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Tauranga District Council
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23 July 2007

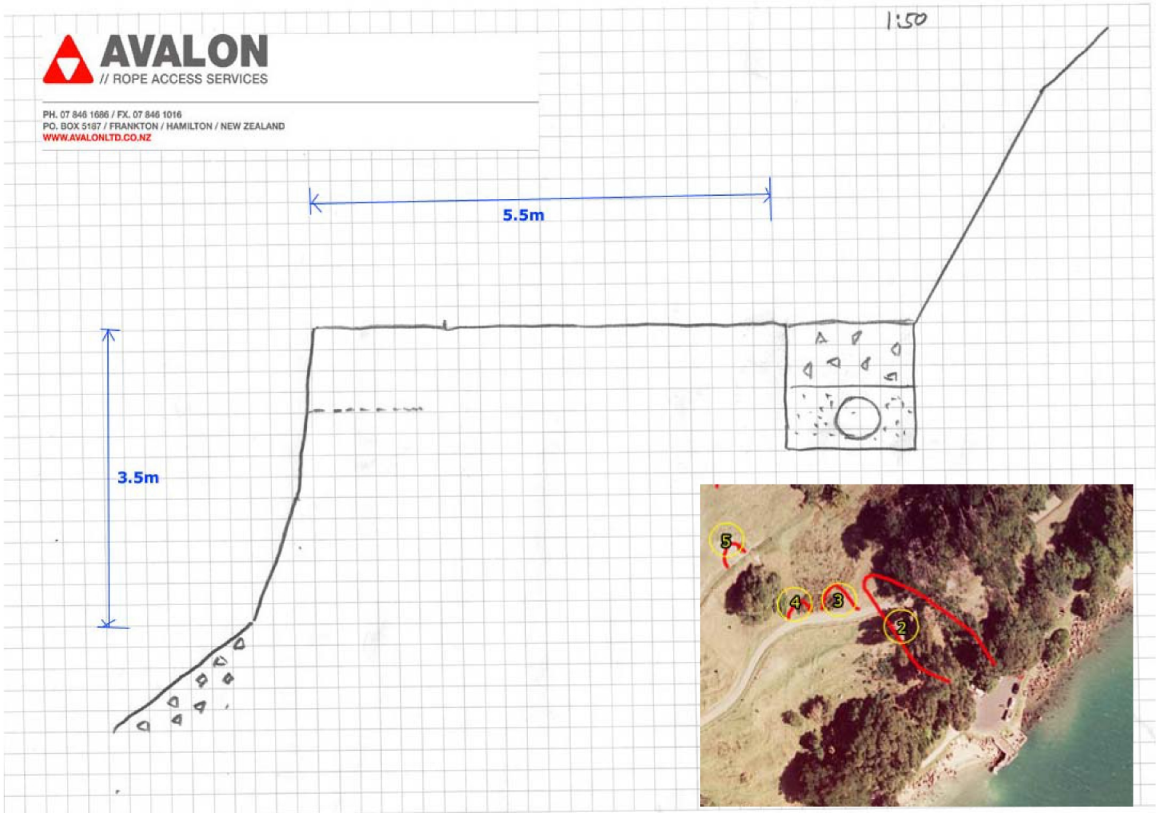
For the attention of s 7(2)(f)(ii)

Mauao Slope Monitoring July 2007; pipe trench adjacent to 4WD track dropout

As you are aware, last week we carried out our six monthly inspection and survey to monitor the rockfall and slip hazards on Mauao.

Avalon was commissioned to undertake this work for TDC following the 2003 fire. In the last four years Mauao has experienced extreme rainfall events, minor earthquakes and ongoing erosion, all of which have been shown to trigger rockfall and slips. Our investigations have included numerical risk analysis.

Further to our discussion on site please find below a sketch section of a 'dropout' of particular concern below the 4WD track, between the base and the water tower. The slip is approximately at location 2 in the inset photograph.



This slip in question occurred during the May 2005 floods and was triggered by intense rainfall and high flows in a spring directly downslope.

It is fortunate that the near vertical face did not fail further in the preceding two years as the slope is overly steep for these materials; the upper metre or so appears to be fill and below this lies a chaotic colluvial mix, predominantly clayey but with sandy layers and buried topsoil.

The adjacent natural slopes are not stable at such steep angles as this slip face.

Tension cracks can be seen up to 500mm back from the crest.

My first concern on seeing the new trench was that construction might have the potential to alter the local groundwater and that this might not be ideal, considering the adjacent marginally stable slope.

The lower 700mm or so depth of trench is being back filled with pumice sand, which should provide excellent drainage down the trench, however, the colluvium contains interlayered clay and sand therefore the excavation still has the possibility of creating new flow paths.

The excavated colluvium is being reused for capping above the pumice sand. Much of this material is clay and this presents two issues: 1. it is impossible to compact sufficiently (in the prevailing wet conditions) and 2. it might allow pressure to build up within the trench.

The contractor on site (s 7(2)(a) - Privacy) informed me that he has been having trouble getting compaction on the wet clay. To assist with this he installed one transverse drain to the trench (and this can be seen flowing just south of the slip). He was intending to install additional drainage but this was apparently stopped for financial reasons.

I think the cost benefit of additional drainage and importing a more freely draining material for the capping would be likely to be justifiable considering the likely costs of further slips, which could potentially leave the track unusable by vehicles.

I understand that the slip is scheduled for some form of remedial stabilisation. To minimise the risks it would probably have been preferable to stabilise the slope prior to trenching, however, I would now recommend that the work now be commenced asap.

I will get my general report on the slope monitoring to you in the next week or so.

If I can be of further assistance or you have any queries, please give me a call.

Regards

s 7(2)(a) - Privacy