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The Comparison Of Accuracy Of Length Measurement Obtained From Terrestrial Laser Scanner And Total Station

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Nowadays the developments in the technologies are contributed to accuracy and reliability of terrestrial laser Scanning Technology. Therefore, Terrestrial laser scanners (TLS) are used in many engineering applications. The working principle of Terrestrial laser scanners is similar to reflectorless total stations. Terrestrial laser scanner is a device that can quickly measure the 3-dimensional point cloud of an image that is scanned in the form of x, y, z points. With the help of these operations, the realistic 3D models of scanned objects are generated. Terrestrial laser scanners have also significant advantages that distinguish them from traditional measurement methods. The accuracy and reliability of final products of TLS depends on accuracy and resolution of data obtained from laser scanner. The scientific research studies are carried out focusing on accuracy and sensitivity.

Studies in this paper were made in Calibration Baseline (20-meter) and EDM Baseline (300 -meter) in the department of Geomatic Engineering, at the Yildiz Technical University. Purpose of this study is to determine the accuracy and sensitivity of length measuring of Optech ILRIS 3D Terrestrial Laser Scanner and Total station. Tests were carried out with specially prepared targets and in environments where they included the environmental and laboratory impacts. In this paper, geometric and nominal measurements of 3-dimensional (3D) models or point coordinate gathered by scanning object surfaces and targets using TLS were compared to the measurements of Total Stations (1+2ppm). In particular, the effects of the accuracy and sensitivity of the measuring length of the targets were determined. This reference targets shifted at varying intervals from the center of the scan point. TLS measurements were made between reference points and the starting point. The point clouds obtained by scanning created surface models. The differences in these movement directions of created surface models have identifying the movement of the reference object. The Tests determining the accuracy of length measurement of Optech ILRIS 3D Terrestrial Laser Scanner and Total Station are discussed.