Geotechnical Desktop Study

Leumeah Hotel, 80 O'Sullivan Road, Leumeah

Report Ref: P21599-R-001-Rev0
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Prepared for

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Project Details

Site Address:	Leumeah Hotel, 80 O'Sullivan Road, Leumeah	
Project Type:	Proposed Commercial and Residential Buildings	
Project no	**Report type**	**Report no**
P21599	R	001

Report Register

Revision Number	Reported By	Reviewed By	Date
Rev0	ML	NR	15/6/2021

We confirm that the following report has been produced for Equity Development Management Pty Ltd, based on the described methods and conditions within.

For and on behalf of **Hunter Civilab**,

Nathan Roberts
Geotechnical Engineering Manager

Executive Summary

The following report details the geotechnical investigation undertaken by Hunter Civilab (HC) under the request of Equity Development Management Pty Ltd. The desktop study was undertaken at Leumeah Hotel, 80 O'Sullivan Road, Leumeah.

The desktop study indicated that the site lies within the Wianamatta geological landscape.

The desktop study indicated that the site lies within the Blacktown soil landscape.

The site does not lie within an acid sulfate soils zone.

The desktop study also indicated that the site does not lie within a mine subsidence zone.

The site lies within an area of a moderate to high potential of salinity and sodicity occurring within the soils.

The subsurface profiles are likely to be fill, overlying residual or alluvial clays, overlying sandstone/ siltstone/ shallow bedrock at between 5m and 10m of the surface.

Based on the desktop findings recommendations on Geotechnical Investigation at the site are presented ion **Section 10** of this report.

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1 Introduction

At the request of Equity Development Management Pty Ltd, Hunter Civilab (HC) have carried out a geotechnical desktop study to assist with assessing the feasibility of expanding the existing underpass to fit a second traffic lane. The investigation works were undertaken in accordance with HC services agreement Q2021_430, dated the 3rd of June 2021.

The desktop study consists of the following:

- Review of available geotechnical information applicable to the site (available reports within the area, review of topographical, geological terrain, soil mapping and risk mapping e.g. slip zones/ faults lines/ salinity/ sodicity/acid sulfate/ aggressive soil or rocks);
- Identification of potential geotechnical constraints which may impact the redevelopment of the site;
- Identification of any recommendations or mitigation measures recommended to support the proposal from a geotechnical perspective.

1.1 Project Background

It is understood that Equity Development Management Pty Ltd are proposing to construct two mixed use commercial and residential towers at 80 O'Sullivan Street, Leumeah NSW. It is understood that the towers are to be up to 16 storeys in height with 2 basement level carparks.

2 Site Description

The site is located at 80 O'Sullivan Road, Leumeah. The site is bordered by O'Sullivan Road to the west, Council nature strip and Pembroke Road to the south and a mix of existing commercial, residential and carpark developments to the north and west.

Existing development at the site consists of a single storey hotel and a liquor store with both developments surrounded by existing concrete and asphalt paved access roads/ driveways/ carparks/ footpaths.

Existing vegetation consisted of some smaller trees and shrubs around the existing hotel and liquor store with some areas of short grass. Larger trees were found on site boundaries and in neighbouring properties.

Topographically the site sloped gently down towards the northeast at up to 10°.

Figure 1 below shows the site located on a Google Maps image.

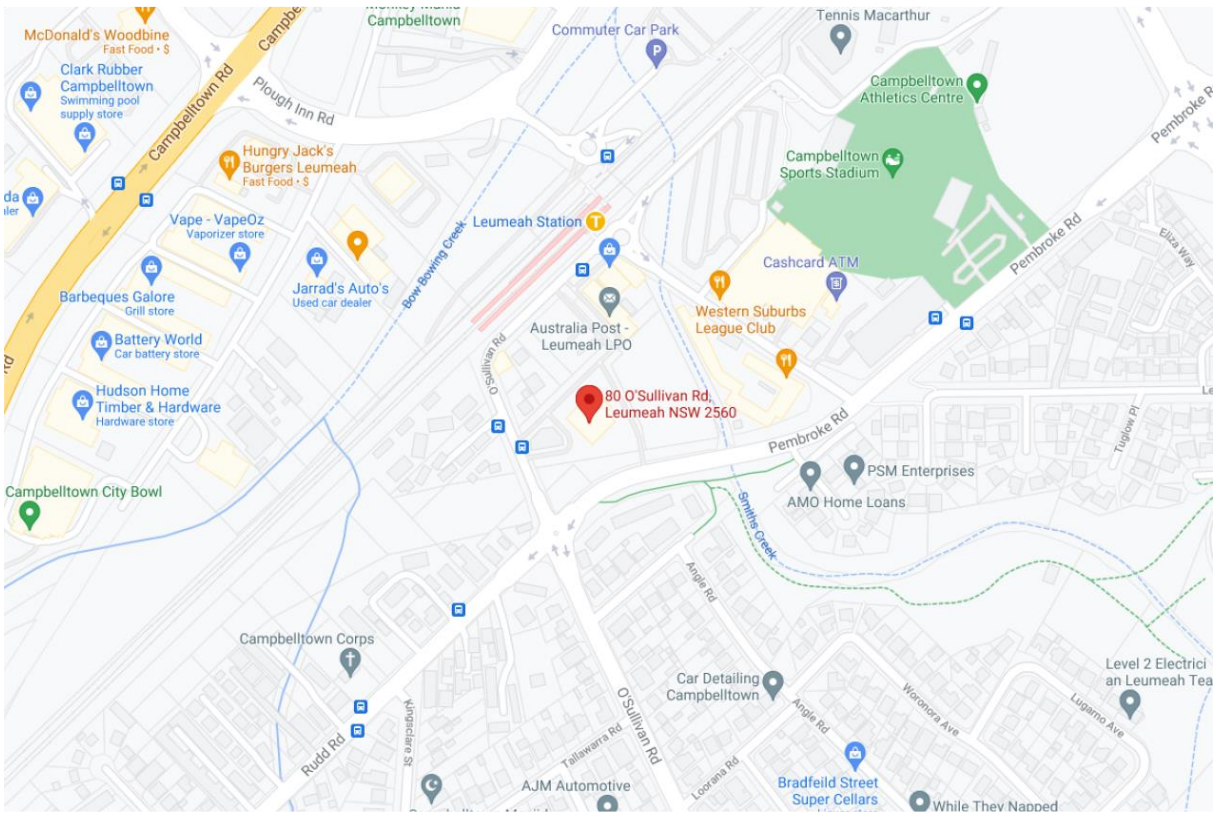

Figure 1 - Google Map overview of the area showing the location of the site.

3 Geological Landscape Setting

Reference to the 1:100,000 Wollongong – Port Hacking Geological Map indicates that the site lies within a sub-group of the Wianamatta Group, consisting of laminate and dark-grey siltstone. The site however lies close to the boundary of Quaternary Alluvium material in the northwest, consisting of quartz and lithic "fluvial" sand, silt, and clay. There also appears to be no noted geological fault lines within the immediate area.

Refer to **Figure 2** for approximate location of geological landscapes.

Figure 2 - Site location on Wollongong – Port Hacking 1:100,000 map

4 Soil Landscape Setting

Reference to the 1:100,000 Wollongong – Port Hacking Soil Landscape Map indicates that the site is located within the Blacktown soil landscape with the Hawkesbury soil landscape close to the site towards the southeast.

The Blacktown soil landscape is characterized by gently undulating rises on Wianamatta Group shales and broad rounded crests and ridges with gently inclined slopes. Local slopes are generally >5% on local reliefs of up to 30m. Soils generally consist of shallow to moderately deep hard setting mottled texture contrast soils, red and brown podzolic soils on crests grading to yellow podzolic soils on lower slopes and in drainage lines. Vegetation consists of cleared eucalypt woodland and tall open-forest.

The Hawkesbury soil landscape is characterised by rugged, rolling to very steep hills on Hawkesbury Sandstone. Local slopes are generally >25% on local reliefs of 40-200m with rock outcropping >50%. Topography is usually narrow crests and ridges, narrow incised valleys, steep side slopes with rocky benches, broken scarps and boulders. Vegetation is mostly uncleared eucalypt opne-woodland and tall open-forest. Soils for the landscape consist of shallow, discontinuous lithosols/siliceous sands associated with rock outcrops, earthy sands, yellow earths and some yellow podzolic soils on inside of benches and along joints and fractures, localised yellow and red podzolic soils associated with shale lenses and secondary yellow earths along drainage lines.

Refer to **Figure 3** below for the approximate boundary of the Blacktown (green) and Hawkesbury (pink) soil landscapes.

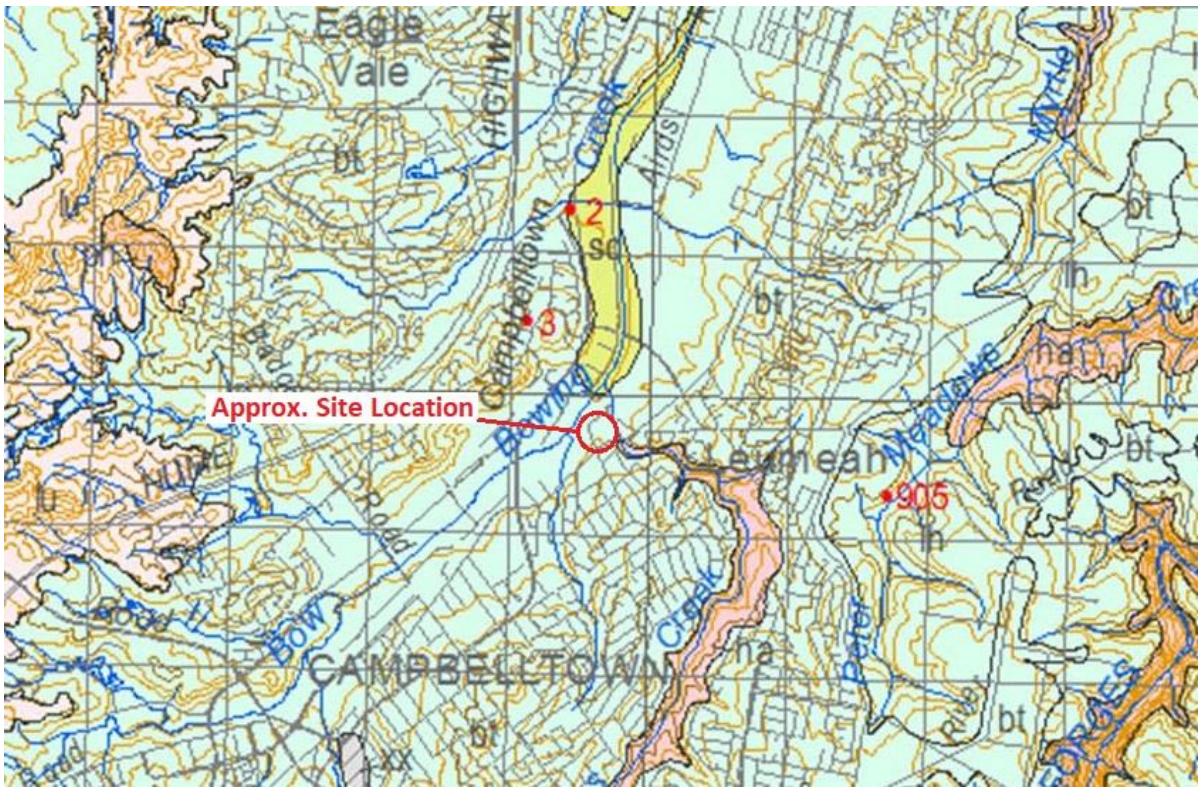

Figure 3 - Approximate extent of soil landscapes at the site

5 Acid Sulfate Soils Risk Maps

Reference to the NSW Office of Environment and Heritage's online database 'ESPADE' indicates that the site lies in an area of no known occurences of acid sulfate soils. Furthermore, the NSW Government online Planning Portal does not indicate any planning requirements for acid sulfate soils.

6 Mine Subsidence

Reference to Subsidence Advisory NSW Mine District Maps indicates that the site does not lie within a mine subsidence district.

7 Slope Stability

Reference to the NSW Government online Planning Portal does not indicate any planning requirements for slope stability. Reference to Campbelltown City Council Development Control Plan and online guidelines also does not indicate any planning requirements for slope stability.

8 Salinity and Sodicity Risk Maps

Reference to the NSW Government's online database 'SEED' (Sharing and Enabling Environmental Data) indicates the site lies in an area of moderate salinity and sodicity potential with an area of high potential along the eastern boundary of the site.

Refer to **Figure 4** below for the approximate boundary of salinity and sodicity potential with very low (green), moderate (yellow) and high (orange).

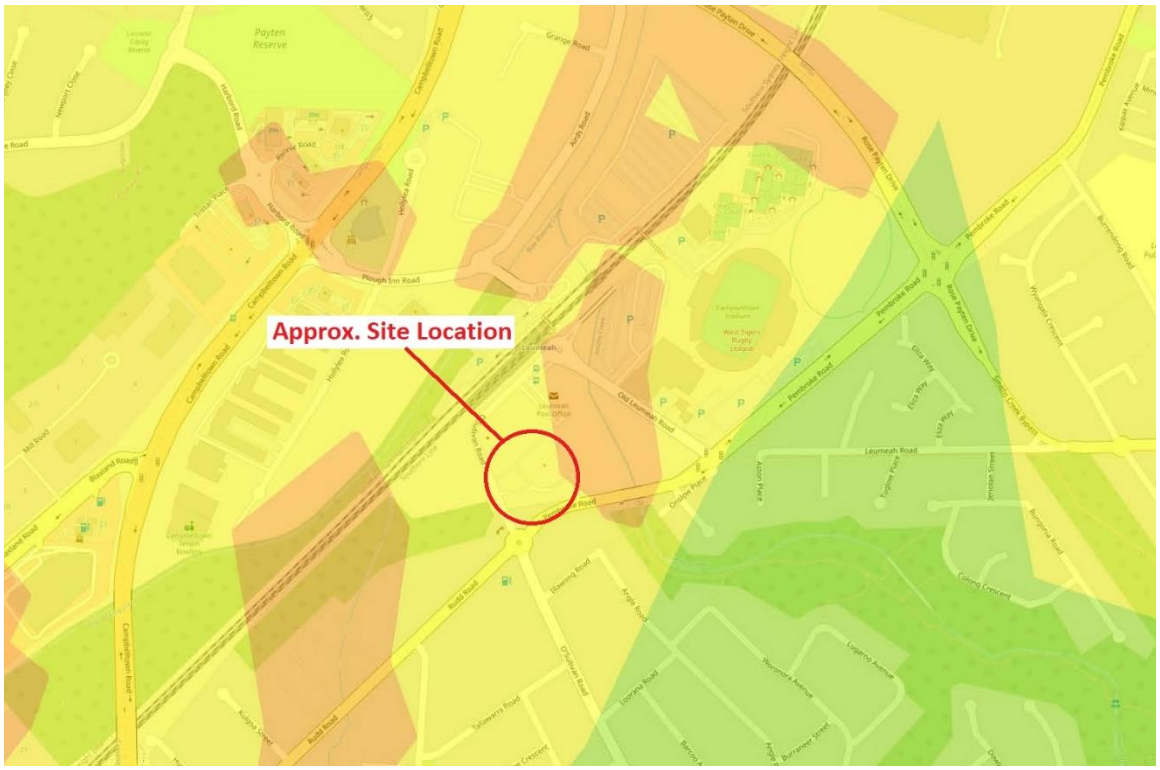

Figure 4 - Approximate extent of the potential for salinity and sodicity within the soils

9 Likely Subsurface Profile

There is limited geotechnical data available on the existing subsurface profile at the site. However, based on what data is available and the geological and soil landscapes for the area it is likely that the underlying subsurface soil profile consists of:

- Fill to unknown depths (likely less than 2m);
- CLAY of alluvial or residual origin;
- SANDSTONE, SILTSTONE and SHALE rock (likely encountered between 5m and 10m from the surface).

10 Proposed Geotechnical Investigation Scope

Based on the desktop study at the site it is our opinion that the following is required:

- Proposed buildings will require piered footings founded within medium to high strength rock (dependant on the footing loadings). As such, rock coring will be required at the site with a minimum of 5m of medium strength to high strength rock recovered (dependant on the footing loadings) at a minimum of 4 locations;
- Detailed salinity and sodicity testing at the site and the development of a salinity management plan (if required);
- Given that the site lies in a potentially moderate to high salinity zone, it is recommended that detailed aggressivity testing be undertaken at the site to determine aggressivity of soils to buried structures (concrete and steel);
- An acid sulfate soils assessment will not be required;
- As a minimum, foundation design parameters should include both allowable and ultimate shaft adhesion capacity and both allowable and ultimate end bearing capacity of underlying soils and rock;
- As a minimum, retaining wall parameters should include γ – unit weight, Φ' – angle of friction, C' – drained cohesion, Cu – undrained cohesion, Ka – Coefficient of active earth pressure, Kp – Coefficient of passive earth pressure Ko – Coefficient of at rest earth pressure.

11 Report Limitations

This report has been prepared by Hunter Civilab (HC) for the specific site and purposes described within this report. HC will accept no responsibility or liability for the use of this report by any third party, without the express consent of HC or the Client, or for use at any other site or purpose than that described in this report.

This report and the services provided have been completed in accordance with relevant professional and industry standards of interpretation and analysis. This report must be read in its entirety without separation of pages or sections and without any alterations, other than those provided by HC.

The scope of the investigation described in this report is based on information and plans provided to HC by the Client as well as any additional limitations imposed by either the Client and / or site restraints. Such limitations may include but are not limited to budget restraints, the presence of underground services or accessibility issues to a site. 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. HC should be consulted if site plans or design proposal is changed as the recommendations and / or opinions presented may not be suitable for the new revisions or variations made.

The conclusions, recommendations and opinions expressed within this report are subject to the specific conditions encountered and the limited geotechnical data gathered at the site during the time of the current investigation. The sub-surface conditions and results presented in this report are indicative of the conditions encountered at the discrete sampling and testing locations within the site at the time of the investigation and within the depths investigated. Variations in ground conditions may exist between the locations that were investigated, and the subsurface profile cannot be inferred or extrapolated from the limited investigation conducted by HC. For this reason, the report must be regarded as interpretative, rather than a factual document.

Sub-surface conditions are subject to constant change and can vary abruptly as a result of human influences and /or natural geological and / or climatic processes and events. As such, conditions may exist at the site that could not be identified during or may develop after the current investigation has been conducted and as such, may impact the accuracy of this report. HC should be contacted for further consultation and site re-assessment should sub-surface conditions differ from those conditions identified in this report.

We are pleased to present this report and trust that the recommendations provided are sufficient for your present requirements. If you have any further questions about this report, please contact the undersigned.

For and on behalf of

Valley Civilab Pty Ltd, trading as Hunter Civilab

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References:

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