

Positional Deformation Monitoring for High-Rise Buildings Using GNSS

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Deformation refers to any change an engineering structure may abide in its position, shape or its dimensions due to internal or external factors that may affect to deform the original structure of the body. These factors include the construction defect as well as many natural factors such as tidal changes, tectonic phenomena, wind and climate changes and land movements. Dams, bridges, reservoirs, high rise buildings and large engineering constructions are the most considered deformable structures available in the world scenario. Based on that knowledge, this research is intended in focusing on the high-rise buildings in Sri Lanka. Coupled with the rapid economic development and urbanization, high-rise buildings appear over most of the major cities in Sri Lanka allowing easy access to commercial stores, apartments and other beneficial economic activities. The stability of high-rise buildings can be deflected due to some significant environmental issues, human errors, explosions, or terrorist activities. Yet currently there is no proper monitoring happen for the damage assessment of these structures after developed within the Sri Lankan Context. Thus, the ultimate objective of this study was to ascertain whether Global Navigation Satellite Systems (GNSS) can be in cooperated to find an appropriate technique to monitor the deformations of the high-rise structures. Thus, filed data were collected at the Colombo Lotus Tower, the Highest building in the South Asia, through GNSS techniques and subsequently the data were analyzed in creating a favorable result and the findings of the study indicate that GNSS can be adopted as an efficient and effective method to monitor the stability variations of the high-rise structures over the conventional geodetic surveying techniques.

Key Words: High-Rise Buildings, Deformation, GNSS