



# Fixing Mauao

## Mauao track repair and rehabilitation timeline

### What did we do, when did we do it, and why?

June 2011

Regular users of the base track may find it useful to read about some of the decisions that have been made since the mountain was closed after the 29 January storm. This information was compiled for the Mauao Steering Group on 9 June and subsequently made available to media and published on the Council's website.



Mauao is an archaeological site. Any proposed earthworks on site requires clearance from the Mauao Steering Group and in many cases from the Historic Places Trust. Before any debris is to be moved a representative from the Mauao Steering Group needs to advise staff whether or not an Iwi monitor will be required for each given section.

**The main principle driving all decisions about track repair on Mauao are:**

- no unnecessary earthworks
- keep machinery movements along the tracks to a minimum.

# Timeline

## 29 January, 2011

It rained – a lot! Major slips, closure of the entire mountain.



Map showing all of the slips that were identified after the January storm event.

## 3 February

Staff and geotech consultants presented a report detailing the status of the mountain to the Mauao Steering Group. At this meeting approval was given by the Steering Group for debris clearing works to proceed on the maunga. Minor works began that day, major debris shifting work began 8 February, partial base track access and one summit track opening (Waikorire) was achieved by 5pm 9 February.

## February focus

Ongoing repairs to summit tracks with a focus on clearing as much debris as possible from the summit tracks and along the opened base track section on the ocean side. Designs prepared for repair to the Oruahine summit track.

## 3 March

The Mauao Steering Group was presented with a range of options that could be used to repair the major base track slips. (The major slips are numbered as Slips 3, 4, 5 and 6.) Of the options available to repair the largest slip, Slip 5, a bridge was recommended as the best long term way to ensure pedestrian safety and to manage ongoing debris. The Steering Group approved the bridge as an option to pursue, and that it should be a timber bridge. They directed that a 'soft' approach be taken on the other slips; that debris was to be cleared without any unnecessary aggressive construction.

During February/March methodology was being assessed for repair of the base track stone wall section. The stone wall section needed to be repaired first to allow machinery access to the major slips.

Main considerations were how to fix the stone wall section in the most economic way while not adversely damaging the tracks.

A 'fast fix' option was considered which involved bringing in rocks to prop up the wall. This was ruled out for a number of reasons. It was not the best long term option for the integrity of the track; over 200 movements would have been required to transport the rocks along the base track between Pilot Quay and the stone wall. This would have required extensive track resurfacing. Alternatively, a barge could have been used to transport the rocks in at \$5K per day with a larger set up cost. Even without the barge, the price estimate for the job was around \$65K.

The method eventually used to repair the stone wall section cost \$28K and has provided a better long term solution.

### **14 March**

4WD track opened.

By 3 March designs had been completed for the first Oruahine slip repair, which required a "crib" retaining wall. Building consent was issued on 14 March. (It was issued as an "emergency works" consent which saved 4 – 6 weeks.)

Work on the first Oruahine retaining wall started 24 March and was completed on 16 May.

**15 April** – designs received for the stone wall and the process to draw up formal contract documents began.

### **March – May**

Continued investigations into bridge option for Slip 5. Considerations included:

- Should it be a suspension bridge or conventional. (Settled on conventional)
- Should it have deep piles or shallow foundations?
- Surveys were undertaken to better understand the profile of the ground that was being worked with.
- What would the drilling costs be?
- How best to manage ongoing debris that will continue to be delivered down the slope.

### **3 May**

Stone wall contract documents sent as an invited tender to three contractors.

### **9 May**

Stone wall tenders all received and contract awarded.

### **18 May**

Stone wall work started on site



**Oruahine track, April**

## June

Stone wall work was completed 7 June.

By the end of May the stone wall work had reached a point sufficient to permit machinery access to the major base track slips. Slips 3 and 4 were tidied up pretty quickly.

About the same time (end of May) City Planners advised that the proposed bridge, which had not yet reached final design, would need to go through a robust resource consent process. In addition to the two months required for construction, the resource consent process would add at least three months to the timeline.

This prompted a directive to the contractor to construct a temporary track in the hope that a reasonable alternative could be achieved as a short term option for public access. The aim was to create a path at least 1m wide. The main obstacle was a 4 tonne boulder. The heaviest excavator able to be used for work on the base track was a 3 tonne digger. (Blasting or breaking of rocks on Mauao is not permitted by Tangata Whenua.)

As it turned out, the contractor had a superb piece of luck with the way the boulder shifted during the track construction. The result exceeded all hopes, enabling a 2m wide track.

In light of this result the bridge option has been put on hold for reassessment. It remains the best long term option. Preparation and design to date for the bridge option is \$26K. If the contractor had not had such a good result with the Slip 5 boulder we would continue with the bridge.

## Ongoing issues

It should be noted that there have been ongoing weather events throughout the year. The 4WD track had several reactivated slips and has needed to be closed more than once. Slip 6 has failed five times – the most recent being Saturday 4 June.

The Oruahine track will remain closed for at least three months. Design, building consent and resource consent preparation is still being finalised for a second crib retaining wall that is needed for additional washouts that occurred in the intervening months since January's storm event.

Prior to the base track being reopened, we have installed two warning signs, one at the approach to Slip 6 on the ocean side and at the approach to Slip 3 on the Pilot Bay side. (The signs are temporary but will be replaced with permanent versions as soon as possible.)



**CAUTION**  
Beware of falling rocks  
Especially in wet weather

Future communication about Mauao on the website, brochure and general information will state that the mountain is an unsafe area in wet weather.

We should also expect that track closures will be a part of life in future.