ACCURACY ANALYSIS OF EARTHWORK CALCULATION BASED ON TRIANGULATED IRREGULAR NETWORK (TIN)

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ABSTRACT—In most of conventional methods for calculating earthwork, the assessment of accuracy contains many uncertainties. This paper discusses the relationship between the accuracy of terrain data and that of the earthwork calculation. The main research method is propagation of error, and a formula is created which expresses the quantity relationship that how the errors of terrain data effects the accuracy of earthwork calculation. Setting the different values of parameters, the relative errors can be calculated. Through adjusting values of parameters, it is easy to make a plan of data acquisition that is cost-optimal and meets the accuracy requirement of the land consolidation. In the end, the calculating methods with different sources of terrain data are discussed.

Key Words: Earthwork calculation, Triangulated Irregular Network (TIN), Errors Propagation, Assessment of accuracy