Influence of former near-surface ore mining on a road construction project

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PROJECT DESCRIPTION

Road Construction Department

District Steinfurt, Germany

FLAC3D™ 7.0

The road construction department of the district of Steinfurt, a district in the north of the coal mining area in the Ruhr region, is planning the construction of the new road K 24n. The road axis runs through an area partly affected by old mining operations. These mining operations took place between 1880 and 1921. During this time various ores have been mined on three different levels in depths of up to 40 m. The height and width of the drifts are assumed to be 2 m while the excavation areas have varying surface areas and heights of 5 m.

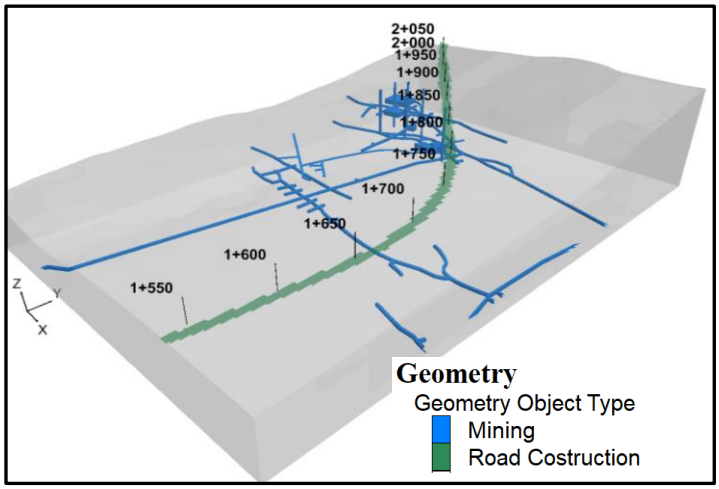

Figure 1. Road construction above mining infrastructure

ITASCA'S ROLE

Itasca was contracted to investigate the effects of the near-surface ore mining and possible safety measures on the new construction of the K 24n. The evaluation of the calculations is comparative: First a reference case is examined, which is followed by the investigation of variants. The variants offer the possibility to cover uncertainties or planned safety measures and to evaluate the respective influence.

PROJECT RESULTS

In the first two variants, the influence of reduced material properties and less favorable geological conditions was investigated. In the third variant, the influence of a stabilization of the old mine by a backfilling measure in the area of the road route is examined.

Neither the reference case or any of the investigated variants give reason to suspect that adverse effects are to be expected outside the immediate construction area of the planned road. The buildings taken into account, shown in blue in Figure 2, do not exceed the threshold for permissible inclinations and do not show any influence by subsidence from the planned construction measure.

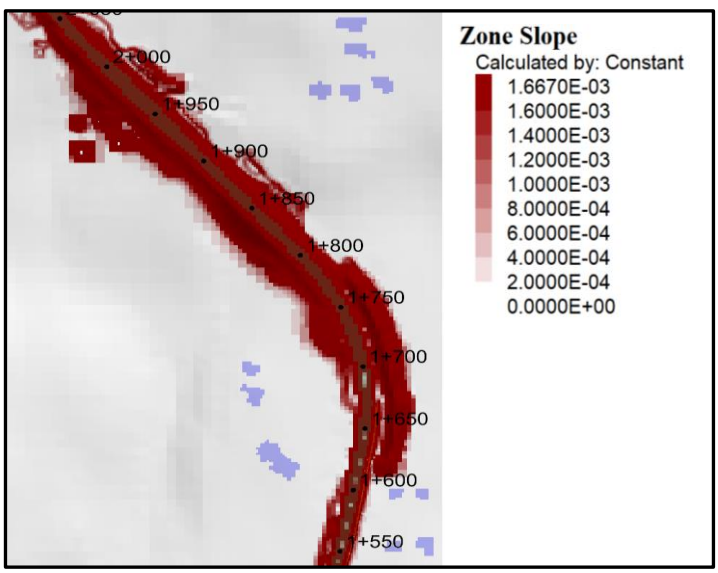

Figure 2. Investigated inclinations

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