

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

Development Application for _____
Name of Applicant

Address of site 8 Belinda Place, Newport

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 15/05/23 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 8 Belinda Place, Newport
Report Date: 15/05/23


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	8 Belinda Place, Newport

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 8 Belinda Place, Newport
Report Date: 15/05/23
Author: BEN WHITE
Author's Company/Organisation: WHITE GEOTECHNICAL GROUP PTY LTD

Please mark appropriate box

- ☒ Comprehensive site mapping conducted **9/5/23**
(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 **9/5/23**
- ☒ 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 at 8 Belinda Place, Newport

1. Proposed Development

- 1.1** Extend the existing first-floor deck.
- 1.2** Construct a pergola over the deck.
- 1.3** Various other minor internal and external alterations and additions.
- 1.4** Details of the proposed development are shown on 9 drawings prepared by Blue Sky Building Designs, project number 2022-010, drawings numbered A100 to A108, dated 22.07.22.

2. Site Description

- 2.1** The site was inspected on the 9th May, 2023.
- 2.2** This residential property is on the high side of the road and has a SE aspect. It is located on the steeply graded middle reaches of a hillslope. The natural slope rises across the property at an average angle of $\sim 24^\circ$ before rising at near vertical angles at a rock face in the vicinity of the upper boundary. The slope above and below the property continues at similar angles.
- 2.3** At the road frontage, a concrete driveway runs up the slope to a carport underneath the house (Photo 1). The cut for the driveway is lined by a covering of rock armour reaching up to $\sim 1.1\text{m}$ in height (Photo 2). The cut for the carport is supported by a stable $\sim 1.0\text{m}$ high brick retaining wall. In between the road frontage and the house is a steeply sloping densely vegetated **garden area** (Photo 3). The part two-storey brick house is supported on brick walls (Photo 4). The brick walls show no significant signs of movement. A $\sim 5.0\text{m}$ high sandstone cliff face rises at near vertical angles immediately upslope of the house (Photo 5). Low Strength Shale was observed

at the base of this rock and it is likely that this is the contact between the Newport Formation of the Narrabeen Group and Hawkesbury Sandstone (Photo 6). The sandstone cliff was slightly undercut in several locations and was jointed (Photo 7). Six rock anchors had previously been installed to support the cliff face (Photo 8). A stable stone retaining wall reaching up to ~2.0m high supports the slope batter immediately above the sandstone cliff (Photo 9). A stable ~3.5m high concrete crib wall supports the fill for the neighbouring driveway along the upper common boundary.

3. Geology

The Sydney 1:100 000 Geological sheet indicates the contact of the Hawkesbury Sandstone and the Newport Formation of the Narrabeen Group is in close proximity to the site. Given the ground test results, the Newport Formation of the Narrabeen Group is expected to underlie the proposed works. This is described as interbedded laminite, shale and quartz to lithic quartz sandstone.

4. Subsurface Investigation

One hand Auger Hole (AH) was put down to identify soil materials. Three 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 (~RL80.0) – AH1 (Photo 10)

Depth (m)	Material Encountered
0.0 to 0.3	FILL , dark brown clay, fine traces of organic matter, damp.
0.3 to 0.6	FILL , mottled clay, fine grained, firm to stiff, dry.
0.6 to 0.9	CLAY , sandy, orange, and brown, fine grained, stiff, dry.

End of test @ 0.9m. 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 (~RL80.0)	DCP 2 (~RL79.4)	DCP 3 (~RL76.8)
0.0 to 0.3	5	8	6
0.3 to 0.6	8	14	11
0.6 to 0.9	5	17	11
0.9 to 1.2	12	24	18
1.2 to 1.5	18	30	21
1.5 to 1.8	26	#	30
1.8 to 2.1	34		#
2.1 to 2.4	#		
	End of Test @ 2.1m	End of Test @ 1.8m	End of Test @ 1.8m

#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 clay on dry tip.

DCP2 – End of test @ 1.8m, DCP still going down slowly, red clay on dry tip.

DCP3 – End of test @ 1.8m, DCP still going down slowly, red clay on dry tip.

5. Geological Observations/Interpretation

Where sandstone bedrock is visible above the house, the surface features are controlled by the outcropping and underlying sandstone bedrock that steps up the property forming sub-

horizontal benches between the steps. Where the grade is steeper, the steps are larger, and the benches narrower. Where the slope eases, the opposite is true. The geomorphology of the slope under and below the house is indicative of a shale-derived slope typical of the Narrabeen Group. In the test locations, the depth to Extremely Low Strength Shale ranged between ~1.2m and ~1.5m below the current ground surface. We point out around the contact of two rock types (sandstone & shale) groundwater seepage can be higher than usual. See Type Section attached for a diagrammatical representation of the expected ground materials.

6. Groundwater

Ground water seepage is expected to move over the denser and less permeable clay and weathered shale layers in the profile. 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. As above, ground water seepage may be slightly elevated around the contact of the Hawkesbury Sandstone and Narrabeen Group.

7. Surface Water

No evidence of surface flows were observed on the property during the inspection. It is expected that normal sheet wash will move onto the site from above the property during heavy down pours. This will move down the slope at a relatively high velocity due to the steep slope.

Should the owners be aware or, if at a later time, become aware that overland flows enter the property during prolonged heavy rainfall, our office is to be contacted so appropriate drainage can be designed and installed to intercept the flows. It is a condition of the risk assessment in **Section 8** that this be done.

8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed beside the property. The steeply graded slope that rises across the property and continues above and below is a potential hazard (**Hazard One**). The undercut rock face (Photos 5 - 10) failing and toppling onto the slope below is a potential hazard (**Hazard Two**).

Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two
TYPE	The steep slope that rises across the property and continues above and below failing and impacting on the proposed works.	The undercut rock face (Photos 5 - 8) failing and causing damage to the property below.
LIKELIHOOD	'Unlikely' (10^{-4})	'Rare' (10^{-5})
CONSEQUENCES TO PROPERTY	'Medium' (15%)	'Major' (60%)
RISK TO PROPERTY	'Low' (2×10^{-5})	'Low' (6×10^{-5})
RISK TO LIFE	9.1×10^{-7} /annum	8.3×10^{-7} /annum
COMMENTS	This level of risk is 'ACCEPTABLE', provided the recommendations in Section 7 & 13 are followed.	This level of risk is 'ACCEPTABLE'.

(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 Belinda Place. 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, no excavations are required.

12. Foundations

The timber staircase can be supported footings embedded into the underlying natural clays. A maximum allowable pressure of 200kPa can be assumed for footings supported on the underlying Firm to Hard Clays.

Any additional footings required for the proposed balcony extension can be supported on piers taken to the underlying Extremely Low Strength Shale. This material is expected at depths of between ~1.2m and ~1.5m below the current surface in the area of the proposed works.

A maximum allowable bearing pressure of 600kPa can be assumed for footings on Extremely Low Strength Shale. 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. Site Maintenance

Where slopes approach or exceed 20°, such as on this site, it is prudent for the owners to occasionally inspect the slope (say annually or after heavy rainfall events, whichever occurs first). Should any of the following be observed: movement or cracking in retaining walls, cracking in any structures, cracking or movement in the slope surface, tilting or movement in established trees, leaking pipes, or newly observed flowing water, or changes in the erosional process or drainage regime, then a geotechnical consultant should be engaged to assess the slope. We can carry out these inspections upon request. The risk assessment in **Section 8** is subject to this site maintenance being carried out.

14. 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.

15. Inspection

The client and builder are to familiarise themselves with the following required inspection as well as council geotechnical policy. We cannot provide geotechnical certification for the owners and Occupation Certificate if the following inspection has 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.



Tyler Jay Johns
BEng (Civil)(Hons),
Geotechnical Engineer.

Reviewed By:



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 (top to bottom)

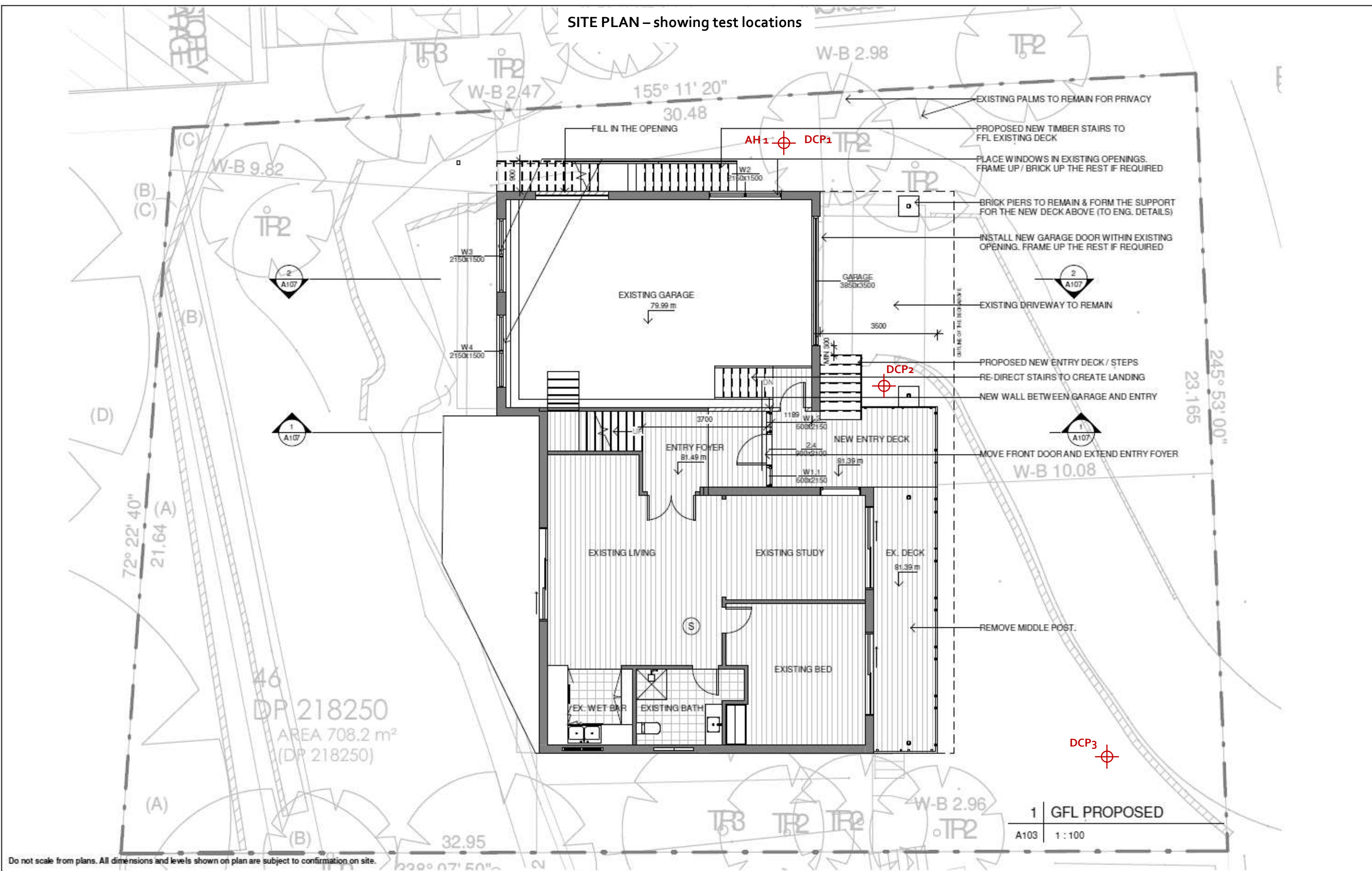
Important Information about Your Report

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



Do not scale from plans. All dimensions and levels shown on plan are subject to confirmation on site.

ISSUE	DATE	DESCRIPTION	DRWN	CHKD
	22.07.2022	MEASURED DRAWINGS	TM	KM
	11.01.2022	CONCEPT	TM	
	20.04.2023	DA ISSUE	KM	

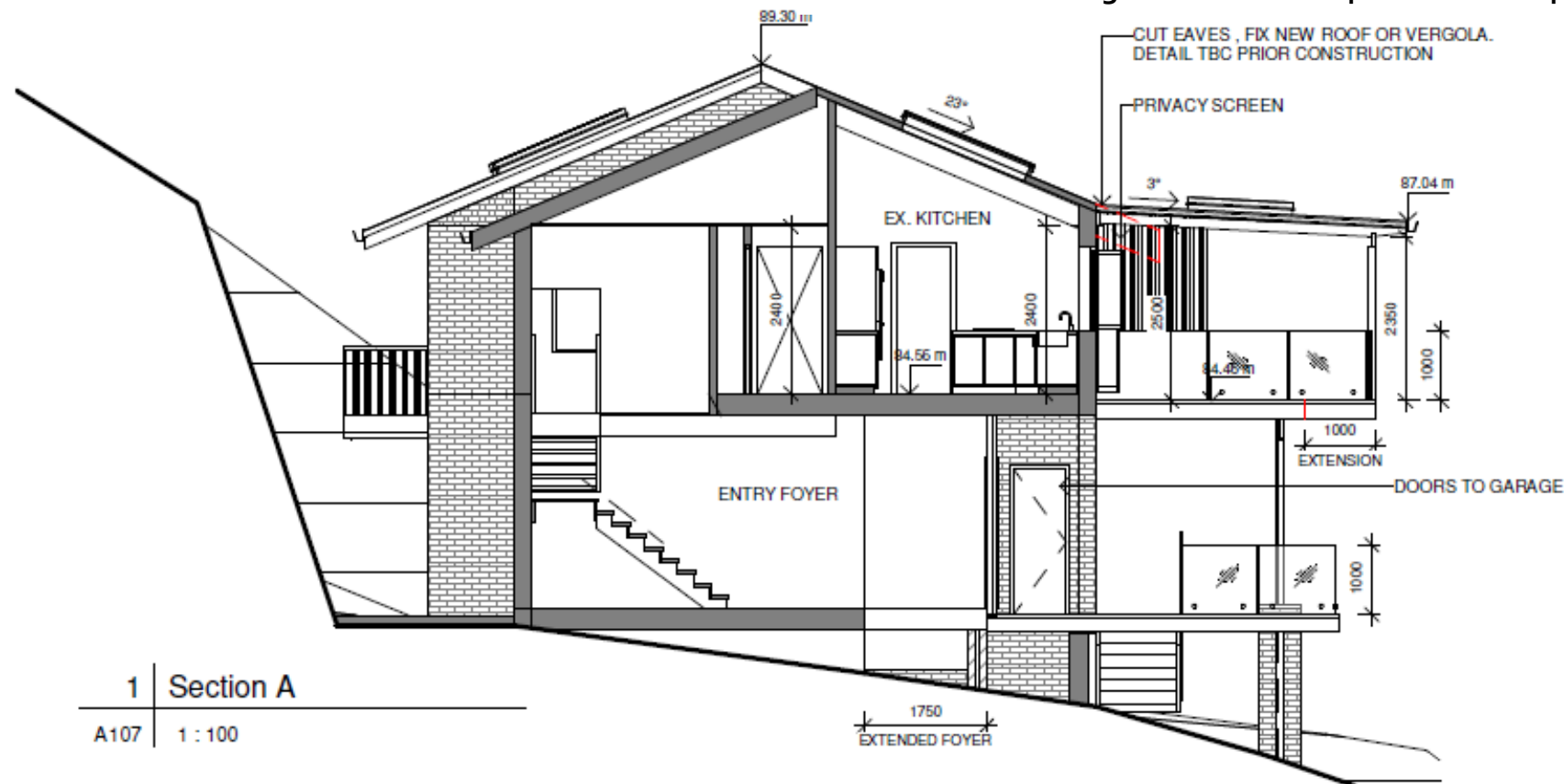
BLUE SKY
BUILDING DESIGNS
www.blueskybuildingdesigns.com.au
E: info@bsbd.com.au

PROJECT TITLE: ALTERATION & ADDITION
PROJECT NO.: 2022-010
AT: 8 BELINDA PLACE, NEWPORT, NSW 2106
FOR: STEPHEN & LUCILLE FLEGG

SHEET TITLE: GROUND FLOOR PLAN
SHEET NO: A103
SCALE A3: 1 : 100



TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials

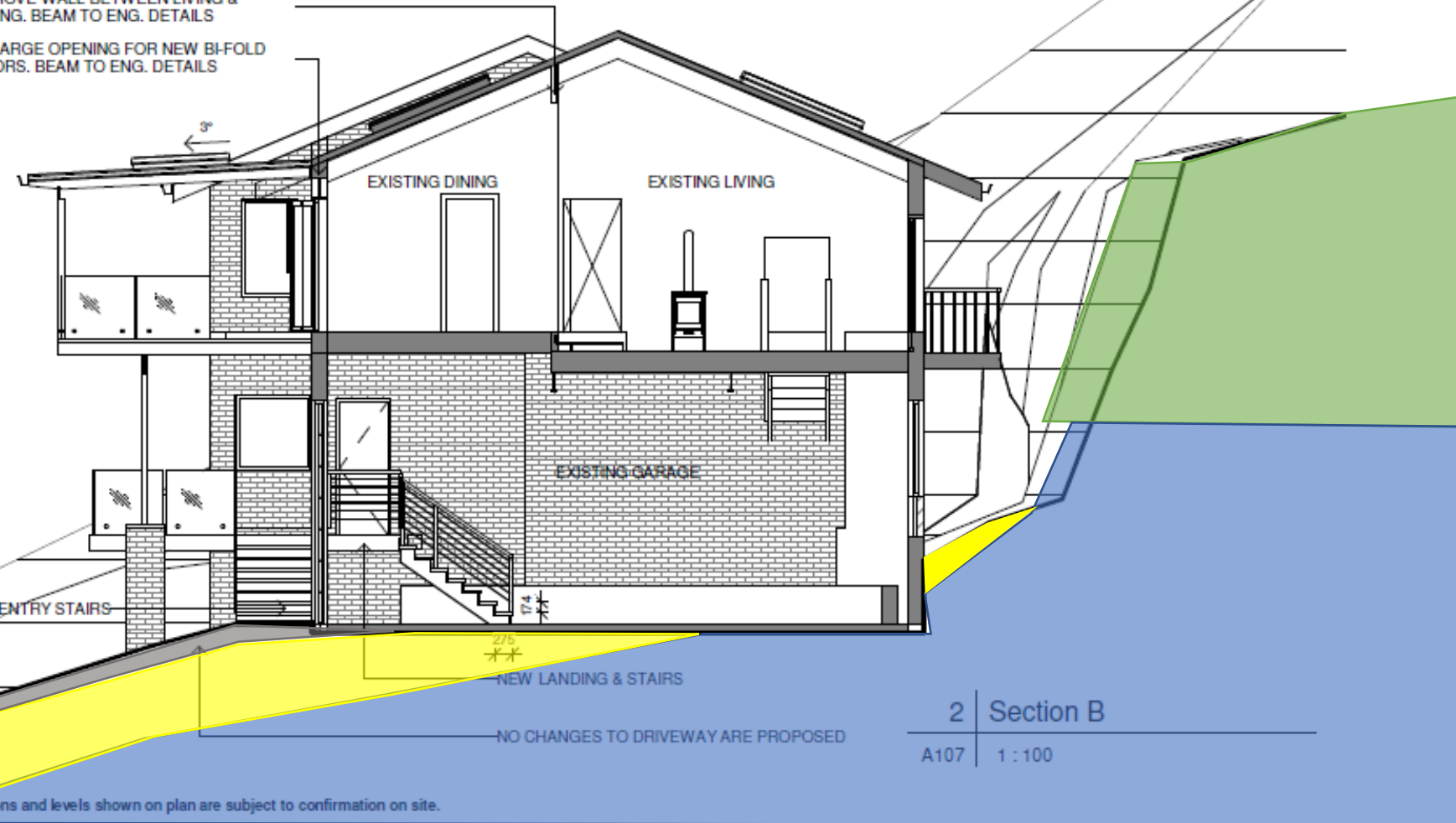


Expected Ground Materials

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

REMOVE WALL BETWEEN LIVING & DINING. BEAM TO ENG. DETAILS

ENLARGE OPENING FOR NEW BI-FOLD DOORS. BEAM TO ENG. DETAILS



Do not scale from plans. All dimensions and levels shown on plan are subject to confirmation on site.

ISSUE	DATE	DESCRIPTION	DRWN	CHKD
	22.07.2022	MEASURED DRAWINGS	TM	KM
	11.01.2022	CONCEPT	TM	
	20.04.2023	DA ISSUE	KM	

BLUE SKY
BUILDING DESIGNS

www.blueskybuildingdesigns.com.au

E: info@bsbd.com.au

PROJECT TITLE: ALTERATION & ADDITION

PROJECT NO.: 2022-010

AT: 8 BELINDA PLACE, NEWPORT, NSW 2106

FOR: STEPHEN & LUCILLE FLEGG

SHEET TITLE: SECTIONS

SHEET NO: A107

SCALE A3: 1:100

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE

