

## Is the Ground in Ulu Klang Unstable?

Engr Dr Gue See Sew, Engr Liong Chee How  
(gnp-geo@gnpgroup.com.my)

**ABSTRACT:** The Ulu Klang area has suffered several fatal landslides since December 1993, when a Block of Highland Towers collapsed, causing a tragedy involving 48 deaths. Subsequently, there were a few other major landslides within this area including slides in Bukit Antarabangsa in May 1999, the Taman Hillview landslide (November 2002) that killed eight residents in the collapsed bungalow and the landslide in May 2006 that claimed four lives in Kampung Pasir. After the Kampung Pasir landslide, the Star (03 June 2006) reported that the hills in the Klang Valley are made of granite or schist, both of which have a layer of soil in between and are prone to landslides. This paper examines the landslide investigation results and the main causes of the landslides. It is concluded that generalization that the ground in Ulu Klang is unstable is unfounded.

### INTRODUCTION

In December 1993, Block 1 of Highland Towers collapsed, claiming 48 lives . In May 1999, more than 10,000 residents at Bukit Antarabangsa received an alarm when a few major landslides occurred and cut off the access road to Bukit Antarabangsa. Thousands of residents in the condominium located adjacent to the landslides were also evacuated. Fortunately, there were no fatalities.



*Block 1 of Highland Towers at Taman Hillview which collapsed on 11 December 1993*



*Landslides at Bukit Antarabangsa on 15 May 1999*

The landslide victims after the year 2000 were not as lucky as the victims in 1999. The November 2002 Taman Hillview landslide completely destroyed the bungalow of Tan Sri Ismail Omar, killing 8 people. In May 2006, another four persons were killed in the landslide at Kampung Pasir.



*Bungalow destroyed by landslide at Taman Hillview on 20 November 2002*

## **WHAT ARE THE CAUSES OF THESE LANDSLIDES?**

Various opinions have been offered for the causes of landslides in Ulu Klang. It is easy for a layperson to generalise that the ground at Ulu Klang is most likely unstable based on the fact that many landslides occurred in Ulu Klang, not realizing that only a detailed investigation would reveal the real cause of the landslides.

A team of experts from different fields have carried out a detailed investigation into the causes of the Highland Tower collapse. The investigation results show that:

- a) Design of the superstructure and materials was adequate.
- b) The failure of a rubble wall triggered a landslide which caused the building to collapse. The Factor of Safety (FOS) of the rubble was found to be less than 1.0, which is unsafe.
- c) The site is found to be tectonically stable and no active fault movements had been recorded.

Similarly, the Bukit Antarabangsa landslides in 1999 were investigated by a team of engineers, geologists, hydrologists and surveyors. The investigation results reveal that the landslides were due to high (about 66m) and steep (steeper than 35°) un-engineered filled slopes. These were aggravated by blockage of berm drains and cascading drains at the slopes.

The cause of landslide at Taman Hillview in 2002 was similar to the Highland Towers tragedy, where failure of a rubble wall again triggered a landslide. The Factor of Safety of the rubble wall in the Highland Towers was found to be less than 1.0 even without considering any presence of geological features such as relic joints etc and water table. Investigation of the Kampung Pasir landslide is still ongoing and no concluding cause could be made at this juncture.



*Collapse of Reinforced Soil Wall at Kampung Pasir on 31 May 2006*

### **Conclusion**

From the four landslides that happened in Ulu Klang, three landslides were attributed to inadequate design of walls and slopes, in which the Factor of Safety of the un-engineered walls and slopes was less than 1.0 even without considering any presence of geological features such as relic joints etc and water table. The factors of safety for all three landslides are grossly inadequate. The latest landslide at Kampung Pasir is pending investigation results. It is therefore no surprise that the unsafe wall and slope manifested as landslides, as the occurrence of failure for these structures is imminent. It is only a matter of time when these failures will occur! Therefore, professionals should carry out detailed studies and investigation supported by engineering (quantitative) analyses and should not generalise that the ground in Ulu Kelang is unstable.

### **Reference:**

1. Majlis Perbandaran Ampang Jaya (1994), "Report of the Inquiry Committee into the Collapse of Block 1 and the Stability of Blocks 2 and 3 Highland Towers Condominium, Selangor Darul Ehsan".