

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

Development Application for _____
Name of Applicant

Address of site 141 Riverview Rd, 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 26/11/19 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 141 Riverview Rd, Avalon

Report Date: 26/11/19

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>141 Riverview Rd, 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>141 Riverview Rd, Avalon</u>
Report Date: <u>26/11/19</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 20/11/19
(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 20/11/19
- ☒ 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:

New Driveway, Carport and Store Room at **141 Riverview Road, Avalon**

1. Proposed Development

- 1.1** Construct a new driveway and suspended carport with a store room underneath.
- 1.2** Details of the proposed development are shown on 2 drawings prepared by R. Conway, drawings numbered 19/15/1 and 19/15/2, dated 14th of November, 2019.

2. Site Description

- 2.1** The site was inspected on the 20th November, 2019.
- 2.2** This residential property is on the low side of the road and has a W aspect. From the road frontage, the natural surface falls at steep angles at an average angle of ~25° up to a maximum angle of ~36°. The slope above and below the property continues at similar angles.
- 2.3** At the road frontage, the fill batter for the road drops steeply across the vacant block for a short distance before merging into the natural slope (photos 1 & 2). Along the upper and middle slope sandstone joint blocks are exposed at the surface (photo 3). It is unclear whether these are dislodged boulders from above, or are bands of outcropping sandstone bedrock. At the W boundary of the property a sandstone flagging retaining wall in good condition supports the cut batter for the neighbouring concrete driveway (photo 4). The surface of the slope is lawn covered and has a scattering of shrubs and mature gums. No significant signs of movement were observed on the block.

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 auger hole was put down to identify the soil materials. Five Dynamic Cone Penetrometer (DCP) tests were put down to determine the relative density of the overlying soil and the depth to bedrock. 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 and the results are as follows:

AUGER HOLE 1 (~RL35.8) – AH1 (photo 5)

Depth (m)	Material Encountered
0.0 to 0.2	SANDY SOIL , brown, fine to medium grained, dry.
0.2 to 0.5	SANDY CLAY , brown, firm, dry.

End of hole @ 0.5m in Sandy Clay. No water table encountered.

DCP TEST RESULTS ARE 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 (~RL36.2)	DCP 2 (~RL34.3)	DCP 3 (~RL34.0)	DCP 4 (~RL31.0)	DCP 5 (~RL31.2)
0 to 0.3	18	17	45	31	31
0.3 to 0.6	25	31	#	40	40
0.6 to 0.9	21	40		#	#
0.9 to 1.2	45	#			
1.2 to 1.5	#				
	End of test @ 1.2m	End of test @ 0.8m	End of test @ 0.3m	End of test @ 0.4m	End of test @ 0.5m

#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 @ 1.2m, DCP still very slowly going down, orange shale on dry tip.

DCP2 – End of test @ 0.8m, DCP still very slowly going down, orange shale on dry tip.

DCP3 – End of test @ 0.3m, DCP still very slowly going down, white dust on dry tip.

DCP4 – End of test @ 0.4m, DCP still very slowly going down, orange shale on dry tip.

DCP5 – End of test @ 0.5m, DCP still very slowly going down, orange 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 Sandy Soil over Firm to Stiff Clay. The clays merge into the underlying weathered rock at a maximum depth of ~1.2m below the current surface. The weathered rock is interpreted to be Extremely Low Strength rock or better. Sandstone joint blocks are embedded in the slope on the upper and middle slope. It is unclear if these are detached joint blocks that have moved down the slope from above or if they are bedrock. From previous work on the neighbouring properties, we have noted that there is a band of sandstone that runs through the slope below Riverview Rd, in the otherwise shale dominated

profile. 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 significant surface flows were observed on the property during the inspection. Normal sheet wash from the slope above will be intercepted by the street drainage system for Riverview Road above.

8. Geotechnical Hazards and Risk Analysis

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

Risk Analysis Summary

HAZARDS	Hazard One
TYPE	The steep slope that falls across the property and continues above failing and impacting on the property.
LIKELIHOOD	'Unlikely' (10^{-4})
CONSEQUENCES TO PROPERTY	'Medium' (12%)
RISK TO PROPERTY	'Low' (2×10^{-5})
RISK TO LIFE	9.1×10^{-7} /annum
COMMENTS	'ACCEPTABLE' level of risk to life & property.

(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

All stormwater or drainage runoff from the proposed development is to be piped to the existing easement through any tanks that may be required by the regulating authorities.

11. Excavations

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

12. Vibrations

The proposed excavation is set back sufficiently from any surrounding structures or boundaries so that vibrations from the excavation will not exceed tolerable limits for building or infrastructure damage.

13. Excavation Support Requirements

Should any minor levelling be required, soil is to be battered at not more than 1.0V to 2.0H (26°), or is to be supported by retaining walls.

14. Retaining Walls

If retaining walls are required the following advice is appropriate: For cantilever or singly-propped retaining walls, it is suggested the design be based on a triangular pressure distribution of lateral pressures using the parameters shown in Table 1.

TABLE 1 IS ON THE NEXT PAGE

Table 1 – Likely Earth Pressures for Retaining Walls

Unit	Earth Pressure Coefficients		
	Unit weight (kN/m ³)	'Active' K _a	'At Rest' K ₀
Soil and Residual Clays	20	0.40	0.55
Extremely Low Strength Weathered Rock	22	0.25	0.35

For rock classes refer to Pells et al "Design Loadings for Foundations on Shale and Sandstone in the Sydney Region".
Australian Geomechanics Journal 1978.

It is to be noted that the earth pressures in Table 1 assume a level surface above the wall, do not account for any surcharge loads and assume retaining walls are fully drained. Rock strength and relevant earth pressure coefficients are to be confirmed on site by the geotechnical consultant.

All retaining walls are to have sufficient back-wall drainage and be backfilled immediately behind the wall with free-draining material (such as gravel). This material is to be wrapped in a non-woven Geotextile fabric (i.e. Bidim A34 or similar), to prevent the drainage from becoming clogged with silt and clay. If no back-wall drainage is installed in retaining walls, the likely hydrostatic pressures are to be accounted for in the structural design.

15. Foundations

The proposed car port can be supported on piers embedded at least 0.6m into Extremely Low Strength rock or better. We would expect the minimum pier depth to be in the order of ~1.8m from the surface.

As the bearing capacity of clay and weathered rock 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 weathered rock 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.

16. 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 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: AH1 – Downhole is from 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.

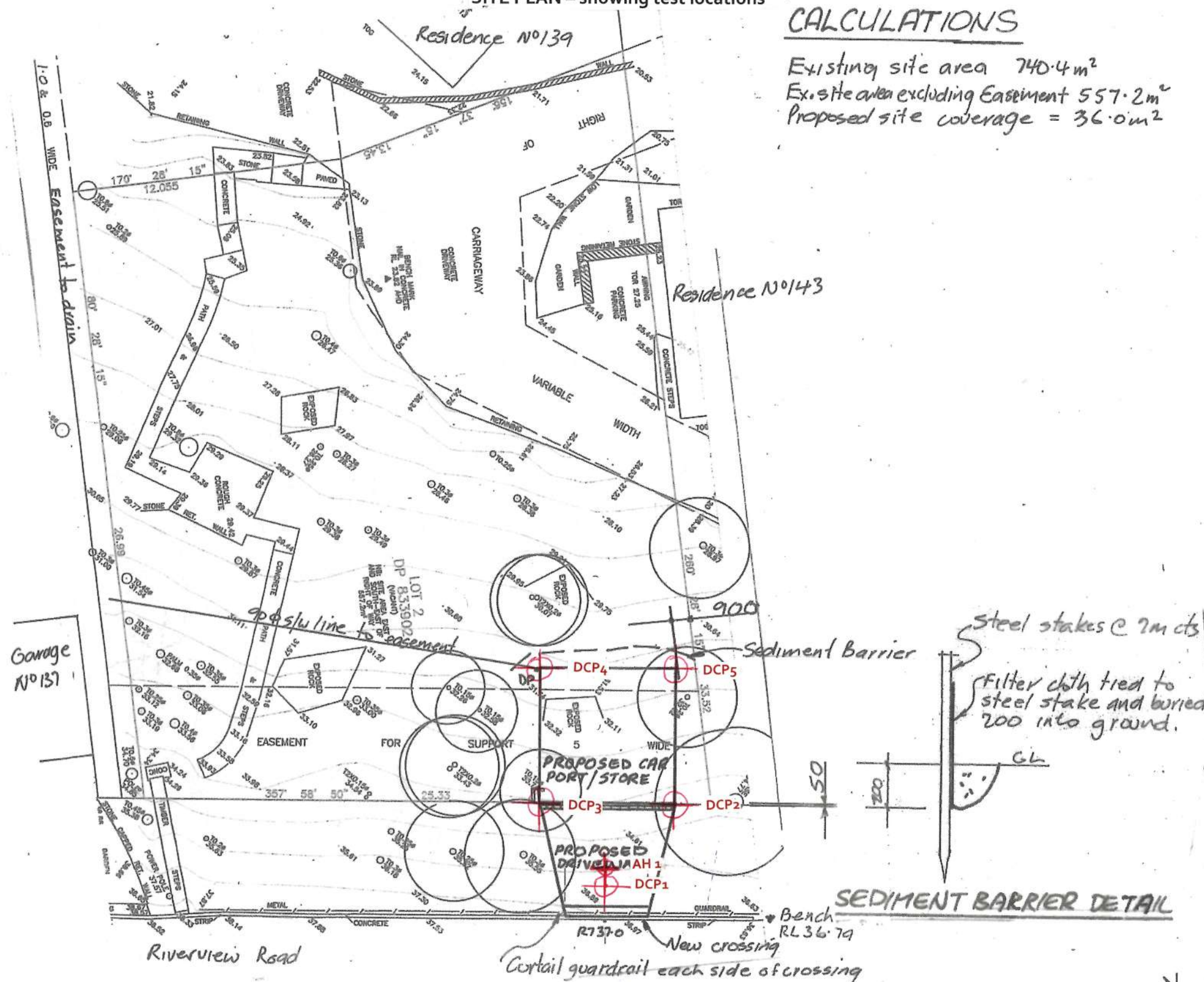
SITE PLAN - showing test locations

CALCULATIONS

Existing site area 740.4 m²
 Ex. site area excluding Easement 557.2 m²
 Proposed site coverage = 36.0 m²

NOTES & SPECIFICATION

1. All dimensions shall be checked on site prior to ordering materials
2. All workmanship and materials shall comply with SAA codes and the BCA.
3. New carport shall have a concrete floor
4. New store room shall have a timber floor
5. Entire structure shall be supported on a galv. steel frame
6. New driveway shall be concrete.
7. New roof shall be colourbond.
8. New handrails shall be timber painted
9. Provide villa board lining to carport ceiling
10. Roof and driveway shall be drained to existing storm water easement on the southern boundary
11. Existing steel guardrail shall be curtailed each side of proposed new crossing
12. New cladding shall be
13. Provide wheel stops at rear of carport.
14. New handrails shall be timber 1000 high.
15. Sediment barrier shall be a filter cloth system
16. No significant trees shall be removed for the building of this carport/store room.



EXTERNAL FINISHES

Roof - Colourbond -
 Cladding -
 Steel Frame -
 Driveway - concrete

PROPOSED NEW CARPORT/
 STORE ROOM

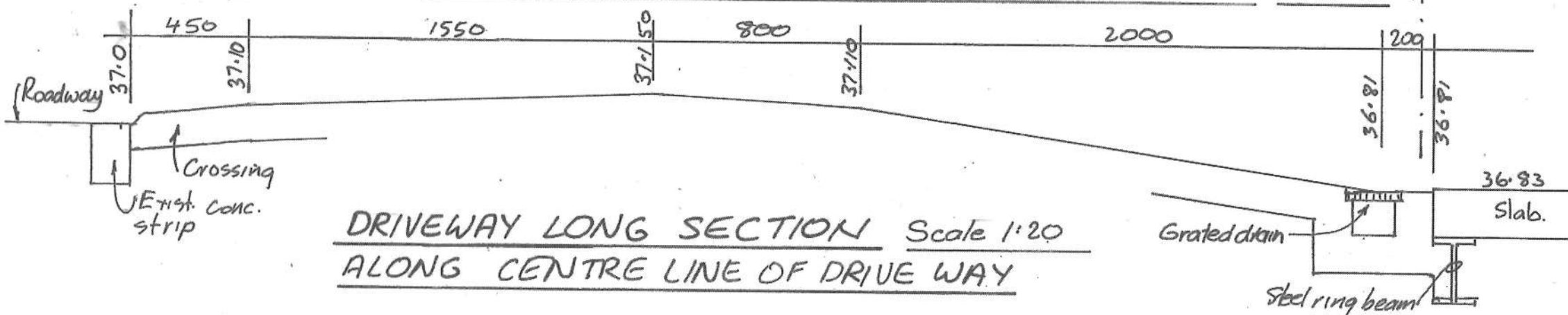
AT 141 RIVERVIEW ROAD
 AVALON BEACH

FOR Ms. A. JACOBY

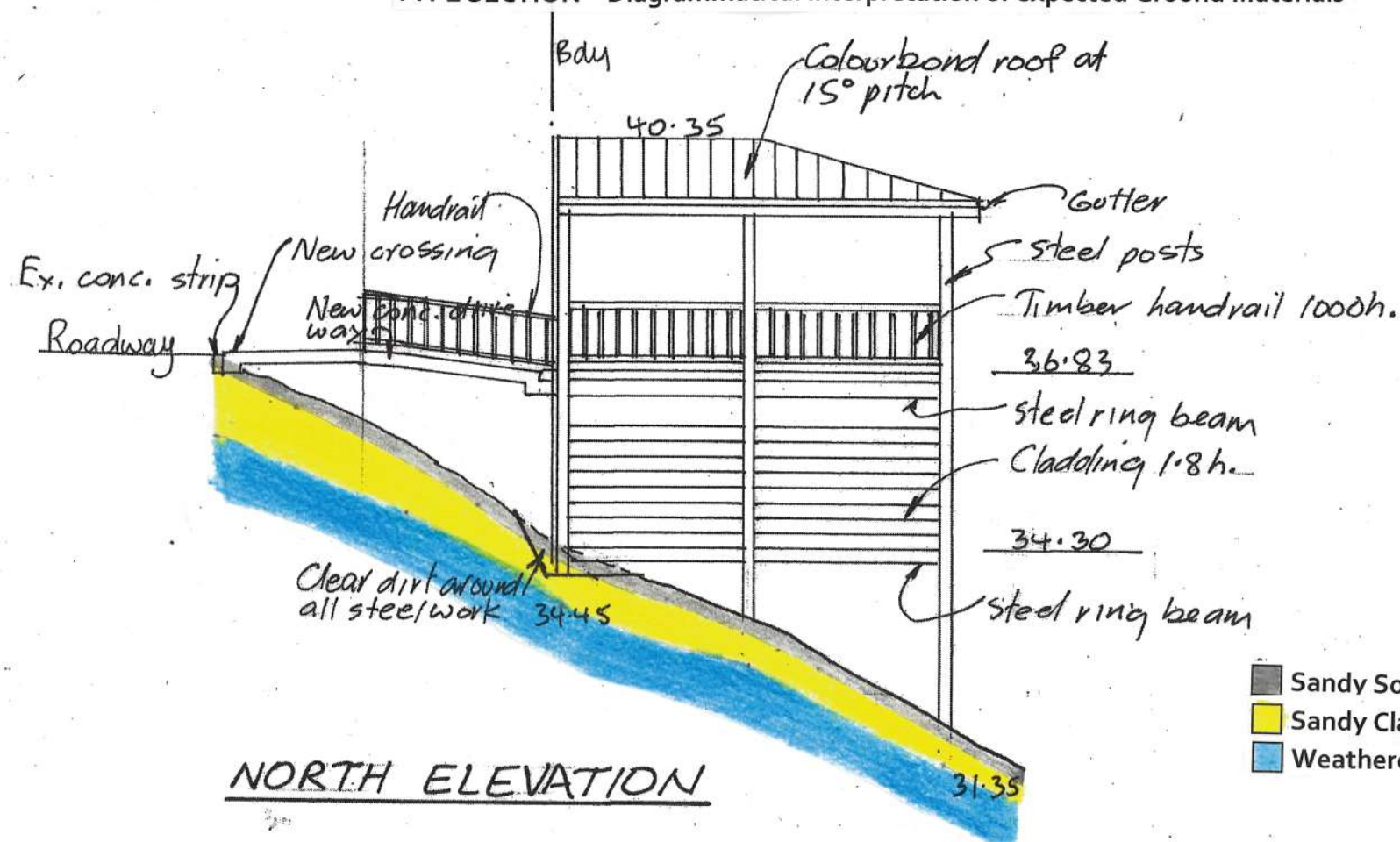
SITE, LANDSCAPE DRAINAGE
 AND SEDIMENT PLAN
 Scale 1:20 & 1:200 Date 14.11.19 Dm by R. Conway
 Phone 0425 314 716 Dra. N° 19/15/13

SITE, LANDSCAPE, DRAINAGE & SEDIMENT PLAN Scale 1:200

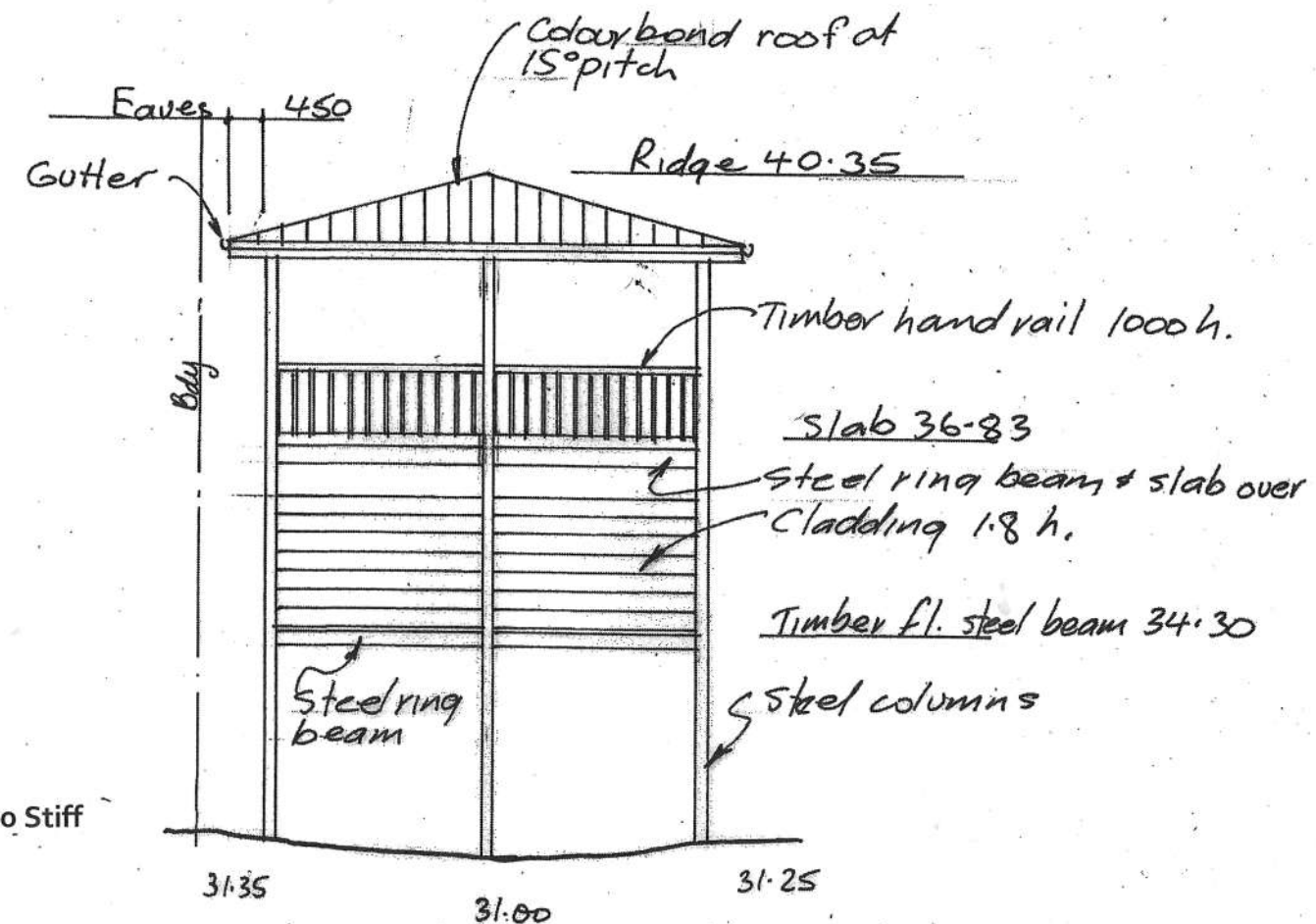
DRIVEWAY LONG SECTION Scale 1:20 ALONG CENTRE LINE OF DRIVE WAY



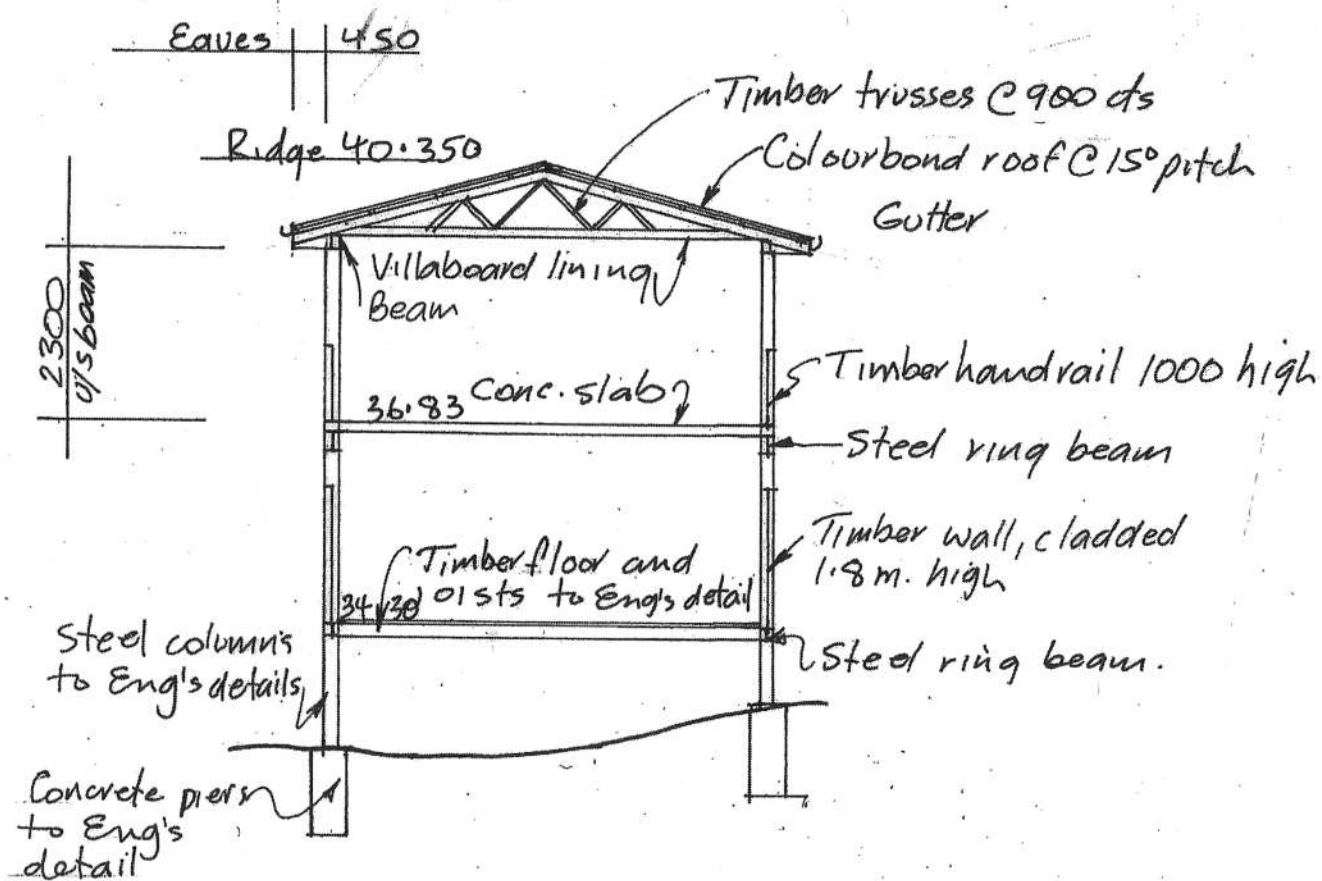
TYPE SECTION - Diagrammatical Interpretation of expected Ground Materials



NORTH ELEVATION



WEST ELEVATION



SECTION A-A

PROPOSED NEW CAR PORT / STORE ROOM.
AT 141 RIVERVIEW ROAD AVALON BEACH
FOR M^S. A. JACOBY

ELEVATIONS & SECTION

Scale 1:100 Date 14.11.19 Drawn by R. Conway.
Phone 0425314716 Drawing No 19/15/19

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE

