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

Development Application for _____
Name of Applicant

Address of site 114 Grandview Drive, 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 23/2/21 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 **114 Grandview Drive, Newport**

Report Date: 23/2/21

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 114 Grandview Drive, 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 **114 Grandview Drive, Newport**

Report Date: 23/2/21

Author: BEN WHITE

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

Please mark appropriate box

☒ Comprehensive site mapping conducted **10/12/20**
(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 **10/12/20**

☒ 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 **114 Grandview Drive, Newport**

1. Proposed Development

1.1 Construct a new lower floor addition and deck on the downhill side of the proposed addition.

1.2 Details of the proposed development are shown on 6 drawings prepared by Jo Willmore Designs, drawings numbered DA-01 to DA 06, dated February, 2021.

2. Site Description

2.1 The site was inspected on the 10th December, 2020.

2.2 This residential property is on the low side of the road and has an E aspect. The block is located on the moderate to steeply graded middle reaches of a hillslope. The natural slope falls across the property at an average angle of ~22°. The slope below the property continues at similar angles for ~130m to the base of the slope. The slope above the property continues at gradually decreasing angles for ~150m to the crest of the slope.

2.3 A brick-paved parking area extends directly off the road frontage (Photo 1). The fill for the parking area is supported by two stepped retaining walls (Photo 2). The upper wall is a stable treated timber retaining wall ~0.6m high and the lower wall is a stable ~1.2m high sandstone block retaining wall. An excavation has been made in the slope between the lower wall and the house for a level tile-paved area (Photo 3). This cut is supported by a stable rendered brick retaining wall reaching ~0.6m high. The single-storey timber framed and clad house is supported on vertical steel posts (Photo 4). Some of these posts were built directly off the outcropping Medium Strength Sandstone. A ~3m high sandstone rock face falls under the house (Photo 5).

The S end of this rock face is undercut ~1.0m (Photo 6). The undercut joint block has a relatively thick cantilever arm relative to its overhang length, is bridged at both sides, and displays no cracking as observed from above or below. Thus, it is considered stable. No other significant geological defects were observed in the rock face. An excavation has been made in the slope under the house to create a level area. The cut has been taken entirely through sandstone and appears stable. Another excavation under the house footprint has been made below this. The S end of this cut is supported by a stable sandstone block retaining wall reaching ~1.5m high (Photo 7). The N end is unsupported by has also been taken entirely through sandstone and appears stable (Photo 8). The slope below has been terraced with three stable treated timber retaining walls (Photos 9 to 11). The upper two walls appear to have been anchored back into the slope. The slope that extends below to the lower boundary and beyond is undeveloped bushland (Photo 12).

3. Geology

The Sydney 1:100 000 Geological sheet indicates the site is underlain by Hawkesbury Sandstone. It is described as a medium to coarse grained quartz sandstone with very minor shale and laminite lenses.

4. Subsurface Investigation

Eight 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 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:

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 (~RL99.2)	DCP 2 (~RL99.3)	DCP 3 (~RL99.4)	DCP 4 (~RL99.2)	DCP 5 (~RL97.4)	DCP 6 (~RL97.3)	DCP 7 (~RL97.3)	DCP 8 (~RL97.3)
0.0 to 0.3	Rock Exposed at Surface	Rock Exposed at Surface	Rock Exposed at Surface	9	4	Rock Immediately Below Surface	30	8
0.3 to 0.6				12	29		#	10
0.6 to 0.9				11	13			15
0.9 to 1.2				30	#			#
1.2 to 1.5				#				
				End of Test @ 1.2m	Refusal on Rock @ 0.8m		Refusal on Rock @ 0.3m	Refusal on Rock @ 0.9m

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

DCP Notes:

DCP1 – Rock exposed at the surface.
DCP2 – Rock exposed at the surface.
DCP3 – Rock exposed at the surface.
DCP4 – End of test @ 1.2m, DCP still slowly going down, white impact dust on dry tip.
DCP5 – Refusal on rock @ 0.8m, DCP bouncing off rock surface, white sandstone fragments on dry tip.
DCP6 – Rock immediately below surface.
DCP7 – Refusal on rock @ 0.3m, DCP thudding, white impact dust on dry tip.
DCP8 – Refusal on rock @ 0.9m, DCP bouncing off rock surface, white impact dust on dry tip.

5. Geological Observations/Interpretation

The surface features of the block are controlled by the outcropping and underlying sandstone bedrock that steps down 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. Where the rock is not exposed, it is overlain by sandy soils over sandy clays that fill the bench step formation. Filling has been placed below the house for landscaping. In the test locations, where it was not exposed, the depth to rock ranged between 0.3 to 1.2m below the current surface, being slightly deeper due to the presence of fill and due to the stepped nature of the underlying bedrock. The outcropping sandstone on the property is estimated to be Medium Strength or better and similar strength rock is expected to underlie the entire site. 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 Grandview Drive above.

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**). The undercut rock face below the house is a potential hazard (**Hazard Two**).

Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two
TYPE	The moderate to steep slope that falls across the property and continues above and below failing and impacting on the property.	The undercut rock face failing and impacting on the house and proposed works (Photo 6).
LIKELIHOOD	'Unlikely' (10^{-4})	'Rare' (10^{-5})
CONSEQUENCES TO PROPERTY	'Medium' (20%)	'Major' (60%)
RISK TO PROPERTY	'Low' (2×10^{-5})	'Low' (6×10^{-5})
RISK TO LIFE	8.3×10^{-7}/annum	8.3×10^{-7}/annum
COMMENTS	'ACCEPTABLE' level of risk to life & property.	'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

No significant additional stormwater runoff will be created by the proposed development.

11. Excavations

Apart from those for footings, no excavations are required.

12. Foundations

A concrete slab and shallow piers supported directly off Medium Strength Sandstone are suitable footings for the proposed addition and deck. This ground material is exposed across the majority of the level area under the house. Where sandstone is not exposed, it is expected

at shallow depths. A maximum allowable bearing pressure of 800kPa can be assumed for footings on Medium Strength Sandstone.

Naturally occurring vertical cracks (known as joints) commonly occur in sandstone. These are generally filled with soil and are the natural seepage paths through the rock. They can extend to depths of several metres and are usually relatively narrow but can range between 0.1 to 0.8m wide. If a footing falls over a joint in the rock, the construction process is simplified if, with the approval of the structural engineer, the joint can be spanned or, alternatively, the footing can be repositioned so it does not fall over the joint.

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. 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

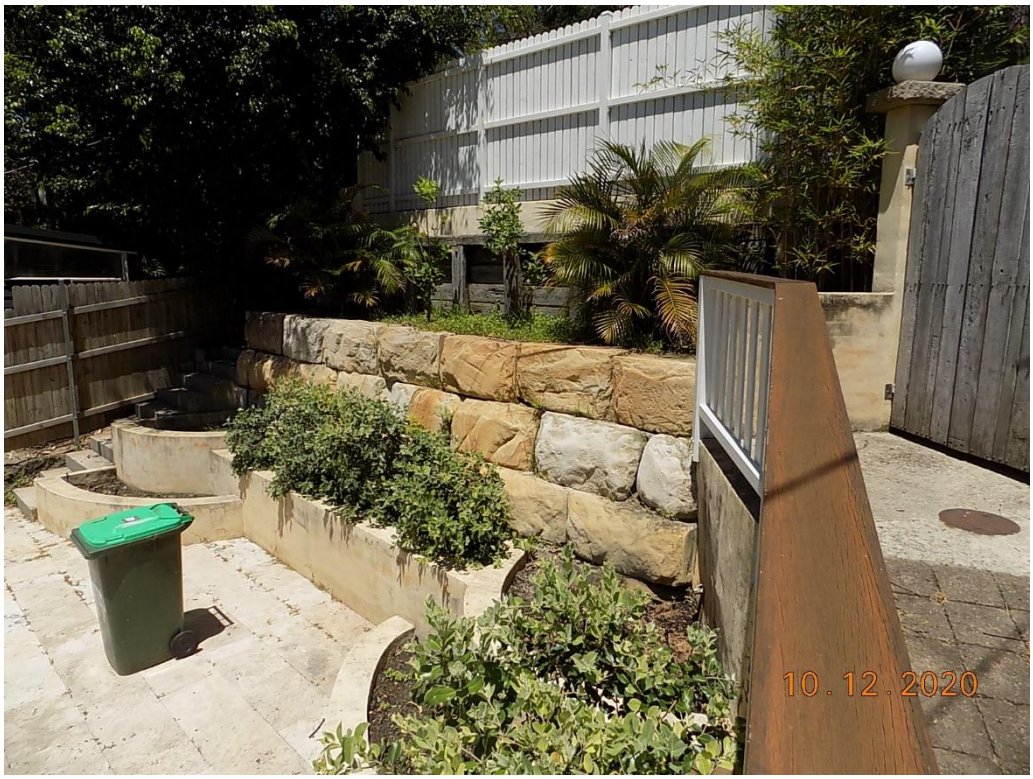


Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

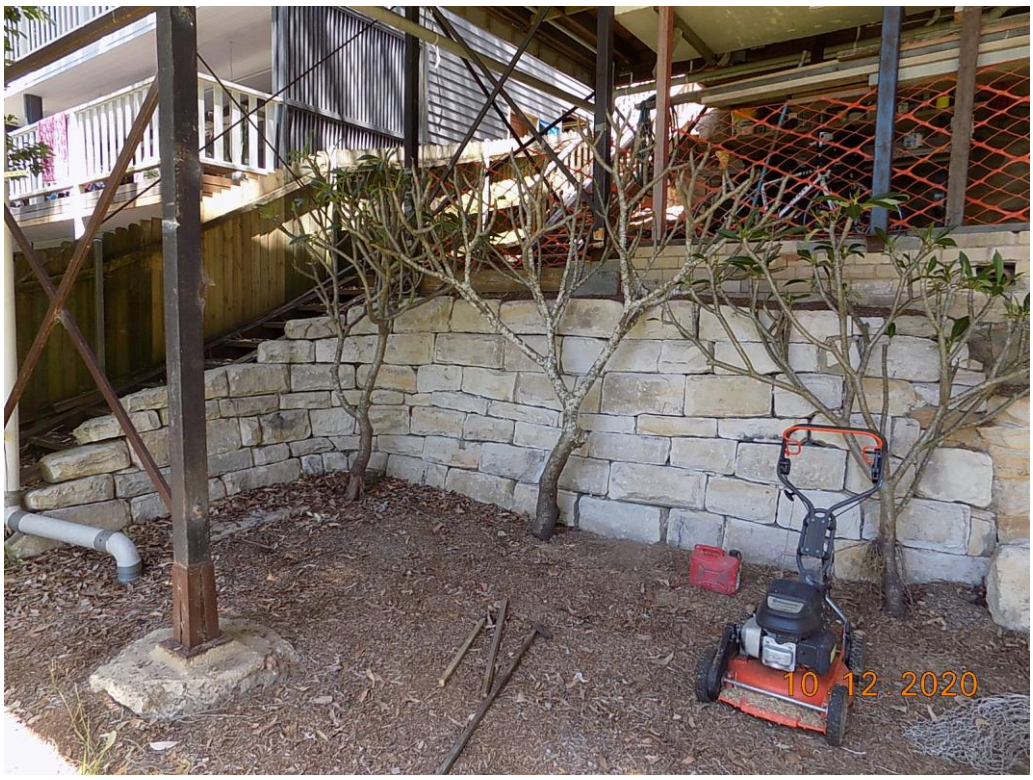


Photo 7

Photo 8

Photo 9

Photo 10

Photo 11

Photo 12

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.

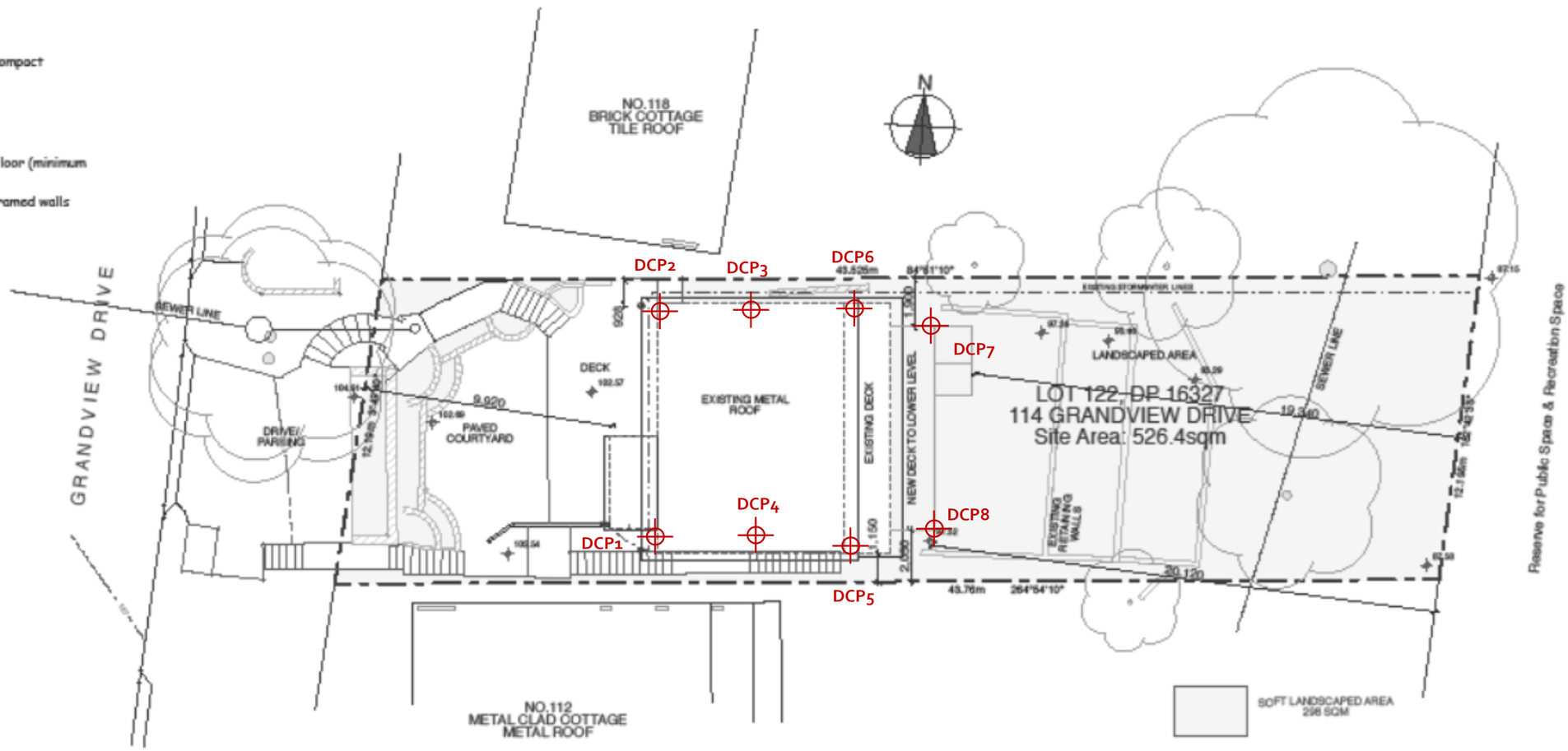
SITE PLAN – showing test locations

GENERAL NOTES

1. The Works shall be constructed in accordance with NCC2019/BCA and all relevant Australian Standards together with any amendment or replacement of those Standards
2. Smoke alarms shall be installed in accordance with 3.7.5 of the BCA, AS 3786 and Manufacturers Specification recommendations and connected to consumer mains power and interconnected where there is more than one alarm
3. Balustrade construction shall comply with the provisions of Part 3.9.2 of the BCA . Balustrades shall have a minimum height of 1m and no openings greater than 125mm

BASIX COMMITMENTS:

1. All construction to comply with BASIX certificate A403233
2. 40% of all new or altered lighting fixtures to be fluorescent, compact fluorescent or LED
3. Minimum 3 star water rating shower heads to be installed
4. Minimum 3 star water rating toilets to be installed
5. Minimum 3 star water taps to be installed
6. Minimum R0.8 insulation to be installed below open suspended floor (minimum combined Rvalue with construction R1.6)
7. Minimum R1.3 insulation to be installed to all external timber framed walls (minimum combined Rvalue with construction R1.7)



SITE CALCULATIONS

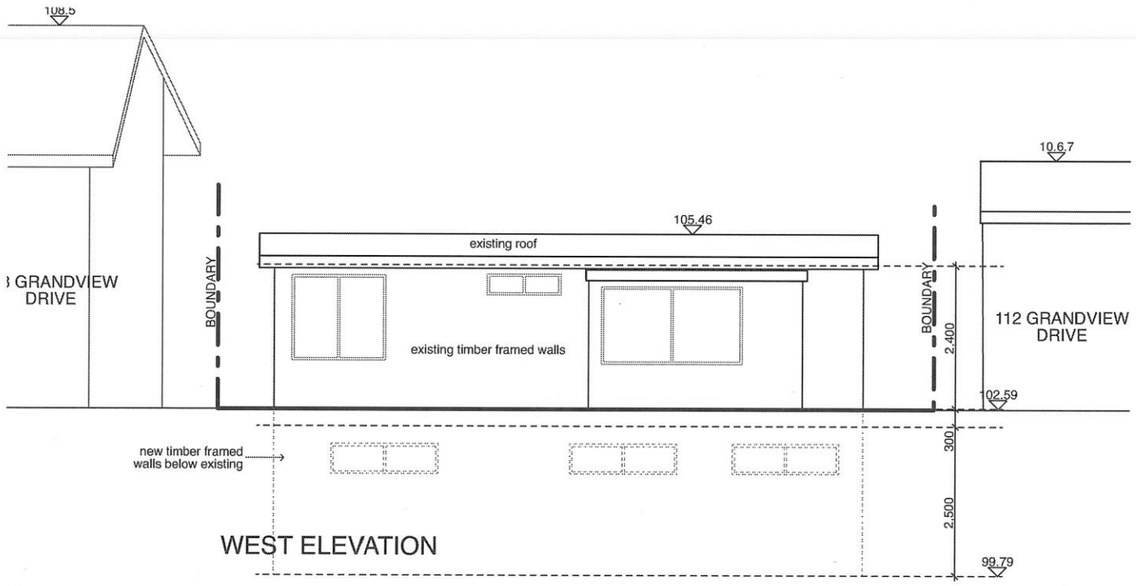
Site Area : 526.4 sqm

Existing Soft Landscaped area - 316sqm = 60.03%

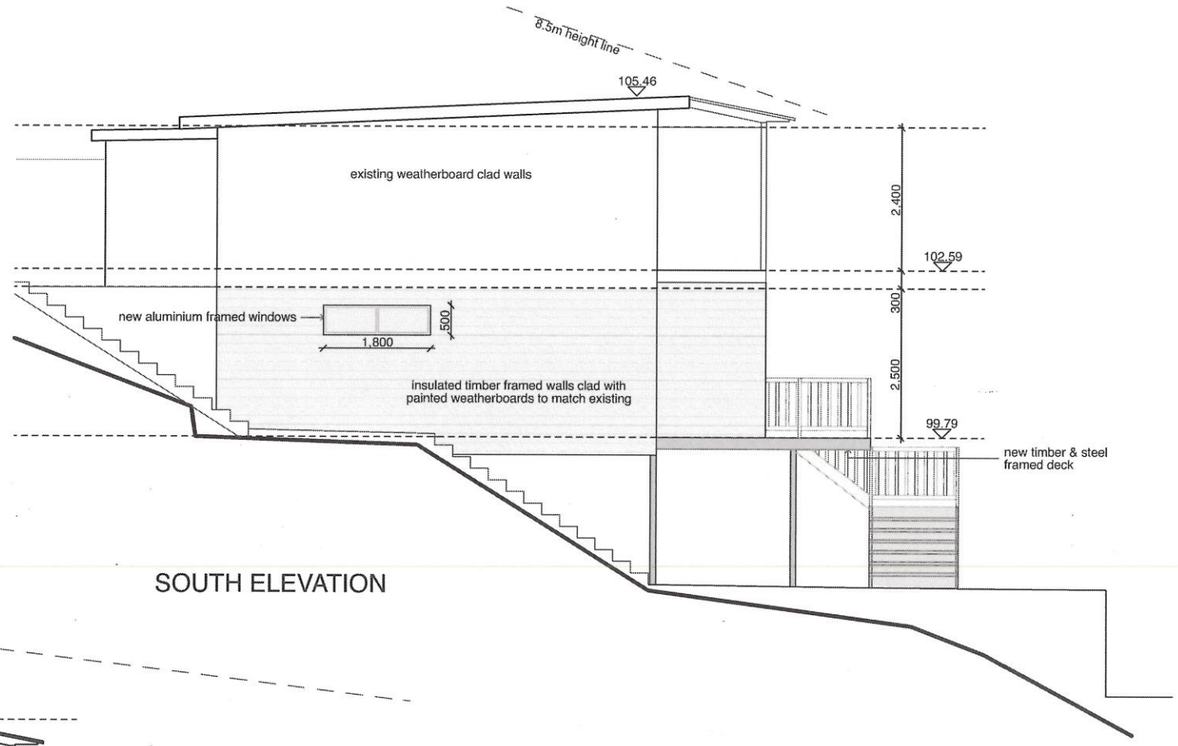
Proposed Soft Landscaped area - 298 sqm = 56.6%

AMENDMENTS	JO WILLMORE DESIGNS 11 Hudson Parade Clareville NSW 2107 (02) 9918 2479 ABN 27 370 370 173	**PROPOSED ALTERATIONS AND ADDITIONS** for: T. Casson & A. Hannon at: LOT 122, DP 16327, 114 Grandview Drive NEWPORT, 2106	drawing title **SITE PLAN** NOTE: Use figured dimension only. Do not scale off drawings . All levels and dimensions to be verified prior to construction of work	date: FEBRUARY 2021 scale: 1:200 (A3) drawing number DA-01

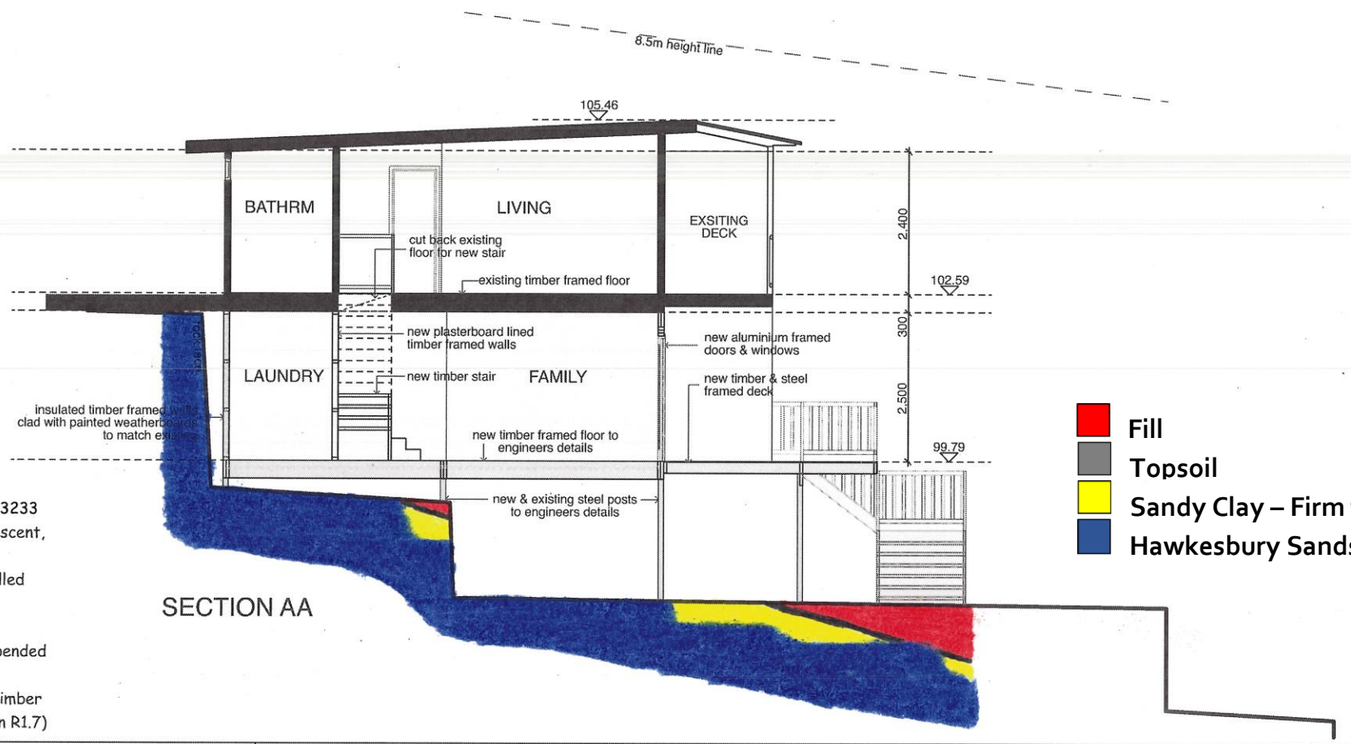
TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



WEST ELEVATION



SOUTH ELEVATION



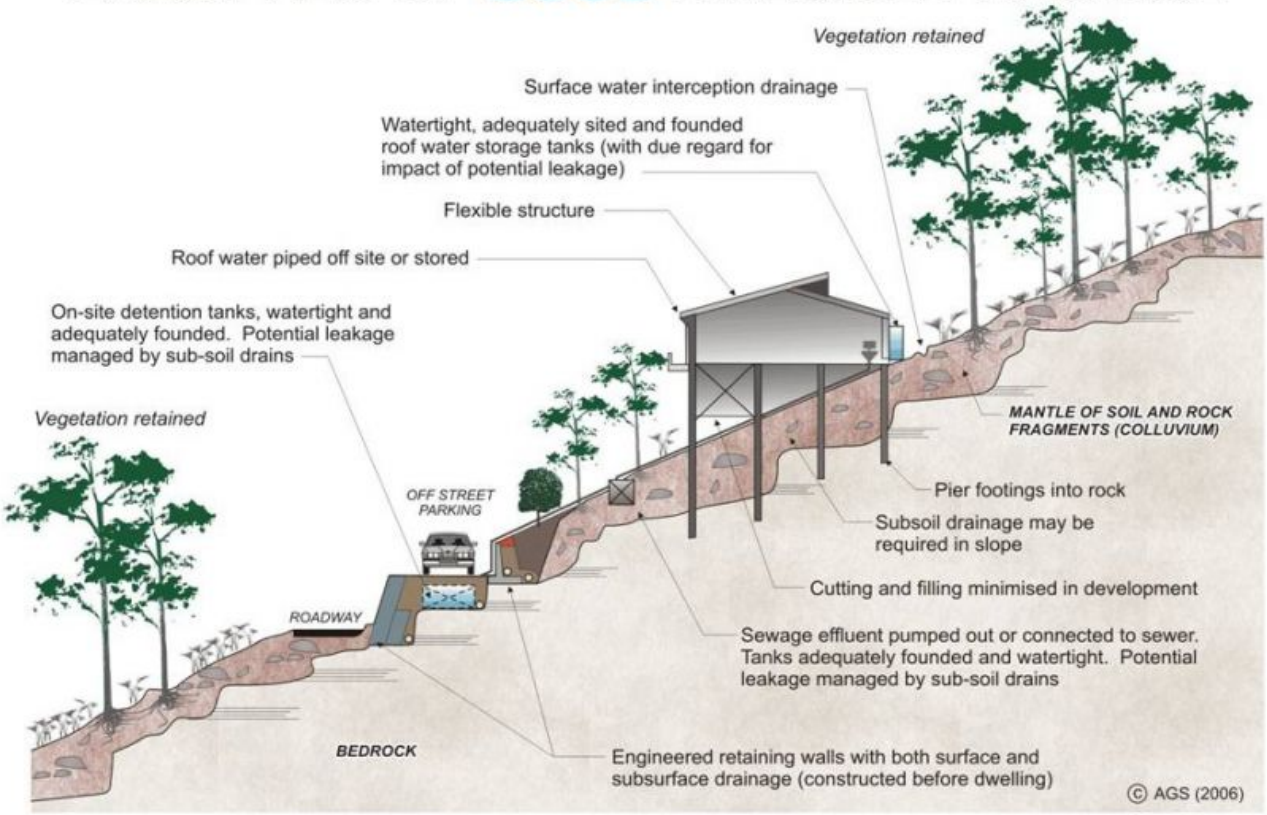
SECTION AA

Fill
Topsoil
Sandy Clay – Firm to Stiff
Hawkesbury Sandstone – Medium Strength

BASIX COMMITMENTS:
1.All construction to comply with BASIX certificate A403233
2.40% of all new or altered lighting fixtures to be fluorescent, compact fluorescent or LED
3. Minimum 3 star water rating shower heads to be installed
4. Minimum 3 star water rating toilets to be installed
5.Minimum 3 star water taps to be installed
6.Minimum R0.8 insulation to be installed below open suspended floor (minimum combined Rvalue with construction R1.5)
7.Minimum R1.3 insulation to be installed to all external timber framed walls (minimum combined Rvalue with construction R1.7)

AMENDMENTS	JO WILLMORE DESIGNS 11 Hudson Parade Clareville NSW 2107 (02) 9918 2479 ABN 27 370 370 173	**PROPOSED ALTERATIONS AND ADDITIONS** for: T. Casson & A. Hannon at: LOT 122, DP 16327, 114 Grandview Drive NEWPORT, 2106	drawing title **ELEVATIONS** NOTE: Use figured dimension only. Do not scale off drawings . All levels and dimensions to be verified prior to construction of work	date: FEBRUARY 2021 scale: 1:100 (A3) drawing number **DA-04**

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE