GEOFIRST PTY LTD

GEOTECHNICAL ASSESSMENT

FOR

PROPOSED RESIDENTIAL DEVELOPMENT

AT

13 LODGES LANE
(STRATA PLAN 30051)
FRESHWATER NSW 2096

TO

CONNOISSEUR PROPERTY HOLDINGS PTY LTD

OUR REPORT REFERENCE: GF1692-A

DATE ISSUED: 20 MARCH 2023

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Appendices

1 Introduction

This report presents the results of a geotechnical assessment for a proposed residential redevelopment at 13 Lodges Lane (Strata Plan 30051), Freshwater, NSW 2096.

Based on the supplied drawings (DWG Nos. A110-000 to A110-004, dated 13 March 2023) by Studio Johnson, it is understood that the existing building is to demolished, and a five-storey building is proposed. An excavation up to 9.5m in the middle section of the site will be required for the proposed basement floor construction (RL37).

The assessment aimed to use our walkover assessment to provide recommendations and comments on excavation condition, retention system and footing design.

2 Assessment Procedure

This assessment has included a visit to the site by a Principal Geotechnical Engineer on 11 October 2022.

The objective of the site visit was to obtain an understanding of the site location, topography of the site, and existing surface conditions.

3 Results of Assessment

3.1 Site Location

The site is within the Northern Beaches Council area and is zoned as R2 (i.e. Low-Density Residential). The site is identified as CP and 1 to 4 in Strata Plan 30051 (13 Lodge Lane), Freshwater, NSW 2096.

3.2 Site Description

The site is situated in hilly terrain and located at the crest of the hill.

At the time of the fieldwork, a two-storey building was occupied in the middle section of the site (the upper part of the site). A garage was located in front of Coastview Place (the bottom part of the site). A rock cliff was exposed near the middle portion of the site, in front of the existing building. The rock cliff was estimated to be approximately 8m high. No obvious sign of slope instability (e.g. rock toppling) was observed during our walkover assessment.

Sandstone outcrops were also observed on the backyard surface.

The existing site conditions are shown in Photos 1 to 4 below:

Photo 1:Site Aerial Image

Photo 2:Rock cliff face in front of the existing building

Photo 3: Looking to the site from Lodge Lane

Photo 4: Existing backyard condition exposing Sandstone outcrops

4 Discussion and Recommendations

4.1 Dilapidation Report

Prior to commencing the demolition and the excavation works, it is recommended that detailed dilapidation reports should be carried out on the neighbouring properties to the East and South by a qualified structural engineer.

The dilapidation reports are to present a fair record of existing building conditions and may be used as a benchmark against any potential future claims arising from the excavation works.

4.2 AS2870 Site Classification

Based on our walkover assessment, high-strength sandstone rock was exposed at the surface and the cliff face. Hence, the site is classified as Class A in accordance with AS2870-2011. A qualified geotechnical engineer must confirm this prior to pouring concrete.

Allowance should be made for redesigning the building slab if any unexpected ground condition is encountered during the construction.

4.3 Excavation Condition

All earthworks should be conducted in accordance with AS3798-2007: 'Guidelines on Earthworks for Commercial and Residential Developments'.

As discussed in Section 1, the proposed basement floor construction will require excavation to a depth of around 9.5m requiring the removal of fill and high strength Sandstone rock.

It is considered that the fill materials can be excavated using conventional earthmoving equipment (e.g. 8 tonnes or heavier excavator with bucket attachment).

However, the high-strength sandstone rock cannot be excavated by an excavator attached with bucket attachments.

Hence, an excavator attached with a rock hammer and handheld jackhammer will be required. Care must be taken when hammering the rock as it might generate vibration to the neighbouring building. Rock saw must be used to cut through the rock before using the rock hammer to reduce the propagation of vibrations. We recommend two cuts may be required to control the vibrations induced during the rock hammering.

Vibration monitoring must be carried out by a qualified geotechnical engineer to quantify the vibration induced during the excavation and provide engineering advice to minimise the vibration effect to the neighbouring buildings to the East and the South.

4.4 Excavation Retention

Based on our walkover assessment, in particular the presence of high-strength sandstone outcrops; hence, the following recommendations and comments are made for excavation retention:

- If Class III or better quality sandstone is exposed during the excavation, it may be cut vertically and left unsupported in the long-term, subject to a professional geotechnical engineer's confirmation at the appropriate time. Therefore, a qualified geotechnical engineer must be engaged to assess the exposed cut face at 1.5m intervals to confirm the rock quality and defect spacing.
    - Written permission by the geotechnical engineer should be obtained before continuing the excavation.
- Allowance should be made for rock anchors and another retention system, such as shotcrete, if adverse defects are identified by the engineer during the inspection.
- All retaining wall footings should be embedded at least 1m into the underlying sandstone in order to resist the lateral earth pressure subject to the structural engineer's design.
- All retaining walls should be permanently drained to avoid development of hydrostatic pressure behind the wall.

4.5 Vibration Control

Typically, the vibration frequency should be limited and set to an acceptable limit 5mm/s for residential development. We recommend that vibration monitoring be carried out during trial excavations in order to establish the method of excavation to limit the vibration of adjoining structures.

4.6 Footing design

Based on our site observation, high strength Sandstone rock is anticipated to be exposed at the base of the proposed basement floor.

Pad and strip footings may be designed to support the building. An allowable bearing pressure of 2000kPa can be adopted.

All foundation materials should be inspected by a qualified geotechnical engineer before pouring concrete. The base of the excavated footings must be cleared of debris, and standing water should be pumped out prior to pouring concrete.

4.7 Report Limitation

This Report has been prepared for the project described and is intended for the use only by that Client. The sole purpose of this Report is to assess the condition of the site in accordance with the scope of works set out in the proposal between Geofirst and the Client.

This Report is subject to the terms of the contract between Geofirst and the Client, including terms limiting the liability of Geofirst.

In preparing this Report, Geofirst has not attempted to verify the accuracy or completeness of any information provided by the Client and/or from other sources. If the information is subsequently determined to be false, inaccurate or incomplete, then it is possible that our observations and conclusions, as expressed in this Report may change.

Due to the nature of the geotechnical investigation, geological strata would generally be inferred from the data on the particular boreholes only, nearby projects in this assessment. Should the strata found to be different during construction/excavation, further geotechnical assessment should be carried out and Geofirst should be notified immediately.

Geofirst has prepared this Report in accordance with the usual care and diligence of consulting engineers. However, no other warranty or guarantee, whether expressed or implied, is made or intended.

This Report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Geofirst for use of any part of this Report in any other context.

This Report has been prepared on behalf of, and for the exclusive use of the Client of Geofirst. Geofirst accepts no liability or responsibility for any use of this Report by any third party who seeks to use this Report without the express written consent of Geofirst does so entirely at their own risk and to the fullest extent permitted by law. Geofirst accepts no liability whatsoever, in respect of any loss or damage suffered by any such third party.

Please do not hesitate to contact the undersigned should you have any queries.

For and on behalf of

GEOFIRST PTY LTD

Prepared by:

Long Tsang

Principal Geotechnical Engineer

BEng, MEngSc, MIEAust, CPEng, NER, APEC Engineer, IntPE (Aus), RPEQ

Appendix A

Information Sheets

Information About The Report

General information

This report has been prepared for the project described. The sole purpose of this report is to assess the condition of the site in accordance with the scope of works set out between GEOFIRST PTD LTD and the Client.

In preparing this report, GEOFIRST PTD LTD has not attempted to verify the accuracy or completeness of any information provided by the Client and/or from other sources. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Site Condition

This report is considered accurate at the date of issue with regards to the current conditions of the site. The engineering logs presented herein are based on geological interpretation of the subsurface condition subjects to method of drilling or excavation. The results provided in the report are indicative of the subsurface conditions on the site only at the specific sampling locations, and then only to the depths investigated and at the time of work was carried out. Subsurface conditions between the test locations may vary significantly from conditions encountered at the test locations.

Groundwater

Water table levels recorded / shown on the engineering logs may vary from time to time with seasons or recent weather changes. No matter what, allowance should be made for dewatering during the construction stages as the groundwater level may not be the same at the time of construction.

Soil Description

The methods of description and classification of subsurface profile used in this report are in according with Australian Standard AS1726:2017.

Reports

The reports are prepared by a qualified engineer and are based on the information found and on current engineering standards of interpretation and analysis. Duty of Care has been taken with the report in relation to interpretation of subsurface, recommendation and comments for design and construction, but not limit to the following:

- Subsurface condition change between the test points;
- Changes in policy or interpretation of policy by statutory authorities;
- The actions of persons or contractors responding to commercial pressures.

The company obtain a right to assist with further investigation or advice to resolve the matter.

Site Inspection

The Company recommends to provide engineering inspection services for geotechnical aspects of work to which this report is related. This could range from a site visit to confirm that ground conditions are similar description to the report.

Responsibility

Reporting relies on interpretation of factual information based on opinion and judgement and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants. The client /designer should consult with the GEOFIRST PTY LTD to interpret the geotechnical information prior to commencement of their projects in order to obtain an adequate geotechnical information for the construction. This will reduce the potential risk to misinterpretations of the reports by the client / designer at the initial stage, resulted in logging a claim against consultants. Haven GEOFIRST explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

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Limitation

GEOFIRST accepts no responsibility whatsoever for the performance of the structure where recommendations are not implemented in full or properly tested, inspected and documented.

GEOFIRST has prepared this report in accordance with the usual care and diligence of consulting engineers. However, no other warranty or guarantee, whether expressed or implied, is made or intended.

If there is any change in the proposed development described in this report, then all recommendations should be reviewed.

This report should be read in full, and no excerpts are to be taken as representative of the findings. No responsibility is accepted by GEOFIRST for use of any part of this report in any other context. This report has been prepared on behalf of, and for the exclusive use of the Client of GEOFIRST. GEOFIRST accepts no liability or responsibility for any use of this report by any third party.

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