

# **Application, Specifics and Technical Implementation of the 3D Terrestrial Laser Scanning for Measurement and Analysis of the Spatial Geometry of a Steel Construction**

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**Key words:** Engineering survey; Laser scanning; Positioning; Professional practice; 3D terrestrial laser scanning; LIDAR; measurements; coordinates; discrepancy, axes

## **SUMMARY**

The technology of the 3D terrestrial laser scanning offers the geodesists and other professionals many new possibilities. 3D laser scanning could be applied in a number of engineering tasks and one of them is our specific case - measurement and detailed analysis of the spatial geometry of a steel construction. This paper studies the technical details from the practical implementation of: 3D terrestrial laser scanning, data processing and analysis of a steel construction. The last consisted of two rows with ten columns in each one. Two under-crane beams, mounted over each row of the columns were also subject of detailed analysis. The sequence of the geodetic activities, also the specifics (including the scanner settings, processing and the interpretation of the information in the point cloud) are discussed in details in the paper. The final results from the 3D laser scanning (the spatial coordinates of each point) were used later on for thorough analysis of the steel construction, using specialized geodetic software. The respective discrepancies of the elements of the steel construction from their theoretical values were analyzed in details in the paper. The axes of both: rows of the columns and the under-crane beams were also studied and the results were presented in the respective geometrical and analytical way. Recommendations and proposals for future work are also given.

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