

23 March 2020

Kiwi Property Holdings No.2 Ltd
C/- Barker & Associates
Level 4
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Auckland 1010

Attn: Rebecca Sanders

RE: Drury Centre Private Plan Change RFI Response
(Our Reference: 13451.000.000_23)

1 Introduction

ENGEO Ltd was requested by our client Kiwi Property Ltd (Kiwi) to prepare a response to the Drury Centre Private Plan Change RFI Request from Auckland Council ref: AKLC-1201561183-501 (V1), dated 17 February 2020.

ENGEO has previously undertaken due diligence level investigations across a majority of the proposed plan change site to provide guidance to our client on the geotechnical risks and parameters specific to the site. This work has been undertaken in conjunction with the development of the draft master plan and is at a level suitable to support the level of plan development being undertaken.

2 RFI Response

Table 1: Requests for further information

Request for further information	Reason for request	ENGEO Response
5.1 Section 32 Drury Centre PPC request report		
Please provide ground investigation, laboratory test information and interpreted geological information (e.g. geological cross sections).	The report states that some localised soft and organic deposits are anticipated within the vicinity of creeks and tributaries on the site, as well as very expansive surface soils on the property at 133 Fitzgerald Road and that specific foundation design will be required for future buildings at this location.	The updates to the GIR requested as part of this request for further information require a level of testing and analysis associated with a specific development proposal which will happen through the resource consent process. Therefore, no updates to the Section 32 Assessment Report are considered necessary.

	It is likely that weak / organic deposits and expansive soils are not limited to 133 Fitzgerald Road, however it is not possible for us to adequately assess this without first reviewing the ground investigation and laboratory test results.	
5.2 Appendix 7: Urban design assessment		
Please provide results of settlement and liquefaction assessments as well as any other constraints and opportunities identified in the course of the geotechnical assessment. This information could be included within the body of the report or as figures (e.g. hazard maps or constraints/opportunities maps).	Appendix 1, Section 4.14.3 'Geotechnical & Floodplain': The geotechnical section includes comment on investigation coverage, proposed further investigation and brief comment on the suitability of the site for development. At master planning stage it would be reasonable to include results of settlement and liquefaction assessments as well as any other constraints and opportunities identified in the course of the geotechnical assessment.	Not applicable for a Plan Change geotechnical assessment. ENGEO undertook geotechnical investigations to support evaluation of geotechnical risks and a high level ground model for the site to determine if urban development of the Plan Change area is appropriate. Detailed and targeted liquefaction and settlement modelling, analysis and assessment will be made following the development of a concept plan to provide targeted investigation locations to support this plan and earthworks design. This is a matter for Resource Consent.
Please update Appendix 1 of the Urban design assessment: Master Plan report. Following updates	There are several comments in Section 5.4 of this (Council) memo that could result in updates to the Due Diligence Review Report, such updates should be reflected in Appendix 1 of the Urban Design Assessment: Master Plan report.	This matter is addressed in the Urban Design RFI response.
5.3 Appendix 13: Engineering and infrastructure report		
Please provide ground investigation, laboratory test information and interpreted geological information (e.g. geological cross sections).	The report states that future earthworks for the development will be designed to achieve a cut fill balance over the Drury Metropolitan Centre Plan Change Area and that preliminary geotechnical investigations to date have	ENGEO undertook a due diligence level geotechnical investigation. This broadly characterised the subsurface ground profile with high level discussion on potential earthworks considerations. All risks identified are able to be mitigated

	<p>confirmed that the underlying soils are suitable for a bulk cut to fill operation. The presence of expansive soils and the corresponding tight moisture content requirements could limit the earthwork season such that using site won soils for bulk earthworks may no longer be a viable option. However, the extent and nature of weak/organic deposits and expansive soils at the site is not presented in sufficient detail for us to adequately assess suitability of site soils to be used for bulk earthworks.</p>	<p>and further delineation of material types and risk related areas will be undertaken to support consent level development and earthworks concept designs.</p>
<p>5.4 Appendix 20: Geotechnical and environmental due diligence review report</p> <p>The due diligence report includes both a desk-based assessment and review of information from physical investigations carried out on four parcels of land within the proposed plan change area. While the results presented in the report appear realistic, there are some notable omissions.</p> <p>The following queries were identified in the course of the review:</p>		
<p>Please provide geotechnical investigation information (location plan, borehole logs, borehole photographs and laboratory test results) for the whole plan change area.</p>	<p>Section 5.1 Geotechnical Discussion: The report references geotechnical investigations carried out on land parcels within the proposed plan change area, however no geotechnical investigation information (location plan, borehole logs, borehole photographs and laboratory test results) is included in the report.</p> <p>Note; ground investigation information must be obtained for the whole plan change area, including the northern and southern parts of the area which appear have not been covered by any investigation.</p>	<p>ENGEO was not able to access the entire plan area at the time of undertaking the due diligence level investigations. As such investigations were limited to land parcels where access was available, however we do not anticipate from the desktop and intrusive testing results that other land parcels within the plan change area would not be suitable for development.</p> <p>Ground conditions through areas which have not been investigated are consistent with the ground conditions encountered throughout our investigations undertake within the Plan Change area. There is no</p>

		<p>reason to believe these would differ with any significance that would not be able to be mitigated.</p>
<p>Please provide the results of a liquefaction assessment. Such an assessment must also include comment on the likely extent of lateral spread adjacent to the stream and the impact of liquefaction on foundation/infrastructure design in areas underlain by potentially susceptible soils.</p>	<p>Liquefaction potential is not discussed in sufficient detail in either of the geotechnical discussion sections of the report (Section 5.1 and 7.1). Given the likely presence of silts and clays of the Puketoka Formation adjacent to the Hingaia Stream, we expect a high-level liquefaction assessment to have been carried out as a minimum, as results of such an assessment could place constraints on the development potential of the site.</p>	<p>Our client has advised us that land adjacent to the Hingaia Stream is likely to be utilised as a recreation area and it is proposed to be zoned Open Space – Informal Recreation.</p> <p>As a result, we don't accept that detailed liquefaction / lateral spread analysis on the data obtained from this area at the plan change stage of the process was required until a clear development and earthworks concept had been developed.</p> <p>This is also the case for gully areas where a due diligence level investigation has been carried out.</p>
<p>Please provide the results of a settlement assessment. Such an assessment must also include comment around the areas of the site which could be affected by settlement either as a result of loading underlying peat or weak soils (e.g. near the stream) or as a result of dewatering associated with service trenches.</p>	<p>Soil compressibility is not discussed in sufficient detail in either of the geotechnical discussion sections of the report (Section 5.1 and 7.1). We expect a high-level settlement assessment as a minimum in light of the likely presence of compressible silts and clays of the Puketoka Formation and the proposal to construct buildings of up to nine (9) storeys in the vicinity of the Hingaia Stream.</p>	<p>This is a matter for Resource Consents and Building Consents once there is a development proposal. ENGEО had not been provided with development concept or earthworks plans at the time of undertaking the investigations. Combined with the due diligence level of the investigations, we do not accept that undertaking settlement analysis / assessment would be accurate or provide sufficient value at this plan change stage given that specific cut and fill designs have not been finalised and as such cannot be accurately modelled. Suitable mitigations such as pre-loading the use of wick drains or removal of compressible soils can be used to mitigate the effects of compressible</p>

		<p>soils in any critical areas of the development.</p> <p>Our reports note the requirement to assess compressible soils in subsequent investigations to support a development concept plan.</p>
<p>Please identify and discuss potential constraints associated with geology and geomorphology.</p>	<p>Section 6.1, Paragraph 2: The report notes the presence of a steep sided, northwest trending gully in the northernmost part of the site. No significant scarps were identified during the walkover inspection, but physical ground investigations were not carried out at this location, therefore the level of uncertainty with respect to the presence of soft/weak soils and slope instability remains significant. This must be noted more clearly in the report or clearly shown on a hazard map.</p>	<p>ENGEO was not able to access this part of the site at the time of undertaking the due diligence level geotechnical investigations.</p> <p>Given the early stages of the development proposal there is an ability to design around critical areas. The ground conditions encountered do suggest that mitigation of geologically hazardous features can be undertaken. Further detail on these areas can be ascertained and factored into the specific concept design as needed.</p> <p>The overall assessment of the ground conditions encountered on site during the investigations undertaken was that the site was suitable for development in line with other sites in the area, which have been successfully developed. The ground conditions encountered supported development of the site.</p>
<p>Please provide the following:</p> <ul style="list-style-type: none"> - Areas where soakage may be appropriate, thus reducing the development cost by avoiding reticulated drainage. 	<p>To give a clearer indication of development potential.</p>	<p>We consider most of these are matters for resource consent:</p> <ul style="list-style-type: none"> • Soakage testing was undertaken by T&T, please refer to the Stormwater Management Plan.

<ul style="list-style-type: none"> - Areas where acid sulphate soils may be a hazard that may require more robust buried infrastructure. - Geological faults in the vicinity of the site. - Review and summary of other readily available reports outlining the development potential of the site in question. - An investigation location plan. - Borehole logs. - Laboratory test results. - A geological cross section through the site. 		<ul style="list-style-type: none"> • ENGEO does not anticipate that acid sulphate soils will be a risk at this site but in any case if testing for these were required this would be done as part of a consent level geotechnical investigation. If acid sulphates are found to exist there are mitigation measures available to be employed to neutralise these such as combining with lime. • The Wairoa North Fault is active and within the vicinity of the site. The corresponding PGA will be used to address analysis and modelling during detailed design to ensure this is taken account of. As per other developments in proximity to the Wairoa North Fault, this would not act to impact the development of this site. • ENGEO undertook limited review of publicly available reports and property files but focussed on undertaking due diligence level site specific investigation where possible. The desktop assessment combined with the targeted site-specific investigation undertaken provided a representative outline of
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		<p>the soil conditions expected to be encountered over the wider Plan Change area. The scope was in line with the brief from our client.</p> <ul style="list-style-type: none">• All factual investigation data and testing is available within our reports.• Development of a detailed geological cross section to be undertaken to support a consent level development concepts.
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3 Limitations

- i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Kiwi Property Holdings No.2 Ltd, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.
- ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the Client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.
- iii. Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.
- iv. This Limitation should be read in conjunction with the Engineering NZ / ACENZ Standard Terms of Engagement.
- v. This report is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on (09) 972 2205 if you require any further information.

Report prepared by



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Report reviewed by



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