

Self-Reference Frame Engineering Body Approach for Complex Setting Out Operations

Joel van Cranenbroeck, Mohammed Haider Abusharkh, SangHoon OH, Vincent Lui and Oleg Evstafiev

KEY WORDS: Monitoring Concepts for Static and Dynamic Deformations of Engineering and Geotechnical Structures, Applications in Geotechnical and Structural Engineering, Innovative Concepts for Sensors and Methods, Automation of Monitoring Measurements and Interpretation

ABSTRACT:

Geodesists and Surveyors have all the time used serious benchmarks and concrete pillars to support their works. In that new approach the authors are considering engineering bodies to host their own reference frame that will be used to position them in the 3D space or to retrieve from them the location of measuring instruments. With fiducial marks and RFID information technology the engineering elements are becoming smart and active. That concept has been developed recently when confronted to the survey control of mega columns anchored in a high rise tower located in the new financial district of Riyadh - Saudi Arabia, the authors have been asked to provide a solution to the surveying team. Previously that approach has been also developed to setup Total Station in closed floors of tall buildings such the Al Hamra tower in Kuwait and the Burj Khalifa in Dubai. The procedure is however well known in the industry especially for short range geodetic measurements where the geometry of large elements are described by virtual points such the intersection of plane and 3D lines or center of circle. In the context of civil engineering applications one make it sure that the considered elements can be deformed and therefore integrated into the functional model.