

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

Development Application for _____
Name of Applicant

Address of site 35A Plateau Road, Avalon

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 14/9/20 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 35A Plateau Road, Avalon

Report Date: 14/9/20

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 | <u>35A Plateau Road, Avalon</u> |

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 <u>35A Plateau Road, Avalon</u> |
| Report Date: <u>11/9/20</u> |
| Author: <u>BEN WHITE</u> |
| Author's Company/Organisation: <u>WHITE GEOTECHNICAL GROUP PTY LTD</u> |

Please mark appropriate box

- ☒ Comprehensive site mapping conducted 7/9/20
(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 7/9/20
- ☒ 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 35A Plateau Road, Avalon

1. Proposed Development

- 1.1** Extend the existing decks on the downhill and W sides of the house.
- 1.2** New upper level addition.
- 1.3** Various other internal and external alterations.
- 1.4** Details of the proposed development are shown on 11 drawings prepared by Barker Architects, drawings numbered A110 to 112, 200, 201, 500 to 503, 600, and 601, Revision 2, dated 28/62/19.
- 1.5** Details of the proposed stormwater design are shown on 5 drawing prepared by NB Consulting Engineers, Job number 181129, D01 to 05, Issue A, dated 11/8/20.

2. Site Description

- 2.1** The site was inspected on the 7th September, 2020.
- 2.2** This residential property is on the low side of the road and has a S aspect. The block is located on the moderate to steeply graded upper middle reaches of a hillslope. From the upper boundary to the downhill side of the house, the natural slope falls at an average angle of ~19°. The slope between the downhill side of the house and the lower boundary falls at an average angle of ~30°. The slope below the property continues at steep angles. The slope above the property continues briefly before encountering crest of the slope.
- 2.3** At the road frontage, a long and steep concrete Right of Carriageway (ROW) runs down the slope (Photo 1). A brick-paved parking area diverts off the ROW on the

subject property (Photo 2). The cut for the parking area is supported by a stable sandstone block retaining wall reaching ~1.6m high (Photo 3). An excavation has been made in the slope to create a level platform for a stable outbuilding and deck on the uphill side of the house (Photo 4). The cut is supported by a stable ~0.9m high treated timber retaining wall (Photo 5). The single-storey sandstone block and timber framed and clad house is supported on sandstone block walls and piers (Photo 6). No significant signs of movement were observed in the supporting walls and the supporting piers stand vertical. A steep slope falls from the downhill side of the house to the lower common boundary (Photo 7). The slope has surface covering of unkept grass and is mostly vegetated with weeds. To improve the long-term stability of the slope we recommend it be planted out in native shrubs that have deep root systems that bind the soils to the rock below. Competent Medium Strength Sandstone outcrops through this slope below the house (Photo 8).

3. Geology

The Sydney 1:100 000 Geological sheet indicates the site is underlain by the Newport Formation of the Narrabeen Group. There is a band of sandstone underlying the existing house that extends through the otherwise shale-dominated profile.

4. Subsurface Investigation

Two 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. 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:

| 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 (~RL56.6) | DCP 2 (~RL56.6) |
| 0.0 to 0.3 | 7 | 4 |
| 0.3 to 0.6 | 11 | 6 |
| 0.6 to 0.9 | 8 | 5 |
| 0.9 to 1.2 | 7 | 8 |
| 1.2 to 1.5 | 8 | # |
| 1.5 to 1.8 | 20 | |
| 1.8 to 2.1 | 19 | |
| 2.1 to 2.4 | 16 | |
| 2.4 to 2.7 | # | |
| | Refusal on Rock @ 2.3m | Refusal on Rock @ 1.1m |

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

DCP Notes:

DCP1 – Refusal on rock @ 2.3m, DCP bouncing off rock surface, white, orange, and maroon shale fragments on dry tip.

DCP2 – Refusal on rock @ 1.1m, DCP bouncing off rock surface, white impact dust 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 a thin topsoil over firm to stiff clays. The clays merge into the underlying weathered rock at depths between 1.1 to 2.3m below the current surface. The weathered zone is interpreted to be Very Low to Medium Strength Rock that becomes

progressively stronger with depth. 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 excavation.

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.

8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed beside the property. The moderate to steeply graded land surface that falls across the property and continues above and below is a potential hazard (**Hazard One**).

Risk Analysis Summary

| HAZARDS | Hazard One |
|--------------------------|---|
| TYPE | The moderate to steep slope that falls across the property and continues above and below failing and impacting on the property. |
| LIKELIHOOD | 'Unlikely' (10^{-4}) |
| CONSEQUENCES TO PROPERTY | 'Medium' (20%) |
| RISK TO PROPERTY | 'Low' (2×10^{-5}) |
| RISK TO LIFE | 8.3×10^{-7} /annum |
| COMMENTS | This level of risk is 'ACCEPTABLE' provided the recommendations in Section 13 are carried out. |

(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

According to the stormwater plans by NB Consulting Engineers, the site stormwater is to be directed to a level spreader system between the lower boundary and Barrenjoey Road. This system is suitable provided flows are kept close to natural runoff for the site and the system is to be located to RMS approval as per the stormwater plan numbered D01, Issue A, dated 11/8/20. All stormwater is to be piped through any tanks that may be required by the regulating authorities.

11. Excavations

Apart from those for footings, no excavations are required.

12. Foundations

Due to the moderate to steep slope across the property, the proposed deck extensions are to be supported on piers embedded 0.6m into the underlying Very Low to Medium Strength Rock. A maximum allowable bearing pressure of 600kPa can be assumed for footings on Very Low to Medium Strength Rock.

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/Remedial Works

Where slopes approach or exceed 30°, such as between the downhill side of the house and the lower boundary, 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 re-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. 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 owner or the regulating authorities 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 is 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

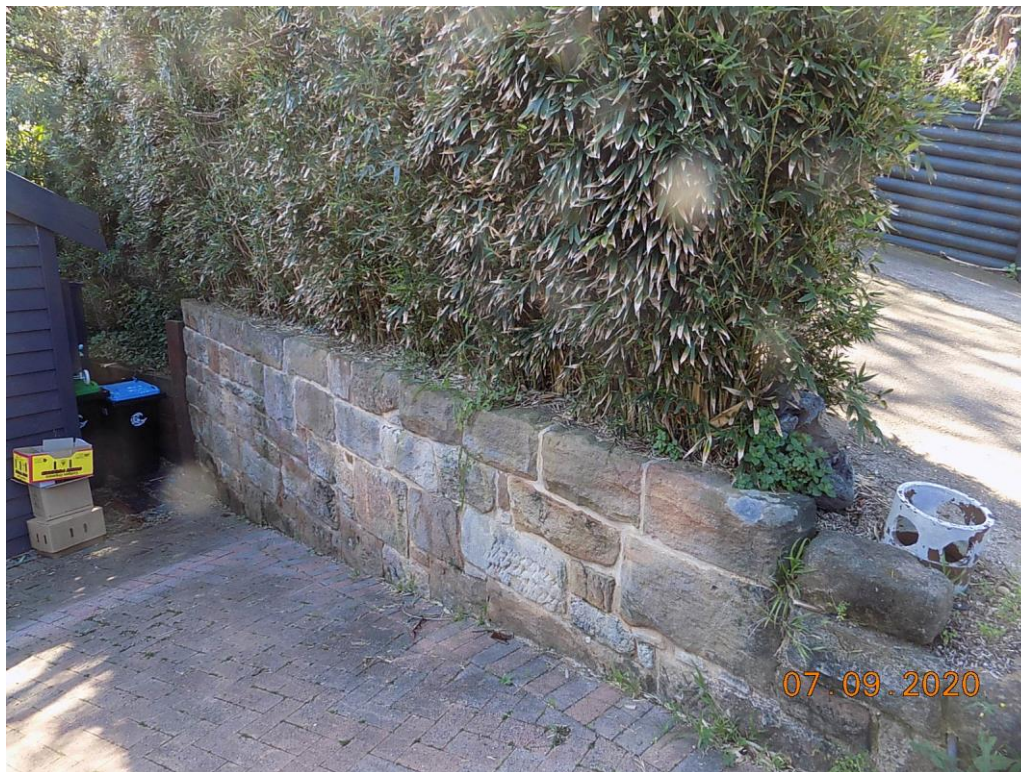


Photo 3



Photo 4

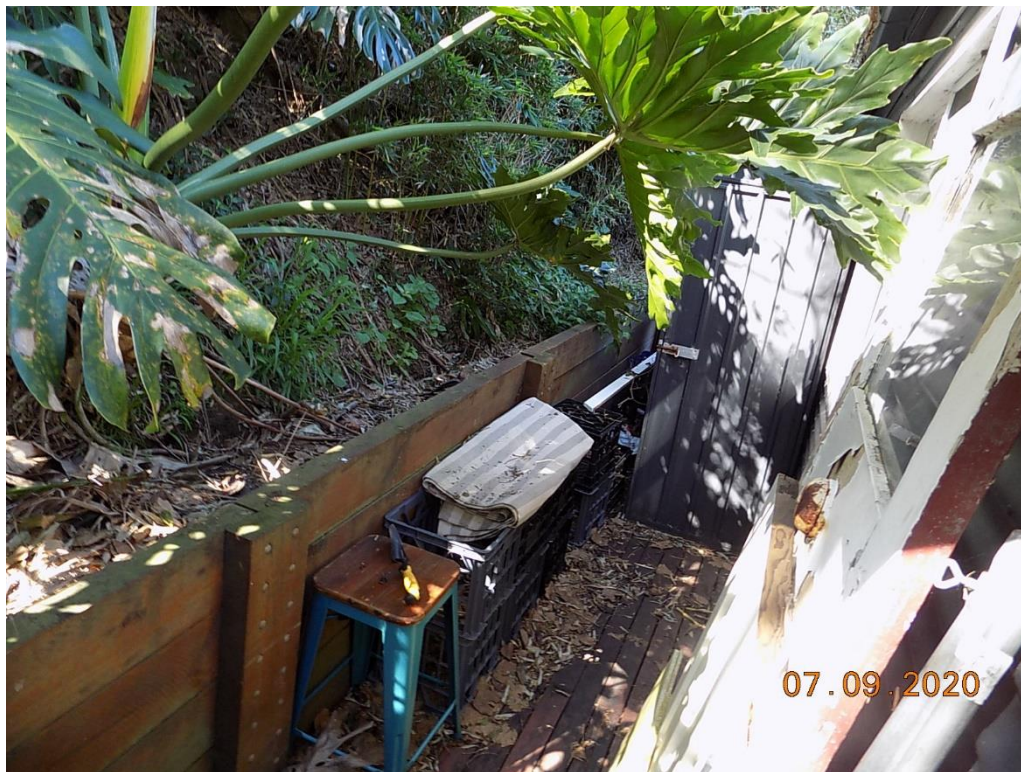


Photo 5



Photo 6



Photo 7



Photo 8

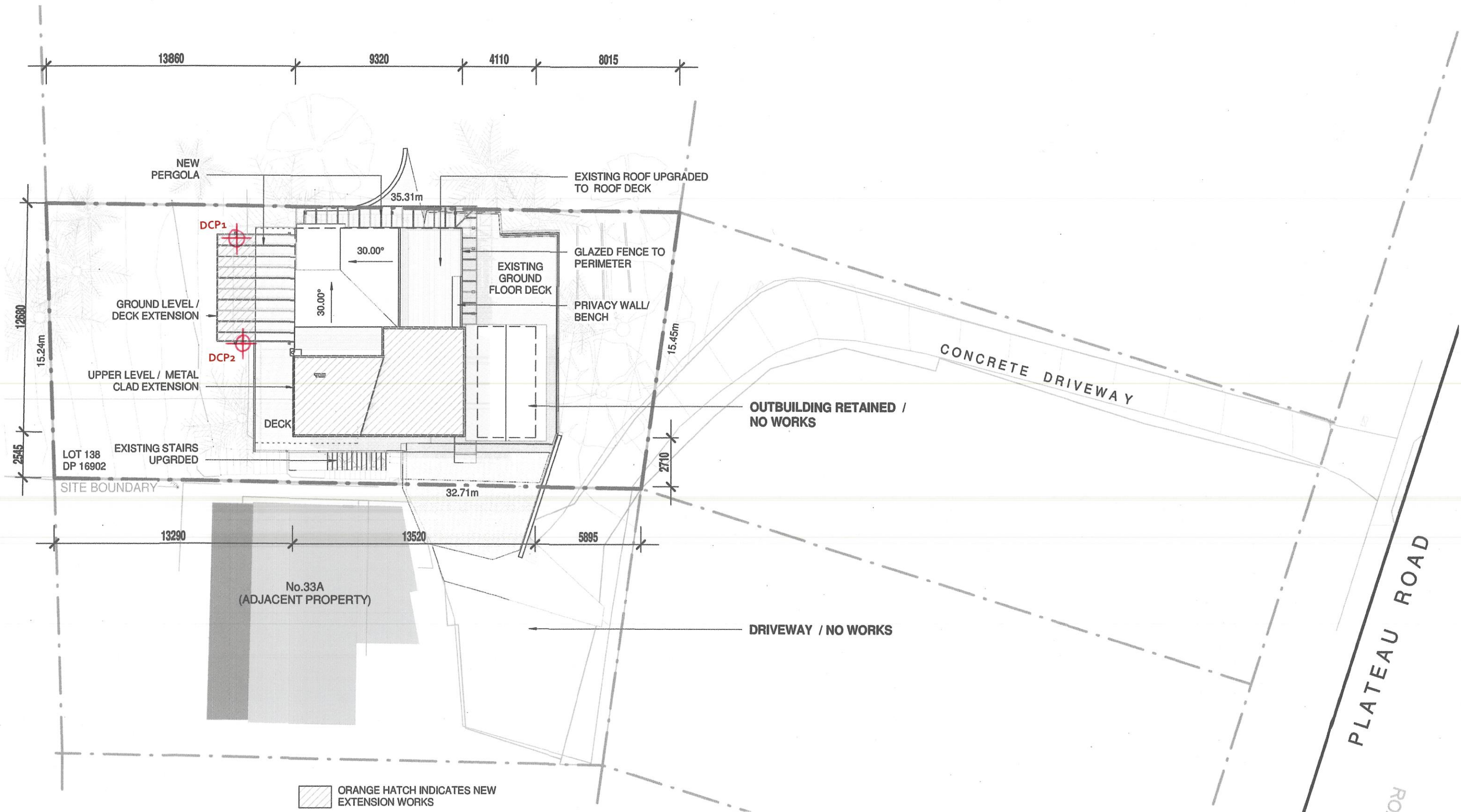
Important Information about Your Report

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



| ISSUE | DATE | REVISION |
|-------|----------|---------------------|
| 1 | 15.05.19 | PLANNING DISCUSSION |
| 2 | 28.06.19 | CONSULTANT ISSUE |

LEGEND

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Use figured dimensions in preference to scale. All dimensions to be verified on site.

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A.B.N. 35 160 523 660

Trading as: Barker Studio ©

NOMINATED ARCHITECT:
Luke Barker 8910

PROPOSED SITE PLAN

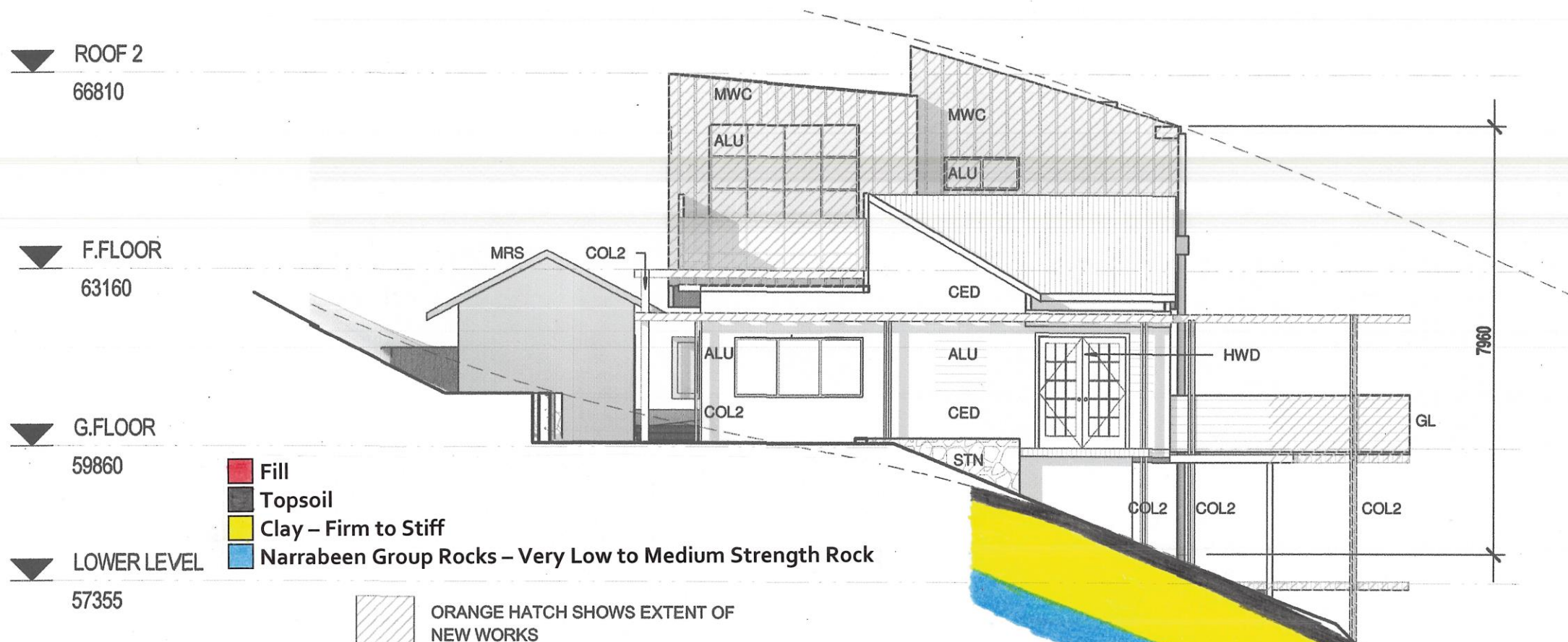
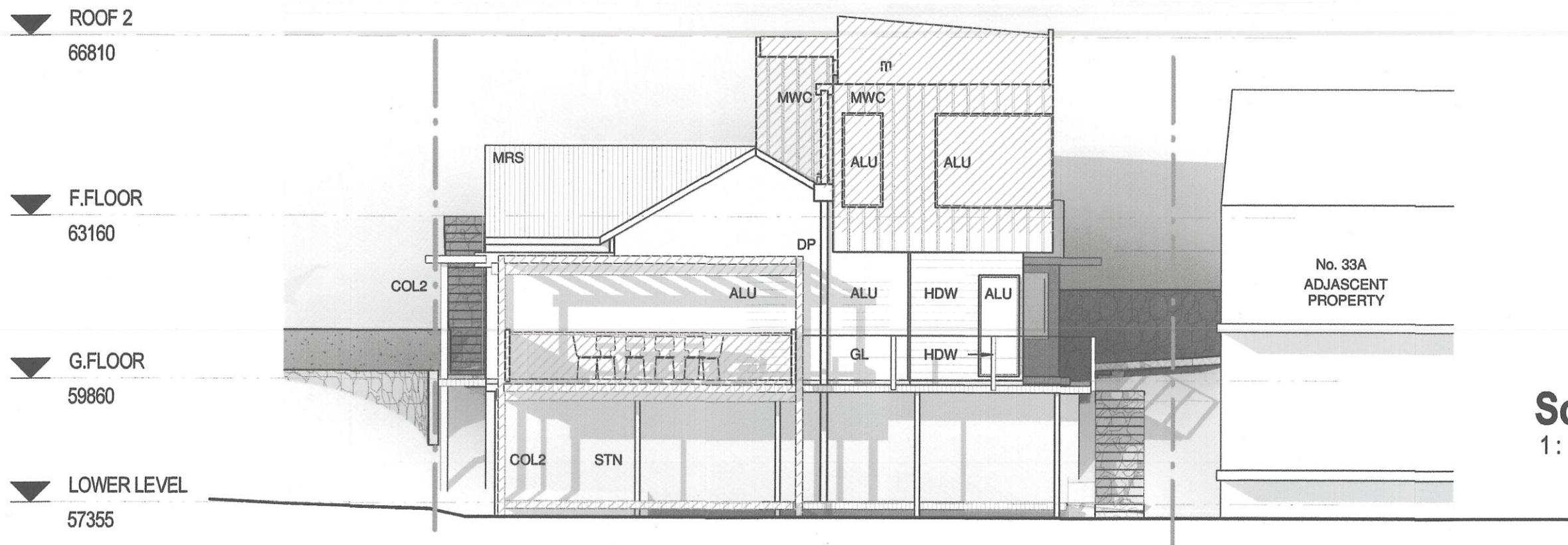
1807 ALTERATIONS & ADDITIONS

PHILL & JESS NOSWORTHY
35 A PLATEAU ROAD
BILGOLA

| | |
|-----------|---------|
| sheet no. | A112 |
| scale: | 1 : 200 |
| date: | JUNE |
| drawn: | FA |
| revision | 2 |

**BAR
KER**
ARCHITECTS

TYPE SECTION – Diagrammatical Interpretation of Expected Ground Materials



| ISSUE | DATE | REVISION |
|-------|----------|---------------------|
| 1 | 15.05.19 | PLANNING DISCUSSION |
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Luke Barker 8910

PROPOSED ELEVATIONS PG 2

1807 ALTERATIONS & ADDITIONS

PHILL & JESS NOSWORTHY
35 A PLATEAU ROAD
BILGOLA

sheet no. **A503**
scale **As indicated**
date: **JUNE**
drawn: **FA**
revision **2**

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EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE

