

2018-07-11

Greg Dewe
Land Operations Manager
Fulton Hogan Ltd

Via email: Gregory.Dewe@fultonhogan.com

Dear Greg,

**Rosemerryn Subdivision - Stage 12
Geotechnical Completion Letter Report**

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, Aurecon has completed a geotechnical investigation and assessment for Stages 10 to 18, including the area now known as Stage 12. This assessment is detailed in the Aurecon geotechnical report "*Rosemerryn Subdivision, Lincoln, Stages 10 to 18 Geotechnical Investigation Report*", dated 25 September 2015.

2 Liquefaction Hazard Assessment

The report was issued following the publication of the Ministry of Business Innovation & Employment (MBIE), guidelines in December 2012 and subsequent updates in 2014, which define the Technical Category zoning and the liquefaction induced deformation limits for each Technical Category.

The categories and corresponding criteria are summarised and in Table 1 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.

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		Lateral Spread		
	SLS	ULS	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.

A liquefaction hazard assessment was carried out as part of the site assessments in 2015 using the prescribed in the Ministry of Business, Innovation, and Employment (MBIE, 2014) guidelines for residential development in Canterbury following the Canterbury earthquake sequence.

The liquefaction analysis for Stage 12 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 12 is part of a large group of geotechnical information and only the tests that are relevant for this stage has been assessed. Consideration was given to information and data from outside the stage boundary when assessing geotechnical hazards and issues, as well as the site's performance in the recent Canterbury Earthquake sequence.

3 Technical Category Classification

Based upon this assessment and observed site performance we believe:

- **Lots 375 to 376, 420 to 425, 431 to 434 and 437 to 440 fulfil the requirements of TC1 Classification.**
- **Lots 372 to 374, 426 to 430, 435 to 436 and 474 fulfil the requirements of TC2 Classification**
- **Lot 7001 is roading reserve area and therefore no Technical Category Classification is applicable for this lot.**

A TC1 Classification means that *'Future land damage from liquefaction is unlikely, and ground settlements are expected to be with normally accepted tolerances.'* Standard type foundations (e.g. NZS3604, NZS3229 etc.) are acceptable subject to shallow geotechnical investigation.

A TC2 Classification means *'Minor to moderate land damage from liquefaction is possible in future significant earthquakes'*. house foundations 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.

This report is not intended to be a detailed site specific shallow ground investigation suitable to support a building consent application.

4 References

Aurecon, 2015. *Rosemerryn Subdivision, Lincoln, Stages 10 to 18 Geotechnical Investigation Report, Rev3* - dated 25 September 2015. 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.

MBIE, 2014. *Repairing and rebuilding houses affected by the Canterbury earthquakes*. Ministry of Business, Innovation and Employment, Wellington, New Zealand – October 2014.

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 presented in the geotechnical report for Stages 10 to 18 “*Rosemerryn Subdivision, Lincoln, Stages 10 to 18 Geotechnical Investigation Report*”, dated 25 September 2015.

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

Yours faithfully



Ian McPherson
Technical Director – Ground Engineering

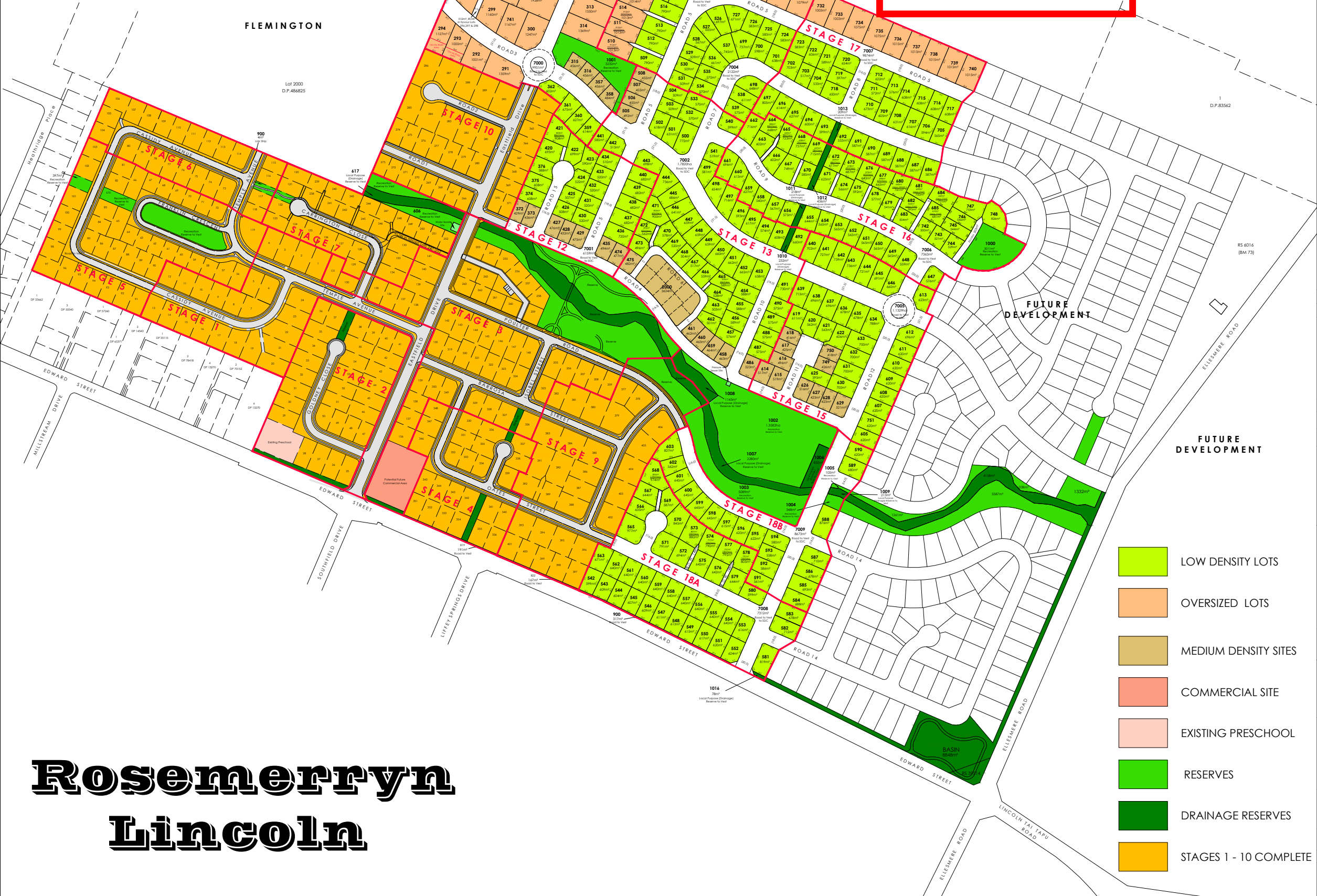
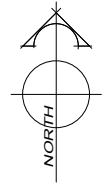
Enc: SDC Approved Subdivision Plan for Rosemerryn Subdivision

Stage	Residential Lots	Reserves
11	33	3566m ²
12	27	-
13	62	2,3176ha
14	41	162m ²
15	42	-
16	46	3665m ²
17	43	209m ²
18A	41	78m ²
18B	20	666m ²

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

**RESOURCE CONSENT
RC175446**

25/09/2017 bonifk
D.P.26432



AMENDMENT	DATE	DESCRIPTION
R19	23/03/2016	5m RADIUS ARCS AMENDED, ROAD 4 WIDTHS REDUCED & ADJACENT LOTS UPDATED, ROAD AREAS UPDATED, CURB-DE-SAC HEADS INCREASED, RIGHT OF WAYS WIDENED, LINK STRIPS REMOVED, TOTAL AREA UPDATED.
R20	02/09/2016	STAGE 9 REDESIGN OF LOTS 377-406
R21	23/03/2016	LOTS 295-300, 315, 316, 357, 1001 & 7000 AMENDED, STG 11 AREAS
R22	17/07/2017	STAGE BOUNDARIES & ROAD AREAS AMENDED
R23	24/07/2017	CHANGES TO LOTS 360, 361, 422, 423, 568, 569, 570, 602 & 603, NO BUILD

- 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 subdivision consent 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.
 - 5) This plan is subject to the granting of subdivision and/or resource consents and should be treated as a proposal until such time as the necessary consents have been granted by the relevant authorities.

	STAGES 1-10	STAGES 11-18B	FUTURE DEVELOPMENT
TOTAL AREA	29.0618ha	37.5982ha	24.9919ha
NET AREA	27.6520ha	36.9827ha	23.6913ha
LOTS	301	366	241
LOTS/ha	10.885	9.896	10.17
OVERALL LOTS/ha	10.280 Sites /ha		

STAGES 11-18B SCHEDULE OF AREAS	
Description	Area
Residential Lots	25,269 ha
Roading	8,725 ha
Reserve	2,536 ha
Drainage Reserve	615 m ²
Right of Way	3646 m ²
	37,511 ha

Total Area: 62.5032ha
 Comprised in: CFR 696599, CB7B/1326



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 Telephone: 03 379-0793 Website: www.dls.co.nz E-mail: office@dls.co.nz

JOB TITLE :
 Fulton Hogan Limited
 Edward Street, Lincoln

SHEET TITLE :
 Proposed Subdivision of
 Lot 703 DP 505326 & RS 39514

DRAWING STATUS
 Resource Consent Purposes

SCALE : 1:5000@A3 1:2500@A1	DATE : July 2017	REVISION : R23
CAD FILE : J:\17001\517001 STAGING PLAN_R23.dwg	SHEET No :	
S.17001		

Rosemerryn Lincoln

- LOW DENSITY LOTS
- OVERSIZED LOTS
- MEDIUM DENSITY SITES
- COMMERCIAL SITE
- EXISTING PRESCHOOL
- RESERVES
- DRAINAGE RESERVES
- STAGES 1 - 10 COMPLETE