

Cairich Enterprise Pty Ltd

20 Station Street,
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Report Number: 10973-GR-1-1
Report Date: 4th June 2020
Report Type: Geotechnical Desktop Report
Project Name: Proposed Multi-Storey Residential Development
Project Address: 27 Albert Road, Strathfield, NSW 2135

STRATHFIELD COUNCIL
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DA2020/156
8 September 2020

1. INTRODUCTION

At the request of Cairich Enterprise Pty Ltd (Client), Alliance Geotechnical Pty Ltd (AG) has prepared this desktop geotechnical assessment report for the proposed multi-storey residential development at 27 Albert Road, Strathfield, NSW 2135 (site). The assessment is undertaken in accordance with the scope of works (for Stage 1) outlined in AG's proposal (Ref.: 03584, dated 15th May 2020).

The aim of this report is to provide geotechnical information to assist with the development application (DA) process, project planning, and preliminary design estimates for the proposed development.

Referring to the provided information including architectural preliminary drawings and the site survey plan, it is understood that the proposed development will comprise the demolition of the existing residential structure and the construction of a five-storey development over two staggered levels of basement.

This geotechnical desktop study report was prepared to provide preliminary comments on excavation conditions, foundation strata with preliminary design parameters, and potential geotechnical constraints for the proposed development at this site.

In order to achieve the objectives, the following scope of work was carried out:

- Review of published geological information for this site,
- Review of AG's borehole records for projects undertaken in nearby sites;
- Provide preliminary geotechnical comments and recommendations in relation to the proposed development.

It should be noted that all the preliminary comments and recommendations provided in this report are based on engineering judgment and AG's experience at nearby sites. It is recommended that borehole drilling be carried out to confirm the actual subsurface soil conditions prior to carrying out detailed design and producing For Construction drawings.

2. SITE DESCRIPTION & REGIONAL GEOLOGY

The site includes one block of land at 27 Albert Road, Strathfield. The site is located within a residential area, approximately 400m northwest of the Strathfield Train Station and within 150m of the railway line. Powells Creek is located approximately 100m northeast of the site. Figure 1 shows the general site location.

The site is occupied by a single-storey brick house and two fibro garages and access is from Albert Road to the south. It is bounded by a single-storey brick house (No. 25 Albert Road) to the east, a three-storey brick building (No. 29 Albert Road) to the west and back yards of two residential properties to the north. The neighbouring buildings have a minimum offset of 2m from the boundaries except for the property to the east (No. 25 Albert Road) and a swimming pool on the north which extend to the site boundaries.

Referring to the site survey plan¹, the lowest site level is at RL 11.2m along the south-eastern side and rises to RL 12.3m at the north-western side. Referring to DBYD plans, there is a sewer main along the northern boundary.

The 1:100,000 NSW Department of Mineral Resources Geological Map of the Sydney Region indicates the site to be underlain by Ashfield Shale (Rwa). This unit is described as *black to dark-grey shale and laminite*. The site location on an extract of the geological map is shown in Figure 2.



Figure 1 - The site location

¹ Reference No. 4876ALBERT, dated May 2020, prepared by Land and Engineering Surveyors.

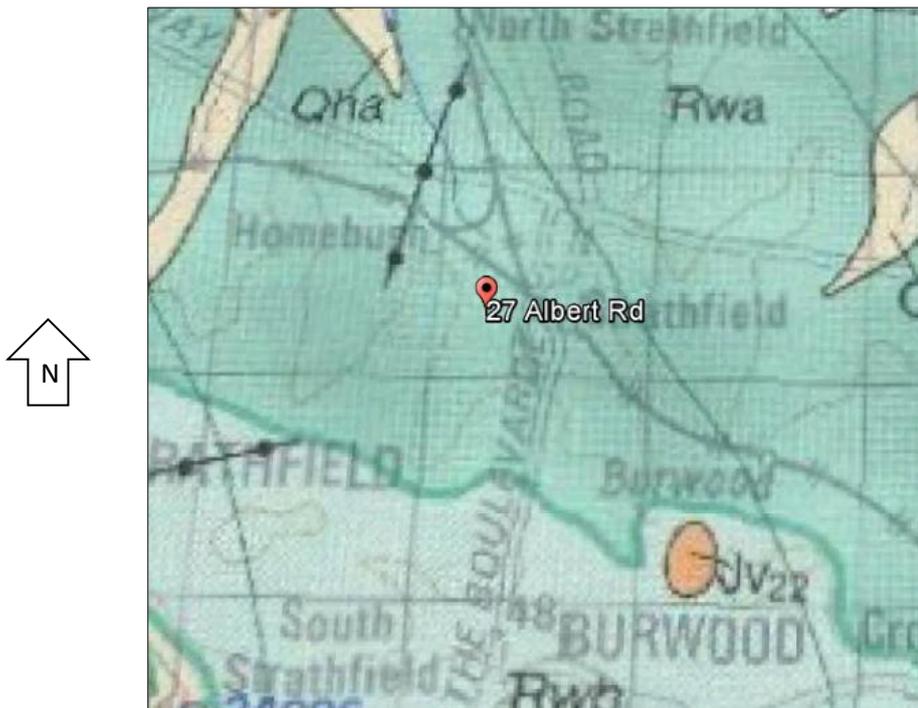


Figure 2- An extract of the site geological map

3. PROPOSED DEVELOPMENT

AG was supplied with a set of preliminary architectural drawings (dated June 2020) prepared by Texco Architecture and the site survey plan prepared by Land and Engineering Surveyors.

Referring to the provided information, it is understood that the proposed development comprises the construction of a five-storey building over two staggered basement levels.

The proposed basement extends to the site boundaries to the east and west. The basement offsets from the northern and southern boundaries are 3m and 6m, respectively.

The lowest basement level is at RL 2.5m and the maximum excavation depth will be approximately 9.5m (assuming 300mm over excavation).

4. COMMENTS AND RECOMMENDATIONS

4.1. Excavation Conditions

Based on the indicated site geology and AG's previous projects in this area, the excavation of the basement is expected to encounter natural residual clay extending to a depth between 2m and 4m below existing surface level and extremely weathered, very low strength shale bedrock below the residual clay. The very low strength shale is anticipated to be underlain by highly weathered, low to medium strength shale below an approximate depth of 7m. The bulk excavation base is anticipated to be within low to medium strength shale. Groundwater seepage is expected to be encountered at a depth between 2 to 4m below the ground surface which may be managed by the sump-pump method.

Excavation of the upper soil layer and very low strength shale will be possible using conventional earthworks equipment. However, excavation of the low to medium strength shale may require large hydraulic hammers during excavation. The actual subsurface profile and rock strength should be determined by drilling boreholes, undertaking in-situ and laboratory testing.

4.2. Vibrations

A vibration monitoring system may be needed to be set up during the excavation of low to medium strength shale. The system would include a warning alarm which sounds as vibrations approach the specified limit. Excavation methods should be adopted which limit ground vibrations at the adjoining residential developments to less than 5mm/s. A low-vibration excavation and work method should be developed in conjunction with advice from a geotechnical engineer followed by on-site vibration monitoring.

4.3. Dilapidation survey

It is recommended that a dilapidation survey be undertaken on existing neighbouring structures and the sewer main by a qualified structural engineer. The report should include precise measurements of the existing defects and cracks presented with relevant photos.

4.4. Temporary Batter Slopes and Retaining Structures

Considering the neighbouring properties and the street infrastructures, the proposed basement excavation will require the installation of shoring structures prior to commencing excavation on site to protect surrounding structures and infrastructure from damage by ground movements. The retaining structures can incorporate temporary shoring walls into the permanent basement excavation support.

Support systems consisting of semi-contiguous piles or soldier piles for perimeter walls are considered technically feasible at this stage. It is expected that an unrestrained, temporary or permanent shoring system will experience some lateral movement during construction as the active earth pressure is mobilised onto the wall. If any lateral movements are not acceptable then a temporary anchorage system will be required to avoid movement-induced damage on adjoining properties (i.e. where movements may affect adjacent structure footings). Temporary anchor installation beyond the property boundaries will be subject to approval by the owners of the adjacent buildings, roads, and underground assets. Otherwise, it may be required to internally prop the excavation.

Potential surcharge loadings from neighbouring structures should be taken into account in the design of retaining structures along the site boundaries as the footings of these structures may be founded within the zone of influence of the proposed excavations. The zone of influence for this site can be defined as the area above a hypothetical plane projected from the medium strength shale depth upwards in the direction of the retained ground surface at 45° from the horizontal.

Temporary batter slopes may be considered for the site preparation excavations where the excavation footprint has sufficient setback from the boundaries and the neighbouring structures are not in the zone of the influence of the proposed excavation.

4.5. Footings

It is currently anticipated that the site will be underlain by residual clay underlain by variably weathered shale bedrock. It is also anticipated that the bulk excavation base will be located within low to medium strength shale. In this case, shallow/pad footings at the basement level may be feasible for the footing system. The quality of shale is expected to be variable and it is anticipated that the

allowable bearing pressure of the shale bedrock could range from 700kPa to 2500kPa depending on the rock quality encountered at founding depths.

On this basis, an intrusive geotechnical investigation would be required to ascertain the depth to rock at the site and its engineering properties for footing design.

4.6. Groundwater Control

AG's observations during investigations at nearby locations indicate that groundwater seepage will be encountered within the basement excavation. As such, the construction should be planned to manage seepage and surface runoff into the excavations by installing suitable drains and sump pits and pumping system for dewatering purposes.

The groundwater seepage level and inflow rate should be verified during borehole drilling with installation of monitoring wells, if encountered.

4.7. Impact on Adjacent Properties

The surrounding structures and infrastructure (including the neighbouring properties to the east and west, the sewer main along the northern boundary and the water main along the southern boundary) are expected to be within the zones of influence of the proposed basement excavation. The impact of the proposed excavation on the surrounding structures and services can be minimised by adopting an appropriate shoring system. Given a 150m offset from the railway track, it is not expected that there would be any risk to Sydney Train Asset due to the proposed basement excavation.

4.8. Future Geotechnical Investigation

The provided recommendations in this report are based on a desktop study and should be confirmed by an intrusive geotechnical investigation. The geotechnical investigation should comprise the drilling of at least two cored boreholes to a 12m depth (approximately 3m below the basement level). Installation of groundwater monitoring wells should be considered to measure/monitor the standing groundwater level. Should groundwater monitoring wells be installed then it is recommended to carry out a rising head test in the monitoring wells to provide an indication of the groundwater inflow rate during the proposed basement construction works.

5. LIMITATIONS

This desktop report is based on published geological information and AG's previous experience in this area. A geotechnical drilling investigation (e.g. boreholes and in-situ testing) have not been conducted at this site to date. The information provided in this report is preliminary and will need to be confirmed by a geotechnical intrusive investigation prior to finalising structural designs for the development.

Should you need any further information or to discuss this report, please contact the undersigned.

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