GEOTECHNICAL INVESTIGATION:

Alterations and Additions and New Pool at **34 Beatty Street, Balgowlah**

1. Proposed Development

1.1 Install a new elevator and access way from the existing garage to the uphill side of the proposed extension by excavating to a maximum depth of ~12.0m into the slope for the lift shaft.

1.2 Extend the uphill side of the existing house by excavating to a maximum depth of ~2.9m into the slope.

1.3 Install a new pool and pool area on the uphill side of the proposed extension by excavating to a maximum depth of ~4.4m into the slope.

1.4 Various other internal and external modifications.

1.5 Details of the proposed development are shown on 22 drawings prepared by Chrofi, project number 1816, drawings numbered DA-000 to 008, 101 to 105, 201, 202, 301, 302, and 901 to 904, Issue A, dated 14/1/19.

2. Site Description

2.1 The site was inspected on the 30th May, 2018.

2.2 This residential property is on the low side of the road and has an E aspect. It is located on the gentle to steeply graded lower reaches of a hillslope. The natural slope falls steeply from the road frontage at angles of ~40° before easing to moderate angles at the base of a sandstone rock face. The moderately graded slope eases to gentle angles in the location of the existing house. The slope above the property continues at moderate to steep angles. The property backs onto Forty Baskets Beach reserve below.

2.3 The property is accessed by a Right of Carriageway (ROW) that diverts off Beatty Street. A stable brick and concrete block garage and studio extends off the ROW (Photo 1). The garage and studio are supported off vertical concrete piers. Some of the piers were observed to be supported directly onto outcropping competent Medium Strength Sandstone. A sandstone rock face ~3.1m high steps down the slope below the garage. The rock face is undercut to ~1.2m at its N end (Photo 2). The cantilever arm of the undercut rock does not show any jointing or cracking as viewed from above and below. Thus, the rock is currently considered stable. The slope under the garage and surrounding the rock face has been sealed/stabilised in the past with sprayed concrete (Photo 3). The moderate slope between the rock face and the uphill side of the house is well vegetated and terraced with a series of stack rock retaining walls that will be demolished as part of the proposed works (Photos 4 & 5). An excavation has been made on the uphill side of the house for a tile-paved patio area and for the inclined lift's lower stop (Photo 6). The excavation is supported by a stable sandstone block retaining wall reaching ~2.5m high. The two-storey brick house is supported on brick walls (Photo 7). No significant signs of movement were observed in its external supporting brick walls. A stone-paved patio area extends off the downhill side of the house to the lower boundary (Photo 8). Below the lower boundary is a gently sloping lawn reserve that falls to Forty Baskets Beach (Photo 9). A concrete-lined stormwater easement runs down the S boundary of the property and then into the ground at the beach reserve (Photo 10).

3. Geology

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

4. Subsurface Investigation

Ten 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 with DCPs 8, 9, and 10, as the results in these locations differed significantly from a previous report by another company that was provided by the owners. The results are as follows:

DCP TEST RESULTS – Dynamic Cone Penetrometer					
Equipment: 9kg hammer, 510mm drop, conical tip.				Standard: AS1289.6.3.2 - 1997	
Depth(m) Blows/0.3m	**DCP 1** (~RL13.8)	**DCP 2** (~RL10.3)	**DCP 3** (~RL7.9)	**DCP 4** (~RL7.2)	**DCP 5** (~RL7.4)
0.0 to 0.3	Rock Exposed at Surface	8	7	Rock Exposed at Surface	3
0.3 to 0.6		16	12		14
0.6 to 0.9		6	6		14
0.9 to 1.2		7	40		19
1.2 to 1.5		7	#		26
1.5 to 1.8		6			#
1.8 to 2.1		#			
		Refusal on Rock @ 1.6m	End of Test @ 1.2m		Refusal on Rock @ 1.5m

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

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 6** (~RL6.3)	**DCP 7** (~RL6.1)	**DCP 8** (~RL3.7)	**DCP 9** (~RL3.1)	**DCP 10** (~RL3.5)
0.0 to 0.3	10	7	3	1	2F
0.3 to 0.6	10	8	19	2F	17F
0.6 to 0.9	11	16	4	#	5
0.9 to 1.2	6	34	#		#
1.2 to 1.5	#	#			
	Refusal on Rock @ 1.0m	Refusal on Rock @ 1.2m	Refusal on Rock @ 0.7m	Refusal on Rock @ 0.4m	Refusal on Rock @ 0.8m

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

DCP Notes:

DCP1 – Rock exposed at the surface.
DCP2 – Refusal on rock @ 1.6m, DCP bouncing off rock surface, white sand on wet tip.
DCP3 – End of test @ 1.2m, DCP still very slowly going down, yellow sand on wet tip.
DCP4 – Rock exposed at the surface.
DCP5 – Refusal on rock @ 1.5m, DCP bouncing off rock surface, yellow sand on dry tip.
DCP6 – Refusal on rock @ 1.0m, DCP bouncing off rock surface, white sand on dry tip.
DCP7 – Refusal on rock @ 1.2m, DCP bouncing off rock surface, white impact dust on dry tip.
DCP8 – Refusal on rock @ 0.7m, DCP bouncing off rock surface, brown and white sand on wet tip.
DCP9 – Refusal on rock @ 0.4m, DCP bouncing off rock surface, white sand on wet muddy tip.
DCP10 – Refusal on rock @ 0.8m, DCP bouncing off rock surface, brown sandstone fragments on damp tip.

5. Geological Observations/Interpretation

The surface features of the block are controlled by the outcropping and underlying sandstone bedrock that steps down the property forming sub-horizontal benches between the steps. Where the grade is steeper, the steps are larger and the benches narrower. Where the slope eases, the opposite is true. Where the rock is not exposed, it is overlain by manmade fill over

sandy soils and sandy clays that fill the bench step formation. In the test locations, the depth to rock ranged between 1.0 to 1.6m below the current surface, being slightly deeper where filling has been used for landscaping and due to the stepped nature of the underlying bedrock. It is to be noted that testing by another firm indicated that rock was encountered to depths of up to 2.4m at the downhill side of the site. Additionally, the rock profile in the area is known to contain layers of Extremely Low to Low Strength Shale that can be up to 1.5m thick. The outcropping sandstone on the property is estimated to be medium strength or better and similar strength rock is expected to underlie the entire site with the possibility of weathered shale layers. See Type Section attached for a diagrammatical representation of the expected ground materials.

6. Groundwater

Normal ground water seepage is expected to move over the buried surface of the rock and through the cracks. Due to the slope and elevation of the block, the water table is expected to be many metres below the base of the proposed excavation.

7. Surface Water

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

8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed below or beside the property. The gentle to steeply graded land surface that falls across the property and continues above is a potential hazard (**Hazard One**). The vibrations from the proposed excavations are a potential hazard (**Hazard Two**). The proposed excavations for the pool and house extension are a potential hazard until retaining walls are in place (**Hazard Three**). The proposed excavation for the lift and lift access is a potential hazard until retaining walls are in place (**Hazard Four**).

Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two
TYPE	The gentle to steep slope that falls across the property and continues above failing and impacting on the existing house and proposed works.	The vibrations produced during the proposed excavations impacting on the surrounding structures.
LIKELIHOOD	'Unlikely' (10^{-4})	'Possible' (10^{-3})
CONSEQUENCES TO PROPERTY	'Medium' (15%)	'Medium' (15%)
RISK TO PROPERTY	'Low' (2 x 10^{-5})	'Moderate' (2 x 10^{-4})
RISK TO LIFE	5.5 x 10^{-7}/annum	5.3 x 10^{-7}/annum
COMMENTS	This level of risk is 'ACCEPTABLE'.	This level of risk to property is 'UNACCEPTABLE'. To move risk to 'ACCEPTABLE' levels the recommendations in **Section 12** are to be followed.

HAZARDS	Hazard Three	Hazard Four
TYPE	The excavations for the pool and house extension (up to a depth of ~4.4m) collapsing onto the work site and impacting on the neighbouring property to the N and drainage easement to the S before retaining walls are in place.	The excavation for the lift and lift access (up to a depth of ~12.0m) collapsing onto the work site and impacting on the drainage easement to the S before retaining walls are in place.
LIKELIHOOD	'Possible' (10^{-3})	'Likely' (10^{-2})
CONSEQUENCES TO PROPERTY	'Medium' (20%)	'Medium' (30%)
RISK TO PROPERTY	'Moderate' (2 x 10^{-4})	'High' (2 x 10^{-3})
RISK TO LIFE	7.3 x 10^{-4}/annum	1.0 x 10^{-3}/annum
COMMENTS	This level of risk to life and property is 'UNACCEPTABLE'. To move risk to 'ACCEPTABLE' levels the recommendations in **Section 13** are to be followed.	This level of risk to life and property is 'UNACCEPTABLE'. To move risk 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 technically challenging but, provided suitably experienced engineers and contractors are engaged, it is considered 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 Forty Baskets Beach below. All stormwater or drainage runoff from the proposed development is to be piped to the waterfront.

11. Excavations

An excavation to a maximum depth of ~12.0m is required to construct the proposed lift and lift access. The deepest portion of the excavation is expected to be taken through Medium Strength Sandstone or better. However, the slope under the existing garage and sandstone outcrop has been sealed/stabilised in the past with sprayed concrete (Photo 3). This suggests the rock in this location may be of lower strength and/or contains defects. See **Section 13** for recommendations. Where the excavation continues downslope of the sandstone outcrop, it will be taken through a manmade fill over a sandy soils and firm to stiff sandy clays with Medium Strength Sandstone expected at a maximum depth of ~1.6m below the surface.

Another excavation to a maximum depth of ~4.4m is required to construct the proposed pool and house extension. The excavation will be taken through a manmade fill over a sandy soils and firm to stiff sandy clays with Medium Strength Sandstone expected at a maximum depth of ~1.6m below the surface.

It is envisaged that excavations through fill, sandy soils, and sandy clays can be carried out with a bucket and excavations through rock will require grinding or rock sawing and breaking.

12. Vibrations

Possible vibrations generated during excavations through fill, sandy soils, and sandy clays will be below the threshold limit for building damage. The majority of the excavations are expected to be taken through Medium Strength Sandstone.

Excavations through rock should be carried out to minimise the potential to cause vibration damage to the subject house and garage, N neighbouring house, and S neighbouring house and garage. The subject house will be at least ~6.0m, the subject garage will be immediately beside, the N neighbouring house will be ~5.0m, the S neighbouring house will be ~6.0m, and the S neighbouring garage will be ~1.5m from the edges of the excavations. Close controls by the contractor over rock excavation are recommended so excessive vibrations are not generated.

Excavation methods are to be used that limit peak particle velocity to 5mm/sec at the property boundaries and supporting walls of the surrounding structures. Vibration monitoring will be required to verify this is achieved.

If a milling head is used to grind the rock, vibration monitoring will not be required. Alternatively, if rock sawing is carried out around the perimeter of the excavation boundaries in not less than 1.0m lifts, a rock hammer up to 300kg could be used to break the rock without vibration monitoring. Peak particle velocity will be less than 5mm/sec at the property boundaries using this method provided the saw cuts are kept well below the rock to broken.

It is worth noting that vibrations that are below thresholds for building damage may be felt by the occupants of the subject house and neighbouring houses.

13. Excavation Support Requirements

It is recommended, before the structural design commences for the project, exploration core drilling is to be carried out on the site to confirm to the rock quality and strength. This is to be arranged and supervised by the geotechnical consultant and should consist of a minimum of two cored bore holes taken to a minimum of 2.0m below the bulk excavation. The following

ground support advice can be considered preliminary and will be reviewed on recovery of the drill core. It may change as a result of the assessment of the drill core.

As this job is considered technically complex and due to the steep grade of the site and depth of the excavations and narrow width of the proposed excavation for the lift and lift access, we recommend it be carried out by builders and contractors who are well-experienced in similar work and can provide a proven history of completed work. We recommend a pre-construction meeting between the structural engineer, the builder, and the geotechnical consultant to discuss and confirm the excavation plan and to ensure suitable excavation equipment will be on site.

On steep sites such as this one, to help maintain excavation stability, it is critical upslope runoff be diverted from the proposed excavations with temporary or permanent drainage measures. Temporary measures may be trenches and sandbag mounds and permanent measures could be a wide diameter dish drain or similar. These are to be installed before any excavation work commences.

Bulk Excavation for Proposed Lift and Lift Access

The excavation for the proposed lift and lift access will be taken above and through an undercut outcrop of Medium Strength Sandstone (Photo 2). The undercut portions of the outcrop will remain on either side of the excavation. Thus, prior to the excavation commencing, the remaining undercut portions of rock are to be supported with blade walls or a similar suitable support designed by the structural engineer in consultation with the geotechnical consultant.

The excavation will also come close to flush with a stormwater easement that runs along the S common boundary and with the S supporting wall of the subject garage. The subject garage was observed to be supported on rock so no additional support will be required in that location. The stormwater easement contains a concrete dish drain along its majority. The

depth to rock varies between 0 to ~1.6m, being shallower further upslope. Thus, the stormwater easement will fall within the zone of influence of the excavation.

The cut through soil and clay is to be permanently supported along the N and S sides before the excavation through rock commences. The support is to be installed systematically as the excavation progresses to ensure the integrity of the stormwater easement into the future. Medium Strength Sandstone or better will stand at vertical angles unsupported subject to approval by the geotechnical consultant.

Bulk Excavation for Pool and House Extension

The excavation for the pool and house extension will come close to flush with the N common boundary and stormwater easement running along the S common boundary. The excavation will reach a maximum depth of ~4.4m in the location of the proposed pool and will be taken through a maximum of ~1.6m of fill, sandy soil, and sandy clay before encountering rock. Thus, the N common boundary and stormwater easement to the S will fall within the zone of influence of the excavation.

The cut through soil/clay is to be permanently supported along the N and S sides before the excavation commences with piles or similar suitable support. Alternatively, the support may be installed systematically as the excavation progresses to ensure the integrity of the N neighbouring property and stormwater easement into the future. An example of this type of support would be to construct a retaining wall in a “hit one, miss two” sequence so large lengths of unsupported soil are avoided. Medium Strength Sandstone or better will stand at vertical angles unsupported subject to approval by the geotechnical consultant.

No structures or boundaries will be within the zone of influence of the uphill side of the excavation. The fill, soil, and clay portions of the cut batter in this location are to be scraped back from the excavation line 0.5m and the fill and soil portions are to be battered at 1.0 Vertical to 1.7 Horizontal (30°) prior to the excavation through rock commencing. Excavations through natural firm to stiff clay will stand unsupported for a short period of time until the

retaining walls are in place provided they are kept from becoming saturated. Medium Strength Sandstone or better will stand at vertical angles unsupported subject to approval by the geotechnical consultant.

Advice Applying to Both Excavations

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 can't blow off in a storm. Upslope runoff is to be diverted from the cut faces by sandbag mounds or other diversion works. The materials and labour to construct the 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.

To ensure no defects or unstable cut faces are present that require temporary support, the geotechnical consultant is to inspect the excavation as it is lowered in not more than 1.5m intervals or on encounter of softer sections of rock, whichever occurs first. This is particularly relevant to this job as anyone working below the excavation in the lift and liftwell access will be in a very confined space surrounded by high cut faces. A failure could engulf them. Should any weak sections of rock be encountered, works are to stop until temporary or permanent support is in place such as pre-fabricated commercial trench support or similar support designed by the structural engineer. Our office is to be informed of any unexpected changes in the ground conditions.

Upon completion of the excavations it is recommended all cut faces be supported with retaining walls to prevent any potential future movement of joint blocks in the cut faces that can occur over time, when unfavourable jointing is obscured behind the excavation faces. Additionally, retaining walls will help control seepage and to prevent minor erosion and sediment movement.

Excavation spoil is to be removed from site.

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, and Residual Clay	20	0.40	0.55
Rock up to Low Strength Sandstone - Jointed	24	0.25	0.35
Medium Strength Sandstone	24	0.00	0.10

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

A concrete slab and piers supported directly off Medium Strength Sandstone are suitable footings for the proposed lift, lift access, and house extension. This ground material is expected to be exposed the majority of the base of the excavation. Where this material is not exposed, it is expected at a maximum depth of ~1.6m from the current surface.

Ideally, footings should be founded on the same footing material across the structure. Where the footing material changes across the structure, construction joints or similar are to be installed to prevent differential settlement, where the structure cannot tolerate such movement.

The proposed pool is expected to be seated on the Medium Strength Sandstone. This is a suitable foundation material.

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

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

NOTE: If the contractor is unsure of the footing material required, it is more cost-effective to get the geotechnical consultant on site at the start of the footing excavation to advise on footing depth and material. This mostly prevents unnecessary over-excavation in clay-like shaly rock but can be valuable in all types of geology.

16. 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 owners or the regulating authorities if the following inspection has not been carried out during the construction process.

- During the excavation process, the geotechnical consultant is to inspect the cut faces in 1.5m intervals or on encounter of softer sections of rock, whichever occurs first, as they are lowered to ensure ground materials are as expected and that there are no wedges or other defects present in the rock that may require additional support.

- 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

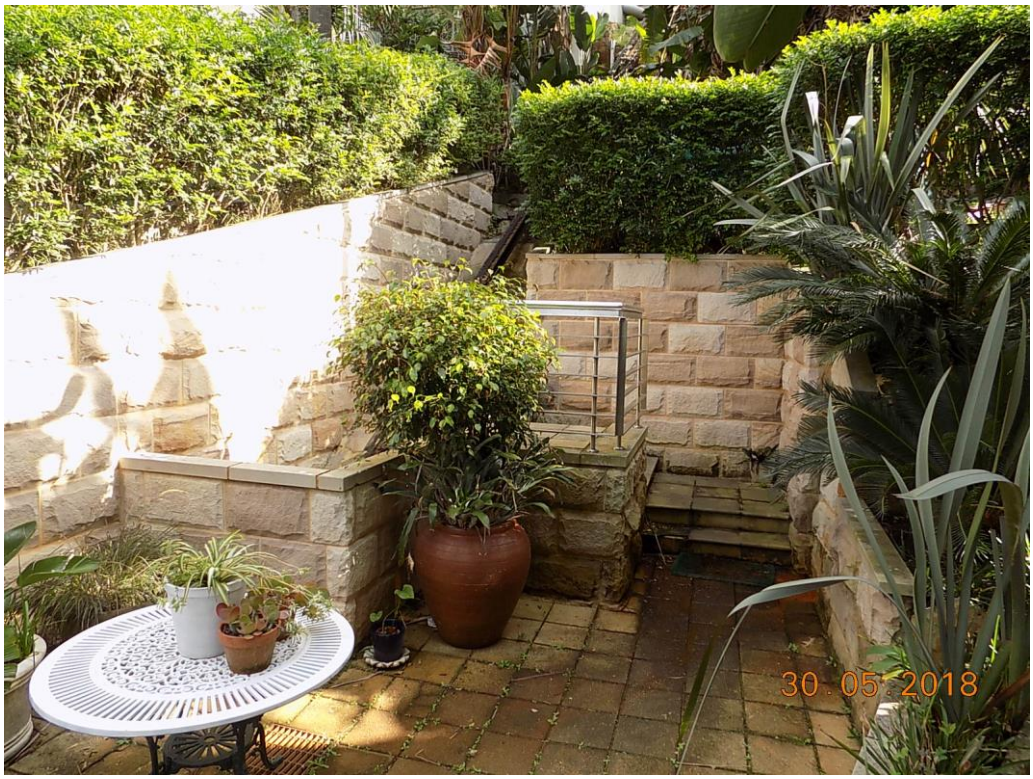


Photo 6

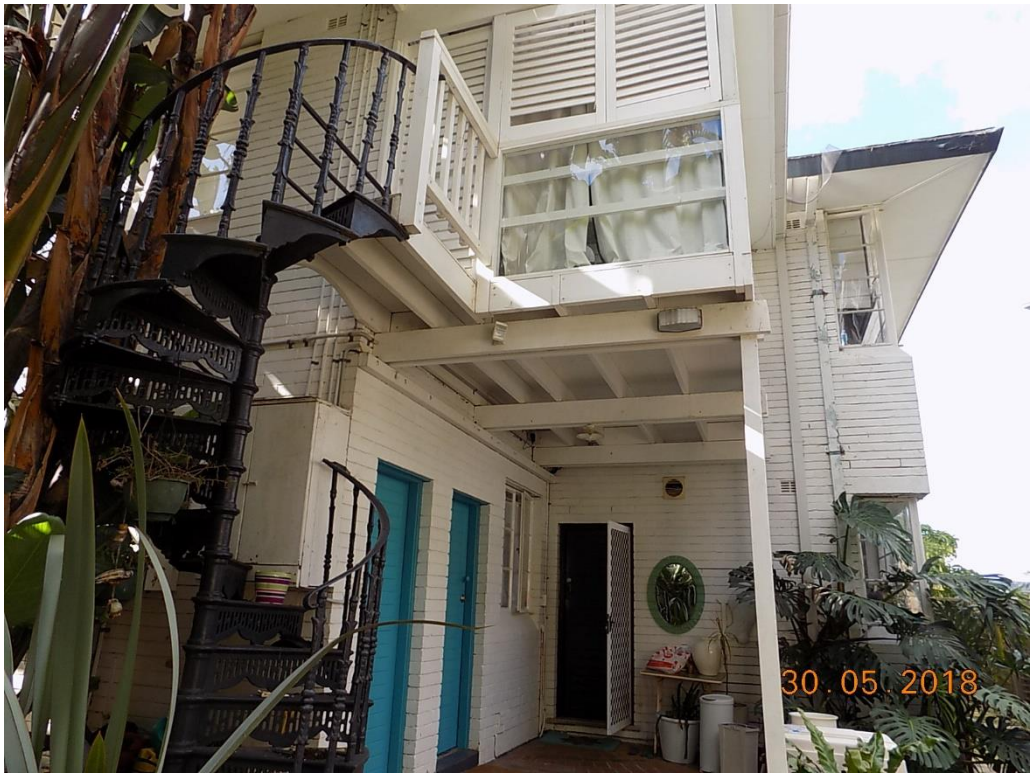


Photo 7

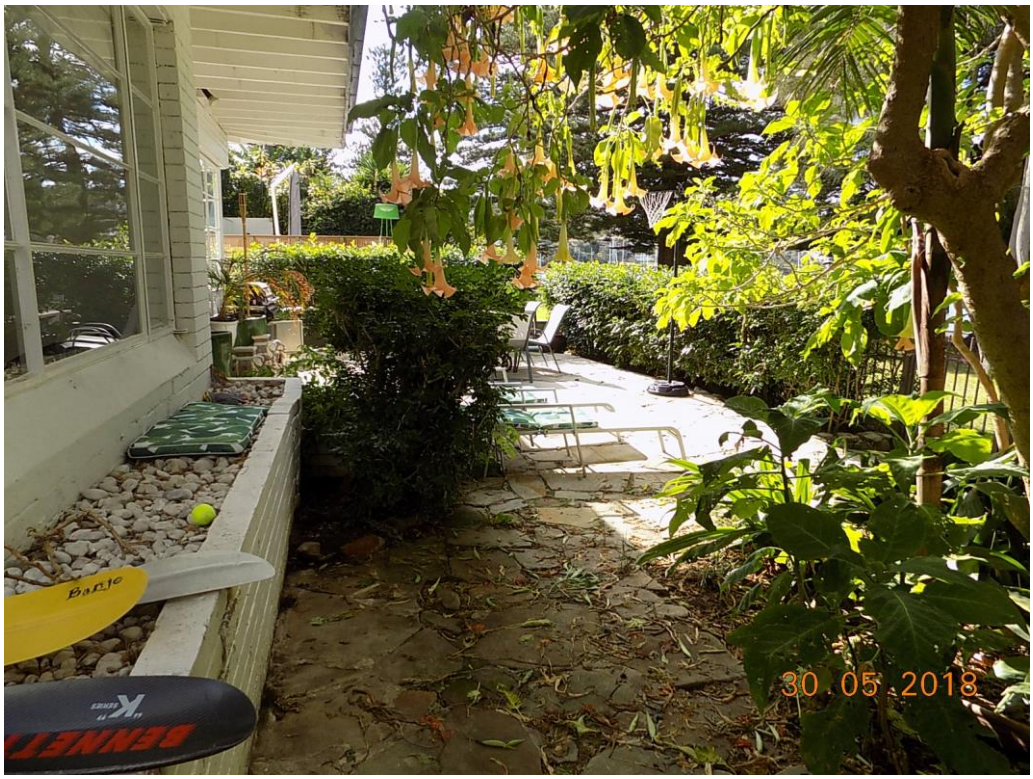


Photo 8

Photo 9

Photo 10

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.

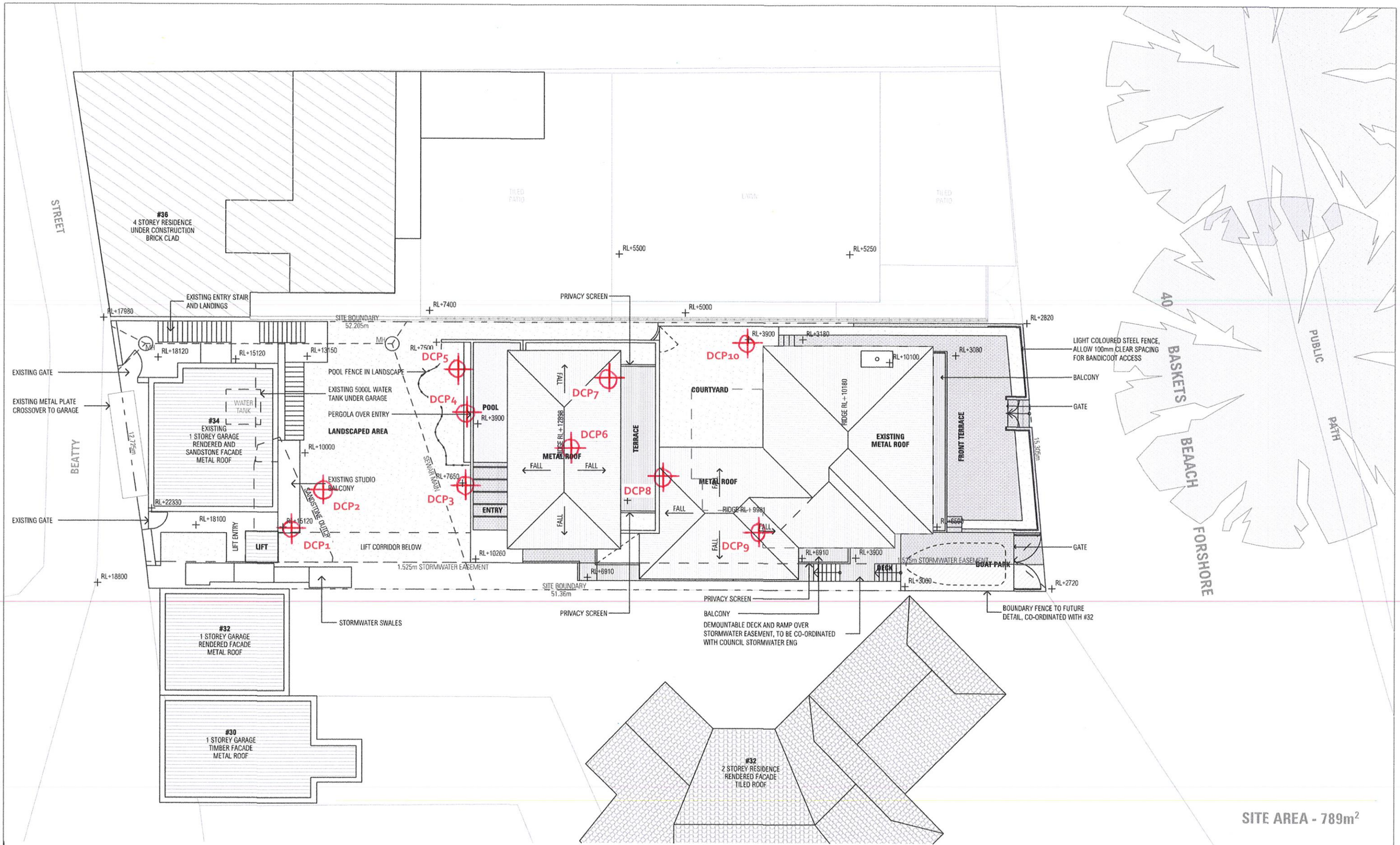
- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

- 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



SITE AREA - 789m²

ISSUE	DATE	DESCRIPTION

ISSUE	DATE	DESCRIPTION

ARCHITECT
CHROFI
3/1 THE CORSO MANLY NSW 2095 AUSTRALIA T +61 2 8096 8500 F +61 2 8007 0411 E info@chrofi.com

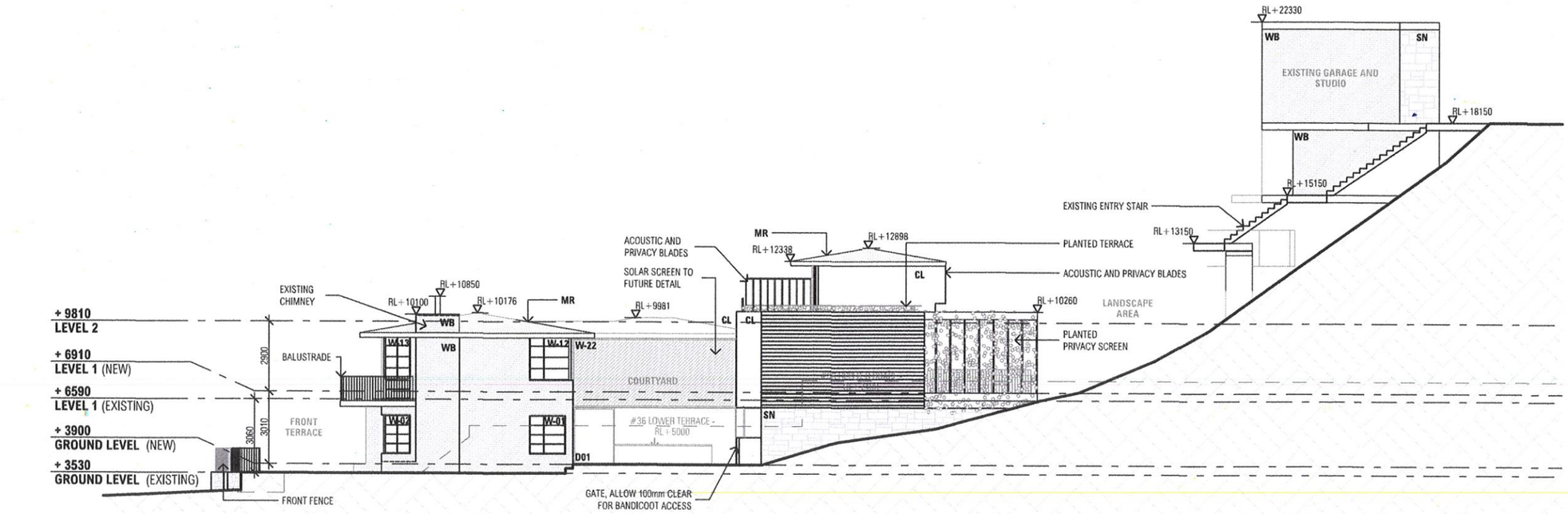
PROJECT
34 Beatty St, Balgowlah Heights
LOT 21A, DP 350345

NORTH

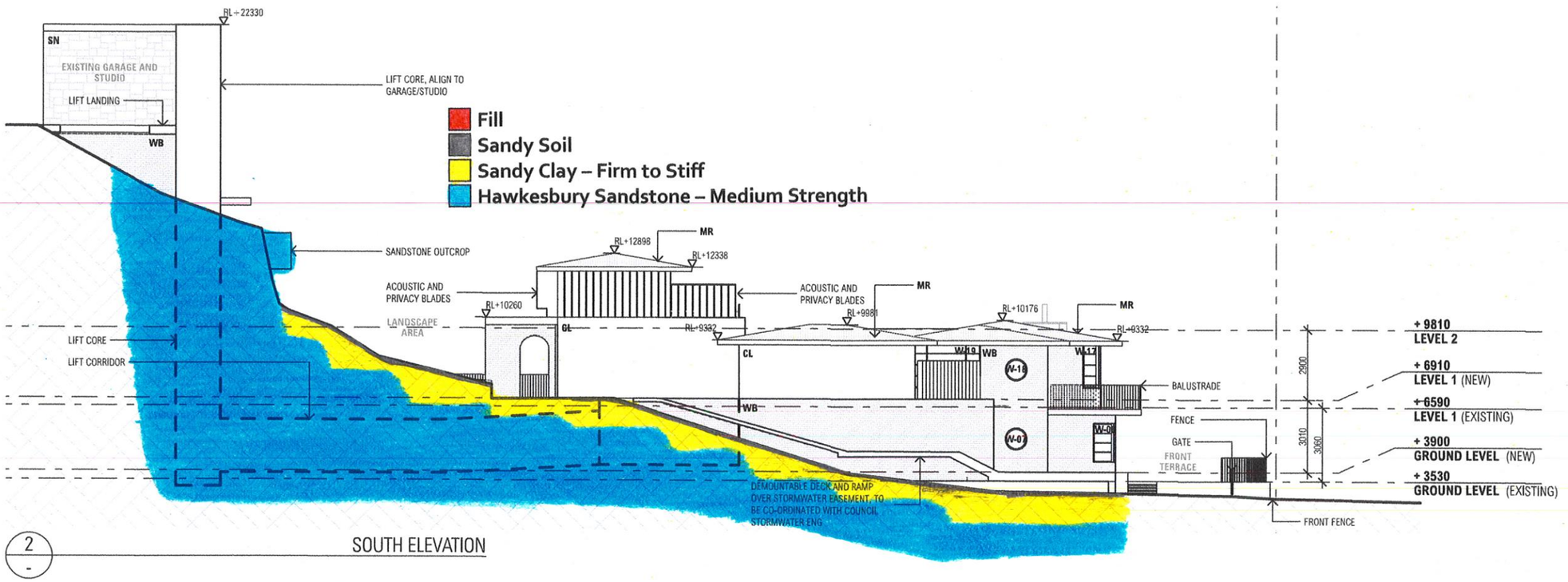
SHEET TITLE
SITE PLAN

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	SHEET NUMBER	ISSUE
1816	14/1/19	DC	TR	1:200	A3	DA-002	A

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials



1 / - NORTH ELEVATION



2 / - SOUTH ELEVATION

KEY

WB - WHITE PAINTED BRICK (EXISTING)
SN - SANDSTONE FACADE (EXISTING)
CL - LIGHT COLOURED CLADDING
SN - SANDSTONE CLADDING
MR - LIGHT COLOURED METAL ROOF

ISSUE	DATE	DESCRIPTION

ISSUE	DATE	DESCRIPTION

ARCHITECT
CHROFI
3/1 THE CORSO MANLY NSW 2095 AUSTRALIA T +61 2 8096 8500 F +61 2 8007 0411 E info@chrofi.com

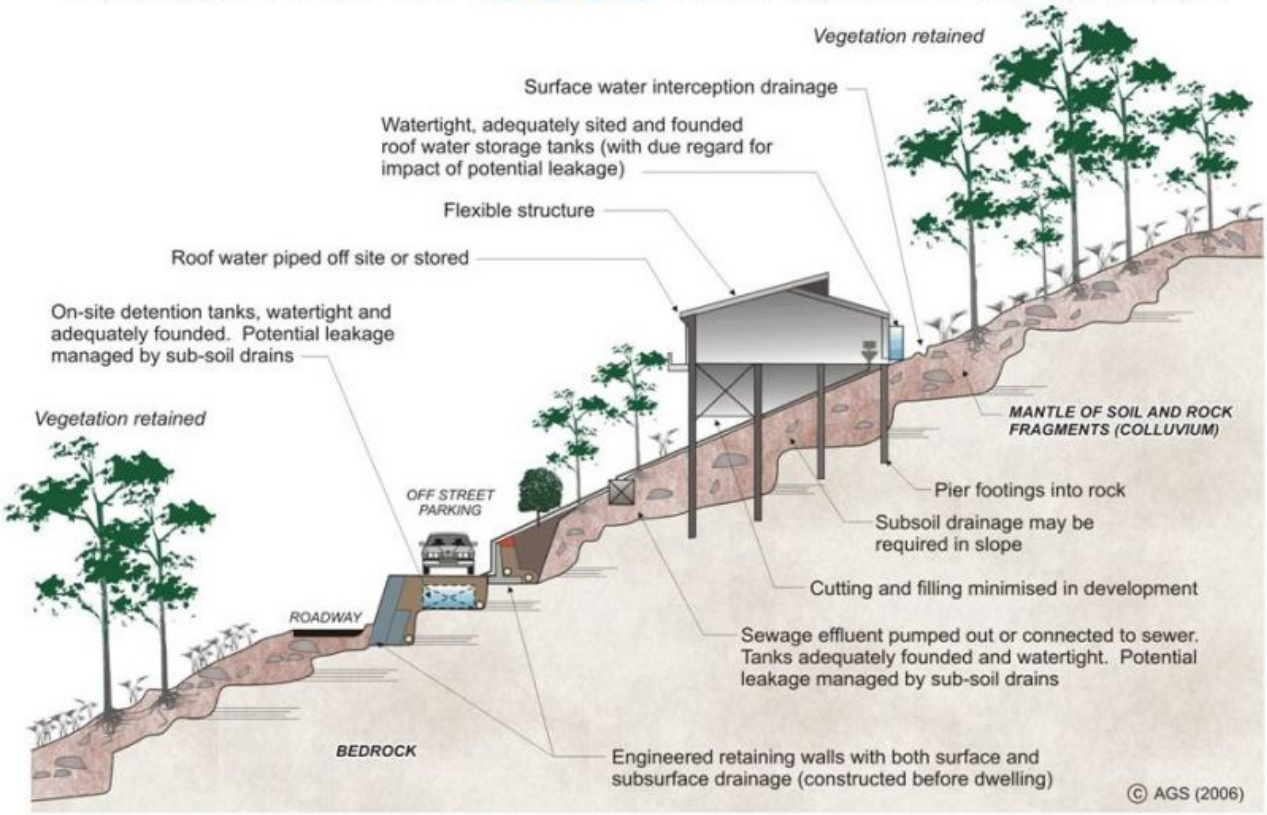
PROJECT
34 Beatty St, Balgowlah Heights
LOT 21A, DP 350345

NORTH

SHEET TITLE
ELEVATIONS - SHEET 1

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	SHEET NUMBER	ISSUE
1816	14/1/19	DC	TR	1:200	A3	DA-201	A

EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE