

2025-03-06

Bellgrove Land Development Joint Venture  
Being Bellgrove Rangiora Ltd & NTP Development Holdings Ltd  
PO Box 13 046  
Christchurch 8141  
New Zealand

**Bellgrove Subdivision Stage 2, Rangiora**  
**Geotechnical Summary**  
**Our Ref: 509177**

## **1 Introduction**

Bellgrove Land Development Joint Venture is proposing to develop an area of land on the eastern outskirts of Rangiora township into a new residential subdivision (Bellgrove Subdivision). The wider development is located between Northbrook Road to the south and Coldstream Road to the north and is approximately 100 hectares in area. However, Stage 2 is located on the north side of Kippenberger Ave, to the north of Stage 1, and is approximately 15 hectares in area.

Bellgrove Land Development Joint Venture has engaged Aurecon New Zealand Ltd (Aurecon) to provide engineering services for the development, part of which includes carrying out a geotechnical assessment of the site to confirm the ground conditions, assess any geotechnical hazards, and to provide indicative engineering mitigation measures.

## **2 Geotechnical Investigations**

Aurecon has undertaken geotechnical investigations for the new subdivision, which comprised a review of relevant previous geotechnical investigations from the wider development within the site, and site-specific investigations. The results of these investigations are provided in the following reports:

- *Inch Property, Kippenberger Avenue, Rangiora – Preliminary Geotechnical Investigation Report*, dated 30 July 2019, Ref 506685
- *Bellgrove Subdivision Stages 2 to 5 – Geotechnical Investigation Report*, dated 29 July 2022, Ref 509177.
- *Bellgrove Subdivision, Rangiora – Footbridges Geotechnical Investigation Report*, dated 14 June 2023, Ref 509177.

From the geotechnical testing undertaken over the wider development, two geotechnical boreholes, four CPTs, twenty test pits, three soakage tests and one piezometer are within Stage 2.

## **3 Ground Conditions and Groundwater Conditions**

The ground conditions within Stage 2 comprise a layer of silt and sand overlying gravels from a depth of 0.4m to 1.6m, which extend to at least 15m depth. Investigations indicate that the silt and sand layers are thicker towards the south. The depth to groundwater across Stage 2 is expected to be between 2.7m to 4m+ below existing ground level and has shown to vary seasonally.

#### 4 Engineering Recommendations

Based on our investigation and assessment a summary of the geotechnical aspects for the site are provided in the table below.

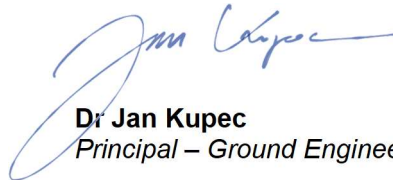
Aspect	Comments
Geotechnical Hazards (liquefaction, slope instability and soft ground)	Due to the flat nature of the site and the underlying ground conditions, geotechnical hazards are unlikely to pose significant issues to the development.
Technical Classification (MBIE 2012)	Based on our analysis the site is likely to be equivalent to Technical Category 1 (TC1).
Building Foundations	For typical residential type structures, the ground conditions will be suitable for shallow type foundations. Specific investigation and design will be required but it is expected that residential buildings can be founded on either NZS3604 type foundations or raft type foundations, where there is soil with lower bearing capacity.

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

Yours faithfully



**James Muirson**  
Lead Engineering Geologist



**Dr Jan Kupec**  
Principal – Ground Engineering