Absolute & Relative GPS Orthometric Heights Using Regional Fitted Geoid

Kamaluddin Hj Talib, Saiful Aman Hj Sulaiman, Mohd Zainee Zainal, Jasmee Jaafar and Azahari Mohamed (Malaysia)

Key words: GNSS/GPS; Absolute, Relative,Heighting, Static

SUMMARY

Establishment of vertical datum for land related surveying works using conventional levelling technique is a tedious process. With the advent of GPS (Global Positioning System) technology, determination of heights value for vertical datum in engineering works and alike seems feasible. In this study, two approaches in height determination using GPS are explored. The two technique involve are the absolute and relative GPS heighting . In the absolute technique, the ellipsoidal heights obtained through GPS observation for the observed points are transformed to the orthometric heights (H) by applying the respective geoidal separation value (N). In this technique, only one GPS is needed for the observation. However, for the determination of horizontal position (x,y), the processing will integrate the MyRTKnet (Malaysian Real Time Kinematic Network) as base station. As for the relative approached, two GPS receiver are needed. One of the GPS receivers will be placed at a known point with known height value and the other receiver at an unknown point. In this study, it is found that for 14 tested points, the Root Mean Square Error (RMSE) for the corresponding heights obtained using the absolute and relative techniques proposed are ±0.115m and ±0.046m respectively. In this study, it is found that for height determination using the two GPS observation technique, the relative GPS heighting approached seems to be more reliable.