COMPARISON OF ACCURACY DETERMINATION OF BULK MATERIAL PILE VOLUMES BASED ON PICTURES FROM UNMANNED AIRCRAFT AND GEO-DESIGN MEASUREMENTS

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The article describes the methodology for modeling geodetic and photogrammetric data obtained from unmanned aerial vehicles to study the accuracy of determining the volume of bulk materials piles. As the modeling pattern was accepted a frustrum elliptic cone, which most closely reminds piled stores in shape. For modeling measurement results were used the error values, peculiar to each method. After modeling the measurement results, volumes were calculated based on the construction of the TIN surface. Then the obtained results were compared with the ideal figure and the relative measurement error was calculated. As a result of the studies, it was found that the geodetic method for determining the volumes of bulk materials piles is more accurate for small volumes up to 300 thousand cubic meters, and for large sizes of piles it is more expedient to use the photogrammetric method, which is practically comparable with the geodetic in accuracy, but less time-consuming, and with a pile volume of more than 1000 thousand cubic meters, the accuracy of the photogrammetric method becomes higher than the geodetic one.

Key words: geodetic method, photogrammetric method, determination of volumes, modeling, accuracy, relative error, bulk materials piles.

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