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GEOTECHNICAL

Tauranga District Council
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Tauranga

3 December 2018
Avalon Project #19145

For the attention of § 7(2)(f)(ii)

Dear § 7(2)(f)(ii)

Mauao Slopes; Monitoring Report for November 2018

This letter is to report the rock bluff survey benchmark monitoring, site geotechnical walkover and known rockfall/slip developments since the previous monitoring.

1. Report on works during winter 2018

In June Avalon attended site at your request to investigate the report of a 25cm diameter rock reported by a member of the public as falling onto the mid Waikorere track.

The rock source appeared to have been the steep soil slope between the track and rock bluffs. We found many similar rocks resting on the surface and trapped by vegetation. The worst of these were then removed from that locality.

2. Items reported last year

In August 2017 Avalon provided a team of two Technicians to assist with vegetation survey work above the Oruahine track.

During that work the team came across a number of unstable areas of rock face. Some of the smaller rocks were scaled in a controlled manner, landing on the closed Oruahine track below.

Some significant larger unstable boulders were also found, indicated in the following photos. These could not be scaled in the time available.

We recommend these hazards be scaled. Track security would be required.



Photo 1. Areas identified on the bluff above the Oruahine track.



Photo 2. Loose rock previously identified above the Oruahine track.

3. Walkover Geotech Inspection 30 November 2018

3.1 Slope above the southern area of the campground

As requested a close inspection was made behind the southern area of the campground. Recent management has included the felling of a number of mature trees, leaving the area more open, visible and accessible to the public.

Previous experience on Mauao has shown, in similar locations nearby, that as dead tree roots decay this is detrimental to local slope stability, particularly where boulders are loosely embedded in the surface of steep slopes, as is the case in this recently cleared area.

The removal of the trees also leaves the slopes more exposed to wind and rain erosion and surface runoff tends to channel around boulders. A number of potentially affected boulders are shown in the following photos.



Photo 3. Boulders in the steep slope behind the southern area of the campground.



Photo 4. Boulders in the steep slope behind the southern area of the campground.



Photo 5. Boulders in the steep slope behind the southern area of the campground.

It would be advisable to probe around these boulders to better determine the size and shape and where necessary safely scale them. This should be able to be achieved relatively quickly and at minimal cost. Additional security guards would not be necessary.

Small patches of erosion control mat could be pinned to any resulting scars on the slope.

3.2 Inspection re options for improving sight line on the Waikorere track.

As requested the sharp bend with poor sight lines on the Waikorere track below the camp bluff was inspected.



Photo 6 and 7. Sharp bend on the Waikorere track.

As known, the drop off at this location is very steep and hazardous and the potential for runners to collide is clear.

The rock corner could be reprofiled and cut back to improve the sight line. Signage and or a guardrail could also be considered. At your request Avalon would be happy to work on proposals for this work.

3.3 The active slip above the mid Goat track.

The Goat track is in the process of track upgrade.

It is recommended that this active slip slope should be scaled prior to the track being fully reopened to the public.

Some of the hazards are clear in the following photo.



Photo 8. Active slip slope above the Goat track.

3.3 The active slip above the mid western Base track



Photo 9. 2016



Photo 10. Current.

As expected the surface of this slip continues to actively erode. The minimum recommended hazard management measure would be to scale the surface every two or three years and/or following major and prolonged storms. A catch fence or slope erosion control mesh/mat would be higher level options.

3.3 Rockfall evidence on the Oruahine track

As usual the inspection walkover found some evidence of recent rockfall onto the Oruahine track although in this case only very small rock fragments were found, though these were at three different locations. The Oruahine has the highest evaluated risk level.

3.4 Boulders on the slope surface above the southern base track



Photo 11. Boulders on the slope surface above the southern base track

This location has been reported previously but has never been worked on.

Many large rounded boulders are loosely embedded in the sandy soil which in places lies at a steep slope angle. The slopes in this vicinity are heavily vegetated which tends to hide the hazard although the roots also help stabilise the slope.

Some of the worst of these hazards could be scaled relatively easily.

3. Bluff survey

The benchmark EDM survey found no significant movement on the bluffs.

In conclusion, the previous evaluations of the rockfall risk remain relevant and the risk to individual visitors appears to be within tolerable limits. However, there will no doubt eventually be a rockfall injury incident due to the popularity of Mauao and the high visitor numbers.

If you have any queries please don't hesitate to contact me at any time and let us know if you want to go ahead with any of the options mentioned above.

Regards

s 7(2)(a) - Privacy