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

Development Application for Geoff Ainsworth & Johanna Featherstone
Name of Applicant

Address of site **5 Northview Road, Palm 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 23/12/20 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 **5 Northview Road, Palm Beach**
Report Date: 23/12/20

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 5 Northview Road, Palm 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 **5 Northview Road, Palm Beach**

Report Date: 23/12/20

Author: BEN WHITE

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

Please mark appropriate box

☒ Comprehensive site mapping conducted **22/9/20**
(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 **22/9/20**

☒ 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 **5 Northview Road, Palm Beach**

1. Proposed Development

1.1 Construct a new timber deck on the downhill side of the house.

1.2 Demolish and replace the retaining wall on the NE side of the house. Extend the pathway on the N side of the house.

1.3 Extend the lower ground floor verandah on the downhill side and extend the ground floor verandah on the NE side and W corner.

1.4 Various external modifications to the existing house.

1.5 Construct new timber steps on the S side of the house

1.6 Details of the proposed development are shown on 20 drawings prepared by Brooke Aitken Design, drawings numbered 100 to 109 and 200 to 209, Revision A, dated December 2020.

2. Site Description

2.1 The site was inspected on the 22nd of September, 2020.

2.2 This residential property is on the low side of the road and has a NW aspect. It is located on the moderate to steeply graded upper reaches of a hillslope. The natural slope falls from the uphill boundary to the downhill side of the house at an angle of ~11° before increasing in grade to an angle of ~26°. The slope below the property continues at similar steep angles for some 30m before gradually easing. The slope above the property eases to near level angles on the crest of the hillslope.

2.3 At the road frontage, a concrete driveway runs to a parking area on the S side of the house (Photos 1 to 2). The two storey rendered masonry and sandstone block

house is supported by rendered masonry walls, sandstone block walls and brick walls (Photos 3 & 4). One of the supporting sandstone block walls displays cracking through the mortar but is considered to be stable (Photo 5). Sandstone bedrock outcrops on the N and downhill sides of the house (Photos 6 & 7). A sandstone block retaining wall ~1.5m supports fill near the SW corner of the house (Photo 7). The wall displays two thick stepped and vertical cracks through the mortar. See '**Section 14** Ongoing Maintenance'. Fill provides a near level lawn area on the downhill side of the house. The fill is supported by timber crib and stack rock retaining walls up to ~2.5m high (Photos 8 & 9). The timber crib retaining wall is in a dilapidated state. See '**Section 14** Ongoing Maintenance'. Sandstone bedrock is outcropping on the steep slope below the lawn area (Photo 10). No signs of slope instability were observed on the property that could have occurred since the property was developed. The adjoining neighbouring properties were observed to be in good order as seen from the street and subject property.

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. Eleven 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 may have occurred for DCP5. Due to the possibility that the actual ground conditions vary from our interpretation there should be allowances in the excavation and foundation budget

to account for this. We refer to the appended "Important Information about Your Report" to further clarify. The results are as follows:

AUGER HOLE 1 (~RL37.0) **–** AH1 (photo 11)

Depth (m)	**Material Encountered**
0.0 to 0.6	**TOPSOIL**, sandy soil, dark brown, moist, fine to medium grained with fine trace organic matter.
0.6 to 0.7	**CLAY**, brown yellow, stiff, moist.

End of Test @ 0.7m in stiff clay. No watertable 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** (~RL37.1)	**DCP 2** (~RL37.0)	**DCP 3** (~RL37.0)	**DCP 4** (~RL37.5)	**DCP 5** (~RL38.5)	**DCP 6** (~RL38.5)
0.0 to 0.3	17	3	4	11	26	10
0.3 to 0.6	25	14	22	11	15	21
0.6 to 0.9	18	9	15	7	#	12
0.9 to 1.2	26	23	20	15		9
1.2 to 1.5	34	35	40	20		14
1.5 to 1.8	#	#	#	#		26
1.8 to 2.1						7
2.1 to 2.4						#
	End of Test @ 1.5m	End of Test @ 1.5m	End of Test @ 1.4 m	Refusal @ 1.3m	Refusal @ 0.5m	Refusal @ 1.8m

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

DCP TEST RESULTS CONTINUE ON 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 7** (~RL40.7)	**DCP 8** (~RL39.8)	**DCP 9** (~RL39.8)	**DCP 10** (~RL42.4)	**DCP 11** (~RL43.5)
0.0 to 0.3	3F	4	4	#	2
0.3 to 0.6	2	14	4		4
0.6 to 0.9	5	28	9		10
0.9 to 1.2	34	32	4		6
1.2 to 1.5	#	#	14		#
1.5 to 1.8			30		
1.8 to 2.1			#		
2.1 to 2.4					
	End of Test @ 1.2m	End of Test @ 1.2m	End of Test @ 1.8m	Rock at Surface	Refusal @ 1.0m

DCP Notes:

DCP1 – End of Test @ 1.5m, DCP still very slowly going down, white rock fragments and brown sandy soil on moist tip.
DCP2 – End of Test @ 1.5m, DCP still very slowly going down, white impact dust on moist tip.
DCP3 – End of Test @ 1.4m, DCP still very slowly going down, white and orange impact dust on dry tip.
DCP4 – Refusal on rock @ 1.3m, DCP thudding, white impact dust and white clay on dry tip.
DCP5 – Refusal @ 0.5m, DCP bouncing, white impact dust on moist tip.
DCP6 – Refusal @ 1.8m, DCP bouncing, white impact dust on moist tip.
DCP7 – End of Test @ 1.2m, DCP still very slowly going down, light and dark brown soil on damp tip.
DCP8 – End of Test @ 1.2m, DCP still very slowly going down, maroon clay on moist tip.
DCP9 – End of Test @ 1.8m, DCP still very slowly going down, orange clay and white impact dust on dry tip.
DCP10 – Rock exposed at surface.
DCP11 – Refusal @ 1.0m, DCP bouncing, white rock fragments on dry tip.

5. Geological Observations and Interpretations

The slope materials are colluvial at the near surface and residual at depth. Sandstone bedrock is outcropping on the NE and downhill sides of the house and near the downhill boundary of the property. These are expected to be sandstone bands in an otherwise shale dominated profile. The rock is overlain by sandy soil and clays. In the test locations the depth to rock ranged from exposed at the surface to a depth of ~1.8m below. The weathered rock in the location of the tests is interpreted to be Extremely Low Strength Rock or better. 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 in the rock.

Due to the slope and elevation of the block, the water table in the location is expected to be many metres below the base of the proposed excavations.

7. Surface Water

No evidence of 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 Northview Road above.

8. Geotechnical Hazards and Risk Analysis

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

RISK ANALYSIS SUMMARY ON NEXT PAGE

Geotechnical Hazards and Risk Analysis - Risk Analysis Summary

HAZARDS	Hazard One
TYPE	The moderate to steep slope that falls across the property and continues below 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	8.3×10^{-7}/annum
COMMENTS	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

It is recommended a drainage easement be obtained from the downhill neighbouring property and all stormwater or drainage runoff from the proposed development be piped to the street below. If this option is not feasible, a spreader/dispersion trench is suitable as a last resort, provided flows are kept close to natural runoff for the site. All stormwater is to be piped 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. Retaining Structures

For cantilever or singly propped retaining structures it is suggested the design be based on a triangular distribution of lateral pressures using the parameters shown in Table 1.

Table 1 – Likely Earth Pressures for Retaining Structures

Unit	Earth Pressure Coefficients		
	Unit weight (kN/m^3)	'Active' K_a	'At Rest' K_0
Fill and Soil	20	0.40	0.55
Residual Clays	20	0.35	0.45
Extremely Low to Low Strength Rock	22	0.25	0.38

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 structure, do not account for any surcharge loads and assume retaining structures are fully drained.

Rock strength and relevant earth pressure coefficients are to be confirmed on site by the geotechnical consultant.

All retaining structures are to have sufficient back-wall drainage and be backfilled immediately behind the structure 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 structures the full hydrostatic pressures are to be accounted for in the retaining structure design.

13. Foundations

The new retaining walls and house additions are to be supported on piered foundations taken to Extremely Low Strength Rock or better. This ground material is expected at depths from between 1.2 to 1.8m below the current surface and averaging ~1.5m. Where the new deck posts are close to downslope retaining walls (at the N corner in particular) foundation depths might need to be deeper than expected due to the presence of fill. Test results in fill can be difficult to interpret as the composition of the fill is not known and hard components in the fill can be confused for weathered rock. In these locations expected foundation depths can be estimated as 'the depth of the fill + ~ 1.5m. A maximum allowable bearing pressure of 600kPa can be assumed for footings on Extremely Low Strength Rock or better.

The foundations of the existing house are unknown. Footings should be founded on the same footing material across the structure. Where the footing material does change across the structure construction joints or similar are to be installed to prevent differential settlement, where the structure cannot tolerate such movement.

As the bearing capacity of 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 weathered rock on the footing surface will have to be removed before concrete is poured.

NOTE: If the contractor is unsure of the footing material required it is more cost effective to get the geotechnical professional 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.

14. Ongoing Maintenance

If the sandstone block, timber crib and stack rock retaining walls (Photos 7 to 9) are to remain, they are to be monitored by the owners on an annual basis. A photographic record of these

inspections is to be kept. Should further movement occur the wall is to be remediated so it meets current engineering standards. We can carry out these inspections upon request.

15. Inspections

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 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 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: 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.

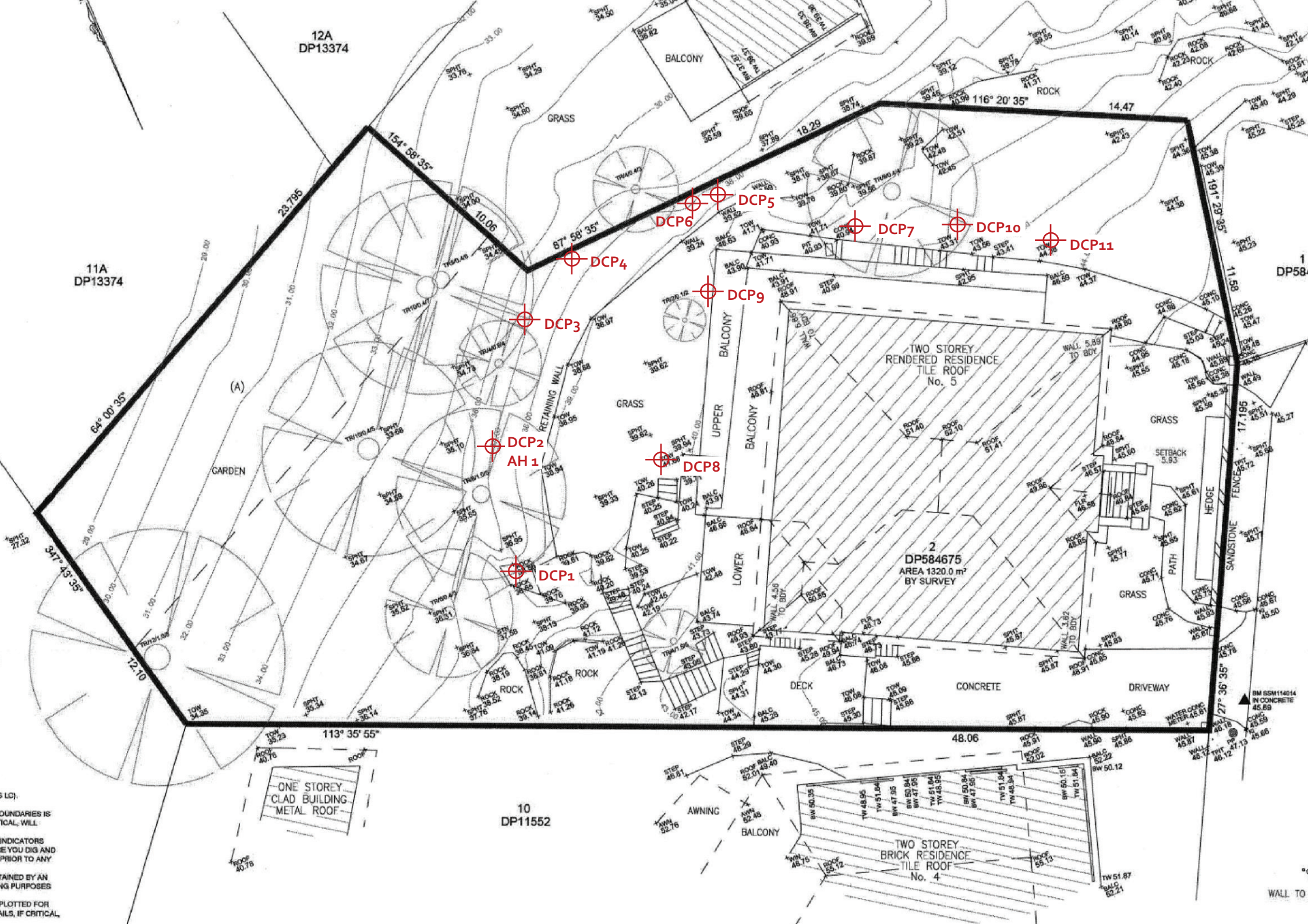
- If this report is used by other professionals during the design or construction process, any questions should be directed to White Geotechnical Group as only we understand the full methodology behind the report's conclusions.

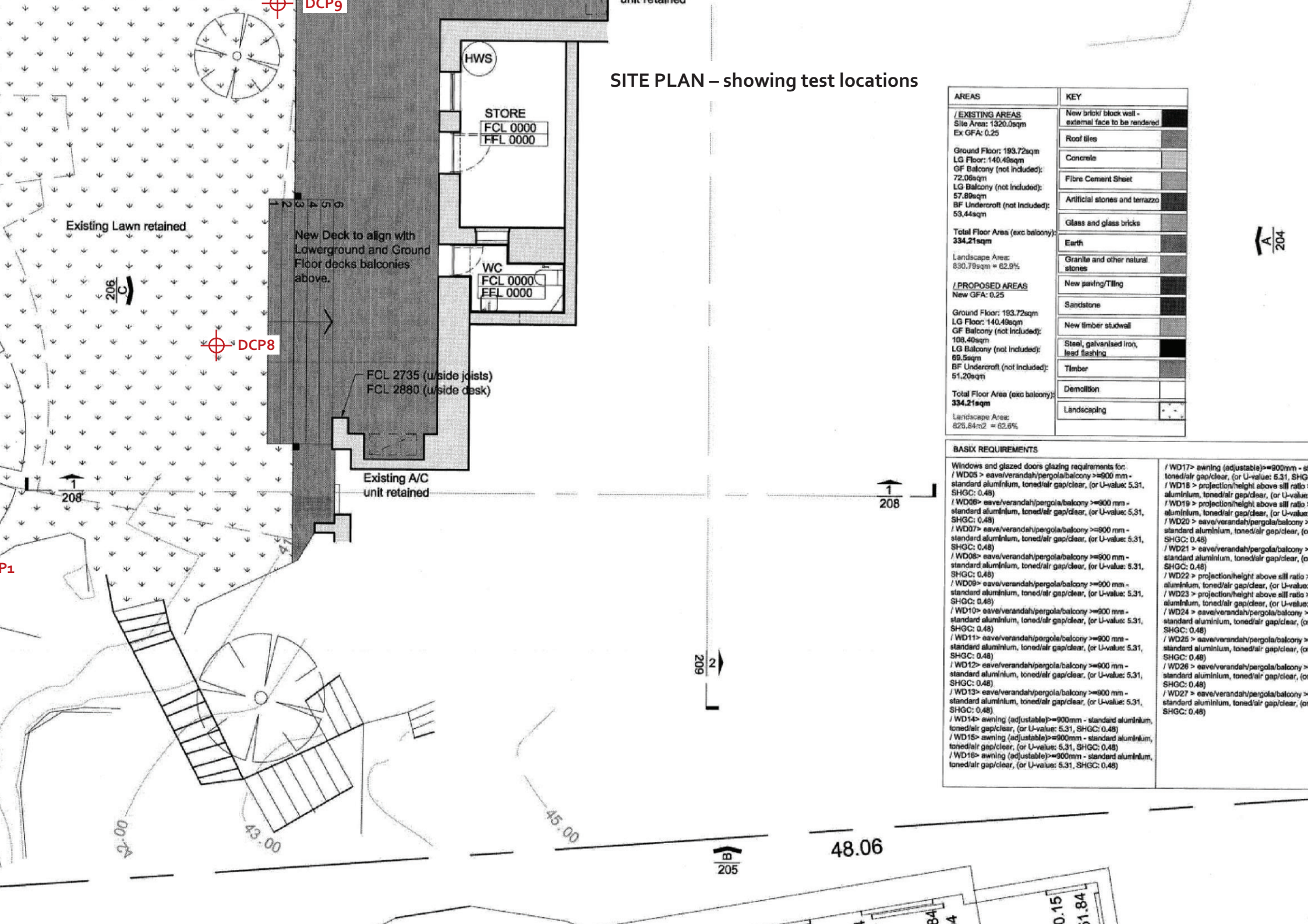
- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

- 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.


12A
DP13374
11A
DP13374
10
DP11552
DP584
BALCONY
GRASS
ROCK
116° 20' 35"
14.47
18.29
154° 58' 35"
23.795
10.06
87° 58' 35"
64° 00' 35"
347° 43' 35"
12.10
113° 35' 55"
48.06
27° 36' 35"
17.195
11.58
191° 23' 35"
DCP1
DCP2
AH 1
DCP3
DCP4
DCP5
DCP6
DCP7
DCP8
DCP9
DCP10
DCP11
RETAINING WALL
UPPER BALCONY
LOWER BALCONY
TWO STOREY
RENDERED RESIDENCE
TILE ROOF
No. 5
2
DP584675
AREA 1320.0 m²
BY SURVEY
SETBACK
5.93
HEDGE
FENCE
SANDSTONE
PATH
GARDEN
(A)
DECK
CONCRETE
DRIVEWAY
ONE STOREY
CLAD BUILDING
METAL ROOF
AWNING
BALCONY
TWO STOREY
BRICK RESIDENCE
TILE ROOF
No. 4
BM SSM114014
IN CONCRETE
45.69



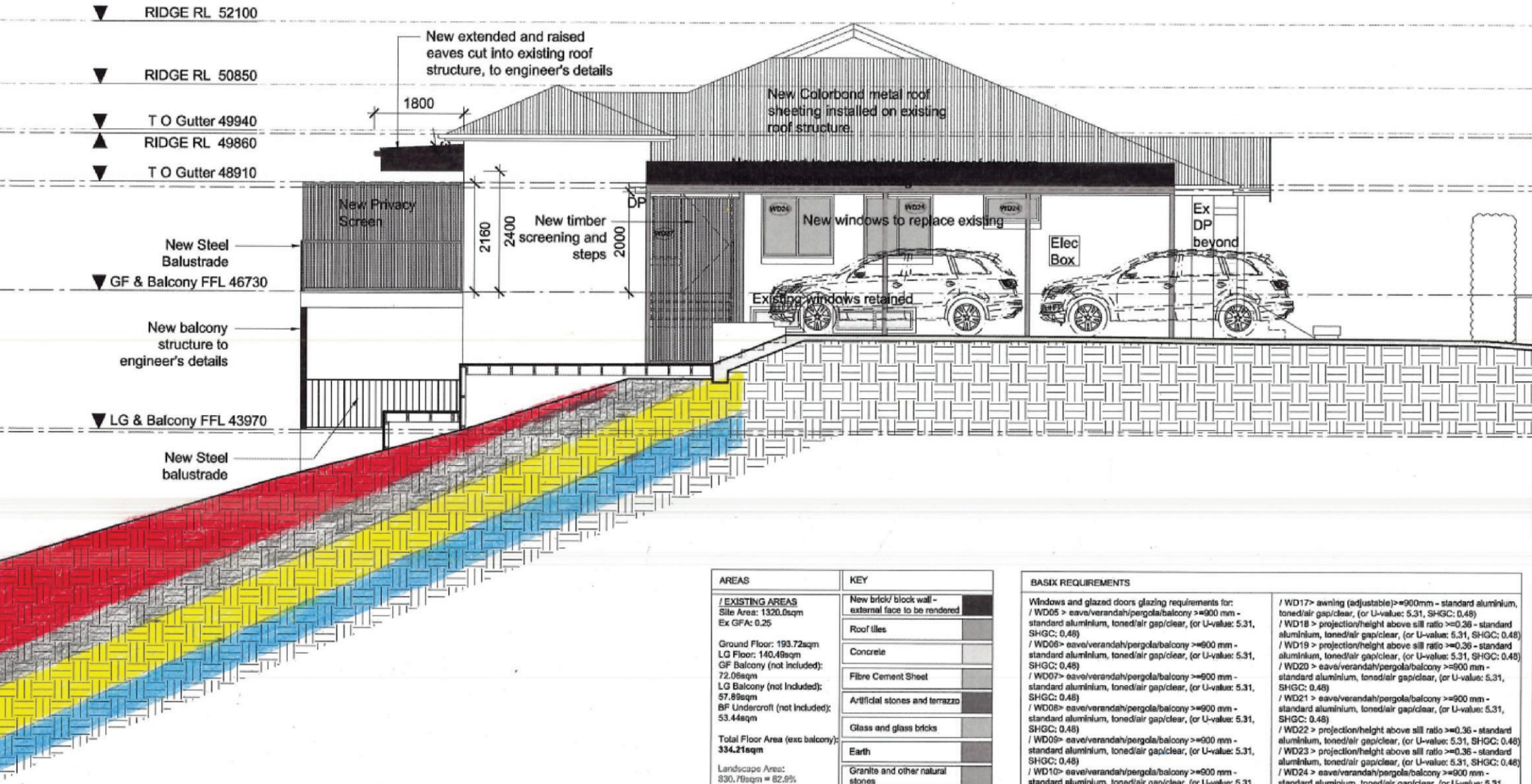
SITE PLAN – showing test locations

AREAS	KEY
/ EXISTING AREAS Site Area: 1320.0sqm Ex GFA: 0.25 Ground Floor: 193.72sqm LG Floor: 140.49sqm GF Balcony (not included): 72.06sqm LG Balcony (not included): 57.89sqm BF Undercroft (not included): 53.44sqm Total Floor Area (exc balcony): **334.21sqm** Landscape Area: 830.79sqm = 62.9% / PROPOSED AREAS New GFA: 0.25 Ground Floor: 193.72sqm LG Floor: 140.49sqm GF Balcony (not included): 108.40sqm LG Balcony (not included): 69.5sqm BF Undercroft (not included): 51.20sqm Total Floor Area (exc balcony): **334.21sqm** Landscape Area: 826.84m2 = 62.6%	New brick/ block wall - external face to be rendered Roof tiles Concrete Fibre Cement Sheet Artificial stones and terrazzo Glass and glass bricks Earth Granite and other natural stones New paving/Tiling Sandstone New timber studwall Steel, galvanised iron, lead flashing Timber Demolition Landscaping

BASIX REQUIREMENTS

Windows and glazed doors glazing requirements for:
/ WD05 > eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD06> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD07> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD08> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD09> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD10> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD11> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD12> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD13> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD14> awning (adjustable)>=900mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD15> awning (adjustable)>=900mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD16> awning (adjustable)>=900mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)

/ WD17> awning (adjustable)>=900mm - st... toned/air gap/clear, (or U-value: 5.31, SHG...
/ WD18 > projection/height above sill ratio ... aluminium, toned/air gap/clear, (or U-value...
/ WD19 > projection/height above sill ratio ... aluminium, toned/air gap/clear, (or U-value...
/ WD20 > eave/verandah/pergola/balcony ... standard aluminium, toned/air gap/clear, (o... SHGC: 0.48)
/ WD21 > eave/verandah/pergola/balcony ... standard aluminium, toned/air gap/clear, (o... SHGC: 0.48)
/ WD22 > projection/height above sill ratio ... aluminium, toned/air gap/clear, (or U-value...
/ WD23 > projection/height above sill ratio ... aluminium, toned/air gap/clear, (or U-value...
/ WD24 > eave/verandah/pergola/balcony ... standard aluminium, toned/air gap/clear, (o... SHGC: 0.48)
/ WD25 > eave/verandah/pergola/balcony ... standard aluminium, toned/air gap/clear, (o... SHGC: 0.48)
/ WD26 > eave/verandah/pergola/balcony ... standard aluminium, toned/air gap/clear, (o... SHGC: 0.48)
/ WD27 > eave/verandah/pergola/balcony ... standard aluminium, toned/air gap/clear, (o... SHGC: 0.48)



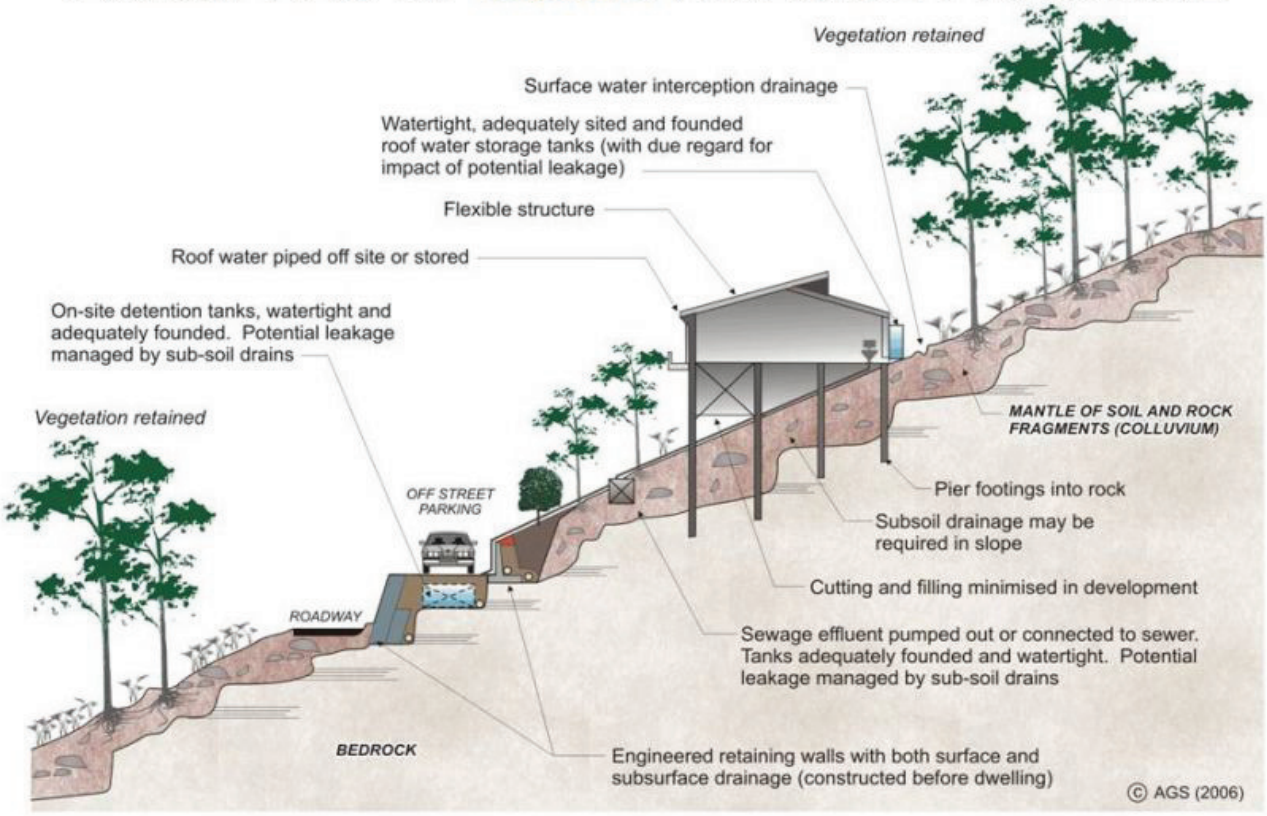
Fill
Topsoil
Clay
Narrabeen Group Rocks – Extremely Low Strength Rock or better

AREAS	KEY
/ EXISTING AREAS Site Area: 1320.0sqm Ex GFA: 0.25 Ground Floor: 193.72sqm LG Floor: 140.49sqm GF Balcony (not included): 72.06sqm LG Balcony (not included): 57.89sqm BF Undercroft (not included): 53.44sqm Total Floor Area (exc balcony): **334.21sqm** Landscape Area: 830.79sqm = 62.9%	New brick/ block wall - external face to be rendered Roof tiles Concrete Fibre Cement Sheet Artificial stones and terrazzo Glass and glass bricks Earth Granite and other natural stones New paving/Tiling Sandstone New timber studwall Steel, galvanised iron, lead flashing Timber Demolition Landscaping
/ PROPOSED AREAS New GFA: 0.25 Ground Floor: 193.72sqm LG Floor: 140.49sqm GF Balcony (not included): 108.40sqm LG Balcony (not included): 69.5sqm BF Undercroft (not included): 51.20sqm Total Floor Area (exc balcony): **334.21sqm** Landscape Area: 825.84m2 = 62.6%	

BASIX REQUIREMENTS

Windows and glazed doors glazing requirements for:
/ WD05 > eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD06> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD07> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD08> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD09> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD10> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD11> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD12> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD13> eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD14> awning (adjustable)>=900mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD15> awning (adjustable)>=900mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD16> awning (adjustable)>=900mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD17> awning (adjustable)>=900mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD18 > projection/height above sill ratio >=0.36 - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD19 > projection/height above sill ratio >=0.36 - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD20 > eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD21 > eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD22 > projection/height above sill ratio >=0.36 - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD23 > projection/height above sill ratio >=0.36 - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD24 > eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD25 > eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD26 > eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)
/ WD27 > eave/verandah/pergola/balcony >=900 mm - standard aluminium, toned/air gap/clear, (or U-value: 5.31, SHGC: 0.48)

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE