

Comparisons of Surveying with Terrestrial Laser Scanner and Total Station for Volume Determination of Overburden and Coal Excavations in Large Open-Pit Mine

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Abstract : The volume of overburden and coal excavations in open-pit mine is generally determined by conventional survey such as total station. This study aimed to evaluate the accuracy of terrestrial laser scanner (TLS) used to measure overburden and coal excavations, and to compare TLS survey data sets with the data of the total station. Results revealed that, the reference points measured with the total station showed 0.2 mm precision for both horizontal and vertical coordinates. When using TLS on the same points, the standard deviations of 4.93 cm and 0.53 cm for horizontal and vertical coordinates, respectively, were achieved. For volume measurements covering the mining areas of 79,844 m², TLS yielded the mean difference of about 1% and the surface error margin of 6 cm at the 95% confidence level when compared to the volume obtained by total station.

Keywords : mine, survey, terrestrial laser scanner, total station

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