

Altis Bulky Retail Pty Ltd
Level 14, 60 Castlereagh Street
Sydney NSW 2000

Project 210589.01
29 March 2023
R.004.Rev0
JCP:csm

Attention: Cameron Hay

Email: chay@essencepm.com.au

Geotechnical Investigation Services
Proposed Residential Development
Crn of Berry and Holdsworth Street, St Leonards

1. Introduction

This letter report provides a summary of the additional geotechnical investigation works carried out by Douglas Partners Pty Ltd (DP) at the above site during February and March 2023 (refer to the attached marked up drawing for the site outline and borehole locations). This report also provides comment on the future geotechnical investigation services scheduled for the first week of April 2023.

It is understood from correspondence with Essence that the above information is required for ongoing communication with WaterNSW and council regarding the option for a drained basement (proposed lowest basement finished floor level at RL 55.4 m).

2. Scope of Works

2.1 Fieldwork Completed

DP have recently completed drilling three additional boreholes (BH101 to BH103) at the above site. Borehole BH101 and BH102 were drilled to a depth of 20 m below surface and BH103 was drilled to a depth of 30 m below surface.

Temporary observation wells were installed in all three boreholes for groundwater sampling and long-term measurements of groundwater levels. The wells in BH101 and BH102 had been equipped with 8 m screens while BH103 had a 12 m screen installed (as per the minimum requirements for building site groundwater investigations and reporting document prepared by DPIE). The wells were constructed using Class 18 un-plasticised poly-vinyl (uPVC) casing. Slotted screen sections comprised 0.4 mm aperture, machine-slotted, Class 18 uPVC pipe, finished with a bottom cap. A durable single sized (poorly graded) quartzose sand filter was placed around the screened section and sealed with a 11 – 17 m bentonite seal, to prevent any surface water from entering the borehole. The wells were finished with a surface cap and a gatic cover flush with the existing ground surface.

DP have recently recorded the water level in two of the new wells (BH102 and BH103) during the drilling of BH101. The water level in BH103 was measured to be at RL 55.6 m, 0.2 m above the proposed lowest basement finish floor level of RL 55.4 m. The well at BH102 was dry (no water recorded down to RL 51.2 m).

2.2 Fieldwork Scheduled

We will again read all water levels (including BH101) on Thursday 6 April 2023. The wells should have reached equilibrium by the time of the site visit and would more accurately represent the true groundwater level across the site. We will also carry out groundwater sampling, conductivity testing and install a data logger in each well (set to record for a three month period) while we are on site. The above information will be included in DP's updated geotechnical investigation report. A final revised report will be submitted with plots showing the groundwater levels after the completion of the three month monitoring period. The updated geotechnical investigation report can be shared with council and WaterNSW.

3. Comments

Based on the above measurements and the water levels recorded during previous investigations on the site, it is likely that the groundwater level may be just above the proposed bulk excavation level, indicating that ongoing seepage, although expected to be relatively minor, will occur which will have to be managed.

Based on experience, council and WaterNSW will need "proof" that seepage into the basement will not be more than 3 Megalitres/year if a drained basement is constructed.

Note that DP will be able to carry out a crude assessment and provide comment on whether less than 3 Mega litres a year is achievable after the hydraulic conductivity testing. WaterNSW, however, will likely require 3 months of water level monitoring (typically recorded with the use of data loggers). This information is typically used to carry out an impact assessment (detailed numerical analysis will be required) and dewatering management plan to more accurately predict the annual/total groundwater take from the site.

DP have recently completed a two dewatering management plans for the neighbouring sites which predicted less than 3 Megalitres per year with numerical modelling.

Please contact the undersigned if you have any questions on this matter.

Yours faithfully

Douglas Partners Pty Ltd



Jean-Christo Pyper

Associate / Engineering Geologist

Reviewed by



Charles Marias

Principal

Attachments: About this Report
 Borehole location Plan (Mark-up)

About this Report

Douglas Partners



Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

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This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

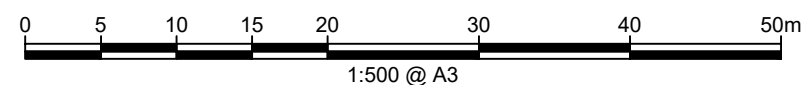
The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.



Locality Plan

 Boreholes Completed February and March 2023

NOTE:
1: Base image from MetroMap (Dated 30.07.2021)



LEGEND

-  Approximate Site Boundary
-  Approximate Proposed Building Footprint
-  Approximate Proposed General Basement Footprint
-  Test Bore Location
-  Geological Cross Section

