A Geotehnical Study of an Old Waste Disposal Site to be Used for a Railway Station Building Site

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Development of the Belgrade junction includes the construction of the suburban railway station KARABURMA. The site selected is an old waste dump located on a river island joined with the Danube bank by an earth fill.

The initial plan was to remove a 2-m thick waste layer and to replace it with sand in the station area proper, while the building itself was to be constructed on piles.

Since 15 years elapsed between completion of this design, a new solution was proposed to the investors, i.e. to carry out additional investigations in order to evade waste removal and thereby considerably reduce costs and ecological risks involved in waste removal through the residential area.

Because of a remarkable heterogeneity of waste matter and lack of dumping technique records, specific methods were applied in the following consecutive order:

1. Geophysical explorations (GPR, electrical scanning, tentatively, also refraction seismic studies),
2. Geotechnical investigations (exploratory boring, installation and monitoring of piezometers, static and standard penetration tests, and loading tests), stady of the gas generation capacity of waste matter,
3. Checking tests and sounding during construction of a pilot section, and building of a trial field with an embankment exerting pressure equivalent to the projected load on the site, coupled with settlement monitoring.

This methodology made it possible to determine approximately homogeneous zones, in its first phase, and a detailed study of characteristic zones in the second phase. In this way it was possible to extrapolate the data obtained at one point onto a broader waste dump area.

It has been confirmed by checking tests and sounding that the techniques were correctly selected, the result of which was a considerable reduction in the cost and construction time, as well as in ecological hazard.