# GROUND TESTING:

New Pool at **10 Kalinya Road, Newport**

## 1. Scope

The aim of this assessment is to determine the ground conditions around the existing pool and provide foundation recommendations for the construction of a new pool in the same location.

The site was inspected on the 7th September, 2020.

## 2. Proposed Development

**2.1** Install a new in-ground pool in the location of the existing pool.

**2.2** Details of the proposed development are shown on 1 sketch prepared by Geoff Ninnes, Fong and Partners dated 28/2/20.

## 3. Geology

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

## 4. Subsurface Investigation

One Auger Hole (AH) was put down to identify the soil materials. 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. 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 –** AH1 (Photo 1)

| Depth (m) | Material Encountered |
|---|---|
| 0.0 to 0.4 | **FILL**, disturbed gravelly soil, dark brown and dark grey, dense, dry, medium to coarse grained with fine trace organic matter. |
| 0.4 to 0.5 | **CLAY**, weathered shale, maroon and mottled orange, very stiff, dry, fine grained. |

End of test @ 0.5m in weathered shale. No watertable encountered.

| DCP TEST RESULTS – Dynamic Cone Penetrometer | | | | |
|---|---|---|---|---|
| Equipment: 9kg hammer, 510mm drop, conical tip. | | | Standard: AS1289.6.3.2 - 1997 | |
| **Depth(m) Blows/0.3m** | **DCP 1** | **DCP 2** | **DCP 3** | **DCP 4** |
| 0.0 to 0.3 | 8 | 7 | 12 | 10 |
| 0.3 to 0.6 | 12 | 5 | 22 | 23 |
| 0.6 to 0.9 | 11 | 13 | 50 | 30 |
| 0.9 to 1.2 | 11 | 6 | # | # |
| 1.2 to 1.5 | 38 | 30 | | |
| 1.5 to 1.8 | 34 | # | | |
| 1.8 to 2.1 | # | | | |
| | End of Test @ 1.8m | End of Test @ 1.5m | End of Test @ 0.9m | End of Test @ 0.7m |

#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 @ 1.8m, DCP still very slowly going down, maroon shale on dry tip.
DCP2 – End of test @ 1.5m, DCP still very slowly going down, maroon shale on wet tip, brown and maroon clay in collar above tip.

DCP3 – End of test @ 0.9m, DCP still very slowly going down, orange and maroon shale on dry tip.
DCP4 – End of test @ 0.7m, DCP still very slowly going down, orange and maroon shale on dry tip.

## 5. Geological Observations and Interpretations

The slope materials are colluvial at the near surface and residual at depth. Filling has been placed across the uphill side of the pool to a depth of ~0.4m. In the test locations, underlying the filling, the ground materials consist of a thin topsoil over firm to stiff clays. The clays merge into the underlying weathered rock at depths of between 0.6 to 1.2m below the current surface. The weathered zone is interpreted to be Extremely Low Strength Shale. This appears as a hard, mottled clay upon excavation.

## 6. Groundwater

Normal ground water seepage is expected to move over the buried surface of the clay and rock and through the cracks in the rock. Due to the low elevation and proximity of the proposed pool to the waterfront, the water table in this location is expected to be at least 1-2 metres below the base of the proposed foundation works. Thus, the water table will not impact on the proposed works.

## 7. Foundations

The new pool is proposed to be constructed within the existing pool shell. The existing pool shell has been in place for ~30 years and shows no significant signs of settlement. Thus, we expect the existing foundations are supported on the Extremely Low Strength Shale, but obviously this is an assumption and without building records from the time, the existing foundation material is unknown. Although the proposed additional shell is a relatively light load, there is a risk of some 'unacceptable' settlement in the existing foundations. It is recommend the new pool and surrounding walkway be supported on foundations taken beyond the existing pool shell and potted ~0.6m into the underlying Extremely Low Strength

Shale. This material is expected at variable depths of between 0.6 to 1.2m below the current surface. Thus, the required pier depths are to be between 1.2 to 1.8m measured from the downhill side of the footing at 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.

The expected settlement for footings founded in Extremely Low Strength Shale with a maximum allowable bearing pressure of 600kPa should be no greater than 0.5% to 1% of the width of the footing.

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.

## 8. Inspections

The following inspection is recommended and if geotechnical certification is desired it is a requirement.

- All footings are to be inspected and approved by the geotechnical professional before concrete is placed while the excavation equipment is still onsite and before steel reinforcement is installed.

White Geotechnical Group Pty Ltd.

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Engineering Geologist


*Photo 1: AH1 – Downhole is from left to right*

## 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**

GEOFF NINNES FONG AND PARTNERS PTY LTD
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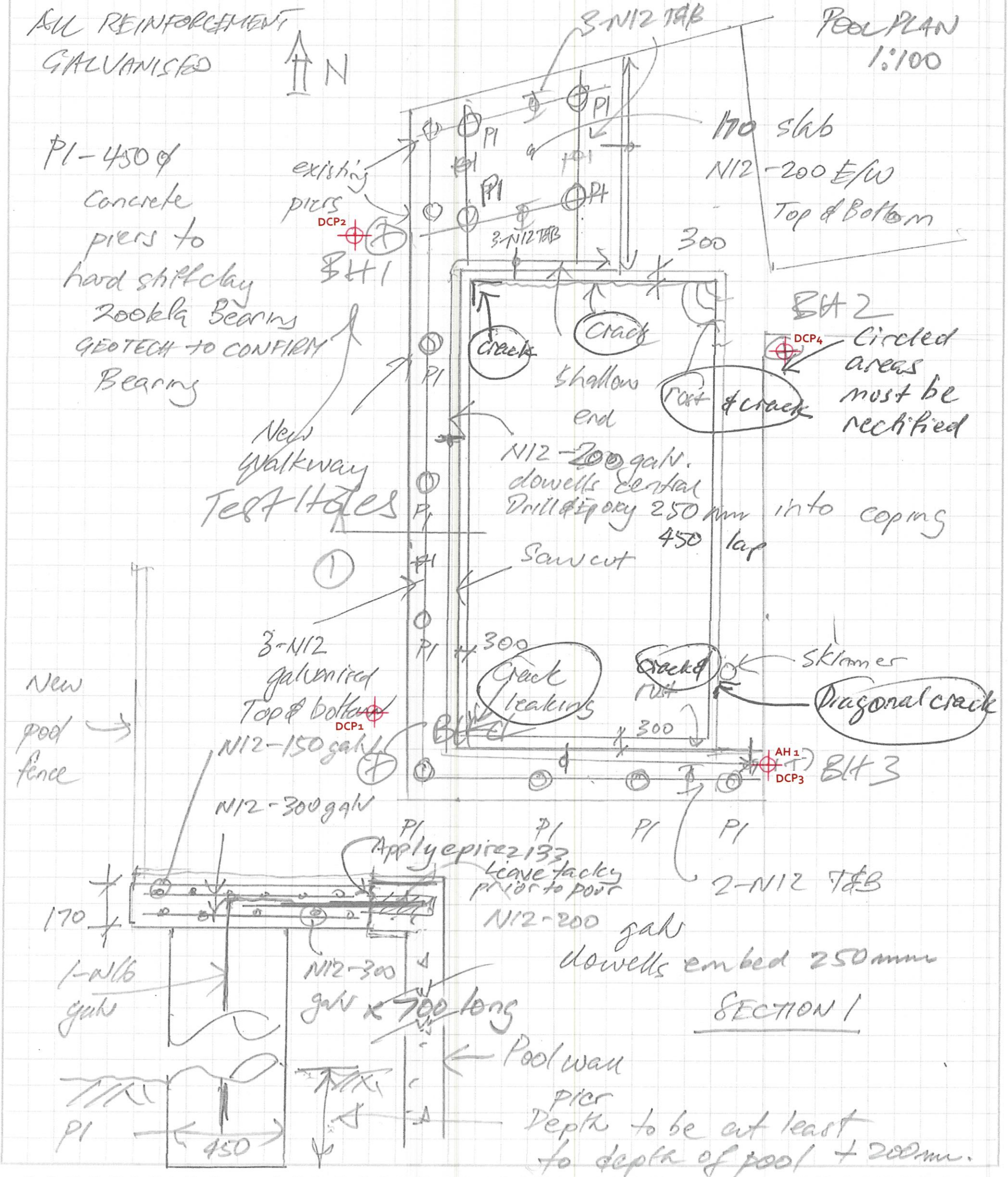
# Geoff Ninnes, Fong & Partners

Project Title: 10 Kalinya St Newport — Job No:

Item: Walkway Replacement — Sheet No. 1 of 2

Designer: — Date: — Checked: — Date: 28-2-20

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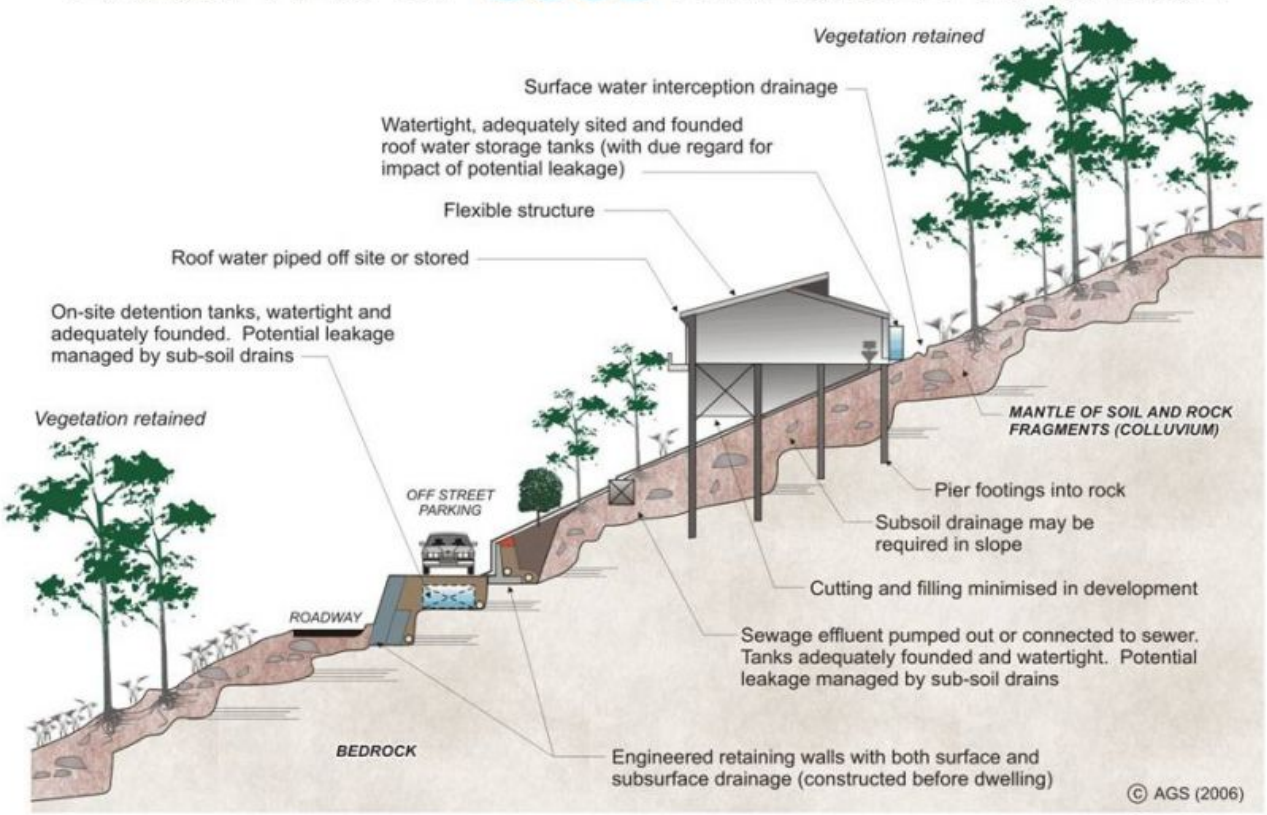
# EXAMPLES OF **GOOD** HILLSIDE PRACTICE




# EXAMPLES OF **POOR** HILLSIDE PRACTICE