

GEOTECHNICAL INVESTIGATION:

New Boat Ramp at 1744 Pittwater Road, Bayview

1. Proposed Development

- 1.1** Construct a boat ramp into Pittwater.
- 1.2** Replace the existing sea wall.
- 1.3** Details of the proposed development are shown on 3 drawings prepared by SDG, Job number 6966_B, drawings numbered 1 to 3, dated 15.1.24.

2. Site Description

- 2.1** The site was inspected on the 7th February, 2024, and previously on the 1st June, 2021.
- 2.2** This residential property is on the low side of the road and has an E aspect. The block runs longways to the NE so the slope is a cross-fall. It encompasses the steep bank that rises at the waterfront ~6m and the gentle slope above that grades at angles of ~7°. The slope rises beyond the site at similar gentle angles for ~300m before the grade gradually increases in the slope to Bayview Plateau.
- 2.3** A paved driveway runs down the slope to a garage on the uphill side of the property (Photo 1). In between the road frontage and the house is a moderately sloping garden area. The retaining wall that supports the cut for the garage was not complete at the time of inspection. The materials to complete this wall were on site and we recommend this be completed as soon as possible (Photo 2). The part three-storey house is supported on rendered masonry walls (Photo 3). The walls show no significant signs of movement. A level lawn area extends off the downhill side of the house to a pool. The cut for the level lawn area is supported by a stable ~1.5m high sandstone log retaining wall (Photo 4). The pool shows no significant signs of movement as indicated by the water level against the tiles (Photo 5). A boatshed is cut

into the slope and extends to a level lawn area at the downhill boundary (Photo 6). The ~1.7m cut is supported by the dintel walls of the boat shed (Photo 7). The fill for the level lawn area at the lower boundary is supported by a low stack rock sea wall (Photo 8). The upper section of the wall is to be replaced as part of the proposed works.

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. Thin bands of Low to Medium Strength Sandstone extend through the otherwise shale-dominated profile. The proposed works extend into Pittwater.

4. Subsurface Investigation

The ground materials within an as-dug trench were recorded (TRENCH). 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:

GROUND TEST RESULTS 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 1 (~RL2.9)	DCP 2 (~RL3.6)	DCP 3 (~RL6.8)	DCP 4 (~RL8.1)	DCP 5 (~RL0.0)	DCP 6 (~RL0.0)
0.0 to 0.3	13	Rock Exposed at Base of Trench	9	10	5	5
0.3 to 0.6	30		17	14	6	6
0.6 to 0.9	6		15	20	17	6
0.9 to 1.2	#		40	#	19	10
1.2 to 1.5			#		34	11
1.5 to 1.8					37	18
1.8 to 2.1					56	31
2.1 to 2.4					#	41
2.4 to 2.7						60
2.7 to 3.0						#
	Refusal on Rock @ 0.7m		End of Test @ 1.2m	Refusal on Rock @ 0.9m	Refusal on Rock @ 2.0m	Refusal on Rock @ 2.5m

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

DCP Notes:

DCP1 – Refusal on rock @ 0.7m, DCP bouncing off rock surface, white impact dust on dry tip.

DCP2 – Low Strength Sandstone exposed at base of ~0.9m deep trench (TRENCH).

DCP3 – End of test @ 1.2m, DCP still very slowly going down, white and maroon impact dust on dry tip.

DCP4 – Refusal on rock @ 0.9m, DCP bouncing off rock surface, orange and maroon sandstone fragments on dry tip.

DCP5 – Refusal on rock @ 2.0m, DCP bouncing off rock surface, brown silty clay on wet tip.

DCP6 – Refusal on rock @ 2.5m, DCP bouncing off rock surface, brown silty clay on wet tip.

5. Geological Observations/Interpretation

The excavations carried out onsite during previous works show that the profile consists of shallow soil and Firm to Hard Clays that merge into the underlying Extremely Low to Very Low

Strength Shale at depths of between 0.9 to 1.8m below the current surface. Thin bands of Low to Medium Strength Sandstone are present through the shale.

As the bulk of the proposed works take place over Pittwater, it is likely sediment will be encountered at increasing depths overlying the Extremely Low to Medium Strength Rock underneath. The depth to Extremely Low to Medium Strength Rock ranged between ~2.0m at 20m from the shoreline to 2.5m at 40m from the shoreline. The underlying rock is likely to drop away at similar angles as it extends into Pittwater.

6. Groundwater

As the footings for the proposed works extend into Pittwater, water will be encountered at the surface.

7. Acid Sulfate Soils

The clays encountered near the lower boundary are in situ and derived from the Newport Formation Shales. This formation is Middle Triassic in age and is much older than the Holocene sediments from which acid sulphates are generally derived from on the east coast. Additionally, Newport Formation Shale does not contain high concentrations of sulphides which can provide the required iron concentrations for acid generation in older bedrock.

8. Surface Water

No evidence of significant surface flows were observed on the property during the inspection. Normal sheet wash from the slope above will be intercepted by the street drainage system for Pittwater Road above.

9. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed above, below, or beside the property. The steep bank that rises from the waterfront is a potential hazard (**Hazard One**).

Geotechnical Hazards and Risk Analysis - Risk Analysis Summary

HAZARDS	Hazard One
TYPE	The steep bank that rises at the waterfront failing and impacting on the proposed works.
LIKELIHOOD	'Unlikely' (10^{-5})
CONSEQUENCES TO PROPERTY	'Minor' (8%)
RISK TO PROPERTY	'Low' (5×10^{-6})
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)

10. 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.

11. Stormwater

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

12. Excavations

Apart from those for footings, no excavations are required.

13. Foundations

The proposed boat ramp can be supported on driven timber piles embedded into the sediment where it is deep enough.

Note we do not certify driven pile foundations. As such, the piling contractor is totally responsible for ensuring the piles can support the loads on the piles and that these are within acceptable settlement limits. They are to provide certification of the foundations they install.

We have provided DCP results indicating that rock was encountered at a maximum depth of ~2.0m at 20m from the shoreline.

It is likely that Extremely Low Strength Rock or better will be encountered at shallow depths close to the shore. If shallow rock is encountered, the boat ramp can be supported on conventional concrete footings taken to the underlying Extremely Low Strength Rock or better.

A maximum allowable bearing pressure of 600kPa can be assumed for footings on Extremely Low to Very 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 Extremely Low to Very Low Strength 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.

14. Geotechnical Review

The structural plans are to be checked and certified by the geotechnical consultant 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.

15. Inspection

The client and builder are to familiarise themselves with the following required inspections as well as council geotechnical policy. We cannot provide certification for the regulating authorities or the owner if the following inspection has not been carried out during the construction process.

- Any conventional foundations other than driven piles 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.



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AIG., RPGeo Geotechnical & Engineering.
No. 10307
Engineering Geologist & Environmental Scientist.





Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8

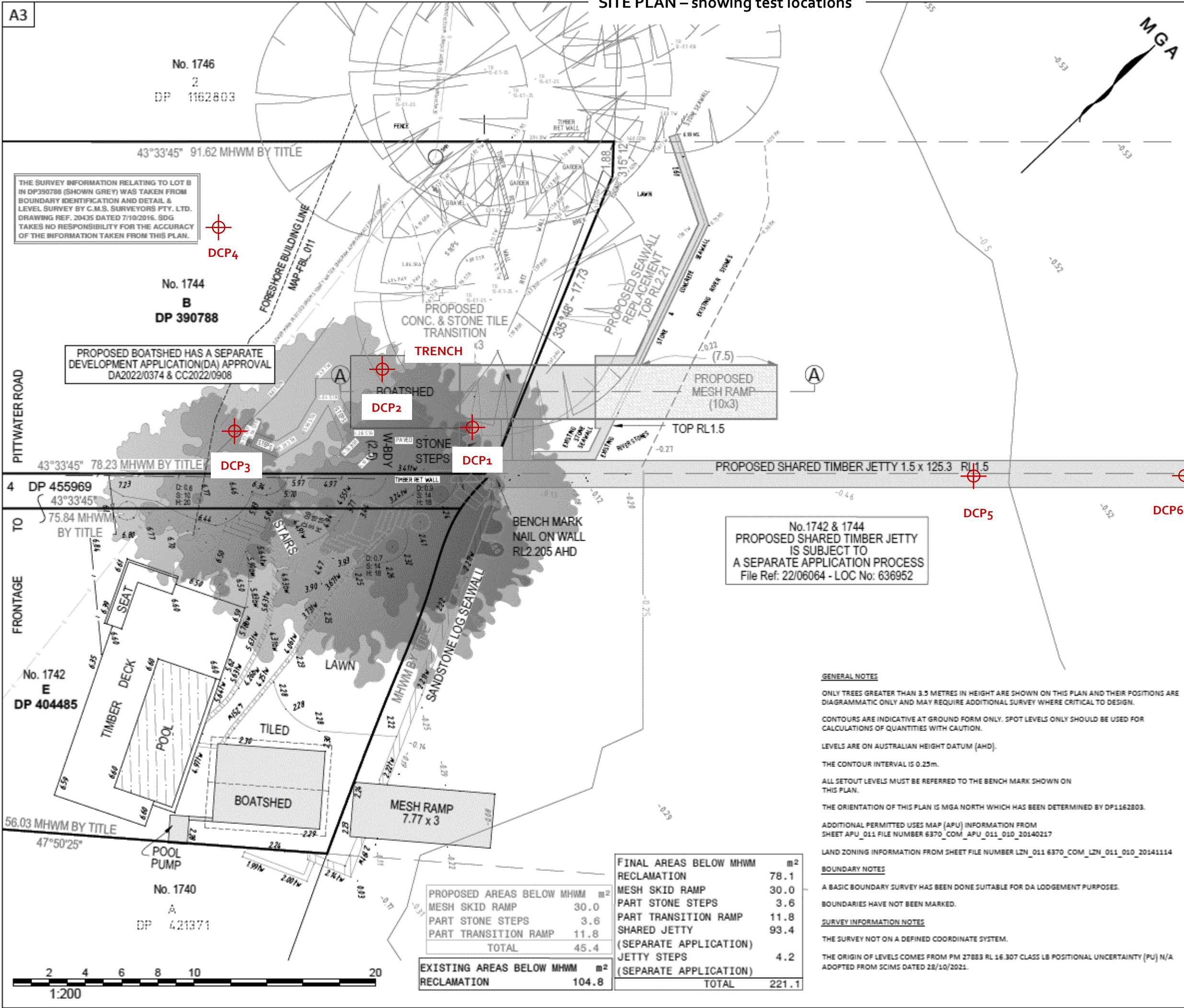
Important Information about Your Report

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



ISSUE	DATE	AMENDMENT	SURV	CHK
A	27/10/21	ORIGINAL ISSUE	GS	MT
B	15/01/24	EASTERN ELEVATION ADDED	GS	

LEGEND				
TW	TOP OF WALL			
BW	BOTTOM OF WALL			
MLW	MEAN LOW WATER			
MHW	MEAN HIGH WATER MARK			
ZFDTG	ZERO FORT DENISON TIDE GAUGE (RL -0.925 A.H.D.)			
	PROPOSED WORKS			

MICHAEL TRIFIRO ID: SU008624 REGISTERED LAND SURVEYOR

PROJECT:
PLAN SHOWING EXISTING WATERFRONT STRUCTURES, PROPOSED SKID RAMP, SEAWALL & BOATSHED

No.1744 PITTWATER ROAD BAYVIEW

CLIENT: CLINT & HELEN BRAGG

FILE: 6966 WATERFRONT SHARED JETTY

LGA: PITTWATER

REF: 6966_B **CONTOURS: 0.25m**

ISSUE: A **DATUM: AHD**

SURVEY DATE: 27/10/2021 **AZIMUTH: MGA2020**

SCALE: 1:200 **SHEET 2 OF 3 SHEETS**

SDG

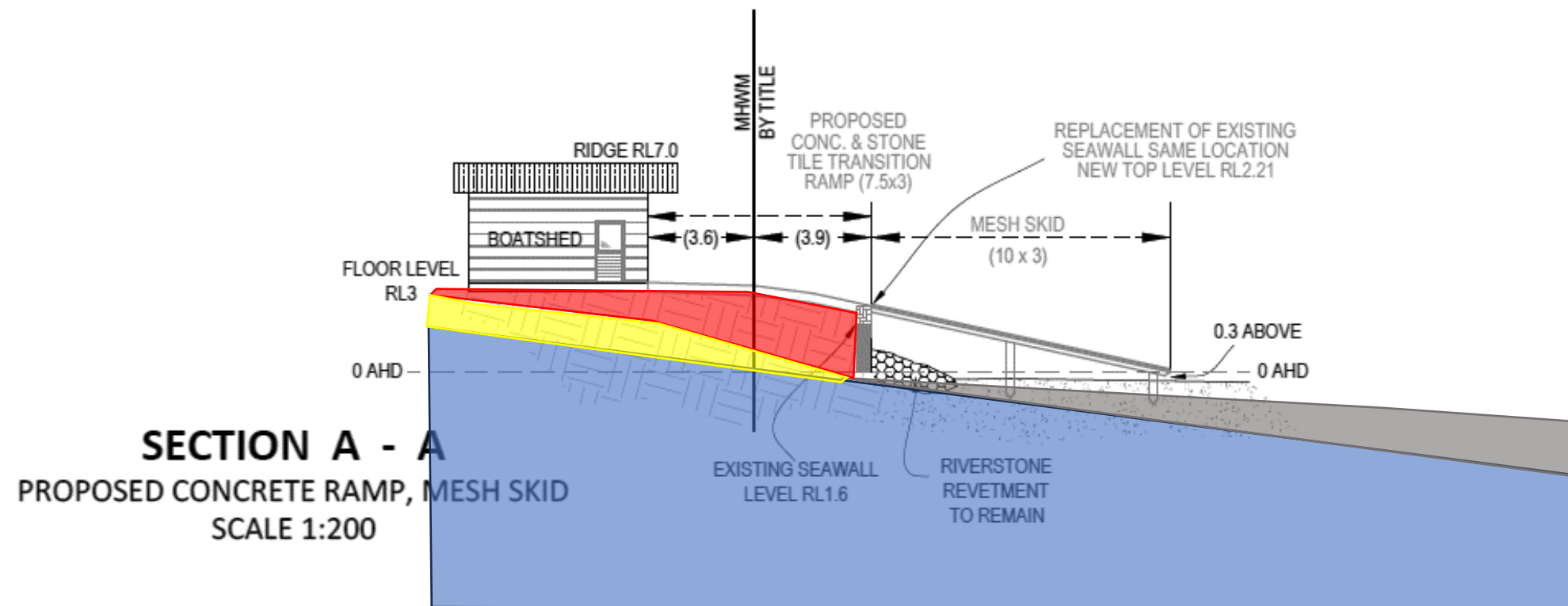
SDG Pty Ltd
abn 85 213 523 621
Suite 1, 3 Railway Street, Baulkham Hills NSW 2153
t: (02) 9630 7955 w: sdg.net.au
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GDA2020

A3

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



ISSUE	DATE	AMENDMENT	SURV	CHK
A	27/10/21	ORIGINAL ISSUE	GS	MT
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LEGEND

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MICHAEL TRIFIRO ID: SU008624
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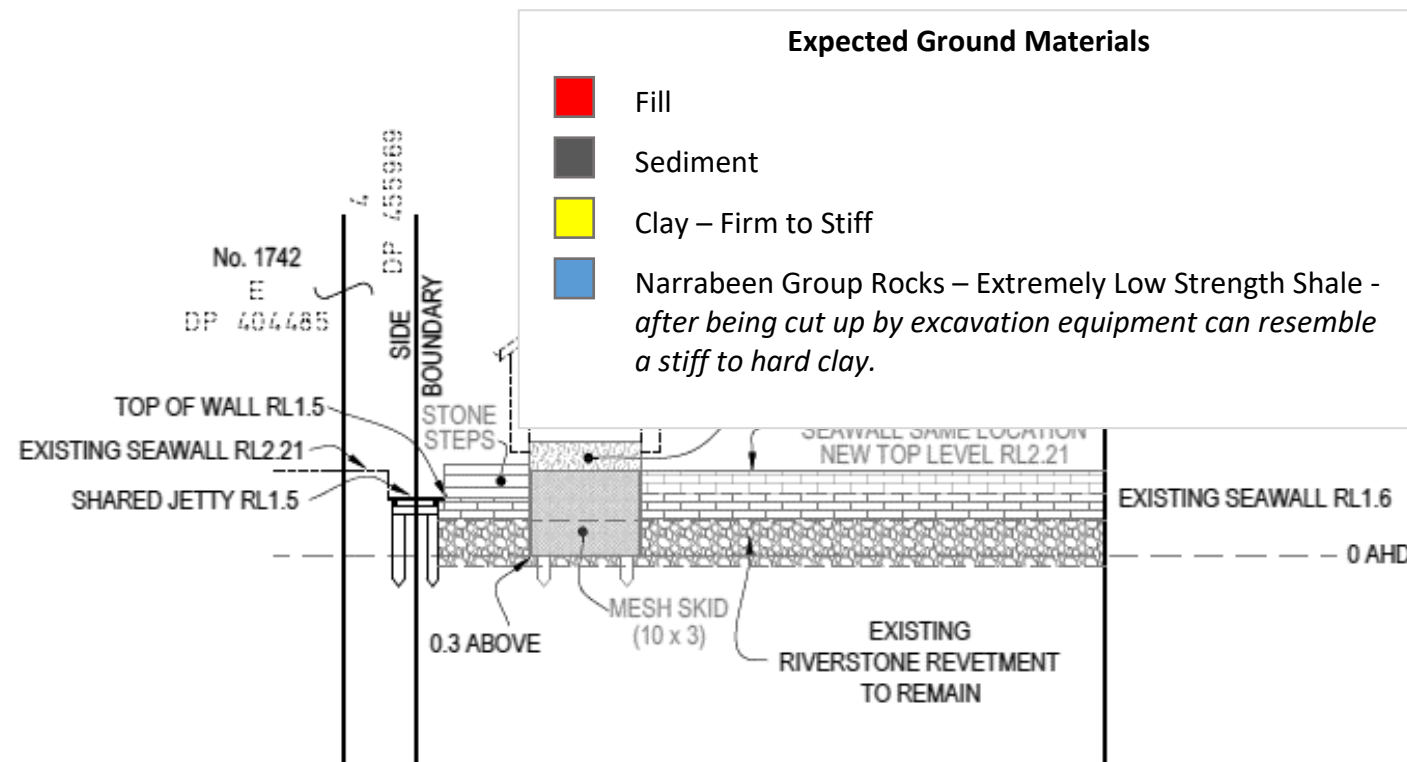
LGA: PITTWATER

REF: 6966_B CONTOURS: 0.25m

ISSUE: A DATUM: AHD

SURVEY DATE: 27/10/2021 AZIMUTH: MGA2020

SCALE: AS SHOWN SHEET 3 OF 3 SHEETS

**EASTERN ELEVATION**

PROPOSED REPAIR, REPLACE AND RASING THE EXISTING SEAWALL, MESH SKID RAMP, CONCRETE AND STONE TILE TRANSITION RAMP AND STONE STEPS.

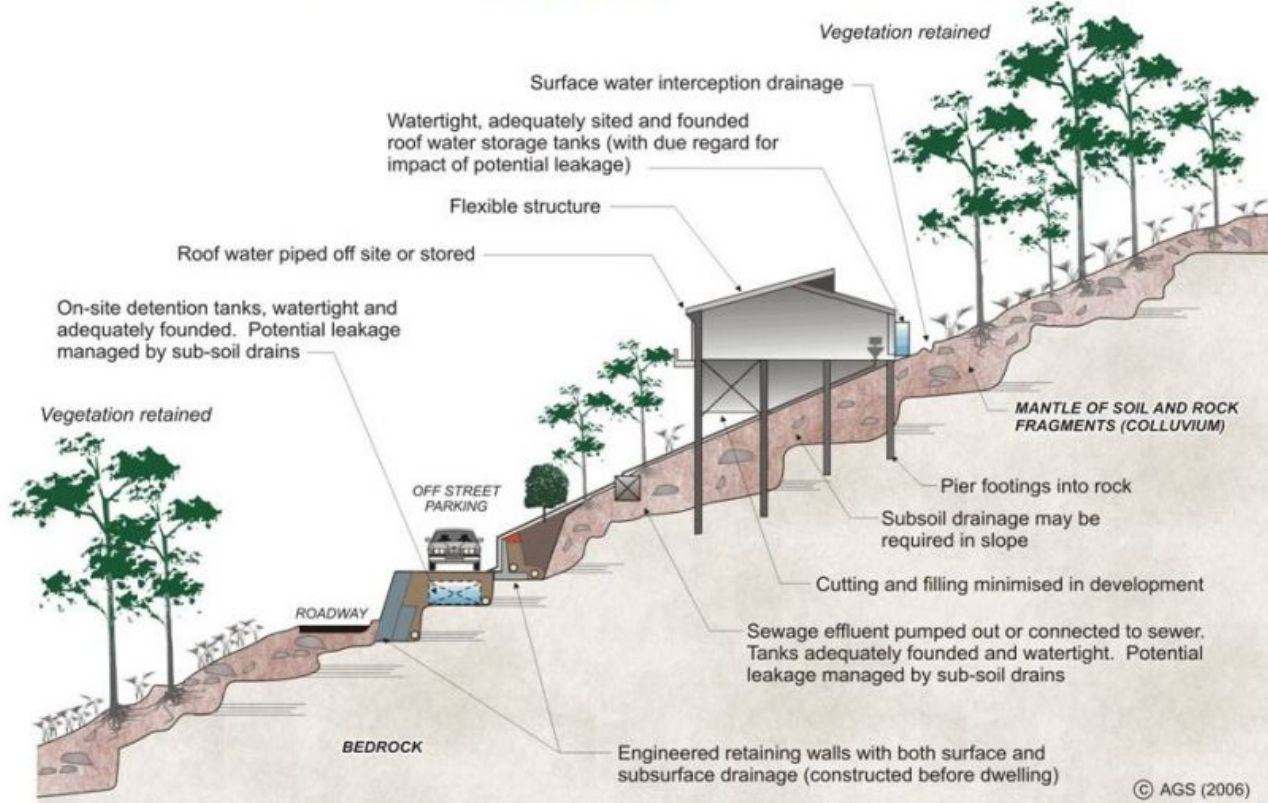
SCALE 1:200



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EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE

