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## The systematisation of factors influencing the accuracy of graphical constructions to interpret the preconsolidation pressure

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The study aims to identify and systematise objective and subjective factors that lead to ambiguities in graphical constructions, which affects the accuracy of the interpretation of the preconsolidation pressure  $\sigma_p$ . Objective factors do not depend on the operator conducting graphical constructions. Subjective factors presuppose any mental activity of the operator regarding the conduct of graphical constructions (determination of points and segments, drawing lines, tangents and secants, their intersections), preliminary evaluation of the result and the establishment of the need to repeat the construction.

The tests were performed on ground pastes of a fluid consistency with a given  $\sigma_p$ . Clay slurries were made from moraine and fluvio-glacial soils selected in Salaryevo (Moscow, Russia). A series of 12 oedometric tests with incremental loading, unloading, reloading and unloading was carried out. Then the obtained data were processed by ten methods (Casagrande, Pacheco Silva, Burland, Boone, bi-logarithmic, Becker, Nagaraj & Shrinivasa, Senol & Saglamer, Wang & Frost, Butterfield). The methods considered in this study are based on the dependence of deformation on applied stresses. For each method, the set and received values were compared. In data processing, the influence of graphical constructions on the obtained result was evaluated. It turned out that almost all methods have approximately the same accuracy, and the relative error does not exceed 8,8 %. At the same time, the discretisation makes the most significant contribution to the accuracy of measurements. From the obtained results, it is recommended to reduce the steps or approximate the obtained points with analytical curves.

Objective factors affecting the accuracy of graphical constructions are manifested at the stage of sampling, transportation, storage of samples, testing, and subsequent processing of the results. The operator for graphical constructions subjectively selects tangent segments and points most representative in his opinion. The tangent is a subjective factor. Different methods use a different set of tangents for their graphical constructions. The study identified and evaluated the influence of objective factors on subjective factors. For example, in order to correctly draw a tangent to the final section, it is necessary to reliably switch to the normal consolidation line (NCL). For reliable output to the NCL, the maximum load stress must be several times higher than the expected  $\sigma_p$ . In case of incomplete access to the NCL,  $\sigma_p$  will be underestimated.

The presented systematisation will help assess the influence of objective and subjective factors and their contribution to the overall error in determining  $\sigma_p$  and simplify the selection of the most appropriate methods for determining  $\sigma_p$ .

