

CLASSICAL AND GNSS SURVEY OF BRIDGE SPAN DEFLECTION

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The researchers' primary objective was to conduct a measurement of bridge span deflection using two methods and draw conclusions based on the analysis of obtained results. The Millennium Bridge in Wroclaw was measured using the classical geodetic technique (tacheometry) and the static Global Navigation Satellite System (GNSS) measurement. The experiment was designed to ascertain whether any changes in the structure of the bridge were evident under the influence of e.g. traffic. However, despite requirements of both techniques, it was necessary to establish a control - three points were located on the bridge, while two other were marked out beyond the structure. The points located nearby the bridge served as the stations of reference receiver and tacheometer to synchronize both measurements. The application of these techniques effects in receiving different values, which affected their final interpretation. The displacements were 0.013, 0.011, 0.032 m by GNSS technique and 0.002, 0.015, 0.002 by tacheometry for P1 (right side), P2 (the middle), and P3 (left side) points, respectively. The calculations revealed that the tacheometry revealed significant displacement only at P2 point. Other values obtained from both methods are not considered to be crucial displacements and do not have a direct impact on the bridge exploitation. However, the length of surveys and their methodology do not provide a sufficient basis for a deeper analysis of the effects of external factors. It is therefore suggested that a monitoring survey should be conducted for several hours or days, as even such short time-series could present a relationship between the structure and the loading.