Application of terrestrial laser scanning technology for creating record drawings of building facades

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Abstract. The technology of terrestrial laser scanning allows solving a large range of measurement tasks, among which the creation of record drawings for building facades can be distinguished separately. The main advantage of laser scanning over other surveying methods is the high speed of data acquisition and their density, which allows displaying even small parts of the facade in the drawing. To reliably determine the details of which size can be identified from laser scanning data, and what maximum scale of the drawing can eventually be created, it is necessary to conduct studies of the accuracy and detail of the data of each laser scanner planned for use. The data of the Leica ScanStation 2 and Geomax Zoom 300 were analyzed. As a result of analysis, it was found that the divergence of Zoom 300 laser beam exceeds the value stated in the technical characteristics. It is shown that the scanner ScanStation 2 allows creating measuring drawings up to the scale of 1:50, and Zoom 300 – up to 1:200. To achieve the accuracy of creating a 1:200 scale drawing using the Zoom 300 scanner, a number of recommendations for placing scanner positions and processing the obtained point cloud to remove measurements made with lower accuracy are offered.

Keywords: terrestrial laser scanning, dimensional drawing, building facade, relative orientation, tacheometry, accuracy estimation, laser beam divergence

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Received 16.03.2022