GEOTECHNICAL RISK MANAGEMENT POLICY FOR PITTWATER
FORM NO. 1 – To be submitted with Development Application

Development Application for _____
Name of Applicant

Address of site 518 Barrenjoey Road, Avalon Beach

The following checklist covers the minimum requirements to be addressed in a Geotechnical Risk ***Declaration made by geotechnical engineer or engineering geologist or coastal engineer (where applicable) as part of a geotechnical report***

I, Ben White *on behalf of* White Geotechnical Group Pty Ltd
(Insert Name) (Trading or Company Name)

on this the 2/11/22 certify that I am a geotechnical engineer or engineering geologist or coastal engineer as defined by the Geotechnical Risk Management Policy for Pittwater - 2009 and I am authorised by the above organisation/company to issue this document and to certify that the organisation/company has a current professional indemnity policy of at least $10million.

I:
Please mark appropriate box

☒ have prepared the detailed Geotechnical Report referenced below in accordance with the Australia Geomechanics Society's Landslide Risk Management Guidelines (AGS 2007) and the Geotechnical Risk Management Policy for Pittwater - 2009

☒ am willing to technically verify that the detailed Geotechnical Report referenced below has been prepared in accordance with the Australian Geomechanics Society's Landslide Risk Management Guidelines (AGS 2007) and the Geotechnical Risk Management Policy for Pittwater - 2009

☐ have examined the site and the proposed development in detail and have carried out a risk assessment in accordance with Section 6.0 of the Geotechnical Risk Management Policy for Pittwater - 2009. I confirm that the results of the risk assessment for the proposed development are in compliance with the Geotechnical Risk Management Policy for Pittwater - 2009 and further detailed geotechnical reporting is not required for the subject site.

☐ have examined the site and the proposed development/alteration in detail and I am of the opinion that the Development Application only involves Minor Development/Alteration that does not require a Geotechnical Report or Risk Assessment and hence my Report is in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009 requirements.

☐ have examined the site and the proposed development/alteration is separate from and is not affected by a Geotechnical Hazard and does not require a Geotechnical Report or Risk Assessment and hence my Report is in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009 requirements.

☐ have provided the coastal process and coastal forces analysis for inclusion in the Geotechnical Report

Geotechnical Report Details:

Report Title: Geotechnical Report **518 Barrenjoey Road, Avalon Beach**
Report Date: 2/11/22

Author: BEN WHITE

Author's Company/Organisation: **WHITE GEOTECHNICAL GROUP PTY LTD**

Documentation which relate to or are relied upon in report preparation:

Australian Geomechanics Society Landslide Risk Management March 2007.

White Geotechnical Group company archives.

I am aware that the above Geotechnical Report, prepared for the abovementioned site is to be submitted in support of a Development Application for this site and will be relied on by Pittwater Council as the basis for ensuring that the Geotechnical Risk Management aspects of the proposed development have been adequately addressed to achieve an "Acceptable Risk Management" level for the life of the structure, taken as at least 100 years unless otherwise stated and justified in the Report and that reasonable and practical measures have been identified to remove foreseeable risk.

Signature _____

Name Ben White

Chartered Professional Status MScGEOLAusIMM CP GEOL

Membership No. 222757

Company White Geotechnical Group Pty Ltd

GEOTECHNICAL RISK MANAGEMENT POLICY FOR PITTWATER
FORM NO. 1(a) - Checklist of Requirements for Geotechnical Risk Management Report for Development Application

Development Application for _____
Name of Applicant

Address of site 518 Barrenjoey Road, Avalon Beach

The following checklist covers the minimum requirements to be addressed in a Geotechnical Risk Management Geotechnical Report. This checklist is to accompany the Geotechnical Report and its certification (Form No. 1).

Geotechnical Report Details:

Report Title: Geotechnical Report **518 Barrenjoey Road, Avalon Beach**

Report Date: 2/11/22

Author: BEN WHITE

Author's Company/Organisation: WHITE GEOTECHNICAL GROUP PTY LTD

Please mark appropriate box

- ☒ Comprehensive site mapping conducted **29/6/22** (date)
- ☒ Mapping details presented on contoured site plan with geomorphic mapping to a minimum scale of 1:200 (as appropriate)
- ☒ Subsurface investigation required
  - ☐ No Justification _____
  - ☒ Yes Date conducted **29/6/22**
- ☒ Geotechnical model developed and reported as an inferred subsurface type-section
- ☒ Geotechnical hazards identified
  - ☐ Above the site
  - ☒ On the site
  - ☒ Below the site
  - ☐ Beside the site
- ☒ Geotechnical hazards described and reported
- ☒ Risk assessment conducted in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009
  - ☒ Consequence analysis
  - ☒ Frequency analysis
- ☒ Risk calculation
- ☒ Risk assessment for property conducted in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009
- ☒ Risk assessment for loss of life conducted in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009
- ☒ Assessed risks have been compared to "Acceptable Risk Management" criteria as defined in the Geotechnical Risk Management Policy for Pittwater - 2009
- ☒ Opinion has been provided that the design can achieve the "Acceptable Risk Management" criteria provided that the specified conditions are achieved.
- ☒ Design Life Adopted:
  - ☒ 100 years
  - ☐ Other _____ specify
- ☒ Geotechnical Conditions to be applied to all four phases as described in the Geotechnical Risk Management Policy for Pittwater - 2009 have been specified
- ☒ Additional action to remove risk where reasonable and practical have been identified and included in the report.
- ☐ Risk assessment within Bushfire Asset Protection Zone.

I am aware that Pittwater Council will rely on the Geotechnical Report, to which this checklist applies, as the basis for ensuring that the geotechnical risk management aspects of the proposal have been adequately addressed to achieve an "Acceptable Risk Management" level for the life of the structure, taken as at least 100 years unless otherwise stated, and justified in the Report and that reasonable and practical measures have been identified to remove foreseeable risk.

Signature _____

Name Ben White

Chartered Professional Status MScGEOLAusIMM CP GEOL

Membership No. 222757

Company White Geotechnical Group Pty Ltd

GEOTECHNICAL INVESTIGATION:

Alterations and Additions and balcony at **518 Barrenjoey Road, Avalon Beach**

1. Proposed Development

1.1 Demolish the existing deck and pool structure and construct a ground-floor extension to the N side of the house.

1.2 Construct a new balcony over the proposed extension.

1.3 Various other minor internal and external alterations and additions.

1.4 Details of the proposed development are shown on 10 drawings prepared by Peter Downes Designs, project number 2202, drawings numbered 00, and 02 to 09, dated 1.7.22, and 01, dated 6.3.22.

1.5 The Coastal Engineering Assessment Report was prepared by Cardno, now Stantec, reference number 304600719/001/L001:PDT, dated 15.9.22.

2. Site Description

2.1 The site was inspected on the 29th June, 2022.

2.2 This residential property is on the high side the road and encompasses the crest and gently graded flanks of a hillslope. From the road frontage the slope rises gently to the house before falling at similar angles to the lower boundary. Below the lower boundary, the slope drops at vertical angles for some ~40m to a rock platform and ocean below.

2.3 At the road frontage, a concrete driveway runs past a parking area to a garage attached to the W side of the house (Photo 1). A stable ~1.3m high timber crib wall supports a cut for the parking area and a fill for the level lawn area (Photo 2). The part three-storey steel framed and rendered masonry house is supported on concrete

block walls and concrete block piers (Photo 3). The concrete block walls show no significant signs of movement and the visible concrete piers stand vertical. A level lawn area extends from the E side of the property to the E boundary (Photo 4). A ~1.5m high timber crib wall that encompasses the N common boundary and the E boundary supports the fill for this lawn area (Photo 5). The crib wall is almost entirely obscured by dense vegetation and could not be adequately assessed. A gentle to moderately sloping lawn extends shortly beyond the E boundary before dropping ~37m at vertical angles to a rock platform below (Photo 6). The cliff line is obscured by thick vegetation. From below it can be seen to be made up of thinly bedded shale and thicker bedded sandstone (Photo 7). The base of the cliff is armoured from the undercutting action of the waves by the rock platform and a build-up of slope debris (Photo 8). The cliff face to the north of the property has been undercut to ~2.0m across its base but adjacent to the subject property the cliff face has no significant defects (Photo 9). In the unlikely event of a failure the undercut will not impact the subject property. The weathering process of the cliff face occurs when the harder beds are undercut by the softer beds. Because the beds are relatively thin and jointed the resulting failures are small in scale. This weathering process is extremely slow, measured from the geological record to be in the order of 7 to 12 mm/year. The proposed works will be at least 8m from the uphill edge of the cliff. The estimated wave run-up height will reach 6.9AHD; ignoring any cliff face roughness. This is well below the site of the proposed works and only very minor spray would affect the site, as per the coastal report referenced above.

3. Geology

The Sydney 1:100 000 Geological sheet indicates the site is underlain by the Newport Formation of the Narrabeen Group. This is described as interbedded laminite, shale and quartz to lithic quartz sandstone.

4. Subsurface Investigation

One hand Auger Hole (AH) was put down on the neighbouring property to identify soil materials. Five Dynamic Cone Penetrometer (DCP) tests were put down to determine the relative density of the overlying soil and the depth to weathered rock. The locations of the tests are shown on the site plan attached. It should be noted that a level of caution should be applied when interpreting DCP test results. The test will not pass through hard buried objects so in some instances it can be difficult to determine whether refusal has occurred on an obstruction in the profile or on the natural rock surface. This is not expected to be an issue for the testing on this site. However, excavation and foundation budgets should always allow for the possibility that the interpreted ground conditions in this report vary from those encountered during excavations. See the appended "Important information about your report" for a more comprehensive explanation. The results are as follows:

AUGER HOLE 1 (~RL39.2) **–** AH1 (Photo 11)

Depth (m)	Material Encountered
0.0 to 0.1	**TOPSOIL**, dark brown clayey soil, medium grained, loose, fine trace of organic matter, dry.
0.1 to 0.3	**CLAY**, brown, fine grained, stiff, dry.
0.3 to 0.6	**CLAY**, yellow and brown, fine grained, stiff, dry.

End of test @ 0.6m. No water table encountered.

DCP RESULTS ON THE NEXT PAGE

DCP TEST RESULTS – Dynamic Cone Penetrometer					
Equipment: 9kg hammer, 510mm drop, conical tip.			Standard: AS1289.6.3.2 - 1997		
Depth(m) Blows/0.3m	**DCP 1** (~RL41.5)	**DCP 2** (~RL41.5)	**DCP 3** (~RL41.6)	**DCP 4** (~RL40.5)	**DCP 5** (~RL41.6)
0.0 to 0.3	3	6	3	7	3
0.3 to 0.6	4	30	#	8	4
0.6 to 0.9	6	15		6	14
0.9 to 1.2	10	36		34	24
1.2 to 1.5	12	#		20	35
1.5 to 1.8	12			#	#
1.8 to 2.1	31				
	#				
	End of Test @ 2.1m	End of Test @ 1.2m	Refusal @ 0.2m	End of Test @ 1.35m	End of Test @ 1.5m

#refusal/end of test. F=DCP fell after being struck showing little resistance through all or part of the interval.

DCP Notes:

DCP1 – End of test @ 2.1m, DCP still going down slowly, red and white shale on dry tip.
DCP2 – End of test @ 1.2m, DCP still going down slowly, red shale on dry tip.
DCP3 – Refusal on unknown obstruction.
DCP4 – End of test @ 1.35m, DCP still going down slowly, clean dry tip, white and orange shale fragments in collar.
DCP5 – End of test @ 1.5m, DCP still going down slowly, red and white shale on dry tip.

5. Geological Observations/Interpretation

The slope materials are colluvial at the near surface and residual at depth. In the test locations, the ground materials consist of fill and soils over clays. The clay merges into the underlying weathered rock at depths of between ~0.9m to ~1.8m below the current surface. The weathered zone is interpreted to be Extremely Low Strength Shale. See Type Section attached for a diagrammatical representation of the expected ground materials.

6. Groundwater

Normal ground water seepage is expected to move over the buried surface of the rock and through the cracks. Due to the slope and elevation of the block, the water table is expected to be many metres below the base of the proposed works.

7. Surface Water

No evidence of surface flows were observed on the property during the inspection. It is expected normal sheet wash from the properties above will move onto the block and over the coastal scarp during heavy down pours.

8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed above or beside the property. The gently graded slope that rises and falls across the property and continues below is a potential hazard (**Hazard One**). The large sea cliff that drops vertically below the lower boundary of the property is a potential hazard (**Hazard Two**). The additional surcharge loads from the proposed extension acting on the existing N boundary wall is a potential hazard (Photo 10) (**Hazard Three**).

RISK ANALYSIS SUMMARY ON THE NEXT PAGE

Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two	Hazard Three
TYPE	The gentle slope that rises and falls across the property and continues below failing and impacting on the proposed works.	A large failure occurring in the sea cliff that impacts proposed works.	The additional surcharge loads from the extension transferring onto the existing concrete block retaining wall causing damage and instability (Photo 10).
LIKELIHOOD	'Unlikely' (10^{-4})	'Rare' (10^{-5})	'Possible' (10^{-3})
CONSEQUENCES TO PROPERTY	'Minor' (5%)	'Major' (60%)	'Medium' (35%)
RISK TO PROPERTY	'Low' (2×10^{-5})	'Low' (6×10^{-5})	'Moderate' (2×10^{-4})
RISK TO LIFE	5.5×10^{-7}/annum	8.3×10^{-8}/annum	5.6×10^{-5}/annum
COMMENTS	This level of risk is 'ACCEPTABLE'.	Cardno, now Stantec advises that the proposed development will not cause detrimental increases in coastal risks to this or other properties, as such, this level of risk is 'ACCEPTABLE.'	This level of risk to life and property is 'UNACCEPTABLE'. To move the risk to 'ACCEPTABLE' levels the recommendations in **Section 12** are to be followed.

(See Aust. Geomech. Jnl. Mar 2007 Vol. 42 No 1, for full explanation of terms)

9. Suitability of the Proposed Development for the Site

The proposed development is suitable for the site. No geotechnical hazards will be created by the completion of the proposed development provided it is carried out in accordance with the requirements of this report and good engineering and building practice.

10. Stormwater

The fall is to Barrenjoey Road. Roof water from the development is to be piped to the street drainage system through any tanks that may be required by the regulating authorities.

11. Excavations

Apart from those for footings and minor levelling, no excavations are required.

12. Foundations

To avoid transferring any surcharge loads from the proposed extension onto the existing concrete block retaining wall that runs along the N common boundary, all piers will need to be taken to below the zone of influence of the concrete block retaining wall (Photo 10).

The proposed extension can be supported on a thickened edge / raft slab with piers taken to Extremely Low Strength Rock and to below the zone of influence of the existing N boundary concrete block retaining wall. This ground material is expected at depths of between ~0.9m and ~1.8m below the current surface.

A maximum allowable bearing pressure of 600kPa can be assumed for footings on Extremely Low Strength Rock or better. It should be noted that this material is a soft rock and a rock auger will cut through it so the builders should not be looking for refusal to end the footings.

As the bearing capacity of clay and shale reduces when it is wet, we recommend the footings be dug, inspected, and poured in quick succession (ideally the same day if possible). If the footings get wet, they will have to be drained and the soft layer of wet clay or shale on the footing surface will have to be removed before concrete is poured.

If a rapid turnaround from footing excavation to the concrete pour is not possible, a sealing layer of concrete may be added to the footing surface after it has been cleaned.

NOTE: If the contractor is unsure of the footing material required, it is more cost-effective to get the geotechnical consultant on site at the start of the footing excavation to advise on

footing depth and material. This mostly prevents unnecessary over-excavation in clay-like shaly-rock but can be valuable in all types of geology.

13. Geotechnical Review

The structural plans are to be checked and certified by the geotechnical engineer as being in accordance with the geotechnical recommendations. On completion, a Form 2B will be issued. This form is required for the Construction Certificate to proceed.

14. Inspections

The client and builder are to familiarise themselves with the following required inspections as well as council geotechnical policy. We cannot provide geotechnical certification for the owners and Occupation Certificate if the following inspections have not been carried out during the construction process.

- All footings are to be inspected and approved by the geotechnical consultant while the excavation equipment and contractors are still onsite and before steel reinforcing is placed or concrete is poured.

White Geotechnical Group Pty Ltd.

Ben White M.Sc. Geol.,
AusIMM., CP GEOL.
No. 222757
Engineering Geologist.

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9

Photo 10

Photo 11 (Top to Bottom)

Important Information about Your Report

It should be noted that Geotechnical Reports are documents that build a picture of the subsurface conditions from the observation of surface features and testing carried out at specific points on the site. The spacing and location of the test points can be limited by the location of existing structures on the site or by budget and time constraints of the client. Additionally, the test themselves, although chosen for their suitability for the particular project, have their own limiting factors. The testing gives accurate information at the location of the test, within the confines of the test's capability. A geological interpretation or model is developed by joining these test points using all available data and drawing on previous experience of the geotechnical consultant. Even the most experienced practitioners cannot determine every possible feature or change that may lie below the earth. All of the subsurface features can only be known when they are revealed by excavation. As such, a Geotechnical report can be considered an interpretive document. It is based on factual data but also on opinion and judgement that comes with a level of uncertainty. This information is provided to help explain the nature and limitations of your report.

With this in mind, the following points are to be noted:

- If upon the commencement of the works the subsurface ground or ground water conditions prove different from those described in this report, it is advisable to contact White Geotechnical Group immediately, as problems relating to the ground works phase of construction are far easier and less costly to overcome if they are addressed early.

- If this report is used by other professionals during the design or construction process, any questions should be directed to White Geotechnical Group as only we understand the full methodology behind the report's conclusions.

- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

- This report should not be applied to any other project other than that outlined in section 1.0.

- This report is to be read in full and should not have sections removed or included in other documents as this can result in misinterpretation of the data by others.

- It is common for the design and construction process to be adapted as it progresses (sometimes to suit the previous experience of the contractors involved). If alternative design and construction processes are required to those described in this report, contact White Geotechnical Group. We are familiar with a variety of techniques to reduce risk and can advise if your proposed methods are suitable for the site conditions.

SITE PLAN – showing test locations

REVISION

BUILDING DESIGNERS AUSTRALIA NSW

peterdownes
multi-award winner designs
77 Riviera Ave, Avalon Beach 2107 0488 662 445
www.peterdownes.com.au

PROJECT
alterations to an existing dwelling at 518 Barrenjoey rd Avalon Beach

DRAWING
site plan

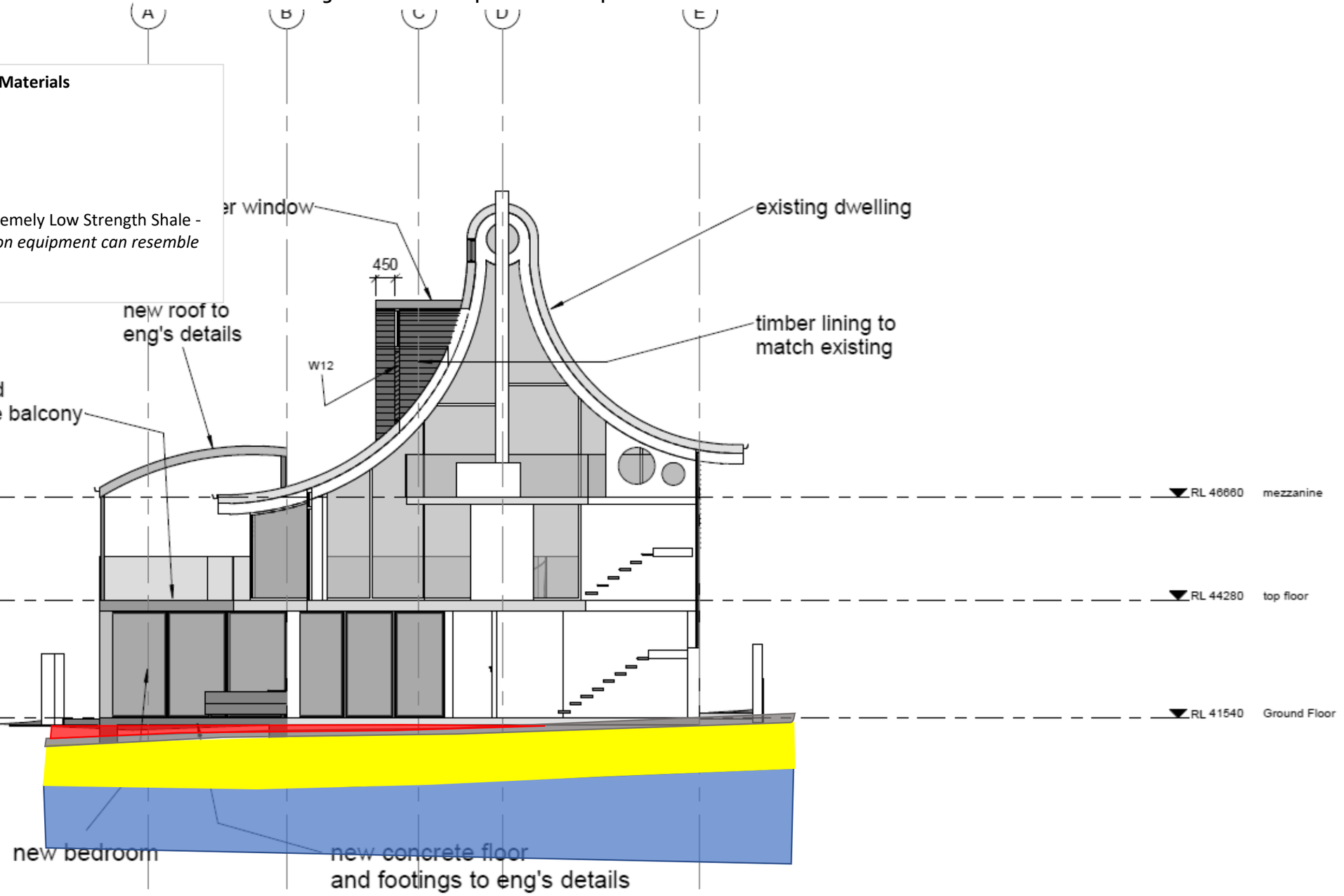
DRAWN	CHECKED
PD	PD
SCALE	DATE
1 : 200	06/03/22

DRG.
A3 2202 01

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials

Expected Ground Materials

- Fill
- Topsoil
- Clay – Firm to Stiff
- Narrabeen Group Rocks – Extremely Low Strength Shale - *after being cut up by excavation equipment can resemble a stiff to hard clay.*



INTERIOR DETAILING TO ALEXANDRA KIDD DESIGN DETAILS

DA ISSUE

REVISION

peterdownes
multi-award winner designs
77 Riviera Ave, Avalon Beach 2107 0488 662 445
www.peterdownes.com.au

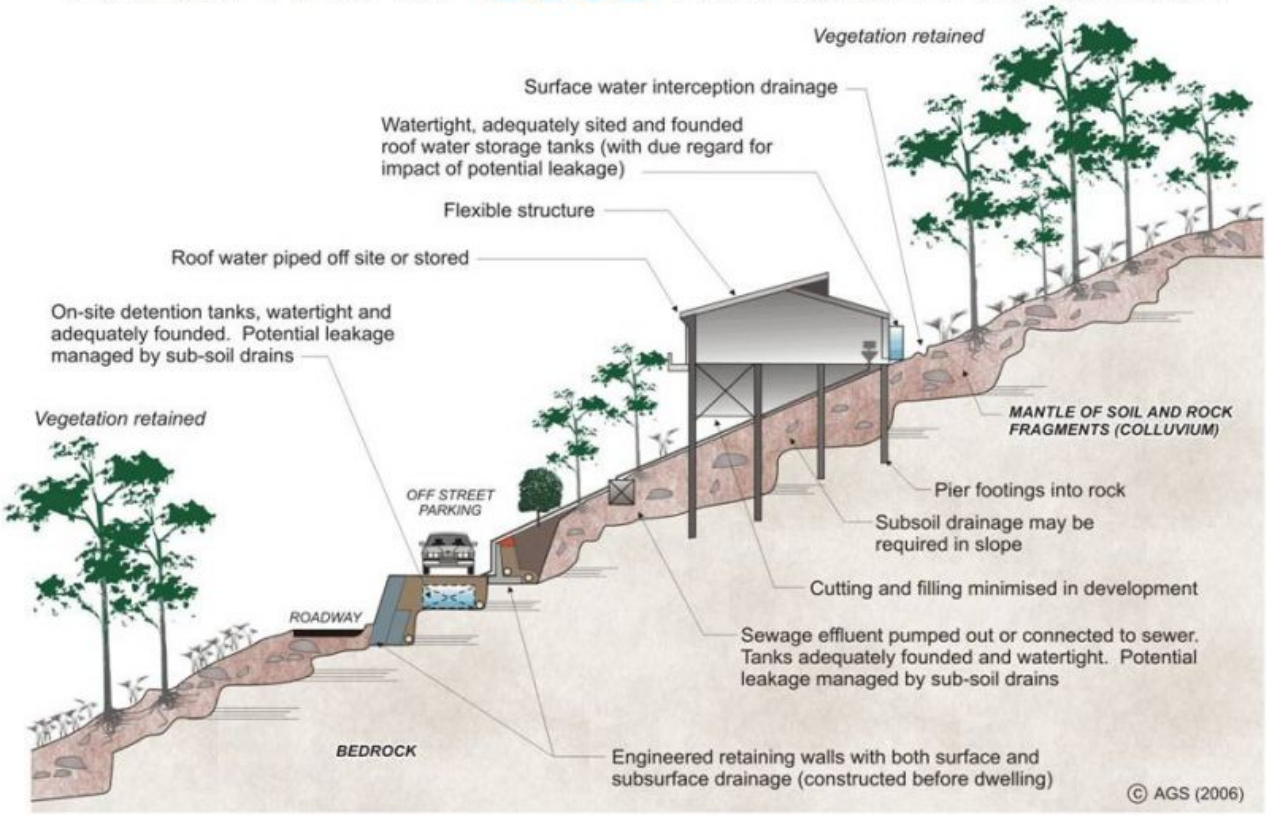
PROJECT
alterations to an existing dwelling at 518 Barrenjoey rd Avalon Beach

DRAWING
section

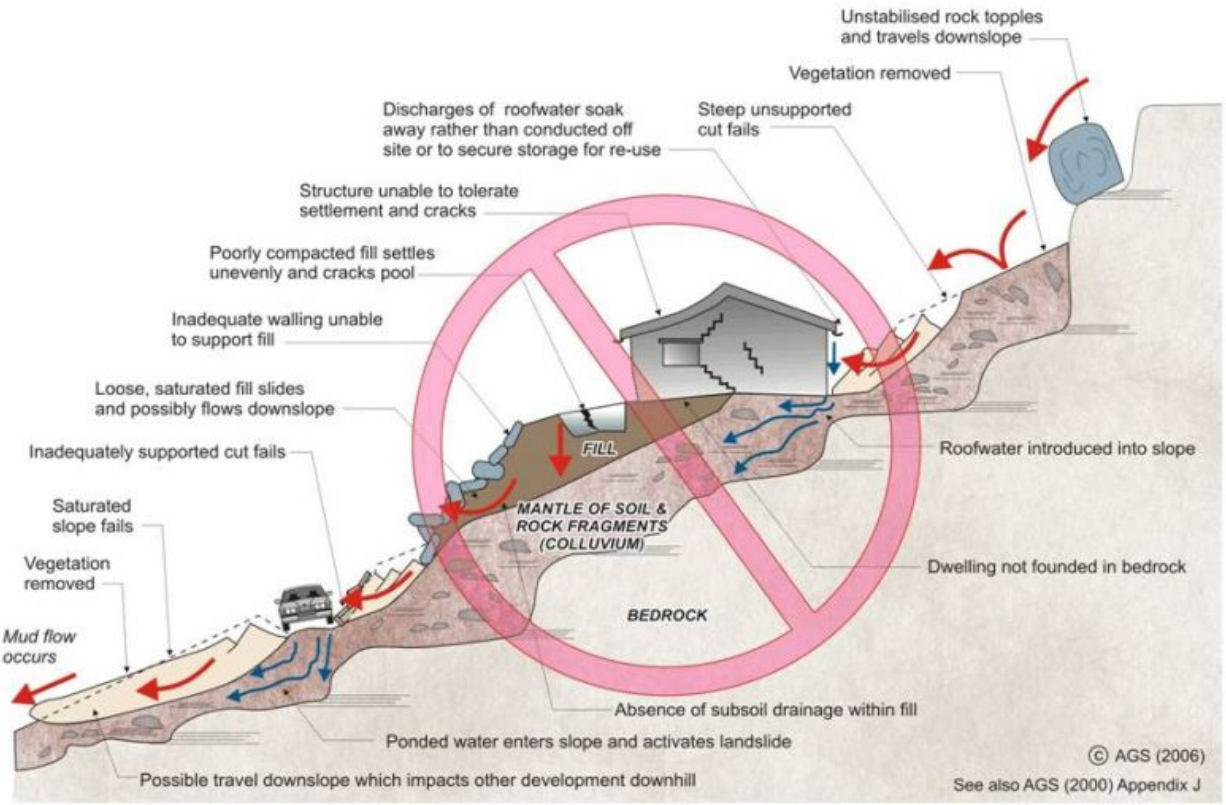
DRAWN	CHECKED
PD	PD
SCALE	DATE
1 : 100	01.07.22

DRG.
A3 2202 09

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE



Our Ref: 304600719/001/L001:PDT
Contact: Doug Treloar

15 September 2022

Mr Derek Chung
518 Barrenjoey Road
Avalon
NSW 2107

Attention: Derek Chung/Peter Downes

now Stantec

Cardno (NSW/ACT) Pty Ltd
ABN 95 001 145 035

Level 9 - The Forum
203 Pacific Highway
St Leonards NSW 2065
PO Box 19

Phone +61 2 9496 7700
Fax +61 2 9439 5170

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www.stantec.com

Dear Sirs,

PROPOSED REDEVELOPMENT AT 518 BARRENJOEY ROAD, AVALON – COASTAL PROCESSES ASSESSMENT

Mr Derek Chung has sought architectural and planning advice from Peter Downes Designs, who have prepared design plans for a proposed new residence at 518 Barrenjoey Road, Avalon. Those plans and a site survey are presented in **Annexure A**. **Figure 1** describes the location of this site, which is on top of the shoreline cliffs, Avalon Beach.

Figure 1 Locality Plan

This site is located at a level of about 40m AHD on the southern Avalon Beach headland. Northern Beaches Council (NBC) DCP P21DCP, Appendix 6, provides advice about coastal hazards in this LGA. All development proposals must address the requirements set-down therein.

Figure 2 was obtained from NBC's online hazard mapping web site. However, no specific hazards are noted on that image for this site. This figure shows that the site is not affected by coastal processes, but geotechnical matters may need to be addressed. The seaward shoreline is formed of a rough rocky cliff that has a vegetated top surface.

Figure 2 Northern Beaches Coastal Risk Planning Map

Generally, the principal coastal hazards are storm erosion, accompanied by potential long term shoreline recession, and wave run-up at 2100. Stability of this rocky site is described in the geotechnical report – White Geotechnical (July, 2022) in **Annexure B**.

Cardno have estimated the wave run-up level at 2100 in the 100-years average recurrence interval (ARI) ocean storm conditions, as follows:

- Estimated 2100 storm tide level at ARI = 2.3m AHD, including 0.9m of projected sea level rise
- Incident wave conditions on the rocky shelf about half a wave length from the rock cliff is about 0.85 x (2.4m AHD – 0m AHD) = 2m breaking wave height (Hb) – rock shelf estimated at 0m AHD.
- Wave set-up on the rock shelf of 0.5m.

The estimated wave run-up level is then 2.4m AHD + 0.5m + 2 x Hb = 6.9m AHD; ignoring cliff-face roughness, which would reduce wave run-up.

This run-up level is much lower than the site proposed for the residence and only very minor spray would affect the site.

Geotechnical investigations have been undertaken by White Geotechnical who provide an assessment of site suitability for the residence in terms of rock cliff stability. They report that '…

adjacent to the subject property the cliff face has no significant defects.' Cliff face weathering rates are very slow, so this condition should be maintained over the life of the present residence.

Yours faithfully,

Doug Treloar
Senior Principal Coastal Engineering
for Cardno
Direct Line: +61 2 9496 7823
Email: doug.treloar@cardno.com.au

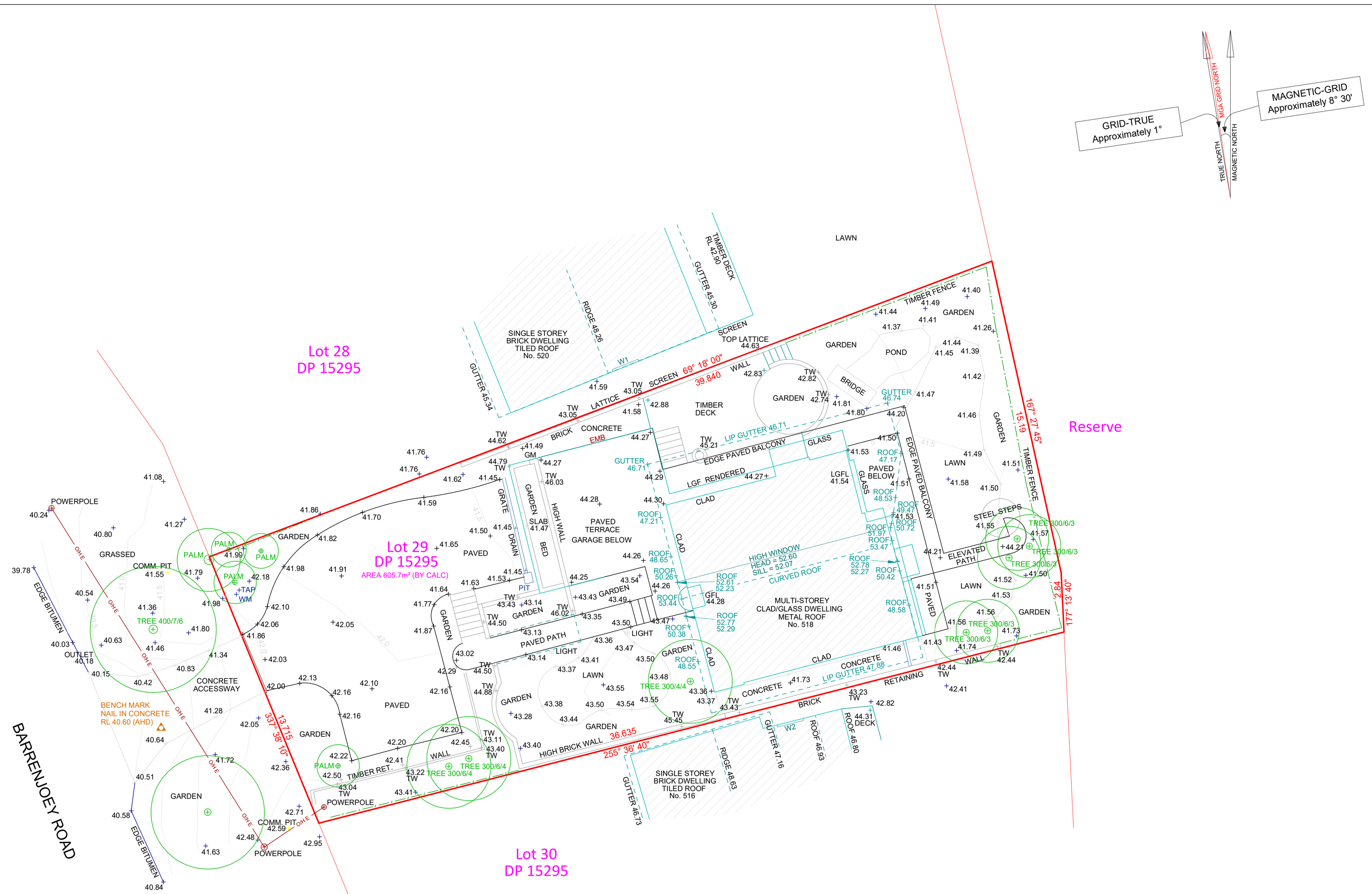
References

White Geotechnical Group (2022): Geotechnical Investigation for Alterations and Additions at 518 Barrenjoey Road, Avalon.

Annexure A

Site Survey and Preliminary Plans

WINDOW SCHEDULE		
No.	HEAD	SILL
W1	45.06	44.33
W2	46.66	46.06



Notes

1. The plan is oriented to Magnetic North.
2. This survey is a boundary identification survey.
3. If construction on or near boundaries is proposed it is a requirement that the boundaries of the subject land be physically marked on site.
4. Except where shown by dimension the location of structures in relation to boundaries is indicative only.
5. No subsurface utility investigation (SUI) has been undertaken. Services shown are based on visible surface indicators present at the time of survey only (i.e. pits and openings). Before any works or extensive designs are undertaken for the site, "Dial before you dig" service plans should be obtained and potholing undertaken by a qualified contractor as required. The location of these services can be plotted by Hammond Smeallie in conjunction with SUI contractors.
6. Ridge, eave, roof gutter, windows have been obtained by indirect methods and are accurate for planning purposes only.
7. Adjoining buildings and features have been plotted for diagamatic purposes only.
8. Tree detail is shown as Dia xx / Ht xx / Sp xx respectivly for Diameter, Height and Spread of the tree.These details are estimates only. If tree details, types and condition of trees are critical a qualified arbourist should be consulted.
9. The location of fencing is diagramatic only.
10. Contours are approximate only and should only be used as a guide. Use spot levels for design purposes. Contour intervals are shown on the plan.

THE SUBJECT LAND IS AFFECTED BY A COVENANT (VIDE C712884)

I, Gary John Skow, a surveyor registered under the Surveying and Spatial Information Act 2002, certify that:

The boundaries shown in this plan was surveyed in accordance with the Surveying and Spatial Information Regulation 2017, is accurate for the purposes of a development application and the survey was completed on 16/03/2022.

Signature:

Surveyor Identification No:1985
Surveyor registered under
the Surveying and Spatial Information Act 2002

DIAL BEFORE YOU DIG www.1100.com.au

0m 2.5m 5m 7.5m 10m
SCALE 1:100 @ A1

LEGEND
TW TOP WALL
WM WATER METER
GM GAS METER
EMB ELECTRIC METER BOX
GFL GROUND FLOOR LEVEL
LGFL LOWER GROUND FLOOR LEVEL

ISSUE	REVISION	DATE
A	ORIGINAL	16/03/2022

Hammond Smeallie & Co Pty Ltd
CONSULTING SURVEYORS AND TOWN PLANNERS
7/22 Leighton Place
HORNSBY NSW 2077
P: 02 9477 1577
F: 02 9476 6062
E: info@hammondsmeallie.com.au
W: www.hammondsmeallie.com.au
ABN: 16 001 894 800

DETAIL AND LEVELS PLAN

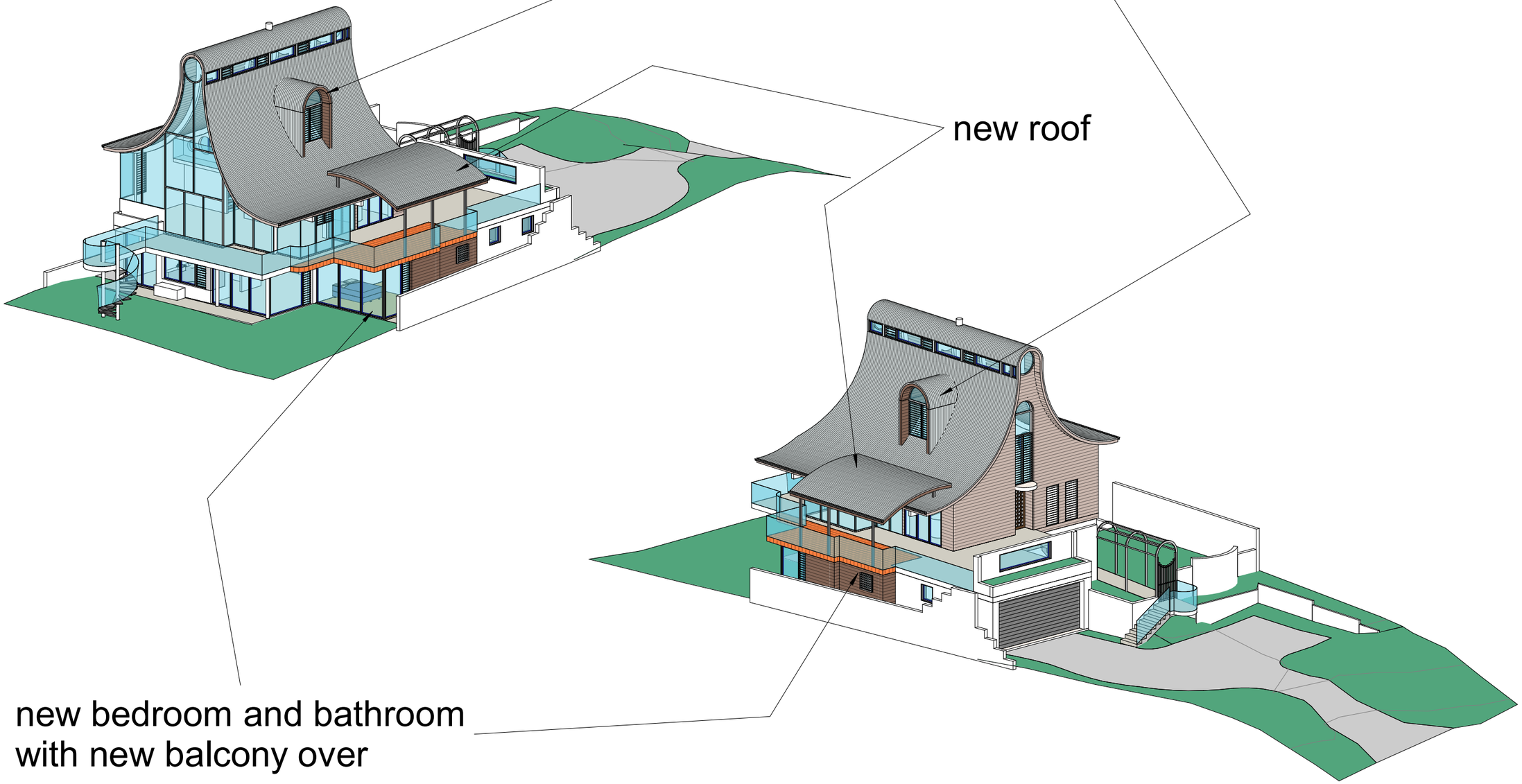
Project: 518 Barrenjoey Road AVALON NSW 2107
LGA: Northern Beaches Council
Title: Lot 29 in Deposited Plan 15295
Client: Derek Chung

Horizontal Datum
Plan Azimuth: Magnetic North
Azimuth adopted from: (DP 15295)

Vertical Datum
Datum: Australian Height Datum (AHD)
Source: PM 61808, Level:31.915
Class: (LC)
Contour Interval: 0.5 Metre

Sheet No:	Surveyed by:	Checked by:
1 of 1	Warren Rolfe	Gary Skow
Scale:	Date of survey:	Revision No:
1:100 @ A1	16/03/2022	A

Drawing No: 15261



INTERIOR DETAILING TO ALEXANDRA KIDD DESIGN DETAILS

DA ISSUE

REVISION

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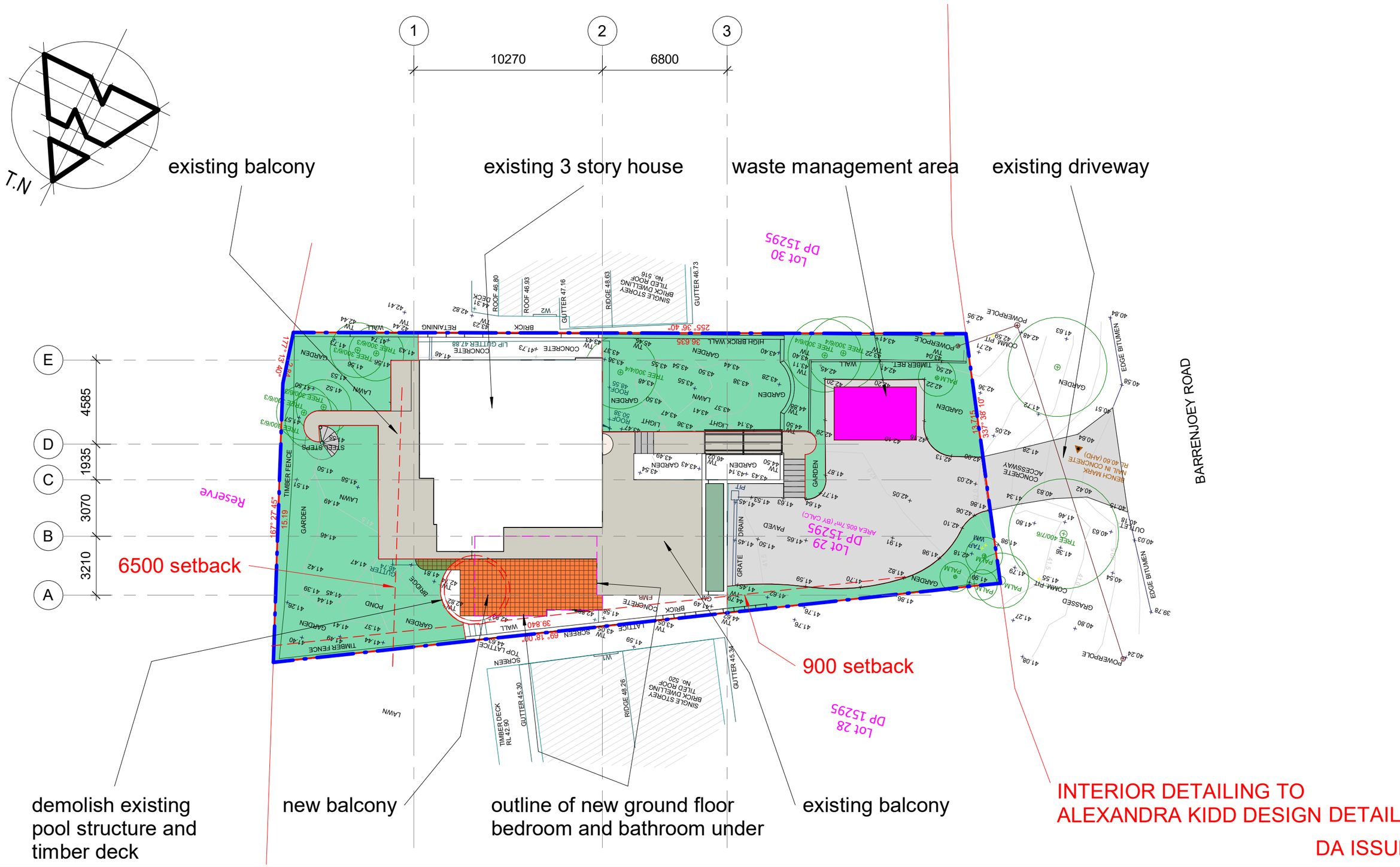
PROJECT
alterations to an existing dwelling at 518 Barrenjoey rd Avalon Beach

DRAWING
cover sheet

DRAWN	CHECKED
PD	PD
SCALE	DATE
	01.07.22

DRG.
A3 2202 00



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PROJECT
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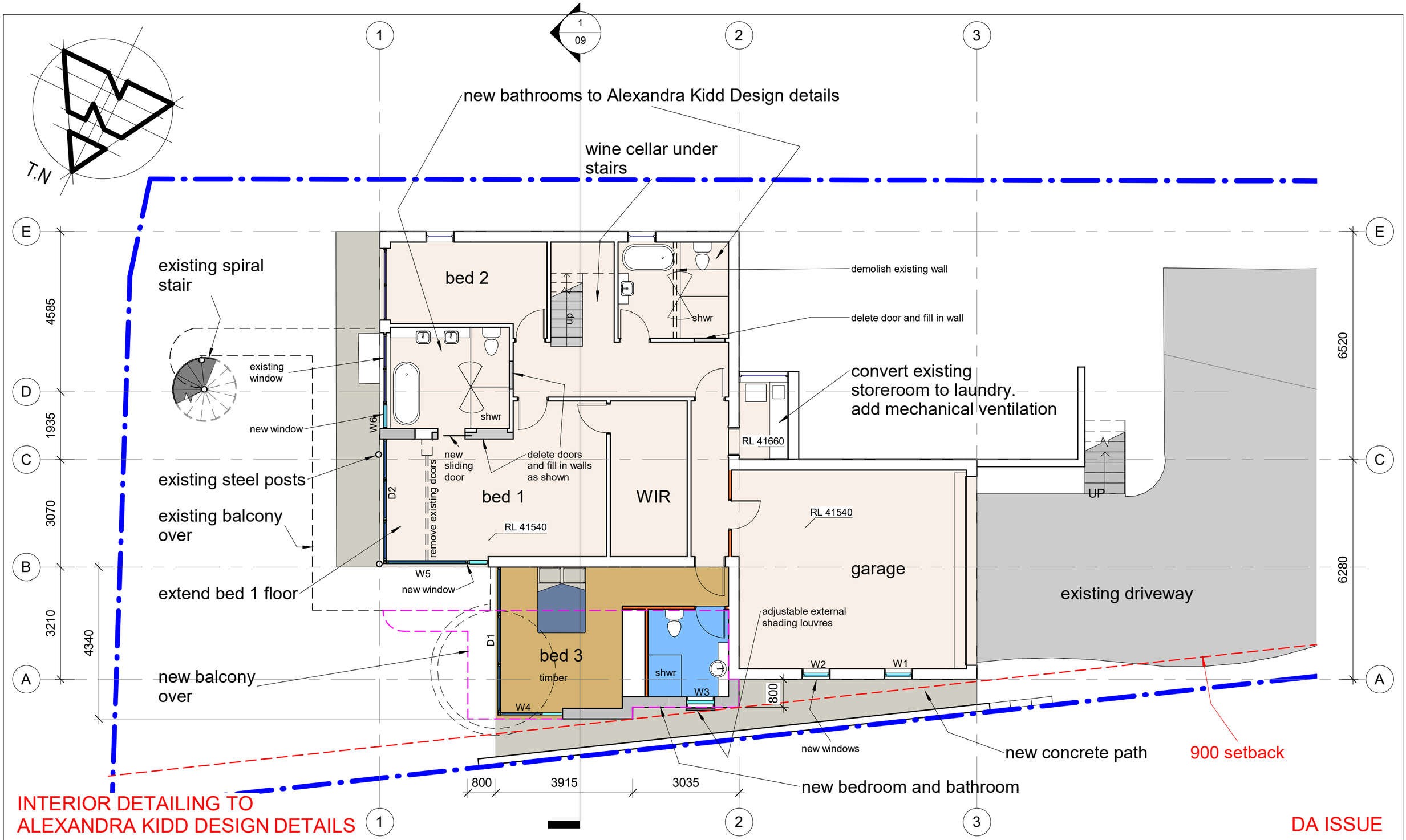
DRAWING
site plan

DRAWN	CHECKED
PD	PD
SCALE	DATE
1 : 200	06/03/22

DRG.
A3 2202 01



INTERIOR DETAILING TO ALEXANDRA KIDD DESIGN DETAILS

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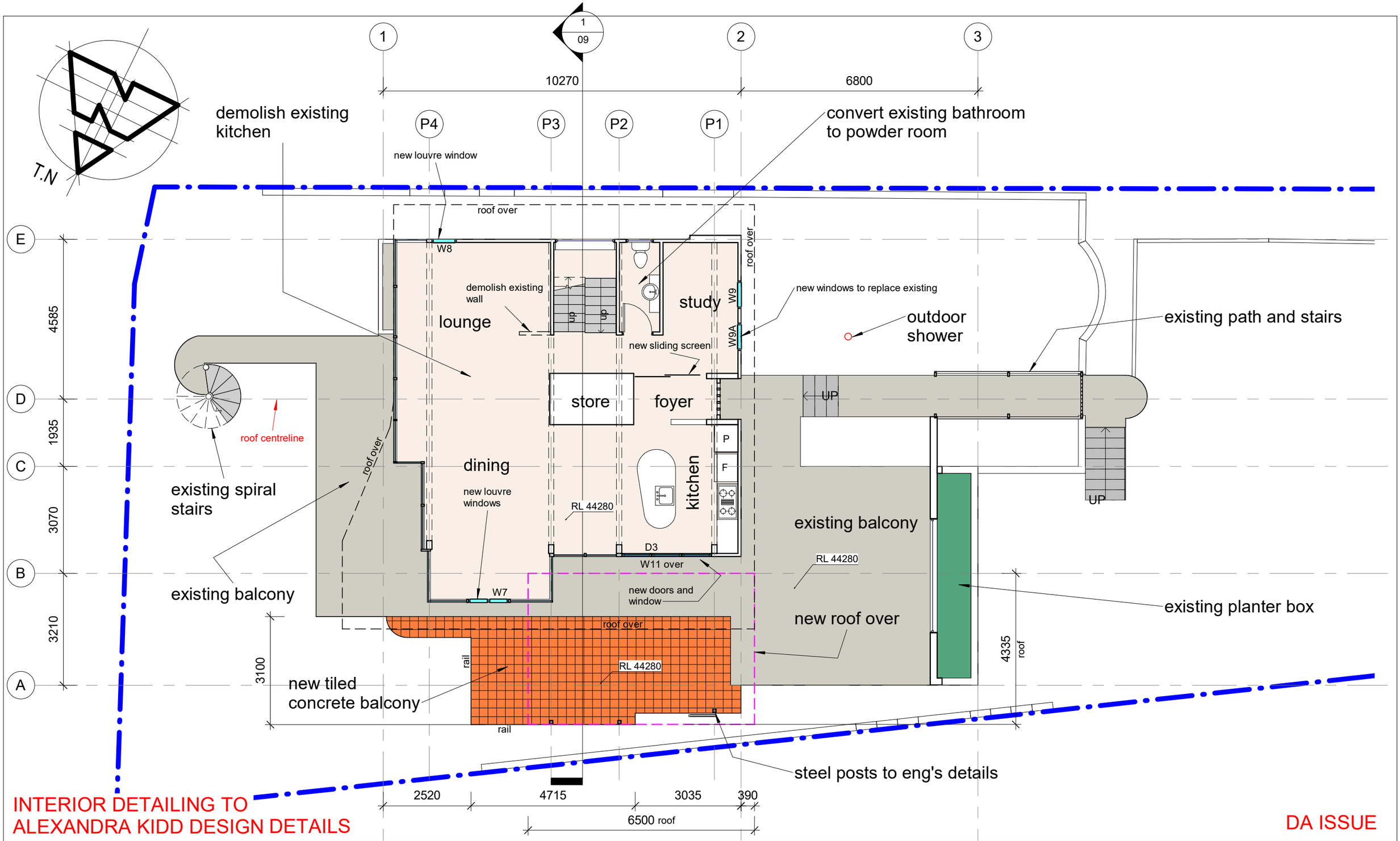
PROJECT
alterations to an existing dwelling at 518 Barrenjoey rd Avalon Beach

DRAWING
ground floor plan

DRAWN	CHECKED
PD	PD
SCALE	DATE
1 : 100	01.07.22

DRG.
A3 2202 02



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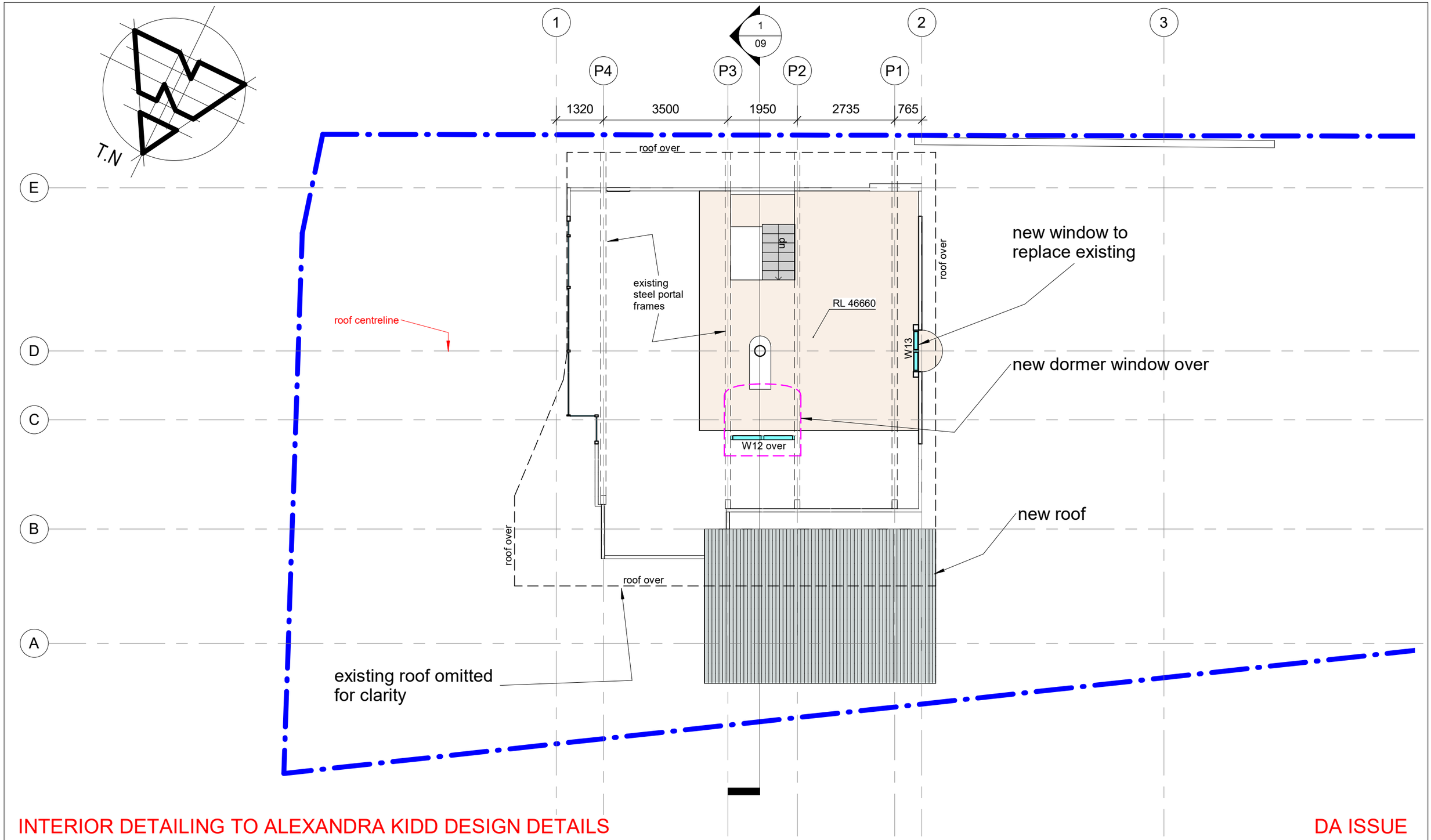
PROJECT
alterations to an existing dwelling at 518 Barrenjoey rd Avalon Beach

DRAWING
top floor plan

DRAWN	CHECKED
PD	PD
SCALE	DATE
1 : 100	01.07.22

DRG.
A3 2202 03



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PROJECT
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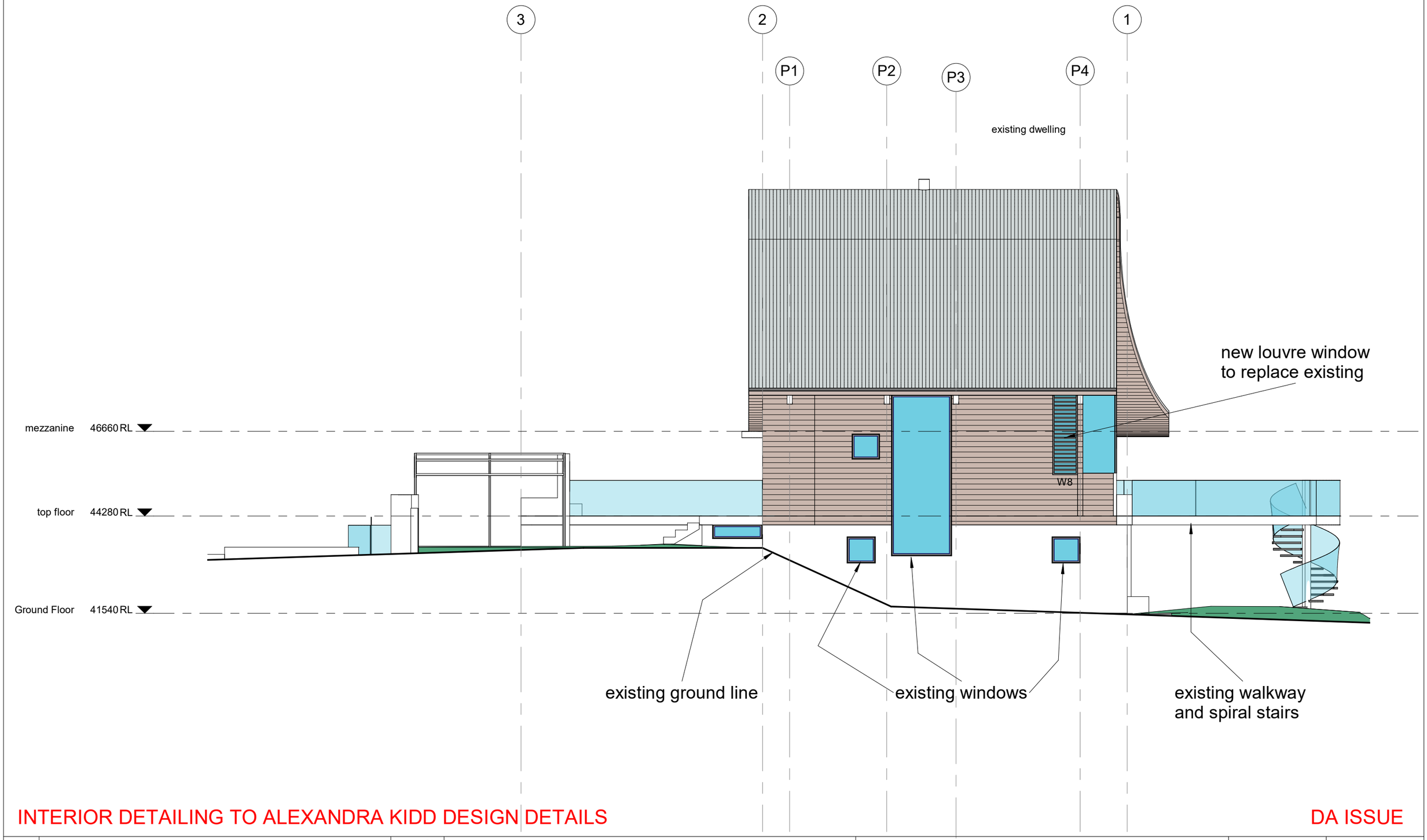
DRAWING
mezzanine floor

DRAWN	CHECKED
PD	PD
SCALE	DATE
1 : 100	01.07.22

DRG.
A3 2202 04



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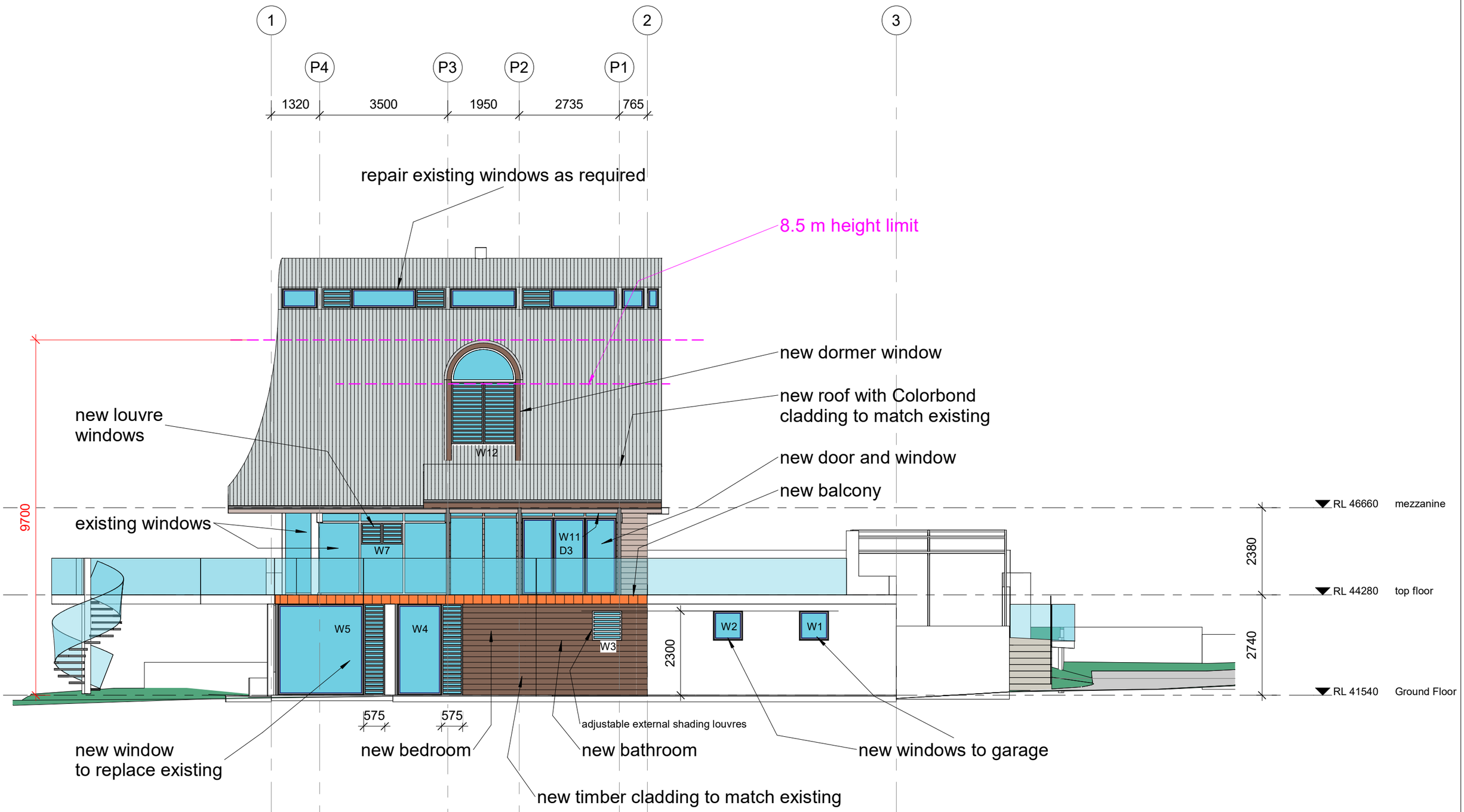
PROJECT
alterations to an existing dwelling at 518 Barrenjoey rd Avalon Beach

DRAWING
south elevation

DRAWN	CHECKED
PD	PD
SCALE	DATE
1 : 100	01.07.22

DRG.
A3 2202 05



INTERIOR DETAILING TO ALEXANDRA KIDD DESIGN DETAILS

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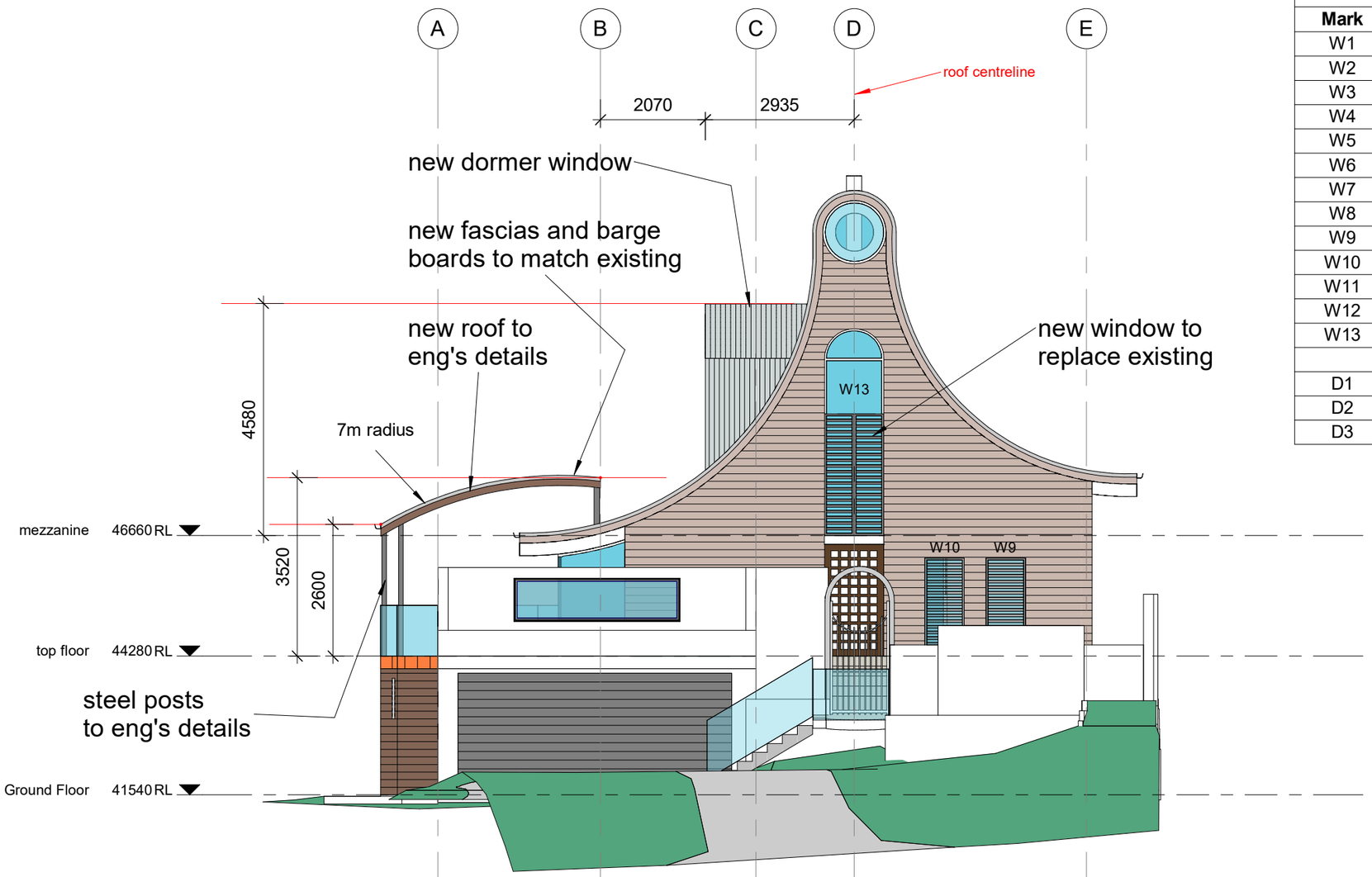
PROJECT
alterations to an existing dwelling at 518 Barrenjoey rd Avalon Beach

DRAWING
north elevation

DRAWN	CHECKED
PD	PD
SCALE	DATE
1 : 100	01.07.22

DRG.
A3 2202 06



WINDOW AND DOOR SCHEDULE					
Mark	**Orientation**	**Width**	**Height**	**Glazed m2**	**Description**
W1	N	800	800	0.6	1 fixed
W2	N	800	800	0.6	1 louvre
W3	N	800	800	0.6	1 fixed
W4	N	1775	2490	4.4	1 fixed, 1 louvre
W5	N	2915	2490	7.3	1 fixed, 1 louvre
W6	E	715	1860	1.3	1 louvre
W7	N	1150	575	0.7	2 louvre
W8	S	700	2280	1.6	1 louvre
W9	W	780	1935	1.5	1 louvre
W10	W	780	1935	1.5	1 louvre
W11	N	2580	360	0.9	3 louvre
W12	N	1750	2620	4.6	2 louvre, 1 fixed
W13	W	1170	4080	4.8	2 louvre, 2 fixed
D1	E	4100	2490	10.2	3 panel stacker
D2	E	3480	2490	8.7	3 panel stacker
D3	N	2580	2100	5.4	3 panel stacker
				54.8	

WINDOW AND DOOR NOTES

all windows and doors to be powdercoated aluminium unless noted otherwise

all dimensions to be verified by the builder

all windows and doors to be fitted with draft seals

all glazing to be to BASIX specifications

INTERIOR DETAILING TO ALEXANDRA KIDD DESIGN DETAILS

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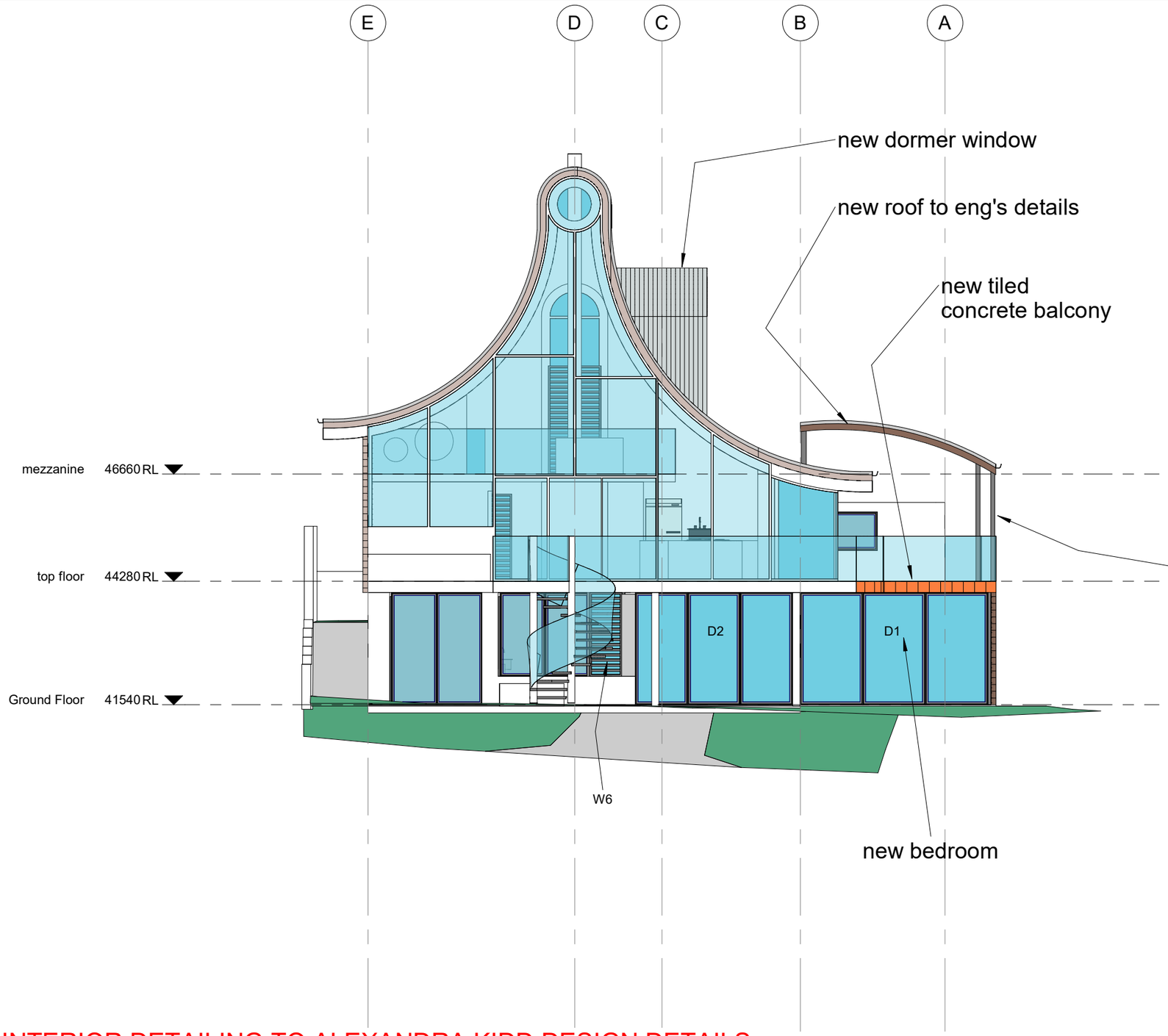
PROJECT
alterations to an existing dwelling at 518 Barrenjoey rd Avalon Beach

DRAWING
west elevation. windows and doors

DRAWN	CHECKED
PD	PD
SCALE	DATE
1 : 100	01.07.22

DRG.
A3 2202 07



BUILDING NOTES

All work to be carried out by suitably licensed and qualified tradesmen, and to comply with all relevant standards and Councils requirements.

Main contractor to be responsible for obtaining all necessary inspection certificates.

An approved sedimentation control system is to be installed and maintained for the duration of the construction.

Smoke alarms are to be fitted in accordance with Building Code of Australia requirements.

Termite protection is to be in the form of a physical barrier (eg Termimesh or similar) - no chemical barriers to be used.

DEMOLITION NOTES

all demolition materials to be disposed of in an approved and proper manner

adjoining properties to be protected at all times

asbestos (if encountered) is to be disposed of in an approved and proper manner

INTERIOR DETAILING TO ALEXANDRA KIDD DESIGN DETAILS

DA ISSUE

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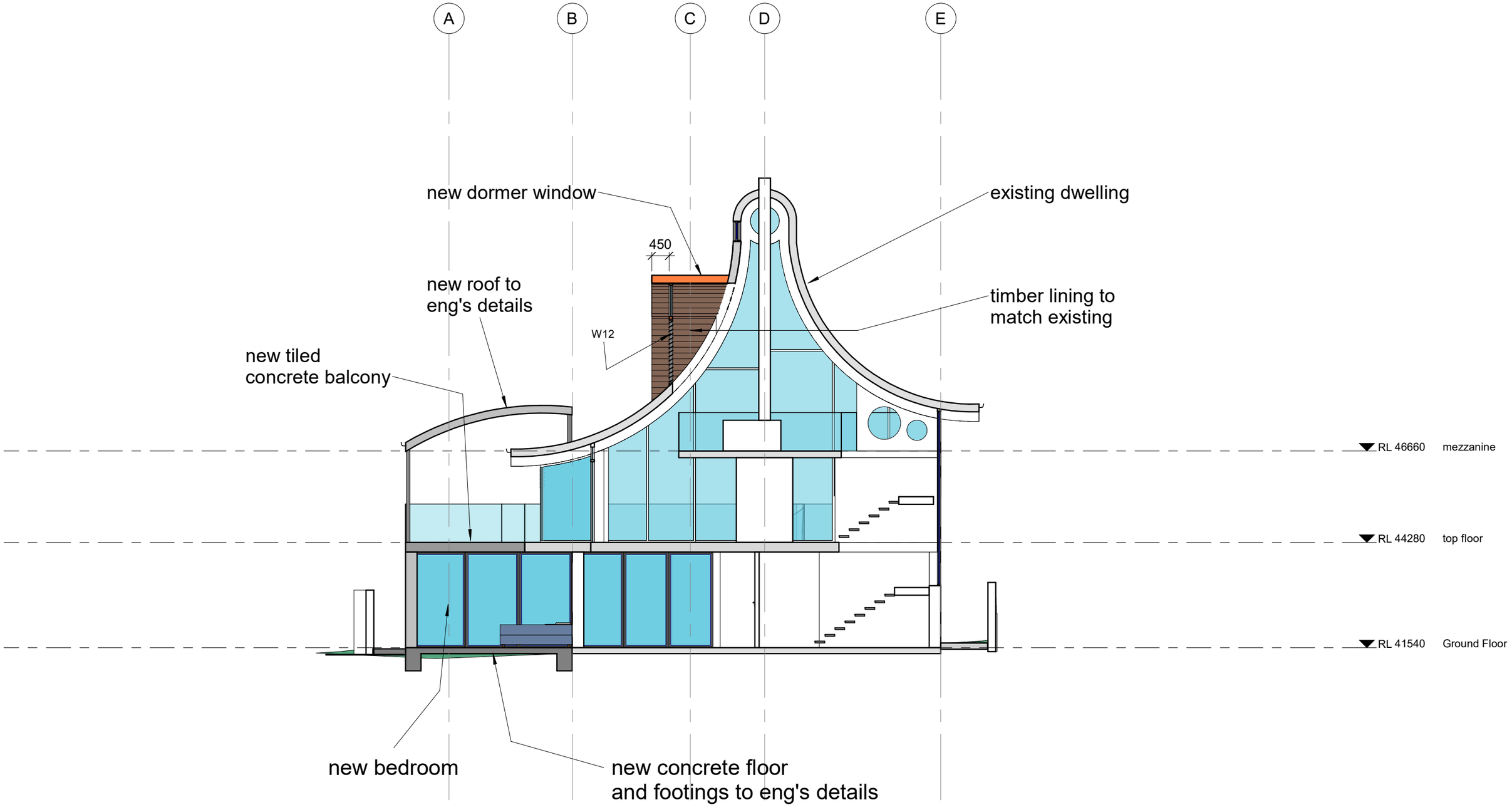
PROJECT
alterations to an existing dwelling at 518 Barrenjoey rd Avalon Beach

DRAWING
east elevation and notes

DRAWN	CHECKED
PD	PD
SCALE	DATE
1 : 100	01.07.22

DRG.
A3 2202 08



INTERIOR DETAILING TO ALEXANDRA KIDD DESIGN DETAILS

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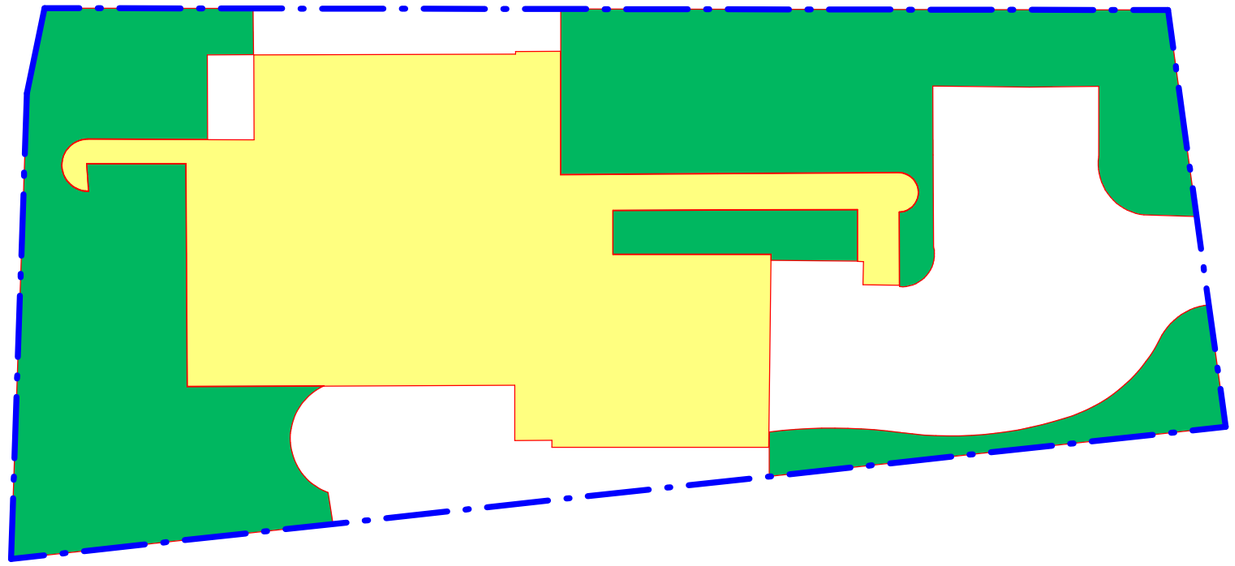
PROJECT
alterations to an existing dwelling at 518 Barrenjoey rd Avalon Beach

DRAWING
section

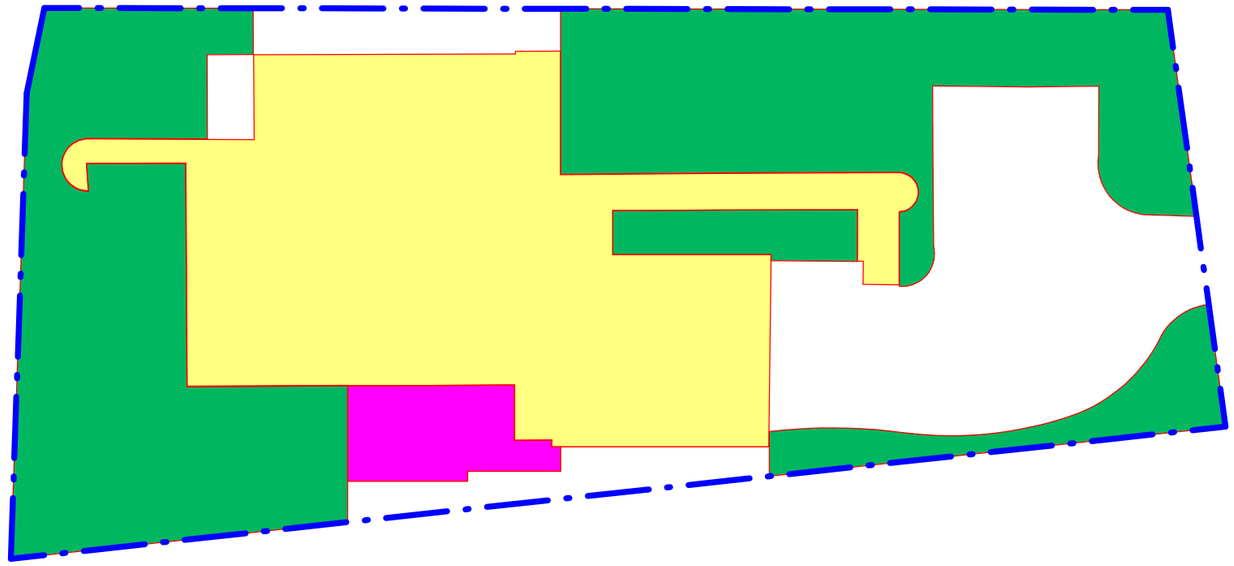
DRAWN	CHECKED
PD	PD
SCALE	DATE
1 : 100	01.07.22

DRG.
A3 2202 09



total site area = 605.7

landscaping = 236.1 m2



total site area = 605.7

landscaping = 242.0 m2

INTERIOR DETAILING TO ALEXANDRA KIDD DESIGN DETAILS

DA ISSUE

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PROJECT
alterations to an existing dwelling at 518 Barrenjoey rd Avalon Beach

DRAWING
landscaping calcs

DRAWN	CHECKED
PD	PD
SCALE	DATE
1 : 200	01.07.22

DRG.
A3 2202 10

Annexure B

Geotechnical Report

GEOTECHNICAL RISK MANAGEMENT POLICY FOR PITTWATER
FORM NO. 1 – To be submitted with Development Application

Development Application for _____
Name of Applicant

Address of site 518 Barrenjoey Road, Avalon Beach

The following checklist covers the minimum requirements to be addressed in a Geotechnical Risk ***Declaration made by geotechnical engineer or engineering geologist or coastal engineer (where applicable) as part of a geotechnical report***

I, Ben White *on behalf of* White Geotechnical Group Pty Ltd
(Insert Name) (Trading or Company Name)

on this the 13/9/22 certify that I am a geotechnical engineer or engineering geologist or coastal engineer as defined by the Geotechnical Risk Management Policy for Pittwater - 2009 and I am authorised by the above organisation/company to issue this document and to certify that the organisation/company has a current professional indemnity policy of at least $10million.

I:
Please mark appropriate box

☒ have prepared the detailed Geotechnical Report referenced below in accordance with the Australia Geomechanics Society's Landslide Risk Management Guidelines (AGS 2007) and the Geotechnical Risk Management Policy for Pittwater - 2009

☒ am willing to technically verify that the detailed Geotechnical Report referenced below has been prepared in accordance with the Australian Geomechanics Society's Landslide Risk Management Guidelines (AGS 2007) and the Geotechnical Risk Management Policy for Pittwater - 2009

☐ have examined the site and the proposed development in detail and have carried out a risk assessment in accordance with Section 6.0 of the Geotechnical Risk Management Policy for Pittwater - 2009. I confirm that the results of the risk assessment for the proposed development are in compliance with the Geotechnical Risk Management Policy for Pittwater - 2009 and further detailed geotechnical reporting is not required for the subject site.

☐ have examined the site and the proposed development/alteration in detail and I am of the opinion that the Development Application only involves Minor Development/Alteration that does not require a Geotechnical Report or Risk Assessment and hence my Report is in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009 requirements.

☐ have examined the site and the proposed development/alteration is separate from and is not affected by a Geotechnical Hazard and does not require a Geotechnical Report or Risk Assessment and hence my Report is in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009 requirements.

☐ have provided the coastal process and coastal forces analysis for inclusion in the Geotechnical Report

Geotechnical Report Details:

Report Title: Geotechnical Report **518 Barrenjoey Road, Avalon Beach**
Report Date: 13/9/22

Author: BEN WHITE

Author's Company/Organisation: **WHITE GEOTECHNICAL GROUP PTY LTD**

Documentation which relate to or are relied upon in report preparation:

Australian Geomechanics Society Landslide Risk Management March 2007.

White Geotechnical Group company archives.

I am aware that the above Geotechnical Report, prepared for the abovementioned site is to be submitted in support of a Development Application for this site and will be relied on by Pittwater Council as the basis for ensuring that the Geotechnical Risk Management aspects of the proposed development have been adequately addressed to achieve an "Acceptable Risk Management" level for the life of the structure, taken as at least 100 years unless otherwise stated and justified in the Report and that reasonable and practical measures have been identified to remove foreseeable risk.

Signature _____

Name Ben White

Chartered Professional Status MScGEOLAusIMM CP GEOL

Membership No. 222757

Company White Geotechnical Group Pty Ltd

GEOTECHNICAL RISK MANAGEMENT POLICY FOR PITTWATER
FORM NO. 1(a) - Checklist of Requirements for Geotechnical Risk Management Report for Development Application

Development Application for _____
Name of Applicant

Address of site 518 Barrenjoey Road, Avalon Beach

The following checklist covers the minimum requirements to be addressed in a Geotechnical Risk Management Geotechnical Report. This checklist is to accompany the Geotechnical Report and its certification (Form No. 1).

Geotechnical Report Details:

Report Title: Geotechnical Report **518 Barrenjoey Road, Avalon Beach**

Report Date: 13/9/22

Author: BEN WHITE

Author's Company/Organisation: WHITE GEOTECHNICAL GROUP PTY LTD

Please mark appropriate box

- ☒ Comprehensive site mapping conducted **29/6/22** (date)
- ☒ Mapping details presented on contoured site plan with geomorphic mapping to a minimum scale of 1:200 (as appropriate)
- ☒ Subsurface investigation required
  - ☐ No Justification _____
  - ☒ Yes Date conducted **29/6/22**
- ☒ Geotechnical model developed and reported as an inferred subsurface type-section
- ☒ Geotechnical hazards identified
  - ☐ Above the site
  - ☒ On the site
  - ☒ Below the site
  - ☐ Beside the site
- ☒ Geotechnical hazards described and reported
- ☒ Risk assessment conducted in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009
  - ☒ Consequence analysis
  - ☒ Frequency analysis
- ☒ Risk calculation
- ☒ Risk assessment for property conducted in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009
- ☒ Risk assessment for loss of life conducted in accordance with the Geotechnical Risk Management Policy for Pittwater - 2009
- ☒ Assessed risks have been compared to "Acceptable Risk Management" criteria as defined in the Geotechnical Risk Management Policy for Pittwater - 2009
- ☒ Opinion has been provided that the design can achieve the "Acceptable Risk Management" criteria provided that the specified conditions are achieved.
- ☒ Design Life Adopted:
  - ☒ 100 years
  - ☐ Other _____ (specify)
- ☒ Geotechnical Conditions to be applied to all four phases as described in the Geotechnical Risk Management Policy for Pittwater - 2009 have been specified
- ☒ Additional action to remove risk where reasonable and practical have been identified and included in the report.
- ☐ Risk assessment within Bushfire Asset Protection Zone.

I am aware that Pittwater Council will rely on the Geotechnical Report, to which this checklist applies, as the basis for ensuring that the geotechnical risk management aspects of the proposal have been adequately addressed to achieve an "Acceptable Risk Management" level for the life of the structure, taken as at least 100 years unless otherwise stated, and justified in the Report and that reasonable and practical measures have been identified to remove foreseeable risk.

Signature _____

Name Ben White

Chartered Professional Status MScGEOLAusIMM CP GEOL

Membership No. 222757

Company White Geotechnical Group Pty Ltd

GEOTECHNICAL INVESTIGATION:

Alterations and Additions and balcony at **518 Barrenjoey Road, Avalon Beach**

1. Proposed Development

1.1 Demolish the existing deck and pool structure and construct a ground-floor extension to the N side of the house.

1.2 Construct a new balcony over the proposed extension.

1.3 Various other minor internal and external alterations and additions.

1.4 Details of the proposed development are shown on 10 drawings prepared by Peter Downes Designs, project number 2202, drawings numbered 00, and 02 to 09, dated 1.7.22, and 01, dated 6.3.22.

2. Site Description

2.1 The site was inspected on the 29th June, 2022.

2.2 This residential property is on the high side the road and encompasses the crest and gently graded flanks of a hillslope. From the road frontage the slope rises gently to the house before falling at similar angles to the lower boundary. Below the lower boundary, the slope drops at vertical angles for some ~40m to a rock platform and ocean below.

2.3 At the road frontage, a concrete driveway runs past a parking area to a garage attached to the W side of the house (Photo 1). A stable ~1.3m high timber crib wall supports a cut for the parking area and a fill for the level lawn area (Photo 2). The part three-storey steel framed and rendered masonry house is supported on concrete block walls and concrete block piers (Photo 3). The concrete block walls show no significant signs of movement and the visible concrete piers stand vertical. A level lawn area extends from the E side of the property to the E boundary (Photo 4). A

~1.5m high timber crib wall that encompasses the N common boundary and the E boundary supports the fill for this lawn area (Photo 5). The crib wall is almost entirely obscured by dense vegetation and could not be adequately assessed. A gentle to moderately sloping lawn extends shortly beyond the E boundary before dropping ~37m at vertical angles to a rock platform below (Photo 6). The cliff line is obscured by thick vegetation. From below it can be seen to be made up of thinly bedded shale and thicker bedded sandstone (Photo 7). The base of the cliff is armoured from the undercutting action of the waves by the rock platform and a build-up of slope debris (Photo 8). The cliff face to the north of the property has been undercut to ~2.0m across its base but adjacent to the subject property the cliff face has no significant defects (Photo 9). In the unlikely event of a failure the undercut will not impact the subject property. The weathering process of the cliff face occurs when the harder beds are undercut by the softer beds. Because the beds are relatively thin and jointed the resulting failures are small in scale. This weathering process is extremely slow, measured from the geological record to be in the order of 7 to 12 mm/year. The proposed works will be at least 8m from the uphill edge of the cliff.

3. Geology

The Sydney 1:100 000 Geological sheet indicates the site is underlain by the Newport Formation of the Narrabeen Group. This is described as interbedded laminite, shale and quartz to lithic quartz sandstone.

4. Subsurface Investigation

One hand Auger Hole (AH) was put down on the neighbouring property to identify soil materials. Five Dynamic Cone Penetrometer (DCP) tests were put down to determine the relative density of the overlying soil and the depth to weathered rock. The locations of the tests are shown on the site plan attached. It should be noted that a level of caution should be applied when interpreting DCP test results. The test will not pass through hard buried objects so in some instances it can be difficult to determine whether refusal has occurred on an

obstruction in the profile or on the natural rock surface. This is not expected to be an issue for the testing on this site. However, excavation and foundation budgets should always allow for the possibility that the interpreted ground conditions in this report vary from those encountered during excavations. See the appended "Important information about your report" for a more comprehensive explanation. The results are as follows:

AUGER HOLE 1 (~RL39.2) **–** AH1 (Photo 11)

Depth (m)	**Material Encountered**
0.0 to 0.1	**TOPSOIL**, dark brown clayey soil, medium grained, loose, fine trace of organic matter, dry.
0.1 to 0.3	**CLAY**, brown, fine grained, stiff, dry.
0.3 to 0.6	**CLAY**, yellow and brown, fine grained, stiff, dry.

End of test @ 0.6m. No water table encountered.

DCP TEST RESULTS – Dynamic Cone Penetrometer

Equipment: 9kg hammer, 510mm drop, conical tip. Standard: AS1289.6.3.2 - 1997

Depth(m) Blows/0.3m	**DCP 1** (~RL41.5)	**DCP 2** (~RL41.5)	**DCP 3** (~RL41.6)	**DCP 4** (~RL40.5)	**DCP 5** (~RL41.6)
0.0 to 0.3	3	6	3	7	3
0.3 to 0.6	4	30	#	8	4
0.6 to 0.9	6	15		6	14
0.9 to 1.2	10	36		34	24
1.2 to 1.5	12	#		20	35
1.5 to 1.8	12			#	#
1.8 to 2.1	31				
	#				
	End of Test @ 2.1m	End of Test @ 1.2m	Refusal @ 0.2m	End of Test @ 1.35m	End of Test @ 1.5m

#refusal/end of test. F=DCP fell after being struck showing little resistance through all or part of the interval.

DCP Notes:

DCP1 – End of test @ 2.1m, DCP still going down slowly, red and white shale on dry tip.
DCP2 – End of test @ 1.2m, DCP still going down slowly, red shale on dry tip.
DCP3 – Refusal on unknown obstruction.
DCP4 – End of test @ 1.35m, DCP still going down slowly, clean dry tip, white and orange shale fragments in collar.
DCP5 – End of test @ 1.5m, DCP still going down slowly, red and white shale on dry tip.

5. Geological Observations/Interpretation

The slope materials are colluvial at the near surface and residual at depth. In the test locations, the ground materials consist of fill and soils over clays. The clay merges into the underlying weathered rock at depths of between ~0.9m to ~1.8m below the current surface. The weathered zone is interpreted to be Extremely Low Strength Shale. See Type Section attached for a diagrammatical representation of the expected ground materials.

6. Groundwater

Normal ground water seepage is expected to move over the buried surface of the rock and through the cracks. Due to the slope and elevation of the block, the water table is expected to be many metres below the base of the proposed works.

7. Surface Water

No evidence of surface flows were observed on the property during the inspection. It is expected normal sheet wash from the properties above will move onto the block and over the coastal scarp during heavy down pours.

8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed above or beside the property. The gently graded slope that rises and falls across the property and continues below is a potential hazard (**Hazard One**). The large sea cliff that drops vertically below the lower boundary of the property is a potential hazard (**Hazard Two**). The additional surcharge loads from the

proposed extension acting on the existing N boundary wall is a potential hazard (Photo 10) (**Hazard Three**).

Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two	Hazard Three
TYPE	The gentle slope that rises and falls across the property and continues below failing and impacting on the proposed works.	A large failure occurring in the sea cliff that impacts proposed pool and house.	The additional surcharge loads from the extension transferring onto the existing concrete block retaining wall causing damage and instability (Photo 10).
LIKELIHOOD	'Unlikely' (10^{-4})	'Rare' (10^{-5})	'Possible' (10^{-3})
CONSEQUENCES TO PROPERTY	'Minor' (5%)	'Major' (60%)	'Medium' (35%)
RISK TO PROPERTY	'Low' (2×10^{-5})	'Low' (6×10^{-5})	'Moderate' (2×10^{-4})
RISK TO LIFE	5.5×10^{-7}/annum	8.3×10^{-8}/annum	5.6×10^{-5}/annum
COMMENTS	This level of risk is 'ACCEPTABLE'.	This level of risk is 'ACCEPTABLE'.	This level of risk to life and property is 'UNACCEPTABLE'. To move the risk to 'ACCEPTABLE' levels the recommendations in **Section 12** are to be followed.

(See Aust. Geomech. Jnl. Mar 2007 Vol. 42 No 1, for full explanation of terms)

9. Suitability of the Proposed Development for the Site

The proposed development is suitable for the site. No geotechnical hazards will be created by the completion of the proposed development provided it is carried out in accordance with the requirements of this report and good engineering and building practice.

10. Stormwater

The fall is to Barrenjoey Road. Roof water from the development is to be piped to the street drainage system through any tanks that may be required by the regulating authorities.

11. Excavations

Apart from those for footings and minor levelling, no excavations are required.

12. Foundations

To avoid transferring any surcharge loads from the proposed extension onto the existing concrete block retaining wall that runs along the N common boundary, all piers will need to be taken to below the zone of influence of the concrete block retaining wall (Photo 10).

The proposed extension can be supported on a thickened edge / raft slab with piers taken to Extremely Low Strength Rock and to below the zone of influence of the existing N boundary concrete block retaining wall. This ground material is expected at depths of between ~0.9m and ~1.8m below the current surface.

A maximum allowable bearing pressure of 600kPa can be assumed for footings on Extremely Low Strength Rock or better. It should be noted that this material is a soft rock and a rock auger will cut through it so the builders should not be looking for refusal to end the footings.

As the bearing capacity of clay and shale reduces when it is wet, we recommend the footings be dug, inspected, and poured in quick succession (ideally the same day if possible). If the footings get wet, they will have to be drained and the soft layer of wet clay or shale on the footing surface will have to be removed before concrete is poured.

If a rapid turnaround from footing excavation to the concrete pour is not possible, a sealing layer of concrete may be added to the footing surface after it has been cleaned.

NOTE: If the contractor is unsure of the footing material required, it is more cost-effective to get the geotechnical consultant on site at the start of the footing excavation to advise on

footing depth and material. This mostly prevents unnecessary over-excavation in clay-like shaly-rock but can be valuable in all types of geology.

13. Geotechnical Review

The structural plans are to be checked and certified by the geotechnical engineer as being in accordance with the geotechnical recommendations. On completion, a Form 2B will be issued. This form is required for the Construction Certificate to proceed.

14. Inspections

The client and builder are to familiarise themselves with the following required inspections as well as council geotechnical policy. We cannot provide geotechnical certification for the owners and Occupation Certificate if the following inspections have not been carried out during the construction process.

- All footings are to be inspected and approved by the geotechnical consultant while the excavation equipment and contractors are still onsite and before steel reinforcing is placed or concrete is poured.

White Geotechnical Group Pty Ltd.

Ben White M.Sc. Geol.,
AusIMM., CP GEOL.
No. 222757
Engineering Geologist.

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9

Photo 10

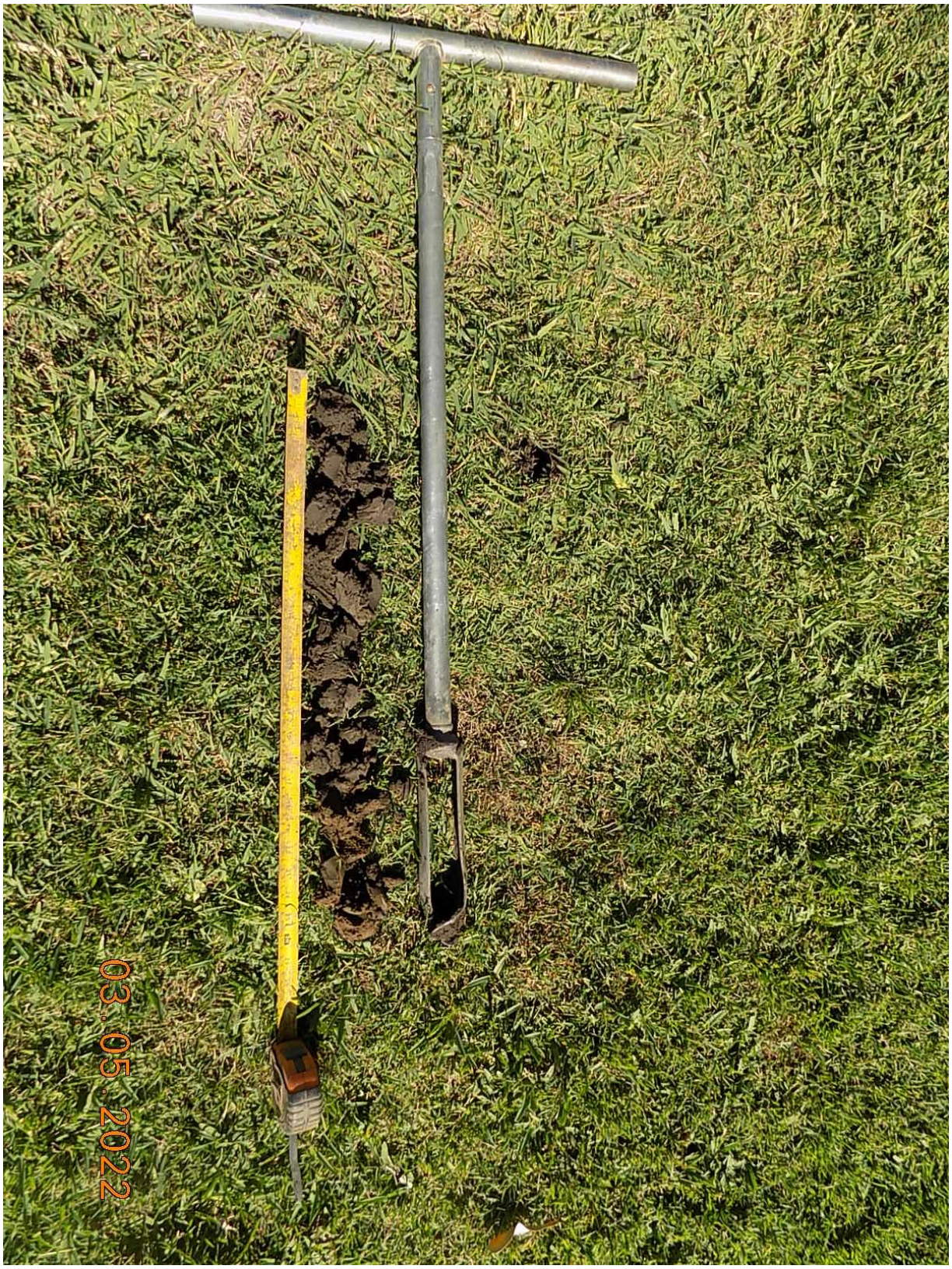


Photo 11 (Top to Bottom)

Important Information about Your Report

It should be noted that Geotechnical Reports are documents that build a picture of the subsurface conditions from the observation of surface features and testing carried out at specific points on the site. The spacing and location of the test points can be limited by the location of existing structures on the site or by budget and time constraints of the client. Additionally, the test themselves, although chosen for their suitability for the particular project, have their own limiting factors. The testing gives accurate information at the location of the test, within the confines of the test's capability. A geological interpretation or model is developed by joining these test points using all available data and drawing on previous experience of the geotechnical consultant. Even the most experienced practitioners cannot determine every possible feature or change that may lie below the earth. All of the subsurface features can only be known when they are revealed by excavation. As such, a Geotechnical report can be considered an interpretive document. It is based on factual data but also on opinion and judgement that comes with a level of uncertainty. This information is provided to help explain the nature and limitations of your report.

With this in mind, the following points are to be noted:

- If upon the commencement of the works the subsurface ground or ground water conditions prove different from those described in this report, it is advisable to contact White Geotechnical Group immediately, as problems relating to the ground works phase of construction are far easier and less costly to overcome if they are addressed early.

- If this report is used by other professionals during the design or construction process, any questions should be directed to White Geotechnical Group as only we understand the full methodology behind the report's conclusions.

- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

- This report should not be applied to any other project other than that outlined in section 1.0.

- This report is to be read in full and should not have sections removed or included in other documents as this can result in misinterpretation of the data by others.

- It is common for the design and construction process to be adapted as it progresses (sometimes to suit the previous experience of the contractors involved). If alternative design and construction processes are required to those described in this report, contact White Geotechnical Group. We are familiar with a variety of techniques to reduce risk and can advise if your proposed methods are suitable for the site conditions.

SITE PLAN – showing test locations

REVISION

BUILDING DESIGNERS AUSTRALIA NSW

peterdownes
multi-award winner designs
77 Riviera Ave, Avalon Beach 2107 0488 662 445
www.peterdownes.com.au

PROJECT
alterations to an existing dwelling at 518 Barrenjoey rd Avalon Beach

DRAWING
site plan

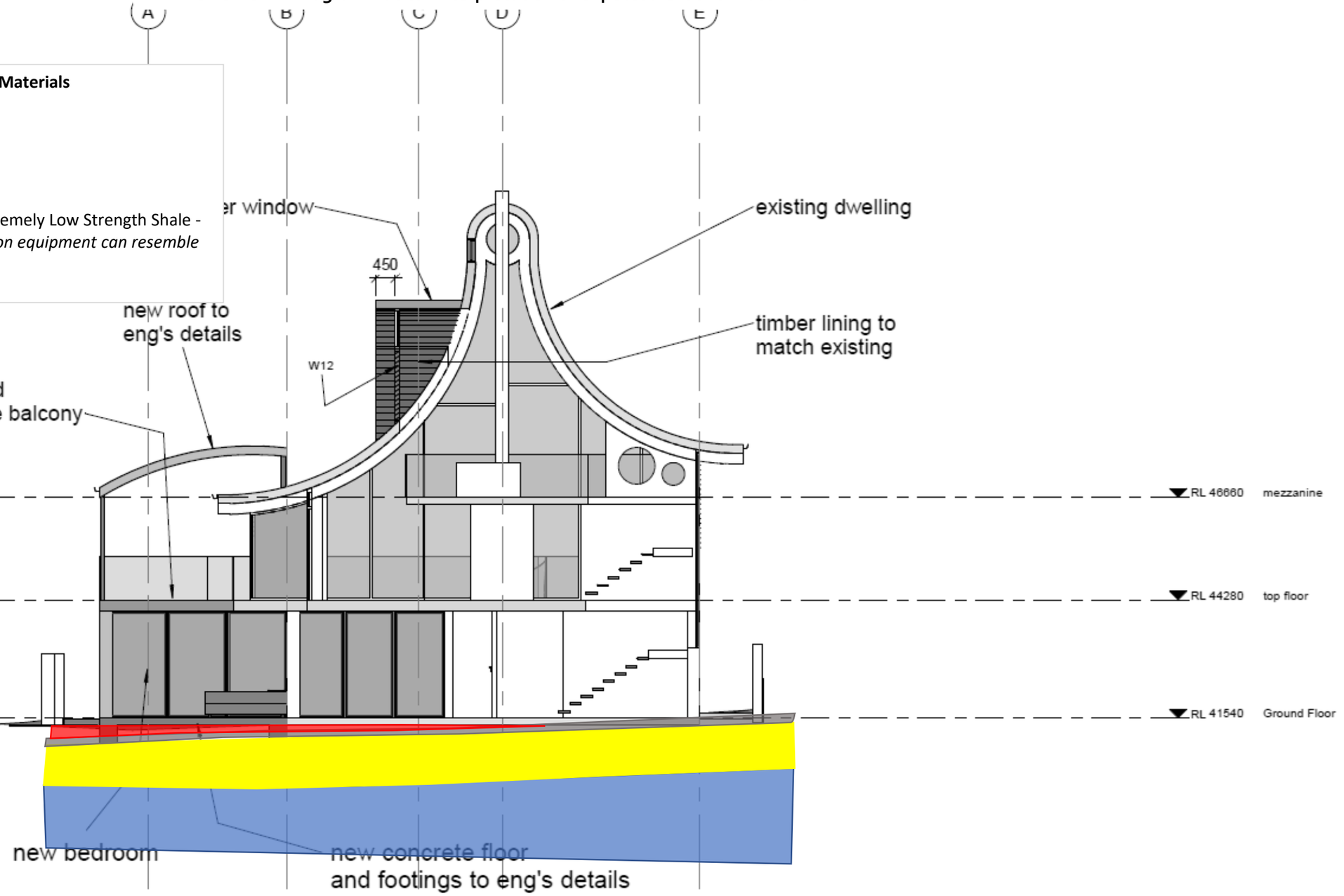
DRAWN	CHECKED
PD	PD
SCALE	DATE
1 : 200	06/03/22

DRG.
A3 2202 01

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials

Expected Ground Materials

- Fill
- Topsoil
- Clay – Firm to Stiff
- Narrabeen Group Rocks – Extremely Low Strength Shale - *after being cut up by excavation equipment can resemble a stiff to hard clay.*



INTERIOR DETAILING TO ALEXANDRA KIDD DESIGN DETAILS

DA ISSUE

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DRAWING
section

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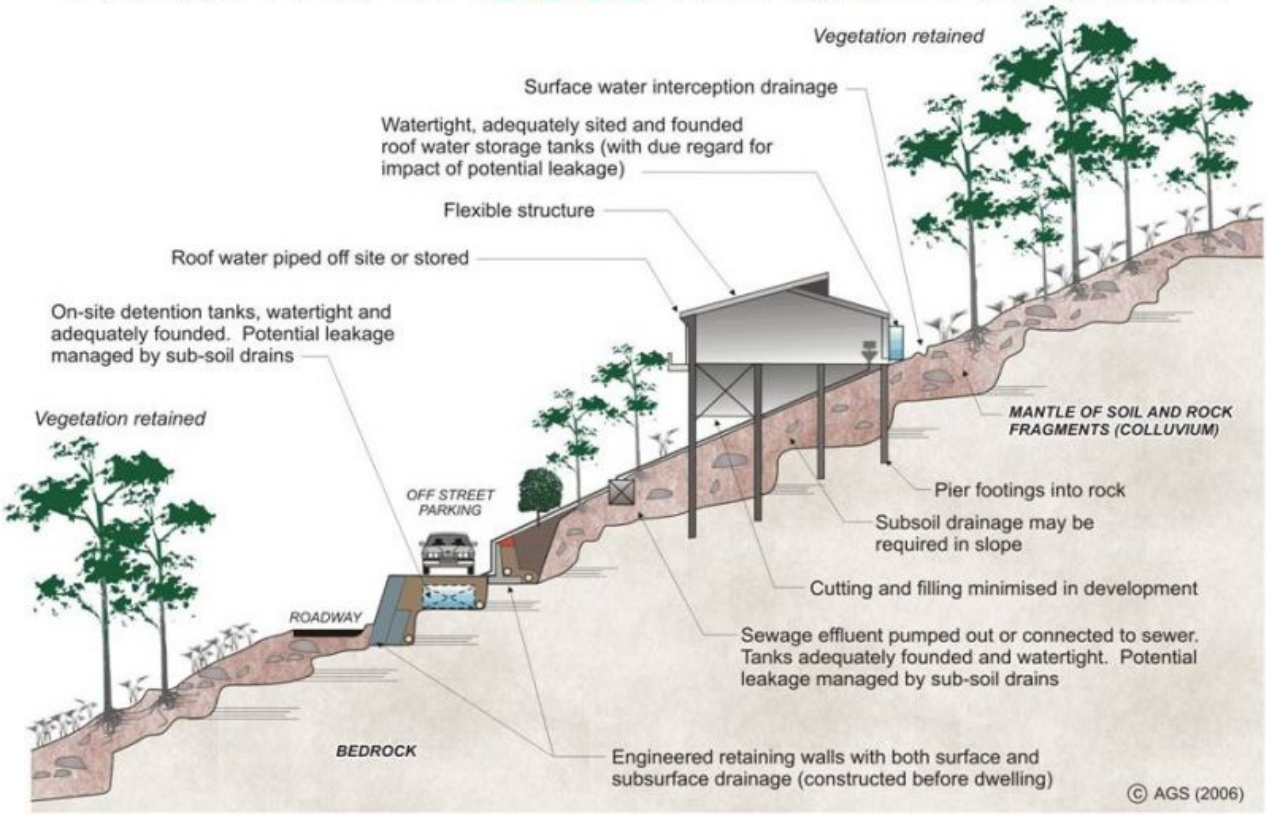
A3 2202 09

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE