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

Development Application for _____
Name of Applicant

Address of site 1772 Pittwater Road, Bayview

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 31/1/20 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 **1772 Pittwater Road, Bayview**

Report Date: 31/1/20

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 1772 Pittwater Road, Bayview

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 **1772 Pittwater Road, Bayview**

Report Date: 31/1/20

Author: BEN WHITE

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

Please mark appropriate box

- ☒ Comprehensive site mapping conducted **19/11/19** (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 **19/11/19**
- ☒ 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 House and Pool at **1772 Pittwater Road, Bayview**

1. Proposed Development

1.1 Demolish the existing house and pool and construct a new part three-storey house by excavating to a maximum depth of ~2.0m into the slope.

1.2 Install a new pool on the downhill side of the property by excavating to a maximum depth of ~2.1m.

1.3 Various other internal and external alterations.

1.4 Details of the proposed development are shown on 12 drawings prepared by Gartner Trovato Architects, project number 1925, drawings numbered DA-01 to 12, Revision A, dated 20/12/19.

2. Site Description

2.1 The site was inspected on the 19th November, 2019.

2.2 This waterfront residential property is on the downhill side of the road and has a NE aspect. It is located on the gentle to moderately graded lower reaches of a hillslope. The natural slope falls across the property at an average angle of ~15° before easing to gentle angles near the waterfront. The slope above the property gradually increases in grade.

2.3 At the road frontage, a concrete driveway runs to a suspended parking platform and lawn area on the uphill side of the property (Photo 1). The platform is supported by steel posts over the old brick driveway (Photo 2). The cut for this sub-floor area is supported by a ~2.0m high stable concrete retaining wall (Photo 3). The part three-storey brick house will be demolished as part of the proposed works (Photo 4). The cut for the house is supported by a ~5.3m high rendered masonry retaining wall that lines the NW common boundary (Photo 5). A gently sloping lawn-

covered fill extends off the downhill side of the house. The fill is supported by a ~1.0m high stack rock retaining wall that will be demolished as part of the proposed works (Photo 6). To the SE of the fill is a pool that will also be demolished as part of the proposed works (Photo 7). Below the fill and the pool, a gently sloping lawn falls to a beach at the waterfront (Photo 8).

3. Geology

The Sydney 1:100 000 Geological sheet indicates the site is underlain by the Newport Formation of the Narrabeen Group. It is described as interbedded laminite, shale and quartz to lithic quartz sandstone.

4. Subsurface Investigation

Four 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 and the results are as follows:

GROUND TEST RESULTS 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** (~RL5.5)	**DCP 2** (~RL5.2)	**DCP 3** (~RL3.1)	**DCP 4** (~RL1.8)
0.0 to 0.3	3	8	3	11
0.3 to 0.6	2	4	8	22
0.6 to 0.9	17	3	14	7
0.9 to 1.2	#	9	15	9
1.2 to 1.5		10	19	6
1.5 to 1.8		8	19	5
1.8 to 2.1		#	19	16
2.1 to 2.4			30	30
2.4 to 2.7			#	#
	End of Test @ 0.9m	Refusal on Rock @ 1.6m	End of Test @ 2.4m	End of Test @ 2.2m

#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 @ 0.9m, DCP still very slowly going down, white shale fragments on dry tip.

DCP2 – Refusal on rock @ 1.6m, DCP bouncing off rock surface, maroon shale fragments on dry tip, grey clay in collar above tip.

DCP3 – End of test @ 2.4m, DCP still very slowly going down, grey clay on wet tip.

DCP4 – End of test @ 1.4m, DCP still very slowly going down, brown sand on wet tip.

5. Geological Observations/Interpretation

The slope materials across the majority of the property are colluvial at the near surface and residual at depth. At the waterfront, sandy sediments overly the residual materials. In the test locations across the upper roughly two-thirds of the property, the ground materials consist of a thin silty topsoil over firm to stiff clays. The clays merge into the underlying weathered rock at varying depths of between 0.9 to 2.1m below the current surface. The variability is due to the existing excavations on site as the soil material has already been removed and due

to the underlying weathered rock being buried by sandy sediments closer to the waterfront. The weathered zone is interpreted to be Extremely Low Strength Shale. The sandy sediments at the waterfront consist of loose to medium dense sand. 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 waterfront location of the property, the water table is expected to be encountered between ~RL0.0 to RL2.0 across the property.

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. Pittwater Road above will provide only limited drainage diversion from surface flows as the road is not guttered above the subject property.

8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed below or beside the property. The gentle to moderately graded slope that falls across the property and continues above is a potential hazard (**Hazard One**). The proposed excavations collapsing onto the work site before permanent support is in place is a potential hazard (**Hazard Two**). The proposed excavation for the house undercutting the footings of the NW boundary retaining wall is a potential hazard (**Hazard Three**).

RISK ANALYSIS SUMMARY ON NEXT PAGE

Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two	Hazard Three
TYPE	The gentle to moderate slope that rises across the site and continues above failing and impacting on the proposed works.	The unsupported cut batters of the excavations collapsing onto the work site before permanent support is in place.	The proposed excavation undercutting the footings of the NW boundary retaining wall and causing movement (Photo 5).
LIKELIHOOD	'Unlikely' (10^{-4})	'Possible' (10^{-3})	'Possible' (10^{-3})
CONSEQUENCES TO PROPERTY	'Medium' (12%)	'Medium' (12%)	'Major' (40%)
RISK TO PROPERTY	'Low' (2×10^{-5})	'Moderate' (2×10^{-4})	'High' (6×10^{-4})
RISK TO LIFE	5.5×10^{-7}/annum	6.2×10^{-5}/annum	8.3×10^{-5}/annum
COMMENTS	This level of risk is 'ACCEPTABLE'.	This level of risk to life and property is '**UNACCEPTABLE'**. To move the risk levels to acceptable levels, the recommendations in **Section 13** are to be followed.	This level of risk to life and property is '**UNACCEPTABLE**'. To move the risk levels to acceptable levels, the recommendations in **Section 13** are to be followed.

(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

There is fall to the waterfront below. All stormwater or drainage runoff from the proposed development is to be piped to the waterfront.

11. Excavations

Excavations to maximum depths of ~2.0 and ~2.2m are required to construct the proposed house. It is expected the excavation will be through a thin silty topsoil over a firm to hard clay and Extremely Low Strength Shale.

Another excavation to a maximum depth of ~2.1m is required to install the proposed pool. This excavation is expected to be taken through loose to medium dense sand. Firm to hard clay may be encountered near the base of the excavation.

Excavations through soil, sand, clay, and Extremely Low Strength Shale can be carried out with an excavator and bucket.

12. Vibrations

No excessive vibrations will be generated by excavation through soil, sand, clay, or Extremely Low Strength Shale. Any vibrations generated by a domestic machine and bucket up to 16 ton will be below the threshold limit for infrastructure or building damage.

13. Excavation Support Requirements

Bulk Excavation for Proposed House

The excavations will reach a maximum depth of ~2.2m deep and will come flush with the NW and upper common boundary. The retaining walls that line these boundaries will be within the zones of influence of the proposed excavations (Photo 5).

Where the retaining walls fall within the zone of influence of the excavation, exploration pits in these locations will need to be put down by the builder to determine the foundation depth and material. The pits are to be inspected by the geotechnical consultant.

If the walls are found to be supported below the base of the proposed excavations, the excavations may commence. If they are not supported below the base of the proposed excavations, the walls will need to be underpinned prior to the excavations commencing.

Underpinning is to follow the underpinning sequence 'hit one miss two'. Under no circumstances is the bulk excavation to be taken to the edges of the walls or piers and then underpinned. Underpins are to be constructed from drives that should not exceed 0.6m in width along brick footings but should be proportioned according to footing type and size. Allowances are to be made for drainage through the underpinning to prevent a build-up of hydrostatic pressure. Underpins that are not designed as retaining walls are to be supported by retaining walls. The void between the retaining walls and the underpinning is to be filled with free-draining material such as gravel.

Where underpinning is not required, the cut batters of the proposed excavation are expected to stand unsupported for a short period until the retaining walls are in place.

Bulk Excavation for Proposed Pool

No structures or boundaries will be within the zone of influence of the proposed pool excavation.

The cut batters for the pool may stand at near-vertical angles for a very short period of time until the pool structure is installed provided the cut batters are kept from becoming saturated. If the cut batters remain unsupported for more than a day before the shell is constructed, they are to be supported with typical pool shoring such as braced sacrificial sheet iron or form ply, until the pool structure is in place.

Advice Applying to Both Excavations

Upslope runoff is to be diverted from the cut faces by sandbag mounds or other diversion works. Unsupported cut batters are to be covered to prevent access of water in wet weather and loss of moisture in dry weather. The covers are to be tied down with metal pegs or other

suitable fixtures so they can't blow off in a storm. The materials and labour to construct the retaining walls/pool structure are to be organised so on completion of the excavations they can be constructed as soon as possible. The excavations are to be carried out during a dry period. No excavations are to commence if heavy or prolonged rainfall is forecast.

All excavation spoil is to be removed from site following the current Environmental Protection Agency (EPA) waste classification guidelines.

14. Retaining Structures

For cantilever or singly-propped retaining structures, it is suggested the design be based on a triangular pressure 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, Sandy Soil, Sand, and Residual Clays	20	0.40	0.55
Extremely Low Strength Shale	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 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 likely hydrostatic pressures are to be accounted for in the structural design.

15. Foundations

The proposed house can be supported on spread footings and piers taken to Extremely Low Strength Shale. This ground material is expected to be exposed across a portion of the base of the excavation. Where the slope falls away on the downhill side, this material is expected at a maximum depth of ~2.1m below the current surface. A maximum allowable bearing pressure of 600kPa can be assumed for footings on Extremely Low Strength Shale. It should be noted that this material is a soft rock and a rock auger will cut through it so the builders should not be looking for refusal to end the footings.

As the bearing capacity of clay and shale reduces when it is wet, we recommend the footings be dug, inspected, and poured in quick succession (ideally the same day if possible). If the footings get wet, they will have to be drained and the soft layer of wet clay or shale on the footing surface will have to be removed before concrete is poured.

If a rapid turnaround from footing excavation to the concrete pour is not possible, a sealing layer of concrete may be added to the footing surface after it has been cleaned.

It is recommended the proposed pool be supported off screw piles due to the presence of sand and the proximity of the base of the pool to the watertable. It is envisaged these will need to go to depths of at least 2.1m where the ground densities increase significantly. We can provide a list of screw pile contractors upon request who have successfully carries out similar works in the past.

Note that we do not certify screw pile foundations. Screw pile design varies between contractors and we are not privy to the details of individual design or how the screw pile contractor converts torque to bearing pressure. As such, the screw pile contractor is totally

responsible for ensuring the screw piles can support the loads on the piles and that these are within acceptable settlement limits

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 regulating authorities or the owner if the following inspections have not been carried out during the construction process.

- The geotechnical consultant is to inspect any test pits dug by the builder to verify foundation depth and material of the existing footings.

- 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.

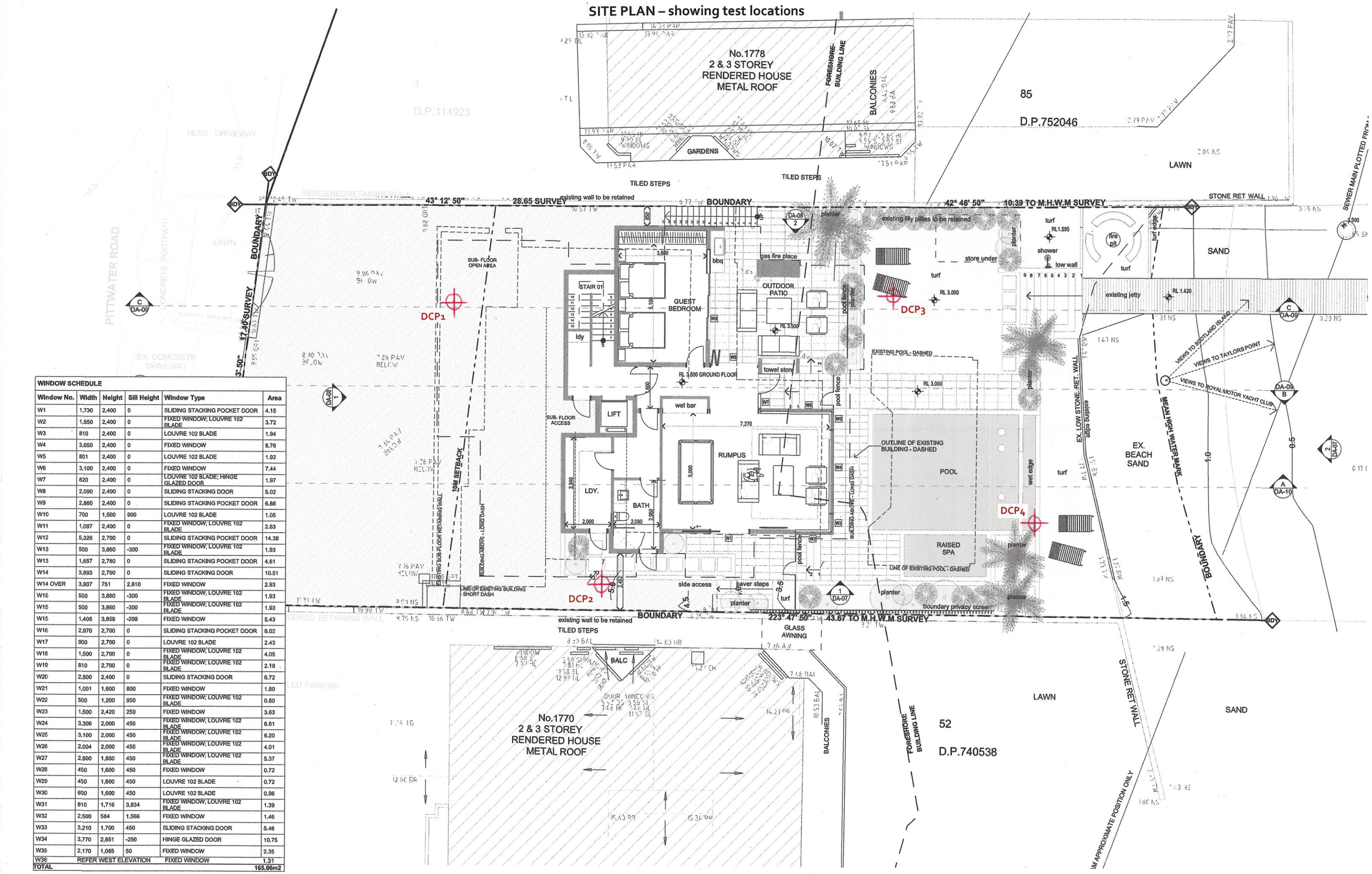
- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

- 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



WINDOW SCHEDULE					
Window No.	Width	Height	Sill Height	Window Type	Area
W1	1,730	2,400	0	SLIDING STACKING POCKET DOOR	4.15
W2	1,550	2,400	0	FIXED WINDOW; LOUVRE 102 BLADE	3.72
W3	810	2,400	0	LOUVRE 102 BLADE	1.94
W4	3,650	2,400	0	FIXED WINDOW	8.76
W5	801	2,400	0	LOUVRE 102 BLADE	1.92
W6	3,100	2,400	0	FIXED WINDOW	7.44
W7	820	2,400	0	LOUVRE 102 BLADE; HINGE GLAZED DOOR	1.97
W8	2,090	2,400	0	SLIDING STACKING DOOR	5.02
W9	2,860	2,400	0	SLIDING STACKING POCKET DOOR	6.86
W10	700	1,500	900	LOUVRE 102 BLADE	1.05
W11	1,097	2,400	0	FIXED WINDOW; LOUVRE 102 BLADE	2.63
W12	5,326	2,700	0	SLIDING STACKING POCKET DOOR	14.38
W13	500	3,860	-300	FIXED WINDOW; LOUVRE 102 BLADE	1.93
W13	1,657	2,780	0	SLIDING STACKING POCKET DOOR	4.61
W14	3,893	2,700	0	SLIDING STACKING DOOR	10.51
W14 OVER	3,907	751	2,810	FIXED WINDOW	2.93
W15	500	3,860	-300	FIXED WINDOW; LOUVRE 102 BLADE	1.93
W15	500	3,860	-300	FIXED WINDOW; LOUVRE 102 BLADE	1.93
W15	1,408	3,859	-299	FIXED WINDOW	5.43
W16	2,970	2,700	0	SLIDING STACKING POCKET DOOR	8.02
W17	900	2,700	0	LOUVRE 102 BLADE	2.43
W18	1,500	2,700	0	FIXED WINDOW; LOUVRE 102 BLADE	4.05
W19	810	2,700	0	FIXED WINDOW; LOUVRE 102 BLADE	2.19
W20	2,800	2,400	0	SLIDING STACKING DOOR	6.72
W21	1,001	1,600	800	FIXED WINDOW	1.60
W22	500	1,200	950	FIXED WINDOW; LOUVRE 102 BLADE	0.60
W23	1,500	2,420	250	FIXED WINDOW	3.63
W24	3,306	2,000	450	FIXED WINDOW; LOUVRE 102 BLADE	6.61
W25	3,100	2,000	450	FIXED WINDOW; LOUVRE 102 BLADE	6.20
W26	2,004	2,000	450	FIXED WINDOW; LOUVRE 102 BLADE	4.01
W27	2,900	1,850	450	FIXED WINDOW; LOUVRE 102 BLADE	5.37
W28	450	1,600	450	FIXED WINDOW	0.72
W29	450	1,600	450	LOUVRE 102 BLADE	0.72
W30	600	1,600	450	LOUVRE 102 BLADE	0.96
W31	810	1,716	3,834	FIXED WINDOW; LOUVRE 102 BLADE	1.39
W32	2,500	584	1,566	FIXED WINDOW	1.46
W33	3,210	1,700	450	SLIDING STACKING DOOR	5.46
W34	3,770	2,851	-250	HINGE GLAZED DOOR	10.75
W35	2,170	1,085	50	FIXED WINDOW	2.35
W36	REFER WEST ELEVATION			FIXED WINDOW	1.31
TOTAL					165.66m2

GARTNERTROVATO
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Issue Date	Rev	Description	Drawn	Checked
20/12/2019	A	ISSUE FOR DA		

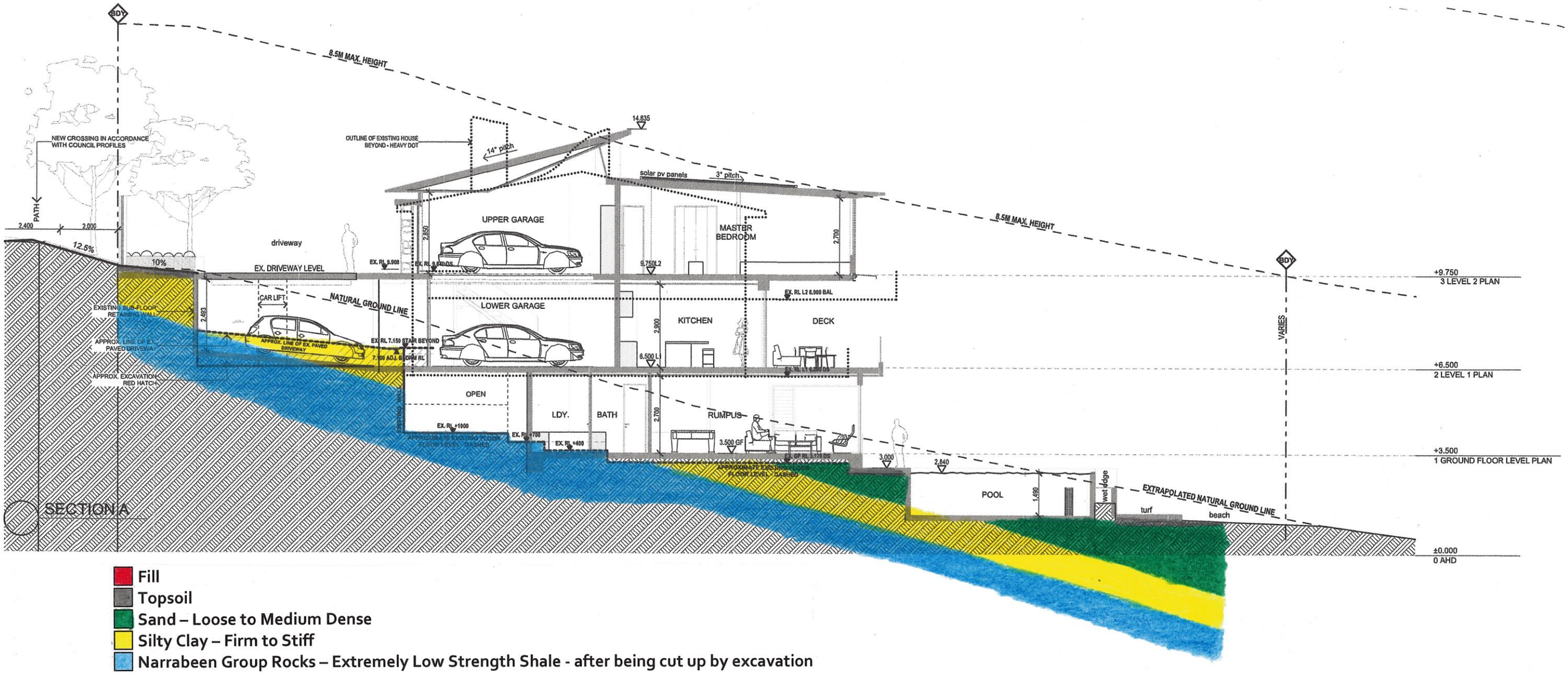
PROJECT
NEW HOUSE
1772 PITTWATER ROAD
BAYVIEW NSW

FOR ANDREW BURSILL & GEORGIE TORRENS

DRAWING TITLE
GROUND FLOOR PLAN

SCALE	DRAWN BY	PLOT DATE
1:100, 1:1 @ A2	JR	20/12/2019
PROJECT NO.	DRAWING NO.	REVISION
1925	DA-04	A

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



- Fill
- Topsoil
- Sand – Loose to Medium Dense
- Silty Clay – Firm to Stiff
- Narrabeen Group Rocks – Extremely Low Strength Shale - after being cut up by excavation equipment can resemble a stiff to hard clay.

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20/12/2019	A	ISSUE FOR DA		

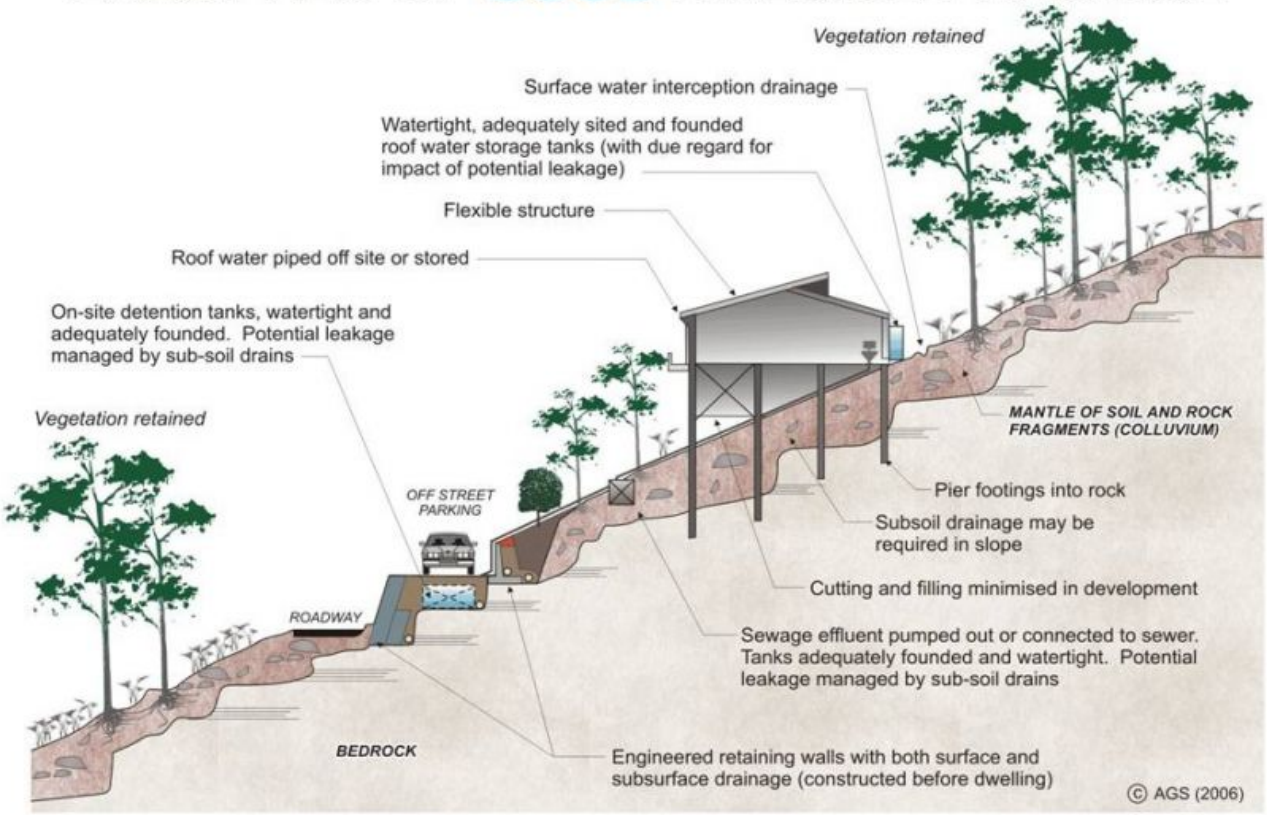
PROJECT
NEW HOUSE
1772 PITTWATER ROAD
BAYVIEW NSW

FOR ANDREW BURSILL & GEORGIE TORRENS

DRAWING TITLE
SECTION A

SCALE	DRAWN BY	PLOT DATE
1:100 @ A2	JR	20/12/2019
PROJECT NO.	DRAWING NO.	REVISION
1925	DA-10	A

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE