

10 March 2020

Document Ref: AKL2018-0233AD Rev 0

Fulton Hogan Land Development Limited
 C/- Barker & Associates
 P.O. Box 1986
 Shortland Street
 Auckland 1140

Attention: Rebecca Sanders

Dear Rebecca

**RE: DRURY EAST PRIVATE PLAN CHANGE
 AUCKLAND COUNCIL REQUEST FOR FURTHER INFORMATION**

1 INTRODUCTION

We have been provided with a copy of the Request for Further Information from Auckland Council in relation to the CMW Geosciences Assessment Report (Ref. AKL2018-0233AB Rev 3, dated 9 August 2019) that was submitted in support of the Drury East Private Plan Change Application.

2 DISCUSSION

The various requests and CMW responses are detailed in Section 2 below. We have utilised the original table from within the RFI as the base for our response.

Request for further information	Reason for request	CMW Response
<p>5.1 Appendix 17: Drury plan change geotechnical assessment report</p>		
<p>The geotechnical assessment report (GAR) presents a desk-based assessment of site conditions. While the results presented in the report appear realistic, there are some notable omissions. The following queries were identified in the course of the review:</p>		
<p>1 - Please provide ground investigation information and the geohazard</p>	<p>Page 6. Section 6 Geohazards Assessment: We note no ground investigation is referred to in the report. There is insufficient information on which to adequately determine the geohazards on the</p>	<p>There are only high-level scheme plans available at present, with no specific information on which to base more detailed assessments (such as final contours, cut/fill plans, Lot layouts, possible final</p>

<p>assessment which references this information.</p> <p>Please update the report accordingly.</p>	<p>site (with the exception of faulting and seismicity, erosion and stormwater).</p>	<p>land use areas). Section 6 is presented to outline the possible hazards that may be present on site that would need to be investigated for, assessed against and potentially designed for during development planning for the site. We do not consider that specific ground investigation information is required at this Plan Change stage.</p>								
<p>2 - Please update the liquefaction assessment based on ground investigation information (also see query 1 above).</p>	<p>Page 7, Section 6.3.1: Paragraph 1 notes that liquefaction susceptibility has been considered in accordance with NZGS guidance Module 3 (NZGS & MBIE, 2016) and is based on published information (geological and topographical maps) and local knowledge. While this type of assessment is a useful “screening” tool for sites where there is a relatively high degree of certainty that liquefaction damage is unlikely, it does result in substantial residual uncertainty in all other cases.</p> <p>MBIE and MfE jointly developed a guidance document (MBIE & MfE, 2017) which presents a risk-based process to manage liquefaction risk in land use planning and development decision making. This guidance includes recommendations for the minimum level of detail in liquefaction assessments to inform planning and consenting processes for a range of scenarios (Figure 2). The recommended level of detail for a Plan Change scenario at the subject site is Level B,</p> <p>Table 3.2: Information typically used for liquefaction assessment</p> <table border="1"> <thead> <tr> <th>LEVEL OF DETAIL</th> <th>INFORMATION TYPICALLY USED¹</th> </tr> </thead> <tbody> <tr> <td>Level A Basic desktop assessment</td> <td>Basic regional-scale information: – Large-scale regional maps of geology and geomorphology. – Large-scale regional maps of depth to groundwater. – Regional seismicity information. – Historical observations of liquefaction in previous earthquakes (will only see eg Fairless & Berrill (1984)). – Assessment using simple screening criteria based on geological age, seismic levels, to identify areas where significant liquefaction-induced ground damage is likely to occur. – Qualitative assessment using simple screening criteria based on geomorphology to identify areas where there is potential for lateral spreading to occur, or the landform suggests it may occur. – Local experience of typical ground conditions across an area. – ‘Walkover’ examination of the area being mapped (for small study areas) or of key geological features (for large study areas).</td> </tr> <tr> <td>Level B Calibrated desktop assessment</td> <td>As above, plus high-level ‘ground-truthing’: – Information from a small number of subsurface investigation points to provide understanding of the nature and variability of the key geological units. – Qualitative (or possibly quantitative) assessment of subsurface ground conditions to provide understanding of the potential for liquefaction triggering to occur, and potential for lateral spreading to occur. – Information from a small number of groundwater monitoring points to provide understanding of variation in groundwater level over time.</td> </tr> <tr> <td>Level C Detailed</td> <td>As above, plus detailed information on ground conditions and groundwater level across the entire study area.</td> </tr> </tbody> </table>	LEVEL OF DETAIL	INFORMATION TYPICALLY USED ¹	Level A Basic desktop assessment	Basic regional-scale information: – Large-scale regional maps of geology and geomorphology. – Large-scale regional maps of depth to groundwater. – Regional seismicity information. – Historical observations of liquefaction in previous earthquakes (will only see eg Fairless & Berrill (1984)). – Assessment using simple screening criteria based on geological age, seismic levels, to identify areas where significant liquefaction-induced ground damage is likely to occur. – Qualitative assessment using simple screening criteria based on geomorphology to identify areas where there is potential for lateral spreading to occur, or the landform suggests it may occur. – Local experience of typical ground conditions across an area. – ‘Walkover’ examination of the area being mapped (for small study areas) or of key geological features (for large study areas).	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Full investigations and assessment will be undertaken as part of detailed design for the future development as part of Resource Consent applications. Accordingly, we do not consider site specific investigations are necessary at this Plan Change stage.</p>
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	Figure 1: Excerpt from MBIE & MfE, 2017 (Table 3.2)	
3 - Please provide the results of a liquefaction hazard assessment based on ground investigation information collected within the site area.	<p>Page 7, Section 6.3.3: Liquefaction susceptibility has been assessed as “not susceptible to liquefaction” on the basis of soil fabric using laboratory test data from the adjacent Drury South development. It is likely that the majority of the laboratory tests on the Drury South site would have been carried out on samples of fine grained weathered South Auckland Volcanic Field (SAVF) basalt lava which is likely to be less susceptible to liquefaction than the coarser grained Puketoka Formation soils located near the northern and western extents of the subject site.</p> <p>Ground investigation information is required within the site area to be able to undertake this assessment with a sufficient level of confidence to assess the liquefaction geohazard at plan change stage (also see query 1 above).</p>	See Section 2 response.
4 - Please provide the results of a settlement hazard assessment based on ground investigation information collected within the site area.	<p>Page 8, Section 6.6. We require comment on the relative risk of long-term consolidation settlement of Puketoka Formation as a result of fill placement (either to form building platforms above flood plains or to create a suitable raft above potentially compressible or liquefiable soils). The impact of settlement due to dewatering associated with utilities trenches must also be considered and commented on. The investigation information as required by query 1 above must be used in this settlement assessment.</p>	We have noted that there is a low risk of settlement across the site. It is unclear how the level of risk of this hazard would affect the zoning of the property. Full investigations and assessment will be undertaken as part of detailed design for the future development as part of Resource Consent applications. Accordingly, we do not consider site specific investigations are necessary at this Plan Change stage.
5 - Please include comment the potential strength loss impact of allophanic content in the SAVF soils.	<p>Page 8, Section 6.8: The potential strength loss impact of allophanic content in the SAVF soils has not been considered for earthworks, nor the potential impact of ashfall deposits and ignimbrites in the Puketoka Formation.</p>	The potential strength loss due to allophanic content is an earthworks consideration and is considered irrelevant at the Plan Change stage.

For and on behalf of CMW Geosciences

Prepared by:



Andrew Linton
Principal Geotechnical Engineer

Reviewed and authorised by:



Richard Knowles
Principal Geotechnical Engineer, CPEng

Distribution: 1 electronic copy to Barker & Associates via email
Original held at CMW Geosciences

