

The use of Leica scanstation2 laser scanning for terrestrial surface displacement studies in Malaysia

Othman Z.¹, Khairani M.Y.M², M. Faizah M.²

¹Department of Civil Engineering, School of Professional and Continuing Study (UTMSpace), University Technology Malaysia, International Campus, Jalan Semarak 54100 Kuala Lumpur, Malaysia. Email: othman08@ic.utm.my

²Department of Surveying and Mapping, National Land and Surveying Institute, Behrang 35950 Tanjong Malim, Perak, Malaysia, Email: khairani@instun.gov.my ; faizah@instun.gov.my

(Received: 30 June, 2010; in final form January 18, 2011)

Abstract: Landslides bring destructiveness and losses to the human being and property. Since 1970 until 2002, more than 300 landslides have occurred throughout Malaysia and at least 30 landslides were reported in Klang Valley alone, due to unstable development of infrastructure in the hillside areas. Various studies have been conducted to monitor the landslide activity using different approaches, such as classical geotechnical and geodetic surveying method. In this new era of surveying, various modern instruments and methods are being used to monitor the landslide movement, and one of them is by using a high density laser scanning (HDS). By using the HDS, the landslide prone area can be easily monitored and changes can be detected. The development of High Density Scanner (HDS) for the generation of Digital Terrain Model (DTM) has made good progress in objects measuring, reaching high resolutions and completeness in models reconstruction. Nowadays it is an essential tool that can be used to detect, classify and to monitor Terrestrial Surface Displacement (TSD). The objective of this study is to analyze the potential of high density laser scanning method for landslide modelling from the analysis of the spatial and three-dimensional (3D) image data. Leica ScanStation2 instrument is used to monitor kinematics surface movement of the landslide prone area. The study is conducted at Malaysian National Institute of Land and Survey (INSTUN). The observations have been carried out in two epochs observation whereby all data have been processed and analysed using Leica Cyclone 6.0 software. The results using the Leica Scanstation2 laser scanner in this study has shown that there was no significant landslide occurred at the area.

Keywords: terrestrial surface, High Density Scanner, displacement, digital elevation model