4 July 2024

Lochinvar Developments Pty Ltd
c/- ADW Johnson
7/335 Hillsborough Road,
WARNERS BAY NSW 2282

Attention: Mr Mathew London

Dear Matthew,

RE: PROPOSED RESIDENTIAL SUBDIVISION – WYNDELLA ROAD, LOCHINVAR
ADDENDUM REPORT – GEOTECHNICAL INVESTIGATIONS

This addendum letter provides response to a Council RFI in relation to the geotechnical report, provided in an email from ADW Johnson dated 17 June 2024, and copied below.

> Geotech & earthworks
>
> a) There are areas of significant fill (2m+). The geotechnical report shall address how the consolidation/settlement of this fill will be achieved within tolerable limits.

Qualtest Laboratory NSW Pty Ltd (Qualtest) has previously conducted geotechnical assessments for the site, including the following reports:

- Preliminary Geotechnical Assessment – Report Ref. NEW22P-0012-AB, dated 4 March 2022;
- Contamination Assessment – Report Ref. NEW22P-0012-AA.rev1, 22 February 2023;
- Geotechnical Investigation – Report Ref. NEW22P-0012A-AA, dated 27 November 2023;

Reference should be made to the reports outlined above for full details of the scope of work carried out, including site description, engineering logs, soil profiles, laboratory testing conducted, and recommendations provided.

To provide background information, settlement of engineered fill may be characterised as having four potential components:

1. **Short-Term Settlement** – which occurs due to self-weight as the fill is placed and for a relatively short time after fill has reached full height.
2. **Elastic Settlement** – which occurs in the fill when subjected to loads from footings and floor slabs.
3. **Long-Term or Creep Settlement** – which occurs over a period of years. In the case of deep fills with light building loads, the creep due to the self-weight of the fill will be the major component of the long-term settlement.
4. **Hydroconsolidation (Collapse) Settlement** – which can occur and is due to saturation of the fill.

Historical data and published reference papers (Ref. 'Settlement Characteristics of Deep Engineered Fills', Peter J. Waddell & Patrick K. Wong, Australian Geomechanics Vol 40, No. 4, Dec 2005) indicate that for various fill materials of thickness up to 10m, predicted creep settlement may be in the range of 5mm to 30mm

With regards to this site:

- Reference to Site Regrade Plans provided by ADW Johnson, indicates that maximum depth of fill will be in the order of 3m to 4m;
- Site classification has not been carried out for the proposed subdivision as part of initial assessments. Based upon soil profiles and investigations to date, together with experience on nearby projects, a preliminary indication is that lots may potentially be mostly classified Class 'H2' in accordance with AS2870-2011 '*Residential Slabs and Footings'*.
- A characteristic free surface movement of 60mm to 75mm is estimated for lots classified as Class 'H2'.
- Where fill depths are to be in the order of 2.0m or greater, an increased compaction specification is covered in the requirements of AS3798-2007 "*Guidelines on Earthworks for Commercial and Residential Developments*", which states that – '*A minimum dry density ratio of 98% or higher may need to be considered if collapse on saturation or excessive settlement is likely to occur*'.
- It is recommended that all site regrade filling should be compacted to a minimum of 98% Standard Maximum Dry Density.

It is anticipated that predicted creep settlements may potentially be in the order of about 10mm over 20 years based on up to 4m depth of compacted fill. For a potential site classification of Class 'H2' (TBC), footings would be designed in accordance with AS2870-2011 based on estimated free surface movement in the range of 60mm to 75mm. This allows for significantly more movement than any potential long-term or creep settlement movements.

Where carrying out filling to relevant Australian Standards and design specifications, possible settlement based on the 4 potential settlement components outlined above can be suitably managed. With adequate control on fill placement to ensure uniform distribution of material types, compaction level and moisture conditioning, it should be possible to adopt shallow foundations on deep fills to meet the footing performance expectations similar to natural sites, and any potential consolidation / settlement of the fill should be within tolerable limits.

In addition to the above, the following points are made with respect to general site specific development conditions at this site:

- This is not a soft soils site. (i.e. Filling is not required to be carried out as part of a Pre-Load Design, to minimise post construction settlements).
- Following stripping, underlying natural soil profile comprises of stiff to very stiff Residual clays and Weathered Rock.
- Based on a review of the Site Regrade Plans provided, it is understood that maximum depth of filling is in the order of 4m. This is not significant deep fill, (i.e. in the order of 10m or greater) where settlement of poorly compacted fill may occur and impact on design requirements.
- The filling performed for site regrade, is to be carried out to Level 1 criteria as defined in Clause 8.2 – Section 8, of AS3798-2007, "Guidelines on Earthworks for Commercial and Residential Developments".
- Subsequent Site Classification for lots to be conducted in accordance with the requirements of AS2870-2011 "Residential Slabs and Footings".

LIMITATIONS

This report comprises the results of an investigation carried out for a specific purpose and client as defined in the document. The report should not be used by other parties or for purposes or projects other than those assumed and stated within the report, as it may not contain adequate or appropriate information for applications other than those assumed or advised at the time of its preparation. The contents of the report are for the sole use of the client and no responsibility or liability will be accepted to any third party. The report should not be reproduced either in part or in full, without the express permission of Qualtest.

Geotechnical site investigation is based on data collection, judgment, experience, and opinion. By its nature, it is less exact than other engineering disciplines. The findings presented in the report and used as the basis for recommendations presented herein were obtained using normal, industry accepted geotechnical design practices and standards. To our knowledge, they represent a reasonable interpretation of the general conditions of the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points.

The recommended depth and properties of any soil, rock, groundwater, or other material referred to in this report is an engineering estimate based on the information available at the time of its writing. The estimate is influenced and limited by the fieldwork method and testing carried out in the site investigation, and other relevant information as has been made available. In cases where information has been provided to Qualtest for the purposes of preparing this report, it has been assumed that the information is accurate and appropriate for such use. No responsibility is accepted by Qualtest for inaccuracies within any data supplied by others.

The extent of testing associated with this assessment is limited to discrete test locations. It should be noted that subsurface conditions between and away from the test locations may be different to those observed during the field work and used as the basis of the recommendations contained in this report. If site conditions encountered during construction differ from those given in this report, further advice should be sought without delay.

This report alone should not be used by contractors as the basis for preparation of tender documents or project estimates. Contractors using this report as a basis for preparation of tender documents should avail themselves of all relevant background information regarding the site before deciding on selection of construction materials and equipment.

If you have any questions regarding this matter please do not hesitate to contact the undersigned.

For and on behalf of Qualtest Laboratory (NSW) Pty Ltd.

Jason Lee
Principal Geotechnical Engineer