LDE
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Memorandum

To:	Renee Fraser-Smith
From:	Shane Lander | Principal Geotechnical Engineer
Copy:	Doyle Smith; Daniel Nakhle
Subject:	Revised Application for Fast Track Referral Pohutukawa Business Park, 885 Whitford Maraetai Road, Beachlands
Date:	5 June 2025
Project Ref:	26909
Document ID:	599361
Revision Status:	For Consent

1 INTRODUCTION

I am a Chartered Professional Engineer (CPEng) and a Chartered Member of Engineering New Zealand (CMEngNZ), with over 25 years of experience in geotechnical engineering across a broad range of land development, infrastructure, and quarry remediation projects. I have provided expert technical input for fast-track consenting processes and acted as the lead geotechnical engineer for numerous subdivision and industrial developments across the Auckland Region.

LDE was previously engaged to prepare a high-level geotechnical review to support the COVID-19 Recovery Fast-Track referral process for the proposed development at 885 Whitford-Maraetai Road, Beachlands. That report, Ref No J00244 dated 24 February 2023 (refer Appendix B), addressed geotechnical conditions and constraints within the eastern and central portions of the site identified for "Yard Base" and "Industrial Zone" uses. The report was accepted following a peer review / RFI process and Fast Track consent was granted

The development proposed in this revised referral application now encompasses the entire site, including the western (front) portion that was previously excluded but is now to become a Retail / Office zone, as shown on the CivilPlan Consultants Limited drawing (refer Appendix A).

2 APPLICABILITY OF PREVIOUS GEOTECHNICAL REPORT

Based on our knowledge of the site and prior investigation data, we confirm that the conclusions and recommendations presented in the previous geotechnical report (2023) remain valid and are equally applicable to the now-included front (western) portion of the site (i.e. Retail / Office zone). This area, situated within the western sector of the landholding, is underlain by competent East Coast Bays Formation (ECBF) soils, as previously described in the 2023 report.

No additional geotechnical constraints are foreseen in this western portion that would alter or limit the proposed end-use, and the recommendations concerning development suitability, slope stability, and foundation design may be confidently extended to include this area.

3 CONCLUSIONS

The geotechnical conclusions and development recommendations provided in the previous report are confirmed to apply across the entire site, including the newly added front (western) portion. No new constraints or investigation requirements are identified at this time in relation to the expanded site area.

4 LIMITATIONS

This report should be read and reproduced in its entirety including the limitations to understand the context of the opinions and recommendations given.

This report has been prepared exclusively for Knight Investments Limited in accordance with the brief given to us or the agreed scope and they will be deemed the exclusive owner on full and final payment of the invoice. Information, opinions, and recommendations contained within this report can only be used for the purposes with which it was intended. LDE accepts no liability or responsibility whatsoever for any use or reliance on the report by any party other than the owner or parties working for or on behalf of the owner, such as local authorities, and for purposes beyond those for which it was intended.

This report was prepared in general accordance with current standards, codes and best practice at the time of this report. These may be subject to change.

For and On Behalf of LDE Limited


Digitally signed
by Shane Lander
Date: 05.06.2025

S G Lander
Principal Geotechnical Engineer

Appendix A: Civil Plan Limited – Revised Scheme Drawing
Appendix B: LDE Limited – Fast Track Geotechnical Report (2023)

APPENDIX A

CIVIL PLAN LIMITED – SCHEME DRAWING

DRAFT

LEGEND

- EXISTING CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- EARTHWORK EXTENT

NOTES:

1. LEVELS ARE IN TERMS OF AUCKLAND VERTICAL DATUM 1946.

   ORIGIN OF LEVELS

   CODE: ADMF
   NAME: CF 10
   798866.761 mN
   422204.973 mE
   RL 46.995

CIVILPLAN CONSULTANTS
Level 9, Laidlaw House, 20 Amersham Way, Manukau, Auckland. Phone: 09 222 2445

PROJECT TITLE:
KNIGHT INVESTMENTS LIMITED
885 WHITFORD MARAETAI ROAD
BEACHLANDS

SHEET TITLE:
FAST TRACK APPLICATION
MASTERPLAN CONTOURS

SCALE: (A1/A3)	1:1000 / 1:2000
SCALE BAR 1:2000@A3	0 20 40 60 80 100m
ISSUE STATUS:	DRAFT@10.03.2025
PROJECT NUMBER:	2038-06
DRAWING NUMBER:	SK01
REV:	-
REVISION DETAILS:	-
REVISION DATE:	dd.mm.yyyy
DRAWN:	-
CHECKED:	-
APPROVED:	-

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APPENDIX B

FAST TRACK GEOTECHINCAL REPORT (2023)

Project Reference: J00244

24/02/23

Knight Investments Limited

885 Whitford-Maraetai Road, Beachlands

Attention: Mr D Smith

FAST TRACK APPLICATION FOR PLAN CHANGE
885 WHITFORD-MARAETAI ROAD, BEACHLANDS

1 INTRODUCTION

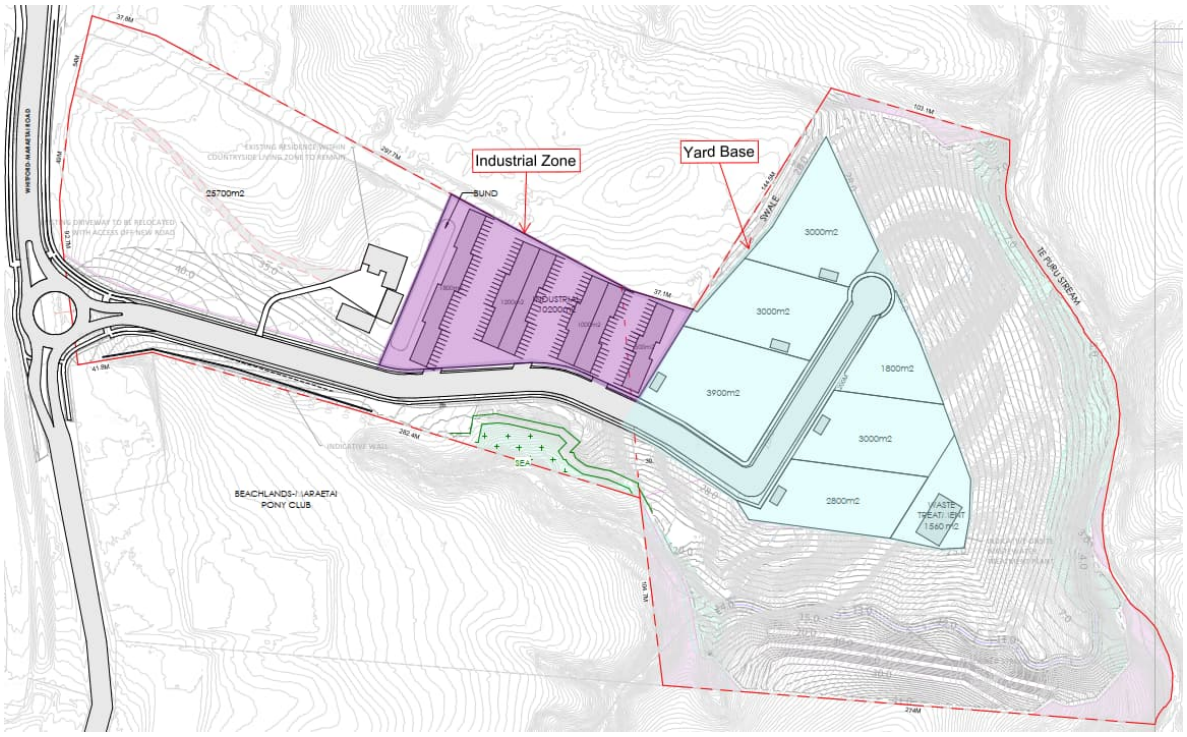
Knight Investments Limited are seeking that the proposed development of a landholding at 885 Whitford-Maraetai Road, Beachlands ("the site") be consented via the COVID-19 Recovery Fast-Track process. To support the application for fast-track referral, this memo provides a high-level review of the geotechnical aspects of the proposal, including:

- Summary of the proposal and site description;
- Summary of geotechnical work completed to date;
- High level geotechnical assessment of proposal; and
- Conclusions.

2 SITE DESCRIPTION AND PROPOSAL

The site is located at 885 Whitford-Maraetai Road, Beachlands, and is legally described as Lot 2 DP 54701 and Lot 2 DP 203289 having a total area of approximately 9.1142 HA. It is bound by the Te Puru stream to the east, rural land to the north and south, and Whitford-Maraetai Road to the west. The site presently contains an active quarry (involving rock extraction & pit remediation via a managed landfill; both activities are concurrent), rock processing yard, & associated office buildings (see inset left). Works to facilitate the construct of the new access will occur along the southern portion of 867 Whitford Maraetai Road legally described as SEC 2 SO 487740 held in certificate of title 709887.

The proposed development seeks to enable light industrial uses (referred to as the "Industrial Zone") and light industrial yard based activities (referred to as the "Yard Base') as depicted by the purple and blue shaded areas on the concept inset below (base plan source: RCG Ltd).



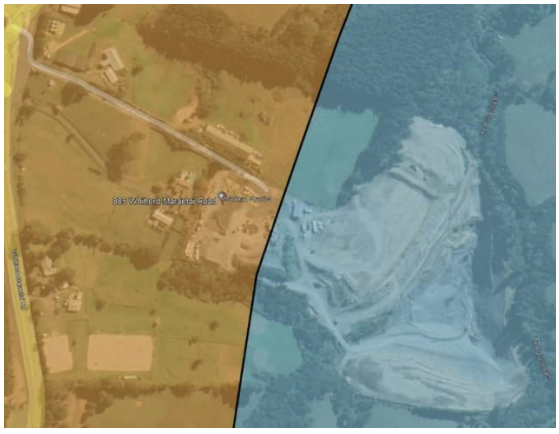
Development Concept

3 SUMMARY OF GEOTECHNICAL INVESTIGATION WORK TO DATE

Lander Geotechnical Consultants Limited (now trading as LDE) have undertaken three tranches of site investigation on the site, all comprising intrusive boreholes. A summary is given in section 3.2 below.

3.1 Geology Overview

The site is underlain by two geological units, these are orange shaded East Coast Bays Formation of the Waitemata Group (ECBF) and blue shaded Waipapa Group (WG). The latter occupies the central and eastern portions of the site, and this is where greywacke rock is currently being extracted for the construction industry. This geology underlies the entire area zoned as 'Yard Base' and the eastern portion of the 'Industrial Zone'. The western portion of the site is ECBF geology, which underlies the balance of the 'Industrial Zone'. Both geologies weather to clayey silts and silty clays, and have different engineering characteristics.



3.2 Previous Site Investigations - Summary

Geotechnical Investigations for a Proposed Office, Ref No J00244, dated 4 December 2015

This investigation was undertaken in support of a Building Consent application for the Quarry office and comprised the drilling a one hand auger borehole to a depth of 2m, as depicted (inset left). This test is located within the proposed 'Industrial Zone' (purple area).

Beneath a 1m thick well compacted hardfill layer (which prevented the test being located within the actual building footprint), very stiff silty clays with fine gravel sized inclusions are present (WG). No groundwater was identified at the time of the site investigation.

Vane shear strength typically increased with depth.

Geotechnical Investigations for a Proposed New Water, Ref No J00244, dated 15 November 2019

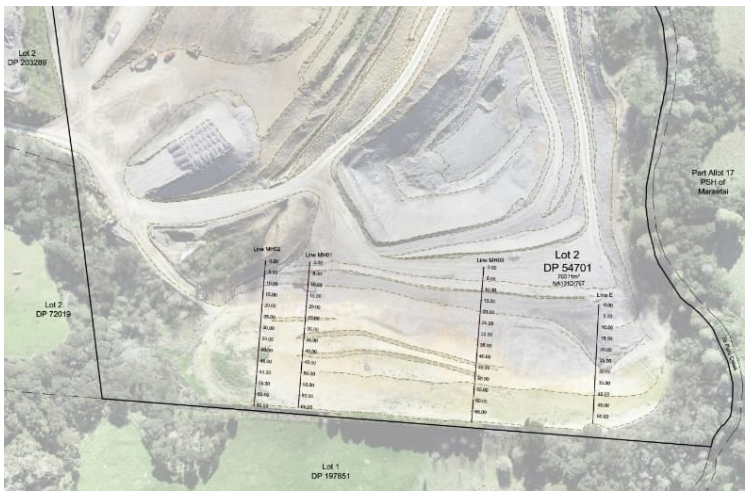
This investigation involved the drilling of two hand auger boreholes, as depicted (inset left). These tests are located within the proposed 'Industrial Zone' (purple area).

Beneath an initial hardfill layer associated with the current use as a rock processing yard, very stiff to hard, inorganic clayey silts and silty clays were identified to at least 5m depth, increasing in vane shear strength with depth (WG).

No standing groundwater table was identified in either borehole at the time of drilling.

Interim Advise for Proposed Quarry Overburden Slope, Ref No J00244, dated 9 November 2020

This investigation was for the design of a proposed soil batter above a future quarry high wall. It involved the drilling of three rotary cored machine boreholes to depth of up to 27.5m, in the alignments depicted on the inset (left). These tests are located east of the proposed 'Yard Base' (blue area).



The investigation found completely weathered overburden soils typically up to 8m in thickness, underlain by highly weathered to less weather deposits of approximately 10m thickness, in turn underlain by unweathered strong Greywacke rock (WG).

4 High Level Geotechnical Assessment

4.1 'Industrial Zone' (Purple Area on Inset page 2)

4.1.1 Settlement

The 'Industrial Zone' area is underlain in the western and eastern portions by ECBF and WG deposits respectively, together with superficial layers of gravelly fill associated with the rock processing yard / quarrying activities. The natural deposits are competent, inorganic, very stiff to hard cohesive deposits and therefore present low consolidation settlement potential and have very low liquefaction damage potential.

4.1.2 Slope Stability

Final land gradients in this area are anticipated to be gentle following a future development to create the 'Industrial Zone', and at this stage slope instability should be dismissed as a foreseeable hazard to future building development in these lots.

4.1.3 'Industrial Zone' End Use Suitability

The 'Industrial Zone' is considered suitable for conventional light industrial or commercial buildings (i.e. single storey structures with or without timber mezzanine floors, comprising reinforced concrete block or tilt panel boundary walls, lightweight roofing and cladding elements fixed to timber or steel portal or truss frames with reinforced concrete floor slabs on grade) incorporating shallow strip and/or pad foundations constructed to a typical minimum embedment depth of 600 to 900mm below cleared ground level, and having a geotechnical ultimate bearing pressure of 300 kPa, and design floor live loads typically up to 15 kPa).

4.2 'Yard Base' (Blue Area on Inset page 2)

Following rock extraction activities, the remediated quarry pit will comprise 40 to 50m depth of managed fill deposits, comprising highly variable soil mixtures, that have not been accepted or compacted in accordance with NZS4431:2022 Engineered Fill Construction for Light Weight Structures.

4.2.1 Settlement

It is foreseeable that this area will be prone to long term consolidation settlements due to the fill self-weight, unproven compaction, and slow decomposition of organic matter (if any) within the fill mass. These types of consolidation settlement will likely occur over many years, as the fill compresses upon itself and the moisture content of the soil mass changes and equilibrates, and a groundwater table establishes. Settlement is likely to occur differentially, the magnitude of which cannot be accurately estimated at this stage. The rate of settlement would continue for an indefinite amount of time, but at an ever-decreasing rate.

4.2.2 Slope Stability

Managed fills form batter slopes at the northern edge of the 'Yard Base' area. We understand that these batters have been constructed as a series of benches to heights and angles as determined appropriate by the Quarry Manager, based on his judgement, experience and observations of slope performance. They are not engineer design, in that the factor of safety against slope instability (in terms of minimum requirements normally accepted by Council for the proposed end use) are currently unknown. A safe set back distance from the edges of these slope for yard storage / associated facilities will need to be adopted to mitigate slope stability risks. This a matter to be addressed during the detailed design of the subdivision.

4.2.3 'Yard Base' End Use Suitability

Due to the foreseeable long-term consolidation settlement and batter slope stability concerns, end use upon the 'Yard Base' might comprise (as the name implies) unsealed hardstanding yards for low stacking storage, nurseries, vehicle parking, or other such use that does not involve the creation of large paved surfaces and/ or substantial buildings. However regarding the latter, it would be sensible to conclude that small 'porta-com' type buildings would be suitable to be located within the 'Yard Base', as they are small footprint portable structures, which can be relevelled easily should differential settlements occur beneath them.

Future design of the 'Yard Base' will need to address settlement and slope stability in greater detail, particularly with regard to any building development and infrastructure servicing located within this area (e.g. wastewater, stormwater, etc). This is a matter for specific investigation and design.

It would be advisable to install geotechnical instrumentation (e.g. surface settlement markers, extensometers, etc) upon the 'Yard Base' clean fill areas once they are constructed to grade, in order to capture the magnitude and settlement trends of the clean fill mass, thereby increasing confidence levels for future development upon this area.

This requirement particularly applies to the area(s) of the proposed Waste Water Treatment Plant depicted ion the RCG concept drawings.

5 CONCLUSIONS

The purpose of this report is to inform a proposed Fast Track Application for Plan Change in relation to geotechnical constraints within the 'Industrial Zone' and 'Yard Base'.

In summary:

- The Eastern and Central portions of the site contain deep / variable depth non-engineered fills placed to date and commercial end use here is limited on account of long term consolidation settlement and slope stability concerns. It is considered suitable for 'Yard Base' end use, in general as outlined in section 4.2.3 above. A Waste Water Treatment Plant and associated infrastructure located in the 'Yard Base' area will require specific foundation investigations and design to mitigate the geotechnical issues described above.
- The Western portion of the site is located upon competent natural deposits and is considered suitable for conventional 'Industrial Zone' end use, typically as outlined in section 4.1.3 above.

6 LIMITATIONS

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This report was prepared in general accordance with current standards, codes and best practice at the time of this report. These may be subject to change.

Opinions given in this report are based on visual methods and subsurface investigations at discrete locations designed to the constraints of the project scope to provide the best assessment of the environment. It must be appreciated that the nature and continuity of the subsurface materials between these locations are inferred and that actual conditions could vary from that described herein. We should be contacted immediately if the conditions are found to differ from those described in this report.

For and on Behalf of Land Development and Engineering Ltd

Shane Lander

Principal Geotechnical Engineer

NZCE(civil), BE(Hons, 1st class 1st Div.), CPEng, CMEngNZ