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De Luxe Properties Ltd

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Dear Greg

Liquefaction Assessment; Lots 1-36, Rose Manor Drive, Blenheim
Our Reference 7034

1.0 Introduction

Marlborough District Council have requested a liquefaction assessment for the completed lots 1 to 36 in the first stage of the Rose Manor Drive.

The lots form part of the Rose Manor Subdivision resource consent U160625. The stage 1 and 2 areas were geotechnically assessed by CGW Engineers in 2015, however the liquefaction risk was not assessed in their report dated 7th July 2015. Smart Alliances Ltd completed the geotechnical assessment of the western stage (Stage 3) of the subdivision in 2018 and a report dated 16th November 2018 has been prepared.

2.0 General

The site is relatively flat and grass covered and has recently been developed for subdivision. The site plan is shown below.

3.0 Investigations

The site is located north west of Blenheim in an area previously studied by Opus in 2012. A review of the 2012 Opus study was carried out to comment on the liquefaction for the area.

The site is located in an area potentially susceptible to earthquake-induced liquefaction and lateral spread. Liquefaction-induced lateral ground displacement occurs predominately in the vicinity of watercourses where liquefied soil can laterally displace towards the watercourse.

The Wairau Fault is approximately 1.7km to the north.

The nearest Opus CPT test (CPT3) is located approximately 200m north-east of the site in an area referred to as Area Na:Nb. The test and nearby borehole BH1 indicate that the soil layers susceptible to liquefaction were a shallow silty sand, being at 2m-4m below ground level. These layers overlaid the natural alluvial gravels of the Rapaura Formation.

The predicted ground subsidence due to liquefaction within the area was predicted to be 25-75mm for 1/500 and 1/1000 return period (ULS).

The incidence of lateral spread was predicted to be minor, although most likely in close proximity to water courses. An extract from the Opus report showing the test locations and subject property (highlighted red) is shown in Figure 3.

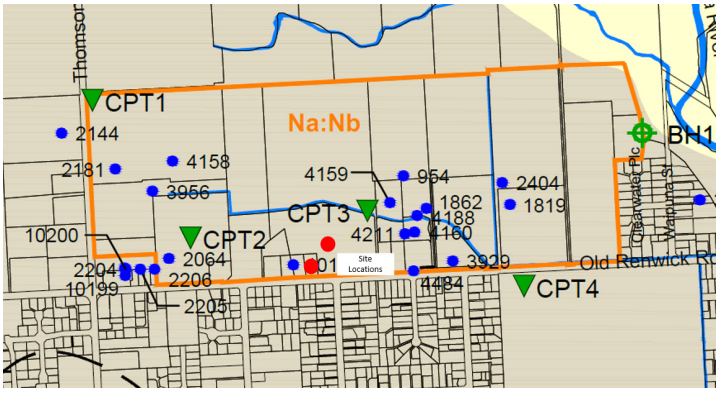

Figure 3: Opus test locations. Area Na:Nb

4.0 Assessment

Based on the quantitative investigations already undertaken in the area, and the specific tests taken at the site, it is considered that under ULS conditions liquefaction induced settlement of up to 75mm can be expected. SLS settlements can be expected to be 15mm. The foundation systems selected for the site should be designed to accommodate the above settlements and be able to be re levelled following an ULS event.

Due to the setback from any significant water course in the area lateral spread risk was considered to be minor, and no specific provision for this is deemed necessary in foundation design other than that required by the building code.

Regards,

Richard Evans
Chartered Professional Engineer (Geotechnical)