



Test pits at a proposed subdivision at Creamery Road, Sulphur Creek

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Four test pits were dug on the site of a proposed subdivision at Creamery Road, Sulphur Creek (418500 mE, 5449800 mN), to examine subsurface conditions. Brief descriptions of the material encountered are attached; the approximate locations of the pits are shown on Figure 1.

The material encountered in the pits is variable although probable weathered basalt occurs in the lower parts of pits 2 and 3 with stiff clay and clayey sand in the others. Relatively soft clayey material occurs in the upper parts of all pits, extending to depths of up to 1.5 m in pits 1 and 3 but only to about one metre in the other two pits. The properties of a sample of this material from pit 3 were determined by R.N. Woolley of the Division with the following results:

Liquid Limit	159
Plastic Limit	34
Linear Shrinkage	26

From these figures it is apparent that the material has a high plasticity and that volume changes in the clay with change in moisture content will be significant.

It is not proposed to develop the land south of the power line and with care, it should be possible to build houses with reasonable safety on the remaining land. Where possible, houses should be sited on the flatter land, away from the steeper sloping land. Excavations on sloping land should be limited unless supported by specially designed strong, drained retaining structures. Drainage around house sites should be maintained so that no ponding occurs and water can drain away quickly. Swimming pools and other large water storage facilities are not recommended on the most southerly blocks because of possible leakage.

In summary, the pits show that relatively stiff material occurs at depth with softer clay at shallower depth. It should be reasonably safe to build houses with appropriate siting, drainage and excavation precautions. Foundations should be designed to take into account the presence of clay with expansion properties.

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Logs of test pits, Creamery Road

Pit 1

- 0–0.5 m Dark brown clay soil, some basalt boulders, damp
- 0.5–0.8 m Brown clay, some boulders
- 0.8–2.0 m Brown and greyish brown plastic clay, soft, becoming harder with depth.
Penetrometer test 0.5 kg/cm² at 1.1 m, 1.5 kg/cm² at 1.7 m, 2+ kg/cm² at 1.8 m.

Material quite hard at base. Seepage at 0.4–0.8 m, no free water at depth.

Pit 2

- 0–0.3 m Dark brown silty clay soil, roots damp
- 0.3–0.75 m Lighter brown gravelly clay with basalt boulders, fragmental, wet some roots
- 0.75–1.1 m Light brown clay, plastic, variable thickness. Penetrometer tests 0.5–1.5 kg/cm²
- 1.1–2.3 m Light brown and grey clayey material, igneous texture, basalt boulders (may be in situ basalt).

Seepage entering pit at about 0.5–0.7 m from the surface on top of clay.

Pit 3

- 0–0.25 m Dark brown silty clay soil with some sand, roots, damp
- 0.25–0.45 m Light brown clayey sand, wet
- 0.45–1.50 m Light grey-brown plastic clay, moist, fairly uniform strength (penetrometer tests 1.1–1.4 kg/cm²)
- 1.50–2.09 m Light brown clayey material, igneous texture, fragmental (weathered basalt), dry and hard

Small seepage on south end at about 1 m depth. Thicknesses of all units variable around the pit.

Pit 4

- 0–0.4 m Dark brown fragmental clayey sandy soil, roots, damp
- 0.4–1.0 m Brown and grey plastic clay fissured, some slip surfaces, occasional fine gravel fragments.
Penetrometer test ~ 1 kg/cm²
- 1.0–1.5 m Clayey grit and sand, some quartz fragments and basalt boulders
- 1.5–2.2 m Blue grey and brown clayey sand or sandy clay, occasional boulders, basalt, indurated rock up to 80 mm across, quite hard and stiff

