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Selwyn District Council  
PO Box 90  
Rolleston 7643

Attention Ben Rhodes

Dear Sir

**Preston Downs Subdivision- West Melton. RC 115187, 6 lot subdivision.**

We have received Councils request for further information in relation to the above resource consent following a directive from CERA for geotechnical assessments of all subdivisions.

Over the course of planning, due diligence, engineering design & construction, spanning back to 2006 we have gained considerable knowledge of the ground materials and believe that as such we can show that the ground is of acceptable quality with known groundwater characteristics that further geotechnical assessments are not required.

We attach a number of reports detailing the soil characteristics measured from very shallow excavations from an Archaeologists Report to deep bores of 100m in depth for new water wells for potable supply. We are also aware you have a copy of a letter supplied by Davie, Lovell- Smith dated 22 June 2011 discussing the potential for liquefaction at Preston Downs.

Please accept the following as a brief on the information we have to date:

#### Archaeological Assessment

This report was written solely for the purposes of an archaeological assessment but is included as a valuable resource in setting a time scale for the formation of the sand dunes and soil strata, and for photos showing the soil strata close to the surface on which dwellings are likely to bear.

Pages 6 & 7 discuss the soil strata found in the excavations. These consisted of varying soil types within the first 1.0m (sands, silts or clays) which were dry & well formed (compacted) and then gravel subsoils.

#### Davie, Lovell-Smith Testing

DLS were engaged to perform test augers & scala penetrometer tests over the sand dune area to assess the soil strata & soil strength. Augers were carried out up to 3.1m in depth with scala's to 1.8m in depth. No water table was discovered.

Part of this work was to assess whether this material was naturally placed or had been loosely back-loaded over a period of time.

The Archaeologists report shows an aerial photograph dated September 1940 indicating the existence of the sand dunes. That, together with our excavations of up to 6m deep to install the sewer & the

DLS testing we believe the sand dunes have occurred naturally as there is no sign of filling over a soil layer. Scala penetrometer results over this area are also included for your reference.

#### Subsoil Investigations

In August 2007, 13 augers were performed over the entire site with the soil strata logged. These were carried out with a 200dia bore on a drilling rig up to 3m in depth. Often the test bore was stopped by underlying gravels making it difficult to achieve a greater depth. No water table was discovered.

Generally, the top 1.0m varies beneath the topsoil layer with a mixture of tight silty sands, silts & silty sandy gravels to gravel substrate. The size of the gravel rounds increase with depth. The strata is dry to moist with underlying gravels showing good infiltration capability.

#### East Coast Drilling- Water wells

Three bore logs are included from the sinking of casings for water supply to the subdivision (one for monitoring) & the existing community. Two of these were up to 100m in depth indicating gravels from 0.5m from the surface. The 200dia bore & 250dia bore are some 300m apart.

The water table at the time of drilling indicated it was at a level of 30-36m from ground level. We have since installed the pump, infrastructure & telemetry in the 200dia bore. The digital transducer has the water table at 26m below ground level at this time.

#### Construction

During construction of stages 1 & 2 at Preston Downs I have undertaken numerous site inspections of trenches & roading subgrades for pavement design. Some of the sewer lines were extremely deep (up to 7m) of which were all benched, shielded & in natural dry materials. The trench faces all help up without caving in allowing the shields to be moved freely as the trenches were advanced. Photo's attached of general site works.

Roading subgrades have needed next to no preparation prior to placing 300mm of metal course for roading. Benkelman Beam testing has rarely shown deflections greater than 1mm. Kerb & channel ND testing has been primarily on natural gravels requiring very little compactive effort to achieve higher than required results. SDC have a folder as part of the 224c application for stage 1 detailing all the testing & auditing carried out for reference.

All filling on the site has been carried out using existing site materials and tested to meet NZS4431. An earthfill certificate has been provided to Council outlining the extent of filling carried out.

I believe that the site is consistent in geology showing a current groundwater level of 26m, gravels from 0.5m to at least 100m in depth, and as such provides a level comfort that the site offers a very low risk of suffering from liquefaction. Further, there are no adjoining rivers or streams with depth that offer a risk of lateral movement.

We trust that the above & attached information provide enough background to assess the subdivision as not requiring a further geotechnical assessment. Should you wish to discuss any item in particular or require further information please do not hesitate to contact us

Yours faithfully



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