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13 March 2017

Fulton Hogan Land Development Limited
c/o Evolve Land Limited

Via email: greg@evolveland.nz

Attention: Greg Dewe

Dear Greg

Fulton Hogan Land Development Limited Stage 9 Rosemerryn Subdivision Geotechnical Completion Letter Report
Our Ref: 224464

This geotechnical completion letter report is submitted in accordance with Section 12.4.1 of the Selwyn District Council Engineering Code of Practise.

1 Introduction

As part of the Fulton Hogan Land Development Limited (FHLD) Rosemerryn Subdivision Development located at Lincoln. As part of the development Aurecon has completed a geotechnical investigation and assessment of the wider site including the area that now identified as Stage 9 of Rosemerryn. This is detailed in the Aurecon geotechnical report "*Geotechnical Investigation Report, Revision 2, Rosemerryn Farm Stages 7 to 15 Fulton Hogan Land Development Ltd*", file 224464, dated 26 July 2012.

The report was issued following the publication of the Department of Building and Housing (now MBIE) guidelines, (dated November 2011) which define the new Technical Category zoning and the liquefaction induced deformation limits for each Technical Category. Overall the liquefaction risk at the site was assessed as being consistent with a Technical Category 2 (TC2) classification. As such no site specific liquefaction mitigation measures were required for the site development.

2 Liquefaction Hazard Assessment

The Ministry of Business Innovation & Employment (MBIE) guidelines define the Technical Category zoning and the liquefaction induced deformation limits for each Technical Category.

The categories and corresponding criteria are summarised as follows:

- **Technical Category 1 (TC1)** – Future land damage from liquefaction is unlikely, and ground settlements are expected to be within normally accepted tolerances.
- **Technical Category 2 (TC2)** – Minor to moderate land damage from liquefaction is possible in future large earthquakes.
- **Technical Category 3 (TC3)** – Moderate to significant land damage from liquefaction is possible in future large earthquakes.

For the Canterbury region, the MBIE has released a new classification system for residential land on the flat in regard to liquefaction susceptibility. These are summarised below:

Table 1: Liquefaction Deformation Limits and House Foundation Implications

Technical Category	Index Liquefaction Deformation Limits				Likely Implication for House Foundations (subject to individual assessment)
	Vertical SLS	ULS	Lateral Spread SLS	ULS	
TC1	15mm	25mm	Nil	Nil	Standard NZS3604 type foundations with tied slabs are acceptable subject to shallow geotechnical investigation.
TC2	50mm	100mm	50mm	100mm	MBIE enhanced foundation solutions.
TC3	>50mm	>100mm	>50mm	>100mm	Site specific foundation solution.

The liquefaction analysis for Stage 9 was based on the boreholes and CPT testing carried out as part of the geotechnical investigations for the larger subdivision. The geotechnical investigation information used to assess Stage 9 is part of a large group of geotechnical information and only the tests that are relevant for this stage have been assessed. Consideration was given to information and data from directly outside Stage 9 boundaries.

3 Technical Category Classification

Based upon our assessment and observed site performance we believe:

- **Lots 1 to 30 fulfil the requirements of TC2 Classification.**
- **Lots 50, 51, 623, 624 and 814 are roading and reserve areas; therefore no Technical Category Classification is applicable for these lots.**

A TC2 Classification effectively means that the MBIE believe that ‘*Minor to moderate land damage from liquefaction is possible in future significant earthquakes*’. House foundation design and site specific geotechnical investigations are required in accordance with the MBIE (2012) guideline documents ‘*Repairing and rebuilding houses affected by the Canterbury earthquakes*’ released in December 2012.

4 References

Aurecon 2012. *Geotechnical Investigation Report, Rosemerryn Farm Stages 7 to 15 Fulton Hogan Land Development Ltd, Revision 2* – dated 26 July 2012. Aurecon New Zealand Limited, Christchurch, New Zealand.

MBIE, 2012. *Repairing and rebuilding houses affected by the Canterbury earthquakes*. Ministry of Business, Innovation and Employment, Wellington, New Zealand – December 2012

5 Limitations

The contents of this letter are for the sole use of the Client and no responsibility or liability will be accepted to any third party. Information or opinions contained within this letter may not be used in other contexts or for any other purposes without our prior agreement. The comments in this letter are based on our investigations of the site for the sole purposes of the geotechnical aspects only, as requested by the Client. Only a finite amount of information has been collected and this letter does not purport to completely describe all the site characteristics and properties. The extent of our investigations and the results of all the tests carried out are as described in the geotechnical report for Stage 9 is detailed in “*Geotechnical Investigation Report, Rosemerryn Farm Stages 7 to 15 Fulton Hogan Land Development Ltd, Revision 2*”, dated 26 July 2012.

We trust this meets your requirements and if there are any further queries please do not hesitate to contact us.

Yours sincerely

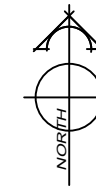


Dr Jan Kupec elect. sign
Technical Director – Ground Engineering

Enc: SDC Approved Subdivision Plan for Rosemerryn Subdivision – Stage 9

Rosemerryn

Stage 9 Lincoln



NOTES :

- 1) Areas and dimensions are subject to final survey and deposit of plans.
- 2) Service easements to be created as required.
- 3) This plan has been prepared for concept purposes only. No liability is accepted if the plan is used for any other purpose.
- 4) Any measurements taken from information which is not dimensioned on the electronic copy are at the risk of the recipient.



**AS APPROVED BY
SELWYN DISTRICT COUNCIL
Planning Department**

**RESOURCE CONSENT
165278**

4/07/2016 flynnr

- RESIDENTIAL LOTS
- FIRST SEQUENCE RESERVES
- DRAINAGE RESERVES



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JOB TITLE :
**Fulton Hogan Limited
Rosemerryn - Lincoln**

SHEET TITLE :
**Proposed Subdivision of
Lot 703 RMA.....**

DRAWING STATUS
Concept

SCALE : 1:1250@A1 DATE : April 2016
1:2500@A3

CAD FILE : J:\18448\E18448_CONCEPT_STG9 R1.dwg REVISION :
DRAWING No : SHEET No :
E.18448.S09 **R2**