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HD2500 – Rotokauri Greenway and Minor Arterial, Hamilton – Geotechnical Memo to Support Covid-19 Fast Track Consent Application

Introduction

Hounsell Holdings Limited propose to lodge an application for the Rotokauri Greenway and Minor Arterial under the Covid-19 Recovery (Fast-track Consenting) Act 2020.

To support the application, this memo provides a high-level review of the geotechnical aspects of the proposal, including:

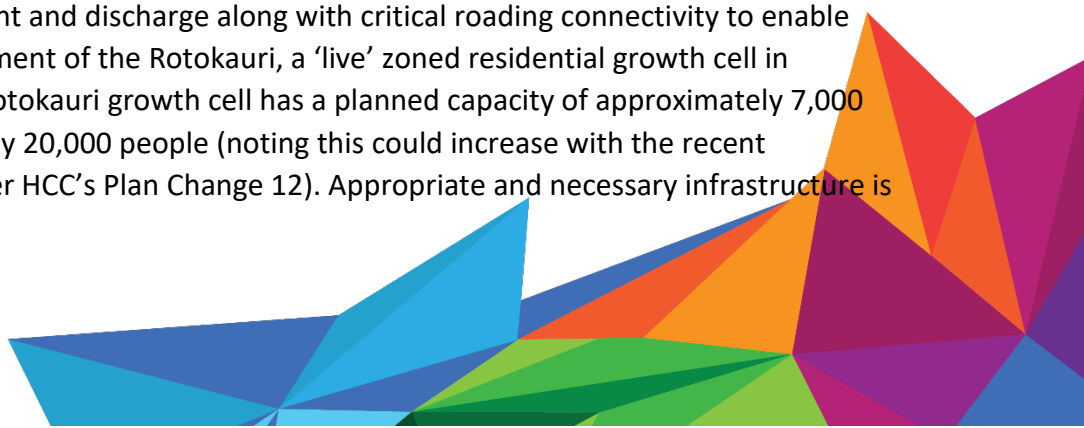
- Project description and scope of works;
- High level assessment of receiving environment and key geotechnical items to consider; and
- Overview of works needed to address geotechnical items.

Project Description

The proposed project for which a fast-track application under the **COVID-19 Recovery (Fast-track Consenting) Act 2020** is being applied for is the consenting and construction of:

- the Rotokauri Greenway;
- the Minor Arterial;
- the bulk watermain under the Minor Arterial and other roads;
- the wastewater rising main, and
- strategic wastewater pipeline and pump station.

The purpose of this project is to provide the necessary infrastructure pertaining to stormwater management and discharge along with critical roading connectivity to enable the residential development of the Rotokauri, a 'live' zoned residential growth cell in Hamilton north. The Rotokauri growth cell has a planned capacity of approximately 7,000 homes for approximately 20,000 people (noting this could increase with the recent proposed changes under HCC's Plan Change 12). Appropriate and necessary infrastructure is



required to enable the balance of this growth cell. The key objective of this project is to design, consent and enable high-quality infrastructure that supports well-functioning urban development that can provide for the social, cultural and economic well-being of the community and wider Waikato region

As highlighted above, there are two key components to this proposal, the Greenway and the Minor Arterial, which integrate and need to be designed and consented in parallel. Both pieces of infrastructure are critical features of the existing Rotokauri Structure Plan contained in the Hamilton City District Plan and certified Rotokauri Integrated Catchment Management Plan (ICMP).

The Greenway is a multi-functioning ecological corridor that will provide for stormwater management, open space and an active transport network, traverses a range of adjacent land use and offering a range of opportunities including ecological restoration, water runoff treatment recreational activities and cultural re-instatement. The Greenway will include a fluvial system of swales, artificial wetlands and ponds, with extensive planting of indigenous species along the length of the corridor. The approximately 4.7km length corridor will run between Lake Waiwhakareke (high point) and Lake Rotokauri (low point) to effectively manage and attenuate stormwater within the area, treating stormwater prior to discharge to enhance the water quality and surrounding natural environments and ecosystems. The overarching purpose of the Greenway is to provide treatment, conveyance and storage of flows from Lake Waiwhakareke at the upper extent of the catchment) to Lake Rotokauri approximately 4km north. Construction of the Greenway includes major re-alignment and re-contouring of the existing Rotokauri Drain, as well as an upgrade to the culvert below Exelby Road and the construction of check dams in the lower reaches to assist in managing flows. The Greenway includes a 5 metre wide shared path on the southern side and a 3 metre wide secondary path on the north side.

The Minor Arterial is a key piece of enabling infrastructure that promotes a housing development within Rotokauri. The Minor Arterial extends 3.8km in length from Te Wetini Drive to the northern boundary of Hounsell Holdings land, including the collector road to the Chalmers Road underpass and the northern boundary of Hounsell Holdings land to the underpass that links to Te Kowhai East Road. Supporting three water infrastructure which is sized to cater for the wider catchment is also proposed which includes:

- the bulk watermain under the Minor Arterial;
- wastewater rising main;
- strategic wastewater pipeline, and
- pump station will also be included in the project.

The Minor Arterial will prioritise and enable active transportation with wide footpaths and separated cycleways, supported by planted medians to improve safety. There will be public transport connections provided, which will connect to the Rotokauri Transport Hub (1 kilometre east of Rotokauri), with bus stops along the length of the corridor.

Currently the site is mostly used for farming with few sensitive structures or features that could be affected by the proposed works.

The proposed activities are relatively standard for land development projects in the Hamilton area. The construction of the Greenway and Minor Arterial will enable the development of the land adjacent (to be completed at a later stage).



Figure 1. Site location plan for Greenway corridor¹

Key Geotechnical Effects to be considered

Based on our knowledge and experience in the area, the following geotechnical items should be considered:

Rotokauri Greenway

- **Ground settlement due to groundwater drawdown.** Dewatering of the land adjacent to the Greenway has the potential to cause settlement to surrounding land and structures.
- **Site instability due to lateral spread/liquefaction hazard.** The construction of the Greenway will create a free face that could increase the risk of instability, especially in a liquefaction event.
- **Construction impacts.** Construction of the Greenway will have potential effects such as sediment runoff and water control that will need to be managed.

¹ Beca Limited - Rotokauri Greenway Geotechnical Effects Management Plan (Draft), prepared for HCC. Dated 30/05/2022, Ref 4287371-526186471-73

Rotokauri Minor Arterial

- The Minor Arterial will involve minor cut/fill operations within the existing greenfield space. Any effects will be mitigated through geotechnical/ civil design and influences are unlikely to have an effect beyond the immediate arterial area.

Approach to Geotechnical Effects

The proposed Rotokauri Greenway does not present any effects that cannot be mitigated through engineering design, stabilisation measures, suitable conditions of consent and monitoring of effects, such as:

Rotokauri Greenway

- Groundwater drawdowns and expected drawdowns will be modelled as part of our assessment. Settlement will be continuously monitored during construction to ensure settlement is within allowable limits established during assessment.
- Site instability due to lateral spread/liquefaction hazard will be mitigated through engineering design or development setbacks
- Construction impacts will be managed via normal construction controls and planning such as erosion and sediment control plans, construction management plans and trigger-action-response plans (TARPs) for monitoring.

Scope of Work

The scope of our services for the Rotokauri Greenway project involves geotechnical investigation and detailed design through to construction. This will typically involve site investigation and testing, followed by assessments (e.g. slope stability, settlement assessment, liquefaction and lateral spread) to establish effects of affected infrastructure.

Our involvement in the Minor Arterial will be limited to subgrade testing for the road designers.

The Rotokauri Greenway has been designed by others to a developed concept stage, sufficient to support the designation process which was completed recently. This involved high-level investigation and design to identify risks, mitigation items and further assessment needed.

Qualifications & Experience

Andrew Holland and the HD Geo team have extensive experience in projects throughout the Waikato. These projects have included large scale bulk earthworks, roading, retaining, and liquefaction and slope stability assessments. Two relevant projects include:

- **Rotokauri Stage 6**, a large subdivision adjacent to the proposed Rotokauri Greenway (see Figure 2 below). HD Geo (as part of large project team) has overseen detailed design tasks through to construction observation of a future greenway crossing and main arterial. Although the site is made complex by the site geology, peat soils and high groundwater, HD Geo has provided design solutions throughout the project.



Figure 2. Site location plan showing neighboring Stage 6 project location²

- **Te Rapa Gateway industrial subdivision** at the northern end of Hamilton (adjacent to the northern side of the Waikato Expressway, which runs parallel to the proposed Rotokauri Greenway). HD Geo provided detailed design through to construction observation of the bulk earthworks. Technical inputs involved slope stability, settlement, and liquefaction assessment of the future lots and stormwater infrastructure (ponds and swales).

Summary

Based on our understanding of the development, the site is geotechnically suitable for the proposed Rotokauri Greenway and Minor Arterial, subject to specific testing, and engineering design.

² Image sourced and edited from Google Earth (10.11.2022)

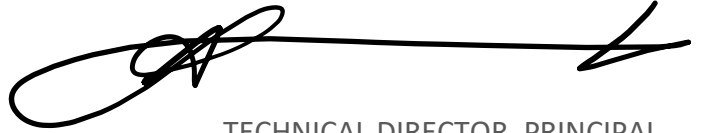
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