

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

Development Application for _____	Name of Applicant
Address of site _____	113 Orchard Street, Warriewood

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 (Insert Name) on behalf of White Geotechnical Group Pty Ltd (Trading or Company Name)

on this the 21/1/25 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 113 Orchard Street, Warriewood
Report Date: 14/1/25
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	<u>Ben White</u>
Chartered Professional Status	<u>MScGEOL AIG., RPGeo</u>
Membership No.	<u>10306</u>
Company	<u>White Geotechnical Group Pty Ltd</u>



**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>113 Orchard Street, Warriewood</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 113 Orchard Street, Warriewood
Report Date: 14/1/25
Author: BEN WHITE
Author's Company/Organisation: WHITE GEOTECHNICAL GROUP PTY LTD

Please mark appropriate box

- Comprehensive site mapping conducted 3/9/24
(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 3/9/24
- 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 MScGEOL AIG., RPGeo
 Membership No. 222757
 Company White Geotechnical Group Pty Ltd



GEOTECHNICAL INVESTIGATION:

New House, Pool, and Horse Arena at **113 Orchard Street, Warriewood**

1. Proposed Development

- 1.1** Demolish the existing house and construct a new house by excavating to a maximum depth of ~2.3m.
- 1.2** Install a pool on the uphill side of the property by excavating to a maximum depth of ~1.3m.
- 1.3** Construct a horse arena with a cut and fill into the slope on the downhill side of the property by filling to a maximum height of ~2.7m and excavating to a maximum depth of ~3.9m.
- 1.4** Construct a horse stable with a cut and fill into the slope by filling to a maximum height of ~3.5m and excavating to a maximum depth of ~1.5m.
- 1.5** Create several horse paddocks.
- 1.6** Various other external additions.
- 1.7** Details of the proposed development are shown on two sets of plans prepared by Tony McLain Architect, Project number 1826, 15 drawings numbered 1 to 9, 11, 14, 16, and 18 dated 6.12.24, drawings 13 and 15 dated 16.12.2024, all Issue N, and 10 drawings numbered 20 to 29 Dated May 2023, All issue J.

2. Site Description

- 2.1** The site was inspected on the 3rd September, 2024.
- 2.2** This residential property is on the high side of the road and has an E aspect. It is located on the moderate graded middle reaches of a hillslope. The natural slope

rises across the property at an average angle of $\sim 11^\circ$. The slope above and below the property eases to gentle angles.

2.3 At the road frontage, a dirt driveway runs up the slope to a parking area on the downhill side of the property (Photo 1). In between the road frontage and the house is a gently sloping lawn area (Photo 2). The single-storey timber framed and clad house is supported on timber posts (Photo 3). The house is to be demolished as part of the proposed works. A moderately sloping lawn area extends from the uphill side of the house to the upper boundary (Photo 4). Medium Strength Sandstone outcrops and steps up the slope near the upper boundary (Photo 5). Several large boulders rest in stable positions on the slope (Photo 6).

3. Geology

The Sydney 1:100 000 Geological sheet indicates the site is underlain by Hawkesbury Sandstone and that the Newport Formation of the Narrabeen Group is in close proximity to the site. Given the ground test results, the Newport Formation of the Narrabeen Group is expected to underlie the proposed works. This is described as interbedded laminite, shale and quartz to lithic quartz sandstone.

4. Subsurface Investigation

One hand Auger Hole (AH) was put down to identify soil materials. Six 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 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:

AUGER HOLE 1 (~RL40.0) – AH1 (Photo 7)

Depth (m)	Material Encountered
0.0 to 0.3	SANDY TOPSOIL , dark brown, Soft, dry, fine to medium grained.
0.3 to 0.7	CLAY , brown, Firm, dry
0.7 to 0.9	CLAY , yellowy brown, Firm, dry.

End of test @ 0.9m in clay. No water table 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 (~RL40.0)	DCP 2 (~RL39.0)	DCP 3 (~RL34.5)	DCP 4 (~RL33.0)	DCP 5 (~RL25.0)	DCP 6 (~RL23.0)
0.0 to 0.3	2	2	4	8	4	3
0.3 to 0.6	4	4	5	8	7	4
0.6 to 0.9	11	7	11	11	11	7
0.9 to 1.2	23	16	18	15	12	14
1.2 to 1.5	32	28	30	31	28	23
1.5 to 1.8	#	31	#	#	40	31
1.8 to 2.1		#			#	#
	End of Test @ 1.5m	End of Test @ 1.8m	End of Test @ 1.5m	End of Test @ 1.5m	End of Test @ 1.8m	End of Test @ 1.8m

#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 @ 1.5m, DCP still going down slowly, orange clay on dry tip.

DCP2 – End of test @ 1.8m, DCP still going down slowly, orange clay on dry tip.

DCP3 – End of test @ 1.5m, DCP still going down slowly, orange clay on dry tip.

DCP4 – End of test @ 1.5m, DCP still going down slowly, orange clay on dry tip.

DCP5 – End of test @ 1.8m, DCP still going down slowly, orange clay on dry tip.

DCP6 – End of test @ 1.8m, DCP still going down slowly, orange clay 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 shallow soils over clays. The clay merges into the underlying weathered rock at depths of between ~1.2m to ~1.5m below the current surface. The weathered zone is interpreted to be Extremely Low Strength Shale. 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 works.

7. Surface Water

No evidence of surface flows were observed on the property during the inspection. It is expected that normal sheet wash will move onto the site from above the property during heavy down pours.

8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed beside the property. The moderately graded slope that rises across the property and continues above and below is a potential hazard (**Hazard One**). The proposed excavations are a potential hazard until retaining structures are in place (**Hazard Two**). The proposed fills for the horse arena and stables are a potential hazard until retaining walls are in place (**Hazard Three**).

RISK ANALYSIS SUMMARY ON THE NEXT PAGE

Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two	Hazard Three
TYPE	The moderate slope that rises across the property and continues below failing and impacting on the proposed works.	The excavation for the new house, pool, and horse arena (up to a maximum depth of ~3.9m) collapsing onto the work site before retaining structures are in place.	The proposed fills (up to a maximum height of 3.5m) failing and impacting the proposed works.
LIKELIHOOD	'Unlikely' (10^{-4})	'Possible' (10^{-3})	'Possible' (10^{-3})
CONSEQUENCES TO PROPERTY	'Minor' (5%)	'Medium' (15%)	'Medium' (15%)
RISK TO PROPERTY	'Low' (2×10^{-5})	'Moderate' (2×10^{-4})	'Moderate' (2×10^{-4})
RISK TO LIFE	5.5×10^{-7} /annum	8.3×10^{-6} /annum	6.0×10^{-5} /annum
COMMENTS	This level of risk is 'ACCEPTABLE'.	This level of risk to life and property is 'UNACCEPTABLE'. To move risk to 'ACCEPTABLE' levels, the recommendations in Section 13 and 14 are to be followed.	This level of risk to life and property is 'UNACCEPTABLE'. To move risk to 'ACCEPTABLE' levels the recommendations in Section 14 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

The fall is to Orchard Street. Roof water from the development is to be piped to the street drainage system through any tanks that may be required by the regulating authorities.

11. Excavations

Four excavations will be required for the proposed development:

- A cut to create a level platform for the house to a maximum depth of 2.3m.
- An excavation to a maximum depth of ~1.3m for the installation the proposed pool.
- An excavation to a maximum depth of ~3.9m for the proposed horse arena.
- An excavation to a maximum depth of ~1.5m for the proposed horse stable.

The excavations are expected to be through shallow soil over clay with Extremely Low Strength Shale expected at depths of between ~1.2m and ~1.5m. It is envisaged that excavations through soil, clay, and Extremely Low Strength Shale can be carried out with an excavator and toothed bucket.

12. Vibrations

No excessive vibrations will be generated by excavation through soil, clay, and Extremely Low Strength Shale. Any vibrations generated by a domestic machine and bucket up to 20 tonne carrying out excavation works will be below the threshold limit for infrastructure or building damage.

13. Excavation Support Requirements

The excavations for the proposed house will reach a maximum depth of ~2.3m. The excavation for the proposed pool will reach a maximum depth of ~1.3m. The excavation for the proposed horse arena will reach a maximum depth of ~3.9m. The excavation for the proposed horse stable will reach a maximum depth of ~1.5m. Once the existing house is demolished, no structures or boundaries are expected to lie within the zone of influence of the proposed excavations.

Bulk excavation for the proposed house, horse arena, and horse stable

Due to the depth of the house, horse arena, and stable excavations, the top 1.0m of these excavation faces are to be battered temporarily at 1.0 Vertical to 1.0 Horizontal (45°) until the

retaining walls are in place. The portions of the vertical excavation faces still greater than 2.0m in depth are to be supported with temporary support such as bulka bags until the permanent retaining walls are in place.

The remaining excavations through natural clay and weathered rock are expected to stand unsupported for a short period of time at near vertical angles until the retaining walls are in place, provided they are kept from becoming saturated.

During the excavation process, the geotechnical consultant is to inspect the cuts in 1.5m intervals as they are lowered, while the machine/excavation equipment is on site, to ensure the ground materials are as expected and no additional temporary support is required.

Bulk excavation for the proposed pool

The sides of the proposed pool excavation are expected to stand at near-vertical angles for short periods of time until the pool structure is installed, provided the cut batters are kept from becoming saturated. If the cut batters through soil and clay remain unsupported for more than a day before pool construction commences, they are to be supported with typical pool shoring until the pool structure is in place.

Advice applying to all excavations

Upslope runoff is to be diverted from the cut faces by sandbag mounds or other diversion works. All unsupported cut batters through fill, soil, and clay 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 cannot blow off in a storm. The materials and labour to construct the pool structure/retaining walls 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. Fills

Two large fills to a maximum of ~3.5m will be placed on the downhill side of the property for the proposed horse arena and stable. All fill brought onto site is to be certified as 'clean fill' with a VENM certificate or similar documentation in accordance with EPA guidelines.

No fill is to be laid until retaining walls are in place. Filling to this depth without appropriate compaction will result in a significant settlement. It is assumed a roller will be used to achieve this.

To avoid excessive settlement, the fill is to be placed in loose layers not exceeding 0.3m thick before being compacted as follows:

The surface is to be prepared before fills are laid. Strip the existing topsoil and remove all organic matter, stockpiling for later use as topsoil or remove from site.

Non-Cohesive Soils (sandy fills)

The proposed fill for landscaping is to be compacted over the prepared surface to a Minimum Density Index (ID) of 65%.

Cohesive Soils (clayey fill & excavated bedrock)

The proposed fill for landscaping is to be compacted over the prepared surface to at least 95% of Standard Maximum Dry Density.

The geotechnical consultant is to inspect and test the fill as it is laid in not more than 1.0m rises to ensure the required density has been achieved.

Filling within 1.5m behind retaining walls should be compacted with light weight equipment such as a hand-operated plate compacter or similar so as to not damage the wall. Where

hand-held equipment is used, the loose depth of placed fill should not exceed 150mm before compaction occurs. No pavements or structures are to be supported on fill.

15. 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 and Topsoil	20	0.40	0.55
Residual Clays	20	0.35	0.45
Extremely Low Strength Shale	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 likely hydrostatic pressures are to be accounted for in the structural design.

16. Foundations

The proposed house can be supported on a thickened edge/ raft slab with piers taken to Extremely Low Strength Shale where necessary. The proposed pool is expected to be partially seated in the underlying Extremely Low Strength Shale. This is a suitable foundation material. This ground material is expected to be exposed across the uphill side of the excavations. Where it is not exposed, and where this material drops away with the slope, piers will be required to maintain a uniform foundation material across the structure. This ground material is expected at depths of between 1.2m to 1.5m below the current surface in the area of the proposed works.

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.

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.

17. Geotechnical Review

The structural plans are to be checked and certified by the geotechnical engineer as being in accordance with the geotechnical recommendations. On completion, a Form 2B will be issued. This form is required for the Construction Certificate to proceed.

18. 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 and Occupation Certificate if the following inspections have not been carried out during the construction process.

- During the excavation process, the geotechnical consultant is to inspect the cuts in 1.5m intervals as they are lowered, while the machine/excavation equipment is on site, to ensure the ground materials are as expected and no additional temporary support is required.
- The geotechnical consultant is to inspect and test the fill for the arena and stable. This is to be carried out at compacted fill heights not exceeding 0.7m. It is to ensure the required density has been achieved during compaction.
- All footings are to be inspected and approved by the geotechnical consultant while the excavation equipment and contractors are still onsite and before steel reinforcing is placed or concrete is poured.

White Geotechnical Group Pty Ltd.



Tyler Jay Johns
BEng (Civil)(Hons),
Geotechnical Engineer.

Reviewed By:



Ben White M.Sc. Geol.,
AIG., RPGeo Geotechnical & Engineering.
No. 10306
Engineering Geologist.



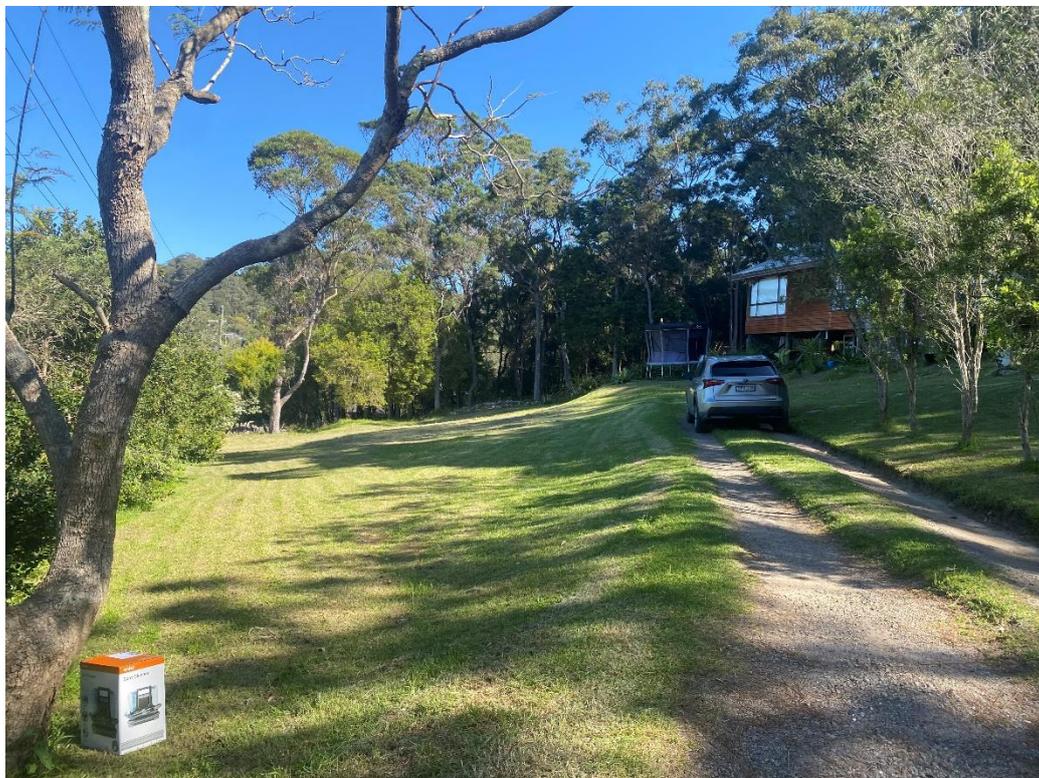


Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7 (Top to Bottom)

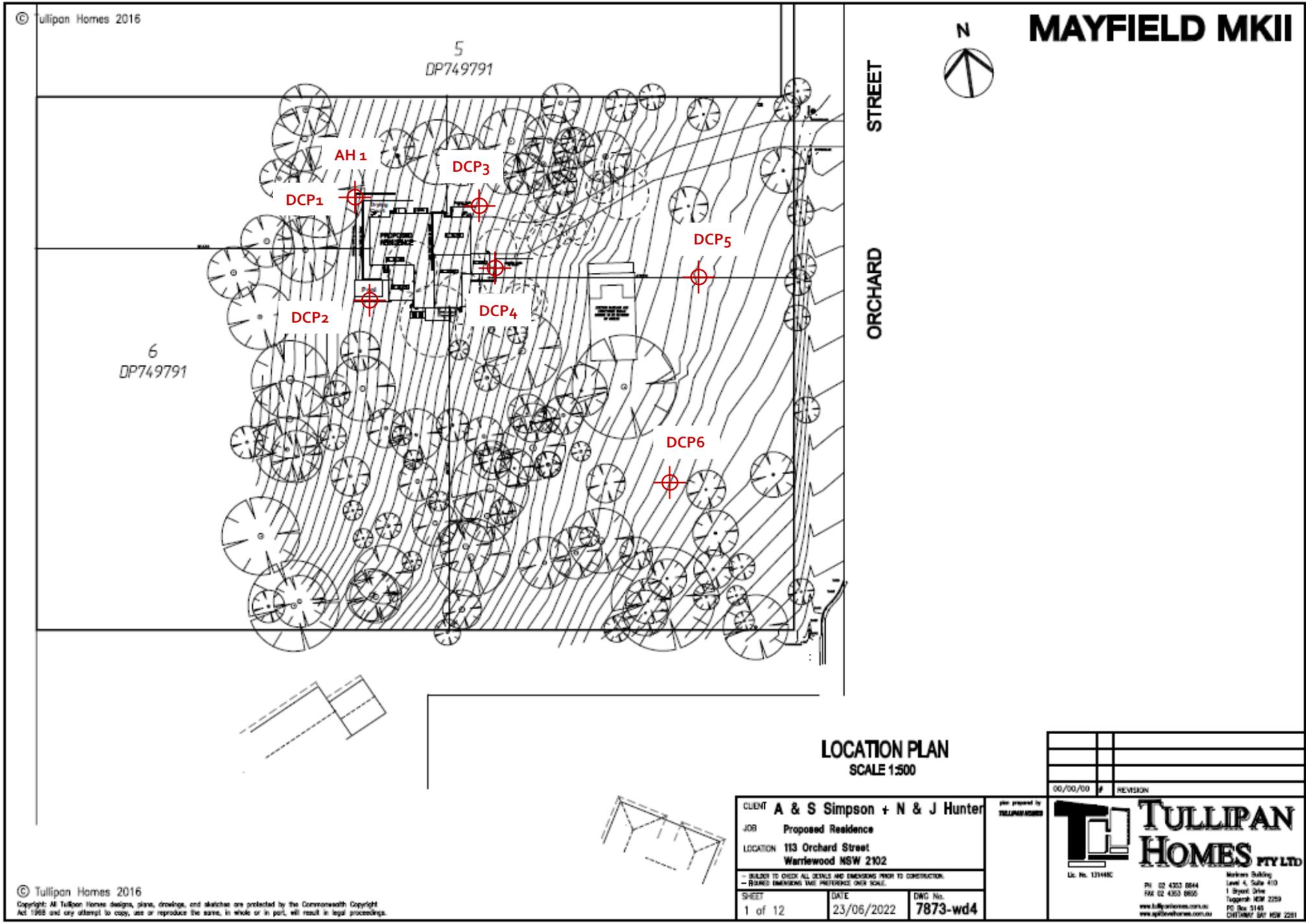
Important Information about Your Report

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.

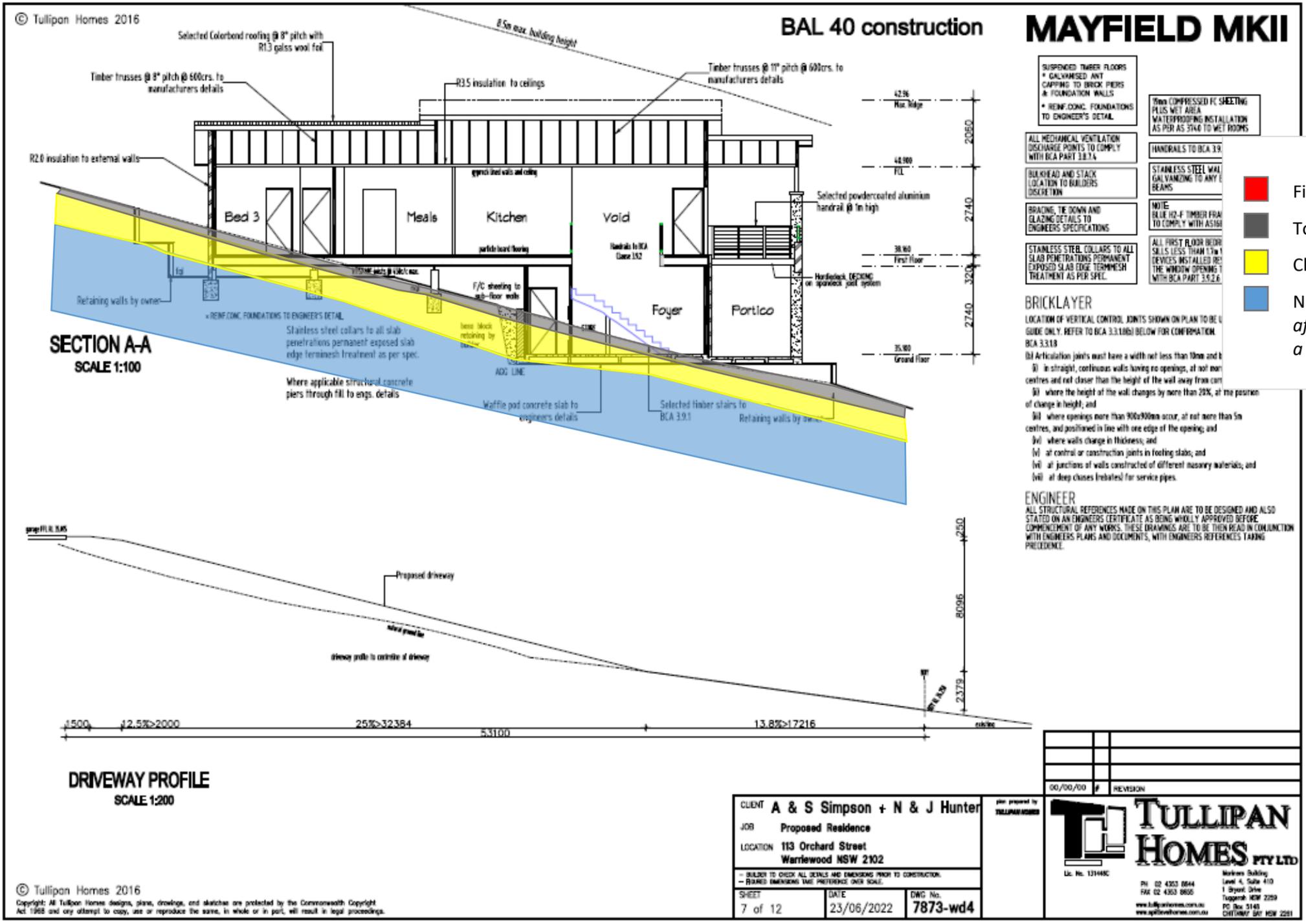
SITE PLAN – showing test locations



SEE DA DRAWINGS No 1826 (1-10) .Issue J
PROPOSED HORSE ARENA AND FACILITIES
AND NEW RESIDENCE
113 ORCHARD ST, WARRIEWOOD

Revision	Date	Remarks
Project		PROPOSED HORSE ARENA AND FACILITIES AND ADDITIONS AND NEW DWELLING
Address		LOT 6 DP749791 113 Orchard St , Warriewood
Title		TULLIPAN RESIDENCE
Architect		Tony McLain Architect (Reg. No. 4291)
Tel	0810 8831	
Mob	04 0222 3985	
	mclain.tony@gmail.com	
Scale	1:1 @A1	Date APRIL 2023
Project No.	1826	Drawing No. 21 Rev. J

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



Expected Ground Materials

- Fill
- Topsoil
- 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.

- SUSPENDED THIRD FLOORS
* GALVANISED ANCHOR CAPPING TO BRICK PIERS & FOUNDATION WALLS
* REINFORCING FOUNDATIONS TO ENGINEER'S DETAIL
- ALL MECHANICAL VENTILATION DISCHARGE POINTS TO COMPLY WITH BCA PART 3.8.7.4
- BULKHEAD AND STACK LOCATION TO BUILDERS DISCRETION
- BRACING, TIE DOWN AND GLAZING DETAILS TO ENGINEERS SPECIFICATIONS
- STAINLESS STEEL COLLARS TO ALL SLAB PENETRATIONS PERMANENT EXPOSED SLAB EDGE TREATMENT AS PER SPEC.

BRICKLAYER
LOCATION OF VERTICAL CONTROL JOINTS SHOWN ON PLAN TO BE GUIDE ONLY. REFER TO BCA 3.3.1.6(b) BELOW FOR CONFIRMATION. BCA 3.3.1.8
(b) Articulation joints must have a width not less than 10mm and be:
i) in straight, continuous walls having no openings, at not more than 3m centres and not closer than the height of the wall away from corner;
ii) where the height of the wall changes by more than 20%, at the position of change in height; and
iii) where openings more than 900x900mm occur, at not more than 5m centres, and positioned in line with one edge of the opening; and
iv) where walls change in thickness; and
v) at central or construction joints in footing slabs; and
vi) at junctions of walls constructed of different masonry materials; and
vii) at deep chases (rebated) for service pipes.

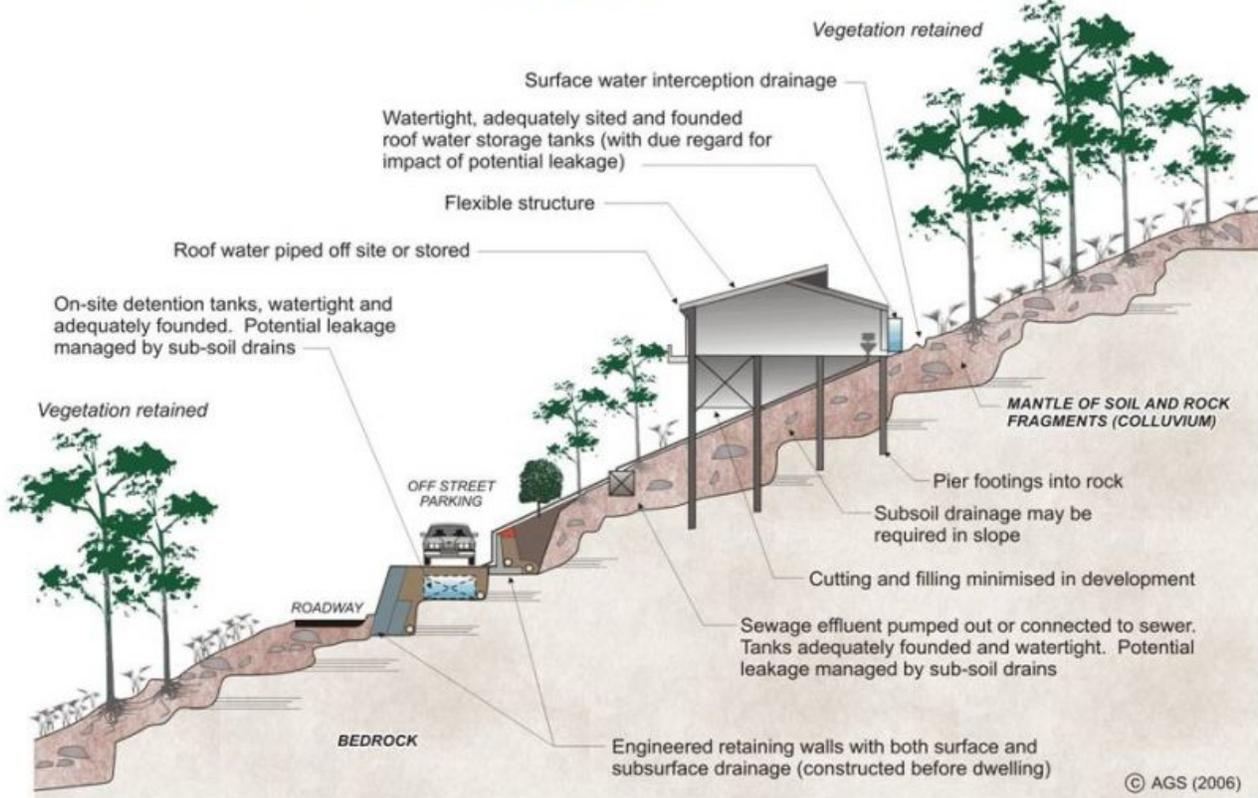
ENGINEER
ALL STRUCTURAL REFERENCES MADE ON THIS PLAN ARE TO BE DESIGNED AND ALSO STATED ON AN ENGINEER'S CERTIFICATE AS BEING WHOLLY APPROVED BEFORE COMMENCEMENT OF ANY WORKS. THESE DRAWINGS ARE TO BE THEN READ IN CONJUNCTION WITH ENGINEERS PLANS AND DOCUMENTS, WITH ENGINEERS REFERENCES TAKING PRECEDENCE.

SEE DA DRAWINGS No 1826 (1-10) .Issue J
PROPOSED HORSE ARENA AND FACILITIES AND NEW RESIDENCE
113 ORCHARD ST, WARRIEWOOD

Revision	Date	Remarks
1	APRIL 2023	PROPOSED HORSE ARENA AND FACILITIES AND ADDITIONS AND NEW DWELLING LOT 6 DP749791
Address 113 Orchard St , Warriewood		
Title TULLIPAN RESIDENCE		
Tony McLain Architect (Reg. No. 4291)		
Tel 98108831 Mob 04 0222 3665 mclainTony@gmail.com		
Scale 1:1 @ A1	Date	Rev
1826	27	J

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EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE

