

Assessment of tunnel's face support pressure

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Abstract. The evaluation of support pressure ensuring tunnel's face stability during excavation using tunnel boring machines is one of the fundamental problems in tunnelling. This paper presents various approaches to this problem. The analytical models, based either on the principle of limit equilibrium or the limiting analysis (low boundary or upper boundary limiting methods), requires considerable simplification (circular tunnel, homogeneous rock mass etc.). But, on the other hand they are less time-consuming in comparison with the numerical models based on the finite element method. This paper describes the comparison of results of minimum face pressure obtained on the basis of different calculation methods with respect to the specific geometrical and material characteristics of the problem. Geotechnical software Midas GTS NX (based on finite element method) was used for presented numerical analysis. The paper also provides a comparison of modelling results with the results of the face pressure corresponding to the real excavation of the tunnel.