

Cors Usage for GPS Survey in Greater Accra Region: Advantages, Limitation & Suggested Remedies

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Key words: GNSS/GPS; Positioning; Continuously Operating Reference Stations (CORS), homogeneity, International Terrestrial Reference Frame (ITRF), beacons, Professional Surveyors.

SUMMARY

The use of Continuously Operating Reference Stations (CORS) enables surveyors to differentially correct static GPS measurements acquired with a single receiver after they return from the field by referring to the selected base stations selected from a network of continuously operating reference stations. Continuously operating reference stations (CORS) are designed to support the broad spectrum of post-processed, relative Global Positioning System (GPS) techniques and applications. In addition to enhancing geospatial positioning applications of CORS data include the critical role in defining the nation's geodetic reference system. Again with the establishment of a coordinated system of CORS, an Online Positioning User Service can become available for processing in single positioning mode to provide corresponding accurate and homogeneous positional coordinates. The Survey and Mapping Division of Ghana has established four (4) Continuously Operating Reference Stations (CORS) in the Greater Accra, Ashanti, Western and Brong-Ahafo Regions respectively to provide a Basic CORS network in accordance with the International Terrestrial Reference Frame (ITRF). However, most Surveyors continue to reference their works in these regions on ground survey beacons that have been coordinated and adjusted by variable survey methods that obviously makes homogeneity of data unpredictable. This study explores the existing CORS network particularly the Greater Accra CORS to know the extent of its usage for GPS surveys in Ghana and to determine its usefulness in ensuring uniform and homogenous data collection. Professional Participatory (interviews) technique was used coupled with differential GPS field observations with the CORS as reference in one case and ground control stations as reference in the other case in making relatively conclusive analysis. Test results show that, GPS field survey of an approximate range of 23 km away from the Accra CORS yields an average positional change in Northings and Eastings of -0.7, -0.2 metres. Beyond a range of 25 km from the Accra CORS the average positional change in Northings and Eastings are -1.2m, -0.2m. 39% of Geomatic professionals are aware of the availability of COR stations in Greater Accra, 61% are unaware, 28% are aware and users of the

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Accra CORS whereas 11% are aware but non-users of the Accra COR station. Of all users sampled, 17.5% are Regular and Frequent users of the Accra COR station and 10.5% are occasional or seldom users. The results show that the Accra CORS is vital to ensuring a uniform homogenous GPS data. However, very few people are using it due to low public awareness of the usefulness of the CORS among Professional Surveyors and other users, and a cumbersome, bureaucratic nature in CORS data acquisition for post-processing and RTK GPS surveys.

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