##C316996 : MAJOR SURVEY ENGINEERING
KEY WORD: SATELLITE SURVEYING/GPS/ORTHOMETRIC HEIGHT/ RESERVOIR
SURAPONG RANGSISOMBATSIRI : APPLICATION OF GPS SATELLITE SURVEYING FOR VERTICAL CONTROLS IN A RESERVOIR CONSTRUCTION PROJECT. THESIS ADVISOR : ASSO. PROF CHUGAIT WICHIENCHAROEN, Ph.D. 131 pp.
ISBN 974-583-902-7

In present time, the development of technology grows very fast, as well as in the field of surveying. Global Positioning System is a new satellite surveying system to make a survey conveniently and rapidly. To determine coordinates of a control point,the reciever is set over the mark on the ground. Intervisibility among the control points is not required. Moreover,satellite observation is independent of geographicical environment,climate and time.

This research used GPS Trimble receivers Model 4000 SE that received only L1 signal. Then Trimvec plus software was used for computing baselines and Trimnet software for adjusting network. The specification of this receiver is 1 cm. +/-(2 ppm.xbase line length) in horizontal position and 2 cm.+/-(2 ppm.xbase line length) in vertical position. An objective of this research is how to get elevation of vertical control points from satellite observation. Since the reference vertical datum of the GPS surveying is WGS84 ellipsoid,while the reference datum in ordinary levelling is geoid which is represented by a mean sea level (MSL). Sufficient data to connect WGS84 ellipsoid to the geoid over Thailand is not available. This research was then emphasis on how to get elevations of vertical control points by satellite surveying.

This research used the test area in Sob Moei District, Amphoe Mae Sariang, Changwat Mae Hong Son. The total area covers about 2,500 sq.km. Most area is mountainous. the network consisted of 35 baselines connecting 20 vertical control points. Elevation above geoid obtained by third-order differential levelling were used as referance in the analysis. The reduction of heights above geoid were done by fixing some vertical control points were range from 1 to 7 . It was found that using 4 fixed control points with 20 KM. spacing was optimum. Compared with the elevations from differential levelling,the mean and the standard deviation of the differences were -0.001 and 0.030 metres,respectively. If differences in elevation of the baselines were considered,the differences between values obtained from GPS and those from differentail levelling gave the mean of -0.003 metres and the standard deviation of 0.036 metres. Base on the allowable error of the third-order levelling,15 baselines were passed and 19 baselines were not. The result of this research showed that GPS satellite surveying for vertical control points could apply to low precision levelling works such as:vertical controls for aerial photography,temporary roads,feasibility study, etc.