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4 June 2022

My Ref: BG-296-220604-Rpt25-DRAFT

Glenorchy City Council

Attention: Mr Patrick Marshal

Dear Sir

REVIEW OF LANDSLIDES FOR GCC
REPORT 25 – 4 June 2022

1 INTRODUCTION

At the request of Mr Patrick Marshal of Glenorchy City Council (GCC) various aspects of the Rosetta Landslide and the Casuarina Landslide are being regularly reviewed.

This is the twenty fifth review report by Baynes Geologic.

This report concludes that small localized movements of parts of the Rosetta landslide are probably continuing to develop and require further consideration and review on site. Overall landslide movements are probably not occurring.

CONTENT REMOVED SINCE NOT RELEVANT TO ROSETTA LANDLSIP MANAGEMENT ZONE

A site visit and a review of the reporting and management systems is planned for June 2022.

2 DATA FOR REVIEW

The data to be reviewed was originally attached to emails dated 27 May 2022 from Mr Dan Egodawatte and included:

- Rosetta Landslip Surveys 1990 – MAR2022

CONTENT REMOVED SINCE NOT RELEVANT TO ROSETTA LANDLSIP MANAGEMENT ZONE

3 COMMENTS ON MONITORING DATA- ROSETTA

The most useful monitoring data to understand the behavior of the landslide is provided by nine monitoring points and the water levels in three piezometers installed in boreholes and three boreholes in which pumps have been installed, the locations of these are shown on Figure 1.

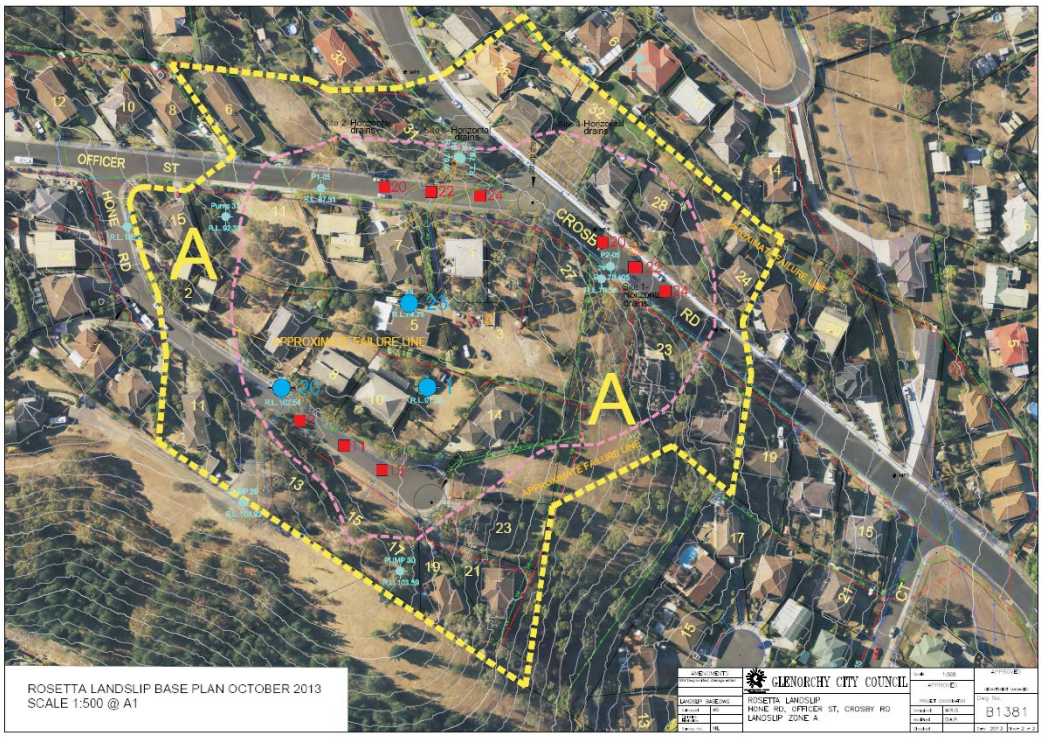

FIGURE 1 Critical survey monitoring points (in red) and groundwater monitoring boreholes (in blue).

The accuracy of the surveys is theoretically in the range of +/- 3 mm for the horizontal co-ordinates and +/- 1mm for the vertical co-ordinates (the level). It is possible that variations associated with setting up the instrument, operator error or the stability of the base station could be greater than this error, as systematic variations in the precise position of the survey points of up to 5 to 10 mm appear to occur regularly. The effects of swelling and shrinkage of clay rich soils during wet and dry periods and settlement associate with the long term consolidation of the landslide mass may also be contributing to the error.

Although the individual movement vectors deduced from the quarterly surveys are not in themselves useful to detect landslide movements, it is suggested that the overall trends that may be deduced from decades of monitoring do provide some insights as to what is happening to this landslide and these are discussed below.

Points 9, 11 & 13 Hone Road

The last survey was in February 2022. There continues to appear to be a long-term trend of settlement or slight landslide downwards movement of between 15 and 20 mm over the last 10 years in this area, with little in the way of lateral movements, which is consistent with the location of these monitoring points within the upper part of landslide, where downward movements would be anticipated.

There is no significant movement of the landslide but the overall movement amounts continue to be probably worthy of more detailed consideration and a site visit to review the conditions is suggested. Comment remains unchanged.

Points 20, 22 & 24 Officer Street

The last survey was in February 2022. There appears to be a long term trend of settlement and lateral displacement of between 10 and 15 mm over the last 10 years in this area with survey point 24 showing possibly 15 to 25 mm settlement over the same period.

There is no significant movement of the landslide but these slight ongoing movements that affect Officer Street, particularly those movements around point 24, continue to require careful consideration and a site visit to review the conditions is suggested. Comment remains unchanged.

Points 20, 22 & 24 Crosby Road

The last survey was in February 2022. The three monitoring points may have settled by between about 5 to 10 mm over the last 10 years.

There is no significant movement of the landslide. Comment remains unchanged.

Boreholes 1, 20 & 23

Groundwater levels continue to be below levels at which immediate actions are required, which indicates that the pumping and the gravity drainage is being successful in maintaining lower groundwater levels.

Pumps in Boreholes 29, 30 & 31

Pumps 29, 30 and 31 appear to be working effectively and water levels in the pump boreholes are generally below the prescribed levels.

The possibility of reducing the prescribed levels to reduce the amount of work the pumps are doing and ultimately dispensing with the pumps should be investigated during the forthcoming June site visit.

Horizontal Drains

Four arrays of horizontal drains were installed to drain and stabilize the landslide. Arrays 1, 2 and 3 are all dry with intermittent flows from two pipes in array 4.

Following discussions with Mr Reza Ramezani, it was agreed that quarterly observations of the drains that are always dry would be acceptable.

Water Usage

The reporting of average daily water usage, which is information that is considered to be beneficial to understanding the stability of the Rosetta landslide, has been modified. An alert system is in place as of Dec 2021 whereby when properties have a water usage that exceeds 0.7kL/day over 3 consecutive quarters, the GCC Landslip Co-ordinator will alert the Taswater team to investigate further on any potential impacts. The outcomes of this new approach have yet to be documented.

It is suggested that improved documentation of the required actions might be useful and these form part of the proposed revisions to the Landslide Manual.

CONTENT REMOVED SINCE NOT RELEVANT TO ROSETTA LANDLSIP MANAGEMENT ZONE

5 COMMENTS ON THE LANDSLIDE MANUAL

The Landslide Manual (which summarizes details of the landslides and the management plans for both the Rosetta Landslide and the Casuarina Landslide) was issued in May 2014, updated in early 2015 and revised in August 2020. It has been agreed that the operational effectiveness of this document should be reviewed interactively and some preliminary comments on the revisions were provided on 15 December 2020. It was planned to review the document during a site visit but this has been postponed due to Covid travel restrictions and will take place in June 2022. The revisions will include:

- Documenting a procedure describing what to do if any signs of reactivation occur.
- Documenting a procedure for recording and reporting any signs of cracking of pavements, distress, etc.

6 OVERVIEW

1. This report concludes that there are probably small localized movements of parts of the Rosetta landslide that are continuing to develop and require further consideration, although overall landslide movements are probably not occurring. A site inspection is planned in June 2022.

   CONTENT REMOVED SINCE NOT RELEVANT TO ROSETTA LANDLSIP MANAGEMENT ZONE

3. The existing monitoring system is excellent and monitoring according to the plan should continue.

4. A schedule of the status of all properties and all infrastructure in the A zone at Rosetta should be created to develop a long term strategy to manage the future of each property most effectively, with consideration of long term aims such as selective demolition of isolated houses, removal of services that could leak, minimization of maintenance of cleared areas, reducing costs of landslide management, working out how this might interface with the Open Spaces Plan etc. It is understood that GCC's policy in regard to this matter is starting to develop and it is possible that this could be documented within the Landslide Manual.

5. A review of the management plan (the Landslide Manual) has been carried out and will be discussed during the site visit in June 2022.

7 CLOSURE

The findings of both geotechnical and engineering geological reports are based on observation, interpretation and opinion derived from limited site investigations. The inherent uncertainty in the findings must be recognized. It will be essential to review and perhaps revise the findings of this report if the nature of the project changes, or if the use of the report, or the conditions encountered, differ from those anticipated.

Yours faithfully

Fred Baynes
Director, Baynes Geologic Pty Ltd