

ABSTRACT

The Ellipsoid height (h) that generated from GPS measurements can be used in a practical way by bring it down to orthometric high (H), which refers to the geoid field. Geoid undulation at an arbitrary point on earth's surface can be determined based on the earth's gravity that spreads across the earth's surface. The research took place in the area of Obstacle Limitation Surfaces (KKOP) Sultan Hasanuddin - Makassar Airport.

Currently, levelling measurement of the height difference is the most accurate thorough. The basic framework of a vertical accuracy (K) is stated as the greatest height difference boundary of round-trip levelling measurements. Basically, positioning by GPS denotes as a distance measurements simultaneously to multiple satellites (whose coordinates are known). To determine the coordinates of a point on the earth, the receiver requires at least 4 (four) well capture signal satellites. Generally GPS positioning is divided into two methods, absolute and relative methods. However, the basic point of the vertical framework or commonly called *Titik Tinggi Geodesi* (TTG) not evenly spread throughout the territory of Indonesia. It's related to the limited availability of geoid undulation's data as the reference point to determine the vertical framework.

This study took place at 18 (eighteen) points in the Obstacle Limitation Surfaces (KKOP) Sultan Hasanuddin - Makassar Airport, with the baseline range of each points on average 1-10 km. Data of GPS height are obtained from geodetic GPS observations (Trimble 4000 SSE) that were calculated using Spectra Precision Survey Office software. Orthometric high data was obtained from measuring waterpass which references *Titik Tinggi Geodesy* around study area. Waterpass data is manually calculated by taking into account necessary corrections to get high in the orthometric system, and also by calculating the least squares adjustment. comparison between test results of waterpass measurements and GPS observations was taken by using statistical test which are normality data test and T-Test Hypothesis Test (Paired Samples T-Test) shows t - value of 0.981 with 0.340 sig. Because sig > 0.05 then we can conclude that Ho is accepted which means that there is no significant difference of the height difference waterpass measurements and GPS observations for local scale measurements.

Key Words: Orthometric High, GPS, Waterpass