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Geological and geophysical survey of a building site: the "European Coast" living block in Novosibirsk, Russia

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Geological and geophysical surveys are an essential aspect to determine irregularities in the bedrock surface caused by tectonic faults and active weathering process. Such kind of investigation is particularly important when dealing with the design of foundations for living block infrastructures.
In the particular case presented in this work, the bedrock is covered by sediments that form quite a flat surface, thus requiring some kind of sub-surface study. The solely use of drilling in this situation can not be enough for civil engineering purposes. Also, the option to drill at a denser grid would increase the price drastically. On the other hand, an insufficient sampling grid is prone to the risk of missing potentially dangerous anomalies.
In addition to that, the urban environment makes the choice of geophysical techniques difficult. In order to obtain a continuous picture of the cross-section, the 3D electric resistivity tomography (ERT) was chosen.
Geomorphology of the site is quite typical for the Ob river floodplain. The Paleozoic bedrock is covered by Paleogene alluvial sediments; modern alluvial, biogene and artificial sediments are on the top.
As a result of the survey, the geological elements of the cross-section, such as bedrock and sediments were determined. The combined use of geophysical techniques, together with drilling, in-situ testing and laboratory analysis have drastically decreased the time and costs of the exploration work, improving its quality and informational content, thus providing essential information for the design of the infrastructure.