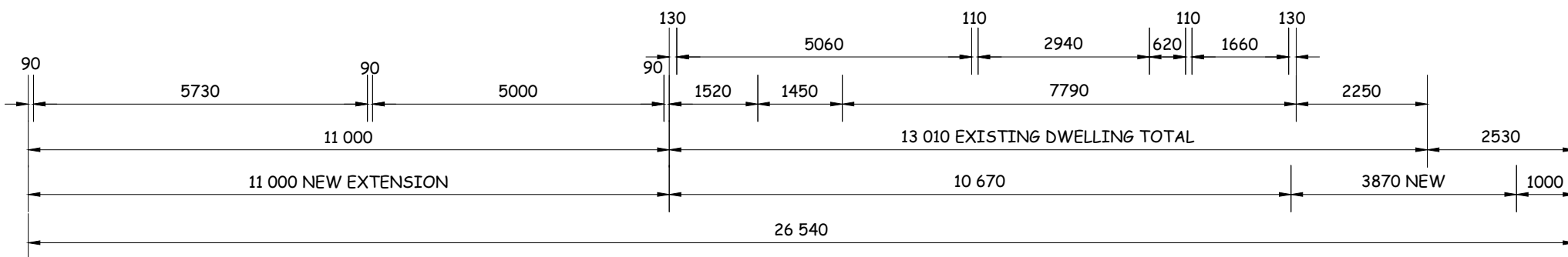


AREA:
 EXISTING MAIN FLOOR 88.85 m²
 NEW MAIN FLOOR EXTENSION 81.95 m²
 NEW FIRST FLOOR EXTENSION 81.95 m²
 NEW ATRIUM 26.00 m²
 REMAINDER VERANDAH 21.65 m²
TOTAL 300.50 m²



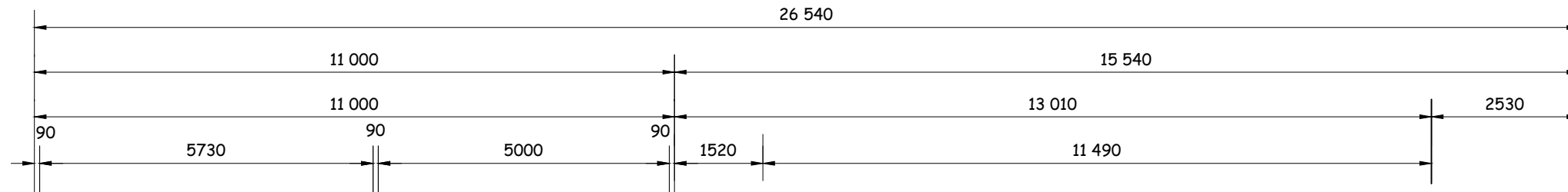
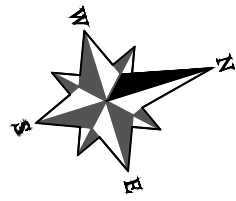
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NOTE:
 EXISTING PRE-FABRICATED GARAGE & FOOTINGS TO BE REMOVED



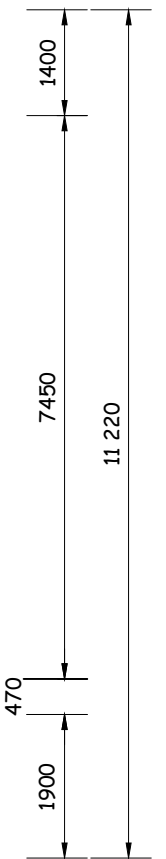
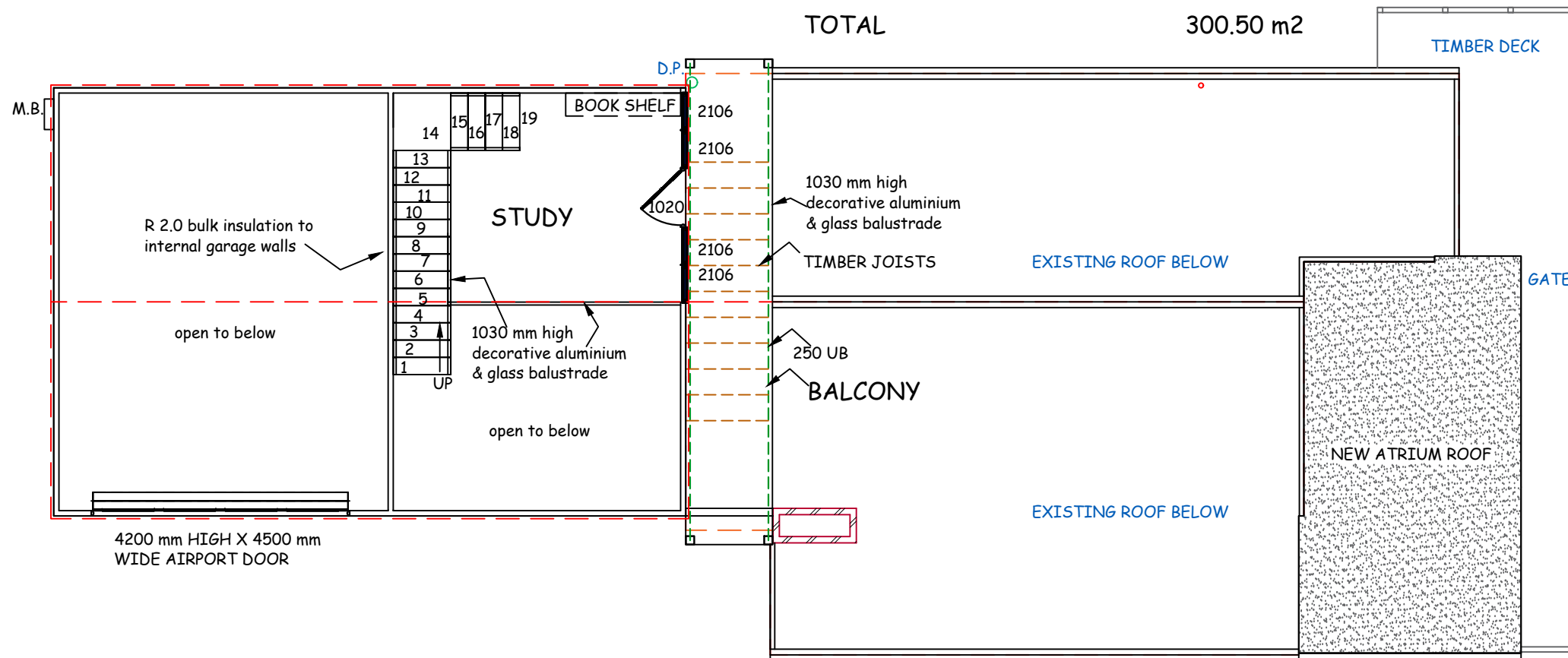
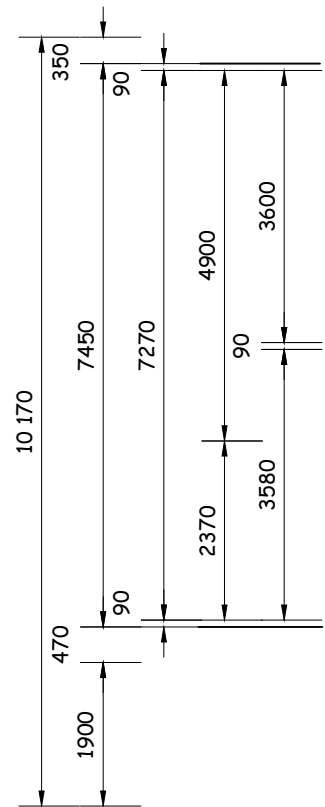
PROPOSED GROUND FLOOR PLAN 1:100

DATE:	SCALE:	CHECKED BY	DRAWN BY	DWG No.
28/10/2025	1:100	J WEEDA	A WEEDA	7425 - 3 OF 9



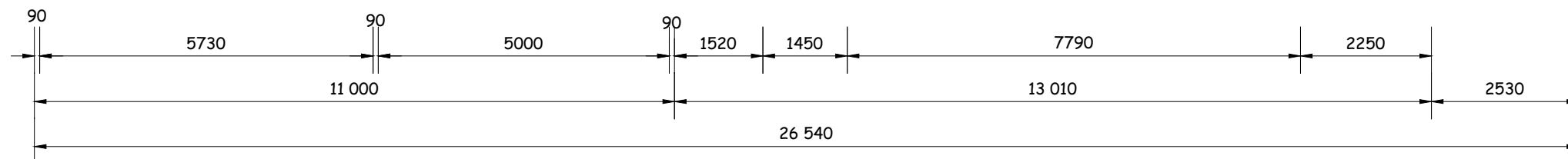
AREA:

EXISTING MAIN FLOOR	88.85 m ²
NEW MAIN FLOOR EXTENSION	81.95 m ²
NEW FIRST FLOOR EXTENSION	81.95 m ²
NEW ATRIUM	26.00 m ²
REMAINDER VERANDAH	21.65 m ²
TOTAL	300.50 m²



NOTE:
 EXISTING PRE-FABRICATED
 GARAGE & FOOTINGS TO
 BE REMOVED

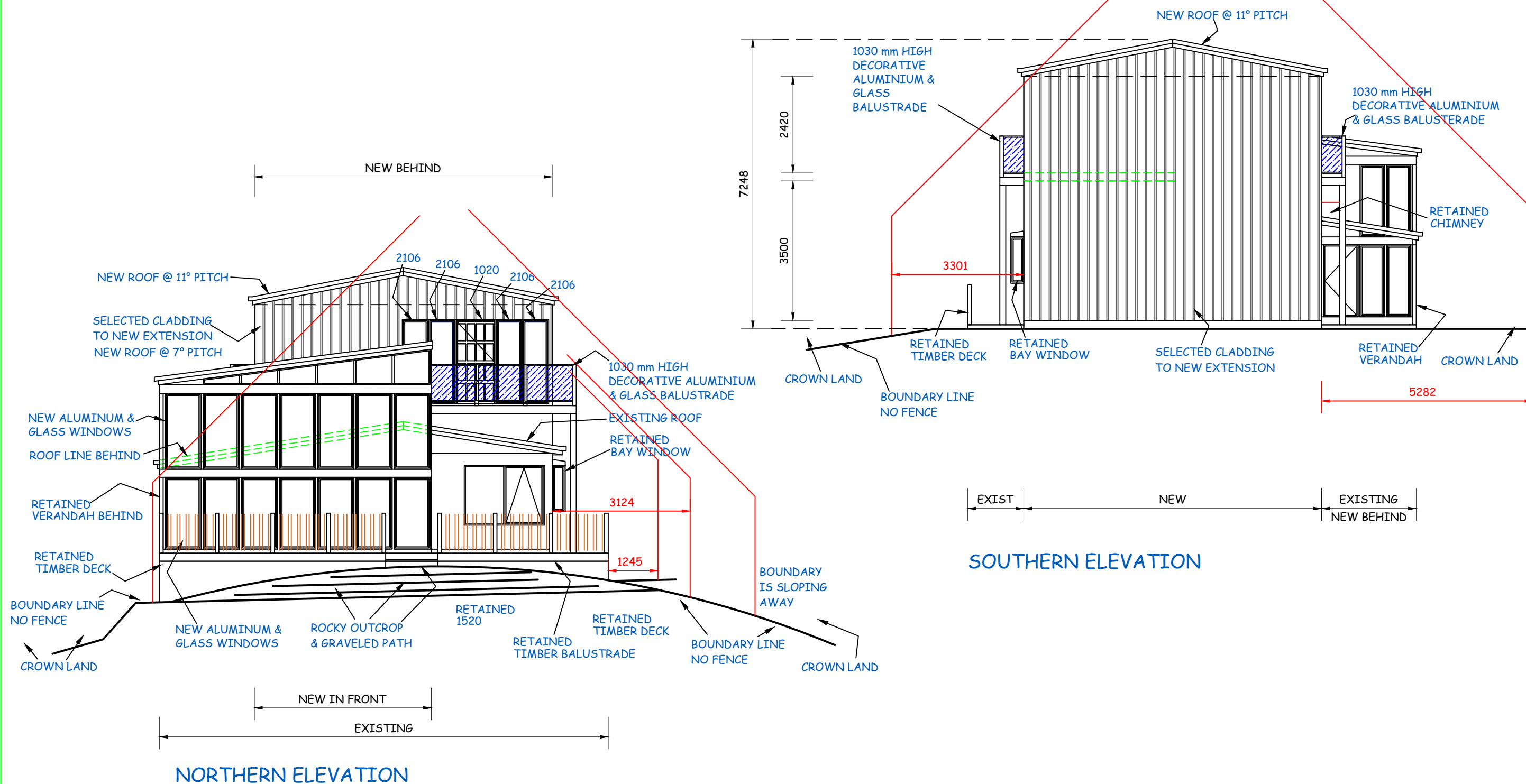
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PROPOSED FIRST FLOOR PLAN 1:100

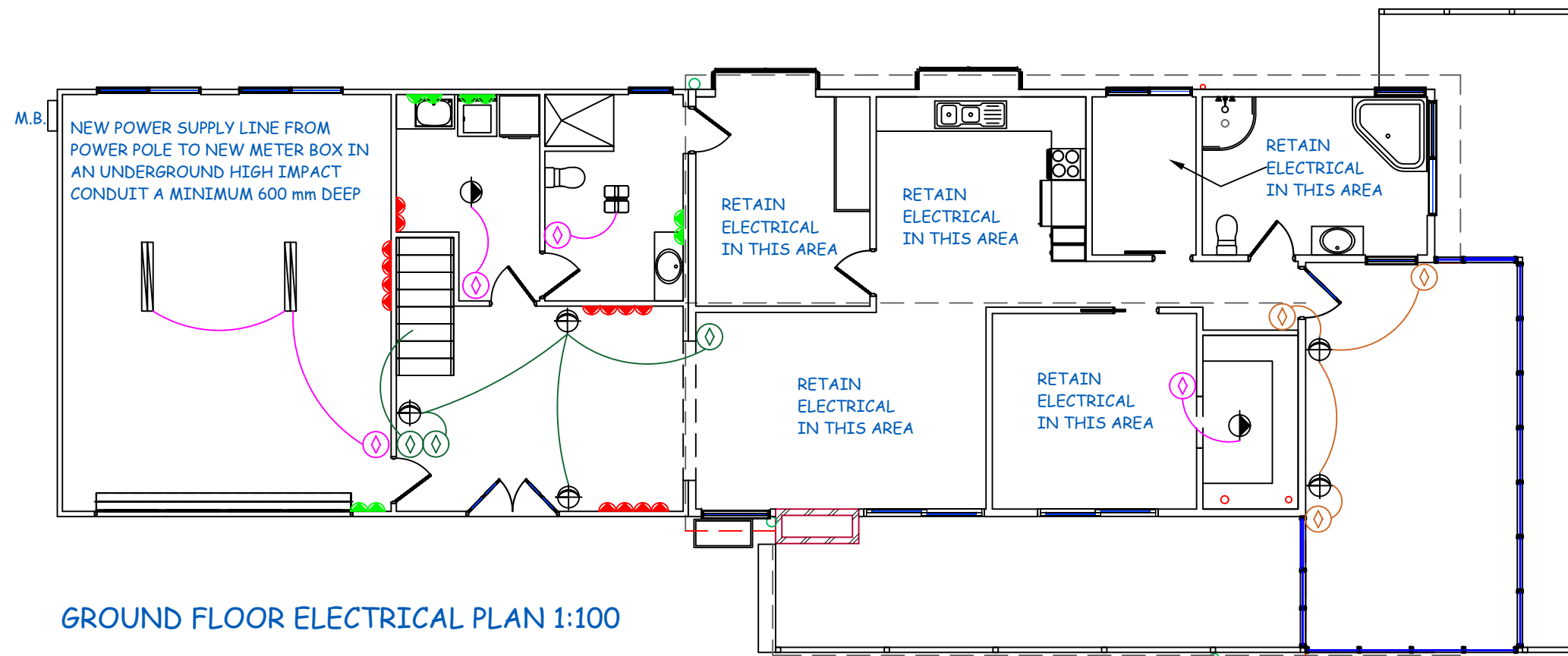


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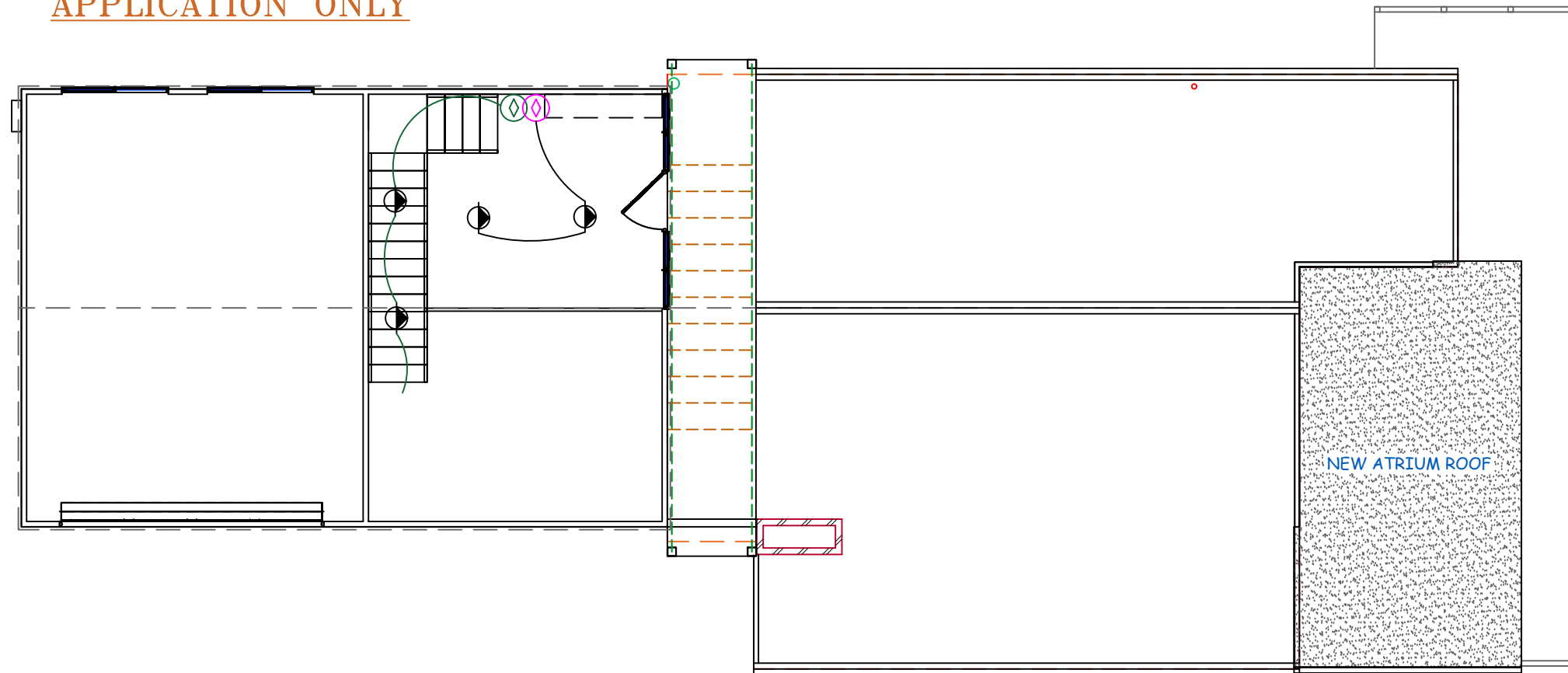
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DATE:	SCALE:	CHECKED BY	DRAWN BY	DWG No.
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GROUND FLOOR ELECTRICAL PLAN 1:100

FOR PLANNING PERMIT APPLICATION ONLY



FIRST FLOOR ELECTRICAL PLAN 1:100

ELECTRICAL LEGEND

- 275 mm HIGH DOUBLE POINTS
- 1125 mm HIGH DOUBLE POINTS
- EXTERNAL POWER POINTS
- DATA CONNECTION POINT
- G.P.O. WITH U.S.B. RECHARGE
- SINGLE 1200 mm 11 W FLURO LIGHTS WITH DIFFUSER
- DOUBLE 1200 mm 22 W FLURO LIGHTS WITH DIFFUSER
- ELECTRONIC VEHICLE CHARGER
- SENSOR LIGHT
- WALL LIGHT
- DOWNLIGHTS
- SWITCH
- 2 WAY SWITCH
- 3 WAY SWITCH
- ISOLATION SWITCH (STOVE)
- SENSOR OVERRIDE
- DIMMER SWITCH
- BATHROOM FAN, LIGHT HEAT VENTED TO OUTSIDE AIR
- CEILING FAN
- INTERNAL FAN
- VENT FANS OUT TO SOFFIT
- 240 VOLT HARD WIRED INTER-CONNECTED SMOKE DETECTOR
- PHONE POINT
- TELEVISION POINT
- ROOF SPACE ACCESS HATCH
- AC - AIR CONDITIONING UNIT
- PH - PANEL HEATER HARD WIRED IN 6.5 kW
- ST - STOVE HARD WIRED IN
- UBO - UNDER BENCH OVEN
- HP- HOT PLATES
- RH - RANGE HOOD
- DW- DISHWASHER
- HW- HOT WATER
- MB- METER BOX
- NBN CUPBOARD 600 mm HIGH X 300 mm DEEP MINIMUM.
- NBN OPTIC FIBRE IN NBN APPROVED CONDUIT

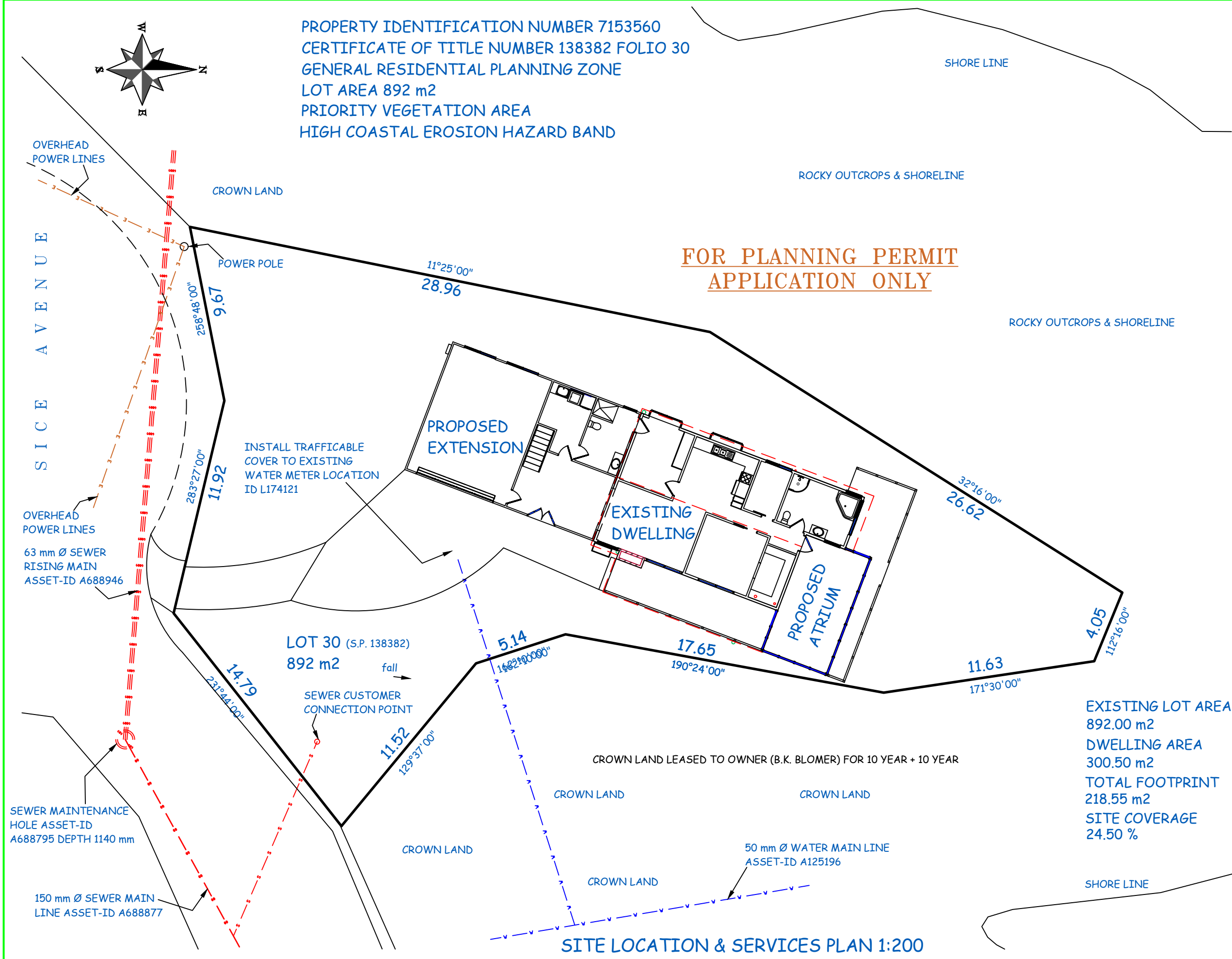
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WORKPLACE STANDARDS TASMANIA BUILDING PRACTITIONER AC
 NUMBERS, ADAM; CC 5317 P Cat B.D.

PROPERTY IDENTIFICATION NUMBER 7153560
 CERTIFICATE OF TITLE NUMBER 138382 FOLIO 30
 GENERAL RESIDENTIAL PLANNING ZONE
 LOT AREA 892 m²
 PRIORITY VEGETATION AREA
 HIGH COASTAL EROSION HAZARD BAND

**FOR PLANNING PERMIT
 APPLICATION ONLY**



PLUMBING NOTES - DOMESTIC

PLUMBING SHALL BE INSTALLED TO:
 A.S./N.Z. 3500.1-2021 WATER SUPPLY
 A.S./N.Z. 3500.2-2021 SANITARY PLUMBING
 A.S./N.Z. 3500.3-2021 STORM WATER
 A.S./N.Z. 3500.4-2021 HOT WATER

- FIXTURES:**
- | | |
|-----------------|----------------|
| 1. TOILET | 4. WASH TROUGH |
| 2. BATH/SPA | 5. SINK |
| 3. VANITY BASIN | 6. SHOWER |
- NOTE:** connection of DN 100 mm Ø branch drain to DN mm Ø main drain now require a 15° incline

- I.O. - INSPECTION OPENING ●
- E.V. - EDUCT VENT ●
- R.E. - ROD EYE ●

O.R.G.-OVERFLOW RELIEF GULLY TOP OF O.R.G.'s SHALL BE A MINIMUM OF 150mm BELOW THE LOWEST FIXTURE A MINIMUM OF 75 mm ABOVE FINISHED GROUND /SURFACE LEVEL. CONCRETE SURROUND PLINTHS SHALL BE PROVIDED GROUND O.R.G.'S. ALL O.R.G.'S TO BE CHARGED WITH TAP OVER

D.P. = DOWNPIPE SIZE AS SHOWN
 STORM WATER LINE 100 mm Ø
 S.W. LINES GENERALLY OUT 1200mm & PARALLEL TO EXTERNAL WALLS. STORM WATER - UPVC 100 mm Ø LAID @ MIN. GRADE OF 1:100
 GRATED PIT 600 X 600 X 600 mm DEEP REFER GRATED PIT DETAIL 150 mm Ø
 STORM WATER LINE DISCHARGING FROM THE GRATED PIT

SEWER LINE 100 mm Ø
 SEWER LINES GENERALLY OUT 1000mm & PARALLEL TO EXTERNAL WALLS. SEWER - UPVC ON 100 LAID @ A MIN. GRADE OF 1:60

WATER SUPPLY 20 mm Ø LINE
 S.V. - STOP VALVE

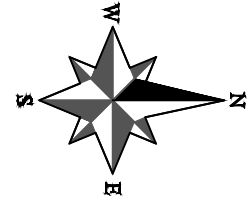
TELSTRA - NBN SUPPLY

POWER SUPPLY

GAS SUPPLY

EXISTING LOT AREA
 892.00 m²
 DWELLING AREA
 300.50 m²
 TOTAL FOOTPRINT
 218.55 m²
 SITE COVERAGE
 24.50 %

PROPOSED EXTENSION, BALCONY & ATRIUM TO THE TIMBER FRAMED DWELLING AT 45 SICE AVENUE HEYBRIDGE FOR B.K. BLOMER.	DATE:	SCALE:	CHECKED BY	DRAWN BY	DWG No.
	28/10/2025	1:200	J WEEDA	A WEEDA	7425 - 8 OF 9



PROPERTY IDENTIFICATION NUMBER 7153560
 CERTIFICATE OF TITLE NUMBER 138382 FOLIO 30
 GENERAL RESIDENTIAL PLANNING ZONE
 LOT AREA 892 m²
 PRIORITY VEGETATION AREA
 HIGH COASTAL EROSION HAZARD BAND

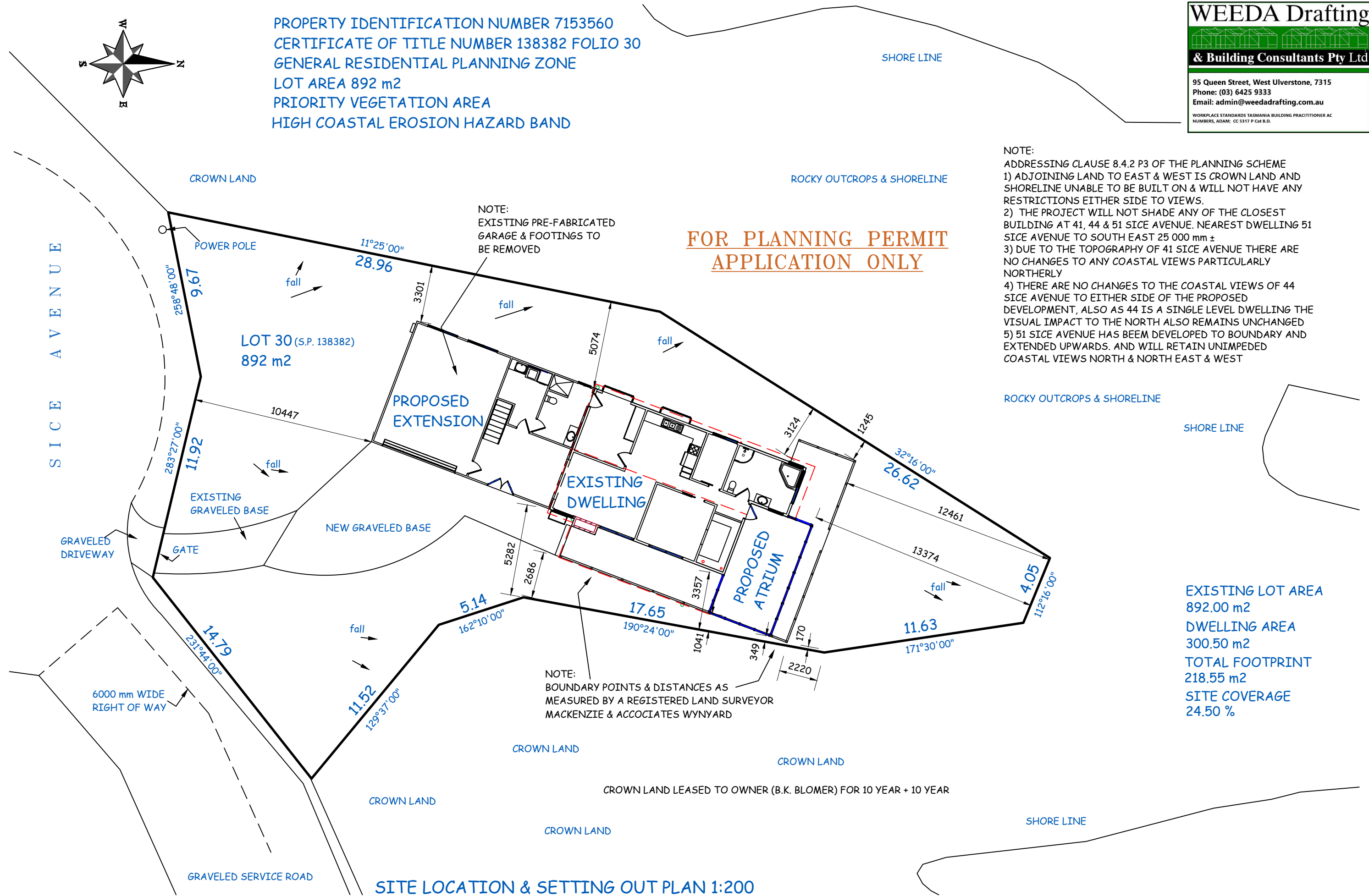
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 NUMBERS, ADAM: CC 5317 P Cat B.D.

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NOTE:
 ADDRESSING CLAUSE 8.4.2 P3 OF THE PLANNING SCHEME
 1) ADJOINING LAND TO EAST & WEST IS CROWN LAND AND SHORELINE UNABLE TO BE BUILT ON & WILL NOT HAVE ANY RESTRICTIONS EITHER SIDE TO VIEWS.
 2) THE PROJECT WILL NOT SHADE ANY OF THE CLOSEST BUILDING AT 41, 44 & 51 SICE AVENUE. NEAREST DWELLING 51 SICE AVENUE TO SOUTH EAST 25 000 mm ±
 3) DUE TO THE TOPOGRAPHY OF 41 SICE AVENUE THERE ARE NO CHANGES TO ANY COASTAL VIEWS PARTICULARLY NORTHERLY
 4) THERE ARE NO CHANGES TO THE COASTAL VIEWS OF 44 SICE AVENUE TO EITHER SIDE OF THE PROPOSED DEVELOPMENT, ALSO AS 44 IS A SINGLE LEVEL DWELLING THE VISUAL IMPACT TO THE NORTH ALSO REMAINS UNCHANGED
 5) 51 SICE AVENUE HAS BEEN DEVELOPED TO BOUNDARY AND EXTENDED UPWARDS. AND WILL RETAIN UNIMPEDED COASTAL VIEWS NORTH & NORTH EAST & WEST



EXISTING LOT AREA
 892.00 m²
 DWELLING AREA
 300.50 m²
 TOTAL FOOTPRINT
 218.55 m²
 SITE COVERAGE
 24.50 %

SITE LOCATION & SETTING OUT PLAN 1:200

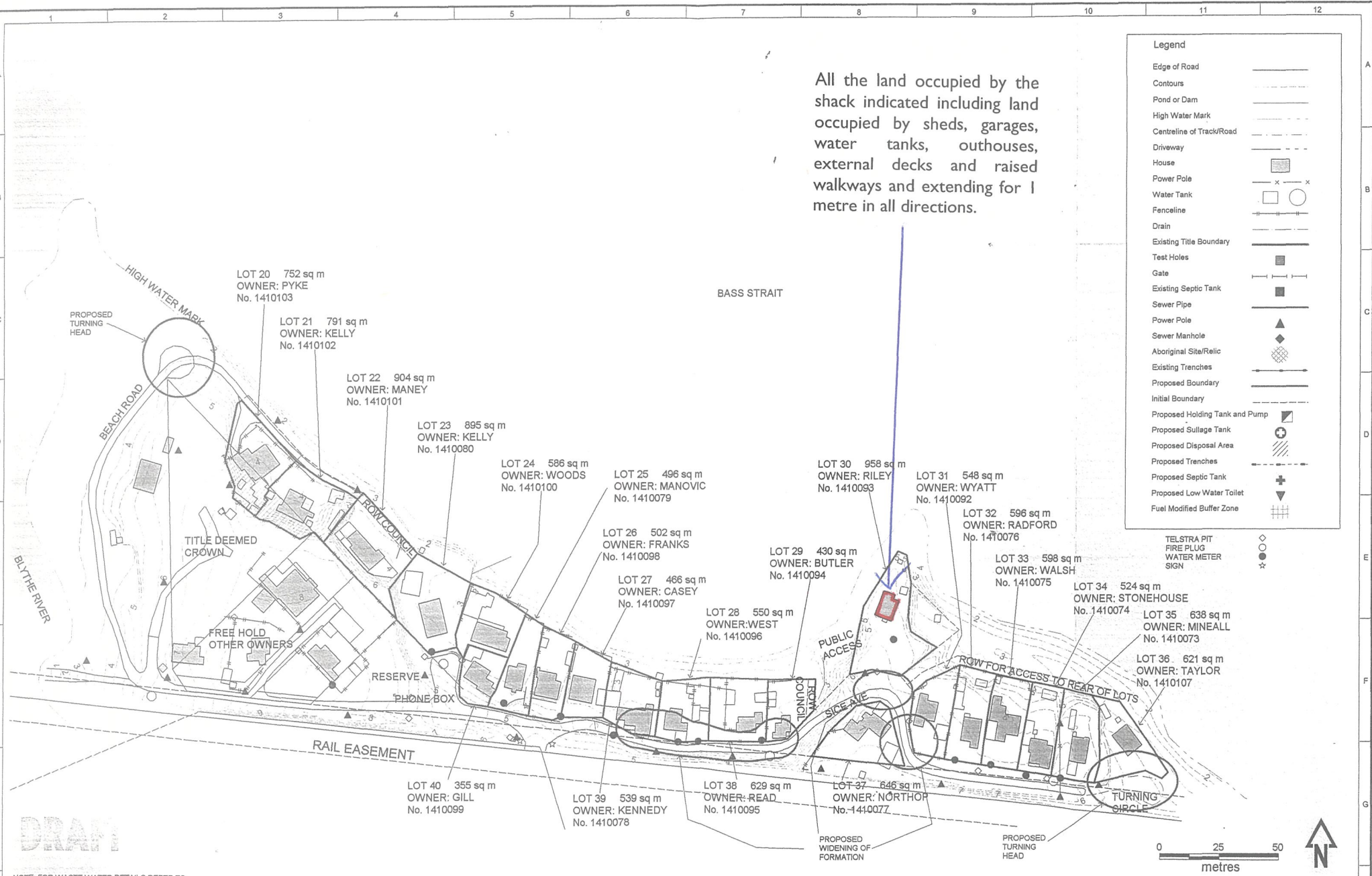
**PROPOSED EXTENSION, BALCONY & ATRIUM TO THE TIMBER FRAMED DWELLING AT 45 SICE AVENUE
 HEYBRIDGE FOR B.K. BLOMER.**

DATE:	SCALE:	CHECKED BY	DRAWN BY	DWG No.
28/10/2025	1:200	J WEEDA	A WEEDA	7425 - 9 OF 9

All the land occupied by the shack indicated including land occupied by sheds, garages, water tanks, outhouses, external decks and raised walkways and extending for 1 metre in all directions.

Legend

- Edge of Road
- Contours
- Pond or Dam
- High Water Mark
- Centreline of Track/Road
- Driveway
- House
- Power Pole
- Water Tank
- Fenceline
- Drain
- Existing Title Boundary
- Test Holes
- Gate
- Existing Septic Tank
- Sewer Pipe
- Power Pole
- Sewer Manhole
- Aboriginal Site/Relic
- Existing Trenches
- Proposed Boundary
- Initial Boundary
- Proposed Holding Tank and Pump
- Proposed Sullage Tank
- Proposed Disposal Area
- Proposed Trenches
- Proposed Septic Tank
- Proposed Low Water Toilet
- Fuel Modified Buffer Zone



NOTE: FOR WASTE WATER DETAILS REFER TO SITE AND SOIL EVALUATION REPORT IN APPENDIX

<p>DISCLAIMER</p> <p>This plan is indicative for shack site conversion and all information is subject to final design.</p>		<p>COPYRIGHT</p> <p>the concepts and information contained in this document are the copyright of Sinclair Knight Merz Pty Ltd. Use or copying of the document in whole or in part without written permission of Sinclair Knight Merz Pty Ltd constitutes an infringement of copyright.</p>		<p>SINCLAIR KNIGHT MERZ</p> <p>Sinclair Knight Merz Pty Ltd A.C.N. 001 924 095 20 Ellerslie Road Battery Point Tas. 7004 Australia Telephone (03) 6221 3711 Facsimile (03) 6224 2325 Job No:</p>		<p>CLIENT Department of Primary Industries, Water and Environment</p>		<p>TITLE Preliminary Design - Heybridge Settlement No. 10</p>	
<p>PROJECT Shack Sites Assessment</p>		<p>GIS OFFICER PT</p>		<p>CHECKED JLC</p>		<p>REVIEWED PROJECT MANAGER</p>		<p>APPROVED PROJECT DIRECTOR</p>	
<p>DESIGNED</p>		<p>DESIGN REVIEW</p>		<p>SCALE 1:1500</p>		<p>DRAWING No Heybridge - 10-03</p>		<p>No IN SET 6</p>	
<p>AMDT A</p>		<p>SCALE 1:1500</p>		<p>DRAWING No Heybridge - 10-03</p>		<p>No IN SET 6</p>		<p>AMDT A</p>	

