

File No: 34300

7 December 2018

Suburban Estates  
26 Peterborough Street  
**CHRISTCHURCH 8013**

Dear Sir/Madam,

**SAMPLE GEOTECHNICAL REPORT FOR A TC2 LOT, OAKBRIDGE SUBDIVISION, PRESTONS ROAD, CHRISTCHURCH**

**1. Introduction**

Davis Ogilvie & Partners Ltd. (Davis Ogilvie) has been commissioned by Suburban Estates Limited to determine the ground bearing capacity at the aforementioned address.

The published site geology is identified as being “dominantly grey river alluvium beneath plains or low-level terraces” (Q1a)<sup>1</sup>. Monitoring during development confirmed the natural soil profile as consisting of topsoil overlying natural alluvial silt, sand and gravels which corresponds to the published geology.

Technical categorisation and reporting for the Oakbridge Subdivision Development, carried out by Davis Ogilvie (August 2017<sup>2</sup>) recommended a land Technical Category of TC2 be assigned to the subject site.

Davis Ogilvie has undertaken engineering design and supervision throughout subdivision construction. Engineered fill has been placed on site in accordance with NZS 4431:1989. According to As Built Plan (FP1A) appended to this report, a maximum of 0.6 m of engineered fill has been placed on the lot.

**2. Soil Testing and Results**

Two Dynamic Cone Penetrometer (DCP) tests were undertaken at the aforementioned address to a maximum depth of 3.0 m below Existing Ground Level (EGL). One Hand Auger (HA) was undertaken at the site, advanced to the target depth of 3.0 m below EGL.

Results from the shallow testing indicate approximately 0.3 m of topsoil underlain by engineered fill, then natural silt and sand soils through the termination depth of the onsite tests.

<sup>1</sup> Forsyth, P.J., Barrell, D.J.A., Jongens, R. (2008) (compilers), Geology of the Christchurch Area, Institute of Geological and Nuclear Sciences 1:250 000 geological map 16. 1 sheet. Lower Hutt, New Zealand. GNS Science. ISBN 987-0-478-19649-8.

<sup>2</sup> Davis Ogilvie & Partners Ltd. (22 August 2017), 203 Prestons Road, Oakbridge Subdivision. Job No. 34300

The indicative soil profile across the site is presented in Table 1. Test locations are presented in attached Geotechnical Site Plan G01A.

Table 1: Summarised Soil Profile				
Summary of Soil Type	DCP (blows/ 100 mm)	Relative Density	Depth Below EGL (m)	
			DCP1+HA	DCP2**
TOPSOIL	3 – 5	*	0.0 – 0.3	0.0 – 0.3
ENGINEERED FILL (SAND)	4 – 8	Medium dense to dense	0.3 – 0.5	0.3 – 0.8
Natural SILT/SAND	3 - 11	Medium dense to dense/firm to stiff	0.5 – 3.0	0.8 – 3.0
* Relative density not assigned to topsoil or non-engineered fill due to the propensity for settlement				
** Soil type inferred from DCP results and nearby testing				

### 3. Foundation Recommendation

Due to the TC2 categorisation of the site, specific engineering design, observation and certification will be required for the development of the lot. TC2 foundation types provided in Section 5.3 of the MBIE 2012 guidance document are considered suitable for this site.

Shallow geotechnical testing has revealed shallow topsoil overlying engineered fill (placed in accordance with NZS 4431:1989), underlain by natural silt and sand soils. Based on DCP testing on the site, a static ultimate bearing capacity of 200 kPa has been achieved below the topsoil unit. Topsoil on the site was encountered to 0.3 m below EGL and should be removed from beneath the building footprint along with any other unsuitable material.

Prior to any fill placement or foundation construction, all excavations on site should be examined by a suitably qualified and experienced Engineer or Engineering Geologist. The Engineer must be competent to judge whether the exposed subsoils are compatible with the inferred conditions on which the report has been based. Should soft, suspect or unsuitable conditions differing to those outlined in this report be encountered, the builder should contact Davis Ogilvie or a suitably qualified and experienced Engineer to confirm foundation requirements.

If you have any queries or wish to discuss the report further please feel free to contact the undersigned.

Yours faithfully,

**DAVIS OGILVIE & PARTNERS LTD.**

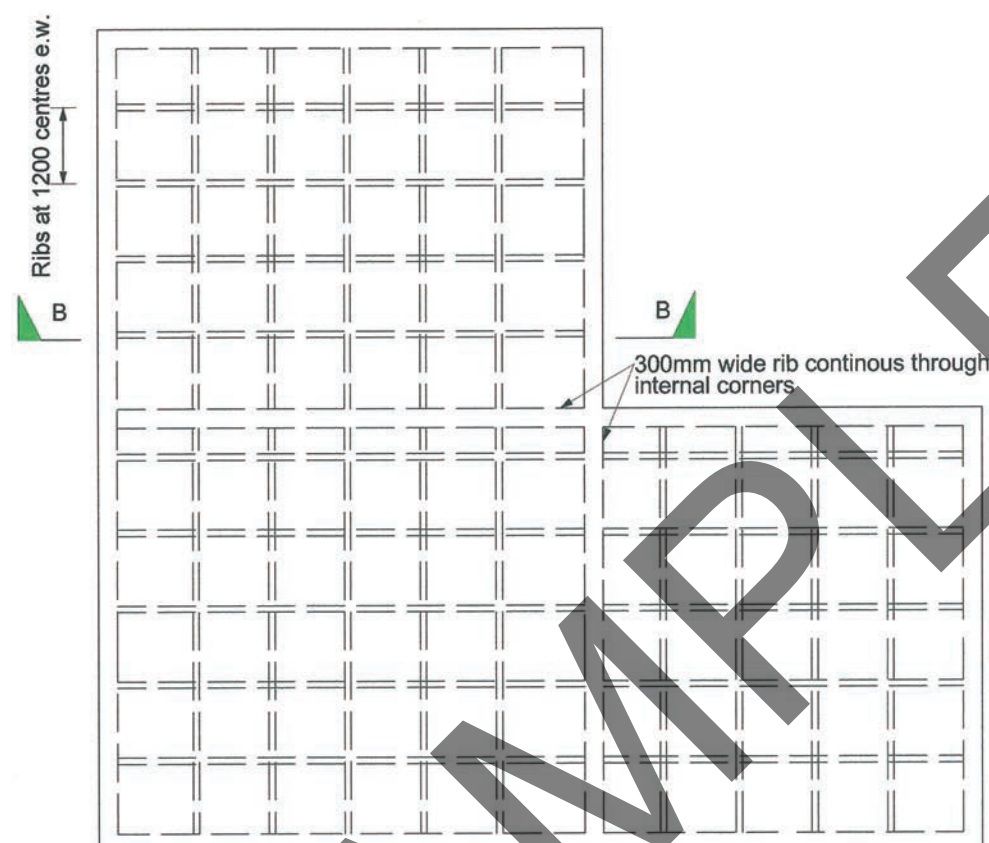
Attachments

MBIE (2012) TC2 Foundation Option 4<sup>3</sup>

<sup>3</sup> Provided as a popular concrete floor option on a TC2 site. Alternative TC2 options are available. Specific engineering design is required.

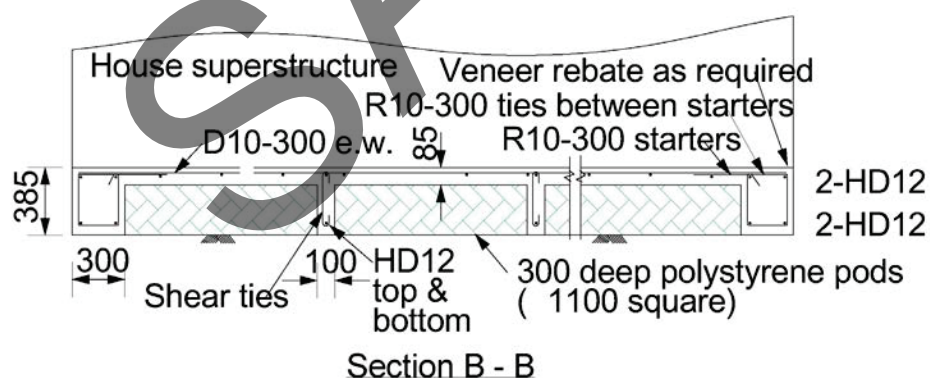
**Option 4** – Construct a waffle slab over the existing soil

**Figure 5.10: Enhanced foundation slab – Option 4 plan**



Note: Reinforcing details are not sufficient for two-storey heavy-weight cladding (brick veneer) with either a heavy or light roof.

**Figure 5.11: Enhanced foundation slab – Option 4 cross-section**



The ground immediately beneath the polystyrene and ribs must have a minimum geotechnical ultimate bearing strength of 200 kPa, or the system should be subject to specific engineering design (refer to section 3.4.1). Shear ties in accordance with NZS 3101 are required in the ribs.